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SUPERSEDING  
MIL-M-38784A  
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## MILITARY SPECIFICATION MANUALS, TECHNICAL: GENERAL STYLE AND FORMAT REQUIREMENTS

This specification is approved for use by all Departments and Agencies of the Department of Defense.

### 1. SCOPE:

1.1 Scope: This specification covers the general style and format requirements for the preparation of manuscripts and reproducible copy for standard technical manuals and changes thereto. This includes all technical documents which are assigned a technical manual identification number and are to be controlled by a TM management information system or are subject to requisition from an inventory control point (ICP). This general style and format specification supplements the various content specifications for specific types of technical manuals and related publications and does not alone deliver any technical data. Examples at the rear of this specification are typical and may be adapted to fit the specific equipment or situation being covered.

1.2 Paragraphs with limited applicability. This specification contains paragraphs which are not applicable to all services. Such paragraphs are prefixed to indicate the services to which they pertain. (A) for Army; (N) for Navy; (M) for Marine Corps; and (F) for Air Force.

### 2. APPLICABLE DOCUMENTS

#### 2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: HQ AFLC/LOLME, Wright Patterson AFB, Ohio, 45433, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

NO DELIVERABLE DATA REQUIRED BY THIS DOCUMENT

AREA TMSS

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## SPECIFICATIONS

## Military

MIL-P-38790      Printing Production. Technical Manuals  
General Requirements For

## STANDARDS

## Military

MIL-STD-12      Abbreviations for Use on Drawings, Specifications,  
Standards, and in Technical Documents

DoD-STD-100      Engineering Drawing Practices.

MIL-STD-1309      Definition of Terms for Automatic Electronic Test  
and Checkout.

DoD-STD-1685      (N) Comprehensibility Standards for  
Technical Manuals (Metric)

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

## PUBLICATIONS

## Department of Defense

DoD 5200.1-R      Information Security Program Regulations.

DoD 5200.22-M      Industrial Security Manual for Safeguarding  
Classified Information.

Library of Congress  
Catalog

No. Z253.U58      U S Government Printing Office Style Manual

Joint Chiefs  
of Staff

Pub 1              Dictionary of US Military Terms for Joint Usage.

(Copies of specifications, standards, handbooks, drawings and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.1.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

### 3. REQUIREMENTS

#### 3.1 General.

3.1.1 Conflict between documents. When conflict exists between the contract and this specification or between the contract and the governing content specification, the contract shall take precedence. When conflict exists between this specification and the governing content specification, the governing content specification shall take precedence. When conflict exists between the requirements of this specification and its referenced documents, this specification shall take precedence. Where the requirements of the US Government Printing Office Style Manual conflict with the format requirements specified herein and in any applicable military standard, format requirements of this specification and the military standards shall apply.

3.1.2 Advertising. Except for the identity of the equipment manufacturer or contractor, publication material prepared in accordance with this specification shall contain no advertising matter.

3.1.3 Jointly used manuals. When manuals are acquired by one Service for joint use with another Service, refer to 3.2.2.5 regarding Army, Navy, Marine Corps, and Air Force publication numbers. See figure 1, note 2, and figure 2, note a, regarding showing two or more publication numbers on cover, title, or title block pages. Paragraphs in joint publications which do not apply to all services concerned, shall be marked to indicate the services to which they apply. For example, "4-4" (Army only) The Landing Gear \*\*\*\*

3.1.4 Manual outline. When specified in the contract or order, a manual outline shall be provided and shall contain the following:

a. A text plan that shall be in accordance with the requirements of the technical content specification, showing Volume, Part, Chapter, Section and paragraph titles to indicate the intended coverage of the various aspects of the equipment or system. Each paragraph title or notation shall be followed by a brief statement outlining the information to be presented. The text plan shall clearly show the specific equipment/system, related procedures/data planned for inclusion in the manual.

b. An illustration plan and a table plan that shall be keyed to the text plan. Each illustration and table listed in the plans shall be described. The illustration plan shall contain figure numbers, title, information, intent, approximate size and nature of illustration (exploded view, schematic, line drawing). The table plan shall describe the tables by table number and information content.

c. An estimated page count for each chapter, and a statement indicating the scope, depth, or coverage.

**3.1.5 Interim copy.** When approved copies of the manuscript are to be used as interim editions or preliminary issues, for training purposes or other early uses,, and cannot be in the manuscript form prescribed herein, the text spacing and the reproduction and binding of copies shall be as specified in the contract or order.

### **3.1.6 Completeness**

**3.1.6.1 Manuscripts.** The manuscript shall be complete in all respects, and shall contain all front matter, text illustrations, and tables to be included in the manual as specified in the technical content specification. The quantity of manuscripts to be furnished will be specified by the acquiring activity. The words "The End" shall appear at the bottom of the last page.

**3.1.6.2 Camera-ready copy.** Camera-ready copy shall consist of all text pages (including tabular data and emergency page markings when applicable) and artwork suitable for use in the development of printing plates. Except when page negatives are acquired, camera-ready copy shall be supplied final size. Reduction shall be obtained by positive to positive production without the use of negatives if the quality of the copy will conform to the applicable requirements herein.

**3.1.7 Nuclear hardness.** (Nuclear Survivability Requirements, i.e., Overpressure and Burst, Thermal Radiation, Electro Magnetic Pulses (EMP) and Transient Radiation Effects on Electronics (TREE). If equipment to be operated, maintained or overhauled has nuclear survivability requirements, applicable warnings shall be incorporated into technical publications to ensure that hardness of equipment is not degraded during operation and maintenance. Caution shall be taken not to include classified information in an unclassified publication.

**3.1.7.1 Symbol.** All hardness critical processes/steps will be marked with the symbol **[HCP]** as follows:

a. When entire paragraph, including all subparagraphs, is considered hardness critical, only major paragraph will be marked. The symbol **[HCP]** shall be placed between paragraph number and title.

b. When only certain processes/steps within a paragraph are hardness critical, only applicable process/step will be marked. The symbol **[HCP]** shall be placed between step number and text.

**3.1.7.2 Explanation.** The introduction will include a listing and explanation of symbol **[HCP]** and other pertinent information as necessary to emphasize specialness of hardness features. This will include an explanation that the symbol establishes the requirement that all paragraphs and processes/steps identified by the symbol must be followed as written to ensure nuclear hardness is not degraded. This statement will be preceded by a caution.

## **3.2 FORMAT.**

**3.2.1 Manuscript.** When specified in the contract or order, a manuscript (or draft) for a basic manual shall be provided. The manuscript shall be fully edited, validated and typewritten, double spaced, on one side of the sheet only. When the manuscript is presented in computer or other form such that the paragraphing or symbols cannot be readily understood it shall be

annotated to make the paragraphing and symbols clear to the reviewer. Except for certain presentations authorized by the acquiring activity, the page size shall be approximately 8 1/2 by 11 inches with image area restricted to 7 x 9 1/4 inches including running head and foot, and the body area (text or illustrations) shall be restricted to 7 x 10 inches. The binding edge shall not be less than 1.00 inch and the outside edge not less than 0.50 inch. Any method of duplication, covering, and binding that will provide legible, collated copies of the manuscript will be acceptable.

**3.2.2 Camera-ready copy preparation methods.** Equipment used for preparing the instructions and marginal copy shall be adequate for the purpose intended and shall provide clearly legible, easily usable publications at the most economical cost, considering both initial preparation and follow-on costs, such as reproduction, printing, handling, filing, storing and shipping. Office composing machines, typewriters, and typesetting equipment, and a combination thereof, electric accounting machines, computers, punched cards, tapes, etc., may be used for preparing text. Type styles and sizes shall be comparable to those shown in figures 3 and 4. Copy shall be prepared as specified below, unless it can be prepared as economically in double-columned justified right margin format. The page elements not imprinted on the page, including corrections, shall be fastened to the page in a manner that will permit repeated handling of the camera-ready copy over a period of years without the possibility of losing stripped-in portions. The camera-ready copy shall be of a quality which will permit reduction to 16mm or 35mm negatives as specified by the acquiring activity (multiframe negatives for foldouts) suitable for subsequent enlargement to full size photolithographic negatives which will be used to produce offset printing plates. Minimum acceptable material shall have the following features:

- a. Unless otherwise specified, manuals shall be prepared double-column.
- b. Single spacing
- c. Unjustified right margins.
- d. Headings prepared on the same composing equipment as the text.
- e. Oversize sheets when the text of reproduction copy is in 12-point type.
- f. Paper stock shall meet or exceed the requirements of JCP-D10 (20 pound).
- g. Printing (or ink) shall be of such color and contrast to permit quality photographic reproduction.

**3.2.2.1 Camera-ready copy leading and spacing.** Layout shall conserve space without lessening usability or clarity of material. (See figures 5 and 6.) Blank pages and spaces shall be avoided, whenever possible. Leading and spacing as indicated by figure 3 shall be used for best legibility and conservation of space. Double spacing of text within a paragraph, or similar wastefulness, is unacceptable. Slight variations are permitted in order to avoid layout practices that would result in:

- a. The first line of a paragraph being at the bottom of a page or column.
- b. The last line of a paragraph being at the top of a new page.
- c. A sidehead falling on the last line of a page or column.

d. Warnings, cautions, and notes being divided so that first lines appear on one page and remaining lines on another. (First lines may appear in the left column, and remaining lines in the right column on the same page.)

e. Undesirable location of an illustration or table.

3.2.2.2 Page size and reproduction area for camera-ready copy. Text and artwork for a camera-ready copy page which will require no reduction photographically for printing shall not exceed the following dimensions for the indicated printed size manual. The technical content specification or contract will indicate the size in which a manual will be reproduced when 4 by 5½, 4 by 8, 5 by 8, or 17 by 11 inch size is required, otherwise 8½ by 11 inch size shall be prepared. 4 x 5½ inch manuals shall not exceed 200 pages.

<u>Paper Size of Printed Manuals (Inches)</u>	<u>Width - Text/Art (Inches) (Picas)</u>		<u>Depth - Text/Art (Inches) (picas)</u>		<u>Depth (Including Marginal Copy) (Inches) (Picas)</u>	
(A) 4 by 5 1/2	3 1/8	19	4 1/2	27	5	30
4 by 8	3 1/8	19	7	42	7 1/2	45
5 by 8	4 1/8	24	7	42	7 1/2	45
8 1/2 by 11	*7	42	9	55	10 1/4	61
17 by 11	15 ½	93	9	55	10 1/4	61

\* Single-column width; when double-columned, each column shall be 20 picas (approximately 3 3/8 inches) wide with a 2 pica (approximately 1/4 inch) gutter between.

3.2.2.2.1 Oversize camera-ready copy. Camera-ready copy may be prepared oversize not to exceed 50 percent larger than the prescribed image area for each printed manual page size. Type shall be of such size that after final reduction, the text shall be no smaller than 10 point. When final camera-ready copy is specified, reduction shall be positive to positive (without using film) whenever possible; when negatives are used, they shall be in accordance with MIL-P-38790.

3.2.2.3 Marginal copy. Marginal copy (generally the running heads and feet) shall be placed outside that portion of the page used for either narrative text, full page tabular data, or full page illustrations, but within the printing area dimensions of the page. When applicable, marginal copy may also consist of the change number, security classification, page content/equipment identification, figure number and figure title. Also refer to 3.7.2.7 for deleted pages statement. Full page illustrations, including those for foldout pages, that have been prepared in exact printing size (or in the same size as text pages) shall have the marginal copy mounted thereon. Full page photographs that are oversize shall either have the marginal copy separate, or have the marginal copy also prepared proportionately oversize and mounted on (included in) the photograph unless the acquiring activity advises which method shall be used. Marginal copy shall not be on an overlay. Reproducible copy shall be mounted and covered when required by the acquiring activity. Text may be separately prepared in single-column galleys and then attached to the appropriate layout page. Refer to 6.3.12 for definition.

3.2.2.4 Running heads and feet. Complete running heads and feet shall be included on all pages (see figure 5).

3.2.2.4.1 Running heads.

3.2.2.4.1.1 Security classification. The security classification, including unclassified pages, of classified manuals shall be at the top center of each page and 8 1/2 inch segment of foldouts. (see 3.4.)

3.2.2.4.1.2 Technical manual identification number. The technical manual identification number, as assigned for each volume and part shall be at the top (center for Navy and outer edge for Army, Marine Corp and Air Force) of each page and 8 1/2 inch segment of foldouts. This number shall not be changed on change pages.

3.2.2.4.1.3 Binder edge. (N) The binder edge should indicate the equipment or subject to which the manual applies and shall relate to the prime title. Appropriate abbreviations may be used. Top-bound manuals shall place this information on the top, left-hand corner.

3.2.2.4.1.4 Outer edge. (A) (N) Significant reference information such as chapter, section or subject titles or paragraph number or figure number may be used or added. Appropriate abbreviations may be used. Top bound manuals shall have this information placed on the top, right-hand corner.

3.2.2.4.2 Running feet.

3.2.2.4.2.1 Page number. Page numbers shall be located at the outer edge. Even numbers, including zero, shall be assigned to lefthand pages and odd numbers to righthand pages.

3.2.2.4.2.2 Issue indicator. The issue indicator shall be located at the binder edge of all pages of basic manuals and superseding revisions. The change indicator shall be located at the binder edge of change pages.

3.2.2.4.2.3 Security classification. The security classification of classified manuals/volumes shall be located in the center.

3.2.2.5 Publication number. The publication number assigned by the acquiring activity shall be located on each page as specified in 3.2.2.4.1.2. However, when all the information for a 4 by 5 1/2 or 4 by 8 inch manual is placed horizontally on all pages, and all pages are to be printed head to foot, the publication number shall be placed in the upper-right corner of all pages. If the publication is jointly used, each service's number shall be prefixed with the word Army, Navy, Marine Corps, or Air Force as applicable. The acquiring activity's publication number shall be placed above the using activity's publication number. Example:

ARMY	TM 9-1000-200-15
AIR FORCE	TO 36-1-22
NAVY	SE 211-FA-MMA-010/SPS-10A
MARINE CORPS	TM-12345/1

3.2.3 Numbering.

3.2.3.1 Manuscript. Page numbering technique shall approximate that to be used in camera-ready copy. These page numbers are used only to establish the continuity of the manuscript pages and have no bearing on page numbers which will appear later in the printed publication.

**3.2.3.2 Camera-ready copy.** The page number shall appear in the lower-outer corner of each page. However, when all the information for a 4 by 5 1/2, 4 by 8, or 5 by 8 inch manual is placed horizontally on all pages, and all pages are to be printed head to foot, the page number shall be placed in the lower-right corner of all pages.

**3.2.3.2.1 Blank page number.** A blank page shall be assigned a number, but it shall appear on the preceding or following page; for example, if page 10 of Chapter 1 is blank, page 9 shall bear the number 1-9 (1-10 blank); or if page 9 of Chapter 1 is blank, page 10 shall bear the number (1-9 blank)/1-10. Also, when applicable, an added page, such as 1-10.1 shall show that 1-10.2 is blank.

**3.2.3.2.2 Pages, tables, illustrations.** Pages, illustrations and tables for chapters shall be numbered consecutively within each chapter, using two-part Arabic numerals separated by a hyphen. The first part shall be the chapter number and the second part the order within the chapter. For example: 2-17 shall be the 17th page, in Chapter 2, Table 2-17 shall be the 17th table in Chapter 2. (A manual may contain both a figure 2-17 and table 2-17). When a chapter starts with a full page illustration the illustration may be placed on a left-hand page and the page numbered "zero"; for example, 2-0, 3-0, etc. If a chapter is so short that the chapter can be completed on one page, permitting another chapter to start on the same page, both chapter numbers shall be indicated, for example, 3-1/4-1. For numbering of blank pages, refer to 3.2.3.2.1. Manuals divided into chapters and, in turn, into sections, shall contain consecutively numbered pages, illustration, and tables for the entire chapter. Unless specified otherwise in the detail specification, multiple-sheet illustrations shall be consecutively sheet numbered following the title; for example, Figure 2-17. Wing Hydraulic assembly (Sheet 1 of 3). Remaining sheets shall be numbered in consecutive order, Sheet 2, Sheet 3, and so forth.

**3.2.3.2.2.1 Title pages.** Title pages shall be unnumbered; however the first page of a brief manual that uses an abbreviated title block on the first page, below which the beginning text is placed, shall be assigned Arabic numeral 1.

**3.2.3.2.2.2 List of effective pages.** Refer to paragraph 3.5.3.

**3.2.3.2.2.3 Front matter.** Front matter pages following the list of effective pages and preceding chapter 1 shall be assigned sequential, lower case Roman numerals "i", "ii", "iii", etc.

**3.2.3.2.3 Procedural steps.** Procedural steps and substeps shall be identified consecutively. Procedural steps shall be identified by Arabic numerals and substeps by lowercase letters.

**3.2.3.2.4 Appendix.** Appendixes shall be identified by capital letters, e.g., APPENDIX A, APPENDIX B and so forth. Pages, paragraphs, illustrations and tables for appendixes shall be consecutively numbered in Arabic numerals, preceded by the capital letter of the appendix: for example, A-17 shall be the 17th page or paragraph in Appendix A; figure B-17 shall be the 17th illustration in Appendix B; table C-17 shall be the 17th table in Appendix C.

**3.2.3.2.5 Glossary.** Unless specified otherwise by the detail specification or contained in the manual introduction, the page numbers for an independent glossary shall be consecutively numbered in Arabic numerals with the word "Glossary" preceding the page number; example: "Glossary 1".



3.2.3.2.6 Index. Unless specified otherwise by the detail specification, page numbers for indexes shall be consecutively numbered in Arabic numerals with the word "Index" preceding the page number; example: "Index 1".

3.2.4 Headings. Numbers and titles for parts, chapters, sections, appendixes, alphabetical index, etc, shall be centered at the top of the first page of text for each. Parts, chapters, appendixes, and the alphabetical index shall begin on a right-hand page. The Section I heading shall be centered immediately below the chapter heading; subsequent section headings shall be centered on the page preceding applicable text.

3.2.5 Foldout pages and illustrations over one page in size. Foldout pages shall be prepared only when approved by the acquiring activity. If approved, foldout pages may be prepared for the 4 by 8, 5 by 8, and 8 1/2 by 11 inch manuals. Foldout pages shall not be used in 4 by 5 1/2 inch or 17 by 11 inch manuals. All foldout pages shall be prepared for printing on one side only and full blank aprons shall be used. Foldout pages shall not be spliced. A manual or volume of a manual shall be so arranged that all foldout pages fall at the end of the chapter or document as specified. Such pages shall follow the last chapter, last appendix, or alphabetical index, whichever forms the last portion of the manual or volume. The figure numbers for foldouts shall be "FO-1", "FO-2", etc., and shall be placed preceding the figure title under the illustration. Foldout pages shall be assigned page numbers FP-1/(FP-2 blank), FP-3/(FP-4 blank), etc. When a foldout consists of several sheets, the sheets will be numbered in consecutive order following the figure title. Each sheet shall be assigned a page number. The figure number for a foldout page shall be so placed (lower-outer corner) that the number will be visible when the printed page is folded. Foldout-foldup pages are not permitted. Maximum page sizes, maximum foldout page sizes, and maximum printable area for foldout pages shall be as follows:

<u>Manual size</u>	<u>Foldout maximum page size (including blank apron)</u>	<u>Foldout maximum printable area</u>
4 by 5 1/2	None	N/A
4 by 8	29 by 8	23 3/4 by 7 1/2 *
5 by 8	30 by 8	24 3/4 by 7 1/2 *
8 1/2 by 11	45 by 11	36 by 10 1/4
17 by 11	None	N/A

Minimum margins for the above: 1/4 inch, head and side opposite binding and 1/2 inch bottom, except \* 1/4 bottom.

3.2.5.1 Illustrations over one page in size. When an illustration will exceed one page, unless the usefulness of an illustration will be adversely affected, the illustration shall be divided and planned for presentation on facing pages and numbered figure FO-1, Sheet 1 and FO-1 Sheet 2. Sheets 3, etc., can be planned for succeeding pages when required and if this treatment will not affect the usefulness of the manual.

3.2.6 Blank pages. Blank pages normally require no marginal copy. However, if the reverse side is classified, security markings shall be in accordance with 3.4.4.

3.2.7 Emergency page markings. Emergency page markings are not considered marginal copy. Pages containing emergency information shall have a broken black border in accordance with the requirements of figure 7.

**3.2.8 Indentations.** The first line of procedural steps shall be indented two spaces or characters from the preceding paragraph. The first line of substeps shall be indented two additional spaces or characters. All lines of warnings, cautions, and notes shall be indented approximately five spaces or characters from both left and right margins. When the right margin is unjustified, indentations of five spaces shall be from the maximum allowable width of the type text. (For typeset copy, one pica shall be considered equal to two spaces or characters.)

**3.2.9 Tables and charts.** (See 3.2.3.2.2 for numbering of tables.)

**3.2.9.1 Manuscripts only.** Tables and charts shall be on separate sheets, which shall be inserted in the manuscript as the page immediately following the first reference thereto.

**3.2.9.2 Manuscripts and camera-ready copy.** A horizontal rule shall be placed at the beginning (head) and at the end (foot) of a table or chart. The table or chart number and title shall be centered above the head rule of a table or chart. The first letter of the first word and of each principal word shall be capitalized; the remaining letters shall be lowercase. The first letter of the first word of boxhead titles shall be capitalized; the remaining letters shall be lowercase. Tables shall be so designed that related entries in different columns are aligned. Carryover lines shall be indented two spaces. Tables applicable to one service, in a manual that will be used by more than one service, shall be identified to the applicable service.

**3.2.9.2.1 Continued material (figure 8).** When a table or chart is continued on a following page, the number and title shall normally be repeated at the head of the columns on all following pages of the table, followed by a dash and the abbreviation "CONT". Boxhead titles shall also normally be repeated. The above information shall not be repeated on a following page, when the page is a foot page of a head to foot tabular arrangement. When information opposite an item is continued, the item or its identifying number or letter shall be repeated followed by a dash and the word "continued".

**3.2.9.2.2 Footnotes.** Numbering of footnotes to tables or charts shall be independent of that of footnotes to the text. The references shall be indicated by consecutive superior numbers within each table or chart. (Superior lowercase letters, asterisks, or other designation may be used where numbers would cause confusion.) The footnotes, which shall be kept to the minimum consistent with clarity, shall be placed immediately below the table or chart in which they are referenced. Footnotes at the end of the table or chart shall be started on the second line below the closing rule. All table or chart notes and footnotes shall be indented five spaces and carryover lines shall return to the left margin (see figure 8.)

**3.2.9.2.3 Rules.** Tables may be vertically ruled as required for clarity. A horizontal rule shall be placed at the beginning and at the end of the table or chart. The "closing" rule is omitted at the foot of a continued table or chart; the "opening" rule is omitted at the head of the continuation thereof. (See Figure 8.)

**3.2.10 Illustration placement and legends.**

**3.2.10.1 Illustration outline.** The point at which an illustration, table, or chart is to be placed shall be indicated by a break in the text and the insertion of the figure number, title, and illustration identification number (figure 9). Outlines shall be placed at the end of the first paragraph or subparagraph to which they pertain. The figure number shall begin at the left margin and there shall be a 1 1/2 inch space above and below the outline. Outlines for foldout

illustrations shall be placed at the end of the text. For camera-ready copy, the illustration is mounted in place and the cutline becomes the figure title.

3.2.10.2 Figure titles. Illustrations shall be assigned figure titles. The title shall follow the figure number and shall be centered below the applicable illustration. Figure titles should begin with an identifying name; examples: Guidance System; Engine Assembly. The title shall be short and describe the contents or purpose of the illustration. Illustrations applicable to one service, in a manual that will be used by more than one service, shall be identified. Example: "FIGURE 2-3. (Army only) Fuel Indicator."

3.2.10.3 Illustration legends. Legends shall be placed four spaces above the cutline and shall be headed by the word "legend", followed by the number of the figure to which it is applicable (see figure 10). The entire legend shall be indented 5 spaces. If the legend is continued, the figure number and title shall be repeated, followed by the word "continued". Only that information which is necessary to clearly identify the items shall be included in the legend. Where methods such as the tabular presentation technique are used, no legends are required.

3.2.10.4 Illustration identification numbers. When required, illustration identification numbers shall be placed in the lower right-hand corner of the illustration.

3.2.11 Divisions. The hierarical breakdown of a publication shall be divided into volumes, parts, chapters, sections, and paragraphs, as appropriate. There shall be at least two of each subdivision used; i.e., where there is a Volume 1, there shall be a Volume 2, where there is a part one there shall be a part two; where there is a chapter 1, there shall be a chapter 2, etc. All volumes, parts, chapters, sections and numbered paragraphs shall be titled except procedural steps or those statements which follow a colon. The second and all following subparagraph lines shall begin at the left margin. Breakout shall be planned so as to subordinate that which should be subordinated. For example:

2-7 NONREVERSIBLE VALVE.

- a. Removal.\*\*\*\*\*.
- b. Disassembly.\*\*\*\*\*.

3.2.11.1 Volumes. (A) (N) When volume numbering is required, volumes shall be numbered consecutively in arabic numerals.

3.2.11.1.1 Volumes (N). Two or more volumes shall be identified sequentially by volume numbers and subtitles indicative of volume content and have a unique Navy Technical Manual Identification Number System (TMINS) number assigned as provided by the contracting activity. No separately-bound volume shall exceed approximately three (3) inches in thickness.

3.2.11.2. Parts (N). When a volume exceeds approximately 3 inches in thickness, it shall be divided by chapters (where possible) into separately bound parts. Each part shall be identified by both its volume and part numbers and have a unique TMINS number assigned as provided by the contracting activity.

3.2.11.3 Chapters. Arabic numerals shall be used to number chapters consecutively throughout all volumes of the publication. Format shall be as shown by figure 9, except that the second and all following chapter headings shall appear in the position shown in figure 9.

3.2.11.4 Sections. Roman numerals shall be used to number sections consecutively within each chapter. Format shall be as shown in figure 9.

3.2.11.5 Paragraphs. Text shall be divided into primary paragraphs and subordinate paragraphs. Subordinate paragraphs may be further identified as first subordinate, second subordinate and third subordinate. Paragraphs may also be divided into procedural steps. Procedural steps may be further divided if necessary. Decimal paragraph numbering as shown in paragraph 3.2.11.5.2 shall be used.

3.2.11.5.1 Paragraph headings. Paragraph headings are identified as primary sideheads, first subordinate sideheads, second subordinate sideheads, etc. Periods shall follow paragraph headings. All numbered paragraphs shall have a sidehead. Paragraphs without sideheads shall be handled as procedural steps.

3.2.11.5.1.1 Primary sideheads. Primary sideheads are normally used to divide text within chapters or sections into two or more portions. There should be at least one primary sidehead in each chapter or section. Primary sideheads stand alone (are not run in with text) and shall appear in capital letters. They shall begin on the left margin and shall be underscored or prepared in bold face type.

3.2.11.5.2 Subordinate sideheads Subordinate sideheads shall be numbered and have the order of heading as follows:

Order of  
Heading

- (1) 1-1 PRIMARY SIDEHEAD.
- (2) 1-1.1 First Subordinate Sidehead
- (3) 1-1.1.1 Second Subordinate Sidehead.

a. First procedural step. (xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)

(1) First subordinate procedural step

(xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)

(a) First subsubordinate procedural step

(xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)

- (1) 1-2 NEXT PRIMARY SIDEHEAD.
- (2) 1-2.1 Next Subordinate Sidehead

Breakdowns beyond the third subordinate normally shall not be used. All subordinate sideheads shall begin on the left margin. The first letter of the first word of the title and of each principal word shall be capitalized, and the title shall be underscored. The text shall begin on the same line as the title and the title and text shall be separated by a period and two (2) spaces. The second and all following subordinate sidehead lines shall begin at the left margin.

3.2.11.5.3 Procedural steps. Procedural steps shall be used to provide step-by-step instructions, such as disassembly, reassembly, and alignment procedures. Steps may be further divided into substeps. Procedural steps and checklist items shall be numbered in accordance with subordination requirements of 3.2.11.5.2. The steps/items shall be indented in block format as shown in 3.2.11.5.2.

3.2.11.6 Appendixes. Appendix headings shall be capitalized and centered. Appendixes shall immediately follow the last chapter of the manual. Pages, paragraphs, illustrations and tables for appendixes shall be numbered in accordance with 3.2.3.2.4.

3.2.11.7 Glossaries. Glossaries shall be used in technical manuals only when the terms are not adequately defined in the text, or in the Army, Navy, Air Force, DOD or standard dictionary. If a glossary is required, it shall immediately precede the index, if any. Glossary headings shall consist of the word "GLOSSARY" capitalized and centered. Page numbers for a glossary shall be consecutively numbered as specified in 3.2.3.2.5.

