TR 70-23

Volume II

Feasibility Study to Determine Format for Presentation of Information for Explosive Ordnance Disposal (EOD) Procedures

Explosive Ordnance Job Guides

Technical Data Preparation

Guidelines and Specifications

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Prepared For:

AIR FORCE HUMAN RESOURCES LABORATORY

AIR FORCE SYSTEMS COMMAND

WRIGHT - PATTERSON AIR FORCE BASE, OHIO

VOLUME II

EXPLOSIVE ORDNANCE DISPOSAL (EOD)
JOB GUIDES
TECHNICAL DATA PREPARATION GUIDELINES
AND SPECIFICATION

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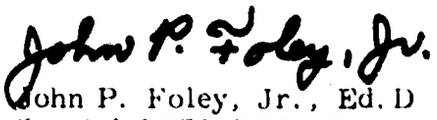
FOREWORD

This report (Volumes I, II, and the classified supplement) represents the results of a portion of Contract AF04(694)-729 and Contract AF04(694)-984, Project 1316, Presentation of Information for Maintenance and Operation (PIMO). This portion explored the feasibility of applying the PIMO data presentation concepts to Explosive Ordnance Disposal technical data. Contained in this report are the results of that study, as well as the methodology employed during this study. In addition, recommendations for the development and implementation of a new technical data subsystem are included. This study was completed and the final report submitted in September 1969.

James Goff, Warren Barr, and John Parlog at Serendipity, Inc., were the principles during the program development. Dr. John P. Foley, Jr. (HHRT) of the Training Research Division of the Air Force Human Resources Laboratory (AFHRL), Wright-Patterson Air Force Base, Ohio, was the Air Force Project Scientist and monitored the technical aspects of the contract for AFHRL. Mr. Charles Schaffer monitored the contract for Space and Missile Systems Organization (SAMSO). Any success one may attribute to the study must be shared by numerous individuals; credit is due to members of E.O.D. Headquarters staff, including Lt Col Herbert G. Tyson, Lt Col C. R. Smith, Maj Ernest Tschirhard, Maj Allan L. Brown, Capt Albert Ricksecker, Jr., Senior Master Sgt James R. Kramer, and Senior Master Sgt Raymond R. Bramini. The inconvenience imposed upon their organizations are realized and sincerely appreciated. Credit must be given to Mr. Walt Henning of Air Force Logistics Command for his cooperation and assistance during this effort. Last but not least, grateful acknowledgement is tendered to Lt Col John Stevenson of Headquarters, United States Air Force who was instrumental in the initiation of this study. The study could never have been conducted without the cooperation and competent performance of these individuals.

This technical report has been reviewed and is approved.



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ABSTRACT

This report describes a program involving the analysis of Explosive Ordnance Disposal (EOD) operational procedures and mission requirements, evaluates the outputs of the analysis, and develops technical data presentation principles within unique and influencial constraints peculiar to EOD activities. A number of analytical tools were employed during the analysis phase of the program: 1) Mission Profiles and Function Flow Block Diagrams were used to display mission paths and the use of existing technical data during a mission; 2) Task and Skill Analyses were used to provide a profile of the EOD technician; and 3) Operational Sequence Diagrams (in ordinal time) were used to reflect man-machine facility interface during a mission. The analyses put out two basic requirements: 1) the need for clear, concise, and unambiguous data presented in a format that is technician-oriented with respect to the size of the material, the ease and speed of data assimilation and reduced memory and yet portraying all material relevant to successfully affecting the EOD mission; and 2) the need for a format that is easily stored and can be rapidly retrieved from a data file. Conclusions reached underscore the need for in depth, job task analysis as a prerequisite for successfully meeting these requirements. This report presents the analyses, conclusions from the analyses, and a specification guideline for the preparation of EOD Job Guides.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF ILLUSTRATIONS

LIST OF TABLES

SECTION 1

INTRODUCTION

1. GENERAL

1.1 This document presents practical guidelines for the preparation of Explosive Ordnance Disposal (EOD) Job-Oriented Guides. The guidelines and specifications contained in this volume are intended to provide both sequential instructional data to enable qualified EOD personnel to identify, render safe and dispose of explosive ordnance and chemical, biological and radiological agents that constitute a hazard to operations, installations, personnel or materials, and sufficiently detailed ordnance operational data to permit EOD personnel to program procedures as demanded by the unique event. The instructions that follow are general only to the extent as to permit alterations to fit a specific piece, type, or model of ordnance or agent. This is a proposed guideline and specification and should be field-tested before accepted for general use.

2. APPROACH

2.1 As a basic premise, Job Guides are to be regarded as a "tool" to be used by technicians in the handling of hardware systems. The efficiency of any tool is predicated upon its interchangeability or versatility, and these attributes are obtained in greatest measure primarily through standardization. The more that standardization can be applied to data tools, the more efficient they will be. Every part of the proposed EOD Job Guide is standardized.

2.2 The concept underlying the development of EOD Job Guides is the presentation of the data in a confined format containing all necessary information, excluding all extraneous material, and simplified to permit familiarity. The format and content, outlined in detail in Section II, displays the data in three general elements: Preliminary Information, Render Safe Procedures, and Disposal Procedures. In the development program, simplifications of data presentation have been engineered according to rigorous Human Factors

criteria. For example, a format was selected that could be stringently confined, so as to permit the desired degree of standardization, the type of illustrations have been used that meet the specific requirements of EOD procedures; and the number of callouts on an illustration is limited, thereby reducing the technician's memory load.

2.3 A further example of scientific standardization in the Job Guides is the verb list. (Refer to Section VI.) Verbs are the action in the language of the technical manuals. Verb diction allows simple instructions and acts as the fulcrum of performance accuracy. In the genesis of these guidelines, every communicative element of the technical manual was examined relative to system requirements. The resulting list was analyzed by USAF EOD personnel who were requested to rank the verbs in order of meaningfulness. In this manner, technical writers are provided with a highly refined reference for the formatting of EOD data as job guides.

3. PROCEDURE

There are two major functions associated with development of a Job Guide: Planning and Writing. They are of equal importance in producing a quality product. However, the planning function will normally require more analysis and synthesis than the writing function.

3.1 Inputs to the planning function will vary as a consequence of design (e.g., new systems versus existing systems). The output of this function will always be the same. With this process, the writing function becomes more "automatic" which, among other things, allows more consistent quality and production control.

3.2 The planning portion of the major development functions is divided into two basic sub-functions: Establishing the Data Base, outlined in detail in Section III, and Job Guide Development, outlined in Section III.

4. QUALITY CONTROL

4.1 Compliance with quality control and review procedures outlined in Sections III and V is mandatory. Failure to adhere to quality control/validation procedures outlined in the above sections could constitute a hazard to life and/or equipment.

SECTION II

ESTABLISHING THE DATA BASE

1. INTRODUCTION

1.1 The purpose of this function is manifold and vital to the complete and accurate generation of the EOD technical data set. Because ordnance is a gross term that can be associated with a wide spectrum of hardware; from a simple cartridge round to a highly-sophisticated system, the establishment of a configuration control system is essential. The Job Guide writer and planner, by establishing a data base, will have created a Job Guide preparation tool to assist in the preparation of the material within two basic constraints:

(a) Distinct format boundaries which must be adhered to.

(b) Interchangeability of ordnance subsystems and/or end items that, when assembled according to mission requirements, can make up a diversified group of weapons, different in arming and firing methods, but all within an ordnance family (or set).

1.2 The ordnance family, or sets described above, can be best exemplified by a general purpose bomb series. The warhead (or major ordnance) is a hardware subsystem without a fuzing system. The fuzing system can consist of a variety of nose fuzes, tail fuzes, and combinations thereof. Until a fuzing system is installed in the warhead, an explosive weapon, capable of detonating at a pre-determined time or under pre-determined conditions, does not exist. Technical data covering the warhead and the installed fuzing system as a specific entity does not, in most cases, exist, hence the Job Guide writer/planner must review the EOD technical library, establish data base matrices, and reduce the combinations of ordnance to specific entities.

1.3 By developing the data base matrices, certain beneficial outputs are achieved:

(a) A specific entity for the ordnance systems is established.

(b) Redundancy of data preparation tasks is reduced or removed.

(c) The most current source of reference material is displayed.

(d) A data (configuration) management program is in effect.

2. DEVELOPMENT OF EOD JOB GUIDE(S) BASELINE USING END-ITEM MATRICES

The development of the data base matrix must be viewed as a multi-tiered set of documents.

2.1 First-Tier Matrix

The first tier is the generation of a top-level matrix that displays ordnance 'families' against existing ordnance series. Two types of entries are possible in the matrix cell. The first type is the letter 'E' (Entity). This designates an existing system or ordnance article that does not interface with an ordnance subsystem. The second type of entry is the letter 'N' (Non-entity) that requires installation in, or accepts the installation of, another ordnance article or subsystem. By generating this first-tier (top level) matrix, existing ordnance entities have been identified and the baseline for the second tier matrix has been established. Table I is a sample first-tier matrix.

2.2 Second-Tier Matrix

Developing the second-tier matrices requires several steps: 1) analyze existing technical data library, 2) establish ordnance entity identification, and 3) introduce Job Guide control numbers. The generation of material and the matrix cell entries associated with these steps will exhibit an organized data base foundation, partitions with the ordnance families and series, and all areas of commonality and/or similarity of significant value to the Job Guide development program.

Table 1. Sample First-Tier Matrix

ORDNANCE FAMILY	ORDNANCE SERIES							
	MK81	MK82	Mabcd	xxx EYE	yyy EYE	dddM	MK105	CDU/20B
BOMBS								
BOMB FUZES								
PROJECTILES								
PROJECTILE FUZES								
GUIDED MISSILES								
ROCKETS								
ROCKET FUZES								
GRENADES								
LAND MINES								
PYROTECHNICS								
CARTRIDGES								
CARTRIDGE ACTUATED DEVICES								
CLANDESTINE DEVICES								
NAVAL MINES								
NAVAL MINE COMPONENTS								
TORPEDOES								
TORPEDO COMPONENTS								
DEPTH CHARGES								
SOUND SIGNALS								
MARKERS								
MISCELLANEOUS EXPLOSIVES								

LEGEND:

E - Existing Ordnance Entity

N - Non-Entity - Requires installation in or accepts instation of another ordnance article or subsystem.

2.2.1 The first step in the development of the second-tier matrices is to analyze the existing technical data library to establish a cross-reference document that displays all references to a specific ordnance system, sub-system and article. This document, shown as an example in Table II is the basis for the first of a series of cell entries in the formal matrix.

2.2.2 The second step is the establishment of ordnance entities (i.e., bomb-to-fuze-to-fin, rocket-to-fuze, etc.). These first cell entries in the formal matrix establish the configuration baseline for a specific ordnance. An example of the matrix, developed through the second step, is shown in Table III.

2.2.3 The third step is the introduction of Job Guide control numbers. This step is comprised of two sub-steps:

(a) Analyze the second step cell entries, establish those areas of commonalities and/or similarities, and rank the order in which the Job Guides should be prepared.

(b) Assign Job Guide control numbers according to the applicable ordnance family.

2.2.3.1 The essential key to the effectiveness of the matrix is the manner in which the data is presented (input). The columnar information must be consistent in that the contents are easily retrievable thus enabling the Job Guide writer/planner to extract (output) areas of interest. In this regard, it is recommended that a general matrix, common to all types of ordnance, not be used. Table III represents a matrix format applicable to general bomb groups. Analysis (outlined in paragraph 2.2.1) will provide sufficient information to the writer/planner to enable him to realistically partition the ordnance types into matrix groups. Once the matrix group partitioning is accomplished, the assignment of the Job Guide control numbers can be affected. Table IV shows a recommended Job Guide Control number prefix letter. Table V shows an example of a typical second-tier matrix providing all elements necessary to effectively perform the mission for which it was intended.

Table II. Sample Technical Data Cross References

Ordnance	Primary T.O. (or Data Control No.)	Supportive T.O.(s)	Remarks
MK81, Mod 0 Bomb	T.O. 11A-2-50-1	T.O. 11A-4-603	
MKab Fuze	T.O. 11A-4-60-3		
MKabcd Fuze	T.O. 11A-4-60-5		Interchangeable with MK_{ab} fuze

Table III. Matrix Format for Bomb Groups

Major Ordnance (Warhead)	Fuzing System	Nose Fuze	Tail Fuze	Internal Fuze	Fin Configuration
MK81	MKxxx Mod 0	MKab	MKcd	-	MKp
MK81	MKyyy Mod 0	MKbb	MKcd	-	MKp
MK81	MKxxx Mod 0	Steel Plug	MKcd	-	MKp

Table IV. Job Guide Control Number Prefixes

ORDNANCE TYPE	JOB GUIDE PREFIX LETTER(S)
BOMBS	B
PROJECTILES	P
GUIDED MISSILES	GM
ROCKETS	R
GRENADES	G
LAND MINES	LM
PYROTECHNICS	PT
CARTRIDGES	C
CARTRIDGE ACTUATED DEVICES	CAD
CLANDESTINE DEVICES	DC
NAVAL MINES	NM
NAVAL MINE COMPONENTS	NMC
TORPEDOES	T
TORPEDO COMPONENTS	TC
DEPTH CHARGES	DC
SOUND SIGNALS	SS
MARKERS	M
MISCELLANEOUS EXPLOSIVES	ME

Table V. Sample Second-Tier Matrix

Job Guide Control No.	Major Ordnance (Warhead)	Fuzing System	Nose Fuze	Tail Fuze	Internal Fuze	Fin Configuration
B81000	MK81	MKxxx Mod 0	MKab	MKcd		MKp
B81001	MK81	MKyyy Mod 0	MKbb	MKcd		MKp
B81002	MK81	MKxxx Mod 0	Steel Plug	MKcd		MKp

SECTION III

JOB GUIDE DEVELOPMENT

1. GENERAL

1.1 To ensure a quality product, a considerable amount of analysis (planning) is required before actually writing each activity. This analysis consumes the majority of procedure development time. The purpose of the planning function is to establish the detailed requirements so the writing activities will fit its intended use.

1.2 Because procedures could be written to the EOD specifications when ordnance is under development -- as well as after a system has been acquired by the Air Force -- planning is discussed for both types. In either case, though, the planning outputs must contain the same information. The following paragraphs treat the inputs needed and functions performed by the planner, and the outputs developed for the writing function.

2. INPUTS TO PLANNER

2.1 Three inputs are required regardless of whether the system is under development or is presently in existence. The first is the data base which the writing must cover. The second is the set of assumptions about the knowledge of the user for whom EOD Job Guides are to be written. The third is the assumed capability of the user.

2.2 Under current USAF training, it can be assumed the EOD technician knows the following: basic characteristics of the ordnance in question, general safety information, the need for an accurate and fast job, and the proper selection of common tools for use on the job.

2.3 Inputs for Planning an Extant Ordnance

Planning should be done by collecting all the task and pictorial information for all activities related to the ordnance from the manuals, drawings, etc., already in existence. This creates the data base.

2.4 Inputs for Planning a Development Ordnance

Writing activities for ordnance under development requires the same information as indicated above, although the form and source of the information will differ.

Inputs to the planner, design documents, must contain the data as follows:

(a) A list of the tasks for each activity per ordnance stating:
   (1) The item, subassembly, or subsystem on which the technician works during each task.
   (2) Location of technician per task.
   (3) Time requirements related to operation or detonation of ordnance.
   (4) The sequence of tasks.
   (5) Notes, Cautions or Warnings specific to a task called out prior to the task.
   (6) Supplies required per task per technician: quantity, name and number.
   (7) Special tools: tools and equipment needed per task per technician; quantity, name and number.

(b) Functional drawings of the ordnance system showing well-defined input and output states between functions with regard to information, material, energy flow and any relationships to other components or subsystems.

(c) For each ordnance system: data showing location and configuration of each end item, access for removal of components, the interruption of the firing train and conditions under which tasks must be performed.

(d) Identification of all removable components or subsystems identification of all components which are mounted or connected across or within systems.

(e) Identification of any material necessitating special handling.

(f) Complete pictorial information, as found in engineering drawings, artist's renderings, photographs or mock-ups of component systems.

3. PLANNING PROCESS

3.1 Extant Systems (See Figure 3-1)

3.1.1 When planning actually begins, the impact of the different input forms for the developing and existing system becomes clear. The following is a brief breakdown of the planning function for an existing system. Figure 3-1 presents a detailed Function Flow Logic Diagram (FFLD) illustrating the job Guide development for extant systems.

(a) Using the data base, assemble all relevant data on the ordnance. Group any available pictorials with the tasks they support. It is recommended that the planning of each system begin with the Preliminary Information section of an activity.

(b) Become familiar with the T.O. procedures and the equipment involved.

(c) Organize the data into the following segments: the Preliminary Information section; the Render Safe Procedures section; and, finally, the Disposal Procedures.

