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MILITARY SPECIFICATION

MANUALS, TECHNICAL: AIRBORNE WEAPONS/STORES LOADING/ WEAPONS ASSEMBLY/SUPPORT EQUIPMENT CONFIGURATION

This specification is approved for use by the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for the preparation of technical manuals (TMs) and checklists for aircraft preparation, for functionally testing various armament systems, and for loading/unloading conventional airborne weapons/stores that are approved for carriage on/in naval aircraft, conventional weapons assembly and airborne weapons support equipment description/configuration. Also included are requirements for the preparation of an airborne weapons/stores publication index. The requirements are applicable for both paper and digitally displayed page-oriented TMs and Checklists.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, NAVAIRWARCENACDIV, Systems Requirements Department, Attn: Code SR3, Lakehurst, NJ 08733-5100 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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AREA-TMSS

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SPECIFICATIONS

MILITARY

MIL-M-85337 - Manuals, Technical: Quality Assurance Program, Requirements for

MIL-PRF-28000 - Digital Representation for Communication of Product Data: IGES Application Subsets and IGES Application Protocols

MIL-PRF-28002 - Raster Graphics Representation in Binary Format, Requirements for

MIL-PRF-28003 - Digital Representation for Communication of Illustration Data: CGM Application Profile

MIL-PRF-87268 - Manuals, Interactive Electronic Technical - General Content, Style, Format, and User-Interaction Requirements

STANDARDS

MILITARY

MIL-STD-17 - Mechanical Symbols

MIL-STD-100 - Department of Defense Standard Practices for Engineering Drawings

HANDBOOKS

MILITARY

MIL-HDBK-9660 - Handbook for DoD-Produced CD-ROM Products

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

GOVERNMENT DOCUMENTS

DOD 5200.1R - Information Security Program Regulation

DOD 5220.22-M - Industrial Security Manual for Safeguarding Classified Information

Executive Order 12958 - Classified National Security Information

PUBLICATIONS

NAVA IR 00-25-600 - Technical Manual In-Process Review, Validation, and Verification Guide

OPNAVINST 4790.2 - The Naval Aviation Maintenance Program

OPNAVINST 5510.1 - Department of the Navy Information and Personnel Security Program Regulation

2.1.3 Non-Government publications. The following documents form a part of this document to the extent specified therein. Unless otherwise specified, the issues of the documents that are DoD adopted are those listed in the latest issue of the DoDISS, cited in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DoDISS are the issues of documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Y10.5 - Letter Symbols for Quantities Used in Electrical Science Electrical Engineering

ANSI Y14.15 - Electrical and Electronics Diagrams

ANSI Y32.10 - Diagrams, Fluid Power, Graphic Symbols for

(Copies of the documents listed above are available from the American National Standards Institute Inc., 11 West 42nd Street, New York, NY 10036.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME-Y14.5M - Dimensioning and Tolerancing

(Copies of the documents listed above are available from the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017-2392.)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE STD 91-84 - Graphic Symbols for Logic Functions

IEEE STD 200-75 - Reference Designations for Electrical and Electronics Parts and Equipments
(ANSI Y32.16)

IEEE STD 260-78 - Letter Symbols for Units of Measurement

IEEE 280-85 - Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering
(ANSI Y10.5)

IEEE STD 315 - Graphic Symbols for Electrical and Electronic Diagrams
(ANSI Y32.2)

ANSI/IEEE STD 315A - Graphic Symbols Supplement

(Copies of the documents listed above are available from the IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331).

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated detailed specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 General. Unless specified otherwise, preparation of technical manuals, checklists, and the airborne/stores loading publication index shall be in accordance with the instructions and requirements outlined herein. The requirements are applicable for the output of paper technical manuals or for scrollable, linear structured TMs that can be displayed on an Electronic Display System (EDS). These scrollable, linear structured TMs are hereafter referred to as Electronic Technical Manuals (ETMs).

3.1.1 Data. Requirements for technical manual data established by this specification shall be prepared as specified in the contract.

3.1.2 ETM definition. An ETM is a technical manual normally prepared from a linear Standard Generalized Markup Language (SGML) document file. The ETM is also displayed on an electronic display system (EDS) as a scrollable, linear structured document and may employ a combination of an automated intelligent index, prompted dialog boxes, and content-driven logical "NEXT" functions.

3.1.3 Preparation of digital data for electronic delivery. Technical manual and checklist data delivered digitally in accordance with this specification shall be SGML-tagged and assembled using the Document Type Definition (DTD). SGML tags used in the DTD are noted throughout the text of this specification in bracketed, bold characters (i.e., <safesum>) as a convenience for the TM author and to denote the appropriate tag to be used for this specific information when developing a document instance.

3.1.4 Use of the DTDs. The DTD interprets the technical content and structure for the functional requirements contained in this specification and is mandatory for use. The DTD and associated tag and attribute descriptions, which are SGML constructs, may be obtained from the requiring activity.

3.1.5 Technical content. Technical content requirements contained in this specification are considered mandatory and are intended for compliance. The content structure for the technical data being developed shall conform to the associated DTD.

3.1.5.1 Technical data differences. TMs and checklists incorporating different models/series numbers, modifications, variations, effectivities, etc., shall cover all differences that affect procedural information by flagging and other means to ensure full coverage.

3.1.6 Development of an SGML source file. An SGML-tagged source file is composed of the applicable TM technical content in SGML-coded ASCII, marked up (tagged) in accordance with the DTD. In order to tag text appropriately, the author inserting the tags should be familiar with the DTD or should provide the text file to a person who is experienced with the DTD and who understands the type of documentation being written, especially when content tags are used.

3.2 Level of writing. Level of writing shall be clear to an Aviation Ordnance "A" school graduate, or equivalent of the rating, maintaining the equipment.

3.3 Security classification. If classified information is required to satisfy manual requirements stated herein, a classified supplement shall be prepared. The requirements for handling classified material shall be in accordance with DoD 5200.1R, DoD 5220.22-M, OPNAVINST 5510.1, and Executive Order 12958. For guidance on security classification and handling restrictive markings on Compact Disk-Read Only Memory (CD-ROM), refer to MIL-HDBK-9660.

3.4 Types of manuals/checklists. The technical content, style and format requirements provided in this specification are to be used for the preparation of the following types of technical manuals and checklists.

- a. Airborne weapons/stores loading manuals.
- b. Airborne weapons assembly manuals (WAM).
- c. Armament weapons support equipment configuration manuals (AWSE).
- d. Airborne weapons/stores loading checklists.
- e. Release and control system checklists.
- f. Arm/dearm checklists.
- g. Airborne weapons assembly checklists.
- h. Airborne weapons/stores publication index.

3.5 Arrangement and technical content of manuals. Each manual prepared in accordance with this specification shall be divided into sections. Mandatory section numbers for technical content are noted in parentheses. The manual shall be arranged as follows:

3.5.1 Airborne weapons/stores loading manuals.

- a. Front matter.
- b. Introduction (Section I).

- c. Description (Section II).
- d. Configuration data (Section III).
- e. Release and control system checks (Section IV).
- f. Common procedures (Section V).
- g. Specific loading and unloading procedures (Section VI and subsequent).
- h. Glossary.

3.5.2 Airborne weapons assembly manuals (WAM).

- a. Front matter.
- b. Introduction (Section I).
- c. Description (Section II).
- d. Configuration data (Section III).
- e. Test and reprogramming (if applicable) (Section IV).
- f. Common procedures (Section V).
- g. Assembly and disassembly procedures (Section VI and subsequent).
- h. Glossary.

3.5.3 Armament weapons support equipment configuration manuals (AWSE).

- a. Front matter.
- b. Introduction (Section I).
- c. Common procedures (Section II).
- d. Configuration data (Section III and subsequent).
- e. Glossary.

3.6 Arrangement and technical content of checklists.

3.6.1 Checklists shall be an abbreviated version of procedural information contained in the applicable weapons/stores loading, release and control, or Armament Weapons Support Equipment configuration section of the associated manual. Checklists prepared for aircraft/equipment incorporating different model/series numbers, modifications, variations, effectivities, etc., shall cover all differences that affect procedural information by flagging or other means to ensure full coverage. Stand alone checklists shall be more inclusive in their coverage. In-depth procedural information, where required, concerning authorized/recommended AWSE, release and control test procedures, and detailed aircraft/weapons inspection and loading will be provided. In determining the depth of coverage, the following assumptions will be made:

- a. Firefighting equipment is available.
- b. The aircraft/equipment is properly serviced and positioned for loading/configuration (wheels chocked and tiedowns installed as required); ready to receive accessory equipment and/or weapon/store.
- c. All ground safety devices installed and, as applicable, cockpit ready to receive/remove power.

- d. Standard aircraft system checks (other than armament) completed.
- e. Aircraft/armament safety precautions complied with.
- f. Weapons/stores positioned and secured on approved handling equipment.
- g. After loading/unloading, handling and/or safety equipment will be removed from the area.
- h. Safety and reliability are of primary importance and will be stressed in all applicable portions of the checklists.

3.6.1.1 Weapons/stores loading checklist content (as applicable).

- a. Front matter.
- b. Aircraft preparation/inspection.
- c. Weapons/stores inspection.
- d. Weapons/stores loading.
- e. Postloading inspections.
- f. Prior to launch.
- g. After landing or ground abort.
- h. Weapons unloading.
- i. Additional procedures.

3.6.1.2 Release and control system checklist content (as applicable).

- a. Front matter.
- b. Aircraft preparation.
- c. Release and control system checks.
- d. Postcheck procedures.

3.6.1.3 Arm/Dearm checklist (as applicable).

- a. Front matter.
- b. Safety Summary.
- c. Prior to Launch procedures.
- d. After Landing or Ground Abort procedures.
- e. Turnaround procedures.

3.6.1.4 Weapons assembly checklist content (as applicable).

- a. Front matter.
- b. Applicable sections for weapons/component inspection, assembly and disassembly.
- c. Other sections as needed.

3.7 Airborne weapons/stores publication index. The airborne weapons/stores publications index will list all the weapons/stores checklists, loading manuals, WAM manuals, and checklists. The content will be arranged in a tabulated listing of loading manuals and weapons/stores checklists, in that order, for each aircraft. See figure 1. Aircraft will be listed in alphanumeric sequence. Issue dates of the basic publications will be included and change numbers and dates with national stock numbers and WEB references will be listed, if applicable. Front matter for the airborne weapons/stores publication index shall consist of a title page, list of effective pages, and a point of contact listing.

3.8 Front matter. Except for the airborne weapons/stores publication index, all manuals and checklists shall contain the following front matter unless otherwise noted below.

- a. ETM installation data (**ETMs and ETM checklists only**), if applicable.
- b. CD label and flyleaf data (**ETMs and ETM checklists only**), if applicable.
- c. Content data (**ETMs and ETM checklists only**), if applicable.
- d. Title page <titlepg> (see figure 2).
- e. List of effective pages <niep> (**Page-based TMs and checklists**) or Change summary (**ETMs and ETM checklists**) (see figure 3).
- f. Promulgation page <prompg> (**Airborne weapons/stores and WAM manuals only**) (see figure 4).
- g. Technical Publication Deficiency Report (TPDR) incorporation page <tpdrpg> (**Manuals only**) (see figure 5).
- h. Table of contents <toc> (see figure 6).
- i. List of content <loc> (**ETMs and ETM checklists only**).
- j. "How to Use This ETM" information (**ETMs and ETM checklists only**).
- k. Introduction <intro> (**Checklists only**).
- l. Required reading <reqread> (**AWSE manual and loading/release and control checklists only**).
- m. List of illustrations <loi> (**Manuals only**) (see figure 7).
- n. List of tables <lot> (**Manuals only**) (see figure 8).
- o. Safety summary <safesum> (**Manuals and Arm/Dearm checklists only**) (see figures 9 and 13).
- p. Hazardous material warnings <hmwspg> (**WAM manuals only**) (see figure 10).
- q. Warnings and cautions (**WAM checklists only**) (see figure 11).
- r. Table of aircraft armament switches (**Arm/Dearm checklists only**).

3.8.1 Introduction (Checklists only). The checklist introduction (see figures 12, 13, and 14) shall contain the following information as applicable:

- a. A statement that the procedures therein are abbreviations of the appropriate manual.
- b. Purpose of the checklist.
- c. Other clarifying information concerning utilization of the content therein.

3.8.2 Required reading (Checklists only). The required reading section (see figures 12, 13, and 14) shall contain the following information as applicable:

- a. A background paragraph clarifying the step/section performance sequence.
- b. A list of directives associated with the armament system including Aircraft Service/Airframe Changes, Aviation Armament Changes/Bulletins, Armament Material Changes/Bulletins, Avionics Changes/Bulletins, Accessory Change Bulletins, and Support Equipment Changes/Bulletins. Normally only those directives that must be referenced by number in the checklist text will be listed.
- c. Preloading checks.
- d. Applicable restrictions.
- e. A list of recommended handling/loading equipment, and when applicable, a separate list of test equipment and/or special tools shall be provided (see figure 14).
- f. Applicable manuals for flight authorization shall be listed under the heading "Verified Weapons Loading."
- g. Other clarifying information as specified by the responsible activity, when applicable.

3.9 Introduction. An introduction shall be prepared for all types of manuals. Checklists shall also contain an introduction, but it shall be part of the front matter (refer to 3.8.1). The introduction for all manuals except the airborne weapons/stores publication index, shall contain the following data, as applicable. The introduction for the airborne weapons/stores publication index shall contain the statements and notes shown in figure 15.

- a. Purpose.
- b. Scope.
- c. Requisitioning and distribution.
- d. Arrangement of manual.
- e. Changes to manual.
- f. Warnings, cautions, and notes.
- g. Aircraft effectivities (**loading manuals only**).
- h. How to use the manual.
- i. Assumptions.
- j. Reference publications.
- k. Technical directives.

3.10 Description. Descriptive information shall be prepared for the airborne weapons/stores loading and airborne weapons assembly manuals only.

3.10.1 Airborne weapons/stores loading manuals.

- a. Introduction.
- b. Airframe.
 - (1) Aircraft external hazards.
 - (2) Ground safety devices.

- (3) External power and grounding.
- c. Aircraft armament systems.
 - (1) Armament system.
- d. Component description and location.
 - (1) Armament system basic controls.
- e. Operational description of armament sub-systems.
- f. Suspension/accessory equipment.
 - (1) Parent rack.
 - (2) Accessory racks.
 - (3) Launchers.
 - (4) Adapters.
 - (5) Other accessories.
- g. Mechanical/electrical fuzes.
- h. Cartridges and cartridge activated devices.
 - (1) Impulse cartridges.
 - (2) Spotting charges.
- i. Weapons stores.
 - (1) Bombs, retard/nonretard.
 - (2) Guided bomb units (GBUs).
 - (3) Cluster bomb units (CBUs).
 - (4) Firebombs.
 - (5) Air-laid mines.
 - (6) MK-60 series mines.
 - (7) Glide weapons.
 - (8) Torpedoes.
 - (9) Pyrotechnics.
 - (10) Dispensers.
 - (11) Practice bombs.
 - (12) Search stores.
 - (13) Electronic countermeasures (ECM).

- (14) Forward firing weapons.
 - (a) Missiles.
 - (b) Rocket launchers.
 - (c) Guns.
- (15) Specialized stores.
 - (a) ECM pods.
 - (b) Fuel tanks/external baggage container.
 - (c) Camera.
 - (d) Cargo pods.
 - (e) Other.
- j. Armament weapons support equipment (AWSE).
 - (1) Armament support equipment (ASE).
 - (2) Weapons support equipment (WSE).
 - (3) Logistics support equipment (LSE)
- k. Safety/protective devices/special tools.
 - (1) Safety devices.
 - (2) Protective devices.
 - (3) Special tools.