3.2.11.8 Index. (figure 11). An alphabetical index shall be prepared when the number of paragraphs in a publication exceeds 100. It shall list pertinent subjects under every topic for which users are likely to look. All applicable paragraph numbers for each item shall be indicated. The index shall be so constructed as to enable the user to locate easily any part, information, or operation described in the text. The index head shall consist of the word "INDEX" capitalized and centered. Page numbers for alphabetical indexes shall be consecutively numbered as specified in 3.2.3.2.6. The index shall be located at the end of the publication but will be located before any foldout page(s) (See 3.2.5.)

3.3 Style of writing. The paramount consideration in preparing a technical publication is its technical content. This should be presented in language free of vague and ambiguous terms, using the simplest words and phrases which will convey the intended meaning. All essential information must be included, either by direct statements or by reference. For maximum clarity and usefulness, there shall be consistency in terminology within the same publication or series of publications. To the extent that the nature of the data being presented will allow, there shall be consistency of organization among like-type publications. Sentences shall be short and concise. Punctuation shall be used in a manner which aids in reading and prevents misreading. Well planned word order requires a minimum of punctuation. When extensive punctuation is necessary for clarity, sentences shall be rewritten. The U. S. Government Printing Office Style Manual shall be used as a general guide for capitalization, punctuation, compounding of words, numerals in the text, and spelling of non-technical words. Technical words shall be used only when no other wording will convey the intended meaning. Quotation marks and underscoring shall not be used for emphasis. Words which have more than one meaning which will fit the context in which they are used, such as "replace" for "reinstall", shall not be used. Chapter, section and paragraph headings shall be descriptive of the contents of the division they head; "General" and "Miscellaneous" shall not be used unless no other title will suffice. Pages containing emergency information shall be marked by a broken black border. Nomenclature shall be consistent within a publication and throughout parts lists, parts breakdowns, and other directly related publications. Statements which explain applicability for individual items of equipment shall use specific serial number(s), block designation(s), specific model designation(s), or similar identification. Such terms as "on later equipment" and "on early serial numbers" shall not be used. Level of writing used in technical manuals will be determined at the time of application of a technical content specification. Technical publications published in accordance with this specification shall make no reference to age, sex, race or national origin. Use sex neutral terms except avoid use of the word "person" (terms

such as "midshipman" and "workman" are considered sex neutral). When graphics or illustrated material are necessary to convey technical information or understanding, human figures used shall reflect a cross section of races and both sexes. For Navy, the style of writing shall also meet the comprehensibility requirements of DoD-STD-1685.

3.3.1 References. The text shall refer to:

a. Only models or types covered by the manual. To facilitate coverage of modified or additional models or types at a later date, references should be held to a minimum consistent with clarity.

b. The basic number of Government specifications and standards. When the contractor cannot ascertain the Government specification number, he shall request this information from the acquiring activity, furnishing complete information concerning the material's composition, properties, characteristics, applications, manufacturer's specification number, etc.

c. Temperature readings as calibrated on the equipment. If other than Fahrenheit, the equivalent in Fahrenheit shall follow parenthetically. General temperature references, such as room temperature, shall normally be given in degrees Fahrenheit.

d. Speed, distance, and meter readings as calibrated on the equipment. When the metric system is used on the equipment, conversion to U. S. standards shall follow in parentheses. If the technical content specification so requires, conversion of U. S. measurements to metric measurements shall be indicated.

e. Switch positions and panel markings exactly as marked on the equipment. However symbols on panel markings may be spelled out when they cannot be produced by the composing equipment used to prepare the manuscript or reproducible copy for the manual, such as the symbol for "ohm", "infinity", etc.

f. Measurements in U. S. standard units (ounces, pounds, gallons, inches, feet, knots, miles, etc) except instances in which metric measurements are required.

g. Illustrations by figure number, including section letter/number when applicable, and the sheet number for multisheet illustrations. References shall be made only to illustrations within the same manual, or another volume of the same manual. References to multisheet illustrations will include figure and sheet number.

h. Index numbers on illustrations first, followed by the figure number; example: (34, FIGURE 2-6). However, when multiple references in a paragraph refer to the same figure, only the first reference need indicate the figure number. Example: "Disassembly of Air Valve, (FIGURE 4-12). Unscrew safety disc retainer (2) from valve body (1) and remove safety disc (3) and safety disc washer (4)." When the sequence is unbroken for procedures requiring two or more pages, the figure number followed by the word "continued" shall be repeated after the first reference on each succeeding page. If two or more figures are involved in the same sequence, the figure with the greater number of items shall be cited as described above. Item callouts for items on remaining figures shall have the figure number follow the item number, e.g., 21, FIGURE 3-5. In such cases, the paragraph lead-in shall contain a statement similar to the following: "Item numbers below refer to FIGURE 3-5 unless otherwise indicated."

i. Parts on diagrams by enough of their reference designation to identify the item. Example: A6R11.

j. Tables by table number. References shall be made only to tables within the same manual, or another volume of the same manual.

k. Other supporting paragraphs in the same manual or another volume of the same manual, by paragraph number. Use of the word "paragraph" or "subparagraph" before the number is optional; use or omission shall be consistent. (Duplication of material within the manual shall be avoided except when required for clarity or emphasis.)

l. Other subparagraphs of the same primary paragraph as "above" or "below".

m. Other publication numbers (omitting dates, page, figure and paragraph numbers) to avoid duplication of material exceeding two pages. Reference may be made only to publications in the publication system(s) of the service(s) that will use the publications and are authorized at user level. Except for classified material, cross referencing is prohibited when material of two pages or less is involved.

n. Footnotes, when essential for reference, explanation, comments, etc. If used in text, consecutive numbers beginning with "1" shall be used. The numbering system, as long as it is consistent, may be per page, per section, per chapter, per manual or per volume for a multi-volume manual. Identical footnotes, shall not be repeated within the unit chosen for numbering (page, section, chapter, manual, or volume). Footnotes in the text shall not be used for mandatory requirements. In tables, footnote references shall be numbered separately for each table in accordance with the U. S. Government Printing Office Style Manual. Footnotes to the text shall be placed at the bottom of the page: footnotes to tables, below the closing line of the applicable table.

3.3.2 Grammatical person and mood. The second person imperative mood shall be used for procedures ("Remove test set from carrying case.") Third person indicative mood shall be used for description and discussion, ("When switch A is in the ON position, lamp 34 lights.")

3.3.3 Readability. Technical publications shall be written at a Reading Grade Level (RGL) commensurate with the capability of the target audience for which they are intended as specified by the acquiring activity. The appropriate RGL for each technical publication shall be determined in advance by the acquiring activity. The method employed to determine readability of narrative material is optional; however, it must meet the quality assurance provisions identified in Section 4. The Overall Grade Level (OGL) as determined in 4.4.3.1., shall not exceed the appropriate RGL by more than 1.0 level. The Grade Level (GL) of each sample, as determined in 4.4.3.2., shall not exceed the appropriate RGL by more than 3.0 grade levels. For Naval Electronics Command and Naval Sea Systems Command the readability criteria of DoD-STD-1685 shall be used to provide a ninth (9th) grade reading level.

3.3.4 Abbreviations. Use of abbreviations shall be held to a minimum and each shall be defined the first time it appears in each chapter. An excellent rule to follow is; "when in doubt, spell it out." Abbreviations used shall be in accordance with the requirements of MIL-STD-12. However, if a manual is prepared on composing equipment cited in 3.2.2 which cannot produce a certain abbreviation or symbol, such as "+" for "plus or minus", an abbreviation such as "POM", may be used provided the new abbreviation does not conflict with one presently listed in MIL-STD-12. Such new abbreviations must be explained in the manual's foreword preface, introduction, or glossary.

**3.3.5 Military terms.** Military terms used shall be in accordance with Joint Chiefs of Staff (JCS) Publication I or any dictionary or glossary of military terms of the appropriate service.

**3.3.6 Automatic electronic test and checkout terminology.** Terms used for automatic electronic test and checkout shall be in accordance with MIL-STD-1309.

**3.3.7 Use of "shall", "will", "should", and "may".** Use "shall" whenever a manual expresses a provision that is binding. Use "should" and "may" whenever it is necessary to express non-mandatory provisions. "Will" may be used to express a declaration of purpose. It may be necessary to use "will" in cases where simple futurity is required, i.e., "Power for the meter will be supplied by the ship".

**3.3.8 Tables, charts, and graphs.** Reference data (other than illustrations, drawings, diagrams) shall be presented in tabular, chart, or graph form. Any other type of data which lends itself to tabular, chart, or graph form may also be so presented. Tables, charts, and graphs shall be so designed that they are easily understood. Charts and graphs shall be considered illustrations, and be assigned figure numbers.

**3.3.8.1 Tabular material.** When a small amount of tabulated information is to be inserted, and will not require referencing from adjacent text, it may be included within a paragraph of text without identifying it as a table.

**3.3.9 Warnings, cautions, and notes.** Unless otherwise specified in the technical content specification, warnings and cautions shall precede the text but follow paragraph headings to which they apply. Notes may precede or follow applicable text, depending upon the material to be highlighted. Warnings, cautions, and notes shall not contain procedural steps nor shall the headings be numbered. When a warning, caution, or note consists of two or more paragraphs the heading WARNING, CAUTION, NOTE, shall not be repeated above each paragraph. If it is necessary to precede a paragraph by both a warning and a note, or a caution and a note, etc., warnings shall precede cautions, which in turn shall precede notes. Figure 12 illustrates the styles. Warnings, cautions, and notes shall be short, concise and used only to emphasize important or critical data. Warnings and cautions may be worded positively or negatively and shall state the hazard and result or reason, unless obvious.

**3.3.9.1 Health hazards.** Procedures prescribed for the operating of equipment shall be consistent with the safety standards established by the Occupational Safety and Health Act, (OSHA) Public Law 91-596 and Executive Order 11612. Warnings and cautions shall also be used when hazardous chemicals or adverse health factors in the environment or use of the equipment cannot be eliminated. A list of personnel protective devices shall be included.

**3.3.9.2 Energy efficiency requirements.** Technical manuals covering products that directly consume energy in normal operations shall include their energy efficiency.

**3.3.9.3 Environmental protection.** All technical manuals that require the use, transportation, handling, storage or disposal of fuels, toxic and hazardous substances, chemicals, ordnance/munitions, etc. shall meet the requirements of the Federal Environmental Protection Standards.

**3.4 Security classification markings.** The security classification markings for titles of parts, chapters, sections, appendixes, paragraphs, illustrations, and tables; also contents of paragraphs, illustrations and tables shall be identified in accordance with DoD 5200.1-R and DoD 5220.22-M.



### 3.4.1 Overall classification.

3.4.1.1 Classification. The overall classification assigned to all technical publications shall agree with highest classification assigned to any sheet therein, and shall be placed conspicuously at top and bottom of cover, title, or title block page, and on outside of front and back covers, and backbone of a binder, if any (figure 13). When this results in a cover, title or

title block page, being marked with a higher classification than that assigned to the contents of that page, an explanation of the higher classification shall be made on that page under the bottom classification marking; for example:

CONFIDENTIAL	SECRET
(This page is UNCLASSIFIED)	(This page is CONFIDENTIAL)

3.4.1.2 Placement. The security classification on the cover and full cover title pages shall be placed at top and bottom center of the border, or at top and bottom center, aligned above the publication number and below the date respectively, for pages without a border. On title block pages it shall be placed at top center of the border and be inserted at bottom center of the text on that page. (See Figure 14.)

3.4.1.2.1 Nomenclature. If nomenclature of equipment is classified, classification shall appear following the nomenclature. If nomenclature is unclassified, it shall be so indicated. (See figure 14.)

3.4.1.2.2 Disclosure notice. The disclosure notice shall be included in accordance with paragraph 3.5.1.10 (See figure 14.)

3.4.1.2.3 Supersedure notice. This notice shall be prepared in accordance with 3.5.1.7 (See figure 14.)

### 3.4.2 Downgrading/Declassification.

3.4.2.1 Downgrading/declassification notice. The downgrading/declassification notice on cover, title or title block page shall be in accordance with DoD 5200.1-R. (Date of classification guide not required in technical publications). The "Classified By" line shall list Security Classification Guide that caused publication to be classified. The "Declassify On" or "Review on" line shall show specific date or event certain to occur. (See figure 14). Terms such as "Indefinite" or "Can Not Be Determined" will not be used. The "Declassify On" date is an instruction to user to effect declassification action on date indicated. Technical publications to be downgraded or declassified earlier than originally scheduled will have a numbered change, title and list of effective pages issued to accomplish this action. The "Declassify On" date shall not include a date for declassification in excess of 20 years from date of original classification. The "Declassify On" dates shall be changed to "Review On" dates not to exceed 20 years.

3.4.2.2 Downgrading procedures. Classifications shall be lined through on title page when a publication's classification is changed with new classification, if any, marked immediately below the old, and a "Classification changed to" notice shall appear in upper left corner. (See figure 14). The notice shall remain until the first following revision, at which time new classification shall be indicated. If classification of a secret publication is downgraded (with a portion of the secret material becoming confidential and a portion of the remainder becoming

unclassified), or if portions of a confidential publication are downgraded, all affected pages shall be re-prepared showing new classification, if any, for each paragraph, illustration, etc., and for the page itself. The old classification, lined out, shall not be shown. If the only downgrading action is that all secret material has become confidential, and no secret or confidential material has become unclassified, changing the title page (and explaining this with a downgrading note thereon) is satisfactory and each classified page need not be changed. (See figure 14.)

NOTE: Title page and list of effective pages are the only pages required to be printed if the only downgrading action is that all secret material has become confidential; however, the activity preparing that change will take immediate action to change all secret markings to confidential on the reproducible copy.

3.4.2.3 Declassification procedures. All security markings, disclosure notice, and nomenclature classification shall be lined through when a publication's classification is cancelled, and a "Classification changed to" notice shall appear in the upper left corner. Below the notice shall be a statement to the effect that classification on all pages of the publication shall be lined out by personnel responsible for maintaining the publication in current status. The notice shall remain until the first following revision, at which time the publication will be issued unclassified. (See figure 14.) If classification of a publication is cancelled, classified pages shall not be reprepared unless there are technical changes to such pages, or unless a revision of the publication is warranted. If a revision is warranted, classification will be removed from all paragraphs, illustrations, tables, and pages. If the only change to the publication is the cancellation action, a changed title page, and list of effective pages shall suffice. These markings will remain on title page until the publication is revised. (See figure 14.)

NOTE: Title page and list of effective pages are the only pages required to be printed to cancel a publication classification; however, the activity that prepared that change will take immediate action to remove all classification markings, except the title page, from the reproducible copy.

3.4.3 Front matter. The front matter of a classified publication shall have a table of contents and if it contains 10 or more illustrations or tables, shall have a list of illustrations and list of tables.) The security classification of any classified caption/title in the front matter shall be shown preceding the caption/title. Every effort will be made to use unclassified captions/titles whenever possible. The classification marking is for caption/title only and does not indicate classification of basic paragraphs, tables, or figures. (See figure 15.) Any other pages in the front matter that include classified information will show classification of all parts.

3.4.3.1 Transmittal cover sheets. Transmittal cover sheets shall be prepared in accordance with 3.7.2.4.

3.4.4 Classification of each page. (See figure 16). Each page other than title page or first page, shall be marked according to its highest content, and this classification marking shall be placed conspicuously at top and bottom of page except when classification of two pages of one sheet (two pages being back to back) differ, then the higher classification shall be used on both pages. Unclassified sheets (both pages being unclassified) shall be so marked. When any page is marked with a higher classification than that assigned to its contents, an explanation shall be made on that page under the bottom classification markings; for example:

CONFIDENTIAL  
(This page is UNCLASSIFIED)

SECRET  
(This page is CONFIDENTIAL)

A blank page (cover sheet) backing up a classified page, shall show classification of classified page. These cover sheets shall be furnished as reproducible copy or negatives. Blank pages backing up unclassified pages need not be marked. If classification shown on last page of a publication is not the same as that shown on cover, then a blank sheet shall be added to back of publication showing same classification as on cover. The cover sheet shall be listed on reproduction assembly sheets as a cover sheet and be counted as a printed page in the page totals. If last page of publication is blank, a cover sheet will be prepared for printing in lieu of a blank page, and a blank page will not be required.

### 3.4.5 Classification of publication contents.

3.4.5.1 All pages, paragraphs, figures, tables, etc., will have classification markings in accordance with DoD 5200.1-R. This applies to all new or revised technical publications. When preparing a change, classification markings for paragraphs, figures, tables and titles will conform to style and format of existing publication (pages will always be marked top and bottom). Backup pages that do not have page markings will be changed to add page markings at top and bottom of page.

3.4.5.2 Paragraph markings. All primary and subordinate paragraphs shall be marked to show level of classification contained in or revealed by it or that it is unclassified. (For module marking, (see 3.4.5.2.1). Classification levels shall be shown by the appropriate classification symbol immediately following paragraph letter or number, or in the absence of numbers or letters, immediately before beginning of paragraph. Parenthetical symbols (TS) for Top Secret, (S) for Secret, (C) for Confidential, and (U) for Unclassified shall be used. In marking parts, warnings, cautions or notes that do not have numbers, the appropriate marking shall be placed immediately preceding and to the left of parts involved. Note that these abbreviated classification markings are for internal use only, not for overall marking of pages. These instructions apply to all new and revised publications. When preparing changes to existing publications that do not have complete markings in accordance with DoD 5200.1-R, classification markings shall be in accordance with existing style and format of each individual publication being changed. (See figure 17.)

3.4.5.2.1 Module markings. For classification marking purposes, each module of information (see 6.3.15) shall be considered the equivalent of one portion and shall bear the highest classification required for any element of the module.

3.4.5.2.2 Portion marking. If a chapter or section (portion) of a classified document does not contain any classified information, a statement may be placed under the chapter/section heading: "THIS CHAPTER IS UNCLASSIFIED". If a chapter/section (portion) contains classified information at one security level and can be clearly identified, a statement may be placed under the chapter/section heading: "THIS CHAPTER IS CLASSIFIED SECRET" only because the range of the TOW missile is discussed throughout. It contains no other classified information". With situations of this nature, only page marking is required; otherwise module marking in accordance with 3.4.5.2 and 3.4.5.2.1 is required.

3.4.5.3 Figure and table markings. Illustrations, photographs, figures, graphs, drawings, charts, tables, and similar portions of classified documents will be clearly marked to show their classification or unclassified status. Such markings shall not be abbreviated and shall be prominent and placed within or contiguous to the portion. Captions of such portions shall be marked on the basis of their content alone by placing the symbol ("(TS)", "(S)", "(C)", or "(U)" immediately preceding the caption. (See figure 18.)

3.4.6 Classified supplements. Classified supplements, when approved by the acquiring activity, shall be prepared in accordance with 3.9.1.

3.4.7 Reprinting classified publications. The requirements for adding classification markings of classified technical publications apply to those being revised, changed, or supplemented. Publications shall be reprinted with existing classification markings unless they have been declassified/downgraded. Whenever reprint action is required on a technical publication that has been declassified/downgraded, every effort will be made to reprint the publication so that all required remarking has been accomplished. If the technical publication has been declassified, markings on all pages except title page will be opaqued or taped out before reprint action. If a publication has been downgraded from secret to confidential and camera-ready copy is available, they should be used for all secret pages so that new negatives can be prepared for these pages. If camera-ready copy is not available, the publication may be reprinted with the security markings on them, with the cover/title page noting that "Secret" classification of all pages in this publication shall be lined out and marked "Confidential" by personnel responsible for maintaining the publication in current status.

3.4.8 Artwork. Classification markings for artwork shall be in accordance with figure 18.

3.5 Front matter. Unless otherwise specified in the contract or the technical content specification, material preceding the first text page shall consist of the following, in the order specified:

<u>MATERIAL</u>	<u>ARMY</u>	<u>NAVY</u>	<u>AIR FORCE</u>	<u>MARINE CORPS</u>
Cover/Title/Title Block Page as applicable	X	X	X	X
Warning page (when specified)	X			X
List of effective pages		X	X	X
Change record		X		X
Foreword/Preface	X	X	X	X
Table of contents	X	X	X	X
List of illustrations		X	X	X
List of tables		X	X	X
Safety summary	X	X	X	X

3.5.1 Cover/Title/Title Block Page. Manuals shall have either a cover, title, or title block page. Camera-ready copy for the cover/title/title block page shall contain the information indicated by figures 1, 2, and 14. Unless otherwise stated in the contract or order, the informa-

tion for either cover, title or title block page will be the same except when there is both a cover and title page, the date will be omitted from the cover page. The acquiring activity will indicate which (or that both) shall be provided. When a manual will require a backbone for binder or cover, the acquiring activity will so state. Camera-ready copy for the backbone or cover of a manual shall be in accordance with figure 13. The publication number will be furnished by the acquiring activity. When a title block followed by text on the same page is used instead of a cover page, the title block shall be confined to a 7 x 5 1/2 area. Type size shall be such that all the information can be included within the prescribed area for title block usage (See 3.10.) Camera-ready copy for the back cover of a classified manual shall show the security classification, at the top and bottom, and in the same size and style as shown on the front cover.

3.5.1.1 Preliminary manuals. Refer to 6.3.21 for definition. When applicable, the word PRELIMINARY shall be centered above the words TECHNICAL MANUAL (or type of publication.).

3.5.1.2 Copy number. (F) Provision for entering a sequential copy number will be provided as follows, in the upper left corner of the title page:

#### SEQUENTIAL COPY

NO. . . . . of . . . . . Copies

If a preliminary manual is changed, each changed title page must also show space for the receiver of the change to enter the proper sequential copy number.

3.5.1.3 Draft manuals. (A) Refer to 6.3.7, 6.3.8, 6.3.9 and 6.3.20 for definitions. The words "Draft" or "Final Draft" shall be centered above the words TECHNICAL MANUAL, as specified by the acquiring activity.

3.5.1.4 Title. The technical manual title as indicated by the applicable content specification shall consist of the following and located as shown in figures 1, 2, and 14.

- a. Heading "Technical Manual"
- b. Type of Manual (operator instruction, maintenance, IPB, etc.)
- c. Maintenance level (if restrictive)
- d. Prime title (name/nomenclature)
- e. Subtitle (as applicable)
- f. Manufacturer

3.5.1.4.1 Maintenance level (s). The level(s) of maintenance, as appropriate, shall be shown beneath the manual type. (N) (F). When only one maintenance manual is being acquired to support a weapon, equipment or hardware, no level shall be specified unless restrictive, since it will be the only manual available for repair and maintenance at any designated maintenance level (O, I, or D).

3.5.1.4.2 Prime title. The nomenclature of the equipment, type, model, part number or subject (blocks, serial numbers, or registration numbers, if appropriate) shall be positioned below the words identifying the manual type or maintenance level, if applicable. If so requested by the acquiring activity, the national stock number and identification of other equipment covered in the manual shall be indicated. The classification of the equipment nomenclature shall be indicated (U), (C), (S), as specified in DoD 5200.1-R and DoD 5220.22-M if the publication itself is classified. The prime title shall be the same on all volumes and parts of a multivolume/part technical manual set.

3.5.1.4.3 Subtitle. A subtitle shall be used and located immediately below the prime title, to indicate the contents of every separately bound volume and part of a technical manual.

3.5.1.4.4 Manufacturer. Identification of the designer of the equipment shall appear below the equipment nomenclature or subtitle as applicable. If the equipment is designed by a sub-contractor but the manual is prepared by the prime contractor, the parenthetical statement "Manual prepared by \_\_\_\_\_)" (6-point) shall appear below the manufacturer's name. However, the identification shall be omitted for any manual applicable to more than one manufacturer unless the prime contractor prepared the manual for two or more sub-contractors; in which case the "(Manual prepared by \_\_\_\_\_)" statement only shall be used.

3.5.1.5 Contract number. (N, F) The original contract number shall be placed on all new issues and carried forward on all subsequent cover, title, or title block pages. If the contract number for a change or revision is different from the original number, the number applicable to the change or revision shall be indicated on the cover/title/title block page in addition to the original number. No more than two contract numbers, the original and the latest, need appear.

3.5.1.6 Distribution statement. The following statement shall be placed on the cover, title or title block page of each unclassified manual.

"This publication is required for official use or for administrative or operational purposes only. Distribution is limited to U. S Government Agencies. Other requests for this document must be referred to (applicable activity and address).

3.5.1.7 Supersedure notice. When the manual under preparation supersedes other manuals or portions of manuals, a supersedure notice, which will be furnished by the acquiring activity, shall be placed on the cover/title/title block page in accordance with figures 1 and 2. If an unclassified manual supersedes a classified manual, or if a manual of a lower classification supersedes one of a higher classification, the following statement shall be included. "This manual supersedes (insert proper publication number) dated (insert date of superseded publication), which shall be destroyed in accordance with applicable security regulations". For Air Force, the supersedure notice for a change or revision shall include a list of all currently superseded safety, operational, and technical order page supplements (TOPS). Superseded supplements shall normally be listed individually, but when several alphabetically/numerically sequenced supplements are superseded, they may be grouped.

3.5.1.7.1 Preliminary manuals. (N, M, F) When a preliminary manual is superseded by a formal manual, the word PRELIMINARY shall not appear on the revised cover, title or title block page. A supersedure notice similar to the following is required: "This manual supersedes Preliminary (publication number) dated \_\_\_\_\_".

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3.5.1.8 Supplement notice. (N, M, F) Cross-reference notes to supplements, or to augmenting manuals, shall be placed on basic publication cover, title, or title block pages initially, or at time of change or revision.

3.5.1.9 Effective date. When a manual becomes effective later than the date upon which it is distributed, a notice similar to the following shall be used: "The effective date of this publication is (\_\_\_\_\_). Instructions herein shall not be used prior to that date".

3.5.1.10 Disclosure notice. The following disclosure notice shall be placed on the cover, title, or title block page of all classified manuals. (See figure 14.)

"If this technical manual is approved for release to a foreign government, it is furnished upon the condition that it will not be released to another nation without specific authority of the (appropriate department or agency) of the United States, that it will be used for military purposes only, that individual or corporate rights originating in the information, whether patented or not will be respected, that the recipient will report promptly to the US, any known or suspected compromise, and that the information will be provided substantially the same degree of security afforded it by the Department of Defense of the United States."

3.5.1.11 Authority notice. The authority notice will be provided by the acquiring activity. Manuals to be jointly used shall show a joint authority notice.

3.5.1.12 Page total and copy number. (N, F) Manuals classified Secret (with or without RESTRICTED DATA or FORMERLY RESTRICTED DATA notations) shall show the statements: (N) (F) "This publication consists of \_\_\_\_\_ secret pages of \_\_\_\_\_ total pages (N). Copy No \_\_\_\_\_ of \_\_\_\_\_ copies (numbers will be inserted following reproduction).

3.5.1.13 Publication date. The publication date of the manual shall be the cut-off date from which no further changes to the manual are permitted without issuing a formal change. This is normally the "approved date", that is, the date the government accepts the manual subject to the inclusion of specified comments. If the acquiring activity does not advise the contractor the exact date to use, the publication date shall be the date at which the last material to be included was received (copy freeze date) - refer to 6.3. 5. The day, month, and year shall be given in that sequence: example: 7 JULY 1982.

3.5.1.14 Change number (or letter) and date. Each change to a manual shall be numbered (A) (F) or lettered (N) (M) in sequence and dated. Identification of changes to each revision of a manual shall begin over again with a number 1 or letter A as applicable. Unless the acquiring activity advises otherwise, the change date shall be the date at which the material to be included was received (copy freeze date). The change number and date shall be shown on the title/title block page as follows:

CHANGE 1            19 DECEMBER 1982

3.5.1.15 Protective marking.

3.5.1.15.1 For Air Force, Navy and Marine Corps use. When specified by the acquiring activity, unclassified manuals shall contain the notice "FOR OFFICIAL USE ONLY" at the bottom center of the cover and title page.

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3.5.1.15.2 For Army Use. When specified by the acquiring activity, the manual shall be marked "FOR OFFICIAL USE ONLY" in bold letters in at least 14-point type. This marking shall be placed near the bottom of the front cover, back cover and each page. The front cover shall also show a cancellation date as provided by the acquiring activity.

3.5.1.16 For MAP or Consortium use only. When the acquiring activity so requests, manuals prepared for limited non-U.S. use (such as for Military Assistance Program (MAP) or Consortium) shall contain the statement "For MAP Use Only" or "For Consortium Use Only" placed on the cover, title, or title block page in the position designated by the acquiring activity.