(d) Interview senior technicians to determine how the activities should really be performed to be both safe and at the step level (as against the task level). Validate what is called for in the T.O. as needed, such as preparation and equipment needed.

(e) Assemble the data into a planning package. This package shall be used as guidelines to write the activity by the technical writer. Check that all data required (e.g., tools, supplies, location of primary components, etc.) are included.

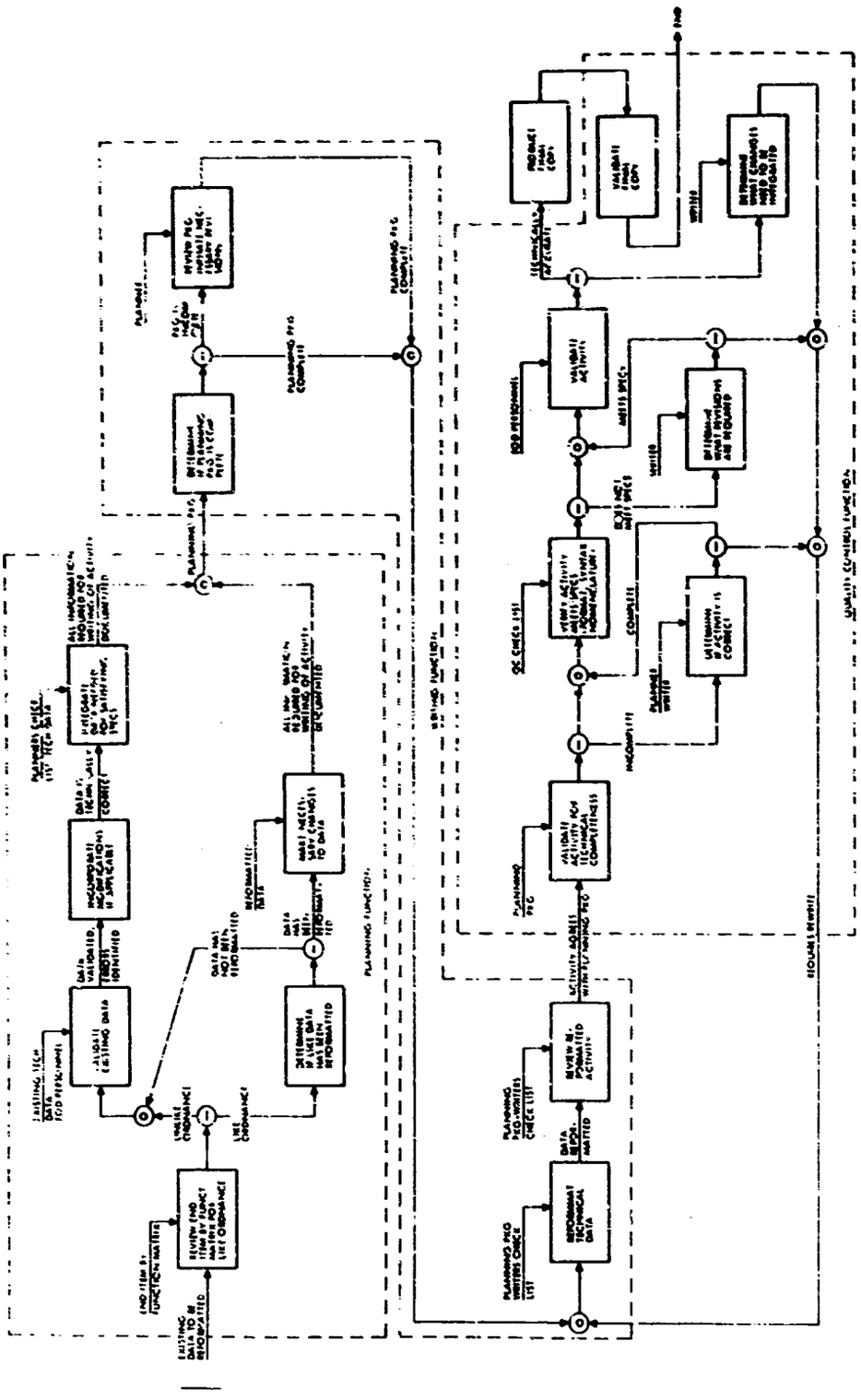


Figure 3-1. Functional Flow Logic Diagram (FFLD) - Job Guide Development for Extant Systems.

(f) Prepare the technical material, constantly keeping in mind the capability and knowledge of the using technician. This is best accomplished by the writer imagining himself as the technician, always considering the user's needs.

3.2 Systems Being Developed

The following is a brief breakdown of the planning function for a system being developed. Figure 3-2 presents a detailed function flow logic diagram illustrating the Job Guide development for newly developed systems.

(a) Using the design documents, assemble all relevant data on the ordnance. Group all available technical drawings with the tasks they support.

(b) Become familiar with the procedures and equipment involved.

(c) Organize the data into the following segments: Preliminary Information; Render Safe Procedures; and, finally, the Disposal Procedures.

(d) Interview design engineers so planned procedures can be validated for technical accuracy.

(e) Interview cognizant EOD technicians so planning procedures can be validated for practicality.

(f) Assemble the data into a planning package. This package shall be used as guidelines to write the activity by the technical writer. Check that all data required, by the writer, are present (e.g., tools, supplies, location of primary components, etc.).

4. PLANNING CHECKLIST

4.1 Before beginning any writing on a system for which all planning has been accomplished, perform the following:

(a) Check to see that all activities that were to have been planned have been planned.

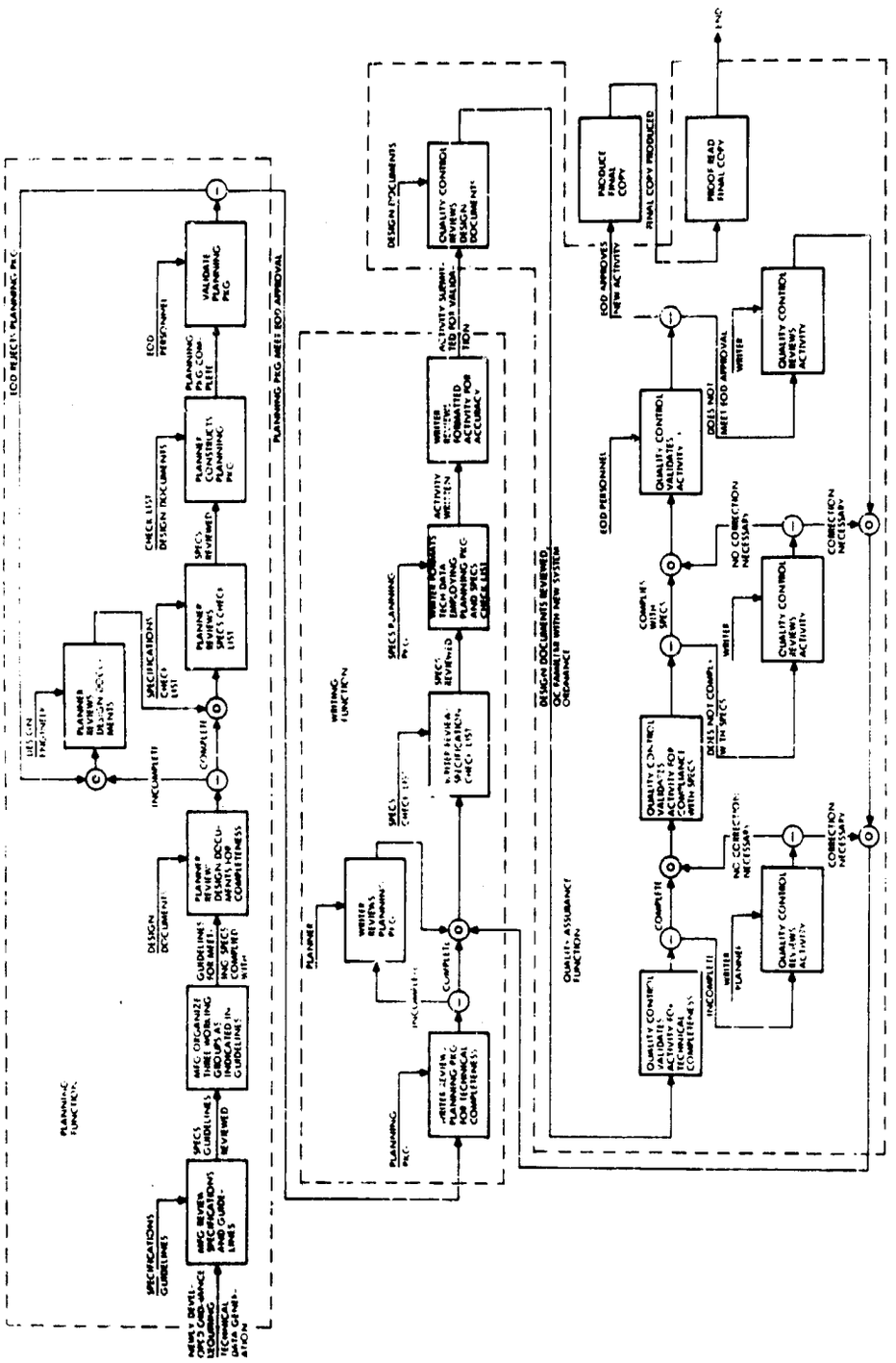


Figure 3-2. Functional Flow Logic Diagram (FFLD) - Job Guide Development for Newly Developed Systems.

(b) Check that uniformity exists across components within the system as reflected in planning the packages.

(c) Check also that Notes, Cautions, and Warnings are consistent across activities where identical situations or tasks exist.

(d) Check all Render Safe activities to determine that the output conditions specified therein direct the technician to the correct Disposal Procedures.

4.2 Once these cross-checks have been made between activites for the system, planning packages for an entire system for all activities may be released for writing.

5. PLANNING OUTPUTS

5.1 Although the outputs of the planning function may be inferred from the previous discussion, a separate treatment of each output is in order. As noted previously, many commonalities exist across functions, for both the planning inputs and the planning process. This is equally true of outputs.

5.2 While the outputs are described below, their form is not treated in any special way. Outputs are listed generally in the order in which one might be exposed to them as he reviews an activity package.

(a) Part identification.

(b) Tools and equipment lists and identifying numbers.

(c) Supplies (expendable, consumable items).

(d) Summary of ordnance operation information.

(e) Location of main work area during activity.

(f) Notes, Cautions, or Warnings applicable to the entire activity which will be placed in the input conditions.

(g) Step-by-step procedures and pictorial information.

(h) If activity is segmented, as some Render Safe and Disposal Procedure activities can be, the procedures should be produced in blocks coinciding with each segment.

(i) Output conditions for each activity as required. There shall never be an output condition from Disposal Procedures.

SECTION IV

PREPARATION REQUIREMENTS

1. GENERAL

1.1 This section establishes the requirements for the format, content, and preparation requirements of EOD Job Guides. The instructions that follow define a divisionalized format that is applicable to any type of ordnance article, ordnance system, or hazardous agent. The content of each Job Guide will vary in accordance with the instructional material required to provide the appropriate data, however, the intended scope and level of coverage shall be fulfilled. The requirements outlined in this section stipulate Human Factored boundaries which, when adhered to, will provide highly standardized documentation.

1.2 Prior to preparing data, in accordance with the requirements outlined in this section, it is mandatory that the technical writer have complete familiarity with the procedures and instructions outlined in Sections III, IV, V, and VI.

2. SPECIFICATION PRIORITY

2.1 This specification provides the modification requirements of WS12755 and those specifications or standards forming a part of WS12755 for:

(a) Data presentation format

(b) Basic characteristics of text

(c) Writing style

(d) Content of technical data

(e) Preparation of reproducible copy

2.2 These modifications specifically define the changes to implement the EOD Job Guides. These requirements also apply to changes and revisions. Where

the requirements specified in the referenced documents conflict with the requirements cited herein, the requirements of this specification shall apply when EOD Job Guides have been specified.

3. FORMAT

Note: The following material in this sub-section(Format) must be viewed as essentially preliminary data. This is necessary due to conclusions from analysis (discussed in Volume I and summarized in Volume II of this report) revealing the need for additional EOD data usage studies.

3.1 General

The format of each EOD Job Guide shall consist of three basic divisions: Preliminary Information, Render Safe Procedures, and Disposal Procedures. With the exception of the Preliminary Information section, the divisions relate to specific EOD activities required during a mission. The format specified herein reflects independent and discrete boundaries between the activities/ divisions.

3.2 Arrangement

The material, consistent with the three basic divisions, shall be arranged to be reproduced in pocket size booklet form. The booklet form is designed to accept the required instructional data regardless of the length (or brevity) of the material. The material shall be arranged as exemplified in Figure 4-1. The division of the material from page-to-page shall reflect good judgment as to where text separations should take place. If at all possible, the separations shall occur between major activities. Separations shall never occur within a step. Notes, Cautions, and Warnings shall be on the same page unit as the text or pictorial to which they refer. Text shall always be on the same page unit as the pictorial to which the text is associated. During the writing phase, as well as serving as a quality control instrument, the technical writer shall adhere to the quality control guidelines established in Section V and the planning checklist in Section IV.

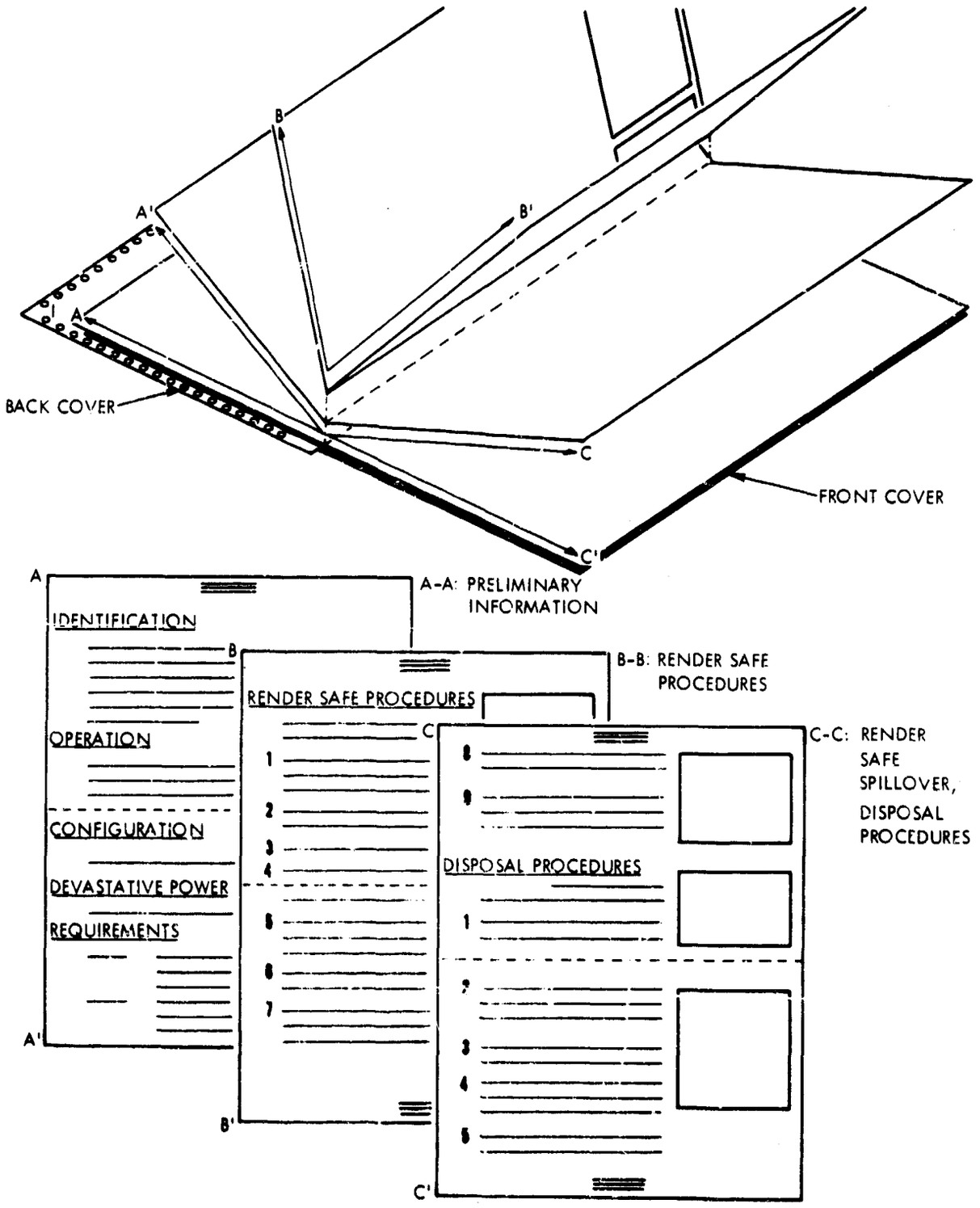


Figure 4-1. Material Arrangement by Activity Segment

3.2.1 The length or brevity of the Job Guide will be in direct proportion to the material required to cover the ordnance article or agent. Thus, occasions will arise when the data will consume an odd number of page units. Figure 4-3 shows the various ways in which data segmentation and the use of page units shall be affected.

