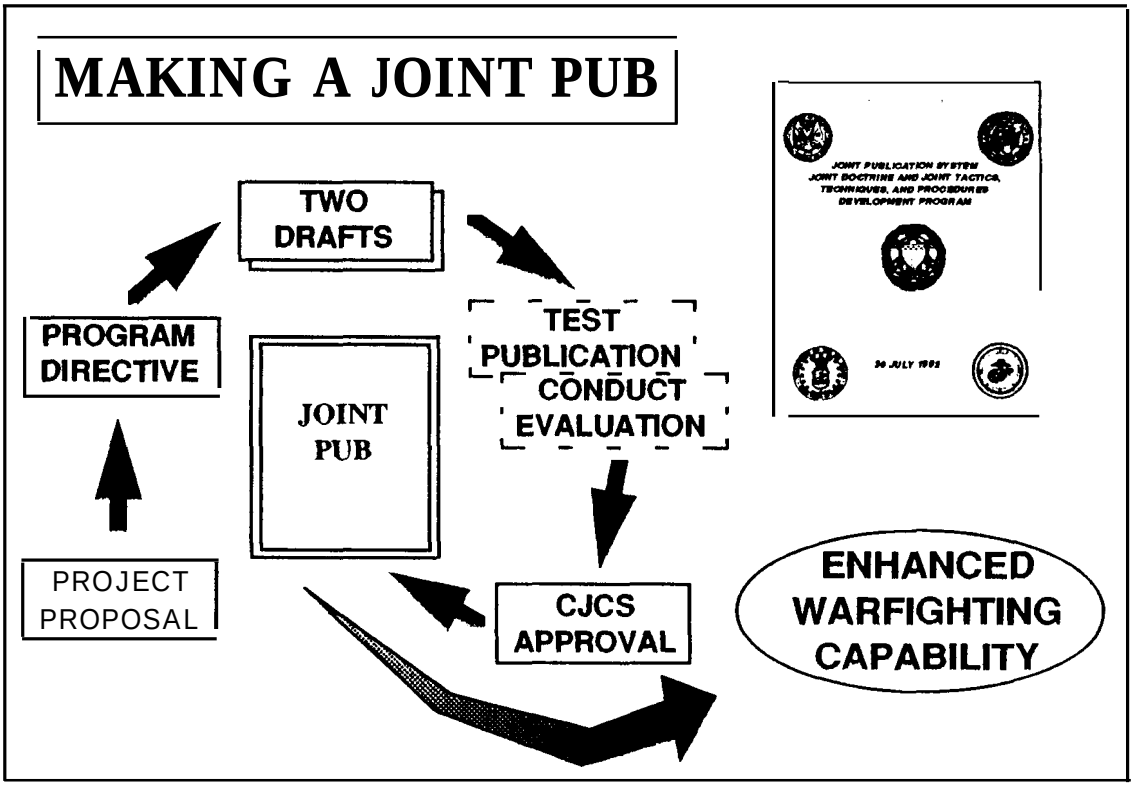
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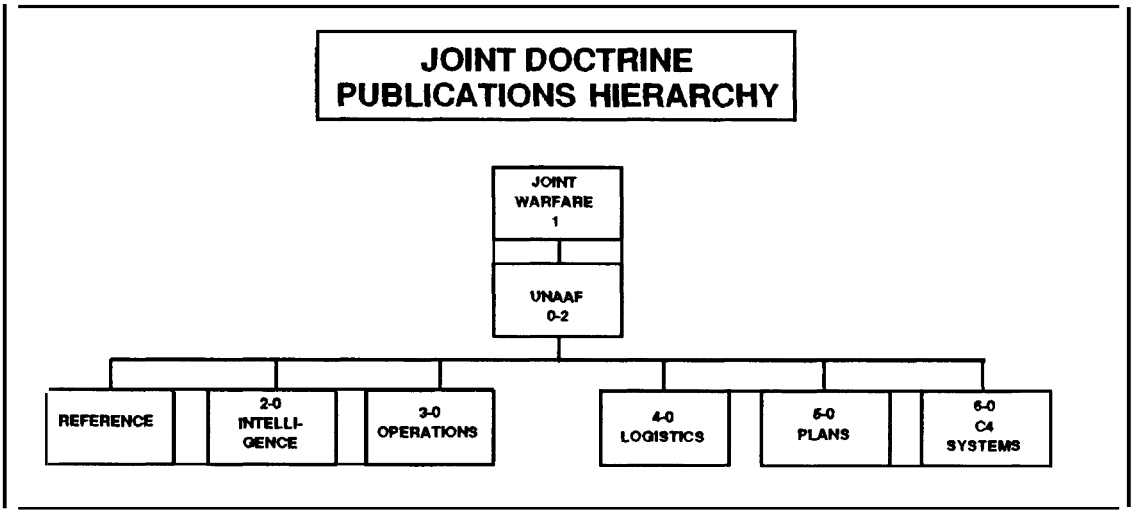
JOINT TACTICS, TECHNIQUES, AND PROCEDURES FOR SHIPBOARD HELICOPTER OPERATIONS

28 JUNE 1993

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Joint Pub 3-04.1
28 June 1993

MEMORANDUM FOR: Distribution List

Subject: Joint Pub 3-04.1, "Joint Tactics, Techniques, and Procedures for Shipboard Helicopter Operations"

1. This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff. It sets forth joint tactics, techniques, and procedures for the activities and employment of the Armed Forces of the United States during shipboard helicopter operations.