3.5.2 Warning page. (A) (M) A warning page(s) shall include each general type of warning and warning symbol used within the Technical Manual. This page(s) shall not be a list of specific warnings that pertain to particular procedural steps, but shall include general subject data (eg., radiation, chemicals, voltage, gas pressure, lazer light, etc) as shown in the examples on Figure 19. The warning page shall be placed on the inside front cover or be the initial page(s) of the manual. (See figure 19.) These pages shall be numbered with lowercase letters, e.g., "a", "b", "c", etc.

3.5.3 List of effective pages (N) (F) (M) A list of effective pages shall be prepared in accordance with figure 20. This page shall back up the title page, or back up a separate transmittal page when the acquiring activity so specifies, and shall be identified by the letter "A" in the lower left hand corner. (For the Marine Corps this shall be a right hand page identified by the letter "A" in the lower right hand corner and not be backed up.) When additional space is required, "B", "C", etc., pages shall be added. The list of effective pages shall be a complete list of all manual pages, including title page, list of effective pages, blank pages, deleted pages, added pages, and foldout pages. The list of effective pages shall be updated for each manual change. The listing shall be held to a minimum by grouping numbers, where applicable. The page numbers for a blank page and the printed side of the sheet shall be listed as separate numbers, even though a double number will appear on the printed side of the sheet. Appropriate change numbers shall be shown in the "Change No" column. The words "Deleted" or "Blank" shall be placed along side the page number of pages so affected.

3.5.3.1 Identifying change numbers and dates. On the "list of effective pages", above the listing of pages contained in the manual shall be a list of applicable change numbers and dates.

3.5.3.2 Acquiring service identification. The abbreviation of the acquiring service, e.g., USAF, shall be placed in the lower right corner of the list of effective pages (page "A" only.) If a service acquires a manual for exclusive use of another service, the symbol in the lower right hand corner of the page shall still show the abbreviation of the acquiring service.

3.5.3.3 List of effective pages for multivolume manuals. (A) (N) A list of effective pages covering all volumes shall be prepared for the basic manual and shall be included in Volume I. In a multivolume manual, each of the volumes, except volume I, shall include the listing of pages provided in that particular volume.

3.5.4 Change record. (N) (M) A permanent change record, when included, shall be prepared in accordance with figure 21, and shall be included in each separate volume. The change record should not back or be backed up. These pages shall not be numbered.



3.5.5 Foreword/Preface. A foreword or preface when included in a volume or part of a manual, shall contain the purpose and scope of the manual plus any other information required by the technical content specification. When necessary, a foreword/preface shall define new abbreviations and symbols. The first volume of a manual shall contain general information regarding all volumes and specific information applicable to Volume I, as required.

3.5.5.1 International standardization agreements. The foreword or preface of a manual implementing an international standardization agreement(s) shall contain the following note:

NOTE:

Certain provisions of this technical manual (identify by chapter, section, paragraph or similar manner, if appropriate) are the subject of international standardization agreement (insert the ABCA or ASCC standard number, the NATO, STANAG, NETR or NEPR number, or other appropriate documentary reference). When changes, revisions or cancellation of this technical manual is proposed which will modify the international agreement concerned, the technical manual management activity will take appropriate action through international standardization channels including departmental standardization offices to change the agreement or make other appropriate accommodations.

3.5.6 Table of contents. (Figures 22 and 23)

3.5.6.1 Manuscripts only. The page number column for tables of contents shall be left blank.

3.5.6.2 Camera-ready copy and manuscripts. A table of contents listing parts, chapters, sections, and paragraphs in the same order and with the exact titles used in the text shall be placed at the beginning of each publication. Paragraph titles in publications containing indexes (See 3.2.11.8) shall be omitted from the table of contents. There shall be no table of contents preceding individual parts, chapters, or sections. Each volume of a multivolume manual shall contain its own table of contents. Volume I shall contain a complete table of contents covering the entire set. Entries shall indicate volume in which referenced material appears; e.g., "Operating Instructions, Vol I." Layout shall conform to figure 22 except that a single column format may be used when the table of contents is one page or less, or a majority of the titles are lengthy. Layout for Army shall conform to figure 23.

3.5.7 List of illustrations. (N) (F) (M) Publications containing ten or more illustrations (including charts and graphs assigned figure numbers) shall have a list of illustrations showing the figure number, title, and page number of each figure. The security classification, if any, of illustration titles shall be indicated. Layout shall conform to figure 24 except that a single column format may be used when the list of illustrations is one page or less, or the majority of illustration titles are lengthy. Each volume in a set of manuals shall contain its own list of illustrations. In addition, Volume I shall contain a list of illustrations for all volumes in the set.

3.5.8 List of tables. (N) (F) (M) Manuals containing ten or more tables shall have a list of tables showing the table number, title, and page number of each table. The security classification, if any, of table titles shall be indicated. Layout shall conform to figure 25 except that a double column format may be used. Each volume in a set of manuals shall contain its own list of tables. In addition, Volume I shall contain a list of tables for all volumes in the set.

3.5.9 Safety summary. When applicable, a safety summary in accordance with figure 26 shall be included in each volume. It shall include all general precautions (high voltage warning, warning against servicing alone, and resuscitation statement), and all warnings and all cautions. If necessary, warnings and cautions shall be rephrased so that they can be understood out of context. Each item shall be referenced to the pages on which it appears.

3.5.9.1 General safety precautions. The safety summary shall contain shop related general safety precautions. These general safety precautions shall not be repeated in the text of the manual. The use of safety glasses while soldering or that a soldering iron is hot, in an electronics manual, is an example of shop related general safety precautions not to be repeated in the text. Soldering may not be an everyday occurrence in a manual on propellers and warnings or cautions related to soldering shall be included in the text. When in doubt, place the warning or caution in the text (see 3.3.9).

3.6 Illustrations. Style and techniques shall be of a quality which will produce artwork that will clearly, adequately, and economically portray the information to be illustrated. Illustrative material shall be used to: describe an item or idea if this can be done more efficiently and effectively by graphic methods; clarify text; present phases difficult to describe by text alone; call attention to details; and furnish graphic identification of parts and tools. Multiple sheet, or sequence number, illustrations, in addition to step-by-step operational type, may be used for depicting disassembly, reassembly, removal, installation, etc. Illustrations, other than foldouts, shall be located as near as possible to the point at which they are first referenced, except where this would require unnecessary duplication of illustrations. Full page illustrations, placed sidewise on a page, shall be turned 90 degrees counterclockwise. The figure number and title for a turned illustration shall be placed at the bottom of the page with the manual in its normal position. For Navy (NAVSEA/NAVELEX) illustrations shall meet the requirements of DoD-STD-1685.

3.6.1 Scale. Illustrations shall be prepared to as small a scale as possible consistent with effective use of space, with all essential detail legible; be same size as areas they will occupy in the manual page or be of such oversize as to permit uniform reduction to this size. Refer to 3.2.5 regarding foldout pages.

3.6.1.1 Letter size. The scale shall be such as to provide for a minimum final letter size, when printed, of 8 points, except for legends, notes, and other tabular matter, which shall be a minimum final size of 6 points. (See figure 4.)

3.6.2 Photographs/line drawings. Line drawings shall be used in lieu of photographs (half tones), when practicable. The use of a photograph over a line drawing shall be determined by the practical considerations of the purpose and suitability of the illustration in the publication. Existing illustrations and engineering drawings shall be used where they meet the requirements herein. In the early development of equipment, a line drawing may be prepared from source data if the equipment is not available for photographing. Rendered drawings, either airbrush or wet-wash, are also acceptable only if such preparation is the most efficient method available. Line tracings of photographs are also acceptable.

3.6.3 Photographs. When required for use, photographs shall be detailed and sharp, free of heavy shadows, distorted objects, cluttered foregrounds or backgrounds, and give good contrast from white, middle tones, and black.

3.6.3.1 Retouching. Photographic retouching shall be held to a minimum through good photography. Retouching shall be used to emphasize detail, exclude unwanted detail, correct slight photographic defects and eliminate undesirable shadow for that portion of the photograph related to the text only. Quality of retouched photographs shall be such that tonal values are held when reproduced.

3.6.3.2 Prescreened photographs. When approved by the acquiring activity, prescreened photographs are acceptable as reproducible copy provided that they are of proper quality, size, and mounted on the reproducible copy of the text page or marginal copy. When prescreened photographs are used, artwork will be clearly marked to indicate prescreening. Unscreened continuous tone photographs and original artwork shall be supplied, with reproducible copy, as specified by the contract.

3.6.4 Line drawings. Line drawings shall be of high reproduction quality. A suitable material capable of maintaining consistent and permanent high density reproducible values, shall be used for preparing the line drawings.

3.6.5 Diagrams. Electrical and electronic diagrams shall be laid out functionally and shall be in accordance with the requirements of DoD-STD-100.

3.6.6 Engineering drawings. Engineering drawings are acceptable as illustrations only if they meet the content, arrangement, and format requirements of the contract and governing content specifications, as well as the non-conflicting style, format and production requirements contained herein; and have all unnecessary data, that would reduce the comprehension or clarity of the illustration, removed. For Navy the illustrations shall be in accordance with the requirements of DOD-STD-1685.

3.6.7 Continuous tone artwork. All artwork containing tonal values of gray as well as black, which are not created by lines or dots, shall be considered "continuous tone artwork. Such artwork, whether photograph or drawing, shall be clear in detail, sharp in contrast of tones and with light and shadow in proper relation to a consistent light source. The background shall be an intense white. It shall extend the full width and depth of the artwork.

3.6.8 Combination artwork. Presentation of a subject by combining photographs, or continuous tone artwork, with line drawings, shall be limited to where this presents the subject more accurately or more clearly.

3.6.9 Multiple-section illustrations. Each section of a multiple-section illustration shall be identified by a capital letter. Sections may or may not be captioned, but if one section is captioned, all shall be captioned. Each caption, with the identifying letter as its first character, shall be centered with respect to the section to which it applies. Where captions are not used, the identifying letters shall be centered. Identifying letters and captions shall be larger and bolder than any other lettering on the illustration. Sections need not be separated by lines. Separation by shading may be used.

3.6.10 Cartoons. When approved by the acquiring activity the use of animated drawings and other visual techniques are permitted. Animated drawings shall not include copyrighted cartoon characters. Such presentations must serve a functional purpose.

3.6.11 Other types of illustrations. If required, a manual may contain illustrations such as frontispiece (assembled view), exploded, operational, procedural, functional, location view,

phantom, lubrication, waveform, etc. See figure 27. Photographs of a cutaway model are acceptable, but preparation of a special cutaway illustration only for manual use requires acquiring activity approval. See figure 28.

**3.6.12 Color in Illustrations.** Unless otherwise specified in the contract or technical content specification, color shall not be used. When color is used, it shall be held to the minimum absolutely necessary to clarify functional operations. The number of colors shall be kept to a minimum by use of tints, patterns, cross-hatching, dots, etc. When color is required, the primary colors (red, blue, yellow) shall be used first. Yellow shall not be used by itself.

**3.6.12.1 Separation of colors.** The black and white, or key, artwork may be prepared on illustration board or on acetate. Each succeeding color overlay shall be made on acetate, or equivalent, and attached securely to the key artwork. Each color overlay shall be marked with its correct color. A color legend shall be an integral part of an illustration. The legend shall contain an exact duplicate of each solid, tint, or pattern of color and identify the usage in the illustration.

**3.6.12.2 Register marks.** The key artwork and each overlay shall contain a minimum of three register marks located outside the reproduction area at the sides, top and bottom. The register marks on each acetate overlay shall accurately align with one another and with the key art.

**3.6.13 Border rules.** Border rules shall not be used for single illustrations, but may be used to separate multiple-section illustrations on the same page. (See figures 27 and 28.)

**3.6.14 Use of the human figure.** Where it is necessary to illustrate an operation, procedure, or installation, illustrations may include a human figure or parts of the body. Jewelry shall not appear in any illustration. The human figure shall not be permitted to obscure details of the equipment necessary for a complete understanding of its operation. The human figure shall be clothed as designated by the acquiring activity. A cross section of races and sexes shall be used.

**3.6.15 Credit lines.** (A) The photographer's or artist's name shall not appear on any artwork; neither shall a manufacturer's name, symbol, or trademark appear thereon for the purpose of identifying the illustration. A contractor's illustration identification number may be used. When used, such numbers shall be in approximately 4 - to 6 - point type in lower right-hand corner of the illustration sufficiently removed to avoid being confused as a part of the illustration.

**3.6.16 Callouts.** Index numbers, reference designations, nomenclature, leader lines, legends (keys), procedures, etc, shall be used, when necessary, to identify significant features. Callouts shall be typeset or prepared by a mechanical method, rather than freehand lettering, except that engineering drawings prepared as stated in paragraph 3.6.6 are acceptable. Unless otherwise specified by the acquiring activity, type size shall be no smaller than 8-point and no larger than 10-point. Lettering shall be in upper case. Nomenclatures shall appear on illustrations only if it can be done without crowding or reducing type size so as to make reading difficult. (Diagram callouts shall be no smaller than 8-point.) Callouts shall be placed in the background areas of illustrations when practical.

**3.6.16.1 Index numbers.** Index numbers for each separate figure shall start with Arabic numeral 1 and continue consecutively. (All the multiple-sheet illustrations in a set shall be considered one figure.) Sequence shall be from top to bottom or clockwise, when possible.

Capital alphabetical suffixes such as 22A, 22B, etc., may be used to identify new callouts inserted between items when an illustration is changed. This system may also be used in basic publications when errors are discovered so late in preparation that renumbering of all following index numbers would delay submittal. Suffixed index numbers need not be eliminated for a revision unless the illustration must be re-prepared. Except for exploded views used for disassembly, all functional items shown as exploded on exploded views shall be identified. Item numbers on exploded views used to show assembly/disassembly shall be in disassembly order.

3.6.16.2 Nomenclature. Nomenclature of more than one line may have the left or right margin justified or may be in inverted pyramid style. All lines of copy shall parallel the horizontal edges of the figure, whenever possible.

3.6.16.3 Leader lines. Leader lines may end close to the callout and object, or may touch the objects to which the lines apply. Lines shall be uniform, short and straight as possible; however, dogleg shaped lines are permitted. Lines shall not cross or come in contact with other callout lines nor shall they obscure essential details. A line shall be highlighted or changed from black to white if it will make the line easier to follow; also, arrowheads may be added for clarity.

3.6.17 Legends (keys). When index numbers are used, a legend consisting of their numerical listing and their identification shall be included on, or adjacent to, the artwork. If a callout is deleted from an illustration, the word "(Deleted)" in parentheses shall be placed after the appropriate number in the legend. (The preceding also applies to the Group Assembly Parts List of an Illustrated Parts Breakdown Manual.)

3.6.18 Steps. Operational or procedural illustrations shall have one or more text steps with each illustrated step. The text step shall be as close to the illustrated step as possible. Steps shall be identified in the order in which they are to be accomplished. See figure 29 for an example. Alternate types of operational and procedural step illustrations are acceptable. See figure 30. Text shall be consistent throughout a manual.

3.6.19 Reference designations. The information and application of electrical and electronic reference designations shall be in accordance with DoD STD-100. Reference designations marked on equipment take precedence.

3.6.20 Overlays for callouts. (Refer to 3.6.12.2 regarding register marks.) The callouts for halftones and continuous tone may be placed directly on the illustration or on transparent overlays.

3.6.21 Crop and size marks. Each separately supplied illustration shall have the reproduction area defined by crop marks appearing on each of the four corners marking the horizontal and vertical dimensions of the area to be reproduced. The lines shall extend no closer than 1/4 inch to the outside of the reproduction area. The exact reproduction size shall be indicated between crop marks. Marks shall not be drawn with ballpoint pen or grease crayon. Crop marks shall be approximately 3/8-inch long and shall not cross or touch. (See figure 31.)

3.6.22 Mounting of artwork. Continuous tone artwork that has not been prepared on illustration board shall be securely fastened to a mounting board by a process that will protect the artwork, will not discolor or distort the illustration, and will assure its being free of wrinkles and blisters. The size of the mounting board shall allow for a minimum border of 1 1/2 inches on all four sides of the image area of each illustration to accommodate required external identification markings. Security classification, if applicable, shall be placed at the top and

bottom center of the reverse side of the mounting board and similarly placed outside image area on the front. (See figure 32.)

3.6.23 Identifying artwork. Artwork not affixed to the completed reproduction page shall bear the publication number, and figure number outside of the reproduction area. The security classification, if applicable, shall be placed at the top and bottom center, also outside the reproduction area. To eliminate the possibility of printing illustrations in incorrect positions, the TOP of the artwork shall be identified. (See figure 32.)

3.6.24 Covering of artwork. All board mounted artwork shall be protected by an inner flap of non-oil tissue or vellum, and an outer flap of heavy paper. The tissue overlay and protective flap shall be cemented or securely taped to the back of the mounting board at the top of the illustration and folded over the face of the illustration. In the outside upper right corner of the outer flap shall appear the figure number, page number, publication number. (See figure 32.) The security classification, if applicable, shall also be placed at the top and bottom center of the outer flap.

3.6.25 Review of illustrations. Copies of illustrations shall be furnished for review. Each illustration copy shall be approximately the same size as a page of text, except for those of foldout size which shall not exceed maximum foldout dimensions.

### 3.6.26 Line drawing details.

3.6.26.1 Darkness and sharpness of lines. The darkness and sharpness of lines shall be sufficient to reproduce clearly at required reproduction size without additional treatment. See figures 33 and 34. Parallel lines on wiring and schematic diagrams shall in no case be less than 1/16-inch apart when reduced to printed size. See figure 35. Secondary lines, such as those used to indicate extensions or measurements, shall be lighter but strong enough to reproduce clearly at reproduction size. Shading may be used to give substance and form to the item depicted, to sharpen the contrast between the subject and its background, or to increase effectiveness. Shadows shall be used only when necessary to provide a clear understanding of form, shape, or depth. Shading effects shall not be used for decorative purposes. Accented lines may be used to emphasize detail. Lined, cross-hatching, or mechanical patterns used for coding shall remain clearly defined when reduced to reproduction size. (See figure 36.)

3.6.26.2 Designations, diagrams and symbols. Designations, diagrams, graphic symbols and letter symbols shall be in accordance with DOD-STD-100. New designations, diagrams and symbols not covered by DOD-STD-100 may be used if they are explained in the manual's foreword, preface, introduction or glossary. Procuring activity approval is required before any new designations, diagrams or symbols are used.

## 3.7 Changes.

3.7.1 Manuscripts. When a contract requires that manuscript copy for changes to a loose leaf manual be provided, only changed paragraphs to a page need to be typed; material for unchanged paragraphs may be taken from a printed copy of the existing manual and mounted in proper place on the proposed change page. Copy shall be furnished for both sides of the page on which a change is made, even though change is made to one side only. Printed pages from the publication may be used as manuscript for the unchanged pages. Pages removed from printed

publications to be used without change shall be pasted to bond paper of the same size as the rest of the manuscript. Unchanged portions of pages may also be mounted and used in conjunction with the typed, double spaced new material.

### 3.7.2 Manuscripts and camera-ready copy.

3.7.2.1 Numbering. Each change to a manual shall be numbered (A) (F) or lettered (N) (M) in sequence. Identification of changes after each revision of a manual shall begin over again with number 1 or letter A as applicable. Unless otherwise specified by the acquiring activity, the change date will be the date at which the material to be included was received (copy freeze date.)

3.7.2.2 Numbering of added material. Except when added at the end of a sequence, (in which case the next consecutive number shall be used) paragraphs, illustrations, tables and pages shall be numbered by adding a decimal (2-4.1) to the preceding paragraph/illustration/table/page number. Pages shall not be added between a right-hand (odd numbered) and a left-hand (even numbered) page. When new material is to be added to a right-hand page, any overrun shall be carried to the left-hand page. The overrun from the left-hand page shall be placed on the added page. Where material is to be added to a right-hand page and adequate blank space is available on the preceding left-hand page, the layout of the two pages shall be changed according to the following sample to avoid decimal pages. If blank space is available on page 2-4 and material is to be added to page 2-5, material at the top of page 2-5 shall be moved to the bottom and 2-4 and the new material added at the top of page 2-5. If pages, paragraphs, illustrations, or tables are added by a later change, those added by an earlier change shall be renumbered. However, if this involves renumbering more than 10 paragraphs or more than 5 pages, the renumbering system demonstrated in the following example shall be used instead of renumbering. An addition between 2-4.2 and 2-4.3 shall be numbered 2-4.2.1, etc.

3.7.2.3 Difference data sheets. When specified in the contract or content specification, difference data sheets shall be used to provide information on additional models of equipment which constitute minor changes from the basic design. Separate Difference Data Sheets shall be prepared for each additional model covered. The first page of the Difference Data Sheet section shall conform generally to figure 37.

#### 3.7.2.3.1 Format (See figure 38.)

a. Sheets shall be identified with title "DIFFERENCE DATA SHEET" centered at the top of each page.

b. The first page of each sheet (for a specific model) shall have a heading in uppercase type consisting of the nomenclature and the model, type, or part number of the item covered. The heading shall be accentuated by having lines drawn above and below it and extending across the width of the page. The heading shall be followed by a statement to this effect: "THE INSTRUCTIONS CONTAINED IN THE PRECEDING SECTIONS OF THIS TECHNICAL MANUAL ARE APPLICABLE TO THIS MODEL EXCEPT FOR THE DIFFERENCES CITED IN THIS DIFFERENCE DATA SHEET."

c. Sheets for each model shall start on a right-hand page. Page numbers, figure numbers, and table numbers shall run consecutively throughout the section. Sheets shall be added as required. Paragraphs need not be numbered, but if numbering is used, single Arabic numerals, beginning with "1" for each added model may be used.

**3.7.2.3.2 Arrangement.** Sheets shall briefly specify how operation and maintenance procedures for that configuration differ from the procedures for the representative configuration contained in the preceding sections or chapters. Sheets shall contain the following data, as appropriate, on one or two pages and shall not exceed four pages.

a. An external view of the model if the view is significantly different from the one shown in Chapter 1.

b. A table of tabulated data if the data are significantly different from those contained in Chapter 1.

c. Illustrations which are essential for clarifying differences. Illustrations in preceding sections or chapters shall not be duplicated, but may be referenced if necessary. Reference shall not be made to illustrations on other Difference Data Sheets.

d. Brief coverage of subjects specified for the original model. The title of each of the preceding chapters shall be listed in the same order of arrangement as the manual. Short, concise statements shall be used to convey the similarity or explain the difference in procedures.

**3.7.2.4 Transmittal cover sheets.** (F) Changed pages classified secret shall be covered with a transmittal cover sheet (see figure 39.) Occasionally, changed pages to a secret manual may only be confidential, or changed pages to a secret or confidential manual may be unclassified. However, the changed title page will still show the manual's overall classification. When this occurs, an appropriate transmittal cover sheet (see figures 40 and 41) shall be prepared. Each transmittal cover sheet shall be prepared and submitted in the same form as the changed pages, i.e., reproducible copy or negative.

**3.7.2.5 Changes to illustrations.** When changes are made to illustrations, the original artwork shall be used unless the preparation of new artwork is less expensive.

**3.7.2.5.1 Multiple-sheet illustration changes.** Sheets added to a set of multiple-sheet illustrations which fall between existing sheets shall be assigned the preceding number plus a decimal number. For example, if a sheet is added between sheets 2 and 3, the new added sheet becomes 2.1. If possible, the new sheet should be added after the last sheet and be assigned the next consecutive number.

**3.7.2.5.2 Index number changes.** Where a change to an illustration adds index numbers between existing numbers, the added numbers shall be the same as the preceding index number with an added decimal number, e.g., 22.1, 22.2, etc.

**3.7.2.6 Deleted paragraphs, illustrations, tables.** Where a change deletes a paragraph, illustration, or table without substituting another, the space formerly occupied by the paragraph, illustration, or table can be used for other instructions, except for sufficient space to provide 1/4-inch above and below a sentence such as "Paragraph 4-2 deleted." The Table of Contents, List of Illustrations, List of Tables, and Alphabetical Index, shall be changed as necessary.

**3.7.2.7 Deleted pages.** When page number continuity is broken by deletion of a page and a blank page results, a statement indicating the deletion shall be placed in the bottom margin (right or left corner, or centered, as space permits) of the preceding page, or top margin of the



succeeding page; for example, "All data on page ....., including figure.....deleted." This also applies when two back-to-back pages are deleted and the same manual change affects a preceding or succeeding page, but a preceding or following page shall not be changed merely to add this statement. In such instances, the list of effective page listings will be adequate.

3.7.2.8 Change designator. Each page containing changed or added material shall bear the words "Change...." placed at the bottom of the page in the same corner and on the same line with the page number. The change designator shall begin about 1/2-inch to the right of the page number for an even numbered page, and end about 1/2-inch to the left of the page number for an odd numbered page. (See figure 42.) For foldout pages, the change number shall be placed in the lower-outer corner of the page beneath the figure title. This change designator requirement is also applicable to all added pages, including those placed at the end of a manual.

3.7.2.9 Change symbols. (See figure 43.) Changes (except as noted below) to the text and tables (including new material on added pages) shall be indicated by a vertical line or a symbol in the margin extending close to the entire area of the material affected (outer margin for double-columned material, margin opposite binding edge for single-columned material.) Exception: pages with emergency markings (black diagonal lines around three edges) may have the vertical line or change symbols placed along the inner margins. Previous change symbols on a page shall be deleted when a page is subsequently changed. Symbols shall show current changes only. The vertical line change symbol shall be 6-point (3/32-inch) in width. It may be 3 or 4-point (3/64-inch) for pages showing emergency page markings, if the symbol is not placed at the inner margin. When a change symbol, such as a number sign "#", or plus mark "+" or black-circle or black square, or the letter "C", "R", or "X" is used, its meaning shall be explained in the introductory portion of the manual. Change symbols are not required for:

- a. Introductory material.
- b. Indexes and tabular data where the change cannot be identified.
- c. Blank space resulting from the deletion of text, or an illustration, or part of an illustration, or a table. Refer to 3.7.2.6.
- d. Correction of minor inaccuracies, such as spelling, punctuation, relocation of material, renumbering paragraphs, etc., unless such correction changes the meaning of instructive information and procedures.
- e. Replacement or addition of a complete part, chapter, or section.

3.7.2.10 Change symbols. (photographs, line drawings, charts, and graphs.) Unless otherwise specified by the acquiring activity, a miniature pointing hand shall be used for photographs and line drawings (other than diagrams and schematics) to highlight the area containing the changed information. Changes confined to the same general area shall be indicated only once on the illustration. A vertical line next to changed text and callouts on illustrations may be used in lieu of a pointing hand. A vertical line next to changed material may be used on a chart or graph. Illustrated Parts Breakdown technical manuals, and illustrations therein require no change symbols.

3.7.2.11 Diagrams and schematics. Unless otherwise specified by the acquiring activity, shading and screening shall be used for diagrams and schematics to highlight the area containing

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the changed information. Extensively changed presentations may be indicated by a screen border around the affected area.

### 3.7.2.12 Changes to looseleaf publications.

3.7.2.12.1 New material identification. The new material shall be identified by a vertical bar or an asterisk in the left margin opposite the changed material. An explanation of the method used shall be included in the change sheets.

3.7.2.12.2 (A) (N) (M) Change sheet. When specified by the contract or content specification a change to a loose leaf manual shall include a change sheet in the format of figure 44. If a list of effective pages is used it shall be prepared as a backup of the change sheet. The change sheet shall:

a. Include the following statement:

(1) "(Technical manual number and date) is changed as indicated in the list of effective pages on the reverse side."

(2) "File this sheet in the back of the publication for reference purposes."

b. Be the first page of each change with additional pages as required.

c. Provide clear instructions for required changes listed page by page.

d. Specify deleted or added pages, reasons for the changes, instructions for completing the change record, and instructions that the sheet be inserted in the volume.

e. If applicable, indicate that the change is the result of an equipment alteration, e.g., ORDALT, and identify the alteration by number.

f. Include an instruction for holders of the manuals at accomplishing activities not to incorporate the change in their copies of the manual until it is verified that the alteration has been accomplished. Also, shall include an instruction for all other holders of the manual to incorporate the changes in their copies of the manual.

### 3.7.2.13 Changes to permanently bound publications.

3.7.2.13.1 Rescissions. When a paragraph is to be deleted, the number of the page on which it appears shall be stated, followed by a statement that the paragraph is rescinded. For example: "Page 3. Paragraph 2-1 is rescinded."