3.10.2 Weapons assembly manuals. Weapons assembly manuals descriptive data preparation will differ depending on weapon/weapon series to be addressed. At a minimum, this section shall consist of the following:

- a. Introduction.
- b. Weapon/components.
- c. Armament weapons support equipment (AWSE).
 - (1) Armament support equipment (ASE).
 - (2) Weapons support equipment (WSE).
 - (3) Logistics support equipment (LSE).

3.11 Configuration data. The configuration data described in 3.11.1 through 3.11.3 shall be prepared for the airborne weapons/stores loading, WAM, and AWSE manuals.

3.11.1 Airborne weapons/stores loading manuals.

- a. Introduction.

- b. Aircraft configuration conversion (tables, charts, narrative or combinations thereof).
 - (1) Installation and removal of suspension/accessory equipment.
 - (2) Others, as required.

3.11.2 WAM manuals.

- a. Introduction.

(1) Listing of tables defining appropriate AWSE for handling and transporting weapons during assembly and disassembly.

- (2) Others, as required.

3.11.3 AWSE configuration manuals. Information for inspecting and configuring each end item of basic mobile support equipment authorized for use with weapons/stores shall be provided. For each trailer/munitions transporter, a section shall be provided for the configuration and authorized adapter. A table shall be provided for the authorization of weapons/stores for transportation and loading. The data shall be arranged in sections in alpha numeric sequence by trailers and munitions transporters being first, followed by powered transporters. Each section shall consist of the following data.

- a. Introduction.
- b. Special tools and equipment.
- c. Equipment preparation/inspection.
- d. Configuration.

3.12 Release and control or test and reprogramming checks (as applicable). Unless otherwise noted, the following release and control or test and reprogramming check information shall be developed for the weapons/stores loading manual and the WAM only.

- a. Introduction.
- b. How to use this section.
- c. Armament weapons support equipment (AWSE).
- d. Aircraft preparation (**loading manuals only**).
- e. Preparation (**weapons assembly manuals only**).
- f. Release and control system checks (**loading manuals only**).

(1) Jettison system check (emergency, selective wing, etc.).

(2) Normal release system checks (parent rack, bomb rack, wing release, ASE (installed), arming checks, rockets, etc.).

(3) Gun system check (internal, gun pods, crew served).

(4) Missile system check (air-to-ground, air-to-air).

(5) Specialized stores system checks (data pods, ECM, tacts, sonobouys, etc.).

- g. Test and reprogramming checks (**weapons assembly manuals only**).

h. Individual system checks (**loading manuals only**). Individual system check procedures shall consist of the following paragraphs in the order shown.

- (1) Test equipment required.
- (2) Applicable technical directives.
- (3) Check preparation.
- (4) Check procedure in tabularized/column format.

i. Postcheck procedures. Explanation that postcheck procedures must be performed upon completion of the last release and control system check to assure that the aircraft is returned to a safe condition and ready to load. Explanatory statement shall be followed by procedural step(s) as necessary to accomplish postcheck procedures.

3.13 Common procedures. The common procedural information described in 3.13.1 through 3.13.3 shall be prepared, as applicable, for the airborne weapons/stores loading, WAM, and AWSE manuals.

3.13.1 Airborne weapons/stores loading manuals.

a. Introduction. Statement that this section contains procedures which are common to more than one section in the manual and which must be performed to complete a safe and reliable weapons/stores loading evolution. These procedures are presented once in this section to avoid repetition and are referenced in other sections.

b. Aircraft preparation. Sequential presentation of steps, illustrated for clarity, which are common to more than one section of the manual such as procedures for aircraft grounding and parent rack preparation. Presentation shall include a tabulated listing of armament switches and circuit breakers and required positions to safe the system. Steps shall include procedures to ensure that the aircraft is fully prepared to accomplish a complete loading evolution in a safe and reliable manner.

c. Accessory suspension equipment. Sequential presentation of steps, illustrated for clarity, for accomplishing functions which may be common to more than one loading and unloading evolution in Section VI and subsequent sections. Procedures pertaining to aircraft accessory equipment shall be presented first, and procedures pertaining to weapons/stores shall be presented last. Where special test equipment is required, it shall be identified by nomenclature and part number. Sequence of heading presentation is as follows:

- (1) MER/TER/BRU-41/42 preparation/inspection.
 - (a) Swaybrace adjustment.
 - (b) Safety stop lever positioning/electrical safety pin installation.
 - (c) Suspension hook release.
 - (d) MER/TER mode selector setting.
 - (e) Cartridge installation.
 - (f) Other.

d. Hoist loading configuration. A brief paragraph defining hoist loading configuration followed by procedural data required to configure hoisting equipment. Sequence of heading presentation is as follows:

- (1) Installation.

e. Stray voltage checks. A brief paragraph defining stray voltage check followed by procedural data required to perform the check. Sequence of heading presentation is as follows:

- (1) Stray voltage procedures.

f. General fuze handling and safety precautions. A brief paragraph defining general fuze handling followed by safety precautions and procedural data required to handle fuzes. Sequence of heading presentation is as follows:

- (1) Fuze procedures.
- (2) Electric fuze arming safety switch.

g. Arming wire procedures. A brief paragraph providing general arming wire routing/configuration to include attachment of wire to lugs, proper length and installation of prefabricated or composite wire, followed by procedural data required. Sequence of heading presentation is as follows:

- (1) General procedures.
- (2) Fabrication of arming wires.

h. Other. Procedural data and/or tables necessary to accommodate yet to be identified common procedures (i.e., aircraft/weapon marriage checks, etc.).

i. Authorized armament/weapons handling equipment combinations for handling and loading. A brief paragraph defining equipment compatibilities and use followed by table depicting all authorized equipment used in loading and transportation. All equipment listed will be illustrated and described in Section II.

j. Arming and safety signals listing of standardized arming safety signal illustrations.

3.13.2 WAM manuals.

a. Introduction. Statement that this section contains procedures which are common to more than one section in the manual and which must be performed to complete a safe and reliable weapons assembly/disassembly. These procedures are presented once in this section to avoid repetition and are referenced in other sections.

b. Emergency procedures. A brief paragraph explaining the following:

- (1) Firefighting.
- (2) Medical.
- (3) Security.

c. Suspension lug installation. A brief paragraph explaining procedural data required for installation of suspension lugs on weapons.

d. Arming wire procedures. A brief paragraph providing general arming wire routing/configuration to include attachment of wire to lugs, proper length and installation of prefabricated or composite wire, followed by procedural data required. Sequence of heading presentation is as follows:

- (1) General procedures.
- (2) Fabrication of arming wires.

e. Weapons assembly tools/equipment requirements. A brief paragraph referring to table for tool/equipment requirements.

f. Other requirements. Procedural data and/or tables necessary to accommodate yet to be identified procedures.

3.13.3 AWSE configuration manuals.

a. Introduction.

- b. Equipment preparation.
- c. AWSE marking and weapons positioning.
- d. Authorized equipment/equipment combinations for weapons/stores handling and loading.

3.14 Specific weapon/store, group loading and unloading procedures (Loading manuals only). For each weapon/store or family group authorized for loading into or onto the aircraft, a separate section shall be prepared containing complete loading through unloading procedures. Where procedures are common to a family group of weapons, the series shall be covered as a single weapon in a family group, i.e., Mk 81, Mk 82 and Mk 83 general purpose bombs. Unless otherwise specified (see 6.2.1) by the requiring activity (see 6.3), section sequence and content presentation shall be as follows:

- a. Bombs, retard/nonretard.
- b. Guided bomb units (GBUs).
- c. Cluster bomb units (CBUs).
- d. Fire bombs.
- e. Air-laid mines.
- f. MK 60 series mines.
- g. Glide weapons.
- h. Torpedoes.
- i. Pyrotechnics.
- j. Dispensers.
- k. Practice bombs.
- l. Search stores.
- m. Fuel tanks/external baggage containers/starter pods.
- n. Electronic countermeasures (ECM).
- o. Rocket launchers: Launcher tube loading procedures will not be included unless otherwise specified by the requiring activity.
- p. Missiles: A separate section will be prepared for each type missile. All models of each missile will be covered in a single section unless otherwise specified. Section shall be sequenced according to mission and numerical designation as follows:
 - (1) Air-to-air.
 - (2) Air-to-ground.
- q. Guns/gun pods/gun turret systems.
- r. Electronic pods.
- s. Tactical air launch decoy (TALD).
- t. Others.

3.14.1 Introduction. Identification of weapons/stores or a family group of weapons authorized for aircraft loading and for which loading procedures are relatively common. If too numerous, weapons/stores shall be presented in list form. Technical directives applicable to loading shall be listed. A note shall follow the introductory paragraph and precede the listing of weapons/stores and shall be worded as follows:

"NOTE

The following list does not authorize station loading for flight. For specific authorization, refer to appropriate aircraft NATOPS/tactical manual."

a. Armament weapons support equipment (AWSE). A paragraph referring to the applicable table in Section V for armament weapons support equipment. A paragraph of approved/authorized special tools and test equipment shall follow the AWSE paragraph listing special tool(s) (e.g., fuzing tools, rack unloading tools, etc., and if applicable, test equipment).

b. Aircraft preparation/inspection. Sequential listing of steps, illustrated as necessary for clarity, which must be accomplished to prepare the aircraft for loading. Listing shall consist of those common aircraft preparation procedures presented in Section V and shall be followed by additional steps as may be required to complete preparation of the aircraft for the specific loading evolution.

c. Weapon/store inspection. Sequential listing of steps, illustrated as necessary for clarity, which must be accomplished to complete an inspection of the weapon/store to be loaded: to include related components (e.g., fuzes, arming devices, etc.) and to ensure weapon/store serviceability and safety. Listing shall consist of those common inspection procedures presented in Section V and shall be followed by additional steps as may be required to complete weapon/store inspection.

d. Weapon/store loading. Under this title the following shall be covered:

(1) Preparation. Sequential listing of steps which must be performed prior to loading to ensure maximum safety of personnel, equipment and aircraft. Procedures shall ensure that all applicable aircraft controls, switches, circuit breakers, etc., are in an OFF or SAFE position; that all applicable safety devices are installed in the aircraft, accessory equipment, and weapons/stores; and that all weapon explosive components are safed. Steps shall be illustrated as necessary in the interest of safety.

(2) Loading. Sequential listing of steps, illustrated as necessary for clarity, which must be accomplished to complete the loading of a specific weapon/store. Coverage shall include differences between shipboard and shore based operations. Where a particular weapon/store may be loaded with both powered and manually operated equipment, procedures for power equipment shall be presented first. Single weapons/stores loading shall include lifting and attachment of individual weapons/stores to the aircraft suspension equipment. Steps involving safety of personnel and equipment (installation of arming wires, safety pins, breech caps, etc.) shall be illustrated. Where applicable, data such as identification of arming wires, impulse cartridges, etc., shall be presented in tabulated form.

e. Postloading inspection. Sequential listing of steps which must be accomplished on the aircraft system, accessories, and individual weapon(s)/store(s) following loading to ensure that the weapon/system is operationally ready and in a safe configuration. Steps shall include checks for position of cockpit switches/circuit breakers, installation of accessory safety devices, installation of bombs and fuzes, removal of fuze safety devices, etc.

f. Prior to launch. Under this title, the following shall be covered:

(1) Rearming area. Sequential listing of steps required to prepare a loaded aircraft for launch. Steps shall include, as applicable, removal of safing devices, checks for stray voltage, securing access doors/panels, etc. Sequences of presentation will be as follows:

- (a) Rearming area (before engine turnup).
- (b) Rearming or arming area (after engine turnup).
- (c) Arming area.

g. After landing or ground abort. Statement explaining that these procedures pertain to an aircraft that has returned from a mission with weapons not expended or to an aircraft with loaded weapons as a result of a ground abort. Procedures for safing and turnaround will be included. Under this title, the following shall be covered:

(1) Safing.

(a) Dearming area (before engine shutdown).

(b) Dearming or rearming area (immediately after engine shutdown).

(c) Turnaround. Procedures to relaunch the partially loaded aircraft when the aircraft does not require reconfiguration. Steps shall include all procedures for safing the weapon system for turnaround and only refer to previous steps, checks, or procedures for reinspection of the weapons/stores, and for reaccomplishment of postloading inspection and prior to launch procedures. Steps necessary to reload the empty station on a partially loaded aircraft, which does not require configuration, shall include complete preparation of the loaded aircraft for subsequent mission. Steps shall refer to previously accomplished procedures as necessary to complete the operation.

h. Unloading. Under this title, the following shall be covered:

(1) Steps which must be performed prior to unloading to ensure maximum safety of personnel, equipment, and aircraft. Procedures shall ensure that all applicable aircraft controls, switches, circuit breakers, etc., are in OFF or SAFE position; that all applicable safety devices are installed in the aircraft, accessory equipment, and weapons/stores; and that all weapon explosive components are safed. Steps shall be illustrated as necessary in the interest of safety.

(2) Steps necessary to unload weapons/stores or family groups from the loaded aircraft. Sequence of presentation by weapon type shall be the same as used in loading procedures. Procedures applicable to more than one weapon rack or aircraft station shall be presented once and cross-referenced for remaining racks/stations. Steps shall be illustrated as necessary in the interest of safety.

3.15 Specific weapons assembly/disassembly procedures (WAM only). For each weapon or family group, a separate section shall be prepared containing complete weapon assembly/disassembly procedures. Where procedures are common to a family group of weapons, the series shall be covered as a single weapon in a family group. Section sequence will be presented according to numerical sequence of weapons (e.g., AIM-7, AIM-9, etc.).

3.16 Checklists. Individual weapons/stores loading, release and control and arm/dearm checklists shall be prepared for each model aircraft, as applicable. In addition, checklists shall be developed for each weapon or family group. These checklists shall consist of front matter (refer to 3.8), introductory data (refer to 3.8.1) and the technical information described in the following paragraphs.

3.16.1 Weapons/stores loading checklists.

3.16.1.1 Checklist general content. In determining the depth of coverage, the following assumptions will be made:

a. Firefighting equipment is available.

b. The aircraft/equipment is properly serviced and positioned for loading/configuration (wheels chocked and tiedowns installed as required); ready to receive accessory equipment and/or weapon/store.

c. All ground safety devices installed and, as applicable, cockpit ready to receive/remove power.

d. Standard aircraft system checks (other than armament) completed.

e. Aircraft/armament safety precautions complied with.

f. Weapons/stores positioned and secured on approved handling equipment.

g. After loading/unloading, handling and/or safety equipment will be removed from the area.

3.16.1.2 Checklist specific content. Checklist data will be divided into unnumbered sections and subsections. For page-based checklists, no more than one section will appear on a page. Sections shall be titled as follows and shall contain appropriate steps to accomplish the applicable procedures. Procedural information need not be limited to that listed.

3.16.1.2.1 Aircraft preparation/inspection. Aircraft preparation/inspection information will be presented under the assumption that the aircraft armament system configuration and associated equipment is ready for the loading evolution to begin (see figure 16).

- a. Verify completion of applicable release and control and release systems checks/tests.
- b. Armament controls for the desired position (general reference to switches and positions).
- c. Illustrations of pylon/rack/launcher connections when required for clarification.

3.16.1.2.2 Weapons/stores inspection. Weapon/store inspection information will be presented under the assumption that the weapons/stores are assembled and ready for the loading evolution to begin (see figure 17).

- a. Checks for unarmed condition and damage of weapon/store, installation of safety and protective devices, completeness of assembly, availability of accessories, etc.
- b. Illustrations may be used to highlight specific inspection or safety items.
- c. Applicable weapons/stores preparation peculiar to the aircraft (positioning of bomb fins for aircraft clearance, attachment of ballast bands, etc.).

3.16.1.2.3 Weapons/stores loading. The Weapons/Stores Loading sections shall be divided into two subsections titled "Preparation" and "Loading." (See figure 18.) Preparation and loading data shall be provided to ensure accomplishment of the following as applicable:

- a. Preparation.
 - (1) Completion of Weapon Inspection and Aircraft Preparation/Inspection.
 - (2) Armament controls for the desired position (reference specific switches and positions).
 - (3) Single and multiple loading information.
- b. Loading.
 - (1) Lifting, attachment, and alignment of the weapon/store.
 - (2) Fuze and arming wire installation and umbilical connections. (Illustrations will be used to show specific arming/release wire routing, cable bail hookup, etc., if required for clarification.)
 - (3) Cartridge installation.
 - (4) Required function checks (launcher continuity, Walleye preflight test, etc.).
 - (5) Removal of specific ordnance related safety devices (fuze safety pins, etc.).