3.2.2 For purposes of printing/reproduction, the reproducible material shall be prepared in folio form. An example of this is shown in Figure 4-3.

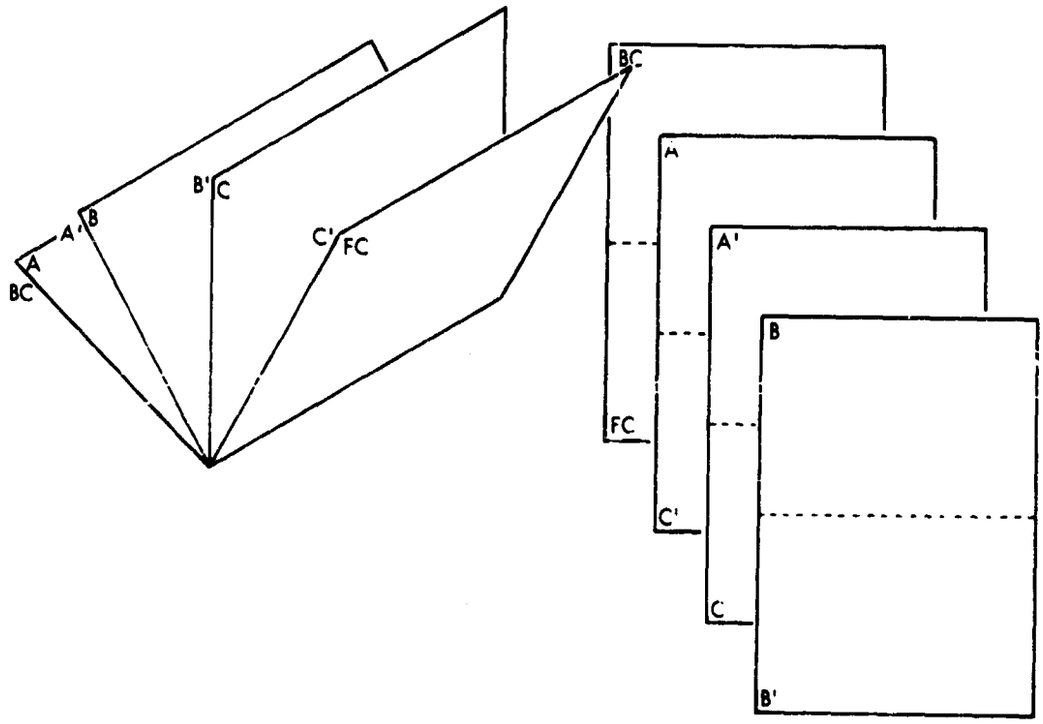
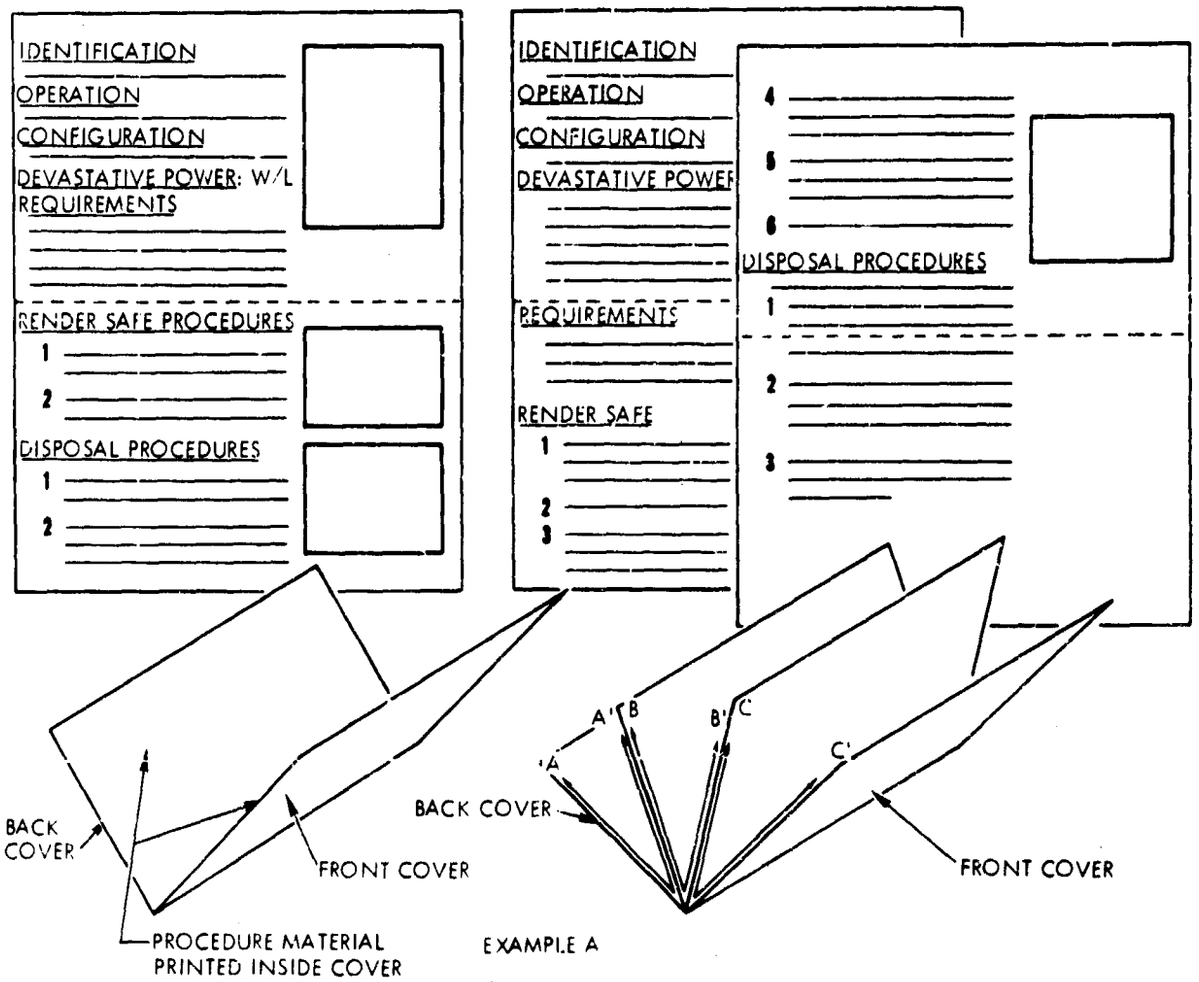


Figure 4-2. Folio Format for Reproducible Copy

3.3 Page Sizes and Content

The following dimensional information and the sizes of type and illustrative material, outlined in paragraph 3.4, are for the final, reproduced size. The size of the working material is not directed by this specification; however, the dimensional requirements for pages, text and illustrations for the final size are mandatory.



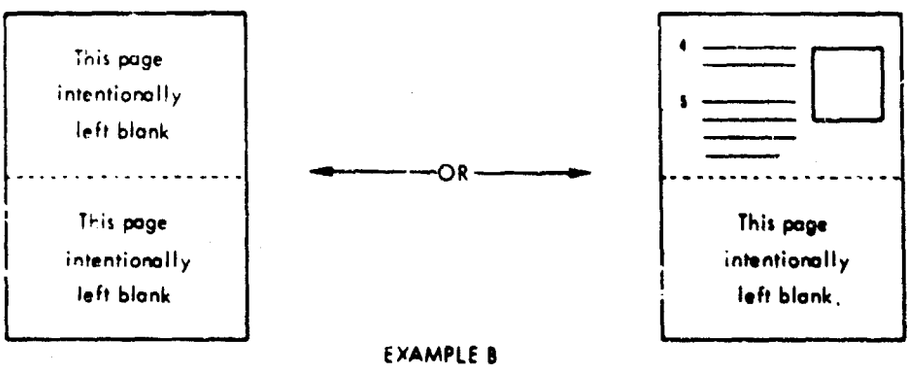


Figure 4-3. Data Segmentation and Page Units Examples

3.3.1 Cover. The cover shall contain the elements shown and be placed according to the dimensions outlined in Figure 4-4.

3.3.2 Internal Pages. Internal pages shall comply with those dimensions shown in Figure 4-5. Internal pages include the inside folds of the cover.

3.3.3 Placement of material shall apply, as appropriate, to Figure 4-4 and 4-5.

3.4 Preparation of Reproducible Copy.

3.4.1 Text. The text material shall be prepared in a gothic type face that, when reproduced in final size, is a minimum of 9 point. The placement and indenture of the text shall be in accordance with Figure 4-5.

4.3.2 Cautions and Warnings. Cautions and Warnings shall be surrounded by a printed border constructed as shown in Figure 4-5.

3.4.3.1 The pictorial shall be limited to only the equipment upon which the actions in the text segment refer, plus its immediate surroundings to allow a technician to clearly identify the equipment item of concern.

3.4.3.2 Callouts or identifiers on pictorials shall be limited to seven, with a leader line connecting the nomenclature to the correct point on the illustration. The callouts or identifiers shall be limited to only those used in the instructions on the facing page. Callouts shall be a gothic type face that, when reproduced in final size, is a minimum of 12 point.

3.4.3.3 Directional arrows shall be used to help the reader orient himself with respect to the illustration.

3.4.3.4 All numerical tolerances will be repeated on the illustration in list form in an area of the illustration which will not affect the readability of the identifiers or callouts.

3.5 Reproduction

3.5.1 Photolith Negatives/Photo Direct.

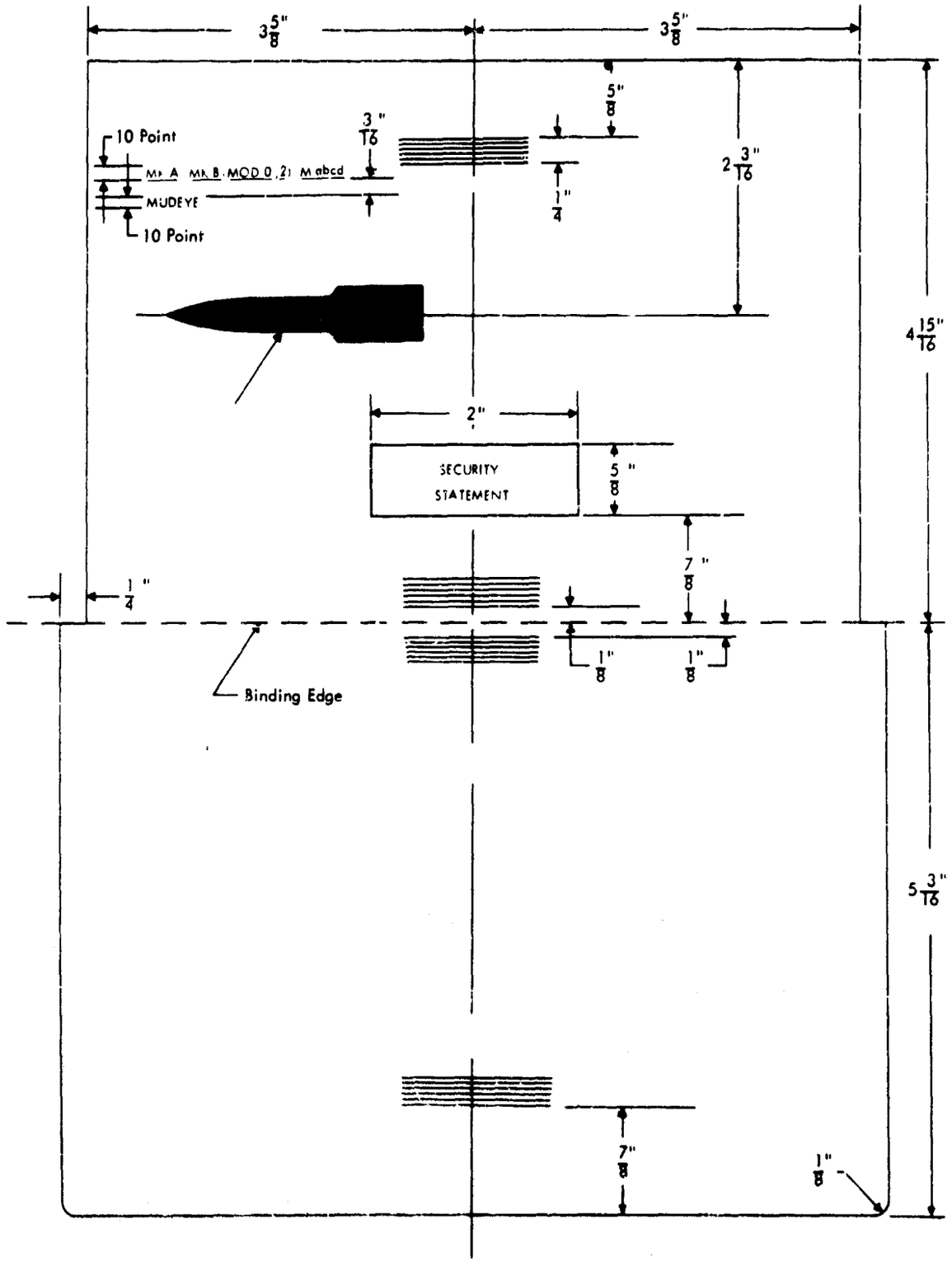


Figure 4-4. Format Layout Dimensions - Cover

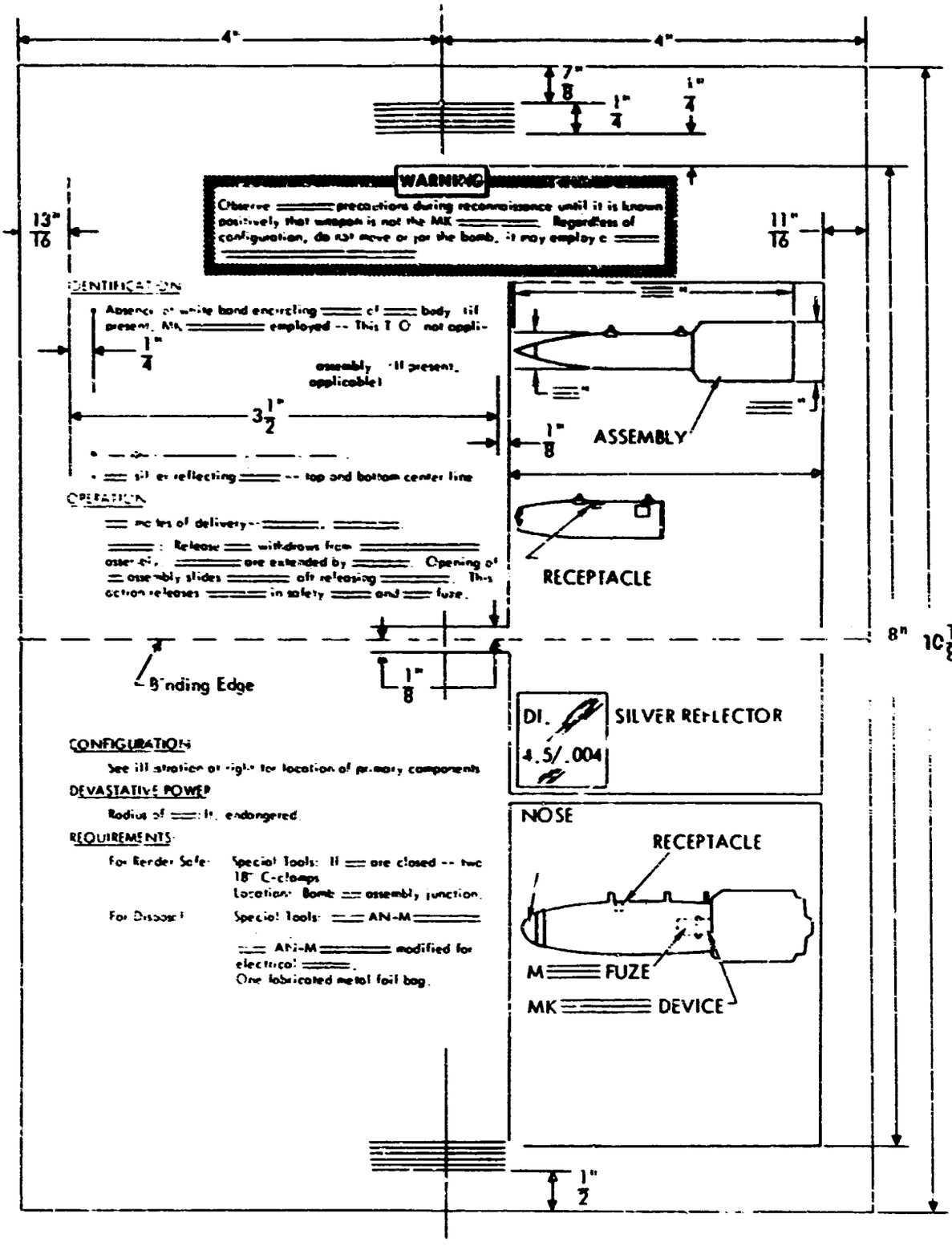


Figure 4-5. Format Layout Dimensions - Internal Pages

3.5.1.1 The requirements of MIL-M-38784 are applicable except as specified herein.

3.5.1.1.1 The photolith negatives for covers shall be no less than 8-3/4 inches, nor no more than 9 inches wide by no less than 10-3/4 inches, nor no more than 11 inches high.