2. Recommendations for changes to this publication should be submitted to the Director for Operational Plans and Interoperability (J-7), Joint Staff, Washington, D.C. 20318-7000.

3. When a Joint Staff directorate submits a proposal to the Chairman of the Joint Chiefs of Staff that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal.

4. The Military Services and other organizations are requested to notify the Director, J-7, Joint Staff, when changes to source documents reflected in this publication are initiated.

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7. The lead agent for this publication is the US Navy.

8. The Joint Staff doctrine sponsor for this publication is J-7.

For the Chairman of the Joint Chiefs of Staff:

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Secretary, Joint Staff

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PAGE	CHANGE	PAGE	CHANGE
i thru viii	O	B-B-1 thru B-B-6	O
I-1 thru I-8	O	B-C-1 thru B-C-4	O
II-1 thru II-2	O	B-D-1 thru B-D-6	O
III-1 thru III-6	O	C-1 thru C-10	O
IV-1 thru IV-2	O	D-1 thru D-2	O
V-1 thru V-18	O	D-A-1 thru D-A-8	O
VI-1 thru VI-10	O	D-B-1 thru D-B-4	O
VII-1 thru VII-2	O	D-C-1 thru D-C-6	O
VIII-1 thru VIII-16	O	D-D-1 thru D-D-2	O
IX-1 thru IX-4	O	D-E-1 thru D-E-4	O
A-1 thru A-2	O	D-F-1 thru D-F-4	O
A-A-1 thru A-A-6	O	E-1 thru E-4	O
A-B-1 thru A-B-2	O	F-1 thru F-28	O
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A-D-1 thru A-D-2	O	H-1 thru H-20	O
B-1 thru B-2	O	GL-1 thru GL-28	O
B-A-1 thru B-A-6	O		

Deleted pages: None.

JOINT TACTICS, TECHNIQUES, AND PROCEDURES FOR SHIPBOARD HELICOPTER OPERATIONS

PREFACE

1. Purpose. This publication sets forth the tactics, techniques, and procedures for conducting joint shipboard helicopter operations and describes how forces will be employed in accordance with doctrine set forth in Joint Publication 3-04, "Joint Maritime Operations (AIR)."

2. Application

a. The Joint tactics, techniques, and procedures (JTTP) established in this publication apply to the commanders of combatant commands, joint task forces, and the subordinate components of these commands.

b. The currency and other requirements listed in this publication apply to all DOD agencies for helicopter operations on board USN ships. Requests for waivers to the currency requirements listed in this publication will be submitted using the format in Annex 2 of Appendix A. All other waiver requests for shipboard helicopter operations shall be submitted through the appropriate joint force chain of command using the format in Annex 3 of Appendix A.

c. In applying JTTP set forth in this publication, care must be taken to distinguish between distinct but related responsibilities in the two channels of authority to forces assigned to combatant commands. The Military Departments and Services recruit, organize, train, equip, and provide forces for assignment to combatant commands and administer and support these forces. Commanders of unified and specified commands exercise Combatant Command (command authority) over these assigned forces. Service component commanders are responsible both to joint force commanders (JFC) in the operational chain of command and to the Military Departments and Services in the chain of command for matters that the joint force commander has not been assigned authority.

3. Scope. This publication incorporates joint and Service tactics, techniques, and procedures into a single-source publication and provides the guidance and procedures necessary

to plan, coordinate, and conduct joint shipboard helicopter operations from US Navy ships.

4. Basis. This publication is based on the following primary sources:

a. Joint Pub 0-2, 1 December 1986, "Unified Action Armed Forces (UNAAF)."

b. Joint Pub 1-02, 1 December 1989, "DOD Dictionary of Military and Associated Terms."

c. Joint Pub 1-01, 15 June 1990; "Joint Publication System (Joint Doctrine and JTTP Development Program)."

d. Joint Pub 3.04, 31 July 1991, "Doctrine for Joint Maritime Operation (AIR)."

5. The following documents provide specific procedures for aircraft operations aboard aviation and aviation capable ships. Familiarity with the procedures in these manuals is essential prior to conducting shipboard operations.

a. NAVAIR 0080T-105, CV NATOPS Manual.

b. NAVAIR 0080T-106, LHA/LPH/LHD NATOPS Manual.

c. NWP-42, Shipboard Helicopter Operating Procedures.

d. COMDTINST M3710.2 (series), Shipboard Helicopter Operational Procedures Manual.