3.16.1.2.4 Postloading inspections. Procedures performed by the loading crew during the weapons loading evolution that must be checked to ensure quality assurance shall be included (see figure 19). The following shall be considered:

- a. Armament controls for the desired position (general reference to switches and positions).
- b. Presence of safety devices.
- c. Presence of seal wire/seals on controls.

- d. Weapon/store suspension properly accomplished (e.g., sway braces adjusted, ejector foot positioned, etc.).
- e. Weapon/aircraft electrical/mechanical connections mated.
- f. Weapon safety condition checks.

3.16.1.2.5 Weapons unloading. Weapons unloading shall be divided into preparation and unloading procedures and steps to accomplish the following as applicable (see figure 20):

a. Preparation.

- (1) Armament controls for the desired position (reference specific switches and positions).
- (2) Checks for unarmed condition of weapon/store, installation of safety and protective devices.
- (3) Fuze removal, disconnection of all mechanical and electrical connections between weapon and aircraft to prepare weapons for unloading.

b. Unloading.

- (1) Lifting, removal, and lowering of weapons/stores (both single and multiple weapons/stores).
- (2) Other procedures required on the aircraft/weapon after downloading.

3.16.1.2.6 Prior to launch. Prior to launch procedures will only be addressed within the weapons/stores loading checklist when an arm/dearm checklist is not required for the aircraft platform because of limited weapons capability. Refer to 3.16.4.3 for procedural information to be included in the weapons/stores loading checklist.

3.16.1.2.7 After landing or ground abort. After landing or ground abort procedures will only be addressed within the weapons/stores loading checklist when an arm/dearm checklist is not required for the aircraft platform because of limited weapons capability. Refer to 3.16.4.4 for procedural information to be included in the weapons/stores loading checklist.

3.16.1.2.8 Turnaround. Turnaround procedures will only be addressed within the weapons/stores loading checklist when an arm/dearm checklist is not required for the aircraft platform because of limited weapons capability. Refer to 3.16.4.5 for procedural information to be included in the weapons/stores loading checklist.

3.16.2 Release and control system tests checklists. Release and control system tests checklists shall cover the operational function checks for the armament systems and subsystems. Separate subsystem checklists will be provided when required. Basic and subsystem checklists shall provide information in a manner that will not require reference to each other. When subsystem checklists are required, those systems not covered in a subsystem checklist will be grouped into a basic checklist and the word "BASIC" will appear below the title of the checklist on the title page only. The subsystem checklists will have the weapon system designator (e.g., Missiles) appear in place of "BASIC."

3.16.2.1 Specific technical content. Checklist data will be divided into unnumbered sections and subsections. No more than one section will appear on a page. Sections shall be titled as follows and shall contain appropriate steps to accomplish the applicable procedures. Procedural information need not be limited to that listed.

3.16.2.1.1 Aircraft preparation release and control. Procedures and steps for the preparation of the aircraft for the required checks shall be developed (see figure 21).

3.16.2.1.2 Individual subsection checks. (See figures 22 and 23.) The following shall be included:

- a. Verify completion of Aircraft Preparation.
- b. Required checks for each system/subsystem (e.g., Weapon Release System, Jettison System, MER/TER Release System, etc.).
- c. Requirement to perform Postcheck procedures at the completion of all subsystem checks/tests.

d. Illustrations/schematics will be used when required for clarity.

3.16.2.1.3 Postcheck procedures. Procedures to verify that the aircraft is returned to a safe condition shall be provided. (See figure 24.)

3.16.3 Weapons assembly checklists. Weapons assembly checklists will cover the assembly/disassembly procedures for each weapon or series of weapons.

3.16.3.1 Specific technical content. Checklist data will be divided into unnumbered sections and subsections. No more than one section will appear on an individual page. Sections shall be titled as appropriate for the weapon and shall contain the procedural steps to accomplish the applicable assembly/disassembly procedures.

3.16.4 Arm/Dearm checklists.

3.16.4.1 Arm/Dearm checklists shall cover the operational functions of arming and dearming of weapons and the safing of aircraft weapons systems. The Arm/Dearm checklist shall be divided into four parts: title page and front matter (refer to 3.7), Prior to Launch, After Landing or Ground abort, and Turnaround.

3.16.4.2 Prior to launch. Prior to Launch information shall be divided into Rearming Area (Before Engine Turnup), Rearming Area or Arming Area (After Engine Turnup), and Arming Area information, as applicable (see figure 25). Each type of information shall contain steps to accomplish the following:

a. Rearming Area (Before Engine Turnup). Only those weapons/stores that require procedures to be performed will be addressed.

- (1) Removal of weapon safety devices.
- (2) Removal of weapon protective devices.
- (3) Cartridge installation or connection of cartridge firing actuator, as applicable, to system peculiarity.
- (4) Installation of weapon components.

b. Rearming or Arming Area (After Engine Turnup). Only those weapons/stores that require procedures to be performed will be addressed.

- (1) Performance of stray voltage checks.
- (2) Removal of specific ordnance related safety devices (e.g., bomb rack safety pins, etc.).
- (3) Performance of weapon reliability checks, if required (e.g., Missile tone/tune check, Missile on aircraft test (MOAT) check, etc.).

c. Arming Area. Only those weapons/stores that require procedures to be performed will be addressed.

- (1) Umbilical connections (e.g., rocket launcher adapter cable).
- (2) Rocket motor arming function.
- (3) Removal of specific ordnance related devices.

3.16.4.3 After landing or ground abort. The After Landing or Ground Abort information will normally be divided into Safing (Dearming or Rearming Area Before Engine Shutdown) and Safing (Dearming or Rearming Area After Engine Shutdown). Safing (Dearming Area Before Engine Shutdown) shall also be included when required by the responsible activity or when forward firing ordnance is involved. Requirements for emergency dearming procedural information and/or reference to proper authority will be specified by the responsible activity (see figure 26). The information shall provide procedures to accomplish the following as applicable:

a. Safing (Dearming or Rearming Area Before Engine Shutdown). Unless otherwise specified, only minimal essential dearming or safing procedures will be given. Only those weapons/stores that require procedures to be performed will be addressed:

- (1) Umbilical disconnections (e.g., rocket launcher adapter cable, gun power cable).
- (2) Rocket motor safing function.
- (3) Installation of specific ordnance related devices.
- (4) Weapons/stores dearming and weapon/aircraft safety; aircraft/weapon made safe for ground handling procedures.
- (5) Removal of loose or used umbilicals, lanyards, arming wires, etc., that present a Foreign Object Damage (FOD) hazard.
- (6) Armament controls set to desired position (general reference to armament switch positions).
- (7) Procedures for safing weapons/aircraft for the purpose of hot refueling of loaded aircraft.
- (8) Procedures for unloading weapons/stores, as authorized, with engines turning.

b. Safing (Dearming or Rearming Area After Engine Shutdown). Unless otherwise specified, only minimal essential dearming or safing procedures will be given. Only those weapons/stores that require procedures to be performed will be addressed.

- (1) Weapon/store dearming and weapon/aircraft safety; aircraft/weapon made safe for ground handling procedures.
- (2) Removal of loose or used umbilicals, lanyards, arming wires, etc.
- (3) Armament controls set to desired position (general reference to armament switch positions).

3.16.4.4 Turnaround. Only standard/normal dearming or safing procedures will be given. If emergency dearming procedures are required to dearm or safe a weapon/store, notification of proper authority will be specified. Only those weapons/stores that require procedures to be performed will be addressed (see figure 27).

- a. Turnaround procedures not requiring reconfiguration shall be used.
- b. Dearming/safing procedures required to return the weapon/store and aircraft to the postload condition.
- c. Weapons/stores that do not require loading or unloading but requiring adjustments prior to launch shall be provided for (retorque of ECM magazines or snubber clamps, etc.).
- d. Applicable weapon inspection checks may be entered for loaded stations. Postload and subsequent checks shall be referenced.
- e. Adequate preparation of unloaded stations for loading shall be made.
- f. Stations to be loaded will be referred to Weapons/Stores Inspection through postload procedures.
- g. Prior to launch procedures will be referenced.

3.17 Glossary. The glossary shall be prepared and shall include a definition of terms used in the manual.

3.18 Style and format. Unless otherwise noted, general style and format requirements for both paper, page-based TMs and checklists and digitally displayed ETMs, including checklists, are provided in 3.18.1 through 3.18.14.3.5. A Formatting Output Specification Instance (FOSI) is used in conjunction with the applicable DTD (refer to 3.1.3 and 3.1.4) to produce formatted final reproducible paper copies of the TM. Style sheets are required to provide a standard screen presentation to

view ETMs on an Electronic Display System (EDS). The approved FOSI and style sheets may be obtained from the requiring activity.

3.18.1 Text development. Text shall be presented in single-column format (see figure 28).

3.18.1.1 Typeface and type size. Typeface, type size and spacing shall be in accordance with best commercial practices for producing the printed page. Type shall be proportionally spaced (non mono spaced). Fonts shall be selected for a balance between readability and economy of space. Setting text in capital letters shall be limited to appropriate uses, such as major headings, acronyms, equipment markings. Typeface and type size requirements for ETMs designed for interactive screen display shall be in accordance with MIL-PRF-87268.

3.18.2 ETM installation data. When ETMs are distributed on a CD-ROM, information on installing the CD-ROM on the computer and launching the ETM shall be prepared. Minimum hardware and software requirements shall be included. The preferred method of operation is to perform a minimal software installation to the display device and access the programmed data from the compact disk (CD) or other distribution media. However, an option to install to the hard drive shall be available. In cases where compressed data is on the CD or medium and must be expanded onto the hard drive, the install routine must determine if sufficient hard drive space is available. All installation routines shall have an uninstall option and when updating to a newer version, shall remove earlier version software/data prior to the installation of updated software/data. This information shall be printed and should be part of the packaging and shipment of the CD-ROM. When ETMs are not distributed on CD-ROM but electronically transferred, any relevant installation data shall become part of a "read me" file.

3.18.3 CD label and flyleaf data. The CD-ROM shall have a label and flyleaf insert that includes the following information, as applicable.

- Publication number
- Equipment nomenclature
- Application
- CD number
- Version
- Data cutoff date
- CD creation date
- Compression information, if applicable
- Copyright information
- Distribution statement
- Authority notice
- Destruction notice
- ETM install data (refer to 3.18.2).

3.18.4 Content data (ETMs only). When more than one ETM is resident on a CD, content data should appear on the display immediately following the preface information. This content data should provide the ETM publication number and title of all technical manuals that are contained on the CD. CD content is displayed and should be scrollable.

3.18.5 Title page information. For page-based TMs, the title page shall not be numbered. For ETMs, title page information shall not be numbered.

3.18.6 List of effective pages (page-based TMs only). The list of effective pages shall be numbered with a capital "A."

3.18.7 Change summary (ETMs only). When a change to an ETM is issued, a change summary should be provided. The change summary should be user-invoked from the List of Contents. The change summary shall contain a list of information by paragraph titles that have been changed. A brief description of the major changes shall be provided for each titled paragraph listed. Change summary information is displayed full screen, frame by frame or inside a scrollable area. The paragraph titles listed in the change summary shall be linked to the paragraph containing the changed information. The change summary shall not be numbered.

3.18.8 Table of contents, list of illustrations and list of tables (page-based TMs only). For page-based TMs, pages containing this data shall be numbered with lower case Roman numerals. For ETM checklists, this data shall not be numbered.

3.18.9 List of contents, list of illustrations and list of tables (ETMs only). A List of Contents should be prepared. The subject matter should be listed by section title. To facilitate access, primary paragraphs may be indented and listed under each section title. When displayed, the List of Contents should provide a search capability. All entries in the List of Contents should be linked to the actual subject matter. A list of illustrations and a list of tables shall appear at the end of the list of contents. All entries in the lists of illustrations and tables should be linked to the actual subject matter.

3.18.10 "How to Use This ETM" information (ETMs only).

a. Information to familiarize the user with special or unusual features of the ETM should be prepared. Coverage should lead the user through the ETM and explain important features of the organization and content. For example, the format is explained, and loading, maintenance instructions, and other pertinent information is explained.

b. Any peculiarities in the basic structure of the ETM should be described. "How to use" information should not repeat instructions given within the sections.

c. For all ETMs, the "how to use" information should include an explanation of how and where parts information is available in the paragraphs and how the parts information is accessed, and if applicable, how the parts can be ordered.

d. An explanation should be included on how to identify hotspots and how they are used and activated.

e. The "How to Use This ETM" information shall be user-invoked from the List of Contents.

3.18.11 Nomenclature. Nomenclature shall be standardized throughout the manual or checklist. Nomenclature used shall be consonant with applicable source data (engineering drawings, illustrated parts breakdown, etc.), aircraft manuals, weapon manuals and aircraft/weapon paneling. Panel placarded nomenclature, such as switch or indicator light titles and switch positions, when referenced, shall be the same as placarded.

3.18.12 Illustrations. Illustrations shall be used as necessary to aid in the understanding of complex procedures, to present phases which are difficult to describe alone, reducing the amount of text necessary to describe a given component and to highlight details which are significant or related to safety/reliability. Line drawings will be used instead of halftone or continuous tone art. For page-based TMs and checklists, each illustration will have a figure number. For ETMs and ETM checklists, illustrations may have figure numbers.

3.18.13 References. The use of references in text can create undue hardship and/or confusion for the user of the technical data. It is recognized that use of references is required to avoid inordinate duplication of data; however, references should be kept to a minimum. For ETMs, as a practical consideration, linking should be used and encouraged. Hotspots should be used to link cross-referenced material. Reference shall not be made to coverage contained in other than NAVAIR manuals, except when the manual has been formally assigned a NAVAIR publication number.

NOTE

Commercial or joint usage manuals must be formally reviewed and approved for use prior to use by NAVAIR activities. When approved, the manuals are assigned NAVAIR publication numbers. Information related to review, approval and assigned number status can be provided by the requiring activity. The NAVAIR number is normally added during the next upgrade of the manual and may not be listed on existing copies of the manual. Clarification can be provided by the requiring activity.

3.18.13.1 Maintenance procedures contained in other manuals. Maintenance procedures that are required to complete maintenance tasks that are contained in another maintenance manual shall be referenced by publication number.

3.18.13.2 References to other manuals. References in the text shall be made by the referenced task title as follows:

a. For other publications, reference shall be made by publication number.

b. Reference shall not be made to a paragraph, figure or table number.

c. Reference to another ETM shall be by the ETM publication number and the task title, if necessary.

3.18.13.3 References within a manual. References in the text shall be made by the referenced task title as follows:

- a. For page-based TMs, paragraphs, figures and tables by number. For ETMs, paragraphs, figures, and tables by title.
- b. Index numbers on illustrations. Detail view identification and sheet numbers should be added for clarity.
- c. Materials such as lubricants, cleaning fluid, or fuel by Government specification number.
- d. Government specifications and standards by the basic number unless it is essential to reference a specific revision to the specification or standard. Government specifications and standards shall not be referenced for completion of maintenance tasks.
- e. Parts on diagrams by complete reference designation.
- f. Switch positions and panel markings by name as marked on the equipment.

3.18.13.4 Mandatory compliance maintenance procedures. Mandatory compliance maintenance practices contained in NAVAIR general series manuals should be referenced (e.g., Aviation Hydraulics, Aviation Hose and Tube Repair, Cleaning and Corrosion Control, etc.). Refer to NAVAIR 00-25-700 (WP 002 00) for a listing of General Maintenance Engineering Series manuals with annotated mandatory compliance.