3.5.1.2.1 The photolith negatives for internal pages shall be no less than 8 inches nor no more than 8-1/4 inches wide by no less than 10 inches wide nor no more than 10-1/4 inches high.

3.5.1.3 Photo Direct. For reasons of economy on limited distribution of printed matter, the photo direct process of offset plate making may be used. Authority for use of this process shall be issued by the procuring agency. Prior to photo direct plate making, one complete set of negatives shall be produced and stored for insurance purposes.

3.5.2 Printing

3.5.2.1 Printing on the material, referenced in 3.5.3, shall be accomplished using an ink substance that cannot be penetrated by water, greases, and other nonacid chemicals.

Note: Firm recommendations for the ink material can be made after sufficient studies have been completed.

3.5.3 Material. The cover and internal page(s) shall be printed on white, water-repellant stock, of sufficient weight to withstand exposure to adverse elements and abusive treatment.

Note: Firm recommendations regarding specific materials can be made after sufficient studies have been completed.

3.5.4 Binding. The binding of the internal pages to the cover shall be done by the most suitable and convenient means. Stapling or saddle-sticking is considered appropriate.

4. PROCEDURE CONTENT

4.1 Preliminary Information Content

4.1.1 The primary purpose of this section is to provide information and instructions to ensure that EOD personnel shall:

(a) Be alert to all hazardous or potentially-hazardous conditions.

(b) Positively identify the ordnance or agent involved.

(c) Be aware of the devastative power and range of the ordnance on which he is working.

(d) Have a complete listing of the special tools, equipment, and supplies required to safely and timely perform the Render Safe and Disposal Procedures.

4.1.2 Hazardous Conditions

4.1.2.1 Because certain types of ordnance are capable of being armed by various fuzing mechanisms and that these ordnance and fuzing mechanisms can be visually similar, a clear, concise, and accurate warning, alerting EOD personnel of this possibility, shall preface any other form of instructional material in the Job Guide.

4.1.3 Identification

4.1.3.1 Information for the identification of the ordnance or agent shall be written in clear, concise, and unambiguous terms, and shall contain illustrative material that will enable EOD personnel to positively identify the ordnance or agent involved. Examples of the type(s) of information required are descriptive text and illustrations showing:

(a) Dimensions relating to length, width, diameter, fin configuration, etc., or any container or shape characteristics that would assist in identification.

(b) Markings and painting data such as basic color descriptions, color and locations of identifying bands, stripes, etc., and the description and location of identifying marks and stenciled nomenclature or decals.

(c) Features and fittings data such as description and location of such details as hoisting lugs, nose windows, extended probes, etc.

(d) Fuze characteristics, such as the pressure of arming vanes, pressure probes, ram air fan blades, etc.

(e) The operational characteristics of the ordnance such as the firing train order, its' methods of operation and, if applicable, the various stages of arming, firing, and detonation.

4.1.4 There shall be an illustration in the Preliminary Information section. This illustration shall depict those elements critical to the identification requirements. The illustration shall be so constructed as to show all identifying characteristics and dimensions. Line drawings are preferred to photographs.

4.2 Render Safe Procedures Content

4.2.1 Information for the Render Safe Procedures shall be written in clear, concise, and unambigous terms. The information shall be completely self-contained without references to other sections of the Job Guide or to other publications. The information shall contain:

(a) All safety precautions which must be adhered to.

(b) Procedures for the use of special tools required to render the ordnance safe.

(c) Underscored and capitalized references to all time or distance requirements (e.g., "After fuze has been removed, WAIT 5 MINUTES to make certain that firing train has positively been interrupted"or"MAINTAIN 100 FOOT DISTANCE until burning has been completed").

Note: If copy in which time or distance requirements are called out as a caution or warning, the entire statement will be capitalized. Refer to paragraph 3.4.2.

(d) Dimensional and location information such as the exact placement of remote chisels against the main charge case, the exact position of a particular ram-air fan blade and the exact attitude (preferable in degrees) of an extended fuze arm or probe.

(e) The identification of, and procedures for, the removal of those parts requiring attention or handling during the render safe activity. This includes parts not associated directly with the firing train but require actions such as removal, rotation, and safety-wiring, etc., as part of the overall task.

(f) Specific step-by-step instructions for the interruption of the firing train (e.g., what to do, how to do it, and where to perform the action).

(g) Specific instructions for the removal of disarmed or safetied components or subassemblies (e.g., what to do, how to do it, and where to perform the actions).

(h) Specific procedures for the separated, safetied components or subassemblies.

4.2.2 There shall be an illustration(s) in the Render Safe Procedures section. This illustration shall depict those elements critical to the procedure. The use of cutaway and exploded views is recommended. Wiring diagrams shall be included when the knowledge of signal flow is critical to the procedure.

4.3 Disposal Procedures Content

4.3.1 Information for the Disposal Procedures shall be written in clear, concise, and unambigous terms. The information shall be completely self-contained. There shall not be references to other portions of the Job Guide or to any other related publication. The information shall contain:

(a) All safety precautions which must be adhered to.

(b) Procedures for the use of special equipment required to hoist, carry, or in any manner transport or munipulate the ordnance.

(c) Procedures (including the locations of hooks, cables, or lines) for the hoisting and handling of the ordnance.

(d) Environmental information in which the ordnance must be destroyed.

(c) Procedures for destruction of the ordnance.

4.3.2 There shall be an illustration in the Disposal Procedures section if, during the procedure, the requirement for and the use of demolition tools, procedures, and methods cannot be clearly defined by the use of descriptive text.

5. PROCEDURE WRITING

5.1 Introduction to Writing

5.1.1 To have utility, the EOD Job Guide must reflect the specific information requirements of the user. The format developed and presented here is the result of substantial analysis and research.

5.1.2 The EOD Job Guide format utilizes the inherent relative advantages of text and illustrations to optimally communicate the procedures. In considering a technician, one must realize that he knows the general characteristics of the ordnance and what it looks like. Information about what the technician is to do to the equipment is presented in the text.

5.1.3 The following section explains the major principles of information presentation which form the basis for the EOD Job Guide format. These must be understood before the writer can effectively prepare the Job Guides.

5.2 Requirements of Information Presentation

5.2.1 There are several requirements the Job Guide is to satisfy. The principles on which these requirements were based are presented below:

(a) Effect the applicable procedure, without errors, by the technician.

(b) Effect the procedures in the fastest possible time.

(c) Provide sufficiently detailed operation for the ordnance to permit the EOD technician to structure the applicable Render Safe/ Disposal) procedure demanded by events and/or conditions.

5.2.2 To fulfill these requirements necessitates the production of procedures and data which:

(a) Are unambiguous,

(b) Are easily understood by the technician as to intent,

(c) Recognize the man's present knowledge and capability,

(d) Allow for the physical conditions under which he must operate.

5.2.3 The writer accomplishes this with some difficulty. It requires that he constantly keep in mind the capability and knowledge of the technician. To perform effectively, the writer must imagine himself as the technician and consider his needs.

5.2.4 With respect to minimizing the time to perform the tasks, several considerations are important. Two factors contribute to time on the job over which the job guide can exercise control. One of these is the time required to read the text and look at the illustrations.

5.2.5 The second factor over which limited control may be exerted is the time for moving from one work place to another. One of the inputs contributed by planning is an optimum sequence of tasks according to location to minimize such movement, thereby reducing time required to do the job.

5.2.6 The writer must endeavor to be as concise as possible, yet convey sufficient explicit information necessary to perform the task. Portray as much as possible of the total information in the pictorial for the jobs or portions of jobs for simple tasks; information is extracted much faster from pictorials.

5.2.7 As noted in paragraph 6-3, a task is comprised of up to three steps. Each step is an instruction for a discrete unit of work. If the job is simple, yet contains several units of work, present as much information as possible in the task. Since tasks are designed to be wholly read at one time the ratio of reading to working will usually be in favor of the working. Again, continual understanding of the technician(s) performing the activity will help determine the way in which a given procedure must be written.

5.2.8 Experimentation in immediate memory has indicated limits for the number of callouts on the illustration and the number of words and steps in a task. No more than seven callouts should be used in a pictorial, otherwise search time and recall are affected. No more than twenty-five words total should be included in a task. These words should be divided into a maximum of three steps. The requirement is that no more than three thoughts per task should be imposed upon the reader. The user should be able to read the task once, store it in memory, and do the job without having to reread it. These requirements result in higher speed of performance and a lower likelihood of errors.

5.3 Preparation for Writing

5.3.1 Prior to writing, the planning input must be reviewed noting:

(a) What is to be accomplished.

(b) What specific steps are to be taken.

(c) Time-related tasks.

(d) Equipment configuration.

(e) Importance of Notes, Cautions, and Warnings.

Note: The remainder of this section presents EOD writing procedures, definitions, and preparation requirements in, or for, Job Guide form.

5.4 Writing Preliminary Information

5.4.1 Figure 4-6 is a sample of a typical Preliminary Information section. It contains many types of information denoted by headings.

5.4.1.1 Hazardous Conditions Warning. As defined in paragraph 4.1.2, certain hazardous conditions are possible by virtue of ordnance and fuze similarities. An example of a proper warning is:

WARNING

> Mk AA, Mod 2 Bombs can be equipped with a Mk xx Proximity Fuze, a Mk y Anti-Disturbance Fuze, a Mk xz Optical Fuze, or any combination of the three. Until positive identification of fuzing is established, do NOT approach the ordnance any closer than 300 YARDS; do NOT approach the ordnance from or within 45 DEGREES of the nose; do NOT approach the ordnance for 5 MINUTES.

5.4.1.2 Identification Data. Identification material must be prepared to display all pertinent characteristics of the ordnance or agent. Research and analysis of the data base matrix shall be accomplished. This research will display references to existing printed material covering common or similar ordnance systems. This printed material shall serve as input data to the Job Guide writer to enable him to construct the identifying text and illustrations so as to prevent any confusion between common or similar ordnance.

5.4.1.2.1 When preparing instructional text for the identification procedures, extreme care must be exercised that assumptions on the part of EOD personnel are not permitted. Under no circumstances shall the material be prepared that can lead to incorrect decisions. All prepared material shall be validated for accuracy, adequacy, and operational requirements by cognizant EOD personnel.

5.4.1.2.2 Identification requirements versus environmental conditions. Occasionally, the Job Guide writer must recognize the possibility of

WARNING

If fuze is ═══, wait ═ hours before performing the following procedures. Fuze ═══ require ═ hours to discharge.

-NOTE-

If holes in ═══ and ═══ do not align in the following task, go to task 10.

9. Depress ═══. Insert ═══ through ═══.

WARNING

If bomb is in ═══ area, ═══ ═ must be placed in a fabricated metal foil bag.

10. Manually unscrew ═══, with ═ attached, counterclockwise. Remove ═══ from bomb. Go to Disposal Procedures.

DISPOSAL PROCEDURES

-NOTE-

If bomb has been rendered safe, Standard E.O.D. procedures shall be employed for fuze disposal.

WARNING

When covering bomb, ensure that no rocks or hard materials jar the bomb.

1. ═ bomb body with ═.
2. Make ═ in ═, ═° from ═══ line. Bottom of ═ must expose ═══.

═══ assembly remains ═. Release of ═ from ═ withdraws ═══ from ═══ and ═ ═.

CONFIGURATION

See illustration at right for location of primary components.

DEVASTATIVE POWER

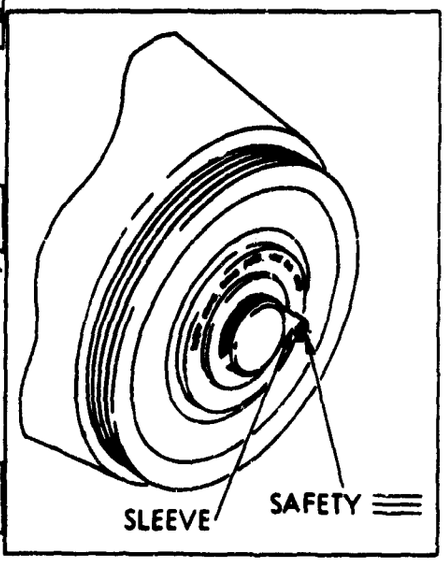
Radius of ═ ft. endangered.

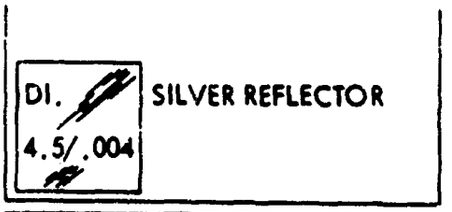
REQUIREMENTS:

For Render Safe: Special Tools: If ═ are closed -- two 18" C-clamps.
Location: Bomb/═ assembly junction.

For Disposal: Special Tools: ═ AN-M═══;

═ AN-M═══ modified for electrical ═.
One fabricated metal foil bag.





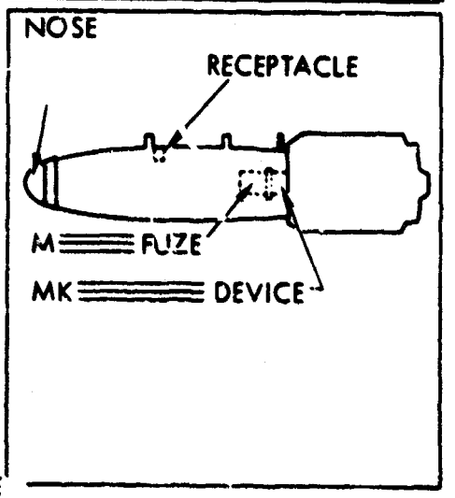


Figure 4-6. Sample Preliminary Information Section

environment creating a constraint to the identification task. If, during research, it is apparent that a marked similarity between ordnance is possible and that under adverse conditions (environment, attitude of ordnance, etc.) positive identification is difficult, or impossible, a statement to that effect shall be made. This is best exemplified by the following precautionary statement.

> "The only identifying characteristic between the MK AA, Mod 3 bomb with an MK ab fuze and the MK AA, Mod 3 bomb with an MK cd fuze is the fuze decal ' ', secured to the underside of the main charge case. If the decal is not visible, the ordnance shall be presumed to be the most hazardous of the two and appropriate safety precautions observed."

5.4.1.2.3 The identification data shall include an illustration depicting all identifiable characteristics of the ordnance. The illustration shall show all pertinent dimensions, features and markings. It shall contain sufficient nomenclature (callouts) to support the descriptive text.

Note: Callouts for the identification illustration are not subject to the limitation of seven per figure. This is not to be construed as permission to include extraneous nomenclature. This illustration is used as a recognition tool and as such is not subject to memory load limitations.

5.4.1.3 Devastative Power and Range Statement. A statement relating to the power and range of the ordnance shall be included. The purpose of this statement is to enable EOD personnel to evaluate personnel and equipment evacuation requirements. An example of this statement is:

> "Blast Effect: 500 yards, ordnance fragments: 750 yards"

5.4.1.4 Special Tools, Equipment and Supplies Required. This section must be prepared to display those logistic requirements necessary to perform the Render Safe and Disposal Procedures. These logistic requirements are predicated on specific mission needs. These are exemplified by the fact that conditions will dictate the needs for tools, and supplies. When preparing the

Job Guide, the writer must assume that under the most adverse conditions, special tools, equipment and/or supplies will be required. On this basis, these requirements must be listed, thus establishing the optimum tool complement for the mission. The planning function identifies the requirements for this sub-section.

5.4.1.4.1 Special Tools and Equipment

5.4.1.4.1.1 By definition, entries in this sub-section are those tools or equipment required for the Render Safe and Disposal Procedures which are not normally part of the technician's tool complement. These tools and/or equipment shall be listed as shown in Figure 4-7.

5.4.1.4.2 Supplies

5.4.1.4.2.1 Supplies are those (consumable) items which may not normally be carried by the technician, yet do not qualify as special tools or equipment. The following is an example. Note that the example lists the name and number.

Supplies: Safety Wire, MS20095CU
Sealant, MIL-S-8802

5.5 Writing Render Safe Procedures

5.5.1 Figure 4-7 is a sample of a typical Render Safe Procedures section. This section relates to a specific EOD mission activity. The necessity for accuracy is of primary importance when preparing instructional data for this section. As defined in paragraph 4-2, the section consists of numerous types of instructional or reference data. By definition, entries in this section are those required for the performance of the activity regardless of the scope required to display the instructional material.