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CHAPTER I

SHIPBOARD HELICOPTER OPERATIONS OVERVIEW

1. General

a. Shipboard helicopter operations are different from land-based operations. This publication provides operating and aviation ordnance procedures required to plan and conduct shipboard helicopter operations, and places emphasis on single-ship, single-helicopter independent operations.

b. The publication is written to reflect peacetime routine operations that may carry into warfighting execution and within that context assumes that the deployment of joint force helicopters on board USN and USCG ships is the result of careful presail planning and not driven by a crisis response or surge requirement. This publication describes shipboard helicopter operational procedures for both embarked and transient aircraft and aviation detachments. Some of the terminology, regulations, and routine encountered aboard ship reflect naval traditions and ways, and are necessary to efficient and safe operations.

c. A ship is designed to provide warfighting requirements to operate in the three-dimensional maritime environment. In aviation support, the ship provides the combined benefits of a landing zone, maintenance and work areas, fuel farm, air operations planning facilities, and command and control. She also provides for sustainment and creature comforts including living, dining, and recreation provisions, as well as other daily necessities such as the ship's laundry, store, and barber shop.

d. Above all else, the shipboard environment demands the epitome of teamwork. At any time there can be an event, combat-related or otherwise (e.g., heavy weather), that may affect every member of the crew. Even during peacetime, the ever-present dangers of flooding or fire can require sounding "General Quarters" which stations the crew (including helicopter detachments) to an assigned battle station. In flight operations it is important to understand the potential lethality of the flight deck environment. If an aircraft mishap occurs

there is the real possibility of a major conflagration because of the explosive characteristics of fuel and ordnance, that if not properly responded to, may cause the loss of ship and lives. It is incumbent on every person embarked on a ship to know their responsibilities during the many evolutions that transpire during normal ship's routine, and ship's company (crew) has the responsibility to impart that knowledge to personnel not familiar with ship surroundings.

e. Daily shipboard routine is promulgated in the Plan Of the Day (POD). The POD is the primary means of announcing each day's schedule of important events and will normally include the daily flight schedule on nonaviation ships, whereas on aviation ships it will be promulgated as a daily airplan. The ship's Executive Officer is responsible for the POD, and, when signed, it constitutes a lawful general order. For information that needs to be passed to the crew in a timely fashion, there is a general announcing system (1MC) operated from the ship's bridge.

2. Scope

a. The joint tactics, techniques, and procedures (JTTP) established by this publication apply to unified and specified commands, subordinate unified commands, and joint task forces. The JTTP apply to joint force helicopter operations conducted to achieve military objectives in the maritime environment. This publication addresses potential threats in general terms and does not seek to establish a primary foe or limit itself to a particular scenario or theater of operations. Circumstances will demand flexible application of JTTP to make the most effective use of military capabilities.

b. These procedures apply to individual operations, exercises, and training involving joint force helicopter operations from USN and USCG ships. General procedures relating to staging and operating in the shipboard environment are addressed. However, specific mission tactics or procedures are not addressed. Consult the source documents listed in the Preface for specific procedures. Wind envelopes (the wind limits for individual helicopter and ship combinations) are contained in Naval Warfare Publication 42, "Shipboard Helicopter Operating Procedures Manual" and COMDTINST M3710.2, "Coast Guard Shipboard Helicopter Operational Procedures Manual." These pubs can be obtained through normal Military Service publication distribution

centers. Requests for inclusion on the NWP 42 distribution list should be forwarded to:

Chief of Naval Operations (N889F)
Pentagon, Room 4E419
Washington, D.C. 20350-2000

DSN: 224-6024
Commercial: (703) 614-6024

Requests for inclusion on the COMDINST M3710.2 distribution list should be forwarded to:

Commandant (G-OAV)
USCG Headquarters
2100 Second St. (SW)
Washington, DC 20593-0001

Commercial: (202) 267-0952

c. This publication addresses JTTP for joint-Service operations. Ships and aviation units contemplating such operations are required to obtain and maintain their mission- or aircraft-specific qualifications and proficiency in accordance with parent-Service regulations.

3. Objective. This publication provides guidelines for the safe and effective conduct of joint helicopter operations from USN and USCG ships. It also serves as a planning and implementation guide for joint force commanders.

4. Flight Operations. Specifics of shipboard helicopter operations are addressed in detail by this publication. A quick overview of events will provide a general impression of what to expect in maritime helicopter operations.

a. From the aircrew perspective, there is a sequence of events that occurs when flying inbound for landing on a ship. Simultaneously, the ship will be executing a series of evolutions to receive the inbound helicopter. Having received an overhead message in advance of scheduled operations, the aircrew will know the ship's location, assigned radio and navigation aid frequencies, and time expected to arrive overhead the ship.

b. Ships, unless constrained by outside influences (other ships, restricted or warning areas, national airspace, military operating areas (MOAs)), have airspace control areas that need to be adhered to. See Appendix B for figures. Aircrews are expected to check in with the

ship prior to entering the control area, or as soon as possible, emission control conditions permitting. When communicating with the ship the international or daily changing call sign (as specified in the overhead message) should be used. The aircraft will be asked for information including:

(1) Position.

(2) Souls on board.

(3) Fuel remaining.

c. The ship's secondary controlled airspace, the control zone, extends out 5 nautical miles in radius up to 2500 feet above ground level (AGL) (much like an airport traffic area). At this juncture or when advised, the helicopter reinitiates radio contact with the ship and should receive pertinent landing information to include:

(1) Deck status information (red, not ready to conduct flight operations, or green, ready to conduct flight operations).

(2) Base recovery course of ship (BRC) (magnetic heading of ship during aircraft recovery).

(3) Wind speed and direction over the deck.

(4) Pitch and roll of the ship.