3.18.13.5 Frequently used maintenance tasks. Frequently used maintenance tasks, such as applying external electrical or hydraulic power, shall be prepared once as a common maintenance task and linked as a common step in all other maintenance tasks requiring the need of external electrical or hydraulic power. It is not necessary to link supporting graphics to common steps with linked tasks.

3.18.14 Graphics guidelines.

3.18.14.1 Graphics format. All graphics developed in accordance with this specification shall be delivered in one of the three graphic formats: MIL-PRF-28003, Computer Graphic Metafile (CGM); MIL-PRF-28002, Continuous Acquisition Life-Cycle Support (CALS) Raster; or MIL-PRF-28000, Initial Graphics Exchange Specification (IGES). Other commercial graphics formats may be acceptable if approved by the requiring activity.

- a. The CGM file format is the preferred graphics file format.
- b. All graphics files for a particular TM should be applied in the same graphics format if practical. Otherwise, files may be delivered in any combination of the allowable formats.

3.18.14.2 Display of illustrations. For ETMs, illustrations should be displayed on the user's EDS in accordance with MIL-PRF-87268.

- a. If the graphic is scrollable, the user should have the capability to activate scroll, zoom, or full screen functions to manipulate the graphic whenever the entire graphic exceeds the size of the data pane.
- b. The user should have the capability to scroll the graphic through the use of scroll up, scroll down, scroll left, and scroll right features. Scroll bars should appear on the display to provide the user with a visual cue that the capability to scroll the displayed information exists.
- c. The user should also have the capability to enlarge and reduce the displayed graphical information by activating a zoom feature.

3.18.14.3 Types of graphics. The following types of graphics shall be used in the preparation of TMs and checklists.

- a. Line drawings.
- b. Engineering drawings.

- c. Diagrams.
- d. Charts and graphs.

3.18.14.3.1 Line drawings. Line drawings including exploded views, locator views, and detailed views shall be used to support the TM and checklist procedures.

3.18.14.3.2 Engineering drawings. Unless specified otherwise by the requiring activity, engineering drawings shall not be used as illustrations. When used,

- a. They shall be in accordance with MIL-STD-100 and shall be modified, as necessary, to meet the content, style, arrangement, legibility, format, and production requirements described in this document and the contract.
- b. All unnecessary data that would reduce the comprehension or clarity of the illustration shall be removed.
- c. They must be reduced or redrawn to meet frame size restrictions.

3.18.14.3.3 Diagrams. Diagrams shall be prepared in accordance with the specifications listed below.

<u>Subject</u>	<u>Equipment Covered</u>	<u>Specification</u>
Abbreviations	All	OPNAVINST 4790.2
Drafting Practices	Mechanical, Electrical, and Electronic	ANSI Y14.15-1966 (R1973)
Engineering Drawing Practices	All	MIL-STD-100, MIL-T-31000, ANSI Y14.15
Graphic Symbols	Electrical and Electronic Mechanical Digital (Logic) Fluid Power	IEEE 315A-86, IEEE 280-85 (ANSI Y10.5) MIL-STD-17 IEEE 91-84 ANSI Y32.10
Reference Designators	Electrical and Electronic	IEEE 200-75
Unit Symbols	All	IEEE 260-78
Logic	All	IEEE 91-84
Dimensions and Tolerances	All	ASME Y14.5M-94

3.18.14.3.4 Charts and graphs. Charts and graphs shall be prepared as illustrations. Instructions shall be provided for use and interpretation of complex graphs.

3.18.14.3.5 Use of color. For ETMs, color may be used when it will enhance the understanding of the data. The use of some colors may not be appropriate for certain environmental conditions. The following color limitations shall apply.

- a. For ETMs that may be displayed on a monochrome system, reverse video and/or underlining shall be used for hotspots rather than color.
- b. The use and choice of colors may be as specified by the requiring activity.

3.19 Specific style and format. Unless otherwise noted, specific style and format requirements for both paper, page-based TMs and checklists and digitally displayed ETMs, including checklists, are provided in 3.19.1 through 3.19.3.1.

3.19.1 Airborne weapons/stores loading, WAM, and AWSE manuals. Specific style and format for airborne weapons/stores loading, WAM, and AWSE manuals shall be in accordance with the following requirements.

3.19.1.1 Header and footer data. For page-based TMs, header information for each section page shall bear the section title in the appropriate upper right- or left-hand corner under the publication number, except weapon assembly publications, which shall have the section title so placed on front matter pages only. For ETMs, header and footer information is not required.

3.19.1.2 Sections. The technical data required for the airborne weapons/stores loading, WAM, and AWSE manuals shall be divided into sections. For page-based, paper TMs, section numbers shall be assigned as designated in 3.5 through 3.5.3. Each section shall start on a new right-hand (odd numbered) page. For ETMs, technical data may be divided into unnumbered sections.

3.19.1.3 Paragraphs and paragraph titles.

3.19.1.3.1 Page-based TMs. Paragraphs, paragraph titles and paragraph numbering shall be prepared as shown in figure 28(23). Where a particular title or paragraph is not applicable, it shall be omitted. Primary (first order) headings shall be all capitals, bold, and stand alone. Secondary (second order) headings shall be all capitals, bold, followed by text. Subordinate headings (third order) shall be initial capitals, bold, followed by text. Primary, secondary, and subordinate headings shall be the same font throughout text.

3.19.1.3.2 ETMs. Paragraphs and paragraph titles shall be prepared as shown in figure 28. Where a particular title or paragraph is not applicable, it shall be omitted. Primary (first order) headings shall be all capitals, bold, and stand alone. Secondary (second order) headings shall be all capitals, bold, followed by text. Subordinate headings (third order) shall be initial capitals, bold, followed by text. Primary, secondary, and subordinate headings shall be the same font throughout text. Paragraphs shall not be numbered.

3.19.1.4 Procedural steps. Procedural steps will be Arabic numbered. Lower case alphabetical letters shall be used for substeps. If further subordination is necessary, Arabic numerals in parenthesis shall be used.

3.19.1.4.1 Display of procedural steps (ETMs only). There shall be no limit to the number of steps and substeps that can be displayed at any one time. Each step may include a feature that permits the user to acknowledge that individual steps have been performed, e.g., a check box or an icon.

3.19.2 Checklists.

3.19.2.1 Layout.

3.19.2.1.1 Page-based checklists. Content, except tabularized, shall be presented on the page in a head-to-foot (tumble turn) manner. Tabulated procedures shall be presented across the length of the page and backing pages (left to right) in a book turn (right to left) manner. A check off space for each procedural step shall be provided in the right margin of each page.

3.19.2.1.2 ETM checklists. Content shall be presented on the display device in a linear, scrollable manner, including tabular material. A check off space or box for each procedural step shall be provided immediately following the end of the step.

3.19.2.2 Header and footer data. For page-based checklists, each checklist page, except the title page, will have the aircraft model/series number, checklist number, and checklist title, in that order, across the top of the page from the left. Except the title page and "A" page, each page shall have the aircraft model/series number and checklist title in the lower left corner. The publication date, and when applicable, the change number and date will appear in the lower right corner of all pages. For ETM checklists, header and footer information is not required.

3.19.2.3 Header and footer data (Weapons assembly checklists only). Each checklist page will have the checklist number centered at the top of the page. The publication date, and when applicable, the change number and change date will appear in the lower right corner of all pages. For ETM checklists, header and footer information is not required.

3.19.2.4 Page numbering.

3.19.2.4.1 Title page information. For page-based checklists, the title page shall not be numbered. For ETM checklists, title page information shall not be numbered.

3.19.2.4.2 List of effective pages (Page-based checklists only). The list of effective pages shall be numbered with a capital "A."

3.19.2.4.3 Table of Contents, Introduction, required reading and ground support equipment. For page-based checklists, pages containing this data shall be numbered with lower case Roman numerals. For ETM checklists, this data shall not be numbered.

3.19.2.4.4 Technical content data. For page-based checklists, procedural information, including tables and illustrations, shall be on Arabic numbered pages. Blank pages will be accounted for sequentially, but will not have numbers appearing thereon. For ETM checklists, this data shall not be numbered.

3.19.2.5 Numbering procedural steps. Procedural steps will be Arabic numbered. Lower case alphabetical letters shall be used for substeps. If further subordination is necessary, Arabic numerals in parenthesis shall be used.

3.19.2.6 Sections. The technical data required for the checklists shall be divided into unnumbered sections. Checklist section and subsection headings shall be presented in an established format. Where a particular section, subsection, or paragraph is not applicable, it will be omitted.

3.19.3 Warnings, cautions, and notes. With the exception of weapons assembly checklists, warnings, cautions, and notes shall precede the text to which they apply. When necessary to precede information with a note and a warning or a note and a caution, they shall appear in the sequence as noted. Warnings, cautions, and notes shall not contain procedural information and shall be presented in an established format.

3.19.3.1 Warnings, cautions, and notes for weapons assembly checklists. Indexed numbered warnings and cautions will be a part of the front matter of the weapons assembly checklist as noted in 3.6. The warnings and cautions shall appear indexed numbered (i.e., Warning 6 or Caution 4) as part of the step it pertains to. Notes will precede the step that they pertain to.

3.20 Revisions, changes, and updates.

3.20.1 Page-based TMs and checklists. When change pages are ordered, the deliverable product for printing and distribution will be a change package. Change pages will be written in the same style and format as the existing manual. There are two types of revisions that can be prepared for a NAVAIR TM: a pickup revision and a complete revision. The requiring activity will determine the type of revision required.

3.20.1.1 Changed pages. Following the basic issue or a complete revision, change pages shall be numbered beginning with "Change 1." Subsequent change pages shall be numbered consecutively until a complete revision is issued. If a page has been previously changed, the previous change number and date shall be removed and replaced by the current change number and date. The change number and date shall be placed below the publication number on all pages affected by the change. The change number and date of the current affected pages shall coincide with the change number and date of the pickup revision and shall be placed on the TM title page below the date of the basic or latest revision of the publication.

3.20.1.2 Pickup revisions. A pickup revision incorporates the basic issue or latest revision of a manual, all previous change pages, and the new change pages that would require the issuance of an additional revision. Only those updated or added change pages will have the current change number and date. Those pages not affected by the current change shall retain the previous change symbols and change number/date.

3.20.1.3 Complete revisions. A complete revision required rewrite and reorganization of the technical content of the data. All pages, paragraphs, illustrations and tables shall be renumbered to establish correct sequence. All existing change numbers, change bars, dates and change symbols shall be removed. Change symbols will be inserted only on those pages incorporating new or changed data during the preparation of the complete revision. The revision date will be assigned by the requiring activity.

3.20.1.4 Change symbols. Changes to text and tables shall be indicated by a change bar or the letter "R." A miniature pointing hand, change bar, or "MAJOR CHANGE" symbol shall be used for illustrations. All existing change symbols shall be eliminated from the pages affected by the current change. After removal of previous change symbols, new change symbols shall be inserted highlighting material changed or added during the current change. Changes to title pages, introductory material, indexes, blank space resulting from change requirements, typographical errors, and minor inaccuracies that do not change the meaning of the information do not require change symbols.

3.20.1.5 Supersedure notice. A supersedure notice is always required when a revision is issued and may be required when a TM supersedes other TMs or portions of TMs.

3.20.2 ETMs and ETM checklists. When changes to ETMs are ordered, the deliverable product shall be either an update or a complete revision. The requiring activity will determine the type and frequency of the change required.

3.20.2.1 Revisions. A complete ETM revision requires rewrite of the technical content of the data to ensure that all new data and past updates are included. When applicable, all existing change numbers, change bars, dates, and change symbols will be removed. When required by the requiring activity, a change summary shall be provided. (Refer to 3.18.7.) Revisions will be incremental and the frequency of revisions will be defined in the contract. Each revision to an ETM should be identified by a revision date.

3.20.2.2 Updates. Updates are changes to the initial version of the ETM or to the latest complete revision of an ETM. Updates are issued incrementally as necessary, or as required by the contract. When authorized by the requiring activity, updates shall include change symbols and change dates to inform the user what has changed and where the changes or additional information is located. When required by the requiring activity, a change summary shall be provided. (Refer to 3.18.7.)

3.20.2.3 Change symbols. When authorized by the requiring activity, change symbols should be inserted to identify technical changes in text, illustrations, and tables. Changes to title pages, introductory material, indexes, blank space resulting from change requirements, typographical errors, and minor inaccuracies that do not change the meaning of the information do not require change symbols.

a. Text and tabular data. The text and tabular data affected by a change should be indicated by the letter "R" or a change bar in the outer margin.

b. Illustrations. Change symbols for illustrations should be as follows:

(1) Miniature pointing hand. A miniature pointing hand should be used to highlight the area containing the changed material.

(2) Change bar. When several changes are made in one area, or the area is congested, a change bar may be used to indicate a general area. The change bar should be placed in such a manner as to clearly indicate the changed area without confusing the user. If an illustration has been extensively changed, a change bar may be placed along the outer margin of the illustration.

(3) Alternate method. An acceptable alternate method for use with an extensively changed illustration is the use of the words "MAJOR CHANGE" enclosed in a box. The enclosed words should be placed in a clear space of the illustration image area.

3.21 Printing and binding (Page-based checklists only).

3.21.1 Type size. Repro type size shall be as specified by the responsible activity. Title and subheading type sizes will be as specified by the responsible activity.

3.21.2 Paper stock. Unless otherwise specified in the contract, text and title pages shall be on 16 or 24 pound white sulphite stock or its equivalent. Checklist sheets shall be plasticized on both sides with an acrylic emulsion having a minimum thickness of 1/2 mil and a maximum thickness of 2 mils. This coating will be applied after printing. Trim size of a checklist page shall be 5 by 8 inches.

3.21.3 Type page area. Maximum width of text and illustrations shall be 4-1/4 inches (25-1/2 picas) allowing 5/8 inch for binding margin and 1/4 inch for bottom margin. Fold-over or fold-out pages shall not be used.

3.22 Numbering and titling. Conventional weapons, airborne stores, and release and control systems checklists will be numbered and titled as follows or as specified by the responsible activity.

NAVAIR 01-XXXX-75-1	RELEASE AND CONTROL (when subsystem checklists are not required)
-1A1	(Basic under separate cover)
-1A2	(Subsystem under separate cover)
-1A3	(Subsystem under separate cover)
Etc.	
NAVAIR 01-XXXX-75-2	(TBD)
-3	BOMBS RETARD/NONRETARD (includes full size practice bombs)
-4	FIRE BOMBS
-5	MK 60 SERIES MINE
-6	MINES
-6A1	MK 65 MINE
-7	TORPEDO
-8	PYROTECHNICS
-9	(TBD)
-10	TOW (tube-launched, optically tracked and wire-guided)
-11	TALD
-12	ROCKET LAUNCHERS
-14	CBUs
-15	DISPENSERS
-16	PRACTICE BOMBS
-17	AIRCRAFT GUNS
-17A	GUN PODS
-18	FUEL TANKS/STORES
-19	WALLEYE
-19A1	DATA POD
-20	AIM-9
-20A1	INSTRUMENTATION PACKAGES
-21	AIM-7 (SPARROW)
-22	ECM
-22A2	AN/ALQ-167
-23	TARGET/LAUNCHERS
-23A2	BQM-74C
-24	SEARCH STORES
-25	AGM-144 (HELLFIRE)
-26	(TBD)
-27	AN/ALQ 170/ALE-43
-28	CAMERA POD
-29	(TBD)
-30	(TBD)
-32	(TBD)
-33	(TBD)
-33A1	PASE AGM-65
-33A2	PASE AGM-88
-34	LGB/GBU
-35	AIM-54
-36	ALE-37
-37	AN/ARQ-49
-38	AGM-84
-39	(TBD)
-40	ARM/DEARM

3.22.1 Technical Manual Identification Numbering System (TMINS). TMINS is a numbering system developed in coordination with SYSCOM's in response to the Naval Air Systems Command (NAVAIR) sponsored project to standardize TM numbers and their method of assignment throughout the Navy. The TMINS provides a single, user-oriented number and indexing system that satisfies the requirements of all NAVAIR Systems Commands for identifying, referencing, and requisitioning TMs and changes thereto; facilitates the identification and ordering of TMs by the operating forces and other uses; is compatible with ADP manipulation procedures; and implements a system with the least disruption to TM operations during the transition period. Weapons checklists will be numbered and titled as follows or as specified by the responsible activity.