5.5.1.1 Planning Render Safe Procedures. Planning the writing and illustrating of these procedures is essential to ensure a complete set of technical data within the Human-Factored boundaries outlined herein. Because ordnance, by definition, is a gross term encompassing a wide

RENDER SAFE PROCEDURES

-NOTE-

If (Mod 0; Mod 2) assembly is open, go to task 5. If assembly is closed, begin with task 1.

1. If present, cut close to flange.

WARNING

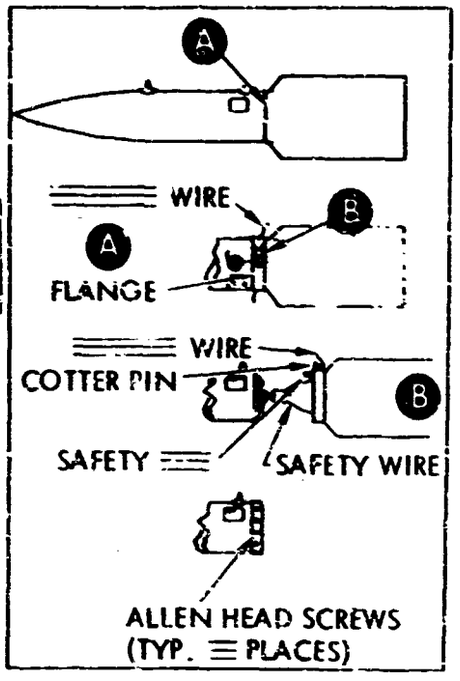
The release and assembly are to prevent withdrawal of from , open the assemblies with extreme caution using C-clamps to secure during following procedures.

2. Install two C-clamps on assembly. Secure clamps.
3. Remove cotter pin and from assembly.
4. Loosening C-clamps slightly open assembly.

-NOTE-

Fuze is located within ° of lug.

5. Cut .
6. Supporting assembly, remove Allen head screws. Remove assembly.



-NOTE-

If is securing , fuze is . If fuze is , continue with task 7. If fuze is , wait hours and go to task 9.

7. Cut and twist ends of safety together. If safety pin is not installed, insert safety pin into .

-NOTE-

If is present with extending through , repeat task 7 for .

8. Manually unscrew , with attached, counterclockwise. Remove from bomb. Go to disposal procedures.

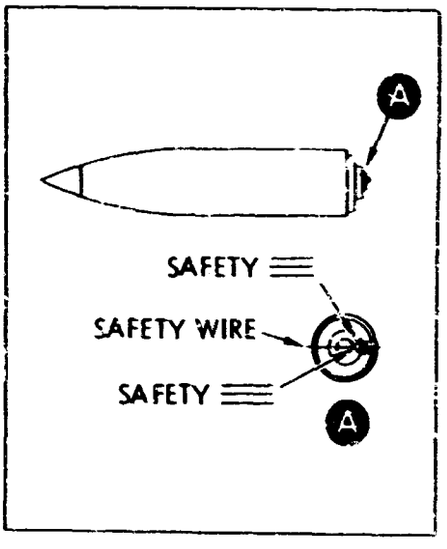


Figure 4-7. Sample Render Safe Procedures Section

variety of types, models, features, and operational characteristics, the writer must carefully address the scope of the activity and the psychological constraints imposed by this specification. Close coordination with the data base matrix, planning activities, and quality control procedures will assist in the creation of an RSP baseline displaying the requirements and boundaries for the specific procedure.

5.5.1.2 The output of the planning exercise, defined above, will normally reveal the necessity to segment the procedures. This is accomplished by the Job Guide writer, exercising the knowledge gained from ordnance research, text and illustration information requirements, writing style constraints (outlined in paragraph 5.7), and the referenced Human Factor boundaries. The example shown in figure 4-7 displays how a normally lengthy procedure was segmented.

5.5.1.3 The Render Safe procedures shall be prepared from the planning data outputs and shall include:

(a) The proper use of Warnings, Cautions, and Notes.

(b) Positive identification of the ordnance sub-systems affected by the procedure.

(c) Positive identification of components and/or end items affected by the procedure. These components or end items fall into two categories:

(1) Those affected by, or effecting, the interruption of the firing train.

(2) Those that require handling, removal, etc., to gain access to firing train components.

(d) All values and tolerances critical or essential to the procedure.

(e) All steps, tasks, and functions necessary to perform the procedure. This instructional material shall be prepared in accordance with writing principles, outlined in paragraph 5.7.

(f) Clear, concise illustrations necessary to perform the procedure. Illustrative material shall be prepared in accordance with illustration requirements, outlined in paragraph 7.2.

Note: The proper, most effective use of illustrations is a fundamental requirement; however, they are used as a means of associating an item with an instructional piece of text. The only exception to this rule is the use of schematics or diagrams that display operational or functional signal flows. The use of this type of illustration is permissible (and in some instances, mandatory) if they are beneficial (or critical) to the procedure.

5.6 Writing Disposal Procedures

5.6.1 Figure 4-8 is a sample of a typical Disposal Procedures section. This section, like the Render Safe Procedures section, relates to a specific EOD mission activity. It is important for the Job Guide writer to recognize the necessity of accurately preparing the material in this section. Ordnance shall be considered hazardous to personnel and equipment until all dangerous elements associated with the ordnance or agent have been completely eliminated by approved means. The interruption of a firing train, the dismantling of a fuze, etc. does not constitute any less hazard to the personnel until proper and complete disposal procedures have been affected.

5.6.1.1 Planning Disposal Procedures. Planning the writing and illustrating of these procedures is essentially the same as that required for the Render Safe procedures. The primary difference lies in the knowledge the Job Guide writer must have in this area of ordnance handling, transporting and basic ordnance destruction methods. Obviously, the writer must understand the scope of the activity, coordinate with the data base matrix and quality control procedures to establish a Disposal Procedure baseline.

5.6.1.2 The output of a planned Disposal Procedure will not normally reveal the necessity to segment the procedures as a disposal activity, by nature, will

not be as lengthy. If the procedure does require segmentation, the requirements of this specification shall apply.

5.6.1.3 The Disposal Procedures shall be prepared from the planning data outputs and shall include:

(a) The proper use of Warnings, Cautions and Notes.

(b) Positive identification of the ordnance sub-systems affected by the procedure.

(c) Positive identification of ordnance components and/or end items affected by the procedure.

(d) Positive identification of destructive components and/or mechanisms used to destroy, burn, cause explosion, etc., thus causing the ordnance or agent to be considered harmless.

(e) All values and tolerances critical or essential to the procedure.

(f) All steps, tasks and functions necessary to perform the procedure. This instructional material shall be prepared in accordance with writing principles, outlined in paragraph 5.7.

(g) Clear, concise illustrations necessary to perform the procedure. Illustrative material shall be prepared in accordance with illustration requirements, outlined in paragraph 7.2.

5.7 Writing Principles

5.7.1 Writing Style. The following grammatical mood, person and use of modifiers shall be used in the preparation of EOD Job Guides:

(a) Two combinations of person and mood are used: Second person imperative for instructions, third person indicative for description or discussion.

(b) Second person imperative mood is command language telling the technician what to do (e.g., Remove locking ring from arming switch).

(c) The third person indicative mood shall be used for description and discussion. An example might be a Note which clarifies a given point yet does not tell the technician specifically what to do. It is simpler for the reader if a Note, Caution, or Warning does not inherently contain instructional tasks, but only precautionary and advisory information as to a condition which must exist prior to or during the performance of the task which follows. Compound sentences should be used only where it is necessary to explain to the technician how something must be accomplished (as well as what). For instance, "Hold_____and slide_____out of_____," or "push and turn_____counterclockwise to disengage from_____."

(d) Modifiers should not be employed if the pictorial can be used to convey the same distinction as the modifier. This is consistent with the concept of using pictures as a means of discriminating and locating equipment.

(e) If necessary, simple modifiers may be used (e.g., fin no. 1 vs. fin no. 3, etc.). To preserve simplicity of text, modifiers should be as short as possible.

(f) Use verbs that describe the action, motion, or other characteristics of the task whenever this adds to the information about how the task is to be done (e.g., twist, slide, pull, push, etc.).

5.7.2 Syntax

5.7.2.1 The sentence structure explained below is the standard for the EOD Job Guide concept. It is treated in terms of its elements as well as its structure. The elements of concern include: subject, verb, object, predicate object, indirect object.

(a) Subject -- implicit only, except when more than one technician is required.

(b) Verb -- using verb list, select the verb which best describes the technician's behavior with respect to the object.

(c) Object -- the specific equipment to which the technician's behavior is directed.

(d) Predicate Object -- the term (or terms) which qualify the condition of the object (seldom necessary).

(e) Indirect Object -- the location of the object (used only in unusual cases where pictorials cannot better provide such information).

5.7.2.1.1 The order of these elements within sentences is:

1. Subject, 2. Verb, 3. Object, 4. Predicate Object, 5. Indirect Object, or:

A. (you -- technician) B. do something, C. X to D. state or condition Y.

An example would be:

(2) Set (c) RUD COMP switch to (d) OFF.
or
(1) (you--technician) (2) do something to (3) X at (5) location X,
e.g., (2) lower (3) bomb to ground.
or
(1) (you-technician) (2) do something to (3) X (4) in state or condition Y at (5) location Z.
e.g., (2) Set (3) master switch to (4) NORM POSITION on (5) IFF CONTROL PANEL.

When a special tool is used, tell the technician he needs it in the following way:

1. Using, 2. tool name, 3. step statement, e.g.; (1) Using (2) snap-ring pliers (3) extract type from bomb.

In the above examples, the subject is understood.

5.7.3 Nomenclature

5.7.3.1 Verbs. The verb list found in Section VI was compiled from analyzing the materials to which technicians are exposed. Each action verb from these materials which is a member of a synonym set has been given a rank of preference. This ranking was accomplished by means of technician's opinions. Whenever a verb is needed, this list must be used.

5.7.3.2 Nouns. Nouns are particularly important, both in terms of the need for accuracy and consistency in names.

(a) If there is a name printed on the equipment or part, that name should be used. If there is no name imprinted, call it by the name assigned to it in the design process.

(b) Numerical tolerance information must be provided as the last entry in the last step of a task. The primary reason for this is that numerical information is easier to retain in immediate memory if it is the last thing perceived. To further guarantee an understanding, the tolerance will be given in the illustration adjacent to the applicable end item.

5.7.3 Writing Activities (Procedures)

5.7.3.1 After the writer has reviewed the output of the planning function, to familiarize himself with the tasks required to perform the activity, he should next determine where natural breaks occur in the activity. Breaks are of three types: 1) accomplishment of a major disarm activity, 2) movement to a different location, 3) movement within a location in both geometric orientation and/or among hardware items involved. Such breaks establish requirements for segmentation.

5.7.3.2 Continuity between illustrations must be used for each major segment. The pictorial used must show the item as the technician would see it. If the transition from segment to segment is not obvious, it will be necessary to include an explanatory note (i.e., view looking aft at fin assembly).

5.7.3.3 Occasions arise when a task must be repeated. The basic approach is to direct the technician to perform the task the first time it occurs and thereafter to simply refer to the task. This requires a descriptive title for the task, e.g., safety arming pin, safety sensing arm, etc. The approach also requires presentation of information concisely to facilitate retention. However, there are conditions which must be met before the repeated task approach can be used:

(a) The task must, in no way, involve danger to the technician or the equipment.

(b) Sequence of steps (a maximum of 4) within the task must not change.

(c) The task must be repeated at least once.

(d) Not more than 4 tasks or 7 steps may intervene between presentations of the task.

(e) If numerical references or tolerances are involved, they must be repeated.

5.7.3.4 Level of Detail. Task is the basic unit of presentation in that it is that set of information which the user will read immediately before performing. A task is comprised of generally no more than three steps, which is the lowest unit of instructional information. There may be cases where four steps are included in a task, if the fourth step closes out a series of related actions. No task can leave the user in an awkward or dangerous situation. Definition of tasks and steps and examples of their usage appears in paragraph 6.

6. DEFINITIONS

6.1 EOD (Explosive Ordnance Disposal). A generic group of actions that are performed by EOD personnel to assure that an incident involving ordnance is rendered safe (e.g., identification of unknown ordnance, rendering safe of ordnance, disposal of safetied ordnance).

6.2 EOD Activity. A single EOD function applied to a specific item, group, or system, (e.g., Render safe MK-180 bomb). EOD job guides pertain to three activity types:

(a) Identification Procedures

(b) Render Safe Procedures

(c) Disposal Procedures

6.3 EOD Task. A group of related steps, generally consisting of, at most, three steps that are performed during an EOD activity (e.g.: Remove clamp screw. Slide clamp aft three inches. Remove clamp.)

6.3.1 Tasks shall be comprised of no more than three steps. This rule may be excepted when three steps would leave the specialist in an awkward or dangerous position.

6.3.1.1 Tasks shall not exceed twenty-five words.

6.3.1.2 Tasks shall be presented in the second person imperative.

6.4 EOD Step. A single action that must be taken (e.g., Remove clamp screw). In certain cases, a step may be comprised of a series of identical actions (Remove three clamp screws.)

6.4.1 Steps shall be short commands, exact, and to the point.

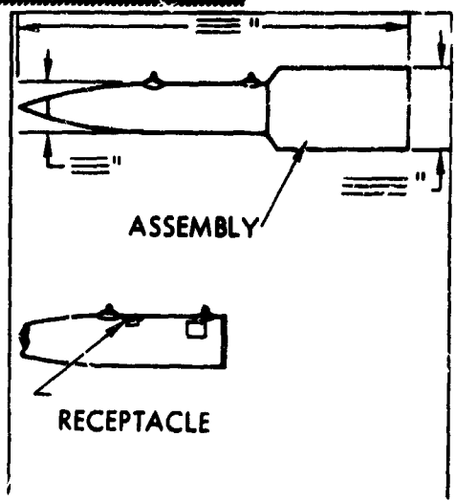
MK MK (MOD) M

WARNING

Observe precautions during reconnaissance until it is known positively that weapon is not the MK . Regardless of configuration, do not move or jar the bomb, it may employ a .

IDENTIFICATION

- Absence of white band encircling of body. (If present, MK employed -- This T.O. not applicable).
- Absence of assembly. (If present, different fuze -- This T.O. not applicable).
- Fuze receptacle.
- Length: "; Diameter: ".
- span "; : ".
- silver reflecting -- top and bottom center line.



OPERATION

modes of delivery--, .

: Release withdraws from assembly. are extended by . Opening of assembly slides aft releasing . This action releases in safety and fuze.

WARNING

AN-M must always be used for disposal. Never use .

3. Place in each . Longitudinal axis of must be to longitudinal axis of .
4. Place modified AN-M on top of each so that longitudinal axis of parallel longitudinal axis of
5. From feet, ignite .

WARNING

Do not approach for minutes after all has ceased.

6. Check that disposal is complete.

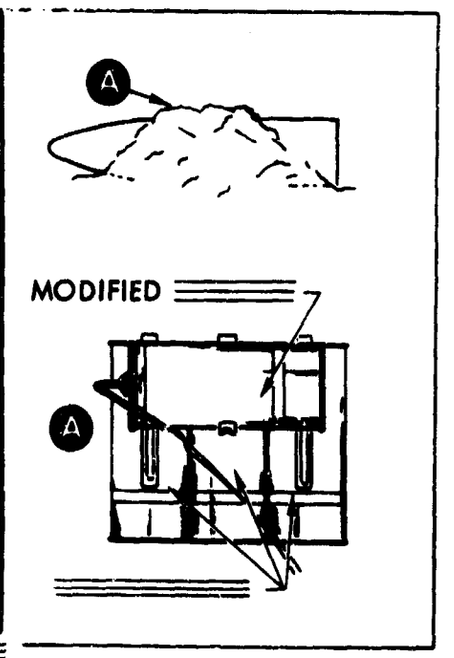


Figure 4-8. Sample Disposal Procedures Section

SECTION V

QUALITY CONTROL/REVIEW

1. GENERAL

1.1 Technical data (EOD Job Guides) prepared according to this specification shall comply with Quality Assurance Provisions in accordance with WS12755. For purposes of complying with the modifications to specification WS12755 (directed by this document) the following quality control/review procedures shall be affected.

Note: The following review criteria shall be used in conjunction with the planning checklist, outlined in Section IV.

1.1.1 Major Areas of Review

(a) Completeness -- all input data from planner should appear in the activity.

(b) Correctness -- all numerical values and equipment nomenclature should appear as given by planner.

(c) Conformity -- all writing should conform to the specifications given in this document.

(d) Specific checks prior to final production of activity.

(e) Be sure all generally applicable Notes, Cautions, and Warnings have been included and are correct.

(f) Be sure tasks have no more than 3 steps and are no longer than 25 words.