3.7.2.13.2 Additions. Except when added to the end of a sequence, added paragraphs shall be numbered according to the decimal system; e.g., 3-2.1, 3-2.2, a.1, b.2. When added to the end of a series, the sequence shall be continued by picking up the next highest number or letter. The number of the page where the added material would appear if it were incorporated into the existing manual shall be stated, followed by a statement to the effect that the material is being added. This shall be followed by the number, title, and text of the new paragraph. Example: "Page 3-14. Paragraph 3-5b(1.1) is added after 3-5b(1.) (1.1) Loosen the two screws (3) in the mounting plate (12)."

3.7.2.13.3 Text supersessions. When a paragraph is changed extensively or replaced entirely, the paragraphs shall be superseded. The number of the page on which the paragraph appears shall be stated, followed by a statement to the effect that the paragraph is superseded. This shall be followed by the number, title, and text of the superseding paragraph. Example: "Page 1-6. Paragraph 1-2 is superseded as follows: 1-2. Record and Report Forms.

a. STD Form XXXX, Depreservation Guide of Engineer equipment.

b. For other record and report forms applicable to operator/crew and organizational maintenance, refer to TM 38-750."

3.7.2.13.4 Minor changes. When a minor change to a lengthy paragraph is necessary, only the affected portion of the paragraph shall be stated. For example: "Page 1-10, paragraph 1-12b(3.) In line 1, "four copies" is changed to read "three copies."

3.7.2.13.5 Changes to tabular material. When changes are made in lengthy tabular material, deletions, additions, and substitutions shall be listed in page sequence and the page number on which each change occurs shall be shown. Example:

Page B-15, appendix B.

The following are deleted from the list of classes:

Page B-15. 5133 Drills, Counterbores, and Countersinks  
5905 Resistors

Page B-16. 6115 Generators and Generators Sets

The following changes are made in the columns indicated:

Page B-21. The description of class 4010 is changed to read, "Chain and Wire Rope."

Page B-27. Class number "2960", appearing between class 2930 and 2940, is corrected to read "2935".

3.8 Revisions. A revision (refer to 6.3.22 for definition) shall be prepared when specified in the contract or order. Revisions shall incorporate current information from previously issued changes to the existing manual. Contractors shall present the following information to the acquiring activity for consideration in approving a revision:

a. Percentage of change.

b. Reason for revision; such as, change in equipment configuration, new technical manual specification to be complied with, etc. This information shall be presented sufficiently in advance to permit the acquiring activity time to reach a decision, yet not delay submittal of data.

3.8.1 Renumbering and removal. In a complete revision, all pages, paragraph, illustrations and tables shall be renumbered, as necessary, to eliminate all number suffixes and to establish correct sequence. In an update revision, suffixed paragraph, illustration, and table numbers may be retained when use of the manual will not be substantially improved by renumbering. All

change numbers (and change dates, if any) shall be removed from pages. All partial pages and all miniature hand, shading, screening, vertical-line-in-margin, and other change symbols, shall be eliminated. For index numbers on illustrations, refer to 3.6.16.1.

3.8.2 Revision change symbols. (N, F). After all previous change symbols have been eliminated, new change symbols shall be inserted, unless specified otherwise by the acquiring activity, to identify technical changes in text, illustrations, and tables that differ in the revision from those contained in the latest previous edition of the manual. (See 3.7.2.9.)

3.9 Supplements. Supplements (refer to 6.3.24 for definition) shall be prepared as specified in the contract or order. They shall conform in style and format to the requirements of the specifications used to prepare the basic manual.

3.9.1 Classified supplements. Where classified information will comprise 10 percent or less of the manual's content and could be concentrated in one area of the manual such information shall normally be prepared as a classified supplement to the manual, permitting the basic manual to be issued at a lower classification or as an unclassified publication. The title pages of both the basic manual and the supplement shall contain a cross-reference note to each other. Supplements shall contain the minimum amount of information required to protect security and maintain continuity of thought. Procuring activity approval is required for each supplement.

3.9.2 Safety supplements. Detailed requirements for formal safety supplements are as follows (see figure 45).

3.9.2.1 Margin. The title block page of a safety supplement shall have red "SS's" on the top, bottom and outer side borders with the words SAFETY SUPPLEMENT at the bottom of the page.

3.9.2.2 Title designation. The words SAFETY SUPPLEMENT will be in red and shall be positioned above the words MANUAL. The nomenclature shall be the same as the basic manual.

3.9.2.3 Supplement notices and replacement notices. A notice shall reference the basic manual supplemented, and, if applicable, reference any publication(s) replaced. For example: "THIS PUBLICATION SUPPLEMENTS TO IC-141A-6 DATED 13 SEPTEMBER 1979 AND SUPERSEDES INTERIM SAFETY SUPPLEMENT TO IC-141A-6SS-144 DATED 23 DECEMBER 1980 WITH NO CHANGES TO THE TEXT." For technical manuals the following sentence will be provided in the notice: "A suitable reference to this supplement will be made on the title page of the basic publication"

3.9.2.4 Responsibility notice. The responsibility notice will be in red and shall be positioned as shown in figure 46.

3.9.2.5 Security information. The security markings shall be the same as for other title pages.

3.9.2.6 Publication date. The publication date shall be the same as the date of the replaced interim safety supplement unless the formal supplement contains additional changes.

3.9.3 Operational supplements. (See figure 46.) Detailed requirements for formal operational supplements shall be the same as for formal safety supplements except:

- a. The margin shall consist of OS's in lieu of SS's.

- b. The words OPERATIONAL SUPPLEMENT in lieu of SAFETY SUPPLEMENT.
- c. The margin shall be printed in black.
- d. The responsibility notice shall be printed in black.

3.9.4 Routine supplements. A routine supplement title page will be the same as operational supplement title page except that the title shall be the single word "SUPPLEMENT" and margins shall be blank."

3.9.5 Incorporation of supplements into manuals. (N) (M) (F). Whenever practical, supplements, other than those of a higher classification, shall be incorporated into the manual's next change.

3.9.6 Supplementary Manuals for Foreign Military Sales (FMS). The style and format of FMS supplementary Technical Manuals shall be identical to style and format of parent Technical Manual, including title and list of effective pages. FMS supplementary Technical Manual shall contain all country peculiar technical data. Affected procedures, paragraphs, figures, tables, etc., shall be included in their entirety. Numbering of paragraphs, figures, tables, etc., shall correspond with numbering in parent Technical Manual (for like subject matter). When subject matter is totally peculiar to FMS supplementary Technical Manual, the paragraphs, figures, tables, etc., shall be assigned suitable unique number designations. When preparation of a supplementary Technical Manual causes like subject matter (identical paragraph titles, figure titles, etc) to be present in both parent and FMS supplementary Technical Manuals, a change/revision to parent Technical Manual shall be prepared limiting applicable country equipment effectivities as required to delineate the peculiar configurations supported by the FMS supplementary Technical Manual.

3.10 Brief manuals. Manuals of eight pages or less shall:

- a. Need not have a cover or title page, list of effective pages, table of contents, list of illustrations, or list of tables.
- b. Have the first page consist of a title block and text below it.
- c. Have chapters or sections begin on left-hand or right-hand pages with no blank pages. Contain more than one chapter or section on a page, where possible.
- d. Have pages, paragraphs, illustrations, and tables numbered consecutively throughout the manual with single Arabic numerals, disregarding chapter and section numbers.
- e. Always be revised, never have changes issued thereto.
- f. Contain the words "THE END" following text on last page.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own or any other inspection facilities and

services acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Quality conformance inspection. Material furnished in accordance with this specification shall be inspected by the supplier for conformance to the applicable requirements herein.

4.3 Government inspection. Material furnished in accordance with this specification shall be subject to inspection, verification, and approval or disapproval by the Government as specified by the terms of the contract. Inspection/verification will be performed by the Government prior to acceptance.

4.4 Validation of readability. Narrative text shall be validated for conformance to readability standards specified in 3.3.3. Navy manuals prepared to meet the comprehension requirements of DoD-STD-1685, shall be tested in accordance with the sampling criteria therein. If Overall Grade Level (OGL) (including tolerance) is exceeded, the manuscript shall be rewritten as required to meet specified Reading Grade Level (RGL). If sample Grade Level (GL) is exceeded, entire text surrounding each sample must be rewritten as required.

4.4.1. Sample selection. Samples of text shall be analyzed for readability. Select samples as follows:

a. Count number of pages of text in publication. The count shall include all full and partial pages that contain text in the form of consecutive sentences. The count shall not include pages containing only illustrations, tables, lists, etc. Record number of text pages.

b. The basic number of samples is determined by the following:

<u>NO. OF TEXT PAGES</u>	<u>DIVISOR</u> DIVIDE BY "N"	<u>BASIC NO.</u> <u>OF SAMPLES</u>	
		<u>MIN</u>	<u>MAX</u>
90 and above	10	9	30
54 to 89	9	6	9
32 to 53	8	4	6
1 to 31	6	2	4

c. Divide number of text pages by appropriate divisor, "N". Round off quotient to the next lowest whole number. For example, quotients of 17.3 and 17.7 shall both be rounded off to 17. This quotient shall equal basic number of samples to be analyzed.

d. For publications that are less than 12 pages, randomly select two samples and mark them for analysis.

e. For publications that are 12 pages or more, randomly select a number between one and "N". The number selected shall be marked as first page of text to be analyzed. Starting at selected page, mark every "Nth" page of text to end of publication. The marked pages shall identify starting points for remaining basic samples to be analyzed.

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f. Check marked pages to verify that at least one sample has been selected for each chapter of the publication. If any chapter has been missed, randomly select one text page from that chapter and add it to the basic samples to be analyzed.

4.4.2 Raw data collection. For each sample marked, raw data must be collected. Data collection will consist of counts of the numbers of words, sentences and syllables in each sample. The size of each sample is based on the number of words to be analyzed.

4.4.2.1 Word count. Most samples will be slightly more than 200 words; in some cases, samples will be smaller. Word count samples shall be determined as follows:

a. Samples shall start at the beginning of the first full paragraph on each marked sample page. If sample falls on a page containing procedural instructions, start sample at beginning of first full sentence on page. Headings, captions, and paragraph titles shall not be counted in the sample.

b. For each sample, count all words up to the end of sentence containing the 200th word. If the marked sample page is less than 200 words, sample can be extended to next page of text; but, do not extend sample into a new chapter or text pertaining to a completely new subject.

c. Count as a word all numbers, letters, symbols, and group of letters surrounded by white spaces. Hyphenated words and contractions count as one word. For example, each of the following count as one word: couldn't; GFE, i.e.; 32,008; 19-inch; +25°F.

d. Record number of words in each sample.

4.4.2.2 Sentence count. For each sample, count number of sentences as follows:

a. Count all sentences in sample including sentence that contains the 200th word.

b. Count as a sentence each unit of thought that can be considered grammatically independent of another sentence or clause. A period, question mark, exclamation point, and semi-colon usually denote independent clauses and thus mark the end of a sentence.

c. Record number of sentences in each sample.

4.4.2.3 Syllable count. For each sample, count number of syllables as follows:

a. For most words, count syllables the way the word is normally pronounced aloud. For example: at is one syllable, maintain is two syllables, area is three syllables, panoramic is four syllables, and recuperator is five syllables.

b. Count all numbers as one syllable. For example, 5.1, 65, and 300 all count as one syllable. However, if a numeric expression contains several numbers separated by hyphens, count each number as a syllable. For example, in the expression TM 9-1025-240-10, 9-1025-240-10 is counted as four syllables.

c. Acronyms and abbreviations are counted as one syllable unless they actually spell out a word of more than one syllable. For example, Hz and DVM each count as one syllable but TRADOC and ARRCOM each count as two syllables.

- d. Record number of syllables in each sample.

#### 4.4.3 Grade level calculations.

4.4.3.1 Overall grade level. The Overall Grade Level (OGL) of a publication is calculated as follows:

- a. Add up total number of words from all samples combined. Record total.
- b. Add up total number of sentences from all samples combined. Record total.
- c. Add up total number of syllables from all samples combined. Record total.
- d. Calculate the average sentence length. Divide total number of words by total number of sentences. Round off quotient to the nearest one-hundredth. Record quotient.
- e. Calculate the average number of syllables per word. Divide total number of syllables by total number of words. Round off quotient to the nearest one-hundredth. Record quotient.
- f. Calculate the Overall Grade Level (OGL) of publication by the following formula:

$$\text{OGL} = 0.39 (\text{Avg words/sentence}) + 11.8 (\text{Avg syllables/word}) - 15.59$$

Round off the OGL to the nearest one-tenth.

4.4.3.2 Sample grade levels. Calculate the GL of each sample as follows:

- a. Calculate the average sentence length. Divide number of words in sample by number of sentences in sample. Round off quotient to the nearest one-hundredth.
- b. Calculate the average number of syllables per word. Divide number of syllables in sample by number of words in sample. Round off quotient to the nearest one-hundredth.
- c. Calculate the Grade Level (GL) of each sample by the following formula:

$$\text{GL} = 0.39 (\text{Avg words/sentence}) + 11.8 (\text{Avg Syllables/word}) - 15.59$$

Round off each GL to the nearest one-tenth.

## 5. PREPARATION FOR DELIVERY

5.1 Packaging. Unless otherwise specified in the contract or order, the material furnished in accordance with this specification shall be packaged as follows?

5.1.1 Manuscript. Manuscript shall be packaged flat in cartons or wrapped separately. Elaborate containers are unnecessary. The artwork and text material may be separated into one package, or may be in separate packages. Copies of large artwork to be used for review purposes only may be folded. Packaging need only be adequate for providing safe delivery and for providing protection against forms of damage that frequently occur during shipping

5.1.2 Camera-ready copy. Camera-ready copy shall be packaged flat and double-packaged. Artwork shall not be folded or rolled. The interior material shall be waterproof and free of any



chemical substance that would discolor or otherwise harm the reproducible copy. The exterior package shall be a standard commercial carton at least equal to Interstate Commerce standards and of sufficient strength to provide for safety and safe delivery, and to protect the camera-ready copy against forms of damage that frequently occur during shipping.

5.1.3 Classified material. Classified material shall be packaged in accordance with DoD 5200.1-R or DoD 5220.22-M as applicable.

5.1.4 Original artwork. Packaging of the original artwork shall be as specified in the contract or order.

5.2 Package information. In addition to sender and addressee information, the exterior of each package shall bear the following:

Publication identifying number.

Contract or purchase order number.

"Manuscript", when applicable.

"Camera Ready copy", when applicable.

Number of packages in shipment.

5.3 Packing list. A copy of the letter of transmittal, or the packing list, shall be placed inside the package. When a shipment consists of several packages, the letter of transmittal or packing list shall be inclosed in the first package and shall identify the material that was wrapped in each package.

## 6. NOTES

6.1 Intended use. Technical publications prepared in accordance with the general style and format requirements of this specification are intended for use in the installation operation, maintenance, repair and logistics support of equipment/systems or for accomplishment of assigned missions and to set a style and format standard for related publications for which no other standards exist.

6.2 Ordering data. Purchasers should exercise any desired options offered herein, and acquisition documents should specify the following:

### 6.2.1 Acquisition requirements.

- a. Title, number, and date of this specification.
- b. Types of equipment publications required. (Operation instruction manual, Maintenance instruction manual, Inspection manual, Parts list manual, etc.).
- c. Location of copyright credit line (3.1.2.1).
- d. If manual outline shall be provided (3.1.4).
- e. If a manuscript (or draft) shall be provided (3.2.1).

- f. Page size (3.2.2.2).
- g. If foldout pages shall be prepared (3.2.5).
- h. If illustration identification numbers are required (3.2.10.4).
- i. If volume numbering is required. (3.2.11.1).
- j. Reading grade level (RGL) of narrative material (3.3.3).
- k. If downgrading/declassification markings are required (3.4.2).
- l. Front matter peculiar requirements (3.5).
- m. Use of cover, title, or title block page. (3.5.1).
- n. Title on draft manuals (3.5.1.3).
- o. Use of National Stock Number on title page (3.5.1.4.2).
- p. Wording for distribution statement (3.5.1.6).
- q. Authority notice wording. (3.5.1.11).
- r. If FOR OFFICIAL USE ONLY notice is required. (3.5.1.15).
- s. If MAP or Consortium use only notice is required. (3.5.1.16).
- t. If prescreened photographs are applicable (3.6.3.2).
- u. If cartoons are to be used. (3.6.10).
- v. If color is to be used. (3.6.12).
- w. If manuscript copy for looseleaf changes is required. (3.7.1).
- x. If change date will be other than specified herein. (3.7.2.1).
- y. If difference data sheets shall be furnished. (3.7.2.3).
- z. If change sheet shall be furnished. (3.7.2.12.2).
- aa. If change symbols shall be other than specified herein. (3.8.2) (3.7.2.10)
- ab. If a change record shall be furnished (3.5.4).
- ac. If shading and screening shall not be used. (3.7.2.11).
- ad. If a revision shall be prepared. (3.8).
- ae. Preparation of supplements. (3.9)

- af. Quality assurance provisions. (4).
- ag. Packaging of original artwork. (5.1.4).

### 6.3 Definitions.

6.3.1 Box head title. Those titles which are enclosed by rules at the head of a column on tables and charts.

6.3.2 Callout. Anything placed on an illustration to aid in identifying the objects being illustrated, such as index numbers, nomenclatures, leadlines, arrows, procedures, and, when placed directly on the illustration, legends (keys).

6.3.3 Caution: An operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness or long term health hazards to personnel.

6.3.4 Change. A change is comprised of corrected pages to the basic manual. It consists of information that improves or clarifies the basic manual without requiring rewriting or reorganization of the technical content of the basic manual.

6.3.5 Chapter. The first major functional division of a publication.

6.3.6 Copy freeze date. The copy freeze date is a date set by contractor or acquiring activity after which no additions, deletions, or changes will be accepted to the publication material. Additions, deletions, and changes after that date will be accumulated for preparation of a subsequent change or revision of the publication. Normally the publication date, approval date and copy freeze date will be the same date.

6.3.7 Department of the Army Equipment Publications (DAEP). (A) Those publications that have been authenticated, printed, and distributed for use during the production and operations phase of the life cycle of the equipment.

6.3.8 Draft Equipment Publication(s) (DEP). (A) Those publications prepared during the development phase of the equipment which are used for engineering tests, service tests and initial production tests, usually of prototype models of equipment. The DEP is also used for coordination and review by user agencies. (FORSCOM and TRADOC). The term DEP is also used to define the publication that is sent for user coordination during revision of DA equipment publications.

a. The DEP is prepared in the format prescribed by applicable technical content specification. It is an updated version of the Preliminary Draft Equipment Publication (PDEP) which includes all changes as a result of the engineering design test and physical teardown function of the maintenance evaluation.

b. The definition replaces terms formerly used to refer to publications used for the above purpose and phase of development (draft manuscript, draft equipment manual, draft TM, preliminary manuscripts, review copy, etc.).

6.3.9 Equipment publication manuscript. (A) The documentation used in preparation of the PDEP, DEP, or FDEP. It may be in any form (typewritten or handwritten, reproducible copy,

drawings, illustrations, unchanged publication pages, changed publication pages, etc.). When the term "manuscript" is used, it will be prefaced with the type of publication, e.g., PDEP manuscript, DEP manuscript, etc. When PDEP or DEP manuscripts are ready for reproduction to be distributed to test and user agencies for evaluation and coordination, the word manuscript will be dropped and the title PDEP or DEP as appropriate) will be used.

6.3.10 Final Draft Equipment Publication(s) (FDEP). (A) Those publications prepared during the final development or initial production phase of the equipment and used for printing of the DA equipment publication.

a. The FDEP is the final document (manuscript copy, reproducible copy, or page negative) with illustrations, ready for transmittal to The Adjutant General (TAG) for printing and publication as an authenticated DA equipment publication. The FDEP includes all necessary changes and final resolutions of all comments and recommendations made as a result of engineer test, service test, validation/verification, user coordination, and maintenance literature conference.

b. This definition replaces terms formerly used to refer to publications used for the above purpose and phase of development (final manuscript, final draft manuscript, final draft TM, draft TM, manuscript for review, etc.).

6.3.11 Formal Manual/final manual. The final document ready for printing and publication as an authenticated technical manual including all necessary changes made as a result of validation/verification procedures.

6.3.12 Index numbers/letters. Those callouts which consist of a number or letter leading to a legend (key) which defines the symbols used.

6.3.13 Layout page. A blank sheet showing marginal copy only, used by an editor to indicate where text, illustrations, tabular data, will appear on the reproducible copy. Text, line drawings, tabular data, can be prepared separately, then firmly attached to the layout page to form reproducible copy.

6.3.14 Leader lines. A line with or without arrowhead extending from index number or letter/nomenclature to item.

6.3.15 Legend (key). A tabular listing of the key numbers of letters and their meanings.

6.3.16 Module. (A) Integrated text and illustration covering performance of a task procedure/step.

6.3.17 Multivolume manuals. Multivolume manuals are assigned individual identification numbers. If a volume, because of its bulk, warrants being further divided, the acquiring activity will decide how these divisions shall be identified. Unless otherwise specified the volume shall be divided into separately bound parts not to exceed approximately three inches in thickness.

6.3.18 Nomenclature callout. Nomenclatures or partial nomenclatures placed directly on the illustration; e.g., "articulated bloget", "1/2 inch giget".

6.3.19 NOTE: An essential operating or maintenance procedure, condition, or statement, which must be highlighted.

6.3.20 Part. A part is the next lower division of a publication below volume. Parts should normally be separately bound.

6.3.21 Preliminary Draft Equipment Publication(s) (PDEP). (A) Those publications prepared during the development phase of the equipment which are used for engineering design test and the physical teardown function of the maintenance evaluation of prototype models of equipment.

a. The PDEP need not conform to format requirements of the applicable technical content specification. They may be in the form of printed books or manuscripts, or they may be a package of documentation such as a draft maintenance allocation chart, engineer drawings, technical data extracted from the logistic support analysis record (LSAR) or from other data required for operation and maintenance of the equipment. The PDEP is used as the basis for preparation of the draft equipment publications and may be used as source data for developing New Equipment Training (NET) and other training requirements.

b. This definition replaces terms formerly used to refer to publications used for the above purpose and phase of development (initial manuscript, preliminary draft manuscript, manufacturer's manual, preliminary operating and maintenance manual (POMM), draft manual, technical data, etc.).

6.3.22 Preliminary issue. A preliminary manual is intended for interim use to make the technical information available for test, verification, training purposes, and operational use pending receipt of formal printed manuals. Preliminary manuals shall be complete and validated accurate, but need not meet the typography requirements for final manuals. Preliminary manuals must be superseded by final manuals.

6.3.23 Revision. A revision is a second or subsequent edition of a manual which supersedes the preceding edition.

6.3.23.1 Update revision. An update revision incorporates the basic manual, all previous changes, and new data that would require the issuance of an additional change. The update is prepared by incorporating applicable portions of pages in the manual (Paste-up or minor composition) without requiring rewrite or reorganization of the technical content of the material. It is prepared in the style and format of the basic manual.

6.3.23.2 Complete revision. A complete revision requires rewrite or reorganization of the technical content of the material and is prepared in accordance with the style and format requirements of this specification.

6.3.23.3 Non-superseding revision. (N) Normally revisions supersede the preceding edition. However, when a new manual is needed to cover a different configuration of a system or equipment for which there is a high degree of commonality, a non-superseding revision can be acquired to minimize cost. A non-superseding revision will stand on its own and shall be identified by a unique publication number.

6.3.24 Section. The first major functional subdivision of a chapter.

6.3.25 Standard technical manual. A standard technical manual is any technical manual that does not require a new concept or special presentation of data that cannot, or should not, be constrained by the size and format requirements of this specification.

6.3.26 Supplement. (N, MC, F) A supplement is a subsidiary document which complements information in a manual).

6.3.27 Technical manual. Technical manuals are defined as publications and other forms of documentation containing a description of equipment, weapons, or weapon system, with instructions for effective use, including one or more of the following sections as required; instructions covering initial preparation for use; operational instructions; maintenance instructions; overhaul instructions; parts list or parts breakdown; and related technical information or procedures exclusive of those procedures of an administrative nature. (For Army this includes all Equipment Publications).

6.3.28 Volume. The first separately bound subdivision of a publication.

6.3.29 WARNING. An operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in injury to or death of personnel.

6.4 Identification of changes. The changes in this specification are extensive. therefore, the changes have not been marked. Bidders and contractors are cautioned to evaluate the requirements of this specification based on the entire contents.

# SECURITY CLASSIFICATION<sup>1</sup>

## PUBLICATION NUMBER<sup>2</sup>

Formerly (previous publication number)<sup>3</sup>

VOLUME NO./PART NO.

REVISION NO.<sup>5</sup>

TECHNICAL MANUAL \*<sup>7</sup>

TYPE OF PUBLICATION<sup>8</sup>

(MAINTENANCE LEVEL(S))<sup>9</sup>

Title<sup>6</sup>  
Block

# NOMENCLATURE OF EQUIPMENT - TYPE, MODEL, PART NUMBER, NATIONAL STOCK NUMBER OR SUBJECT

Prime Title<sup>10</sup>

SUBTITLE<sup>11</sup>

Manufacturer of Equipment<sup>12</sup>  
Contract Number<sup>13</sup>



14

Supersedure Notice<sup>15</sup>

Effective Date Notice<sup>16</sup>

Downgrading Notice<sup>17</sup>

DISCLOSURE NOTICE<sup>18</sup>

DISTRIBUTION STATEMENT<sup>19</sup>

Authority Notice<sup>20</sup>

DATE<sup>21</sup>  
CHANGE-DATE<sup>22</sup>

FOR OFFICIAL USE ONLY<sup>23</sup>

## SECURITY CLASSIFICATION<sup>24</sup>

FIGURE 1. Example of cover/title page for a classified/unclassified manual (sheet 1 of 3).

POINT TYPE  
SIZENOTES

- 24 1. The security classification assigned by the acquiring activity shall be shown, including RESTRICTED DATA and FORMERLY RESTRICTED DATA, as applicable.
- 24 2. The acquiring activity shall furnish the publication number(s). If the manual will be jointly used by more than one Service, the acquiring service number shall appear at the top with the other using Service's number immediately below it and each Service's number shall be prefixed with the word Army, Navy, Marine Corps, or Air Force, as appropriate. All numbers shall appear above the ruled line, near right margin for Army, Marine Corps and Air Force and near left margin for Navy.
- 14 3. When a manual is renumbered, the former publication number shall appear below the new publication number, preceded by the word "Formerly." Both numbers shall remain at this location until the first revision, at which time only the new number shall appear.
- 14 4. Required for multi-volume/part sets only, located below publication number.
- 14 5. For Navy only: Required when it is advisable to indicate status for publications subject to frequent revision. Especially significant when the same publication numbers are maintained for superseding revisions identified by a change of the publication date.
6. The title is required to provide all information necessary to relate the publication to its subject and content, such that readers can discern the applicability of the publications and can discriminate between publications of similar applicability. The title consists of a heading, the type of publication, the level of maintenance, the prime title and the subtitle, as applicable.
- 14 7. The words TECHNICAL MANUAL shall appear in the upper center portion of the page, aircraft flight manuals excepted. \* Not required for Naval Electronics and Naval Sea Systems Command technical manuals.
- 14 8. Required to define the specific type of technical manual (e.g. Maintenance Manual, Flight Manual, IPB, etc.)
- 14 9. Required to specify the intended level of maintenance, when the publication is restricted for use at a specified level.

FIGURE 1. Example of cover/title page for a  
classified/unclassified manual- continued.



POINT TYPE  
SIZE

NOTES

- 18  
to  
24
10. The prime title: nomenclature of the equipment, type, model, part number (blocks, serial numbers, registration numbers, if appropriate), or subject shall be positioned below the words identifying the manual type. The national stock number and identification of any other equipment covered by the manual shall be shown only if specifically required by the acquiring activity. Also, the classification of the equipment nomenclature shall be indicated (U), (C), (S), as specified in DoD Manual 5200.1-R, when the manual itself is classified. For multivolume/part publications, the prime title should be marked on all volumes and parts.
- 14
11. Indicates the content covered. Required on multi-volume/part publication to differentiate between the coverage among volumes.
- 8
12. Identification of the designer of the equipment shall appear below the equipment nomenclature. If the equipment is designed by a subcontractor but the manual is prepared by the prime contractor, the parenthetical statement "(Manual prepared by . . . . .)" (6-point) shall appear below the designer's name. However, the identification shall be omitted for any manual applicable to more than one manufacturer unless the prime contractor prepared the manual for two or more subcontractors, in which case the "(Manual prepared by . . . . .)" statement only shall be used.
- 8
13. The original contract number shall be placed on all new issues and carried forward on all subsequent cover pages. If the contract number for a change or revision is different from the original number, the number applicable to the change or revision shall be indicated on any new cover pages, in addition to the original number. No more than two contract numbers, the original and the latest, need appear.
- 1½ to 1½
14. For Navy only, the Department of the Navy Seal, with Command identifier is inches used.
- 10
15. When a manual supersedes a previous issue, or other manuals, a supersedure notice shall be placed in the space indicated.
- 10
16. When a manual becomes effective later than its issuance, an effective date notice shall appear in the space indicated.
- 10
17. For classified publications only, indicates when the manual is subject to downgrading.