(5) Altimeter setting.

d. From the ship perspective, after a helicopter checks in for landing, the ship commences preparations to receive the helicopter. The helicopter will communicate with a controller. The controller notifies the CIC watch officer or tactical action officer (TAO) who in turn informs the officer of the deck (OOD) of the inbound helicopter. The OOD, with clearance from the ship's captain, directs that flight quarters be set. The OOD is responsible for the safety of the ship.

e. The manning of flight quarters literally impacts the entire ship, especially with smaller surface combatants. Sailors from every division participate as part of the flight quarters team. They will make up the firefighting team, high-capacity firefighting foam stations (HICAPs), search and rescue (SAR) boat crew, repair parties, the

helicopter control station, sound-powered phone talkers, signal bridge, and other teams and stations dependent on the type of operations to expect. It is most likely that the flight quarters has taken sailors away from their primary work area. Flight quarters is a manpower-intensive evolution from the ship's perspective, and therefore, it is imperative that it be completed as quickly and efficiently as possible.

f. In visual meteorological conditions (VMC) conditions, the aircrew will report visual acquisition of the ship, and unless otherwise directed, proceed inbound toward the ship for landing. When the helicopter control officer (HCO) in the helicopter control station visually sights the helicopter, this information is reported to the OOD and CIC. After visual sighting, control of the helicopter is turned over from CIC to the HCO. The analogy is a handoff from approach control to the tower. The HCO passes base recovery course (BRC), winds over the deck, pitch (vertical motion of the deck), and roll of the deck and clearance to land. A typical call from the HCO would be:

> "Aircraft call sign, green deck (ship is ready to conduct flight operations), BRC is 180 (magnetic heading of ship), winds are 30 degrees to port (30 degrees off centerline of ship to the left side, looking from the back of the ship toward the front of the ship), pitch one, roll four (amount of ship's movement in degrees), altimeter 29.92."

g. The helicopter will then complete the landing checklist prior to final approach to landing and report "landing checklist complete, gear down and locked (if applicable), right seat (or left seat) landing." This cues the landing signal enlisted (LSE) in the Navy or LSO (landing signal officer) in the Coast Guard to properly position on the flight deck so as to provide direction and maintain eye contact with the pilot at the controls.

h. The greatest degree of landing difference between land and sea operations occurs from short final to wheels on deck. For both, the rate of closure to the intended landing spot is affected by head winds, but for the sea environment this is complicated by relative motion with the ship's movement through the water. As the helicopter approaches the flight deck, the uninitiated should avoid a tendency to fixate on the movement of white water from the ship's waterline to the wake. Another area of caution is accounting for burble effects of wind around

the superstructure of the ship. Frequently, as the flight deck is approached, there is a potential to get hung up by the invisible "wall" on smaller ships, an area of pressure or wind that requires a correction of additional power and nose attitude to transition. As soon as the "wall" is overcome, then correction is immediately canceled, and the helo air taxies to a hover over the spot and lands.

i. In hovering over the deck, it is extremely important to guard against drift and a tendency to overcorrect. The pilot's scan should not be limited to the immediate flight deck vicinity but should take the horizon, ship's amidships, and the flight deck area into scan. The amidships (middle of the ship) is the area of least movement as seas increase in intensity. This will reduce the propensity to "chase the deck," which makes the shipboard landing more difficult. When stabilized over the deck and ready to set down, the pilot needs to time the deck so the helicopter touches down at that moment the ship moves the least, the bottom or top of the swell, the top being preferred. It is important not to land as the deck is coming up; under the right conditions a hard landing can result, which could damage the aircraft.

j. Once the helicopter is safe on deck, it will normally be chocked and chained (if applicable) to the deck to prevent movement on the deck. The HCO then reports to the OOD that the helicopter is secured on deck, which allows the OOD to maneuver the ship with due caution to any engaged helicopters on the flight deck. If the helicopter disengages the rotor system and shuts down, the OOD will maintain the same course as during landing and an amber deck status light (yellow signal light) will be provided to signal disengagement. Rotor engagement or disengagement is a hazardous evolution, particularly when winds are strong or gusty, the deck is moving, or the helicopter does not have droop stops and/or rotor brake.

k. After the shutdown of the helicopter is complete, the pilot(s) report to CIC for mission debriefing.

l. The launch sequence is basically the reverse of the recovery sequence. Approximately 90 minutes before the scheduled launch time, the pilot(s) reports to CIC for a mission brief. Approximately 30 minutes before launch time, the ship sets flight quarters. If the helicopter is not spotted on the deck already, preparations are made to do so. The aircrew accomplishes the preflight checklist and boards the aircraft, completing the checklists up to engine start.

m. At this point, permission is requested from the HCO to start engine(s). A red deck status light will be provided in coordination with the LSE or LSO for clearance to start engine(s). The aircrew then requires clearance to engage the rotor system from the HCO. Rotor engagement is done under a yellow deck status light. For those helicopters with simultaneous engine start and rotor engagement, the evolution will be accomplished using the yellow deck status light. As with rotor disengagement, the rotor engagement can be hazardous until the blades achieve sufficient speed.

n. Takeoff clearance will be provided by the ship's CO via the OOD and HCO in conjunction with the green deck status light and signal from the LSE or LSO. The HCO will relay ship's BRC, winds, pitch and roll, altimeter, and permission to launch. When ready, the aircrew, using hand signals, calls for the removal of the chocks and tie-down chains (it is the pilot's prerogative to fly out of the chocks or take off without chocks in place).

o. With chain and/or chocks removed, the helicopter lifts into a hover, checks gauges and power, then slides out over the side of the ship (usually parallel to the line-up line) and executes a normal takeoff. Again, it is important to properly time the deck and in this case takeoff is best accomplished as a swell lifts the deck.

p. When safely airborne, the helicopter reports "operations normal" to the HCO, who in turn passes the helicopter to the controller in CIC. Mission dependent, the ship may or may not stand down from flight quarters or go to a 15-minute standby to resume flight quarters.