A1-XXXXXX-LWS-200	Release and Control Basic
A1-XXXXXX-LWS-210	Release and Control Missiles Air-to-Air
A1-XXXXXX-LWS-220	Release and Control Air-to-Ground/WAT end-to-end
A1-XXXXXX-LWS-260	(TBD)
-270	BOMBS RETARD/NONRETARD (includes full size practice bombs)
-280	FIRE BOMBS
-290	(TBD)
-300	(TBD)
-310	(TBD)
-320	MK 60 SERIES MINES
-330	(TBD)
-340	(TBD)
-350	MK 65 MINE
-360	MINES
-370	MK 46 TORPEDOES
-380	(TBD)
-390	MK 50 TORPEDOES
-400	(TBD)
-410	PYROTECHNICS
-420	CBUs
-430	(TBD)
-440	(TBD)
-450	PRACTICE BOMBS
-460	FUEL TANKS STORES
-470	DISPENSERS
-480	SEARCH STORES
-490	TARGET/LAUNCHERS
-500	(TBD)
-510	AIM-120
-520	AIM-7
-530	AIM-9
-540	AIM-54
-550	(TBD)
-560	AGM-65
-570	(TBD)
-580	AGM-84
-590	AGM-88
-600	(TBD)
-610	AGM-154A
-620	AGM-114
-630	AGM-119
-640	WALLEYE
-650	DATA PODS
-660	GBUs
-670	GBU-30 SERIES
-680	ARM/DEARM
-690	FLIR POD
-700	ECM PODS
-710	TACTS POD

-720	ECM
-730	TALD
-740	AN/ALQ 167
-750	ROCKET LAUNCHERS
-760	AIRCRAFT GUNS
-770	GUN PODS
-780	(TBD)
-790	(TBD)
-800	CREW SERVED GUNS

3.22.2 Checklists. Airborne weapons/stores and release and control system checklists that require numbering and titling not listed in paragraph 3.22 will be numbered and titled as specified by the requiring agency or responsible activity.

3.22.3 Weapons assembly manuals and checklists. Weapons assembly manuals will be numbered as NAVAIR 11-140-XX series publications as per the responsible activity. The checklists that support those manuals will be consecutively numbered, NAVAIR 11-140-XX-1 for the first supporting checklist, NAVAIR-11-140-XX-2 for the second supporting checklist, NAVAIR-11-140-XX-3 for the third supporting checklist, and so on.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his/her own or any other facilities suitable for performance of the inspection requirements specified herein unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification when such inspections are deemed necessary to assure supplies and service conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements; however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Validation. Validation shall be performed in accordance with MIL-M-85337 to ensure adequacy of the data consistent with the purpose of the airborne weapon/stores publication.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract order (see 6.2). When actual packaging of material is to be performed by Department of Defense (DoD) personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Manuals prepared in accordance with this specification are intended to provide information required to cover aircraft armament configuration, perform functional checkout of weapon release and control systems on the aircraft, and load/unload conventional airborne weapons/stores along with assembly/disassembly of weapons and configuration of airborne weapons support equipment.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents.
- c. Cross-referencing of indexed material, if required (see 3.4).
- d. Manual shall be volumized, if required (see 3.4).
- e. Sequence of presentation of descriptive data, if required.
- f. Sequence of coverage for specialized stores, if required.
- g. Sequence of specific manual sections, if required.
- h. Responsibility for inspection (see 4.1).

6.3 Technical manual acquisition. This specification must be listed on the Contract Data Requirements List (DD Form 1423) in order to acquire the technical manuals described by this specification, except where DOD FAR Supplement 27.475-1 exempts the requirements for a DD Form 1423.

6.4 Definitions.

6.4.1 Armament weapons support equipment (AWSE). Equipment required to support weapons/stores handling, transportation and loading on aircraft.

6.4.2 Conventional weapons. Conventional weapons include all weapons or weapon components (bombs, rockets, guns, ammunition, pyrotechnics, sonobouys, etc.) which are not normally aircraft inventory items and which do not carry nuclear devices.

6.4.3 NAVAIRWARCENWPNDIV, China Lake, CA. Cognizant Field Activity (CFA) responsible for weapons loading issues.

6.4.4 Requiring activity. The organization of a using military service or that organization delegated by a using service which is responsible for the selection of, and determines requirements for, a specific support element.

6.4.5 Responsible activity. The responsible activity defined as NAVAIRWARCENWPNDIV, Code PST32080, China Lake, CA.

6.4.6 Suspension/accessory equipment. Suspension/accessory equipment is an item which is required to mate the conventional weapons/stores to the aircraft and which remains as an integral part of the system (e.g., pylon, missile launcher and adapters, bomb release unit, rocket launcher, ejector cartridge, etc.).

6.5 Figures contained in this specification. The figures illustrated in this specification are typical examples intended to illustrate style, format and sample content. They shall not be used for interpretation of specific technical contents or exact scale requirements.

6.6 Subject term (key word) listing.

Accessories
Airborne weapons assembly manual
Armament system
Armament weapons support equipment
Conventional weapons
Fuzes
Illustrations
Military specifications
Release and control
Technical manual

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing Activity
Navy-AS

Project TMSS- N336

AIRCRAFT	WEAPON	NAVAIR NO.	CHANGES	ISSUE DATE	STOCK NUMBER	WEB PDF
	TALD	A1-F18EA-LWS-730		01 AUG 00	0801-LP-029-6360	Web
	AN/ALQ-167/AST-4/6	A1-F18EA-LWS-740		01 AUG 00	0801-LP-029-6380	Web
	Rocket Launchers	A1-F18EA-LWS-750		01 MAR 00	0801-LP-025-1560	Web
	Guns	A1-F18EA-LWS-760		01 NOV 99	0801-LP-026-1330	Web
SH-60B	Airborne Weapons/Stores Loading Manual	A1-H60BB-LWS-000		01 MAY 00	0801-LP-029-5540	Web
	Release & Control	A1-H60BB-LWS-200	TMCN	15 JAN 00 16 JAN 00	0801-LP-024-9260 0801-LP-024-9261	
	Mk 46 Torpedo	A1-H60BB-LWS-370		01 MAY 00	0801-LP-029-3490	Web
	Mk 50 Torpedo	A1-H60BB-LWS-390		01 MAY 00	0801-LP-029-3510	Web
	Fuel Tanks	A1-H60BB-LWS-460		01 MAY 00	0801-LP-029-3520	Web
	Search Stores	A1-H60BB-LWS-480		01 MAY 00	0801-LP-029-3530	Web
	Instrumentation Packages (AIS Pods)	A1-H60BB-LWS-530		01 MAY 00	0801-LP-029-3540	Web
	AGM-114 Hellfire	A1-H60BB-LWS-620		01 MAY 00	0801-LP-029-3550	Web
	Penguin	A1-H60BB-LWS-630		01 MAY 00	0801-LP-029-3560	Web
	Arm/Dearm	A1-H60BB-LWS-680		01 MAY 00	0801-LP-029-5490	Web
	Chaff Cartridges	A1-H60BB-LWS-700		01 MAY 00	0801-LP-029-3580	Web
	ECM (ALE-39)	A1-H60BB-LWS-720		01 MAY 00	0801-LP-029-3590	Web
SH-60F	Airborne Weapons/Stores Loading Manual	A1-H60FB-LWS-000		01 OCT 99	0801-LP-029-9240	
	Release & Control	A1-H60FB-LWS-200		01 OCT 99	0801-LP-025-9450	
	Mk 46 Torpedo	A1-H60FB-LWS-370		01 OCT 99	0801-LP-025-8710	
	Mk 50 Torpedo	A1-H60FB-LWS-390		01 OCT 99	0801-LP-021-1430	
	Fuel Tanks	A1-H60FB-LWS-460		01 OCT 99	0801-LP-025-8830	
	Instrumentation Packages (AIS Pods)	A1-H60FB-LWS-530		01 OCT 99	0801-LP-025-8720	
	Sonobuoy/Chaff Launcher	A1-H60FB-LWS-700		01 OCT 99	0801-LP-021-1390	
HH-60H	Airborne Weapons/Stores Loading Manual	A1-H60HA-LWS-000		01 MAR 00	0801-LP-025-2750	Web
HH-60H/J	Release & Control	A1-H60HA-LWS-200		01 JAN 00	0801-LP-027-4080	Web
	Fuel Tanks	A1-H60HA-LWS-460		01 MAR 00	0801-LP-027-4090	Web
HH-60H	Instrumentation Package (AIS Pod)	A1-H60HA-LWS-530		01 MAR 00	0801-LP-027-4110	Web

If Web is indicated, publication can be viewed via the NATEC web at www.natec.navy.mil

ORDNANCE TECHNICAL HOTLINE: DSN 437-4478, Commercial (760) 939-4478

Figure 1. Example of a Conventional Weapons Index.

NAVAIR 01-85AD-75

TECHNICAL MANUAL

AIRBORNE WEAPONS/STORES LOADING MANUAL

NAVY MODELS

A-6 SERIES, EA-6, AND KA-6 AIRCRAFT

THIS PUBLICATION SUPERSEDES
NAVAIR 01-85AD-75 DTD 1 MAY 1989
AND ALL CHANGES THERETO

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0801LP1014570

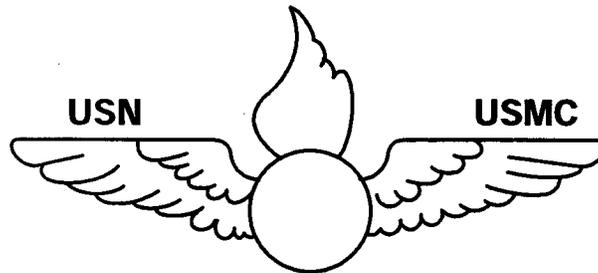
1 MAY 1992

NATEC ELECTRONIC MANUAL

TECHNICAL MANUAL
AIRBORNE WEAPONS ASSEMBLY
MANUAL

MK 80/BLU SERIES
GENERAL PURPOSE BOMBS,
MK 77 FIRE BOMBS
AND PRACTICE BOMBS

FLEET
MAINTENANCE ACTIVITIES



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0801LP1014571

1 APRIL 1990
Change 1 - 1 July 2000

NATEC ELECTRONIC MANUAL

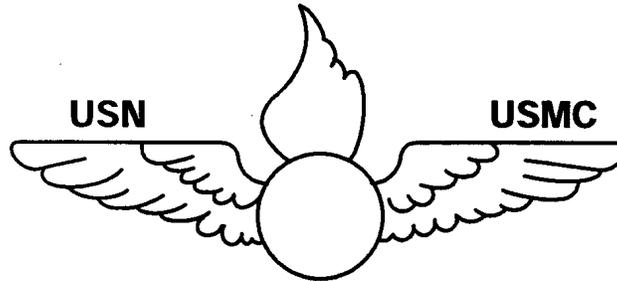
Figure 2. Example of a Title Page (Weapons Assembly Manual) (Sheet 2 of 6).

NAVAIR 11-140-25

TECHNICAL MANUAL

**ARMAMENT WEAPONS SUPPORT EQUIPMENT
CONFIGURATION MANUAL**

**ORGANIZATIONAL AND INTERMEDIATE
MAINTENANCE ACTIVITIES**



THIS MANUAL SUPERSEDES
NAVAIR 11-140-25 DTD 01 SEP 1995
AND ALL CHANGES THERETO

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0811-LP-0146390

1 MARCH 1999

NATEC ELECTRONIC MANUAL

NAVAIR 01-700

AIRBORNE WEAPONS/STORES

MANUALS/CHECKLISTS

PUBLICATION INDEX

**THIS PUBLICATION SUPERSEDES
NAVAIR 01-700 OF 1 APR 2000**

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0801-LP-029-7890

1 JULY 2000

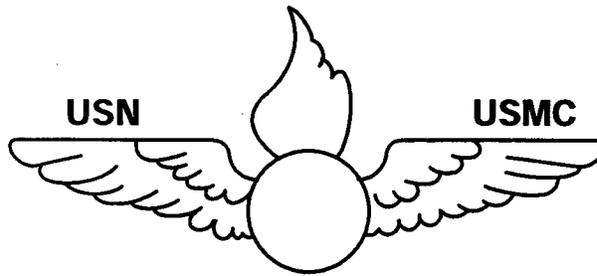
NATEC ELECTRONIC MANUAL

NAVAIR 11-104-5-1

AIRBORNE WEAPONS ASSEMBLY

CHECKLIST

BOMBS/FIRE BOMBS/
BOMB FINS/FUZES/
ASSOCIATED COMPONENTS
AND PRACTICE BOMBS



This publication supersedes NAVAIR 11-140-5-1 dated 1 June 1997 and all changes thereto.

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0801-LP-029-7891

1 APRIL 1999

NATEC ELECTRONIC MANUAL

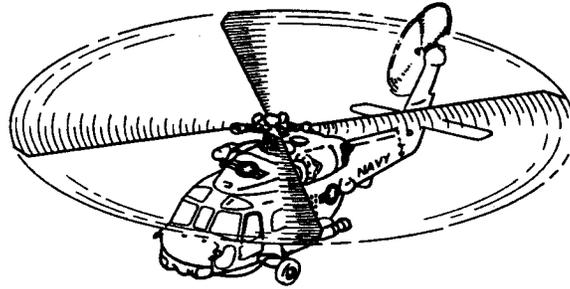
Figure 2. Example of a Title Page (Airborne Weapons Assembly Checklist) (Sheet 5 of 6).

CHANGE NOTICE

A1-H60BB-LWS-370

Conventional Weapons

CHECKLIST
SH-60B
MK-46



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COMMANDER, NAVAL AIR SYSTEMS COMMAND

0801LP0293490

1 May 2000
CHANGE 1 1 OCT 00

NATEC ELECTRONIC MANUAL

Figure 2. Example of a Title Page (Typical Checklist with Change) (Sheet 6 of 6).

A1-H60BB-LWS-000**List of Effective Pages****LIST OF EFFECTIVE PAGES**

Dates of issue for original and changed pages are:

Original.....0 (Incorporates IRAC 1)1 May 2000
 Change11 June 2000

Insert latest changed pages; destroy superseded pages in accordance with applicable regulations.

NOTE: On a changed page, the portion of the test affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Total number of pages in this manual is 323, consisting of the following:

Page No.	*Change No.	Page No.	*Change No.	Page No.	*Change No.
Title	0	5-1 - 5-24	0	(11-10 Blank)	0
A.....	0	6-1 - 6-22	0	12-1	0
Letter of Promulgation	0	7-1 - 7-20	0	(12-30 Blank)	0
i-xviii.....	0	8-1 - 8-7.....	0	13-1 -13-12.....	0
1-1 - 1-7.....	0	(8-8 Blank).....	0	14-1 - 14-11.....	0
(1-8 Blank).....	0	9-1 - 9-13	0	(14-12 Blank)	0
2-1 - 2-66.....	0	(9-14 Blank)	0	Glossary 1 - Glossary 6.....	0
3-1 - 3-6.....	0	10-1 - 10-7	0		
4-1 - 4-55	0	(10-8 Blank)	0		
(4-56 Blank)	0	11-1 - 11-9	0		

*Zero in this column indicates an original page.

A

Figure 3. Example of List of Effective Pages (Typical Manual) (Sheet 1 of 2).

CHANGES INCORPORATED

Insert latest change pages; destroy superseded pages in accordance with applicable regulations.