FIGURE 1. Example of cover/title page for a  
classified/unclassified manual - continued.

POINT TYPE  
SIZENOTES (Cont)

- 8 18. The disclosure notice shall be placed on the cover/title page for all classified publications, including those bearing a FORMERLY RESTRICTED DATA marking, but not on those bearing a RESTRICTED DATA marking.
- 8 19. The distribution statement, to be included on all unclassified documents restricted for use by the government, unless otherwise authorized on a case basis.
- 8 20. Indicates the authority under which the publication is procured and promulgated. For Navy it indicates the cognizant Naval command.
- 18 21. The publication date; normally the copy-freeze date.
- 14 22. Changed cover/title pages shall show a change number and date below the date of the basic manual.
- 14 23. Marking to be included on all publications conforming to the requirements of 19 above.
- 24 24. Same as 1 above.

Spacing between the necessary information shall be such as to result in an attractive well balanced cover page. Horizontal lines 1 point high shall be placed across the page, one just below document identification number and the second just above the date.

FIGURE 1. Example of cover/title page for a  
classified/unclassified manual - continued

	TYPE SIZE IN POINTS
(Note a)	<b>PUBLICATION NUMBER</b> 24
(Note b)	1
(Note c)	<b>TECHNICAL MANUAL</b> 14
(Note d)	<b>OPERATION INSTRUCTIONS MAINTENANCE INSTRUCTIONS OVERHAUL INSTRUCTIONS WITH PARTS BREAKDOWN</b> 18
(Note e)	<b>(AS APPROPRIATE) MAINTENANCE LEVEL(S)</b> 14
(Note f)	<b>NOMENCLATURE OF EQUIPMENT - TYPE, MODEL, PART NUMBER, NATIONAL STOCK NUMBER</b> 18 to 24
(Note g)	<b>Manufacturer of Equipment</b> 8
(Note h)	<b>Contract Number</b> 8
(Note i)	<b>Supersedure Notice</b> 10
(Note j)	<b>Distribution Statement</b> 10
(Note k)	<b>Authority Notice (as appropriate)</b> 8
(Note b)	1
(Note l)	<b>DATE</b> 18

Text

FIGURE 2. Example of a title block page  
(sheet 1 of 2)

## NOTES

- a. The acquiring activity shall furnish the publication number(s). All numbers shall appear above the ruled line, near right margin for Army, Marine Corp and Air Force and near left margin for Navy. If the manual will be jointly used by more than one Service, the procuring Service's number shall appear at the top with the other using Service's number immediately below it. When the manual will be jointly used, each Service's number shall be prefixed with the word Army, Navy, Marine Corps, or Air Force, as appropriate.
- b. A line shall be placed below the publication number(s) and above the date.
- c. The words Technical Manual shall appear in the upper center portion of the page. Not required for Naval Electronics and Naval Sea Systems command technical manuals.
- d. The type of manual, Operation Instructions, Maintenance Instructions, Overhaul Instructions With Parts Breakdown, etc, as indicated by the applicable technical content specification, shall be positioned below the words TECHNICAL MANUAL. The national stock number and identification of any other equipment covered by the manual shall be shown only if specifically required by the procuring activity.
- e. For maintenance manuals, the level(s) of maintenance (organizational, intermediate, depot) as appropriate, shall be shown beneath the manual type.
- f. The prime title nomenclature of the equipment, type, model, part number, etc, shall be positioned below the words identifying the manual type. The national stock number and identification of any other equipment covered by the manual shall be shown only if specifically required by the procuring activity. When applicable a subtitle shall be used and located immediately below the prime title to indicate the contents of each separately bound volume or part of a technical manual.
- g. Identification of the designer of the equipment shall appear below the equipment nomenclature. If the equipment is designed by a subcontractor but the manual is prepared by the prime contractor, the parenthetical statement "(Manual prepared by . . . . .)" (6-point) shall appear below the designer's name. However, the identification shall be omitted for any manual applicable to more than one manufacturer unless the prime contractor prepared the manual for two or more subcontractors, in which case the "(Manual prepared by . . . . .)" statement only shall be used.
- h. The original contract number shall be placed on all new issues and carried forward on all subsequent title blocks. If the contract number for a revision is different from the original number, the number applicable to the revision shall be indicated on any new cover pages, in addition to the original number. No more than two contract numbers, the original and the latest, need appear.
- i. When a manual supersedes a previous issue, or other manuals, a supersedure notice shall be placed in the space indicated.
- j. The requirements of paragraph 3.5.1.6 are applicable for distribution statements.
- k. The appropriate authority notice will be provided by the procuring activity.
- l. Refer to 3.5.1.13 regarding the date to be used.

Spacing between the necessary information shall be such as to result in an attractive well balanced title block.

FIGURE 2. Example of a title block page - continued.

USE	TYPESET	CAPITALIZATION	LEADING (POINTS)	SPACING
1. Marginal Copy	Futura Demibold 10 Futura Bold Italic 12 Gothic or Roman Bold or Extra Bold	Upper and Lower Case	2	6-Point Above or Below Text
1a. Publication No. or Page No.	Same as Above	Upper Case		6-Point Above or Below Text
1b. Change Number	Futura Demibold 10 Gothic Bold 10	Upper and Lower Case		6-Point Below Text
1c. Security Class.	Futura Bold 14 *	Upper Case		6-Point Above or Below Text
1d. Page Content/ Equipment Identification	Futura Demibold 10	Upper and Lower Case	2	6-Point Above Text
1e. Deleted Page(s) Notation	Futura Demibold 8	Upper and Lower Case	2	6-Point Above or Below Text
2. Text	Bodoni Book 10 Garamond Bold 10 Century Textbook 10	Upper and Lower Case	1	12-Point Above or Below Illustration or Table 6-Point Above Warning, Caution or Note Heading 6-Point Below Warning, Caution or Note Heading
2a. Emphasis	Futura Bold Italic 10	Upper and Lower Case		
2b. Formulas and Equations	Century Textbook Italic 10 Cheltenham Old Style Italic 10	Upper and Lower Case	1	12-Point Above or Below Text, Illustration or Table
3. Part Nos., Chapter Nos. and Titles; Appendix and Alphabetical Index Headings	Futura Demibold 14 * Futura Bold Condensed 14 *	Upper Case	6	48-Point Below Marginal Copy 18-Point Above Text, Illustration or Table
4. Section Number and Title	Futura Demibold 12 Futura Bold or Extra Bold 14 *	Upper Case	6	24-Point Below Chapter Title, when Applicable 28-Point Below Marginal Copy, when Applicable 18-Point Above Text, Illustration or Table
5. Paragraph Headings	Futura Demibold 12	Upper Case		
5a. Primary Sideheads	Futura Bold or Extra Bold Condensed		2	8-Point Below Preceding Text, Part, Chapter, Section Title or Marginal Copy
5b. First Subordinate Sidehead	Futura Bold Italic 10 Futura Bold or Extra Bold Condensed 10 Roman Bold 10	Upper and Lower Case	1	4-Point Below Preceding Text or Marginal Copy

FIGURE 3. Style, size, capitalization, leading and spacing (typeset).

USE	TYPESET	CAPITALIZATION	LEADING (POINTS)	SPACING
5c. Second Subordinate Sidehead	Century Textbook Italic 10 Roman Bold 10	Upper and Lower Case	1	4-Point Below Preceding Text or Marginal Copy
5d. Third Subordinate Sidehead	Century Textbook Italic 10 Roman Bold 10	Upper Case for First Letter of Each Word	1	4-Point Below Preceding Text or Marginal Copy
5e. Fourth Subordinate Sidehead	Century Textbook Italic 10 Roman Bold 10	Upper Case for First Letter of Each Principal Word	1	4-Point Below Preceding Text or Marginal Copy
6. Figure No. and Title	Century Textbook Italic 8 Futura Demibold Italic 10	Upper Case for First Letter of Each Principal Word	2	6-Point Below Illustration
7. Legend (Key) 7a. On Artwork 7b. In Text	Century Textbook 8, Bodoni Book 8 Same as Above	Upper Case Upper Case for First Letter of First Word	1 1	Set Solid Above Caption 6-Point Below Illustration 6-Point Above Figure Title Set Solid Above Legend Line
8. Warnings (Heading)	Century Bold Italic 10 Futura Extra Bold (Boxed)	Upper Case		4-Point Above and Below Text
9. Cautions (Heading)	Same as Above	Upper Case		4-Point Above and Below Text
10. Notes (Heading)	Cheltenham Old Style Italic 8 or 10 Futura Extra Bold 10	Upper Case		4-Point Above and Below Text
11. Footnotes	Century Textbook 8	Upper and Lower Case	1	2-Point Below Table. Full measure at Bottom of Page Separated by a 1-inch hairline
12. Table No. and Title	Century Textbook Italic 8 Futura Bold Italic 10	Upper Case for First Letter of Each Principal Word	2	Center Above Table. Repeat on Continued Pages
13. Table Column Heads	Century Textbook 10 Bodoni Book 8, Futura Bold 10	Upper Case or Upper and Lower Case	1	
14. Table Text	Century Textbook 10 or 12 Futura Bold or Medium 8	Upper and Lower Case	2	
15. Boxheads	Century Textbook 8	Upper Case or Upper and Lower Case		Repeat on Continued Pages
16. Rules	Hairline 2			
17. Parts Lists Column Heads	Century Textbook 8	Upper Case	1	
18. Parts Listings	Century Textbook 8 or 10 Futura Bold or Medium 8 or 10	Upper and Lower Case	11	

\*If 14-point is not available, the next smaller size is permitted.  
All type sizes may be plus or minus one point.  
Slight variations in leading and spacing are permitted.  
Reproducible copy that will require no reduction, shall use above type sizes.  
Reproducible copy prepared oversize shall use type that will reduce to specified sizes.

IT IS NOT THE INTENT OF THIS SPECIFICATION TO SPECIFY THE METHODS OR COMPOSING EQUIPMENT TO BE USED, BUT ONLY TO SPECIFY REQUIRED RESULTS.

FIGURE 3. Style, capitalization, leading, and spacing [typeset]-continued.

## MIL-M-38784B

TYPE POINT SIZE	HEIGHT OF FONT DIMENSIONS	
	INCHES (+.005)	
4.....	L - .035	S - .025
6.....	L - .055	S - .030
7.....	L - .060	S - .040
8.....	L - .070	S - .045
9.....	L - .080	S - .050
10.....	L - .090	S - .055
11.....	L - .095	S - .060
12.....	L - .105	S - .065
14.....	L - .125	S - .075
L - Equals upper case letters and numerics plus b,d,f,g,h,j, k,l,p,q,t, and y.		
S - Equals the following lower case letters: a,c,e,i,m,n,o, r,s,u,v,w,x, and z.		

FIGURE 4. Type point sizes

MIL-M-38784B

RADAR SET  
AN/SPS-10A

SE211-FO-MMA-010/SPS-10

SECTION 4  
SCHEDULED MAINTENANCE4-3 PREVENTIVE MAINTENANCE PROCEDURES

The preventive maintenance procedures listed below provide information necessary to conduct a comprehensive program of cleaning and inspecting the AN/SPS-10. Each procedure includes equipment and materials required and step-by-step instructions on how to perform the preventive maintenance.

**CAUTION**

Comply with Navy Safety Precautions for Forces Afloat, OPNAVINST 5100 series prior to performing preventive maintenance.

## 4-3.1 AIR FILTER CLEANING PROCEDURES.

The air filters in the Receiver-Transmitter, the Modulator, and the Video Clutter Suppressor (AN/SPS-10 Field Change No. 22, 30, or 31 incorporated) should be cleaned monthly.

## 4-3.1.1 Tools and Equipment Required.

1. Warning tags
2. Vacuum cleaner with non-metallic nozzle

**WARNING**

High voltages that are dangerous to life may be stored on capacitors after power is removed.

## 4-3.1.2 Preliminary Actions.

1. Turn OFF and tag radar bulkhead main power switch in radar equipment room.
2. Locate filter in center underside of Receiver-Transmitter cabinet.
3. Locate filter on right side below connector panel on Modulator cabinet.

4. For equipments with Video Clutter Suppressor MK-8756A/SPS-10, locate filter inside cabinet door.

## 4-3.1.3 Procedures for Cleaning Air Filters.

1. Remove filters.
2. Vacuum filters, reversing normal air flow.
3. Inspect filters for cleanliness. If additional cleaning is required:
  - a. Wash filters in solution of warm water and detergent
  - b. Rinse filters in clean, fresh water.
  - c. Blow excess moisture from filters with low-pressure air.
  - d. Allow filters to dry thoroughly.
4. Reinstall cleaned filter.
5. Return equipment to normal readiness condition.

4-3.2 AS-936( )/SPS-10B ANTENNA ASSEMBLY AND OIL LEVEL INSPECTION, AND LUBRICATION OF ANTENNA DRIVE MOTOR. These maintenance procedures should be performed quarterly, when AS-936( )/SPS-10B Antenna Assembly (Units 19, 20, or 21) is installed.

## 4-3.2.1 Tools and Equipment Required.

1. Clean rags
2. Warning Tags
3. Small funnel
4. Safety harness
5. Oil, MIL-L-9000 or MIL-L-17331
6. Grease, MIL-G-23827
7. Grease, MIL-G-81322
8. 8" adjustable wrench
9. 3/4" fill pipe with grease cap

## 4-3.2.2 Preliminary actions.

1. Comply with ship's regulations for working aloft.
2. Turn off and tag radar bulkhead main power switch.
3. Press STOP button on Manual Controller Switch and tag "MAN ALOFT".
4. Turn Antenna Switch Control to OFF RESET.

ORIGINAL

43

FIGURE 5. Example of double-columned unjustified text.



CHAPTER 3  
HANDLING AND STORAGE

3-1. GENERAL. Compliance with AFR 127-100 and the instructions in this manual will ensure safe handling, storage, and serviceability of widgets. Waivers and deviations will be in accordance with AFR 127-100. Stored widgets should be protected from adverse climactic conditions. The main hazards linked with the storage and handling of items listed in this TO are:

- a. Blast.
- b. Fragments.
- c. Fire.

3-2. SPECIAL TERMS. The following terms, as defined, apply to widgets.

NOTE

Shelf and service lives are not cumulative. Any combination of shelf and service life accrued by an item cannot exceed the shelf life.

3-2.1. Shelf life: The length of time an item can remain in storage. The expiration date for shelf life on items with the month and year listed is the last day of the month.

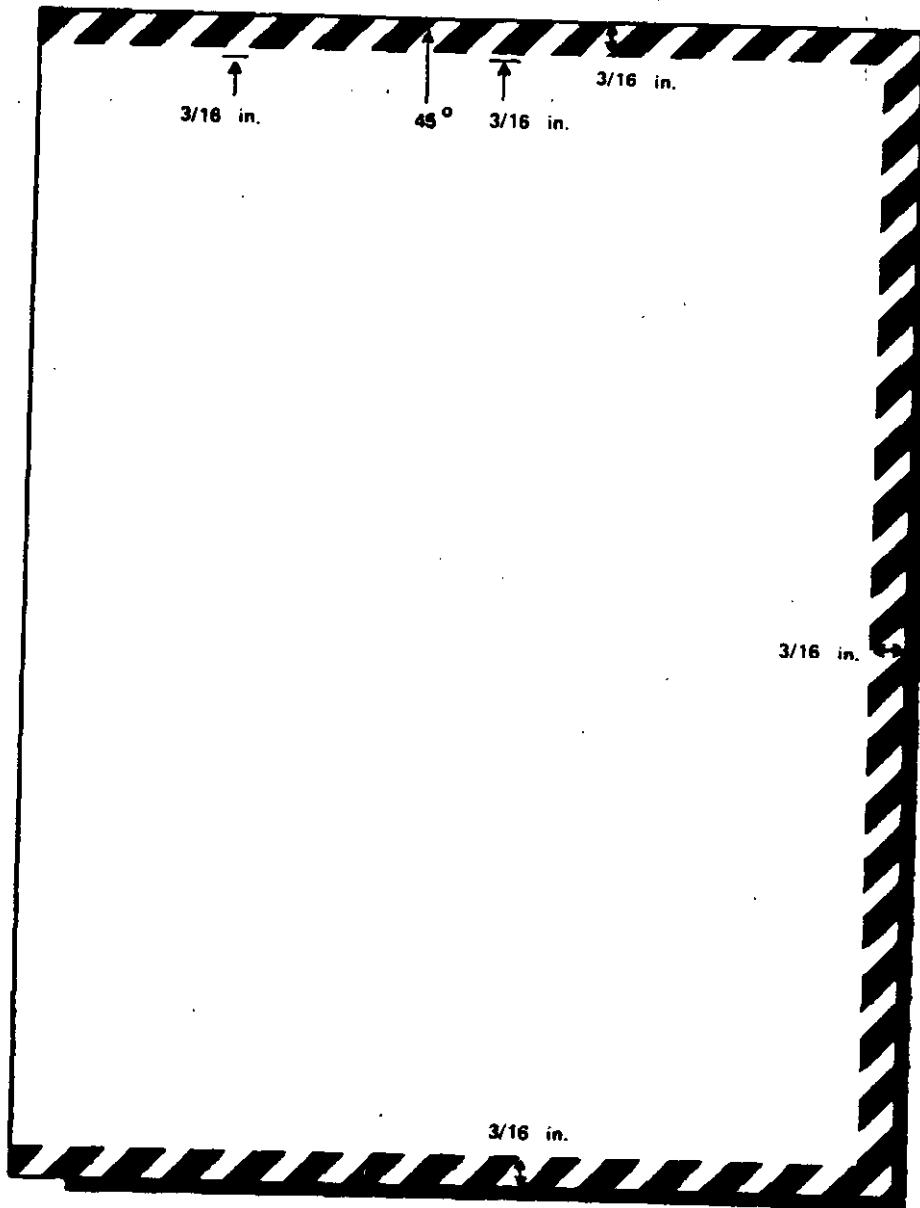
3-2.2 Service life: The length of time an item can remain in operating configuration or in actual usage.

NOTE: For those items packed in hermetically sealed tear strip containers service life starts on date of opening and continues until item(s) are expended.

3-2.3 Magazine: Any building or structure, except an operating building, used for storage of explosives, munitions, or loaded munition components.

3-3. IDENTIFICATION. The use of standard nomenclature and lot number/serial number is mandatory for all storage records and communications. Legible identification markings will be kept on munitions in storage.

FIGURE 6. Example of single-column unjustified copy.



NOTES

COLOR- Black  
PLACE- Three Unbound Edges  
BORDER- 3/16 Inch Wide  
MARKING- 3/16 Inch Wide  
ANGLE OF MARKING-45 Degree  
SPACE BETWEEN MARKINGS-3/16 Inch Wide

FIGURE 7. Emergency page markings.



CHAPTER 16  
SIGHTING AND FIRE CONTROL EQUIPMENT

Section I. INTRODUCTION

16-1. SCOPE. This chapter contains information on the arrangement of the .....  
\* \* \* \* \*

16-2. ORIENTATION.

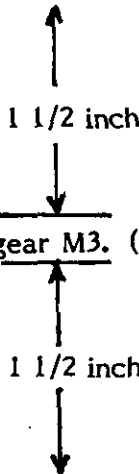
16-2.1 General. The oil gear M3, because of its additional features of self-synchronous operation and the self-contained hydraulic stops for elevation, requires painstaking operation.

NOTE

The procedure outlined in b and c below should be followed carefully if faulty operation is to be avoided.

\* \* \* \* \*

16-2.2 Azimuth Gear. The azimuth oil gear M3 (fig 16-4) can be oriented as follows:  
a. Level the gun carriage  
b. Open the azimuth boresighting clutch by moving the boresighting level to the UP position.



Cutline

FIGURE 16-4. Azimuth oil gear M3. (Illustration identification Number)

Cutline

c. Depress the power synchronizing mechanism to start the oil gear.

16-1

FIGURE 9. Example of a typical manuscript page .

**Legend for fig. 0-0:**

- |  |                                     |
|--|-------------------------------------|
| 1. Screw, fil-hd, 4-40 x 1/2             | 8. Indicator light glass            |
| 2. Plate                                 | 9. Maltese cross indicator<br>light |
| 3. Lockwasher, internal star,<br>1/4 in. | 10. Screw                           |
| 4. Trigger guard                         | 11. Battery testing button          |
| 5. Relay                                 | 12. Wiring harness                  |
| 6. Connector                             | 13. Screw                           |
| 7. Indicator light shell                 |                                     |

Figure 0-0. GCU wiring tester—exploded view (Illustration identification number)

FIGURE 10. Example of cutline with legend.

## INDEX

<i>Subject</i>	<i>Paragraph, Figure, Table, Number</i>
<b>A</b>	
Accessory Section	
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Removal .....	4-54
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Actuator, Compressor Bleed Valve	
Assembly .....	10-111
Cleaning .....	10-108
Disassembly .....	10-107
Inspection .....	10-109
Repair .....	10-110
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Afterburner	
Description .....	2-29
Installation .....	8-110
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Removal .....	4-141
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Anti-icing Air System Description .....	2-17
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Balance .....	6-15
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Igniters .....	3-128
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Repair .....	3-126
Compressor Bleed Valves	
Check .....	6-39
Ground Safety Precautions .....	6-7

Index 1

FIGURE 11. Example of technical manual index.

\* **WARNING**

The following step applies dangerous potentials up to 7000 volts DC to exposed terminals and wiring in the oscilloscope chassis. Exercise extreme caution when working inside this chassis throughout the rest of this procedure.

\* **CAUTION**

All aluminum welding fluxes are highly corrosive. Exercise care to prevent the flux from entering the cooler core. Complete removal of the flux residues is essential for the same reason.

**NOTE**

Be sure to shut off the telephone system when the radar set is not operating. It usually obtains power from a separate source.

\* *Borders optional*

\* **METHOD A**

(Above headings are normally for typeset copy but may be inserted with any copy.)

**WARNING** or **WARNING**

Extended flight is not possible after tail rotor drive system failure. Autorotation must be entered immediately.

**CAUTION** or **CAUTION**

The speed decesser gear must be kept clean at all times to prevent contamination of the lube system. Do not separate the casing halves under any condition.

**NOTE**

Two flange bolts adjacent to each of the leakage air hose fittings are installed with heads aft.

\* **METHOD B**

\* *Use one method consistently*

(Above is for copy prepared by office composing equipment or automated equipment. Underlining may be omitted for equipment without such a capability.)

FIGURE 12. Examples of WARNINGS, CAUTIONS and NOTES.

MIL-M-38784B

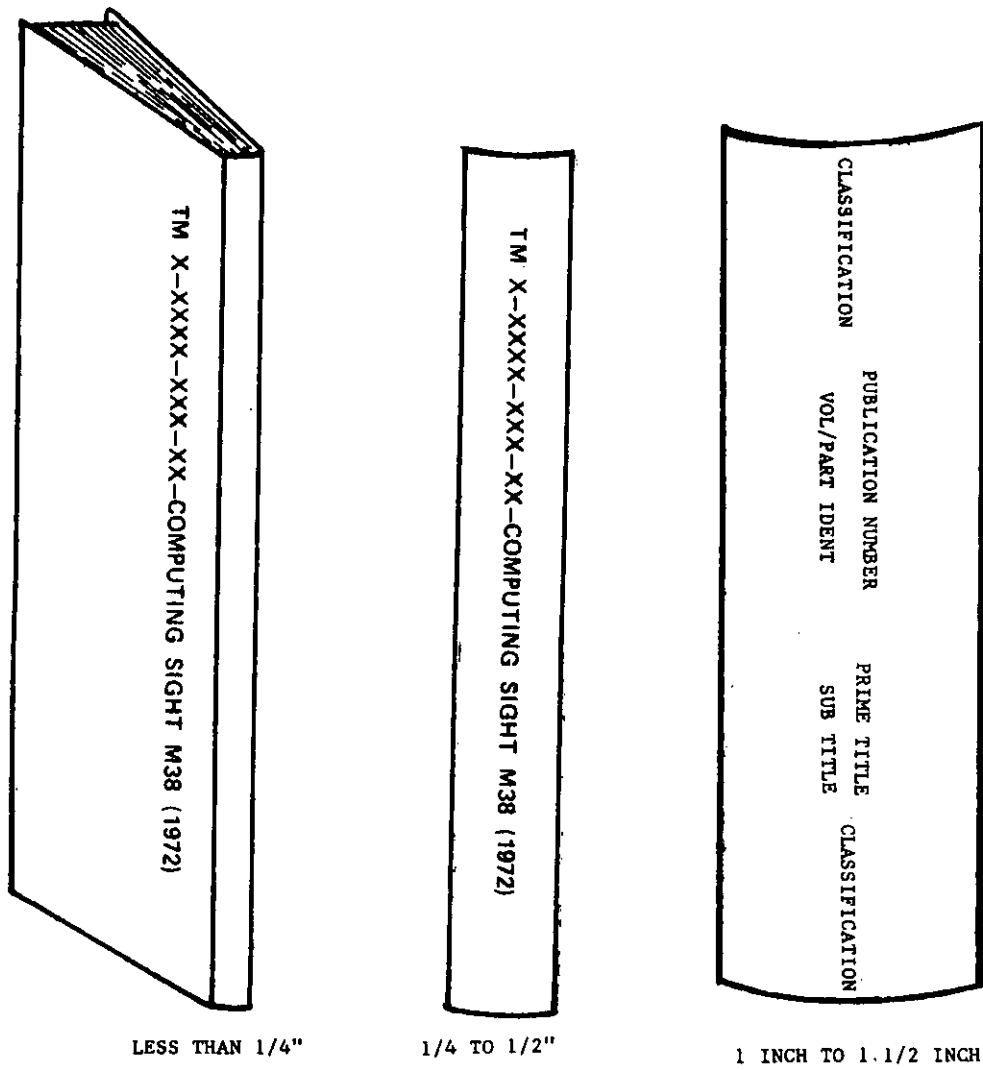


FIGURE 13. Backbone for binder or cover.



MIL-M-38784B

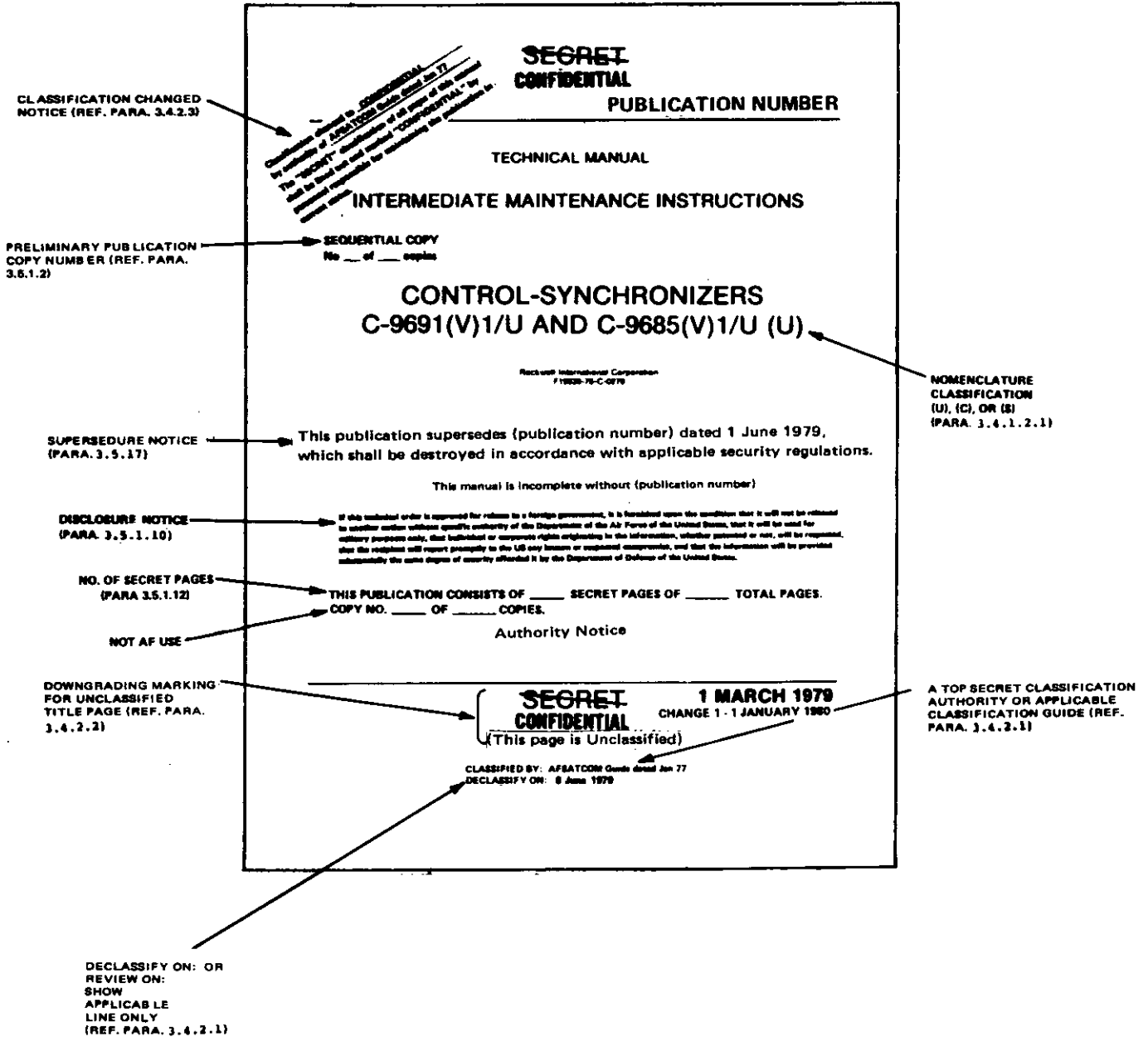


FIGURE 14. Example of title page security classification marking requirements.