5. The following documents provide specific procedures for aircraft operations aboard aviation and aviation-capable ships. Familiarity with the procedures in these manuals is essential prior to conducting shipboard operations (also see Appendix G for additional reference information).

a. NAVAIR 0080T-105, "CV NATOPS Manual."

b. NAVAIR 0080T-106, "LHA/LPH/LHD NATOPS Manual."

c. NWP-42, "Shipboard Helicopter Operating Procedures."

d. Shipboard Aviation Facilities Resume, NAEC-ENG-7576, for specific deck configurations.

e. COMDTINST M3710.2 (series), "Shipboard Helicopter Operational Procedures Manual."

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CHAPTER II

COMMAND RELATIONSHIPS

1. Purpose. This publication supplements Joint Pub 3-04, "Doctrine for Joint Maritime Operations (Air)" (JMO(AIR)), and provides guidance for command relationships when helicopter units embark on ships. Overall command, control, and communications stipulated in JMO(AIR) apply.

2. Joint Force Commander. Joint force commanders may exercise combatant command (COCOM) when the JFC is the unified or specified commander or operational control (OPCON) of joint forces in accordance with Joint Pub 0-2, "Unified Action Armed Forces (UNAAF)." The JFC, under the concept of JMO(AIR), employs joint force air assets to achieve military objectives in the maritime environment. JMO(AIR) forces are employed to destroy or reduce to an acceptable level the enemy air, surface, and subsurface threat to friendly forces and to suppress enemy sea commerce; gain and maintain local air superiority in the maritime environment to protect vital sea areas and sea lines of communications (SLOCs); support land-based operations; and execute power projection missions ashore.

3. Ship's Commanding Officer (CO). Navy and Coast Guard regulations set forth the authority of the ship's commanding officer with respect to aircraft embarked in or operating from the ship. When operating with a joint helicopter detachment embarked, the JFC's Operation Order will define command relationships for the assigned mission. That command relationship will normally apply from initial embarkation until final debarkation. In all cases, the ship's commanding officer retains authority over embarked units, including all helicopter operations involving the safety of the ship.

4. Detachment Officer In Charge (OIC). A detachment OIC shall be provided for embarked joint operations. The OIC reports directly to the ship's commanding officer, air wing commander, or authority specified by the JFC for the mission assigned. Administratively, the OIC normally reports to the ship's executive officer (XO) for matters of day-to-day routine with respect to his detachment while embarked on the ship. When embarked on an aviation-capable or amphibious assault aviation ship, the OIC reports to the officer specified in the appropriate JFC tasking order regarding the assigned mission and administrative routine. Normal

procedure will be for the organic helicopter squadron on the aircraft carrier to act as host for a helicopter detachment and to provide liaison between the detachment, the ship and the embarked air wing. The OIC has the authority and responsibility to:

a. Initiate coordination for a presail conference to be held prior to the actual operation.

b. Coordinate detachment requirements with the executive officer of the ship to be embarked on.

c. Provide certification documents to the ship's commanding officer on the detachment's completion of presail requirements as set forth in paragraph 2 of Chapter IV.

d. Coordinate all requirements for communications to higher authority with the ship's commanding officer.

e. Apprise the ship's commanding officer and operations officer of operational and support requirements that directly affect the ship's operations.

f. Apprise the ship's commanding officer of detachment readiness when required for operational reporting requirements to higher authority.

g. Ensure detachment compliance with ship's routine operating and administrative instructions.

5. Scheduling and Funding

a. In order to program sufficient resources over the long term, estimates for annual training requirements will be provided to combatant commanders by the parent Service. Routine training requirements will be submitted in time for inclusion in the quarterly employment schedule conferences. Emergent training requirements identified after the quarterly employment schedules conference will be handled case-by-case.

b. The USN and USCG will provide ship services to support military deck landing qualifications (DLQ) training requirements. Individual Services will provide assets to conduct the training and will be responsible for helicopter operating costs. Expenses for TDY personnel and operating costs to provide deck qualification training for military aviators will be born by the respective Service.

CHAPTER III

TRAINING

1. Training Ship's Personnel. Maximum operational effectiveness and flight safety require extensive training in the areas of command and control, aircraft coordination, and flight deck procedures. In addition to the standard requirements beginning in paragraph 2 of Chapter IV, the following additional requirements will be met in order to safely operate helicopters aboard ships.

a. Air officer, aviation officer, detachment officer in charge, or a designated officer will brief as follows:

(1) Commanding Officer (CO) and Executive Officer (XO). The CO and XO will receive a thorough brief from the air or aviation department head and the OIC of the Service helicopter detachment. This briefing will cover, but should not be limited to, planned training and operational evolutions. Particular emphasis will be placed on the relation of each evolution to normal operations and any waiver requirements.

(2) Helicopter Control Officer (HCO). The HCO or air officer will thoroughly brief the OIC of the Service unit before commencing joint flight operations. This brief will cover, but is not limited to:

(a) Radio communications and terminology. See recommended brevity codes in Glossary.