(g) Check that there are no more than 7 tasks per page.

(h) Check syntax is correct and preferred verb forms are used.

(i) There should be no more than 7 callouts on the illustration and callouts should be short (three words maximum).

(j) If assistants are used, check that the syntax is correct. That is, "request the assistant _____."

(k) Check each compound sentence and be sure that the compounding is first necessary, and appropriate. Check that modifiers are really required, and delete them if text illustration will be clear without them.

(l) Check that all tolerances are correct in both text and illustration.

1.1.2 Activity Review

1.1.2.1 Preliminary Information.

(a) Check that Hazardous Conditions warning (if applicable) is complete and accurate.

(b) Check that all identifying characteristics are outlined and illustrated.

(c) Check that Destructive Power/range statement (if applicable) is entered and is correct.

(d) Check that Special Tools, Equipment and Supplies Required entired are required and, if so, are correct.

1.1.2.2 Render Safe Procedures

(a) Check that instructional text and supporting illustrations can positively direct EOD personnel to render the ordnance safe.

(b) Check that a lengthy procedure, requiring segmentation, is properly prepared, in that continuity between segments is maintained and text is easily read.

(c) Check that there is no ambiguity in the text or illustrative matter.

(d) Check that the use of schematics and/or block diagrams is valid in that other types of illustrations could have sufficed.

1.1.2.3 Disposal Procedures.

(a) Check that instructional text and supporting illustrations can positively direct EOD personnel to affect the disposal procedure.

(b) Check that a lengthy procedure, requiring segmentation, is properly prepared, in that continuity between segments is maintained and text is easily read.

(c) Check that there is no ambiguity in the text or illustrative matter.

SECTION VI

VERB LIST

1. INTRODUCTION

1.1 In the following list, each verb is defined in terms of one or more meanings associated with explosive ordnance disposal (EOD) activities. A simple sentence has been provided for each usage. A number entry in the preference rank column indicates the standing of that verb compared to others with the same or similar meaning (highest rank is 1). Any synonyms, with which the verb was ranked, are listed, in terms of their own ranking. If a synonym holds first rank, it is underlined. Where necessary, special notes are also included. Lower ranking verbs can be used when the first-ranked verb is particularly awkward or misleading in a given statement.

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Accomplish	To do, carry out or bring about; to reach an objective.	Accomplish a periodic inspection on the landing gear.	2	1. Perform 3. Effect	
Actuate	To put into mechanical motion or action; to move to action.	Actuate the handpump until the pressure gage indicates 3000 psi.	-		
Adapt	To make fit a new situation or use, often by modifying.	Use the bushing to adapt the fuse to the projectile.	-		
Add	To put more in.	Add water to the battery.	-		
Adjust	1. To bring to a specified position or state.	1. Adjust the micrometer to the given measurements.	-		
	2. To bring to a more satisfactory state; to manipulate controls, levers, linkages, etc., to return equipment from an out-of-tolerance condition to an in-tolerance condition.	2. Adjust cable tension using the turnbuckles.			
Advise	To give information or notice to.	Advise man B that the brakes have been set.	4	1. Report to 2. Inform 3. Notify 5. Communicate to	
Advance	To move forward; to move ahead.	Advance the throttle.	-		
Agitate	To move with a jerky, quick or violent action.	Agitate the container so that the paint will be well mixed.	2	1. Shake	
Aid	To give help or support to; to assist.	Aid man B to lift the load.	3	1. Assist 2. Help	
Aim	To direct at.	Aim the dearmer at a 60° angle.	-		
Alert	To warn, to call to a state of readiness or watchfulness; to notify (a person) of an impending action.	Alert personnel that area will be cleared.	-		
Align	To bring into line, to line up; to bring into precise adjustment, correct relative position or coincidence.	Align slot in turnbuckle barrel with slot in cable terminal.	-		
Allocate	To apportion for a specific purpose or to particular persons or things.	Allocate the various maintenance tasks to technicians.	3	1. Assign 2. Distribute	
Allow	1. To permit, to give opportunity to.	1. Allow the sediment to settle out.	1	2. Let	
	2. To allot or provide for.	2. Allow a 2-inch slack in the rope.	1	2. Leave	
Alternate	To perform or cause to occur by turns or in succession.	Alternate between pilot's and copilot's instrument test.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Analyze	To examine and interpret test or inspection results to determine system or equipment condition or capabilities.	Analyze engine inspection findings to determine need for repairs.	-		
Apply	1. To lay or spread on.	1. Apply sealant to gap between the windshield and the aircraft structure.	1	2. Put	Use "lubricate" rather than "apply lubricant."
	2. To energize.	2. Apply power or load.	-		
Approach	Come near to.	Approach with caution.	-		
Arrange	To group according to quality, value or other characteristics, to put in proper order.	Arrange components by size from smallest to largest.	1	2. Order	
Ascertain	To find out with certainty that a proper condition exists.	Ascertain that the light is off.	5	1. Verify 2. Be sure 3. Check 4. Determine	
Assemble	To fit and secure together the several parts of; to make or form by combining parts.	Assemble a jet engine in accordance with specified procedures.	1	2 Construct	
Assess	To determine the importance, size or value of; to evaluate.	Assess the success of the maintenance action.	2	1. Evaluate	
Assign	To apportion to for a specific purpose or to particular persons or things; to appoint to a duty.	Assign the various maintenance tasks to technicians.	1	2. Distribute 3. Allocate	
Assist	To give support or help; to aid.	Assist man B to lift the antenna.	1	2. Help 3. Aid	
Assure	To make someone sure or certain, to inform positively.	Assure other technicians that all warning lights are off.	-		
Attach	To join or fasten to.	Attach electrical leads to the multimeter.	2	1. Connect	Use "tag" in preference to "attach"
Avoid	To keep away from.	Avoid contact with the arming vane.	-		
Back off	To cause to go in reverse or backward.	Back off nut to the nearest castellation.	-		
Balance	To equalize in weight, height, number or proportion.	Balance aircraft so that it is stable.	-		
Be sure	To confirm that a proper condition exists, to find out with certainty.	Be sure that the light is off.	2	1. Verify 3. Check 4. Determine 5. Ascertain	

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Be careful	To exercise caution, to take care.	Be careful not to inhale the fumes of the solvent.	2	1. Exercise caution	
Bend	To turn or force from straight or even to curved or angular, or to force, back to an original straight or even position.	Bend wire until it lies flat against the turnbuckle wall.	-		
Bleed	To extract or let out some or all of a contained substance from.	Bleed off tank air pressure.	-		
Blow	To send forth air, particularly from the lungs through the mouth.	Check for obstructions by disconnecting the hose at the air inlet and blowing through it.	-		
Break	1. To separate into parts with suddenness or violence.	1. Never break safety wire to release air pressure.	-		
	2. To pull away.	2. Break the bead of the tire	-		
Burn	To destroy by fire.	Burn the items on a bed of combustible material.	-		
Bury	To entomb or cover.	Burn the detonating cord.	-		
Calculate	To determine by arithmetic processes.	Calculate the voltage in a circuit with 10 amp of current and 5 ohms of resistance.	1	2. Figure 3. Compute	
Calibrate	To determine accuracy, deviation or variation by special measurement or by comparison with a standard.	Calibrate torque handles at least once each month so that the accuracy can be depended upon.	-		
Cap	To provide with a covering; to install or provide with a device for closing off the end of a tube which has a male fitting.	Cap all lines which have exposed male fittings.	1	2. Install caps	
Care for	To take responsibility for the proper handling and upkeep of.	A mechanic calls for his tools.	-		
Catch	To prevent from falling to the ground, to capture.	Catch any fluid drippings in a drip pan.	-		
Categorize	To put into categories or general classes.	Categorize components by their function.	2	1. Classify	For determining the classification of a supply item, use "identify".
Center	1. To adjust so that axes coincide.	1. Center the nose wheel of the aircraft.	-		
	2. To place in the middle of.	2. Center the pointer on the dial.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Change	To replace with another comparable item; to substitute serviceable equipment for malfunctioning, worn-out or damaged equipment.	Change the switch contact points.	2	1. Replace	
Channel	To form, cut, or wear a groove in.	Channel the rods so that they can be inserted easily.	-		
Charge	To restore the active materials in a storage battery by the passage of a direct current through in the opposite direction to that of the discharge.	Charge the battery for a short time before making a specific gravity check.	1	2. Cycle	
Check	1. To confirm or establish that a proper condition exists; to ascertain that a given operation produces a specified result; to examine for satisfactory accuracy, safety or performance; to confirm or determine measurements by use of visual or mechanical means.	1. Check that the light is off.	3	1. Verify 2. Be sure 4. Determine 5. Ascertain	
	2. To perform a critical visual observation or check for specific conditions; to test the condition of.	2. Check the components for wear, deterioration or defects.	3	1. Inspect 2. Examine	
Checkout	To perform specified operations to verify operational readiness of a subcomponent, component, subsystem, or system.	Checkout the landing gear.	1	2. Test	
Chock	To place chocks adjacent to, and in front of and behind.	Chock main and nose landing gear wheels.	-		
Clamp	To fasten or press two or more parts together so as to hold them firmly.	Clamp the tensiometer to the cable by releasing the handle slowly.	-		
Classify	To put into categories or general classes.	Classify components by their function.	1	2. Categorize	For determining the classification of a supply item, use "identify".
Clean	To wash, scrub or apply solvents to; remove dirt, corrosion or grease.	Clean petroleum products from oxygen equipment.	-		
Clear	1. To move people and/or objects away from.	1. Clear the area.	-		
	2. To open the throttle of an idling engine to free it from carbon.	2. Clear the engine.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Close	1. To block against entry or passage; to turn, push or pull in the direction in which flow is impeded.	1. Close the valve.	-		
	2. To set a circuit breaker into the position allowing current to flow through.	2. Close the circuit breaker.	-		
Code	To put into the form or symbols of a system used to represent words; to mark with identifying symbols.	Color code equipment parts.	-		
Collect	To bring together into one body or place; to accumulate.	Collect the required hand tools	-		
Communicate	1. To exchange information.	1. Communicate with man B during the entire procedure.	-		
	2. To make known.	2. Communicate to man B that the brakes have been set.	5	1. Report to 2. Inform 3. Notify 4. Advise	
Compare	To examine the character or qualities of two or more items to discover resemblances or differences.	Compare the readings from protractor and template.	-		
Compile	To compose or put together out of materials from several sources.	Compile the records of all maintenance on the specified aircraft.	-		
Comply	To conform with directions or rules; to accept as authority, to obey.	Comply with directions.	2	1. Follow	
Compress	To squeeze together; to condense.	Compress the forward and aft sections of the hydraulic pitch lever.	-		
Compute	To determine by arithmetic processes.	Compute the voltage in a circuit with 10 amps of current and 5 ohms of resistance.	3	1. Calculate 2. Figure	
Condition	To put into a proper state for work or use.	Condition components before installing them.	-		
Conduct	To lead, manage or direct.	Conduct the class in proper servicing procedures.	-		
Confer	To consult; to exchange views.	Confer with maintenance supervisor if necessary.	-		
Connect	1. To bring or fit together so as to form a unit, to couple keyed or matched equipment items.	1. Connect the torquometer to the socket wrench.	1	2. Mate 3. Join	
	2. To attach or mate (an electrical device) to a service outlet.	2. Connect the soldering iron to the service power outlet.	2	1. Plug in	

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Consolidate	To join together into one whole, to form into a compact mass.	Consolidate contents of both containers.	-		
Construct	To make or form by combining parts; to fit and secure together the several parts of.	Construct a jet engine in accordance with specified procedures.	2	1. Assemble	
Control	To exercise restraining or directing influence over, to fix or adjust the time, amount or rate of.	Control electrical current generation and distribution.	2	1. Regulate	
Coordinate	To bring into a common action, movement or condition.	Coordinate the activities of man B and man C.	-		
Copy	To make an imitation, transcript or reproduction of.	Copy the tail number on the record form.	-		
Cordon	Block off.	Cordon off the area for security.	-		
Correct	To make or set right, to alter or adjust so as to bring to some standard or required condition.	Correct any error before proceeding with activity.	-		
Cover	To protect or shelter by placing something over or around.	Cover tires whenever maintenance is done on the aircraft.	-		
Crack	To open slightly (the throttle) of an aircraft engine preparatory to starting the engine.	Crack and lock the throttle to 1/8 open.	-		
Crimp	Mechanical operation on material by which it is permanently deformed.	Crimp the blasting cap to the fuze.	-		
Cut	To divide into parts using a sharp instrument such as a scissors or knife.	If the prongs of the cotter pin are too long, they should be cut to proper length.	-		
Cycle	To charge (a battery) for a short time.	Cycle the battery before making the specific gravity check.	2	1. Charge for a short time.	
Decontaminate	To remove or neutralize contamination.	Decontaminate the area with a solution of	-		
Deflate	To release air or gas from.	Deflate the shock strut to check fluid level.	-		
Deflect	To move aircraft control surfaces (elevators, ailerons, etc.) to a position different from the major axes of the aircraft.	Deflect the surface upward to the mechanical stops.	-		
Deplete	To lessen markedly in quantity, content or power.	Deplete system pressure.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Depress	To press or push down.	Depress both brake pedals.	-		
Depressurize	To release gas or fluid pressure from.	Depressurize the hydraulic system.	-		
Desensitize	To make less sensitive.	Desensitize by adding a solution of	-		
Destroy	To ruin, demolish or put out of existence; to make unfit for further use.	Destroy used hydraulic fuel containers.	-		
Detect	To discover or determine the existence, presence or fact of.	Watch very carefully so as to detect any needle movement.	-		
Determine	1. To obtain definite and first-hand knowledge of, to confirm or establish that a proper condition exists.	1. Determine that the light is off.	4	1. Verify 2. Be sure 3. Check 5. Ascertain	
	2. To investigate and decide, to discover by study or experiment.	2. Determine the amount of tension on a cable by following specified procedures.	1	2. Find	
Detonate	To cause to explode.	Detonate the round remotely.	-		
Develop	To set forth or make clear by degrees or in detail.	Develop procedures fully.	-		
Devise	To form by new combinations or applications of ideas or principles; to invent.	Devise new methods of troubleshooting the system.	-		
Diagnose	To make an investigation or analysis of the cause or nature of a condition, situation or problem.	Diagnose the cause of the malfunction.	-		
Dig	To excavate.	Dig a trench 20' x 3' x 2'.	-		
Disassemble	To take to pieces; to take apart to the level of the next smaller unit or down to all removable parts.	Disassemble the No. 1 engine.	1	2. Dismantle	
Discharge	To remove an electrical charge.	Discharge the capacitor by	-		
Disconnect	1. To sever the connection between; to separate keyed or matched equipment parts.	1. Disconnect the bleedair hose from the leading edge anti-icing system.	-		
	2. To detach or separate (an electrical device) from a service outlet.	2. Disconnect the soldering iron from the service power outlet.	2	1. Unplug	