Dates of issue for original and change pages are:

Basic..... 0 (Incorporates IRAC 1)..... 1 May 2000
 Change..... 1 1 Oct 2000

Total number of pages in this checklist is 26, consisting of the following:

<u>Pg. No.</u>	<u>Chg. No.</u>	<u>Pg. No.</u>	<u>Chg. No.</u>	<u>Pg. No.</u>	<u>Chg. No.</u>
Title.....	1	1 - 2.....	0	7 - 15.....	1
A	1	3.....	1	16 - 21.....	0
i - ii.....	1	4 - 6.....	0	22 Blank	0

ADDITIONAL COPIES OF THIS PUBLICATION MAY BE OBTAINED AS FOLLOWS:

Procedures to be used by Naval activities and other Department of Defense organizations requiring NAVAIR technical publications are defined in the NAVAL AIR SYSTEMS COMMAND TECHNICAL MANUAL PROGRAM manual, NAVAIR 00-25-100 and Distribution of Aeronautical Technical Publications Instruction, NAVAIRINST 5605.4 series.

When an activity has a continuing requirement for automatic distribution of technical publications, the Automatic Distribution Requirement Listing (ADRL) shall be used. For complete information on distribution, refer to NAVAIR 00-25-100.

1 May 2000
Change 1 1 Oct 00

A

Figure 3. Example of List of Effective Pages (Typical Loading Checklist) (Sheet 2 of 2).

CHIEF OF NAVAL OPERATIONS
OPNAV (OP-50)
DEPARTMENT OF THE NAVY
WASHINGTON, D.C. 20350

1 February 1991

LETTER OF PROMULGATION

1. The Airborne Weapons Assembly Manual provides technical and procedural information for conventional weapons assembly. The information provided in this manual is abbreviated in approved and verified NAVAIR Airborne Weapons Assembly Checklists. The use of the Airborne Weapons Assembly Manual or Airborne Weapons Assembly Checklists is mandatory for all airborne weapons assembly evolutions.
2. The manual and appropriate checklists are continuously monitored and updated to provide operating personnel with the latest verified data. Operating personnel should verify use of the most recently updated manual/checklist by reviewing the Airborne Weapons/Stores Publication Index, issued quarterly.
3. The Airborne Weapons Assembly Manual/Checklists standardize all weapons assembly procedures. They do not provide authorization for flight or tactical doctrine.
4. If there is a conflict between this manual and any other publications, with the exception of paragraph 1-3 of this publication, the provisions of this manual shall prevail until the conflict is resolved by the Commander, Naval Air Systems Command.


JEREMY D. TAYLOR
Rear Admiral, U.S. Navy
Director, Aviation Plans and Requirements Division

Figure 4. Example of Letter of Promulgation (Loading Manual).

**LIST OF VALID TECHNICAL PUBLICATION
 DEFICIENCY REPORTS (TPDRs) INCORPORATED**

ORIGINATOR	TPDR/REPORT CONTROL NO.	LOCATION
HSL-44	55147-97-2001	Section 2, (Pg) 2-34
HSL-44	55147-97-21002	Section 2, (Fig 2-6) Pg 2-35
HSL-46	53916-97-0021	Section 6, (Pg) 6-14
HSL-46	53916-97-0022	Section 7, (Pg) 7-13
HSL-46	53916-97-0012	Section 2, (Pg) 2-9
HSL-46	53916-97-0013	Section 5, Table 5-1
HSL-41	55138-97-0007	Section 5, Table 5-1
HSL-48	55151-98-2015	Section 8, (Pg) 8-5

Figure 5. Example of List of TPDRs Incorporated.

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Figure 6. Example of Table of Contents (Manual) (Sheet 1 of 2).

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Conical/BSU-33 Fin Inspection/Installation/Removal	13
MK 15 Fin Inspection/Installation/Removal	18
BSU-85 Fin Inspection/Installation/Removal	24
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Figure 6. Example of Table of Contents (WAM Checklist) (Sheet 2 of 2).

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Figure 8. Example of Technical Manual List of Tables.

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 precautions that personnel must understand and apply during many phases of aircraft rearming. FOLLOW APPROVED AND VERIFIED PROCEDURES.

Explosive accidents are prevented by thorough preplanning, extensive knowledge of ordnance and associated equipment, and careful handling of ordnance. The phrase "The life you save may be your own" applies especially to ordnance handlers. It is the responsibility of each individual to ensure that only safe, approved practices and procedures are followed when handling ordnance.

Safety devices shall always be used and maintained in proper working order.

Changes, modifications, disassembly or additions to ordnance material shall not be made without being approved by proper authority.

No ammunition or explosive shall be used in any store or accessory for which it is not designed/authorized.

Personnel who authorize movement of ordnance material by power shall ensure that an adequate safety switch is maintained in the area.

Personnel must be certified for handling aviation ordnance in accordance with the requirements of current instruction/directives.

Personnel working with or near high voltages shall be familiar with modern methods of resuscitation.

Restrictions specified in loading publications are mandatory and must be adhered to by all personnel.

Weapon tiedown straps shall be maintained on the weapon as long as possible when loading, and installed on the weapon as soon as possible when unloading.

Strict compliance with procedures and precautions in NAVSEA OP 3565/NAVAIR 16-1-529/NAVELEX 0967-LP-624-6010 (Vol 1 and Vol 2) is mandatory when in a HERO environment.

The mechanical latching of weapons on aircraft racks/launchers shall be completed before the engine(s) on that aircraft is/are started unless otherwise specified in loading publications. However, operational commitments may dictate that weapons must be loaded/unloaded while engine(s) are turning. This extraordinary action must have prior approval of type commander.

Ordnance must never be handled in a rough and hasty manner.

Access to safety equipment such as fire alarms, fire fighting equipment, first aid equipment, etc., shall not be blocked at any time.

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Safety Summary

SAFETY SUMMARY (Continued)

Anyone knowing of (a) defective ammunition or other explosive ordnance or defective containers or handling devices, (b) rough or improper handling, or (c) willful or accidental violation of the safety precautions, however slight, shall immediately report the act to his/her immediate supervisor.

All persons who supervise work in connection with the inspection, care, preparation, use, or handling ammunition or explosive shall exercise utmost care that all regulations and instructions are observed.

Do not work beneath a weapon/store unnecessarily.

Protective equipment such as safety eye glasses or eye shields, safety helmet or hats, ear protective devices, gloves, mittens, etc., and safety shoes shall be worn as required to guard against personal injury.

Smoking. Smoking is not permitted in magazines, nor in the immediate vicinity of handling or loading operations involving explosives or ammunition.

Accident Reporting. Prompt reporting of accidents involving ordnance equipment, ammunition, and explosives where material damage or personnel injuries are sustained shall be made in accordance with current instructions. If doubt exists as to the necessity of a report, it shall always be resolved in favor of the report. Report in accordance with OPNAVINST 5102.1, 4790.2 and 8000.16.

Visual inspections of ammunition handling equipment shall be performed before, during and after use.

Improper adjustment of swaybraces can cause inadvertent release or hung weapons and may result in loss of life and/or damage to property.

When loading/handling forward firing ordnance, working in front of or behind will be held to a minimum.

APU/Engine noise can cause permanent damage to the unprotected ear. When APU/Engine is operating, personnel working in this area should wear regulation protective devices.

**NAVAIR 11-140-9
Hazardous Material Warnings****WARNINGS APPLICABLE TO HAZARDOUS MATERIALS**

Warnings for hazardous materials listed in this manual are designed to warn personnel of hazards associated with such items when they come in contact with them by actual use. Additional information related to hazardous materials is provided in OPNAVINST 5100.23, Navy Occupational Safety and Health (NAVOSH) Program Manual, NAVSUPINST 5100.27, Navy Hazardous Material Control Program, and the DOD 6050.5, Hazardous Materials Information System (HMIS) series publication. For each hazardous material used within the Navy, a Material Safety Data Sheet (MSDS) is required to be provided and available for review by users. Consult your local safety and health staff concerning any questions on chemicals, MSDSs, personal protective equipment requirements, and appropriate handling and emergency procedures and disposal guidance.

Complete warnings for hazardous materials referenced in this manual are identified by use of an icon, nomenclature and specification or part number of the material, and a numeric identifier. The numeric identifiers have been assigned to the hazardous materials in the order of their appearance in the manual. Each hazardous material is assigned only one numeric identifier. Repeated use of a specific hazardous material references the numeric identifier assigned at its initial appearance.

In the text of the manual, the caption "warning" will not be used for hazardous materials. Such warnings will be identified by an icon. The material nomenclature will also be provided. The user is directed to refer to the listed corresponding identifier for the complete warning applicable to the hazardous material.

Figure 10. Example of Hazardous Material Warnings (Sheet 1 of 3).

CHEMICAL



FIRE



EXPLOSION



POISON

EYE
PROTECTION

VAPOR



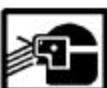
EXPLANATION OF HAZARD SYMBOLS



The symbol of drops of a liquid onto a hand shows that the material will cause burns or irritation of human skin or tissue.



The rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.



The symbol of a person wearing goggles shows that the material will injure your eyes.



The symbol of a flame shows that a material can ignite and burn you.



The symbol of a skull and crossbones shows that a material is poisonous or is a danger to life.



The symbol of a human figure in a cloud shows that vapors of a material present a danger to your life or health.

Figure 10. Example of Hazardous Material Warnings (Sheet 2 of 3).

HAZARDOUS MATERIALS WARNINGS

<u>Index</u>	<u>Material</u>	<u>Warning</u>
1	SEALING COMPOUND, THREAD LOCKING, MIL-S-46163, TYPE I, GRADE K, L; TYPE II, GRADE M, N, O; OR TYPE III, GRADE R	Thread locking, sealing compound, MIL-S-46163, Type I, II or III, may cause dermatitis on prolonged contact. Avoid prolonged skin contact. Protection: rubber gloves, chemical goggles and protective skin compound.
2	INK, STENCIL, A-A-2-8, TYPE III	Stencil ink, A-A-208, Type III is toxic and flammable. Avoid breathing vapors. Use with adequate ventilation. Do not spray in eyes. Do not puncture or incinerate cans. Do not take internally. Keep away from heat, sparks and flame. Do not store above 120°F. Store large quantities in buildings designed and protected for storing of NFPA Class IA flammable liquids. Protection: neoprene gloves and chemical goggles; protective clothing and respirator with organic vapor cartridge and paint mist pre-filter are required during spray operations.
3	SOLVENT, DRY CLEANING, P-D-680, TYPE III	Dry cleaning solvent, P-D-680, Type III, is toxic and flammable. Avoid contact with skin and eyes. Avoid breathing vapors. Use with adequate ventilation. Keep away from heat, sparks and flame. Avoid contact with strong oxidizing agents. Protection: neoprene gloves and chemical goggles; faceshield and protective clothing required when splashing is possible or expected; respirator with organic vapor cartridge required in poorly ventilated areas.
4	COMPOUND, CORROSION, PREVENTIVE, MIL-C-16173, GRADE OPTIONAL	Corrosion preventive compound, MIL-C-16173, is toxic and flammable. Avoid contact with skin and eye. Avoid breathing vapors. Store in sealed containers away from heat, sparks and flame. Avoid contact with oxidizing agents. Protection: rubber gloves, chemical goggles and laboratory apron; faceshield required when pouring large quantities; respirator with acid/organic vapor cartridge and mist pre-filter required during spray operations or in poorly ventilated areas.

Figure 10. Example of Hazardous Material Warnings (Sheet 3 of 3).

WARNINGS/CAUTIONS

The following Warnings and Cautions pertain to a specific operation/procedure and are referenced throughout this publication.

WARNINGS:

1. Bombs with more than 56 square inches or one area greater than 15 square inches of thermal coating missing shall not be used afloat.
2. (FMU-139) If safing pin is removed from FMU-139 series fuzes and no red and black striping is visible on gag rod sleeve (sleeve not extended), fuze is safe; slightly depress gag rod sleeve and reinsert safing pin. If safing pin cannot be reinserted, notify proper authority for disposition. If red and black striping is visible on extended FMU-139 series gag rod sleeve, fuze may be unsafe. Do not attempt to depress (reset) gag rod/sleeve or reinsert safing pin. Notify proper authority for disposition.
3. (FMU-152) Armed fuze could cause damage to equipment and possible injury to personnel. If gag rod SAFE/ARM indicator is protruding from the safing pin housing and shows red, consider the fuze armed. Notify proper authority.
4. (MK 376) If the pop-out pin is accidentally allowed to pop out, push the pin all the way back in so that both holes align; then install the safety cotter pin. The buzz you hear when you reset the pop-out pin on MK 376 fuzes is normal. If the pin binds or will not reset, the fuze may be armed. Notify proper authority for disposition.

CAUTIONS:

1. If closure ring wrench is not available, use spanner wrench and exercise care to prevent damage to closure ring and fuze.
2. Do not remove setscrew or lock pin as parts could be damaged.

INTRODUCTION

This checklist contains abbreviated procedures necessary to assemble/disassemble General Purpose, Practice Bombs and Fire Bombs.

REQUIRED READING

Assembly crewmembers may perform several steps simultaneously provided they do not invalidate or interfere with a preceding or subsequent step and safety precautions are strictly observed.

Ensure all components have not reached an expired shelf/service life.

Ensure compliance/incorporation of the following Technical Directives, as applicable:

<u>Technical Directive</u>	<u>Subject</u>
AWB 98 REV. C AMEND 1	Inspection of MK 83 MOD 5 Lot No. C-44-1 and C-44-2 for Tuffseal Leakage.
AWB 310 REV. A 33BB Conical Fin.	Inspection of BDU-45/B for Non-Compatibility with BSU-33A/B, BSU-

Figure 12. Example of Introduction and Required Reading (WAM Checklist - Typical).

AV-8B

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ARM/DEARM

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After Landing or Ground Abort	11
Dearming/Rearming Area (Before Engine Shutdown)	11
Dearming/Rearming Area (After Engine Shutdown)	14
Turnaround	19

INTRODUCTION

This checklist contains abbreviated Arm/Dearm procedures for all weapons/stores authorized for flight on the AV-8B aircraft. Weapons/stores are grouped in each section by common procedures. Weapons/stores not listed in a particular section have no required procedures to be performed for that particular function.

REQUIRED READING

Due to the unique nature of aircraft arming/dearming, high tempo of operation, high noise environment, and hazards associated with turning aircraft, it is imperative that all Arm/Dearm crewmembers be highly trained and thoroughly familiar with all weapons/stores covered herein.

The term "SAFE racks" or "ARM racks" means rotation of the SAFE/ARM lever (parent rack) or safety stop lever (BRU-42) to the required position.

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ARM/DEARM

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Figure 13. Layout for Arm/Dearm Checklist (Sheet 1 of 2).

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ARM/DEARM

REQUIRED READING (Continued)

The term "Weapon (or Store) safe" means that the Arm/Dearm crewmembers shall inspect the applicable weapon or store to ensure the fuze/arming mechanism is NOT fully or partially armed, all arming wires/lanyards are properly installed, and no components are loose, missing or damaged.

The conditions and location for the Prior to Launch arming procedures specify the earliest in the launch sequence that the procedures may be performed. The conditions and location for After Landing or Ground Abort procedures specify the latest in the recovery sequence that the safing procedures may be performed.

SAFETY SUMMARY

The following safety summary contains general safety precautions that personnel must understand and apply during arming and dearming evolutions. The warnings, cautions and notes listed will not be repeated within the various sections of this checklist.

- Engine nozzles must be aft and engine at ground idle prior to approaching aircraft.
- To the extent possible, the area immediately forward and aft of

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ARM/DEARM

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SH-60B

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MK-46
TORPEDO

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Weapon Inspection	2
Weapon Loading	11
Postloading Inspection	18
Weapon Unloading	20

INTRODUCTION

This checklist contains abbreviated procedures necessary to load and unload Mk 46 Torpedoes on the SH-60B aircraft.

REQUIRED READING

Loading crewmembers may perform several steps simultaneously provided they do not invalidate or interfere with a preceding or subsequent step and safety precautions are strictly observed.