(b) Light and hand signals.

(c) Aircraft configuration, including fueling, armament, tiedown, and rescue specifics.

(d) Night-vision device (NVD) procedures and operating techniques.

(e) Emergency procedures.

b. Ship's Air or Aviation Officer. Flight Deck Officer or Director, and Flight Deck Cargo Supervisor. Key air operations personnel will be briefed on planned

operations by the ship's operations officer. Coordination of flight deck evolutions and operation specific procedures will be covered in detail.

c. Officer of the Deck (OOD). All OODs will be briefed by the air or aviation department head and operations officer regarding specific limitations on deck movement, wind envelopes, and the ship's light configuration.

d. Engineer Officer or Aviation Fuels Officer. These officers will be briefed by the embarked detachment with regard to the type of fuel to be brought aboard by the Service units, fuel requirements, and fueling or defueling procedures once aboard. Particular attention will be paid to the hazards of JP-4 and its effect on storage risks, volatility of mixtures, and firefighting considerations. The engineering or aviation fuels officer is responsible for routine fuel sample inspections and will provide a fuel sample for the helicopter aircraft commander during "hot refuelings" (refueling with engines, APUs, and/or rotors in operation).

e. Crash Crew or Fire Party On-Scene Leader. Firefighting and rescue personnel will be briefed by the embarked detachment regarding aircraft particulars as they pertain to rescue and salvage operations. Once embarked for operations, the helicopter detachments will provide crash crew personnel with orientation lectures on rescue access, armament safing, ordnance, firefighting hazards, and aircraft emergency shutdown procedures.

f. Landing Signal Officer or Landing Signalman Enlisted (LSO or LSE). The LSE or LSO will be briefed by the embarked detachment on special requirements with regard to lighting, signals, NVDs, aircraft securing, and fueling operations.

g. Air Controllers and Combat Information Center (CIC) Personnel. Air control personnel will be briefed by the operations officer with regard to communications and identification equipment, search and rescue (SAR) capabilities, weather criteria, and instrument approach procedures.

h. Flight Deck Personnel. Flight deck personnel will be briefed by the embarked detachment on platform-specific procedures for fueling and deck handling evolutions, including procedures for the use of NVDs if their use is planned.

i. Ship's Company Briefs. When applicable, the ship's company will be briefed by the executive department regarding operations security aspects and restrictive lighting measures, including the lighting hazards during NVD operations.

2. Training of Embarked Personnel. Maintenance personnel and aircrew assigned to helicopter detachments that maintain a capability to operate from ships will receive joint helicopter operations orientation training in order to ensure their safety and effectiveness at sea. These requirements apply to embarked operations and are not intended to restrict personnel whose exposure to the shipboard environment is limited to deck landing qualification (DLQ) training periods. The following requirements will be met for all situations except for immediate operational requirements where the success of the mission would be clearly jeopardized by delaying operations until required training can be obtained.

a. Pre-Embarkation Training

(1) Shipboard and aircraft firefighting training.

(2) Aviation ordnance training.

b. Embarkation Training. The following requirements will be met as soon as practical after embarking. These training evolutions will be conducted by the ship's company indoctrination organization:

(1) Shipboard firefighting training.

(2) Shipboard electrical safety.

(3) Storage, handling, and disposal of hazardous or flammable material.

(4) Hearing conservation.

(5) Emergency escape breathing device (EEBD) and oxygen breathing apparatus (OBA).

(6) Hazards of electromagnetic radiation to ordnance (HERO) and emission control (EMCON) plans.

(7) Material conditions of readiness.

(8) Basic damage control organization and embarked aviation detachment responsibilities.

(9) Abandon ship bill.

(10) Emergency egress blindfold drill (berthing compartment and workspace).

(11) Ship's battle bill and man overboard bill.

(12) General Quarters (with and without flight quarters).

3. Shipboard DLQ Requirements. The following pilot experience, currency, and qualification prerequisites apply to shipboard DLQ training:

a. Ground School. Aircrew assigned to units requiring DLQ training need orientation training in order to ensure their safety and effectiveness at sea. Emphasis will be placed on aircrew coordination with standardized and briefed voice procedures from the crew chief or aircrewman to the pilots on all helicopter clearances with respect to the landing area. Completion and documentation of training for the following are mandatory and must be completed before initial qualification:

(1) Aircraft landing and handling signals.

(2) Deck markings and lighting orientation.

(3) Emergency procedures.

(4) Communication, EMCON, and NAVAIDS.

(5) Aircraft fueling procedures.

(6) Air traffic control.

(7) Maintenance support.

(8) Vertical replenishment (VERTREP) procedures (if applicable).

b. Pilots obtain initial, recurrent, and requalification training for type aircraft in accordance with parent Service directives as appropriate.

c. Deck landing qualifications for Coast Guard, Navy, and Marine Corps helicopter pilots are listed in appropriate Service publications. For Army and Air Force helicopter pilots, the current memorandum of

understanding between the Departments of the Navy, Air Force, and Army titled "Army/Air Force Deck Landing Operations," is in Appendix H.

d. For initial DLQ evolutions, a Service liaison officer qualified as a pilot in the designated DLQ helicopter needs to be present in the ship's helicopter control station (HCS) to render assistance as required.

e. Prior to DLQ operations, the OIC gives a crash and fire parties brief, including an aircraft walk-around for each type of participating helicopter. When a crash and fire parties briefing is conducted prior to the arrival of unfamiliar aircraft onboard the ship, a diagram identifying emergency egress and/or access locations, fuel tanks, oil and hydraulic reservoirs, battery location, engine controls, and onboard fire extinguishing systems of the respective aircraft will suffice for briefing purposes.