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Disengage	To release or detach interlocking parts, to unfasten; to set free from an inactive or fixed position.	Disengage the parking brake.	2	1. Release 3. Unlock	For circuit breaker, use "open".
Dismantle	To take to pieces; to take apart to the level of the next smaller unit or down to all removable parts.	Dismantle the No. 1 engine.	2	1. Disassemble	
Dispatch	To send off or away with promptness or speed.	Dispatch report to supervising technician.	-		
Dispose of	To get rid of.	Dispose of unused hydraulic fluid left in the can.	-		
Distribute	1. To apportion for a specific purpose or to particular persons or things.	1. Distribute the various maintenance tasks to technicians.	2	1. Assign 3. Allocate	
	2. To divide among several or many; to divide or separate, especially into kinds.	2. Distribute paint for various sections of the aircraft.	-		
Don	The act of putting on.	Don appropriate protective clothing.	-		
Drain	To draw off (liquid) gradually or completely.	Drain servicing hose after removing it from the filter valve.	-		
Drill	To pierce with a drill; bore, perforate.	Drill a 3/16" hole.	-		
Dry	To cause to be free from water or liquid.	Dry bearings with low-pressure air.	-		
Effect	To do, carry out or bring about; to reach an objective.	Effect a periodic inspection on the landing gear.	3	1. Perform 2. Accomplish	
Eliminate	To expel; to ignore or set aside as unimportant.	Eliminate all unnecessary movement.	-		
Employ	To put into action or service, to carry out a purpose or action by means of; to avail oneself of.	Employ only antimagnetic fasteners.	3	1. Use 2. Utilize	
Enforce	To compel or constrain.	Enforce safety regulations.	-		
Engage	To cause to interlock or mesh.	Engage threads of turnbuckle with threads of cable terminal.	-		For circuit breakers, use "close".
Enter	1. To go or come in.	1. Enter the aircraft through the troop doors.	-		
	2. To put on record.	2. Enter the data on the form.			
Erect	To put up by the fitting together.	Erect a special maintenance stand.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Establish	To set on a firm basis.	Establish safety rules.	-		
Estimate	To judge or determine roughly the size, extent or nature of.	Estimate amount of cleaning solvent which will be necessary.	-		
Evaluate	To determine the importance, size or nature of; to appraise; to give a value or appraisal to on the basis of collected data.	Evaluate an operating engine.	1	2. Assess	
Examine	To perform a critical visual observation or check for specific conditions; to test the condition of.	Examine the component for wear, deterioration or defects.	2	1. Inspect 3. Check	
Expedite	To accelerate the process or progress of.	Expedite the activity by assigning two men.	-		
Extend	To cause to be drawn out to fullest length.	Extend the main landing gear.	-		
Exercise caution	To be careful, to take care.	Exercise caution not to inhale the fumes of the solvent.	1	2. Be careful	
Extract	To draw forth; to pull out forcibly.	Extract the cotter pin.	-		
Fabricate	To construct from standardized parts.	Fabricate rig pins from 0.25 inch rod.	-		
Feel	To perceive by touch.	Gently feel under the mine for the presence of booby-traps.	-		
Figure	To determine by arithmetic processes.	Figure the voltage in a circuit with 10 amps of current and 5 ohms of resistance.	2	1. Calculate 3. Compute	
File	To rub smooth or cut away with a file (i.e., a tool with cutting ridges for forming or smoothing surfaces).	File one end of the rod to a point.	-		
Fill	To put into as much as can be held or conveniently contained.	Fill oil and de-icing tanks.	-		
Find	1. To discover or determine by search; to indicate the place, site or limits of.	1. Find the No. 9 fitting.	2	1. Locate	
	2. To discover by study or experiment; to investigate and decide.	2. Find the amount of tension on a cable by following specified procedures.	2	1. Determine	
Fire	To discharge or ignite.	Fire the rocket wrench remotely.	-		
Flush	To pour liquid over or through; to wash out with a rush of liquid.	Drain and flush the hydraulic system if it is serviced with a wrong fluid.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Follow	To accept as authority, to obey; to conform with directions or rules.	Follow directions.	1	2. Comply with	
Form	To give a particular shape to; to shape or mold into a certain state; to make up.	Form the compound so that it will fill the hole completely.	-		
Freeze	To retard an action by applying cold temperatures.	Retard or slow the action of the fuse by freezing with a mixture of alcohol and CO_2.	-		
Furnish	To supply what is needed, to equip.	Furnish a flashlight for the man in	2	1. Provide	
Go to	To proceed to; to transport oneself to a given destination.	Go to the control pedestal and position switches appropriately.	-		
Grasp	To seize or catch.	Grasp the receptacle firmly and withdraw from mating connector.	-		
Grip	That action by which anything is held firmly.	Grip the coupling ring to prevent its turning.	-		
Ground	To connect a current, wire or a piece of electrical equipment to a land or other specified surface.	Ground the servicing cart.	-		
Guard	To protect from danger, to defend.	Guard the area while maintenance is taking place.	-		
Guide	To manage or direct the movement of.	Guide the maintenance stand safely to its new position.	-		
Hand	To give, pass or transmit with the hands.	Hand the refueling hose to the technician stationed on the wing.	-		
Handle	To manipulate (load, turn, raise, etc.) objects and equipment manually or with specially designated equipment, such as hoists.	Handle charger cylinders carefully.	-		
Hang	To fasten to some elevated point without support from below, to suspend.	Do not hang tools on projecting parts of the aircraft.	-		
Help	To give support, aid or assistance to.	Help man H lift the load.	2	1. Assist 2. Aid	
Hold	To have or keep in the grasp.	Hold the power switch in position until the voltmeter stabilizes.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Identify	1. To establish the identify of.	1. Identify components by name and function.	-		
	2. To determine the classification of a supply item.	2. Identify the component to be ordered from supply.	-		
Imbed	To implant inside of.	Imbed the detonating cord in the explosive.	-		
Immerse	To plunge into something that surrounds or covers, especially to plunge or dip into a fluid.	Immerse component in solvent.	-		
Improve	To make greater in amount or degree; to make better.	Improve procedures whenever feasible.	-		
Indicate	To point out.	Indicate which dial should be monitored.	-		
Inflate	To fill with a given amount of gas or air.	Inflate tire to desired pressure.	-		
Inform	To make known to; to give notice or report the occurrence of.	Inform man B that the brakes have been set.	2	1. Report to 3. Notify 4. Advise	
Initiate	To perform actions necessary to set into operation, to set going, to begin.	Initiate operation of the powered AGE.	1	2. Start 3. Originate	
Inject	To throw, drive or force in.	Inject lubricant into proper joint.	-		
Insert	To put or thrust in, into or through.	Insert a wire through the hole in the turnbuckle.	1	2. Put	
Inspect	To perform a critical visual observation or check for specific conditions, to test the condition of.	Inspect the components for wear, deterioration or defects.	1	2. Examine 3. Check	
Install	1. To perform operations necessary to properly fit an equipment unit into the next larger assembly or system.	1. Install fuel manifold.	-		a. For wiring a circuit use either "install wiring" or "wire". b. For safety wiring use either "safety wire" or "install safety wire" c. For screws, use "install screws" rather then "screw". d. Use "cap" "plug" rather than install caps (plugs).
	2. To place and attach.	2. Install nuts on bolts.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Insure	To make certain, to ensure	Insure that the area is clear of unnecessary personnel and equipment.	-		
Intercept	To stop or interrupt the progress or course of.	Intercept messages between flight station and tail section technicians.	-		
Interconnect	To connect with one another.	Interconnect the blasting caps.	-		
Interpret	To explain the meaning of.	Interpret instructions for inexperienced technicians.	-		
Investigate	To observe or study by close examination and systematic inquiry.	Investigate the cause of the breakdown.	-		
Isolate	To use test equipment to identify or select a source of trouble.	Isolate the source of the malfunction using pressure gages.	-		
Jack	To use one or more jacks (i.e., mechanisms for exerting pressure to lift all or part of an aircraft).	Jack and level the aircraft in accordance with specified procedures.	-		
Jar	To move or disturb.	Jar the round remotely.	-		
Join	To bring or fit together so as to form a unit; to couple keyed or matched equipment items.	Join the torquometer to the socket wrench.	3	1. Connect 2. Mate	
Keep	To remain, to continue in a place.	Keep away from the danger area.	2	1. Stay	
Latch	To catch with a device which holds a door when closed, even if not bolted.	Close and latch the aft petal doors.	-		
Leave	1. To go away from, depart.	1. Do not leave the area until this activity is complete.	-		
	2. To allot or provide for.	2. Leave a two-inch slack in the rope.	2	1. Allow	
Let	To permit; to give opportunity to.	Let the engine stabilize.	2	1. Allow	
Level	To cause an aircraft to become even or parallel with the plane of the horizon.	Jack and level the aircraft in accordance with specified procedure.	-		
Lift	To move or cause to be moved from a lower to a higher position; to elevate.	Lift the spoiler control lever to the ARMED position	2	1. Raise	
Light	To cause to illuminate.	Light the field indicator light.	-		
Listen	To pay attention to sound.	Listen to the engine while it is operating.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Load	To place in or on a means of conveyance; to place cargo or aircraft components on an airplane or other vehicle.	Load and secure aircraft components on specified truck.	-		
Locate	1. To find, determine or indicate the place, site or limits of.	1. Locate the No. 9 fitting.	1	2. Find	
	2. To set or establish in a particular spot, to station.	2. Locate the test equipment so that it can be seen by both technicians.	3-4	1. Position 2. Place 3-4. Set 5. Put	
Lock	To hold fast or inactive, to fix.	Lock the throttle after it has been properly set.	-		
Look for	To visually search for.	Look for cracks, security, corrosion and damage during inspection of wheels and tires.	-		
Loop	To make into the form or shape of a loop (i. e., a fold or doubling of line leaving an aperture between the parts through which another line can be passed).	Loop the wire.	-		
Loosen	To release from restraint, to cause to become less tight fitting.	Loosen the lock nut on the relief valve.	-		
Lower	To cause to move down; to depress as to direction.	Lower the exhaust stack into the stowed position.	-		
Lubricate	To put lubricant on specified locations.	Lubricate the wheel bearings.	1	2. Apply lubricant	
Maintain	1. To hold or keep in any particular state or condition, especially in a state of efficiency or validity.	1. An aircraft mechanic maintains aircraft.	-		
	2. To sustain or keep up.	2. Maintain standard forms on power plant operations.	-		
Make	To carry out or cause to occur.	Make corrections where necessary.	-		
Mark	To label, to provide with an identifying or indicating symbol.	Mark each component before removing it.	-		If marking is to be done on a tag, use "tag".
Mate	To join or fit together, to couple.	Mate the torquometer to the socket wrench.	2	1. Connect 3. Join	

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Measure	To determine the dimensions, capacity or amount by use of standard instruments or utensils.	Measure voltage drop across each unit of resistance.	-		
Mix	To combine or blend into one mass.	Never mix oxygen with other gases.	-		
Modify	To alter or change somewhat the form or qualities of.	A jet engine mechanic modifies turbofan engines.	-		
Mold	To form or shape.	Mold the explosive around the base of the bomb.	-		
Monitor	1. To visually take note of, to pay attention to in order to check on action or change.	1. Monitor the incicator for changes in airspeed.	3	1. Observe 2. Watch	
	2. To continually or periodically attend to displays to determine equipment condition or operating status.	2. Monitor all engine instruments while starting the engines.	-		
Moor	To secure an aircraft to the ground by tying it down by ropes or cables.	Moor the aircraft when it is to be parked for an extended period of time.	-		
Mount	To attach to a support.	Mount the split-type wheel.	-		
Move	To change the location or position of.	Move and position a B-4 maintenance stand.	-		
Neutralize	To destroy the effectiveness of, to nullify, to make chemically neutral or electrically inert.	Neutralize the solution before applying it to aircraft surface.	-		
Notify	To make known to; to give notice or report the occurrence of.	Notify man B that the brakes have been set.	3	1. Report to 2. Inform 4. Advise 5. Communicate to	
Observe	1. To conform one's actions or practice to.	1. Observe precautions.	-		
	2. To visually take note of, to pay attention to.	2. Observe the indicator for changes in airspeed.	1	2. Watch 3. Monitor	
Obtain	1. To get or find out by observation or special procedures.	1. Obtain a reading on the outside circle of the tensiometer.	2	1. Take	
	2. To gain or attain.	2. Obtain the necessary supplies before starting on maintenance.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Open	1. To move from closed position; to make available for passage by turning an appropriate direction.	1. Open the valve.	-		
	2. To make available for entry or passage by turning back, removing or clearing away.	2. Open the troop door.	-		
	3. To disengage or pull.	3. Open the appropriate circuit breakers.	-		
Operate	To control equipment in order to accomplish a specific purpose.	Operate crew stands and auxiliary power equipment.	-		
Order	1. To requisition or request from supply.	1. Order three cans of appropriate solvent.	-		
	2. To group according to quality, value, or other characteristics.	2. Order components by size from smallest to largest.	2	1. Arrange	
Organize	To arrange elements into a whole of interdependent parts; to form into a coherent unity; to integrate.	Organize the activities of the assisting technicians.	-		
Orient	1. To acquaint with the existing situation or environment.	1. Orient new technicians to location of shops and supplies.	-		
	2. To set or arrange in any determinate position.	2. Orient the aircraft away from wind direction.	-		
Originate	To give rise to, to set going, to begin.	Originate a new procedure.	3	1. Initiate 2. Start	
Pack	To fill completely with grease.	Pack the bearings.	-		
Paint	To apply color or pigment (suspended in suitable liquid) to the surface of.	Paint all exposed surfaces.	-		
Park	To bring (an aircraft) to a stop and leave it standing for a time, usually without pilot, in a specified area.	Park the aircraft between the yellow lines.	-		
Patch	To mend, cover, or fill up a hole or weak spot in.	Patch the tubes where necessary.	-		
Perform	To do, carry out or bring about; to reach an objective.	Perform a periodic inspection on the landing gear.	1	2. Accomplish. 3. Effect	
Place	To put or set in a desired location or position.	Place the test equipment so that it can be seen by both technicians.	2	1. Position 3-4. Set 3-4. Locate 5. Put	

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Plan	To devise or project the achievement of.	Plan the day's schedule for the technicians.	-		
Plug	To provide with a device for closing off the end of a tube which has a female fitting.	Plug all lines which have exposed female fittings.	1	2. Insert plugs 3. Install plugs	
Plug in	To attach or mate (an electrical device) to a service outlet.	Plug in the soldering iron at the service power outlet.	1	2. Connect	
Position	To put or set in given place, to locate.	Position the test equipment so that it can be seen by both technicians.	1	2. Place 3-4. Set 3-4. Locate 5. Put	
Post	To station at a given place.	Post one man in front of the aircraft.	-		
Pour	To cause to flow into a stream.	Pour the acid slowly into the water. Slowly pour the powder into a fast moving stream.	-		
Prepare	1. To make ready; to arrange things in readiness.	1. Prepare the surface for paint.	-		
	2. To prepare to make ready for a maintenance activity.	2. Prepare the Trunion Shaft Kit for removal of the MLG shock strut.	1	2. Set up 3. Ready	
Prescribe	To lay down as a guide, direction or rule of action; to specify with authority.	Prescribe repair activities to correct the malfunction.			
Pre-set	To put in a desired position, adjustment or condition beforehand.	Pre-set tension indicator dial to size of cable being checked.	-		
Press	To act upon through thrusting force exerted in contact.	Press the blower start button.	1	2. Push	For circuit breakers, use "close".
Pressurize	To apply pressure within by filling with gas or liquid.	Pressurize the booster hydraulic system.	-		
Prevent	To keep from happening or existing.	Prevent oil from spilling over on components.	-		
Prime	To prepare for firing.	Prime the round by packing the fuze well with explosive.	-		
Probe	To investigate thoroughly with a long, pointed device or by direct feeling.	Probe the tube with fingers.	-		
Proceed	To continue.	Proceed with caution.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Process	To submit to a series of actions or operations leading to a particular end.	Process the forms so they will be compatible with new recording methods.	-		
Program	To work out a plan or procedure or a sequence of operations to be performed.	Program the maintenance activity in logical sequence.	-		
Provide	To supply what is needed, to equip.	Provide a flashlight for man B.	1	2. Furnish	
Pull	To exert force upon an object so as to cause motion toward the force.	Pull out knob No. 6 on the oxygen servicing cart.	-		For circuit breakers, use "open".
Pump	1. Raise or lower by operating a device which raises, transfers or compresses fluids by suction, pressure or both.	1. Pump up the ramp several inches.	-		
	2. To move up and down or in and out as if with a pump handle.	2. Pump engine primer knob.	-		
Puncture	To pierce with pointed instrument or object.	Be careful not to puncture tube while probing the inside of it.	-		
Push	1. To press against with force so as to cause motion away from the force.	1. Push the blower start button.	2	1. Press	For circuit breakers, use "close".
	2. To move away or ahead by steady pressure.	2. Push the servicing cart toward the aircraft.	-		
Put	1. To place in or through.	1. Put a wire through the hole in the turnbuckle.	2	1. Insert	
	2. To place or set in a desired position or location.	2. Put the test equipment where it can be seen by both technicians.	5	1. Position 2. Place 3-4. Set 3-4. Locate	
	3. To deposit or leave.	3. Put tools out on the bench	-		Use "store" instead of "put away" for depositing or leaving in a specified place for future use.
	4. To lay or spread on or in.	4. Put sealant in the gap between the windshield and the aircraft structure.	2	1. Apply	
Qualify	To declare competent or adequate.	Qualify components which checkout successfully.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Raise	To move or cause to be moved from a lower to a higher position, to elevate.	Raise the spoiler control lever to the ARMED position.	1	2. Lift	
Read	To interpret the meaning of by visual observation.	Read the ammeter.	-		
Readjust	To adjust again, to move back to a specified condition; to bring back to an in-tolerance condition.	Readjust the voltage after performing an operational check of the system.	-		
Ready	To prepare for a maintenance activity.	Ready the Trunnion Shaft Kit for removal of the MLG shock strut.	3	1. Set up 2. Prepare	
Reassemble	To refit and secure together the parts of after they have been taken apart.	Reassemble component before installation on aircraft.	-		
Recall	To call back.	Recall parts which have not been modified.	-		
Recap	To cap again; to replace a covering; to reinstall a fitting for closing the end of a tube.	Recap the filler valve.	-		
Recapitulate	To repeat briefly.	Recapitulate the task sequence.	-		Use "repeat briefly."
Receive	To come into possession of; to get.	Receive supplies as they arrive.	-		
Recognize	To perceive to be something previously known or designated.	A jet engine mechanic recognizes troubles through evaluation of engine operational checks.	-		
Recommend	To urge the acceptance or use of.	Recommend procedure changes where appropriate.	-		
Recondition	To renew; to bring or put back into good condition.	Recondition the pilot's and copilot's seats.	1	2. Renovate	
Reconnect	To rejoin or refaster. that which has been separated.	Reconnect aft pistons to forward pistons.	-		
Record	To set down in writing.	Record maintenance time on appropriate form.	-		
Reduce	To cause to be diminished in strength, density or value.	Reduce pump flow.	-		
Refuel	To put fuel into the tanks of (an aircraft) again.	Refuel the system as outlined from applicable technical manuals.	-		
Regulate	To fix or adjust the time, amount or rate of; to exercise restraining or directing influence over.	Regulate electrical current generation and distribution.	1	2. Control	