MIL-M-38784B

THESE MARKINGS WILL  
REMAIN ON TITLE PAGE  
UNTIL PUBLICATION  
IS REVISED

**CONFIDENTIAL**

**PUBLICATION NUMBER**

**Classification Changed to UNCLASSIFIED**  
by authority of AFSA TCOM Guide dated Jan 77  
The classification of all pages of this manual  
shall be lifted out by personnel responsible for  
maintaining the publication in current status.

**TECHNICAL MANUAL**

**INTERMEDIATE MAINTENANCE INSTRUCTIONS  
CONTROL-SYNCHRONIZERS  
C-9691(V)1/U AND C-9685(V)1/U (U)**

ROCKWELL INTERNATIONAL CORPORATION  
F19628-76-C-0270

**NOMENCLATURE  
CLASSIFICATION  
(U), (C), OR (S)  
(PARA. 3.4.1.3)**

Supersedure Notice

This manual is incomplete without (publication number).

~~If this technical order is approved for release to a foreign government, it is furnished upon the condition that it will not be released to another nation without specific author military purposes only, that individual or that the recipient will report promptly to substantially the same degree of security afforded it by the Department of Defense of the United States.~~

REPLACE WITH  
DISTRIBUTION STATEMENT

United States, that it will be used for  
, whether patented or not, will be respected,  
~~and that the information will be provided~~

Authority Notice

**DATE  
CHANGE-DATE**

**CONFIDENTIAL**

(This page is Unclassified)

CLASSIFIED BY: \_\_\_\_\_  
DECLASSIFY ON: \_\_\_\_\_

FIGURE 14. Example of title page security classification marking requirements.-continued.

**CLASSIFICATION**

**PUBLICATION NUMBER**

---

TECHNICAL MANUAL

**TITLE**

Disclosure Notice

Authority Notice

---

**DATE**

LOCATION OF CLASSIFICATION MARKINGS  
APPLIES TO SUPPLEMENTS, TOPS AND  
SUPPLEMENTARY MANUALS.

TOPS NORMALLY INCLUDE  
SAME DECLASSIFICATION  
INSTRUCTIONS AS  
PUBLICATION BEING  
SUPPLEMENTED

**CLASSIFICATION**

(This page is unclassified)

CLASSIFIED BY: \_\_\_\_\_  
DECLASSIFY ON: \_\_\_\_\_

FIGURE 14. Example of title page security classification marking requirements -continued.

CLASSIFIED PARAGRAPH HEADINGS WILL BE MARKED AS SHOWN. (S) OR (C) UNCLASSIFIED HEADINGS WILL NOT BE MARKED.

CONFIDENTIAL PUBLICATION NO.

## TABLE OF CONTENTS

Chapter	Page	Chapter	Page
1	CHAPTER HEADING . . . . . 1-1	6-83.	Paragraph Heading . . . . . 6-63
	1-1. Paragraph Heading . . . . . 1-1	6-88.	Paragraph Heading . . . . . 6-68
2	CHAPTER HEADING . . . . . 2-1	7	CHAPTER HEADING . . . . . 7-1
	2-1.(C) Paragraph Heading . . . . . 2-1	7-1.	Paragraph Heading . . . . . 7-1
	2-3. Paragraph Heading . . . . . 2-1	7-2.	Paragraph Heading . . . . . 7-3
	2-4. Paragraph Heading . . . . . 2-1		

## LIST OF ILLUSTRATIONS/TABLES

Number	Title	Page	Number	Title	Page
1-1.	Figure Title . . . . .	1-2	3-1.	Figure Title . . . . .	3-6
2-1.(C)	Figure Title . . . . .	2-1	3-2.	Figure Title . . . . .	3-7
2-2.	Figure Title . . . . .	2-2	3-3.	Figure Title . . . . .	3-7
2-3.	Figure Title . . . . .	2-2	3-4.	Figure Title . . . . .	3-8
2-4.	Figure Title . . . . .	2-3	3-5.	Figure Title . . . . .	3-9

CONFIDENTIAL iii

FIGURE CAPTIONS/TITLES WILL BE MARKED AS SHOWN. UNCLASSIFIED CAPTIONS/TITLES WILL NOT BE MARKED.

HIGHEST CLASSIFICATION OF PAGE. IF BACKUP PAGE DOES NOT CONTAIN CLASSIFIED DATA, IT WILL BE MARKED CONFIDENTIAL (This page is Unclassified)

FIGURE 15. Example of security classification markings for table of contents/list of illustrations/tables.

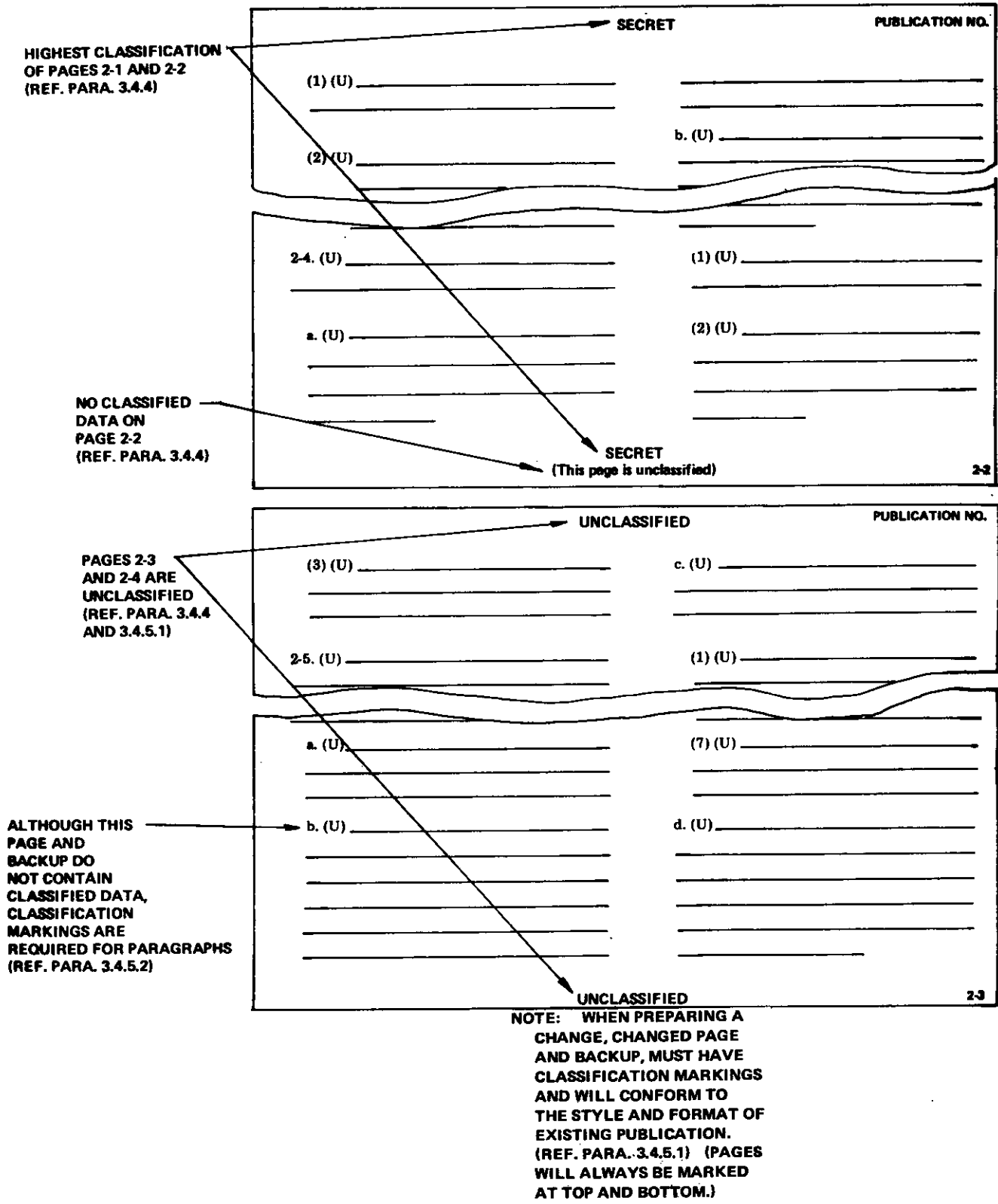


FIGURE 16. Example of security classifications markings for pages.

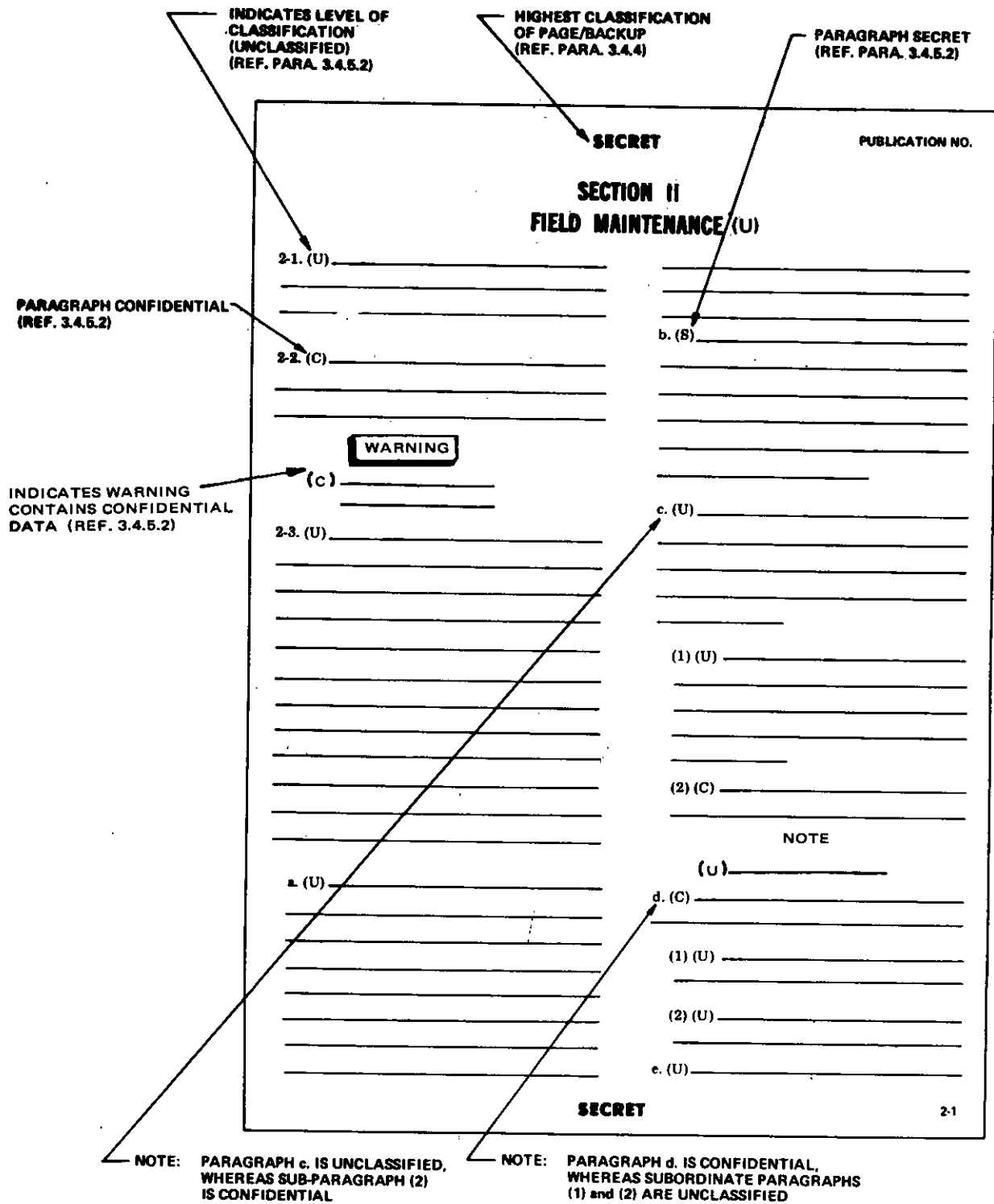


FIGURE 17. Example of security classification markings for paragraphs.

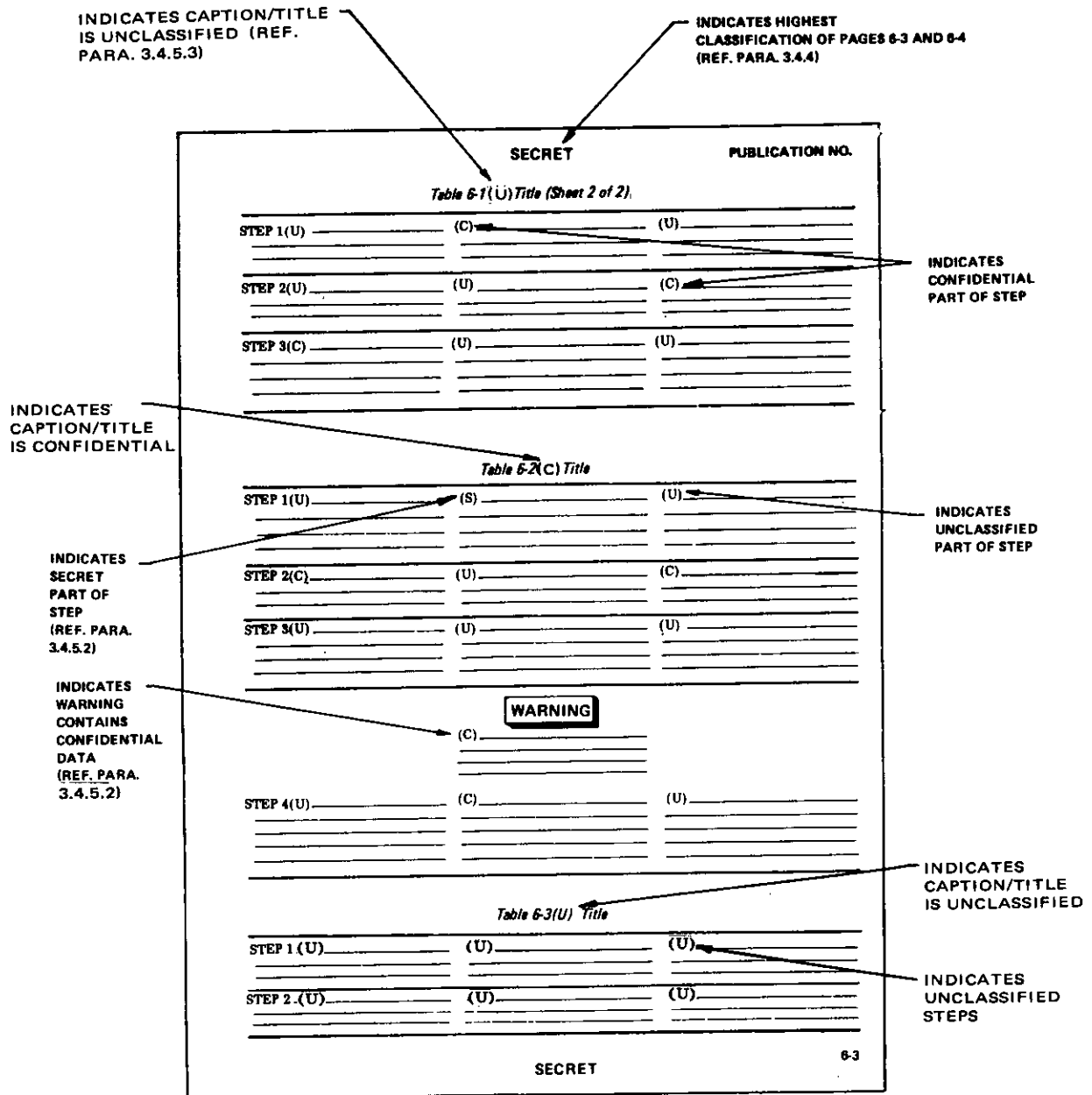
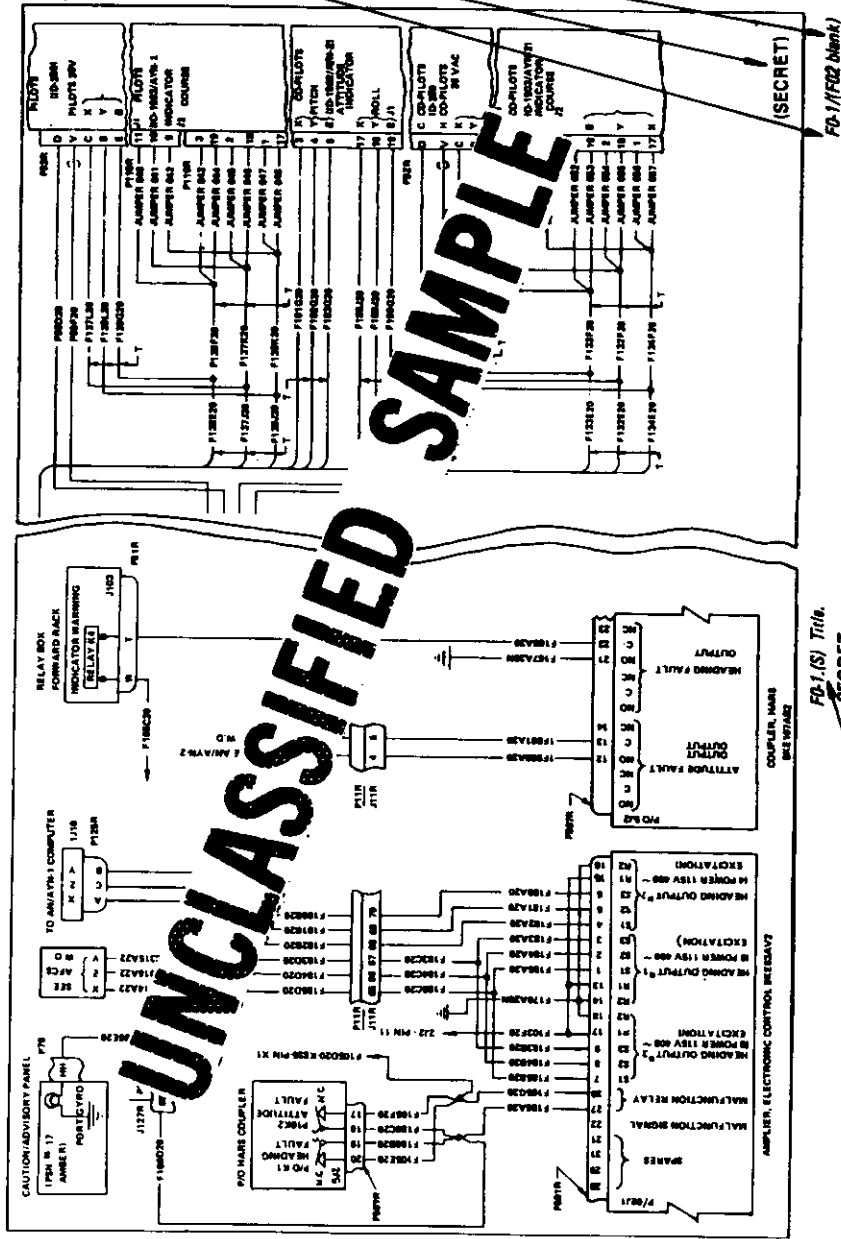


FIGURE 18. Example of security classification markings.

SECRET



UNCLASSIFIED

SAMPLE

FOLDOUTS WILL ALWAYS BE RH PAGES

CLASSIFIED ART WILL BE IDENTIFIED IN LOWER RIGHT CORNER

CLASSIFIED FOLDOUT PAGES WILL BE BACKED UP WITH A BLANK PAGE WITH THE CLASSIFICATION MARKING AT TOP AND BOTTOM OF PAGE

(SECRET)

FD-1(S) Title SECRET

INDICATES CAPTION/TITLE IS SECRET

FIGURE 18. Example of security classification markings - continued.



**SECRET**  
(Unclassified Sample)

Altitude - Nautical Miles

Range - Nautical Miles

Chart No. 2 (U) Test Results

**SECRET**

**SECRET**  
(Unclassified Sample of Photograph and Caption Marking)

**SECRET**

**SECRET**

(C) CAPTION

OR

**UNCLASSIFIED**

(U) CAPTION

**CONFIDENTIAL**

(U) CAPTION

**SECRET**

**FIGURE 18. Example of security classification markings -continued.**

# WARNING

## RADIATION HAZARD



Co 60

Tube types OA2 and 6530/PL-35 (TR tube) used in this equipment contain radioactive material (para 0-0). These tubes are potentially hazardous when broken; see qualified medical personnel and the Safety Director if you are exposed to or cut by broken tubes. For first aid instructions see TB 750-237 and AR 755-15. Use extreme care in replacing these tubes (para 0-0) and follow safe procedures in their handling, storage, and disposal (para 0-0). Refer to paragraph 0-0 and to TB 750-237 and AR 755-15 for instructions on handling, storage, and disposal of radioactive material.

Never place radioactive tubes in your pocket.

Use extreme care not to break radioactive tubes while handling them.

Never remove radioactive tubes from cartons until ready to use them.

SAMPLE A

# ELECTROMAGNETIC RADIATION

**DO NOT STAND IN THE DIRECT PATH OF THE ANTENNA  
WHEN THE POWER IS ON! DO NOT WORK ON THE WAVE  
GUIDES WHILE THE POWER IS ON!**

High frequency electromagnetic radiation can cause fatal internal burns. It can literally "cook" internal organs and flesh. If you feel the slightest warming effect while near this equipment **MOVE AWAY QUICKLY!**

SAMPLE B

FIGURE 19. Examples of warning page information.

**WARNING**  
**RADIATION HAZARD**

This equipment contains the following radioactive tubes:  
(List applicable tubes and equipment locations)  
Radiation may be present at unsealed or broken waveguide elements.

Example C

---

**WARNING**  
**DANGEROUS CHEMICALS**

are used in this equipment  
**DEATH**  
or severe burns may result if personnel fail to observe safety precautions.

Example D

---

**WARNING**  
**HIGH VOLTAGE**

is used in the operation of this equipment  
**DEATH ON CONTACT**  
may result if personnel fail to observe safety precautions.  
Learn the areas containing high voltage in each piece of equipment.  
Be careful not to contact high-voltage connections when installing or operating  
this equipment.  
Before working inside the equipment, turn power off and ground points of high  
potential before touching them.

Example E

---

**WARNING**  
**GASES OR AIR UNDER PRESSURE**  
**3000 PSI AIR PRESSURE**

is used in the operation of this equipment.  
**DEATH**  
or severe injury may result if personnel fail to observe safety precautions.

Example F

FIGURE 19. Examples of warning page information -continued.



To look along the axis of a laser beam without protective glasses is extremely dangerous. Align the laser so that personnel are unlikely to inadvertently look along the axis of its beam.

---

Laser firing systems may store a charge. Take care to prevent accidental pulsing of the laser and to avoid electric shock. Systems should be so designed as to include a "fail-safe" means of avoiding this hazard.

---

Reflections from the laser beam are extremely dangerous. It is essential that all reflective material be removed from its path.

EXAMPLE G

FIGURE 19. Examples of warning page information -continued.

Publication Number		TYPE SIZE IN POINTS	
		18	
		10	
SHOWN LATEST CHANGED PAGE. DELETED SUPPRESSED PAGE		8	
<b>LIST OF EFFECTIVE PAGES</b>		11	
NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margin of the page. Changes to illustrations are indicated by asterisks pointing heads. Changes to wiring diagrams are indicated by shaded areas.		6	
Dates of issue for original and changed pages are: Original... 3 Jun 66 Change ... 10 Feb 66 Change ... 15 May 66		8	
TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 92 CONSISTING OF THE FOLLOWING:		8	
Page No.	* Change No.	Page No.	* Change No.
Title.....	2	2-3.....	0
A.....	2	2-4.....	1
1-1.....	0	3-1.....	0
1-2.....	1	3-1.....	1
1-3.....	0	3-2.1.....	2
1-4 1-5.....	2	3-2.2 Blank.....	2
1-6 Blank.....	2	3-3.....	0
2-1.....	2	3-4.....	0
2-2.....	2	4-1.....	0
2-2.1.....	2	4-2.....	0
2-2.2 Blank.....	2	5-1.....	1
		5-2.....	1
* Zero in this column indicates an original page.			
A Change 2		10	
		18	
		8	

FIGURE 20. Example of list of effective pages.

PUBLICATION NUMBER

RECORD OF CHANGES

CHANGE NO.	DATE	TITLE OR BRIEF DESCRIPTION	ENTERED BY

FIGURE 21. Example of a change record.

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1-34 Principal Dimensions . . . . .	1-9	5-25 Engine Oil System . . . . .	5-5
1-36 Airplane Stations . . . . .	1-9	5-29 Engine Air Induction and Cooling System . . . . .	5-6
1-38 Access and Inspection Provisions . . . . .	1-9	5-31 Propeller . . . . .	5-6
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FIGURE 22. (N, M, F) Example of table of contents.

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TM 9-1440-1585-20-1

TECHNICAL MANUAL

No. 9-1440-1585-20-1

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, D.C., 31 August 1981Organizational Maintenance Manual  
for  
Launching Station M54A1  
Maintenance and Check Procedures  
IMPROVED CHAPARRAL INTERCEPT-AERIAL GUIDED MISSILE SYSTEM

## REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual directly to Commander, U.S. Army Missile Command, ATTN: DRSMI-SNPM, Redstone Arsenal, Alabama 35898. A reply will be furnished to you.

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MS 423293

FIGURE 23. (A) Example of table of contents.



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(When the list of illustrations and list of tables are brief,  
both may be shown on the same page)

FIGURE 24. Sample list of illustrations.

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(When the list of illustrations and list of tables are brief,  
both may be shown on the same page)

FIGURE 25. Sample list of tables.

PUBLICATION NUMBER

**SAFETY SUMMARY**

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

**KEEP AWAY FROM LIVE CIRCUITS**

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position, due to charges retained by capacitors. To avoid casualties, always remove power and discharge and ground a circuit before touching it.

**DO NOT SERVICE OR ADJUST ALONE**

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

**RESUSCITATION**

Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Such information may be obtained from the Bureau of Medicine and Surgery.

The following warning appears in the text in this volume, and is repeated here for emphasis.

**WARNING**

High voltages capable of causing death are used in this equipment. Use extreme caution when servicing either the power supplies or their load components.  
(Page 6-681).

FIGURE 26. Example of safety summary.