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CHAPTER IV

PREDEPLOYMENT

1. Planning

a. Success of joint helicopter detachments on ships, as with any operation, is directly dependent on proper planning. Operators and planners must understand the capabilities and limitations of ship and helicopter interoperability if the maximum degree of safety, flexibility, and effectiveness is to be realized. Presail planning must include sufficient leadtime to accommodate training and qualification and must be completed prior to conducting shipboard operations. For all shipboard helicopter operations, a presail conference is required under normal circumstances. Conference attendees will include, at a minimum, shipboard and helicopter detachment personnel.

b. Appendix A contains a sample letter of instruction to be used for planning purposes by joint helicopter detachments.

2. Detachment Certification. Before embarkation, helicopter detachments will be certified for shipboard operations by their unit commander or other cognizant authority. This certification will ensure that training requirements set forth in this publication have been met and that the detachment has met parent-Service training requirements for the intended mission(s). Any specific training shortfalls or additional training intended after embarkation should be briefed during the presail conference when applicable and appropriate. Certification is not required for all training operations that do not require embarkation (i.e., deck landing qualification).

a. Helicopter Specifications. Prior to operations, and when requested, the detachment OIC will make available diagrams of embarked aircraft to the helicopter control officer (HCO) or air officer (Air Boss) and crash and salvage parties prior to operations. These should include, but not be limited to, depicting aircraft egress, refueling locations, tiedown points, desired wind envelopes, and pitch and roll limitations.

b. Requirements for Aviation Detachment Personnel Assigned to Flight Deck Duties

(1) Aviation personnel will wear prescribed personal protective clothing and equipment while on the flight deck during helicopter operations.

(2) Aviators should attend an instrument refresher training course within the preceding year before participation in shipboard operations. Shipboard firefighting indoctrination training is required for flight deck personnel.

3. Corrosion Prevention and Control. The shipboard environment is inherently corrosive. Embarked aircraft will require cleaning and treatment for corrosion more frequently than shore-based aircraft. Detachment OICs must place special emphasis on the importance of a dynamic corrosion prevention and control program and ensure that corrosion prevention and control receive priority for timely accomplishment along with other required maintenance. The frequency and content of a program for cleaning, corrosion control, and preservation of aircraft and support equipment should be established prior to commencing embarked operations.

CHAPTER V

AIRCRAFT DEPARTURE AND RECOVERY PROCEDURES

1. Deck Operations

a. The ship's flight quarters checklist needs to be completed before helicopter operations.

b. Permission for any movement of helicopters must be obtained from the officer of the deck (OOD) on the bridge, who will be notified when the move is complete and the aircraft tied down.

c. Some military helicopters do not have rotor brakes or droop stops. Helicopters without rotor brakes or droop stops may operate from shipboard landing decks but should not routinely shut down. Extreme caution must be exercised during all operations (especially during gusty wind conditions) to preclude damage to aircraft or injury. All rotor blades will be secured immediately following shutdown.

d. The OOD will provide the safest deck conditions possible until the helicopters have been secured. Helicopters are always chocked (if equipped with wheels) when spotted on the flight deck or in the hangar, except during emergency launch (sea state permitting).

e. The deck status lights system includes a light fixture with three lenses or rotating beacons. They are normally located on a high point in the pilot's field of vision and are used to indicate the flight deck's ability to operate aircraft. Red indicates fouled deck (when ship is operating airborne aircraft) or clear to start engines (when ship has aircraft on deck). The US Coast Guard uses a single amber signal to indicate clearance for both engine start and rotor engagement. Amber is used for rotor engagement or disengagement, and green indicates clear to launch and recover helicopters. Deck status lights are normally for communication with flight deck personnel only. Pilots will not use the deck status lights for clearance for engine start, rotor engagement, or takeoff or landing. Pilots will follow landing signal enlisted or landing signal officer (LSE or LSO) signals. See Table V-1 for command and display signals.

f. Flight crews will request clearance for start and runup before scheduled takeoff time. Engines may be started upon LSE or LSO signal.

(1) Troubleshooting. If the helicopter experiences maintenance problems, the pilot will signal for maintenance personnel. Deck crew personnel will determine the nature of the problem and discuss the situation with the pilot in command and inform the LSE, LSO, HCO, or OOD, and tower operator when a decision has been made concerning the status of the helicopter.

(2) Communications. All necessary communications systems checks should be accomplished before requesting clearance for takeoff.