Ensure compliance/incorporation of the following Technical Directives, as applicable:

1. None.

RESTRICTIONS:

1. Torpedoes carried for Logistic Movement must have arming release wires and static line securely taped to weapon. Preset cable will not be installed. Mk 1/9 arming wire will not be attached to seawater battery.

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TORPEDO

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1 May 2000

Figure 14. Example of Table of Contents, Introduction, and Required Reading (Loading Checklist) (Sheet 1 of 2).

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MK-46
TORPEDO

REQUIRED READING (Continued)

TEST EQUIPMENT/SPECIAL TOOLS:

1. Rubber swaybrace pads P/N 2159194 (4 per station)
2. Plastic tie wrap P/N 3367-6-0 or equal (2 per station)

This checklist does NOT authorize loading for flight. For specific flight authorization, refer to the Tactical Manual or the NAVAIRSYSCOM message. The procedures in this checklist have been verified for the following weapons:

Mk 46 Torpedo (Warshot)
Mk 46 Torpedo (Exercise)
Mk 46 REXTORP (Ballasted)
Mk 46 REXTORP (Unballasted)



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TORPEDO

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Change 1 1 Oct 2000

Figure 14. Example of Table of Contents, Introduction, and Required Reading (Loading Checklist) (Sheet 2 of 2).

INTRODUCTION

This index is designed to provide using activities with a guide to ensure that all existing changes/revisions have been incorporated in aircraft conventional weapon loading, release and control, AWSE, and weapon assembly/disassembly checklists and manuals on hand, and that these publications are the most recent available. Requests for automatic distribution quantities should be submitted on Technical Publications Library (TPL) Diskettes to the Naval Air Technical data and Engineering Service Command (NATEC), Naval Air Station North Island, P.O. Box 357031, Building 90 Distribution, San Diego, CA 92135-7031. Information concerning distribution can be obtained from NATEC via telephone: DSN 735-2357/2570. For Pyro WAM distribution submit requests to Naval Surface Warfare Center (NSWC) Crane, ATTN: Code 4072, 300 Hwy 361, Crane, IN 47522-5001.

Comments and recommendations concerning this publication should be forwarded, via chain of command, to Commander, Naval Air Warfare Center (NAWC), Code 331000D/PST32080, China Lake, CA 93555-6100, with one copy direct to NAWC, Code 331000D/PST32080 and one copy to COMNAVAIRPAC/LANT, COMNAVAIRESFOR, and CGFMFPAC/LANT. Correspondents are requested to include the revision date and changes incorporated in their manual or checklist in all correspondence.

Missile/Pyro publications listed herein are not under the NAWCWD Code 331000D/PST32080 cognizance. The listings are to assist fleet users at the request of Naval Air Technical Data and Engineering Service Command. Technical Publications Deficiency Reports (TPDRs) concerning stock numbers, dates of revisions/changes/rapid action changes, etc., should be directed to the Naval Air Technical Data and Engineering Service (Attn: Code 3.3A78), San Diego, CA. TPDRs concerning the technical content of the publication should be addressed to the Cognizant Field Activity.

NOTES:

1. A National Stock Number (NSN) is assigned to each basic publication and an individual NSN is assigned to each change to facilitate publication updating and reduce cost. **When a basic publication with changes is reprinted (e.g., w/Chg 1 & 2), it will incorporate all changes, revert back to the latest basic or revision date and a new NSN will be assigned.** Reprints of a basic publication without any changes will retain the same NSN.
2. **TMCN** - Technical Manual Change Notice: a change to correct an administrative error in the publishing or printing process. A TMCN will be followed by a formal change during the next scheduled update.
3. The NAWC Code 331000D/PST32080 serves as an information clearing house for U.S. Navy activities on Airborne Weapons, Stores and related items. Questions, concerns, suggestions, comments, or data can be resolved by calling the Ordnance Technical Hotline; Commercial (760) 939-4478, (DSN) 437-4478.

SH-60B

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MK-46
TORPEDO

AIRCRAFT PREPARATION/INSPECTION

1. Release and Control System Checks completed()
2. Loaded stations - LOCKED()
3. BRU-14 Configuration:
 - a. Ignition elements removed.....()
 - b. Rack electrically connected()
 - c. Swaybraces retracted/inboard preset()
 - (1) Present inboard swaybraces as follows:
 - (a) Ensure swaybrace lock nuts up against pylon()
 - (b) Adjust jackscrews to a length of one inch.
(Measurement is made from bottom of lock
nut to top of jackscrew nut).....()
 - (c) After measurement is completed, hold jackscrew in
position and tighten lock nut()
 - d. Install swaybrace pads()
 - e. Suspension hooks open()
 - f. Release unit/rack cocked()
4. Preset cable installed.....()
5. (Inboard stations) Preset cable pullout lanyard
attached to fuselage armament bracket()
6. (Outboard station) Swing arm bracket fully extended;
preset cable pullout lanyard attached to forward ring()

SH-60B MK-46
TORPEDO

Figure 16. Layout for Aircraft/Preparation Inspection (Typical).

WEAPON INSPECTION

1. Firing report available.....()

WARNING .. SUSPENSION BANDS RELEASE WITH SUFFICIENT FORCE TO SERIOUSLY INJURE PERSONNEL.

WARNING IF OTTO II FUEL LEAKAGE IS DETECTED, NOTIFY PROPER AUTHORITY.

- 2. Safety bolts and nuts installed()
- 3. (Warshot/Exercise) No fuel leakage()
- 4. (If applicable) Mk 1/9 arming wire and two Fahnestock clips available()
- 5. Torpedo NOT damaged()
- 6. Remove tape from torpedo openings()
- 7. Arming, release wires, and static line taped to torpedo()
- 8. **(Warshot) Exploder (Fig. 1):**
 - a. "Ss" indicated in window.....()
 - b. Environmental seal edges NOT raised()
 - c. NORMAL/RECOVER switch - NORMAL.....()
- 9. **(Warshot/Exercise) (Fig. 1):**

CAUTION KEEP HANDS CLEAR OF TRANSDUCER WHEN NOSE PROTECTIVE COVER IS REMOVED.

- a. Transducer clean; reinstall cover()
- b. Hydrostatic port clear()
- c. Water inlet port clear and clean()
- d. Seawater battery dry, snap ring installed()
- 10. **(Exercise) (Fig. 1):**
 - a. Safety strap installed.....()
 - b. Flooding valve; remove label exposing cavity, washer NOT corroded()
 - c. (If applicable) Dye pot installed, punctured, replace tape()

Figure 17. Layout for Weapons/Stores Inspection Loading Checklist.

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MK-46
TORPEDO

WEAPON LOADING

A. PREPARATION

1. Aircraft Preparation/Inspection and Weapon
Inspection completed ()
2. (If applicable) Power removed ()
3. Aircraft grounded ()
4. Armament switches positioned (Table 1) ()
5. Place WEAPON LOADED sign in cockpit ()

WARNING

SUSPENSION BANDS RELEASE WITH SUFFICIENT FORCE TO SERIOUSLY INJURE PERSONNEL.

NOTE:

HOISTING BAND/MK 2/ADU/722/E ADAPTER LOCATION 7-7/8 INCHES FORWARD OF AFT LUG.

6. Position/rig loading equipment; remove safety bolt nuts..... ()

B. LOADING

NOTE:

(HOIST LOADING) UNBALLASTED TORPEDO IS TAIL HEAVY. PRESSURE MAY BE APPLIED TO NOSE SECTION TO OFFSET TAIL DOWN ATTITUDE.

NOTE:

SAFETY BOLTS MUST BE REMOVED IMMEDIATELY PRIOR TO LUG AND RACK HOOK ENGAGEMENT OR AS CLEARANCE PERMITS.

1. (If applicable) Apply downward pressure; raise torpedo; remove safety bolts; raise torpedo; latch suspension hooks..... ()
2. Rack indicates latched ()
3. Ensure hooks support torpedo; lock rack..... ()

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TORPEDO

Figure 18. Layout for Weapons/Stores Loading Checklist.

POSTLOADING INSPECTION

1. Armament switches positioned (Table 1) ()
2. WEAPON LOADED sign in cockpit ()
3. Loaded stations - LOCKED ()
4. Swaybraces adjusted ()
5. Ignition elements installed, electrically connected ()
- 6. Inboard stations:**
 - a. 42-inch release wire through groove in aft inboard swaybrace pad ()
 - b. Mk 1/9 arming wire connected to tail solenoid and seawater battery lanyard; wire routed through swaybraces and inboard of aft lug and over 42-inch release wire; lanyard cut and deburred ()
 - c. Preset cable connected, slack removed, secured to aft outboard swaybrace ()
 - d. Preset cable pullout lanyard, 42-inch release wire, parachute band release wire and static line attached to snap hook ()
 - e. Parachute band release wire shortened, cut, bent and deburred ()
- 7. Outboard station:**
 - a. 42-inch release wire through groove in aft inboard swaybrace pad ()
 - b. Mk 1/9 arming wire connected to tail solenoid and seawater battery lanyard; wire routed through swaybraces inboard of aft lug and over 42-inch release wire; lanyard cut and deburred ()
 - c. Preset cable connected, slack removed, secured to aft outboard swaybrace ()
 - d. 42-inch release wire, parachute band release wire and static line attached to snap hook ()
 - e. Parachute band release wire shortened, cut, bent and deburred ()

Figure 19. Layout for Postloading Inspection Loading Checklist.

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MK-46
TORPEDO

WEAPON UNLOADING

A. PREPARATION

1. (If applicable) Power removed()
2. Aircraft grounded()
3. Armament switches positioned (Table 1)()
4. WEAPON LOADED sign in cockpit()
5. Loaded stations - LOCKED()
6. Remove ignition elements()
7. (Exercise/REXTORP) Safety strap installed.....()
8. (Warshot/Exercise) Nose cover installed()
9. Stabilizer clamp installed.....()

WARNING	TO PREVENT ACCIDENTAL RELEASE DURING UNLOADING, ALL ARMING, RELEASE WIRES AND STATIC LINE MUST BE TAPED TO TORPEDO.
----------------	---

WARNING	IF BATTERY ARMING LANYARD IS REMOVED, DO NOT REINSTALL. INSTALL TAPE OVER SEAWATER BATTERY PORT. REJECT TORPEDO.
----------------	--

10. Disconnect arming, release wires, and static line from aircraft, tape to torpedo()
11. Disconnect torpedo preset cable and pullout lanyard from aircraft and torpedo()
12. Position/rig unloading equipment()
13. Retract swaybraces()

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Figure 20. Layout for Weapon Unloading Loading Checklist.

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RELEASE &
CONTROL

AIRCRAFT PREPARATION

1. Aircraft positioned and grounded()
2. Power removed()
3. (If applicable) Remove sonobuoy launcher access cover()
4. (As applicable) Weapon pylon - disconnect P524, P527 (RH), P344, P347 (LH aft) and 2P344, 2P347 (LH fwd) from associated ignition elements.....()
5. Ignition elements removed.....()
6. Armament control switches and circuit breakers:
 - a. (If applicable) Nose Avionics Compartment:
 - (1) LASER - DISABLE()
 - (2) GIMBLE - ENABLE()
 - b. External ICS/ARM panel:
 - (1) DISABLING SWITCH FOR ARMAMENT SAFETY CIRCUIT - NORM()
 - (2) AVIONICS WT ON WHEELS BYPASS - NORM (cover down)()
 - c. Overhead Console:
 - (1) BATT -OFF()
 - (2) EXT PWR - OFF()
 - d. Center/ATO Circuit Breaker Panels:
 - (1) All armament circuit breakers - closed (pushed in)()
 - (2) BACKUP PUMP PWR - open (pulled out).....()
 - e. (If applicable) ACIP (ASQ-165):
 - (1) MASTER ARM - SAFE.....()
 - (2) TORPEDO SELECT - SAFE.....()
 - (3) TORPEDO ARMING - SAFE()
 - (4) TORPEDO LAUNCH - SAFE.....()
 - (5) SONOBUOY LAUNCH - SAFE()
 - f. (If applicable) ACIP (ASQ-198) (Fig. 1 (-60B), Fig. 2 (CORE B), Fig. 3 (RD)):
 - (1) WEAPONS SELECT - OFF()
 - g. (If applicable) ALE-39 Control Panels (Fig. 4):
 - (1) DISP ARM/SAFE - SAFE()
 - (2) PWR OFF/ON/SALVO FLARE - OFF()

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ACFT PREP

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Figure 21. Layout for Aircraft Preparation Release and Control Checklist (Typical).

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RELEASE &
CONTROL

JETTISON SYSTEM CHECK

CHECK PREPARATION

- 1. Aircraft Preparation section completed()
- 2. AN/AWM-54 test set connected as follows (Fig. 5):
 - a. P1 of cable assembly W1 connected to J1 of test set()
 - b. P2 of cable assembly W1 connected to adapter W16()
- 3. Station(s) with fuel tanks installed:
 - a. (RH) Disconnect P521 and P522()
 - b. (LH aft) Disconnect P341 and P342()
- 4. Station(s) without fuel tanks installed:
 - a. Ensure auxiliary fuel tank connector P381 (LH aft) or
P382 (RH) is connected to jumper plug receptacle()

WARNING

PRIOR TO APPLYING POWER, COCKPIT SWITCHES AND CONTROLS MUST BE READY TO RECEIVE POWER.

- 5. Apply external power()
- 6. Proceed to Table I (ASQ 165) or Table II (ASQ 198)()

SH-60B
JETTISON

Figure 22. Layout for Aircraft Preparation for Individual Subsection Check (Typical).

JETTISON SYSTEM CHECK (Continued)

TABLE I		
STEP	TEST SET SWITCHES	AIRCRAFT SWITCHES INDICATIONS
<p>WARNING: ENSURE SONOBUOY LAUNCHER DUMP LEVER IS IN UP POSITION AND LAUNCHER SAFETY LOCKPIN IS IN FREE.</p>		
1	Manually actuate and hold port main mount weight-on-wheels switch.	WOW - off; Rotary valve - VNT; ECU - AU. ()
2	Press and release JETTISON - ALL STORES SONO.	Rotary valve - rotates to each of 25 positions, stops at VNT, clicks are heard; ECU - F2. ()
3	Release port main mount weight-on-wheels switch.	WOW - ON. ()

Figure 23. Layout for Individual Subsection Check (Typical).

POSTCHECK PROCEDURES

1. Aircraft grounded()
2. External power applied.....()
3. Armament control switches and circuit breakers:

NOTE: STATUS OF ACIP SWITCHES CANNOT BE DETERMINED IF POWER HAS BEEN REMOVED.

- a. (If applicable) ACIP (ASQ-165):
 - (1) MASTER ARM -SAFE()
 - (2) TORPEDO SELECT - SAFE.....()
 - (3) TORPEDO ARMING - SAFE()
 - (4) TORPEDO LAUNCH - SAFE.....()
 - (5) SONOBUOY LAUNCH - SAFE()
- b. (If applicable) ACIP (ASQ-198)
 - (1) MISSILE (CORE B) PWR/ARM,
(-60B/RD) POWER - OFF()
 - (2) MK-50 HEATERS - OFF()
 - (3) WEAPONS SELECT - OFF()
 - (4) MASTER ARM - SAFE.....()
- c. External ICS/ARM panel:
 - (1) DISABLING SWITCH FOR ARMAMENT SAFETY
CIRCUIT - NORM()
 - (2) AVIONICS WT ON WHEELS BYPASS - NORM
(cover down)()
- d. Overhead Console:
 - (1) BATT - OFF()
 - (2) EXT PWR - OFF()
- e. Center/ATO Circuit Breaker Panels:
 - (1) All armament circuit breakers - closed (pushed in)()
 - (2) BACKUP PUMP PWR - closed (pushed in)()
- f. (If applicable) ALE-39 Control Panels:
 - (1) DISP ARM/SAFE - SAFE()
 - (2) PWR OFF/ON/SALVO FLARE - OFF()

Figure 24. Layout for Postcheck Procedures (Typical).