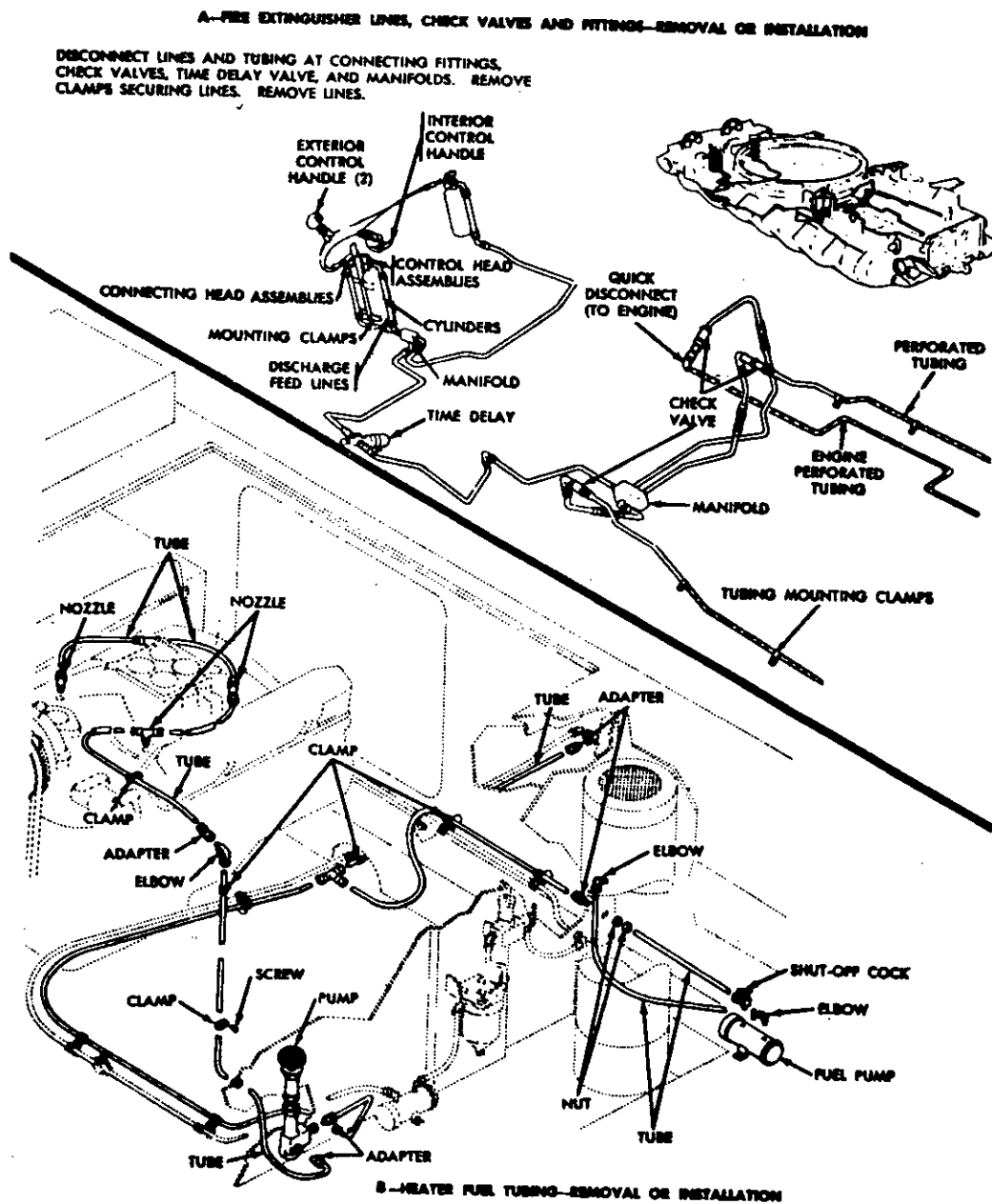


FIGURE 27. Sample functional illustration - location views.

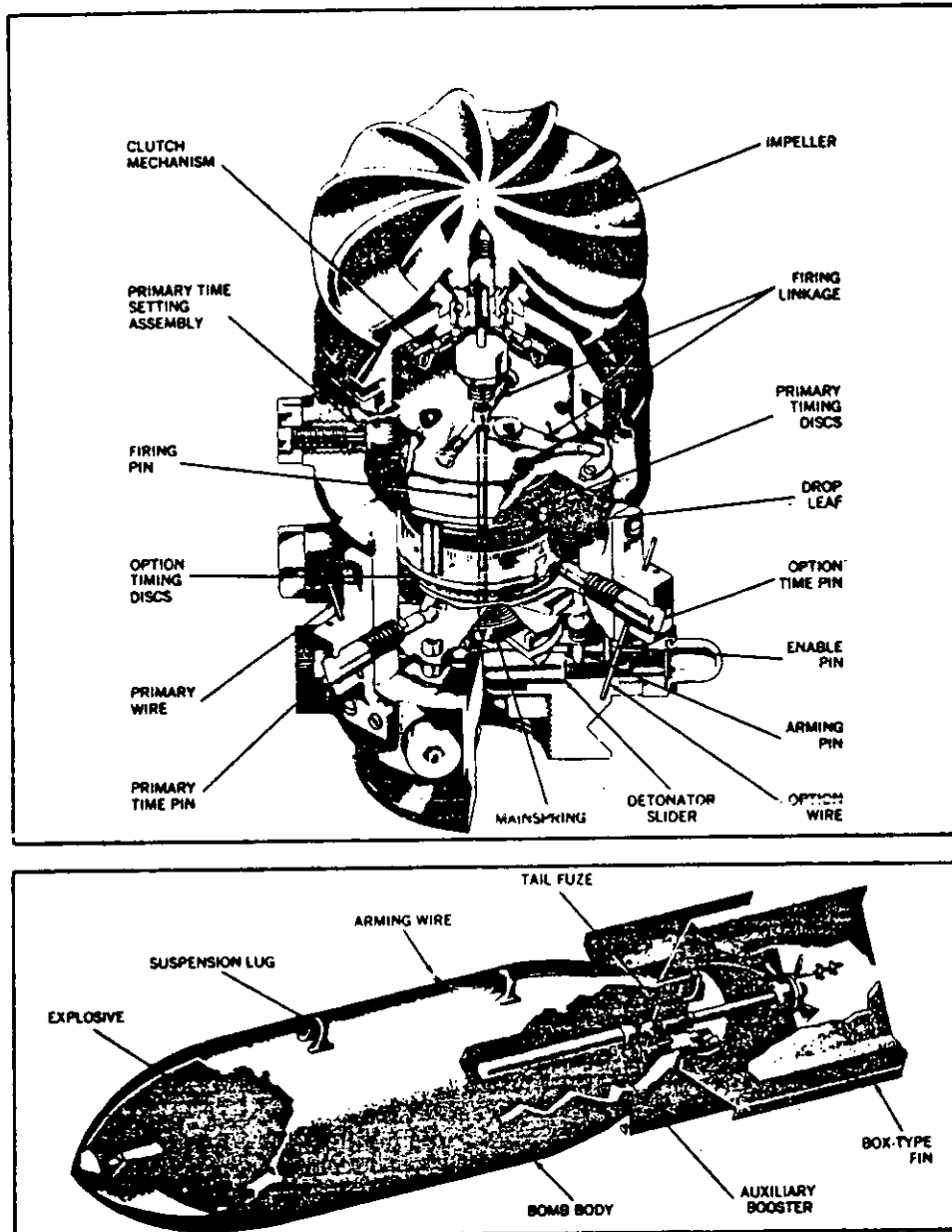
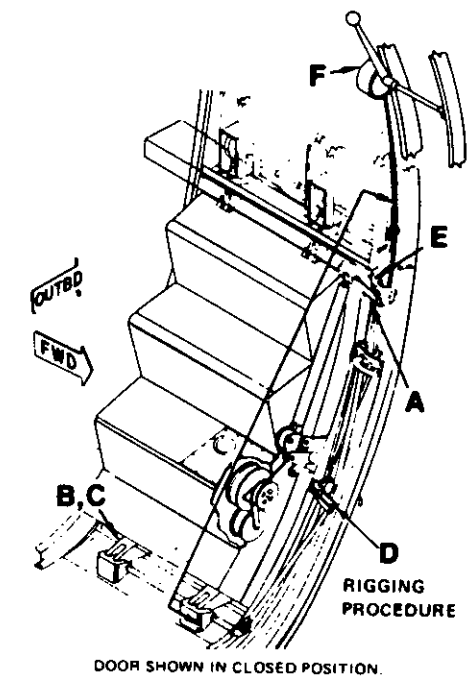
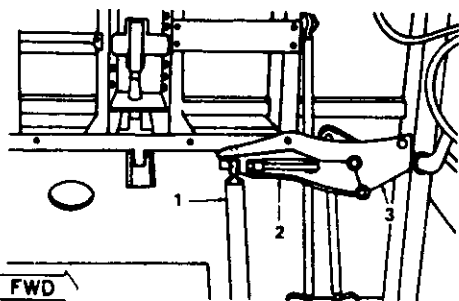


FIGURE 28. Sample cutaway.



**STEP 1**

SUPPORT THE CREW DOOR AND REMOVE THE PIN (2) SECURING THE UPPER END OF THE TELESCOPING ARM (1) TO THE HOUSING (3).



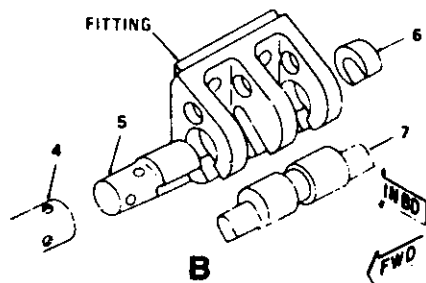
LOOKING OUTBOARD

**STEP 2**

PLACE THE DOOR IN THE JETTISON POSITION AND REMOVE THE DOOR

**STEP 3**

ROTATE THE LOWER TORQUE TUBE (4) TO THE JETTISON POSITION. CHECK THAT THE YOKES (5) AND BUSHING (6) ARE POSITIONED TO LET THE HINGE PINS (7) FALL FREELY.



**STEP 4**

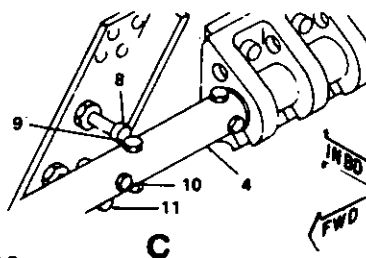
ADJUST THE STOP BOLT (8) AGAINST THE TUBE BOLT (9) WITH THE TUBE (4) HELD IN THE JETTISON POSITION.

**STEP 5**

LOOKING FORWARD, ROTATE THE LOWER TORQUE TUBE (4) COUNTERCLOCKWISE 90 DEGREES TO THE DOOR-KEPT POSITION.

**STEP 6**

CLAMP THE TUBE IN THIS POSITION, AND ADJUST THE OTHER STOP BOLT (11) AGAINST THE TUBE BOLT (10) WITH TUBE (4) HELD IN DOOR-KEPT POSITION.



**STEP 7**

AT THE OUTSIDE OPERATING HAND, INSERT A RIG PIN THROUGH THE RIGGING HOLE IN THE BRACKET (12) AND THE LOWER HOLE IN THE LEVER (13).

**STEP 8**

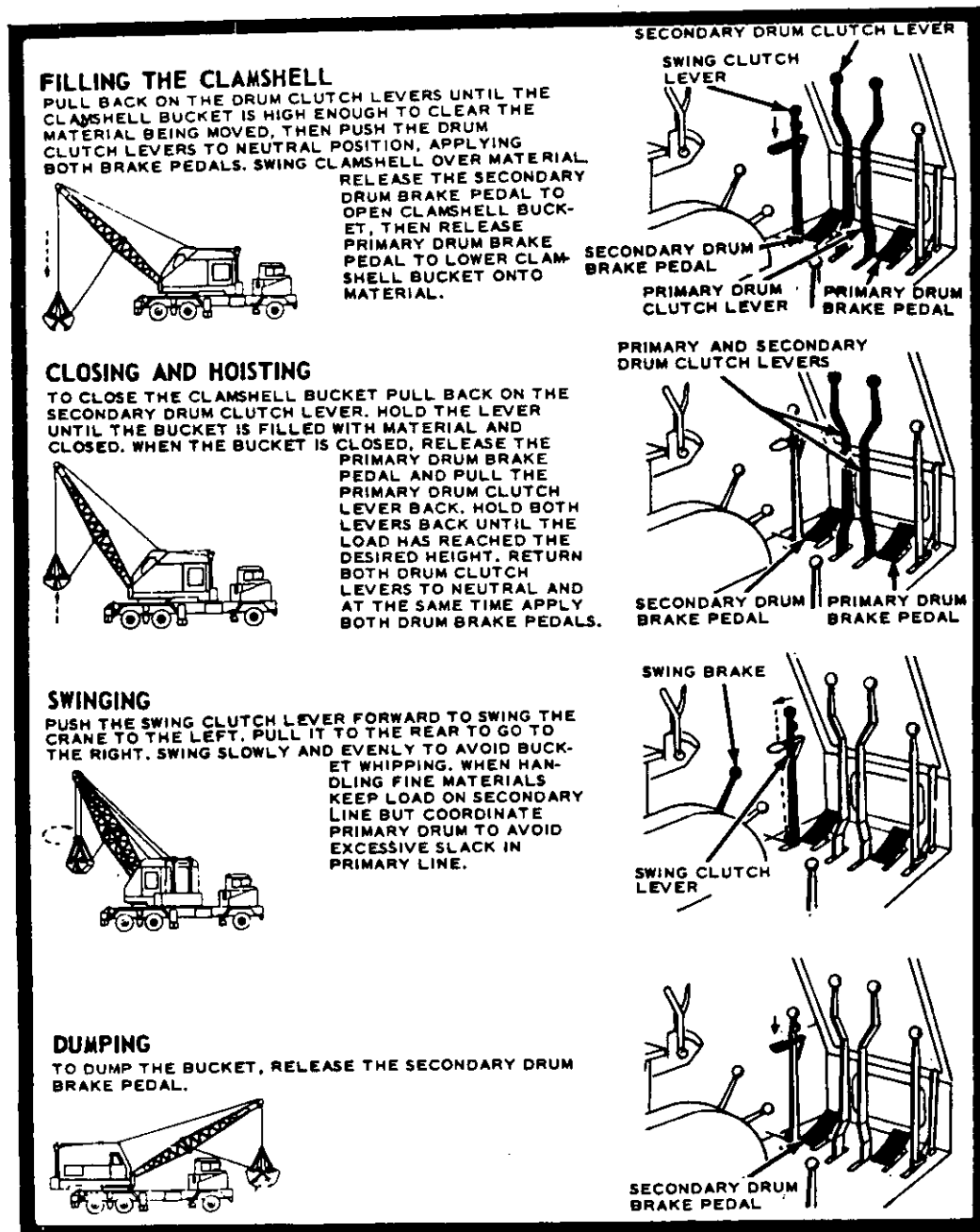
CLAMP LEVER (14) IN POSITION SO THE GAP BETWEEN THE BOLT HEAD (15) AND LEVER (14) IS 0.00 TO 0.10 INCH.

**STEP 9**

MARK POSITION REFERENCE POINTS ON HANDLE AND ADJACENT STRUCTURE TO PERMIT CHECKING HANDLE POSITION THROUGH SUBSEQUENT RIGGING STEPS.

FIGURE 29. Sample procedural illustrations.

MIL-M-38784B

FIGURE 30. Sample operational view.

MIL-M-38784B

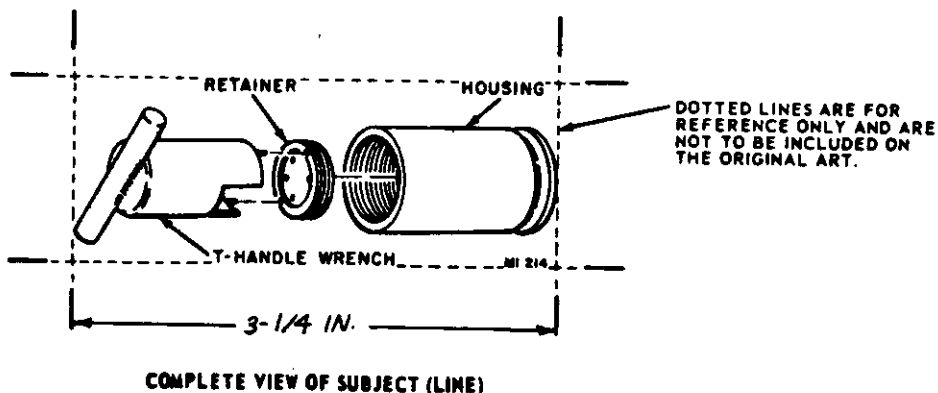
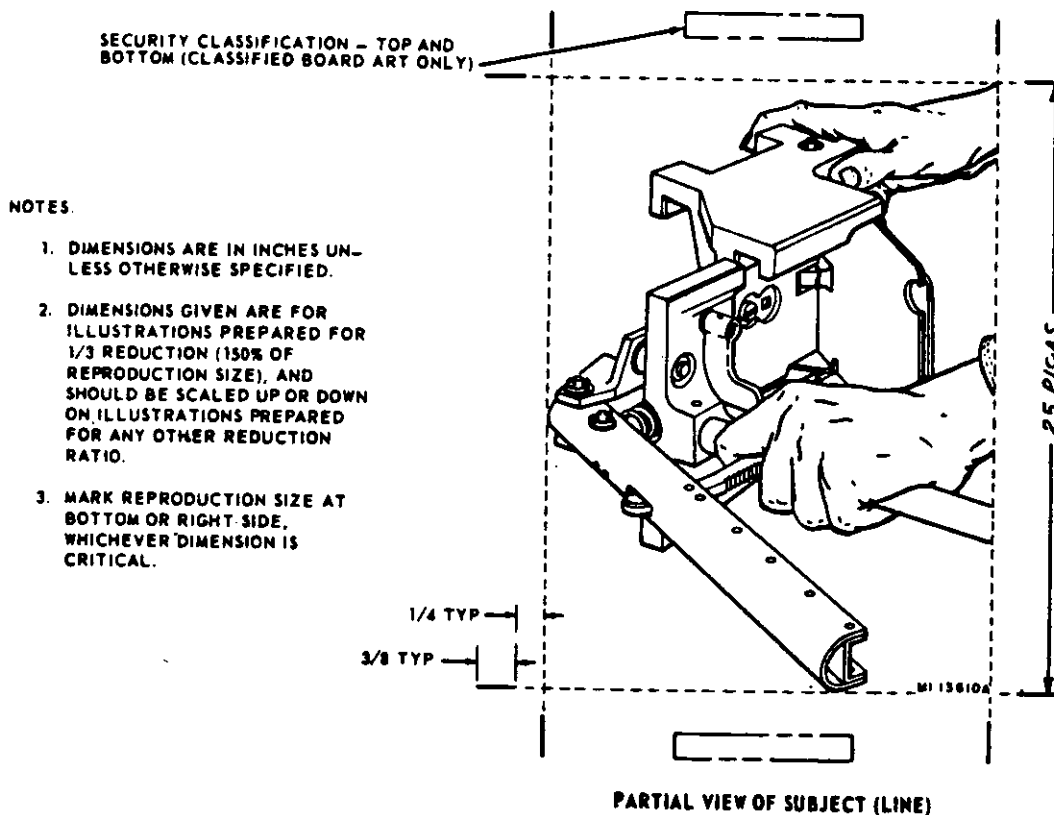
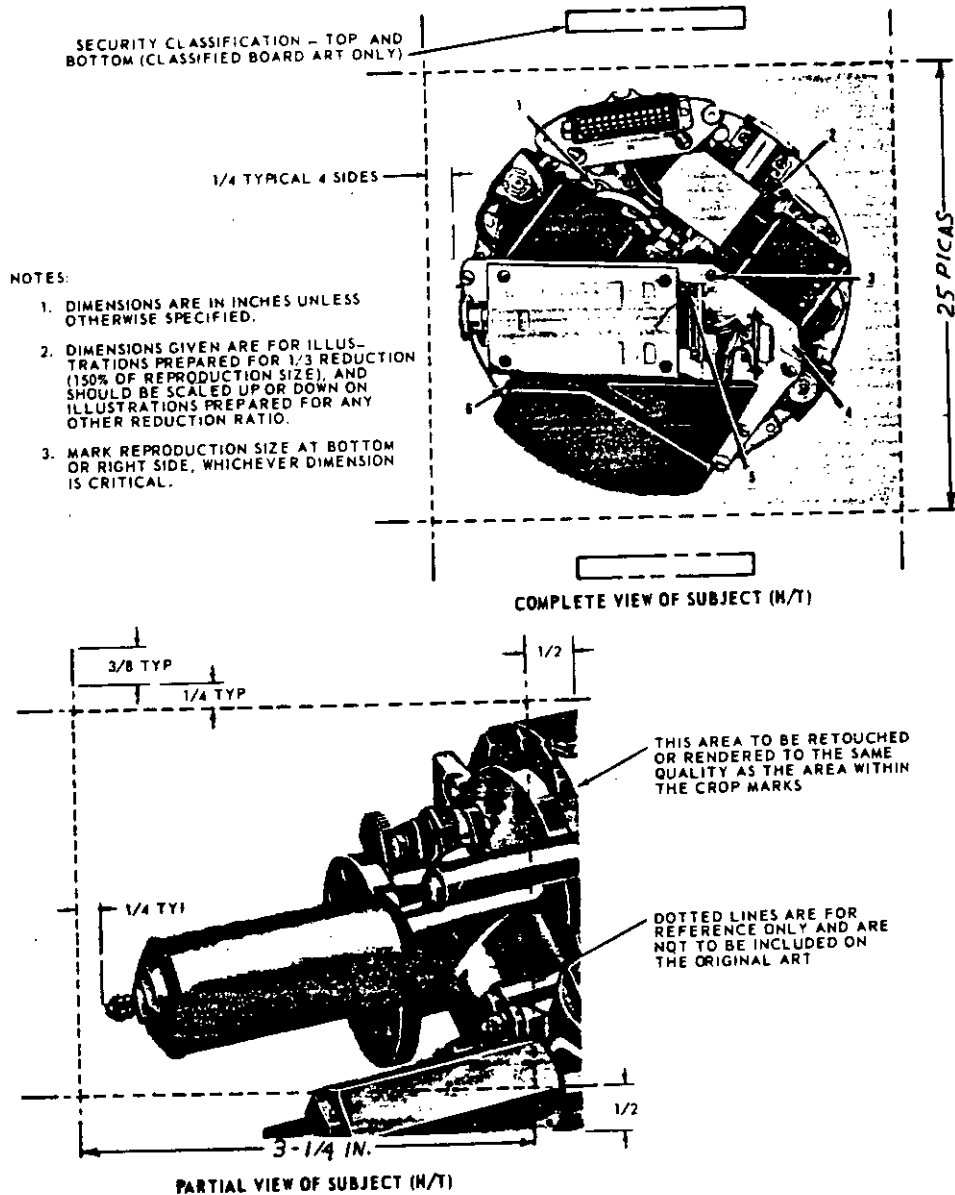


FIGURE 31. Cropping and sizing of illustrations.



MIL-M-38784B

FIGURE 31. Cropping and sizing of illustrations-continued.

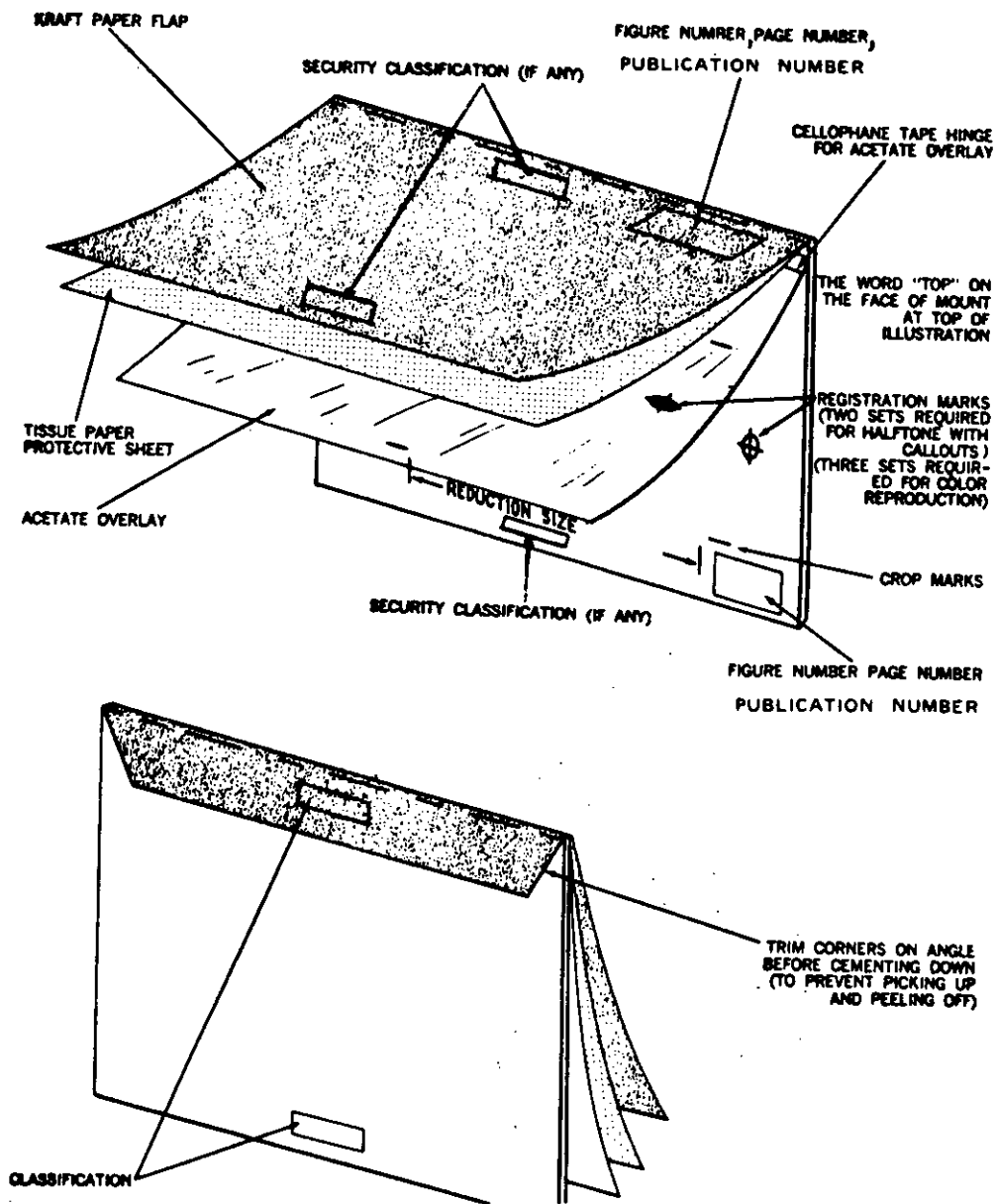


FIGURE 32. Identification, marking and protective covering for artwork.