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Reinflate	To refill with a given amount of gas or air after deflation has occurred.	Reinflate tires to specified psi value.	-		
Reject	To refuse to have, use or take for some purpose.	Reject components which show excessive wear.	-		
Relay	To pass along by stages.	Relay the message to man B.	-		
Release	1. To set free from an inactive or fixed position; to unfasten or detach interlocking parts.	1. Release the parking brake.	1	2. Disengage 3. Unlock	
	2. To let go of.	2. Release tensiometer handle.	-		
	3. To set free from restraint or confinement.	3. Release pressure.	-		
Relieve	To ease or set free of a burden, to partially release.	Relieve hydraulic pressure before working on a system.	-		
Remove	1. To perform operations necessary to take an equipment unit out of the next larger assembly or system.	1. a. Remove bleed air shutoff valves. b. Remove belts from nuts.	-		For screws, use "remove" rather than "unscrew".
	2. To take off or eliminate.	2. Remove paint.	-		
	3. To take or move away.	3. Remove jacks.	-		
	4. To take off devices for closing off the end of a tube.	4. Remove caps (plugs) from all hydraulic lines.	1	2. Uncap (unplug)	
Render safe	To interrupt the firing sequence.	Render safe by	-		
Renovate	To renew; to bring or put back into good condition.	Renovate the pilot's and copilot's seats.	2	1. Recondition	
Repair	To restore damaged, wornout or malfunctioning equipment to a serviceable, usable or operable condition.	Repair engine by replacing parts and removing defects.	1		Repair includes replacement, overhaul and reworking of constitutent parts or materials.
Repeat	To make, do or perform again.	If keys do not engage lugs, remove wheel assembly and repeat procedure.	-		
Replace	1. To restore to a former place or position.	1. Replace covers on jacks.	1		
	2. To substitute serviceable equipment for malfunctioning, wornout or damaged equipment.	2. Replace the switch contact points.	1	2. Change	

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Replenish	To fill or build up again.	Replenish drinking water when supply runs low.	-		
Report	1. To describe as being in a specified state.	1. Report when ready.	1	2. Inform 3. Notify 4. Advise 5. Communicate to	
	2. To make known to; to give notice or report the occurrence of.	2. Report to man B that the brakes have been set.	-		
Repressurize	To reapply pressure within by filling with gas or liquid after pressure has been released.	Repressurize the utility hydraulic system.	-		
Request	To ask for.	Request further information if necessary.	-		
Reset	To put back into a desired position, adjustment or condition.	Reset the field after performing an operational check of the generator.	-		
Resolve	To clear up or find an answer to; to reach a decision about.	Resolve the inconsistentency before proceeding with maintenance activity.	-		
Restore	To bring back or put back into a former or original state.	Restore hydraulic pressure.	-		
Retard	To manipulate so as to hold back or slow down.	Retard the throttle.	-		
Retract	To draw up against or into the aircraft.	Retract the landing gear.	-		
Return	To bring, send or put back to a former or proper place.	Return the horizontal stabilizer to the neutral position.	-		
Review	To examine again; to go over or examine critically or deliberately.	Review procedures which have not been performed for more than two months.	-		
Rework	To reprocess for further use; to revise.	Rework the report forms.	-		
Rig	To assemble, adjust and align the major components of an aircraft (i.e., airfoils or other surfaces); to fit out (an aircraft) with control cables, bracing cables, pulleys, turnbuckles, etc.	Rig and adjust the mechanical linkage in the flight control system.	-		
Rinse	To cleanse (as from soap used in washing) by clear water.	Rinse the battery after cleaning it with soda water solution.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Rope off	To partition, seperate or divide by a rope (i.e., a large stout cord of strands of fibers or wire twisted or braided together).	Clear and rope off an area around the aircraft and post warning signs.	-		
Rotate	To cause to revolve about an axis or center.	Rotate the door handle counter clockwise until latches retract.	1	2. Turn	
Route	To send by a selected course of travel; to divert in a specified direction.	Route the memo to all affected personnel.	-		
Safeguard	To provide a technical contrivance to prevent accident; to comply with precautionary measures or stipulation.	Safeguard technical manuals.	-		
Safety	1. To secure an aircraft part against loosening from vibration.	1. Safety the lock nut on the relief valve.	-		
	2. To use safety wire to make an aircraft component fast or safe or secure against loosening from vibration.	2. Safety the bolts with wire.	1	1. Safety wire 2. Secure (with wire) 4. Install (with wire)	
	3. To use a cotter pin to make an aircraft component fast or safe or secure against loosening from vibration.	3. Safety the bolt with a cotter pin.	3	1. Secure 2. Install	
Safety wire	To use safety wire to make an aircraft component fast or safe or secure against loosening from vibration.	Safety wire the bolts.	1	2. Secure (with wire) 3. Safety 4. Install (with wire)	
Salvage	To rescue or save (as from discard, wreckage or ruin).	Salvage fuel which is drained from tanks.	-		
Sandbag	To cover or surround with sandbags	Sandbag the ordnance to reduce blast and fragments.	-		
Scan	To make a wide, sweeping search of; to look through or over hastily.	Scan the flight engineer's panels before beginning maintenance activity.	-		
Schedule	To appoint, assign or designate for a fixed future time; to make a timetable of.	Schedule maintenance activities for the day.	-		
Screw	1. To attach, fasten or close by means of a screw.	1. Screw the ram safety lock to the ram.	-		
	2. To attach by means of a twisting motion in the proper direction.	2. Screw in jack pad.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Screw (cont)	3. To attach screws by means of a twisting motion in the proper direction.	3. Screw in twelve screws around cover.	2	1. Install	
Scribe	To make a line or mark.	Scribe a line along the axis.	-		
Secure	1. To make fast or safe.	1. Load and secure components on trucks.	-		
	2. To safety (with safety wire or cotter pin) to make aircraft component fast or safe or to keep it from loosening during vibration.	2. a. Secure bolts with safety wire.	2	1. Safety wire 3. Safety 4. Install (with wire)	
		b. Secure the bolt with a cotter pin.	1	2. Install 3. Safety	
Segregate	To set apart.	Segregate the explosive and non-explosive components.	-		
Select	To take by preference or fitness from a number or group, to pick out, to choose.	Select a battery cell and insert hydrometer nozzle in the cell.	-		
Separate	To set apart.	Separate the case sections six inches.	-		
Service	To perform such operations as cleanup, lubrication and replenishment to prepare for use.	Service each battery cell to only 3/8 inch above the plates.	-		
Set	1. To put a switch, pointer or knob into a given position; to put equipment into a given adjustment, condition a mode.	1. Set PWR switch to ON.	-		
	2. To put or place in a desired orientation or location.	2. Set the test equipment so that it can be seen by both technicians.	3-4	1. Position 2. Place 3-4. Locate 5. Put	
Set up	To prepare or make ready for a maintenance activity.	Set up the Trunnion Shaft Kit for removal of the MLG shock strut.	2	1. Prepare 3. Ready	
Shake	To move or cause to move to and fro in a quick, jerky manner.	Shake the container so that the paint will be well mixed.	-		
Shore	To give support.	Shore the sides of the shaft.	-		
Short	To complete an electrical circuit.	Short the firing wire by twisting the bare wires together.	-		
Shunt	To divert an electrical current by means of a shunt.	Shunt the cap wires.			

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Signal	To notify or communicate by signals (i.e., a prearranged sign, notice or symbol conveying a command, warning, direction or other message).	Signal the pilot to move the aircraft to the left.	-		
Simulate	To give the appearance or effect of.	Simulate doppler radar signals.	-		
Slide	To cause to move in a smooth manner over a surface.	Slide the stand in close enough to do the work.	-		
Specify	To name or state explicitly or in detail.	Specify the manufacturer's number of the multimeter.	-		
Spin	To cause to revolve rapidly.	Spin wheel by hand until a bearing drag is noticed.	-		
Spray	To apply with a device which disperses a jet of finely divided liquid.	Spray the fuselage and tail sections moving from center to ends.	-		
Start	To perform actions necessary to set into operation, to set going, to begin.	Start the powered AGE.	2	1. Initiate 3. Originate	
Stay	To remain, to continue in a place.	Stay away from the danger area.	1	2. Keep	
Steam	To expose to the action of steam.	Steam out the explosive using low pressure steam.	-		
Stop	To perform actions necessary to cause an equipment to cease or suspend operation.	Stop the air conditioning.	-		
Store	To deposit or leave in a specified place for future use.	Store the wheel covers after maintenance activity is completed.	1	2. Stow 3. Put away	
Stow	To deposit or leave in a specified place for future use.	Stow the wheel covers after maintenance activity is completed.	2	1. Store 3. Put away	
Submit	To make available, to offer.	Submit request for modification of procedures.	-		
Suggest	To propose as desirable or fitting; to offer for consideration.	Suggest any changes which might be helpful.	-		
Superintend	To oversee; to have or exercise the charge of.	Superintend the repair of the engines.	2	1. Supervise	
Supervise	To oversee; to have or exercise the charge of.	Supervise the repair of the engines.	1	2. Superintend	
Support	To hold up or provide a foundation or props for.	Support the elevator at both ends.	-		
Survey	To examine comprehensively as to condition, situation or value.	Survey entire aircraft surface.	-		

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Synchronize	To cause to happen at the same time.	Synchronize the activities of man A and man B.	-		
Tabulate	To set up in the form of a table (with rows and columns); to compute by means of a table.	Tabulate maintenance times for each occurrence of the various maintenance activities.	-		
Tag	To provide with an identifying or indicating symbol with or as if with a tag (i.e., a cardboard, plastic or metal marker used for identification or classification); to label.	Tag each hydraulic line before removing it.	1	2. Attach a tag 3. Mark 4. Connect a tag to	
Take	1. To get into or carry in one's hands or one's possession.	1. Take supplies out to the aircraft.	-		
	2. To get or find out by observation or special procedures.	2. Take a reading on the outside circle of the tensiometer.	1	2. Obtain	
Tamp	The process of packing mud, wet sand, clay or other dense material.	Tamp the charge with three feet of earth.	-		
Tap	To strike lightly.	Tap the eye of the cotter pin to seat it.	-		
Tape	To fasten or cover with tape.	Tape the exposed leads.	-		
Test	To perform specified operations to verify operational readiness of a component, subcomponent, system or subsystem.	Test the true airspeed indicator.	2	1. Checkout	
Throw	To move (a switch) so as to make or break a connection.	Throw switch to ON position.	-		Use "set" for all switches.
Tie	To fasten, attach or close by means of a line or cord.	Tie mooring ropes to tie points under wing and on nose.	-		
Tighten	1. To perform necessary operations to fix more firmly in place.	1. Tighten all screws.	-		
	2. To apply a specified amount of force to produce a rotation or twisting motion to fix more firmly in place.	2. Tighten the nut to a torque value of 1000 inch-pounds.	2	1. Torque	
Tilt	To cause to slope, lean or incline.	Tilt maintenance stand backwards until wheels contact the ground.	-		
Torque	To apply a specified amount of force to produce a rotation or twisting motion to fix more firmly in place.	Torque the nut to 1000 inch-pounds.	1	2. Tighten	Torque (noun) - length of wrench handle times applied force.

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Tow	To pull along (an aircraft) by means of a towing vehicle and tow bar.	Tow aircraft to the washrack.	-		
Trace	To follow or study out in detail or step by step.	Visually trace the wiring diagram.	-		
Transfer	To convey or cause to pass from one place to another.	Transfer fuel and oil from one	1	2. Transport	
Transport	1. To convey or cause to pass from one place to another.	1. Transport fuel and oil from one tank to another.	2	1. Transfer	
	2. To carry by hand or in a vehicle or hoist, or in a container, etc.	2. Transport landing gear to shop on dolly.	-		
Trepan	The action of cutting a section from the case of unexploded ordnance.	Dispose of the round by trepanning and applying low pressure steam.	-		
Trim	1. To free of excess or extraneous matter by or as if by cutting.	1. Trim patch to fit.	-		
	2. To adjust (a jet engine) to compensate for wear.	2. Trim the No. 1 engine.	-		
Troubleshoot	To localize, isolate and correct the source of a malfunction or breakdown.	Troubleshoot the landing gear control circuit.	-		
Tune	To adjust for precise functioning.	Tune the transmitter for maximum output.	-		
Turn	To cause to revolve about an axis or center.	Turn the door handle counter clockwise until latches retract.	2	1. Rotate	
Turn off	To shut off or stop the flow of by or as if by moving a control to its OFF position.	Turn off power to the signal generator.	-		
Turn on	To cause to flow or operate by or as if by moving a control to its ON position.	Turn on power to the signal generator.	-		
Uncap	To remove a device for closing off the end of a tube with a male fitting.	Uncap and unplug all hydraulic lines.	2	1. Remove caps.	
Unlock	To set free from an inactive or fixed position, to unfasten, to detach interlocking parts.	Unlock the parking brake.	3	1. Release 2. Disengage	
Unplug	1. To detach or separate (an electrical device) from a service outlet.	1. Unplug the soldering iron.	1	2. Disconnect	
	2. To remove a device for closing off the end of a tube with female fittings.	2. Unplug and uncap all hydraulic	2	1. Remove plugs	

VERBS	DEFINITIONS	EXAMPLES	PREF. RANK	SYNONYMS BY ORDER OF PREFERENCE	NOTES
Unscrew	1. To loosen or withdraw by turning in the proper direction.	1. Unscrew the jack pad.	-		
	2. To draw the screws from.	2. Unscrew twelve screws around cover.	2	1. Remove	
Unwind	To cause to uncoil or unroll.	Unwind hoses from hose rack.	-		
Use	To put into action or service; to avail oneself of; to carry out a purpose or action by means of.	Use only antimagnetic fasteners.	1	2. Utilize 3. Employ	
Utilize	To put into action or service; to avail oneself of; to carry out a purpose or action by means of.	Utilize only antimagnetic fasteners.	2	1. Use 3. Employ	
Vent	1. Discharge or expel.	1. Vent the warhead pressure.	-		
	2. To penetrate the case of a round of ordnance.	2. Vent the round by firing a MK-2 shape charge	-		
Verify	1. To conform or establish that a proper condition exists.	1. Verify that the light is off.	1	2. Be sure 3. Check 4. Determine 5. Ascertain	
	2. To establish the truth or accuracy of.	2. Verify the readings before recording them.	-		
Wait	To suspend activity in a sequence of activities until a given condition occurs or a given time has elapsed.	Wait five minutes before performing the next task.	-		
Wash	To cleanse by or as if by the action of liquid; to remove (dirt) by rubbing or drenching with liquid.	Wash the battery with a cleaning solution and a stiff brush.	-		
Watch	To visually take note of, to pay attention to in order to check on action or change.	Watch the indicator for changes in airspeed.	2	1. Observe 3. Monitor	
Wire	To provide with wire, to use wire on.	Wire the circuit.	1	2. Install wiring.	
Withdraw	To take back, away, or out.	Withdraw the bar magnet from the center of the coil.	-		
Wrap	To wind, coil or twine so as to cover something.	Wrap the wire around the terminal.	-		
Zero	To bring to a desired level or null position.	Zero the protractor to the surface.	-		

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13. ABSTRACT

This report describes a program involving the analysis of Explosive Ordnance Disposal (EOD) operational procedures and mission requirements, evaluates the outputs of the analysis, and develops technical data presentation principles within unique and influencial constraints peculiar to EOD activities. A number of analytical tools were employed during the analysis phase of the program: 1) Mission Profiles and Function Flow Block Diagrams were used to display mission paths and the use of existing technical data during a mission; 2) Task and Skill Analyses were used to provide a profile of the EOD technician; and 3) Operational Sequence Diagrams (in ordinal time) were used to reflect man-machine facility interface during a mission. The analyses put out two basic requirements: 1) the need for clear, concise, and unambiguous data presented in a format that is technician-oriented with respect to the size of the material, the ease and speed of data assimilation and reduced memory and yet portraying all material relevant to successfully affecting the EOD mission; and 2) the need for a format that is easily stored and can be rapidly retrieved from a data file. Conclusions reached underscore the need for in depth, job task analysis as a prerequisite for successfully meeting these requirements. This report presents the analyses, conclusions from the analyses, and a specification guideline for the preparation of EOD Job Guides.

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