**PRIOR TO LAUNCH
REARMING AREA (BEFORE ENGINE TURNUP)**

A. BOMBS

- 1. Remove/stow WEAPON LOADED sign.....()
- 2. Arm rack(s)()

B. GUIDED BOMB UNITS (GBUs)

- 1. Remove/stow WEAPON LOADED sign.....()
- 2. Remove detector cover(s) and packing material(s).....()
- 3. Remove wing and latch assembly safety pin(s).....()
- 4. Arm rack(s)()

C. CLUSTER BOMBS (CBUs)

- 1. Remove/stow WEAPON LOADED sign.....()
- 2. Arm rack(s)()

D. FIRE BOMBS

- 1. Remove/stow WEAPON LOADED sign.....()
- 2. Arm rack(s)()

E. PYROTECHNICS (SUU-25F/A, MK 58 MLM)

- 1. Remove/stow WEAPON LOADED sign.....()
- 2. Arm rack(s)()

F. AIM-9 (SIDEWINDER)/AGM-122A (SIDEARM)

- 1. Remove/stow WEAPON LOADED sign.....()
- 2. Secure forward launcher fairing/access door()

G. TACTS/INSTRUMENTATION PODS

- 1. Remove/stow WEAPON LOADED sign.....()
- 2. Secure forward launcher fairing/access door()
- 3. Remove air data probe cover(s).....()
- 4. Remove launcher detent wrench safety pin()

Figure 25. Layout for Prior to Launch Procedures (Typical) (Sheet 1 of 3).

**PRIOR TO LAUNCH
REARMING AREA (AFTER ENGINE TURNUP)**

NOTE: BOMBS, GBUs, CBU's, FIRE BOMBS, TACTS/INSTRUMENTATION POD, PRACTICE BOMBS, 25MM AIRCRAFT GUN, FUEL TANKS, ECM DO NOT REQUIRE PROCEDURES TO BE PERFORMED IN THE REARMING AREA AFTER ENGINE TURNUP.

NOTE: IF OPERATIONAL CONDITIONS REQUIRE, REARMING AREA PROCEDURES MAY BE PERFORMED IN THE ARMING AREA.

A. AIM-9 (SIDEWINDER)/AGM-122A (SIDEARM)

CAUTION	KEEP HANDS CLEAR OF TRANSDUCER WHEN NOSE PROTECTIVE COVER IS REMOVED.
----------------	---

1. Remove dome protector(s).....()
2. Perform TONE check on each missile()

CAUTION	OVERTRAVEL OF THE MK 36 MOD 8/9 OR MK 57 MOD 2 MOTOR SAFE/ARM MECHANISM BEYOND THE ARM POSITION WILL CAUSE DAMAGE TO THE SAFE/ARM MECHANISM.
----------------	--

NOTE: TO ARM MK36 MOD 8/9 OR MK57 MOD 2 MOTOR, DEPRESS "T" HANDLE AND ROTATE 90 DEGREES COUNTERCLOCKWISE.

3. (MK 36 MOD 8/9 or MK 57 MOD 2 motor) Rotate SAFE/ARM mechanism "T" handle to ARM; remove, "T" handle (Fig. 1).....()

NOTE: TO ARM MK36 MOD 10/11OR MK 57 MOD 3 MOTOR, PULL OUT HANDLE AND ROTATE 90 DEGREES COUNTERCLOCKWISE.

Figure 25. Layout for Prior to Launch Procedures (Typical) (Sheet 2 of 3).

**PRIOR TO LAUNCH
ARMING AREA**

NOTE: BOMBS, GBUs, CBU's, FIRE BOMBS, TACTS/INSTRUMENTATION POD, PRACTICE BOMBS/LGTR, FUEL TANKS, ECM DO NOT REQUIRE PROCEDURES TO BE PERFORMED IN THE ARMING AREA.

A. PYROTECHNICS (SUU 25F/A)

1. Remove dispenser safety pin.....()

B. AIM-9 (SIDEWINDER)/AGM-122A (SIDEARM)

WARNING	DO NOT REMOVE LAUNCHER DETENT HOLDDOWN PIN. PIN REMAINS INSTALLED FOR FLIGHT.
----------------	---

1. Remove launcher detent wrench safety pin(s).....()

C. AGM-65 (MAVERICK)

1. Rotate rocket motor standard arming key(s) 90 degrees counterclockwise; remove key(s)()

D. ROCKETS

1. (If applicable) Remove electrical receptacle dust cover.....()
2. Connect rocket cable to launcher()
3. Remove launcher safety pin and flag assembly (Fig. 3).....()

E. 25MM AIRCRAFT GUN

1. Open gun safing door.....()
2. Remove/stow gun safing pin (Fig. 4).....()
3. Secure gun safing door; indicator fully retracted.....()
4. Secure all access doors/panels()

Figure 25. Layout for Prior to Launch Procedures (Typical) (Sheet 3 of 3).

**AFTER LANDING OR GROUND ABORT DEARMING/
REARMING AREA (BEFORE ENGINE SHUTDOWN)**

NOTE: BOMBS, GBUs, CBU's, FIRE BOMBS, PYROTECHNICS, TACTS/INSTRUMENTATION POD, FUEL TANKS, ECM DO NOT REQUIRE PROCEDURES TO BE PERFORMED IN THE DEARMING/REARMING AREA BEFORE ENGINE SHUTDOWN.

A. AIM-9 (SIDEWINDER)/AGM-122A (SIDEARM)

NOTE: LAUNCHER DETENT WRENCH SAFETY PIN MUST BE INSTALLED IN THE DEARMING AREA.

- 1. Install launcher Detent Wrench Safety pin()

CAUTION

MISSILE DOME PROTECTOR COVER MUST BE INSTALLED PRIOR TO ENGINE SHUTDOWN.

- 2. Install missile dome protector()

B. AGM-65 (MAVERICK)

NOTE: STANDARD ARMING KEY SAFING PROCEDURES MUST BE DONE IN THE DEARMING AREA.

- 1. Install Standard Arming Key; press arming key inward and rotate key 90 degrees clockwise (Fig. 2)()

C. ROCKETS

- 1. Install launcher safety pin and flag assembly (Fig. 3).....()
- 2. Electrically disconnect rocket cable from launcher.....()

Figure 26. Layout for After Landing Rearming or Ground Abort Dearming Procedures (Typical) (Sheet 1 of 3).

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ARM/DEARM

AFTER LANDING OR GROUND ABORT DEARMING/REARMING AREA (BEFORE ENGINE SHUTDOWN) (Continued)

WARNING

(LAU-61/68) THERMAL/RADHAZ BARRIERS ARE REQUIRED FOR SHIPBOARD OPERATIONS. FORWARD BARRIER IS OPTIONAL WHEN USING INERT WARHEADS.

- 3. (If applicable) Install thermal/RADHAZ barriers()

D. PRACTICE BOMBS/LGTR

NOTE:

(EXCEPT LGTR) UNLOADING WITH ENGINE OPERATING MAY BE PERFORMED BUT MUST BE HELD TO A MINIMUM CONSISTENT WITH OPERATIONAL REQUIREMENTS. IF UNLOADING WITH ENGINE OPERATING, PROCEED WITH THE FOLLOWING STEPS.

1. PREPARATION FOR UNLOADING:

- a. Ground aircraft()
- b. Armament switches positioned (Table 1)()
- c. Safe racks()
- d. (BDU-33D/B) Install safety block and safety pin()
- e. (MK 106) Install safety pin and cotter pin()
- f. (BRU-42/A) Remove cartridges()
- g. Retract swaybraces()

2. UNLOADING:

- a. Raise weapon until lugs float()
- b. Arm rack()
- c. Release rack; lower weapon()
- d. (As applicable) Perform prior to launch procedures()

AV-8B
ARM/DEARM

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Figure 26. Layout for After Landing Rearming or Ground Abort Dearming Procedures (Typical) (Sheet 2 of 3).

**AFTER LANDING OR GROUND ABORT DEARMING/
REARMING AREA (AFTER ENGINE SHUTDOWN)**

A. BOMBS

NOTE: THE FMU-130 SERIES ELECTRIC TAIL FUZE DOES NOT USE AN ARMING WIRE. FUZE SAFETY IS DETERMINED BY THE GAG ROD NOT EXTENDED.

- 1. (As applicable) Weapon(s) safe; arming wire(s) installed.....()
- 2. Safe rack(s).....()
- 3. Armament switches positioned (Table 1)()
- 4. (If applicable) Place WEAPON LOADED sign in cockpit.....()

B. GUIDED BOMB UNITS (GBUs)

- 1. Weapon safe; arming wire(s)/cables installed()
- 2. Safe racks.....()
- 3. Install wing and latch assembly safety pin(s).....()
- 4. Install detector cover(s) and packing material(s)()
- 5. Armament switches positioned (Table 1)()
- 6. (If applicable) Place WEAPON LOADED sign in cockpit.....()

C. CLUSTER BOMBS (CBUs)

- 1. Weapon(s) safe; extractors installed()
- 2. Safe rack(s).....()
- 3. (CBU-78) Install thermal battery safety pin; set SD selector to safe()
- 4. Armament switches positioned (Table 1)()
- 5. (If applicable) Place WEAPON LOADED sign in cockpit.....()

D. FIRE BOMBS

WARNING

MK 13 INITIATOR MUST BE CONSIDERED ARMED IF ARMING VANES EXTEND THROUGH TEAR TOP OR TEAR TAB IS MISSING. NOTIFY PROPER AUTHORITY.

- 1. (MK 13 Initiators) Tear tops NOT damaged; lanyards installed()

Figure 26. Layout for After Landing Rearming or Ground Abort Dearming Procedures (Typical) (Sheet 3 of 3).

TURNAROUND

A. BOMBS, GBUs, CBU, FIRE BOMBS, PYROTECHNICS, AIM-9/AGM-122, TACTS/INSTRUMENTATION POD, AGM-65, ROCKETS, PRACTICE BOMBS/LGTR, 25MM AIRCRAFT GUN, FUEL TANKS

1. After Landing or Ground Abort procedures completed()

NOTE: UNEXPENDED CARTRIDGES/IGNITION ELEMENTS NEED NOT BE REMOVED, BUT MUST BE ELECTRICALLY DISCONNECTED.

2. (For stations to be loaded) Perform Aircraft Preparation/ Inspection through Weapon/Store Loading()
3. Perform Postloading Inspection()
4. Perform Prior to Launch procedures()

B. CATM-9 with SNUBBER CLAMP ASSEMBLIES

1. After Landing or Ground Abort procedures completed()
2. Retorque snubber clamp assemblies to 35 in-lbs()
3. Perform Postloading Inspection()
4. Perform Prior to Launch procedures()

C. ECM (ALE-39)

1. After Landing or Ground Abort procedures completed()
2. Armament switches positioned (Table 1)()
3. (Dispensers not requiring unloading) Retorque dispenser module to 55±5 in-lbs()

NOTE: ALL DISPENSER MODULES MUST BE DOWNLOADED IF ECM SYSTEM IS TO BE REPLENISHED.

4. For stations to be loaded:
 - a. Download empty/partially expended modules()
 - b. Perform Aircraft Preparation/Inspection through Weapon Loading()
5. Perform Postloading Inspection()
6. Perform Prior to Launch procedures()

Figure 27. Layout for Turnaround Procedures (Typical).

2-10. The aircraft armament system consists of the following systems: Weapon system, Torpedo system, Sonobuoy system, ECM (AN/ALE-39) system, Missile and Jettison system. The aircraft armament system provides the common circuits, basic controls and components necessary to release weapons or stores.

2-11. COMPONENT DESCRIPTION AND LOCATION.

2-12. The aircraft armament system consists of various basic controls and components. Components and controls used in specific subsystems are contained in the subsystem description.

2-13. **ARMAMENT SYSTEM BASIC CONTROLS.** The SH-60B Series aircraft consists of the following armament system basic controls: Armament Control Indicator Panel (ACIP); Armament Signal Data Converter (ASDC); Caution Advisory Panel; Electronic Control Unit (ECU); External Switch for Armament Safety Circuit; Avionics Weight on Wheels Bypass; Emergency Control Panel; and the Armament circuit breakers. The components location and description are described in the following paragraphs.

2-14. **Armament Control Indicator Panel (Figure 23).** There are two armament control indicator panels (ACIP) (ASQ-165 and ASQ-198) located on the lower center console. The ACIPs consist of switches and controls for arming/safing the armament system, auto/manual sonobuoy selection and launch, torpedo programming and launch. The programming and launch functions for aircraft equipped with the Penguin missile system use the ASQ-198 equipped ACIP. The controls, switches, and displays on the ACIPs are pushbutton switches. These pushbutton switches mechanically change position when actuated. Switch positions and indications are listed in table 2-1 or 2-2.

2-15. **Armament Signal Data Converter (ASDC) (Figure 23).** The Armament Signal Data Converter (ASDC) is located in the Airborne Tactical Officer's (ATO's) seat well. The ASDC converts ACIP input signals to output signals of the selected system for release and control of torpedoes and sonobuoys.

2-16. **Caution Advisory Panel (Figure 23).** The armament portion of the Caution Advisory Panel, on the center instrument panel of the cockpit, consists of ARMAMENT ARMED, LAUNCH/JETT FAIL, and WOW capsules. The capsules will light when an indication or select condition exists on the ACIP or within the armament system.

2-17. **Electronic Control Unit (ECU) (Figure 23).** The Electronic Control Unit (ECU) is a microprocessor unit that is programmed to control most of the sonobuoy launcher system operations. The ECU is physically mounted on top of the sonobuoy launcher. An AUTO/MANUAL switch is provided on the ECU front panel. The front panel also provides a fault STATUS display. Faults encountered during system startup or during system self-test will be displayed. If more than one failure exists, the failure messages are cycled at 3-second intervals.

2-18. **External ICS/ARM Access Panel (Figure 2-3).** The DISABLING SWITCH FOR ARMAMENT SAFETY CIRCUIT and the AVIONICS WT ON WHEELS BYPASS switch are both located in the external ICS/ARM access panel. the DISABLING SWITCH FOR ARMAMENT SAFETY CIRCUIT is a momentary, normally off switch that works in conjunction with the Weight-on-Wheels switch and the MASTER ARM switch. This switch provides a means of energizing the launch system for ground test. The AVIONICS WT ON WHEELS BYPASS switch provides a means by which certain avionics equipment may be energized for on-the-ground test.

2-19. **Weight-On-Wheels Switch (Figure 2-3).** The switch in the left stub wing provides a weight-on-wheels signal to the miscellaneous relay panel. The signal is also routed to the aft relay panel. The switch disables the sonobuoy, bomb rack, hoist shear, cargo hook shear, RAST shear, and Magnetic Anomaly Detection (MAD) shear circuits. This prevents inadvertent firing of these systems on the ground.

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Figure 28. Example of Paragraph Heading (Manual).

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.
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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-M-81310F(AS)	2. DOCUMENT DATE (YYYYMMDD) 20001101
3. DOCUMENT TITLE MANUALS, TECHNICAL: AIRBORNE WEAPONS/STORES LOADING/WEAPON ASSEMBLY/ SUPPORT EQUIPMENT CONFIGURATION		
4. NATURE OF CHANGE <i>(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)</i>		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME <i>(Last, First, Middle Initial)</i>	b. ORGANIZATION	
c. ADDRESS <i>(Include ZIP Code)</i>	d. TELEPHONE <i>(Include Area Code)</i> (1) Commercial	7. DATE SUBMITTED (YYYYMMDD)
	(2) DSN <i>(If applicable)</i>	
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a. NAME COMMANDER NAVAL AIR WARFARE CENTER	b. TELEPHONE <i>(Include Area Code)</i> (1) Commercial (908) 323-7488 (2) DSN 624-7488	
c. ADDRESS <i>(Include ZIP Code)</i> ATTN: CODE 41400B120-3 HIGHWAY 547 LAKEHURST, NJ 08733-5100	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office, 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 DSN 289-2340	