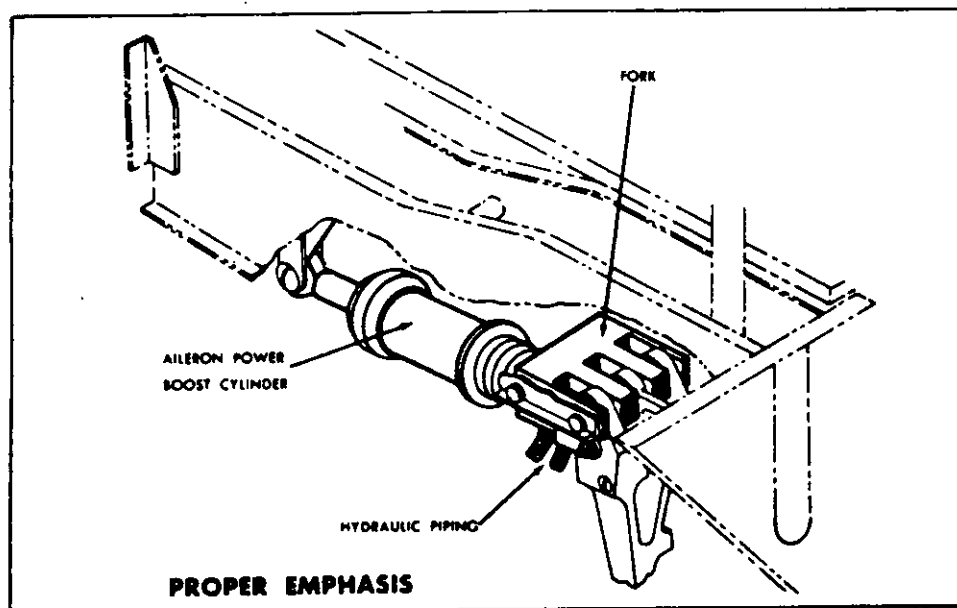
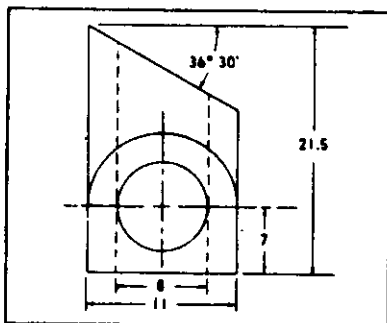
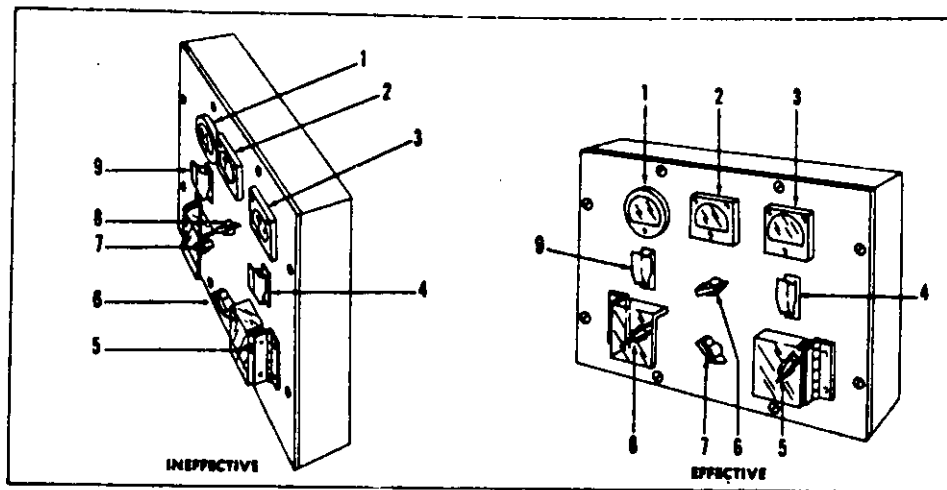
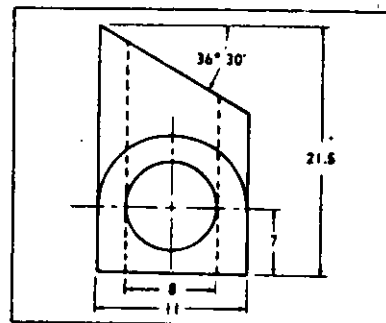


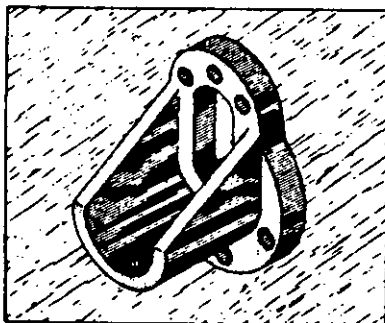
FIGURE 33. Emphasis and subordination of detail.



ALL LINES OF EVEN WEIGHT

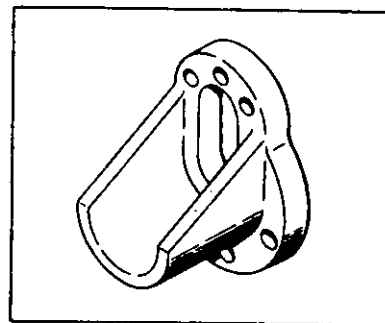


MAIN OUTLINE HEAVY, SECONDARY  
AND DIMENSION LINES LIGHTER



EXCESSIVE SHADING THAT  
DESTROYS FORM

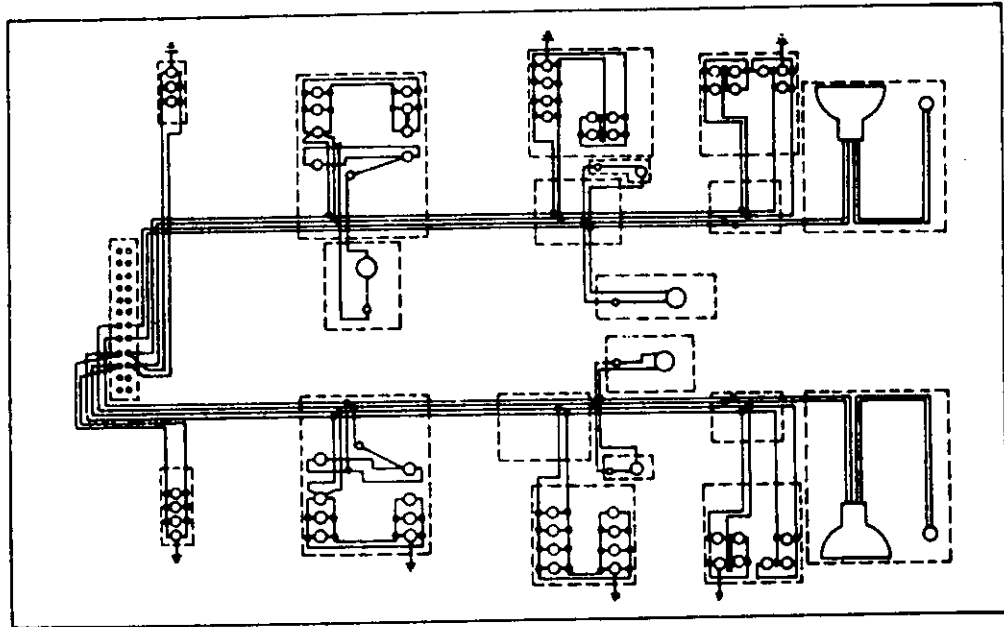
BAD EXAMPLES



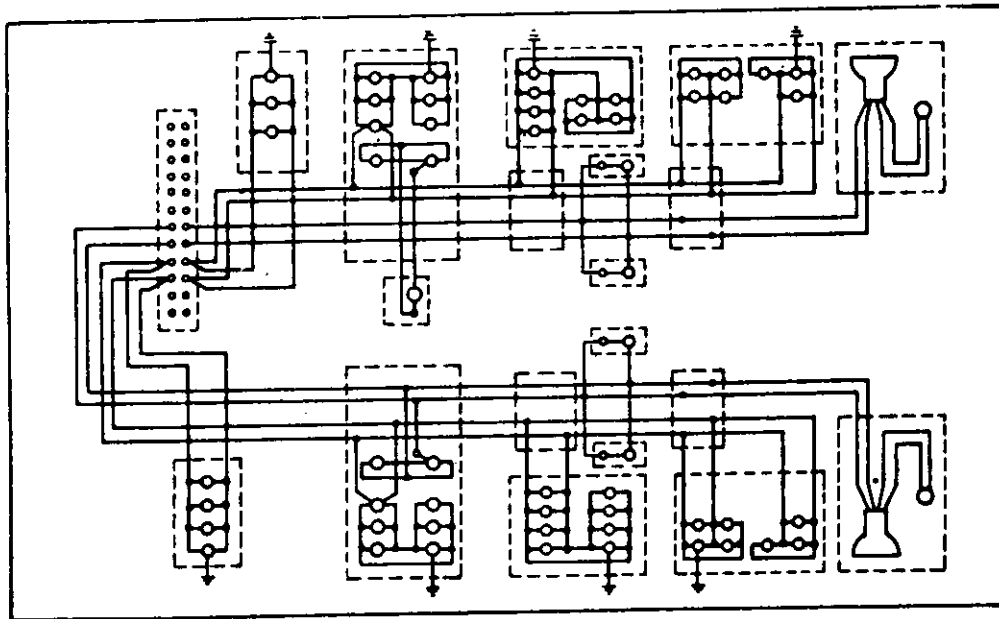
SUFFICIENT SHADING FOR  
DIMENSIONAL EFFECT

GOOD EXAMPLES

FIGURE 34. Good and bad examples of angle view, line weight, and shading.



**Congested Schematic—Hard to Read**



**Neat Schematic—Easy to Read**

**FIGURE 35. Good and bad examples of schematic diagram.**

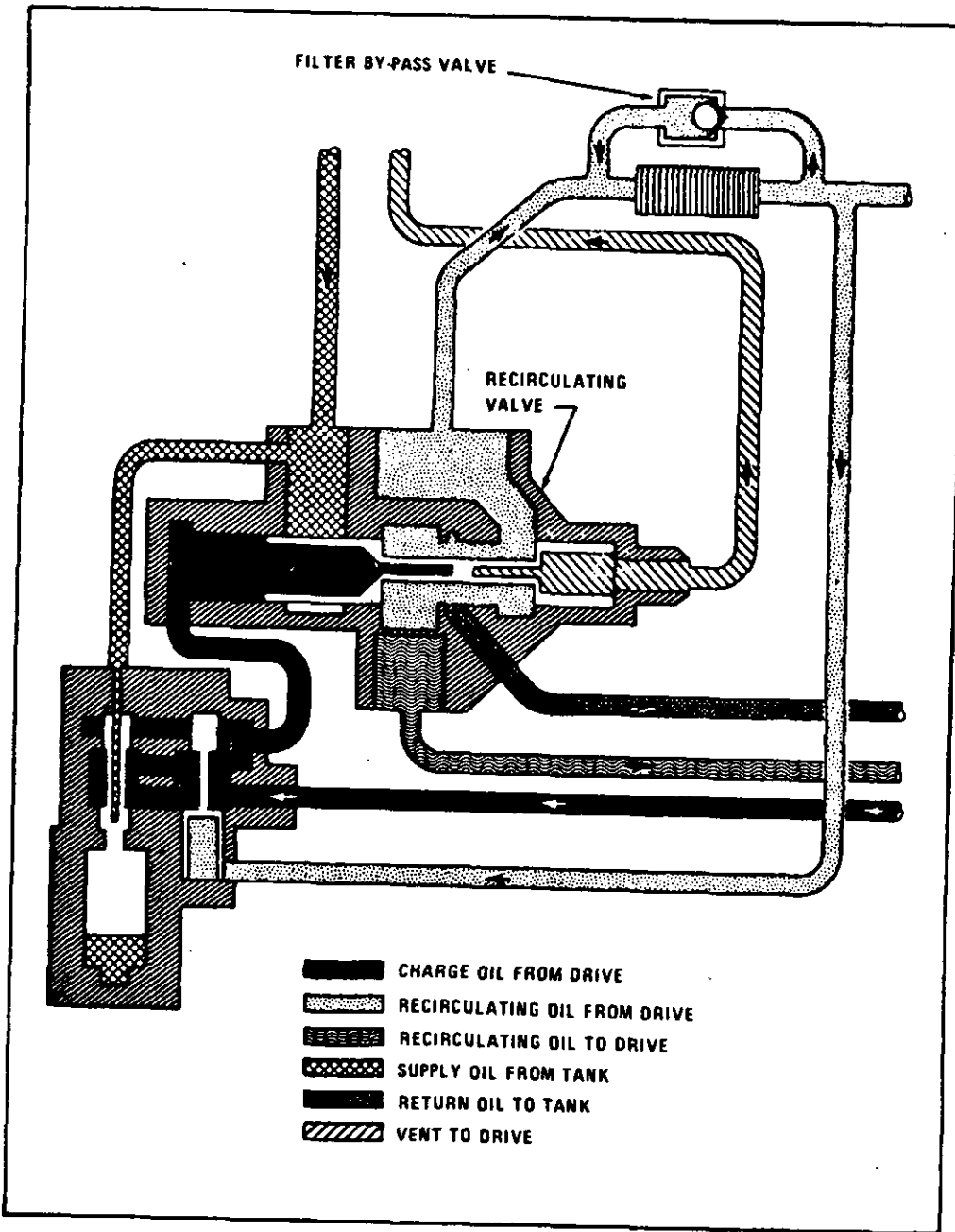


FIGURE 36. Use of patterns instead of colors.

## CHAPTER 4

**DIFFERENCE DATA SHEETS**

## 4-1 INTRODUCTION

Overhaul and test procedures for the models included in this section are the same as the procedures for Regulator Air Pressure Valve, Part No. 1361-596038, except for the specific differences noted by the applicable Difference Data Sheet. Chapters 1 through 3 contain complete overhaul and test information for Regulator Air Pressure Valve, Part No. 1361-596038.

## 4-2 INDEX OF DIFFERENCE DATA SHEETS.

*Models covered by Difference Data Sheets are as follows:*

PART NO.	PAGE NO.
1361-596038M1	4-3
1361-596038M2	4-5
1361-596038M3	4-7
1361-596038M4	4-11

FIGURE 37. Sample first page of difference data sheet section.

PUBLICATION NUMBER

DIFFERENCE DATA SHEET

FUEL PUMP

MODEL 4X-2

THE INSTRUCTIONS CONTAINED IN THE PRECEDING CHAPTERS OF THIS TECHNICAL MANUAL ARE APPLICABLE TO THIS MODEL EXCEPT FOR THE DIFFERENCE CITED IN THIS DIFFERENCE DATA SHEET

**1. INTRODUCTION AND GENERAL INFORMATION.**

Same as Model 4X-1, except the maximum output capacity is increased to 4.8 cubic feet per minute and the output pressure adjustment is increased to 22 pounds per square inch.

**2. SPECIAL TOOLS AND TEST EQUIPMENT.** Same as for Model 4X-1, except seat refacing tool, Part No. 249Y, is not required.

**3. PREPARATION FOR USE AND SHIPMENT.** Same as Model 4X-1.

**4. OPERATION INSTRUCTIONS.** Same as Model 4X-1.

**5. MAINTENANCE.** Model 4X-2 is equipped with a replaceable nylon seat in the by-pass valve (7, figure 5-2).

Inspection of the seat is the same as for Model 4X-1; however, if it is unserviceable, the nylon seat will be replaced rather than refaced. To remove the seat, use a 3/8 inch allen wrench and unscrew counter-clockwise. To install a new seat, apply a light film of lubricating oil to the threads and torque to 20 inch pounds.

Test the same as Model 4X-1, except the output pressure shall be set at 22 pounds per square inch and the measured fuel flow must be between 4.3 and 4.8 cubic feet per minute.

**6. DIAGRAMS.** Not applicable.

**7. ILLUSTRATED PARTS BREAKDOWN.** Seat, Part No. 45462, is used in lieu of Part No. 28431 (9, Figure 7-1).

FIGURE 38. Sample difference data sheet.



<b>SECRET</b>	
RESTRICTED DATA ) insert when ATOMIC ENERGY ACT 1954 ) appropriate	TO _____ DATED _____ CHANGE NO. _____ DATED _____
<b>TRANSMITTAL NOTICE</b>	
THIS NOTICE TRANSMITS A SECRET CHANGE TO A CLASSIFIED TECHNICAL MANUAL	
Destroy this transmittal notice when the change is incorporated into the basic manual.	
<b>SECRET</b> <small>This page is unclassified.</small>	

FIGURE 39. (F) Sample notice for a secret change.

**CONFIDENTIAL**

TO \_\_\_\_\_  
DATED \_\_\_\_\_  
CHANGED \_\_\_\_\_

**TRANSMITTAL NOTICE**

CONFIDENTIAL CHANGE  
TO A  
SECRET MANUAL

Destroy this transmittal notice when the change is  
incorporated into the basic manual.

**CONFIDENTIAL**  
This page is unclassified.

FIGURE 40. (F) Sample transmittal notice when all pages of a secret manual are no higher than confidential.

TO _____
DATED _____
CHANGED _____

**TRANSMITTAL NOTICE**

UNCLASSIFIED CHANGE  
TO A  
CLASSIFIED MANUAL

Destroy this transmittal notice when the change is  
incorporated into the basic manual.

FIGURE 41. (F) Transmittal notice for use when pages of a change to a classified manual are all unclassified.

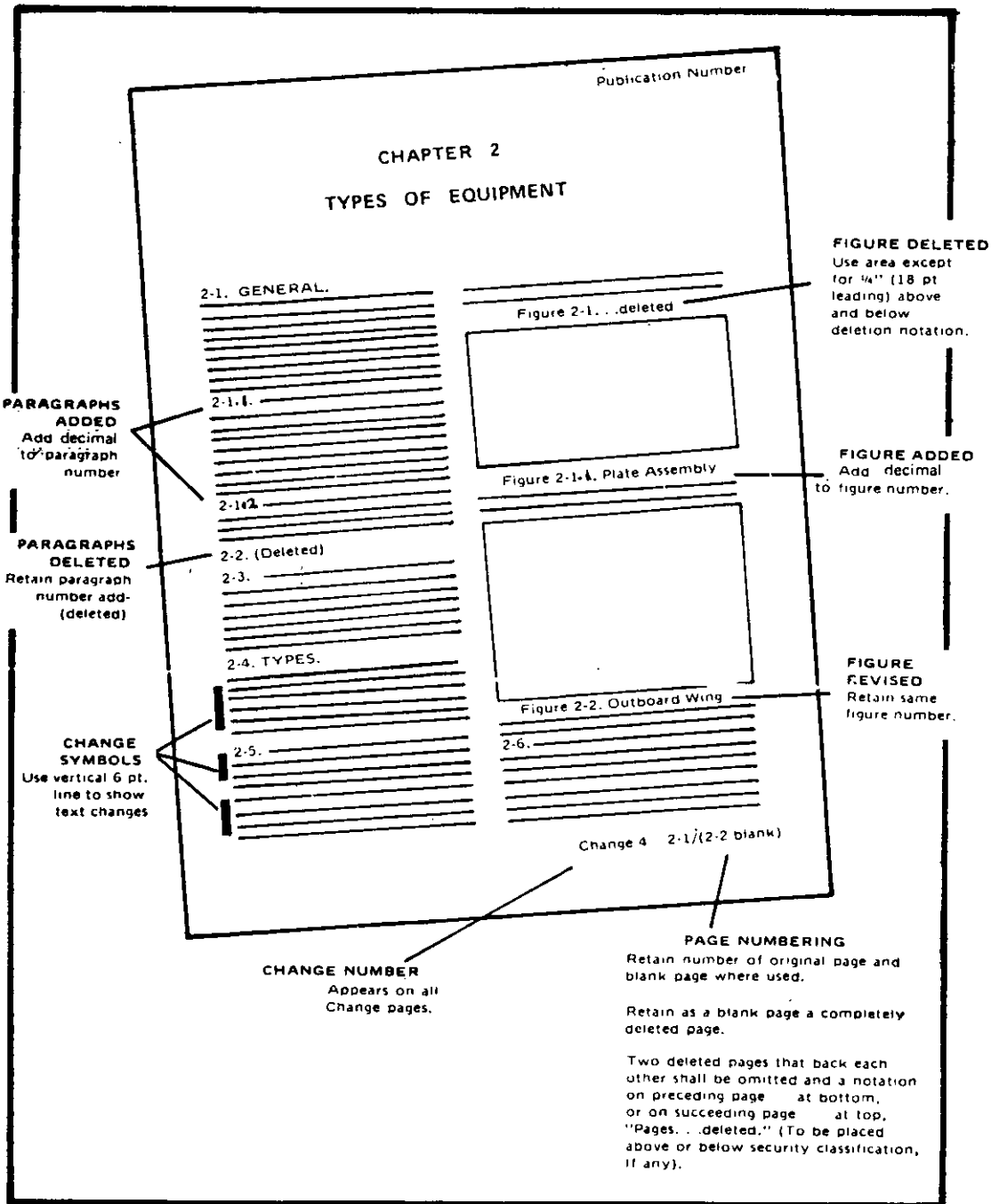


FIGURE 42. Requirements for change pages.

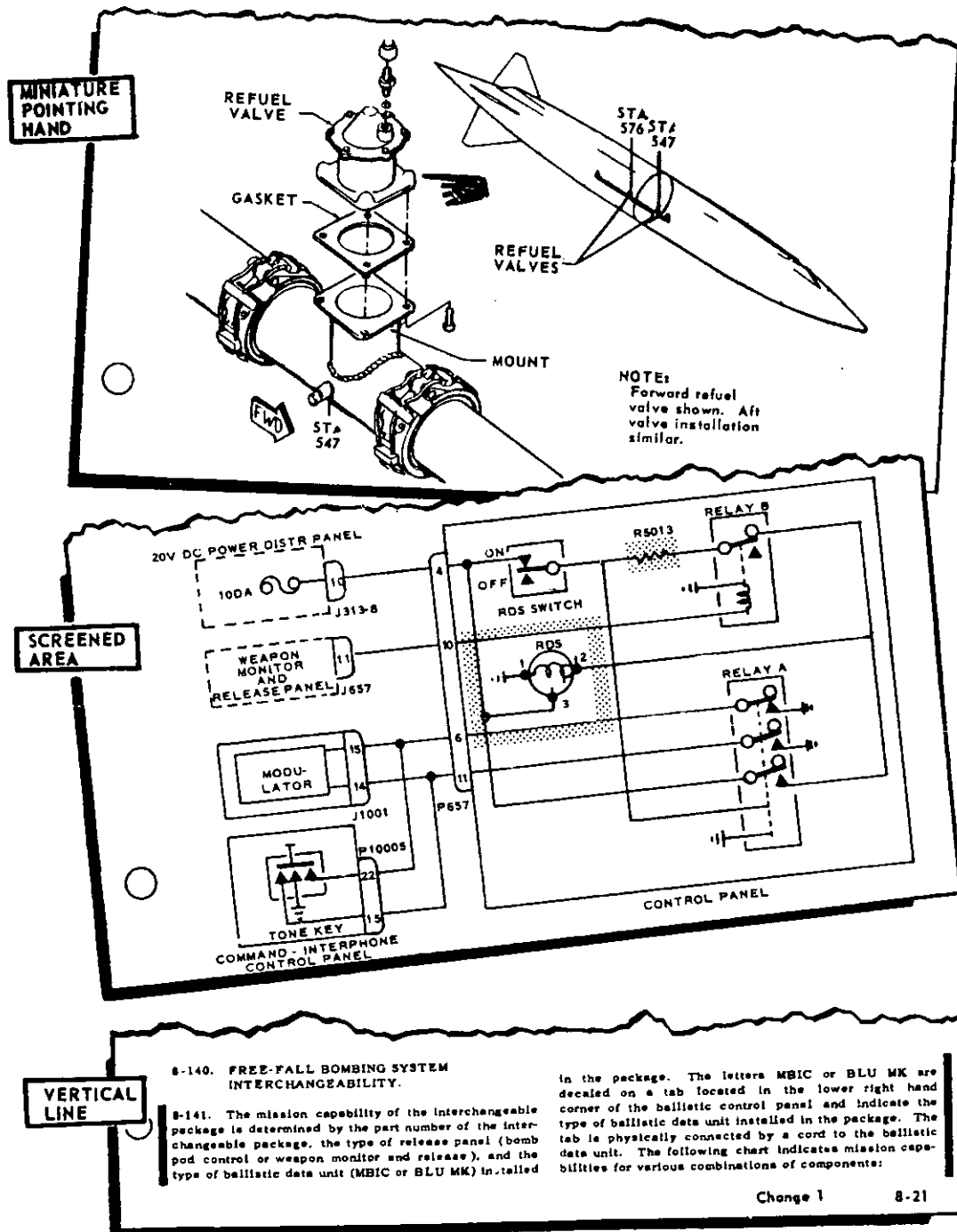


FIGURE 43. Example of change symbols.

TM9-4931-334-14/2

C1

**CHANGE  
NO. 1**

**HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D. C. 6 June 1972**

**Operator's Organizational, Direct Support  
and General Support Maintenance Manual**

**TEST SET  
RADAR AN/TPM-22  
(4931-707-1229)**

TM 9-431-334-14/2, 6 June 1970, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.
3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration identification number.

<b>Remove Pages</b>	<b>Insert Pages</b>	<b>Remove Pages</b>	<b>Insert Pages</b>
5-13 through 5-16	5-13 through 5-16	6-113 and 6-114	6-113 and 6-114
6-1 and 6-2	6-1 and 6-2	6-151 and 6-152	6-151 and 6-152
6-23 and 6-24	6-23 and 6-24	6-167 and 6-168	6-167 and 6-168
6-25 and 6-26	6-25, 6-26 and 6-26.1	6-177 and 6-178	6-177 and 6-178
6-27 through 6-38	6-27 through 6-38	6-183 through 6-192	6-183 through 6-192
6-43 through 6-46	6-43 through 6-44.3 through 6-46	6-195 through 6-198	6-195 through 6-198,
6-51 through 6-56	6-51 through 6-56	6-199 and 6-200	6-199 and 6-200
6-75 through 6-80	6-75 through 6-80, 6-80.1 and 6-80.2	6-213 through 6-216	6-213 through 6-216
6-81 through 6-88	6-81 through 6-88	6-219 through 6-224	6-219 through 6-224
6-95 and 6-96	6-95 and 6-96	B3 and B4	B3 and B4

File this change sheet in front of the publication for reference purposes.

**FIGURE 44. Sample change sheet, including list of pages to be removed and inserted.**

T.O. 1F-4C-6SS-32

**SAFETY SUPPLEMENT**  
**TECHNICAL MANUAL**

AIRCRAFT SCHEDULED INSPECTION AND  
MAINTENANCE REQUIREMENTS

USAF SERIES F-4C, F-4D, F-4E, F-4G AND  
RF-4C AIRCRAFT

THIS PUBLICATION SUPPLEMENTS T.O. 1F-4C-6 DATED  
15 MAY 1979 AND REPLACES INTERIM SAFETY SUPPLE-  
MENT T.O. 1F-4C-6SS-32 DATED 20 FEBRUARY 1980. Ref-  
erence to this supplement will be made on the title page of  
the basic manual by personnel responsible for maintaining the  
publication in current status.

Commanders are responsible for bringing this supplement to the  
attention of all affected AF personnel.

(Distribution Statment)

**PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE**

---

20 FEBRUARY 1980

1. Page 1-C-6, POWER PLANT (System 23), paragraph 5 of basic manual is amended to read:

5. V-Band couplings on inlet fuel disconnect assembly at keel connection; at inlet fuel disconnect assembly and engine fuel manifold connections; and at blockoff cap of engine fuel manifold for evidence of fuel leaks, cracks or distorted retaining segments. It is imperative that damaged clamp be replaced prior to flight.

THE END

1/(2 blank)

**SAFETY SUPPLEMENT**

FIGURE 45. Example of a technical manual safety supplement title page.

O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub>

T O 1T-39A-6CF-1S-10

O<sub>S</sub> \_\_\_\_\_ O<sub>S</sub>

**OPERATIONAL SUPPLEMENT  
TECHNICAL MANUAL**

O<sub>S</sub> O<sub>S</sub>

**FUNCTIONAL CHECK FLIGHT  
PROCEDURES**

O<sub>S</sub> O<sub>S</sub>

**USAF SERIES**

O<sub>S</sub> O<sub>S</sub>

**T-39**

O<sub>S</sub> O<sub>S</sub>

**AIRCRAFT**

O<sub>S</sub> O<sub>S</sub>

THIS PUBLICATION SUPPLEMENTS T.O. 1T-39A-6CF-1 DATED 23 AUGUST 1972.

O<sub>S</sub> O<sub>S</sub>

(Distribution Statement)

O<sub>S</sub> O<sub>S</sub>

COMMANDERS ARE RESPONSIBLE FOR BRINGING THIS SUPPLEMENT TO THE ATTENTION OF ALL AFFECTED AF PERSONNEL.

O<sub>S</sub> O<sub>S</sub>

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

O<sub>S</sub> \_\_\_\_\_ O<sub>S</sub>

4 APRIL 1980

**NOTICE TO AIRCREWS**

O<sub>S</sub> O<sub>S</sub>

- Write the number of this supplement alongside the changed portion of the flight manual.

1. PURPOSE.

O<sub>S</sub> O<sub>S</sub>

To correct T-39B Engine Airstart Checks.

2. INSTRUCTIONS.

O<sub>S</sub> O<sub>S</sub>

On Page 6, the following changes are made:

O<sub>S</sub> O<sub>S</sub>

a. A new Step 7.b. is added to read:

O<sub>S</sub> O<sub>S</sub>

b. AC generator - OFF (T-39B only).

NOTE

O<sub>S</sub> O<sub>S</sub>

- Advise controlling agency that the IFF will be off during this check.

O<sub>S</sub> O<sub>S</sub>

O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> OPERATIONAL SUPPLEMENT O<sub>S</sub> O<sub>S</sub> O<sub>S</sub> O<sub>S</sub>

FIGURE 46. Example of a technical manual operational supplement title page.



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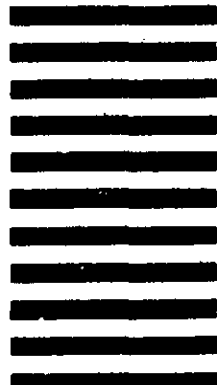
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