Table V-1. Command and Display Signals

Table V-1. Command and Display Signals

EVOLUTION	COMMAND	PILOT SIGNAL[1]	SHIP DISPLAY[2]	MEANING[3]
1. Prepare to start engine.	Check tiedowns, chocks, and all loose gear about deck.	Hand signals to LSE/LSO (day).	Red signal in flight deck area.	Verify chocks and tiedowns in place. Boots removed and stowed. Man fire extinguisher.
2. Start engines.4	Start engines.	Hand signal to LSE/LSO.	Red signal in flight deck area (Navy). Amber signal in flight deck area (USCG).	Authority for responsible flight deck personnel to signal for starting engines. Ship not ready for flight operations.
3. Engage rotors.	Stand clear of helo(s) engaging rotors.	Hand signal. Position lights FLASHING BRIGHT (DIM for night).	Amber signal in flight deck area until rotors are engaged, then red signal.	Ship is ready for pilot to engage rotors. Authority for responsible flight deck personnel to signal for rotor engagement if immediate area clear. Ship restricted from maneuvering and winds within engagement limits. Ship not ready for flight ops.
4. Ready for launch.	Obtain permission from bridge for green deck.	Thumbs up to LSE/LSO (day). Position lights STEADY BRIGHT (DIM for night). May give "thumbs up" signal by turning on flashlight or other movable light and moving it up and down (USCG) (night).	Red signal in flight deck area.	HCO/LSO request green deck from bridge. Ship maneuvers to obtain winds for launch. Pilots finish checklist.

Table V-1 (Con't). Command and Display Signals

EVOLUTION	COMMAND[1]	PILOT SIGNAL[2]	SHIP DISPLAY	MEANING[3]
5. Launch.	Remove all tiedowns on pilots signal. Launch helo(s).	Hand signal to remove chocks and chains.	Green signal in flight deck area.	Ship is ready in all respects for flight ops. Ship is established on flight course and restricts maneuvering. Bridge grants green deck. Wind is within launch envelope. Authority granted to pilot in command to signal removal of chocks and chains. Authority for LSE/LSO to launch helo when chains are removed.
6. Ops normal report.	Secure from flight quarters.	OPS NORMAL radio call from pilot unless prohibited by EMCON, then a ship fly-by with the landing light turned ON prior to departing area.	As appropriate.	Helo system functioning correctly. Commencing assigned mission.
7. Helo(s) inbound for landing.	Prepare to land helo(s).	None.	Red signal in flight deck area.	Prepare designated landing area to land helo(s). Ship not ready to recover helo(s).
8. Recovery.	Land helo.	None.	Green signal in flight deck area.	Ship is ready in all respects to land helo(s). Wind is within recovery envelope.
9. Prep. for shutdown.	None.	Hand signal to disengage (day). Flash position lights (night).	Red signal in flight deck area.	Once chocks and chains are installed, ship is free to maneuver. Pilot signals when ready to disengage, and ship obtains appropriate winds over deck.
10. Disengage rotor.	Stand clear of helo. Disengage rotors.	None.	Amber signal in flight deck area until rotors stopped, then red signal.	Authority for responsible flight deck personnel to signal to disengage rotors when area is clear. Winds within disengagement envelope. Ship restricted from maneuvering until rotors have stopped.

Table V-l (Con't). Command and Display Signals

1 Pilot and LSE hand signals from Appendix F. Ship specific signals between aircraft and ship should be briefed prior to commencing flight operations. These include, but are not limited to, night signals using aircraft navigation and position lights.

2 Deck status lights convey a condition met throughout the ship in preparation for a certain flight evolution. However, final clearance for a specific task depends upon mutual coordination among pilot, officer of the deck, HCO or LSO, and LSE.

3 NVD deck signals are coordinated via sound powered telephone circuits or ICS COM.

4 Some helicopters engage rotors simultaneously with engine start.

(3) Navigation and Sighting Equipment. Navigation and sighting system alignment and stabilization can be accomplished before launch.

WARNING

Under no condition will helicopters be ground taxied on board ships.

g. When all prelaunch checks are completed and the pilot is ready for launch, the pilot signals the LSE, LSO, or HCO by transmitting a request for takeoff to the helicopter control station (HCS) or primary flight control tower and by turning the aircraft's navigation lights to steady-bright (steady-dim at night, if able). When takeoff clearance is granted and all tiedowns have been removed, the pilot is cleared to take off at LSE or LSO signal. The pilot should perform a hover power check before leaving the deck to ensure sufficient power is available for flight. Once the helicopter has cleared the flight vicinity of the helicopter launch and recovery area, the pilot will signal or report "ops normal" to the tower or helicopter direction center, souls on board, and give his total fuel remaining state in hours and minutes unless prohibited by operational or tactical restrictions. Determination of the fuel state will be the time that engine "flame out" (fuel exhaustion) can be expected. If the aircraft is leaving the tower's control, this report will be given to the combat information center (CIC) or helicopter direction center

(HDC). The CIC or HDC will maintain a record of the fuel state of each helicopter during each flight.

h. If required, aviation unit will provide NVDs to the ship for use during NVD operations.

i. Flight quarters should be set before the scheduled recovery time or in sufficient time to allow for recovery of all helicopters before the fuel state of any helicopter reaches 30 minutes fuel remaining. When a helicopter is operating in close proximity to a ship or ships, at least one ready deck will normally be kept available in the event that a helicopter needs to conduct an emergency landing.

(1) Under visual meteorological conditions (VMC), aircraft will contact the tower no later than 5 miles inbound for landing instructions. Aircraft should expect to receive base recovery course (BRC), ship's speed, wind, altimeter, deck pitch and roll information, and clearance into the landing (Charlie) pattern or a holding (delta or plane guard) pattern, upon checkin.

(2) Clearance to land will be obtained from the helicopter control station or primary flight control tower before final approach. Shipboard landings will be performed with aircraft parking brakes set and nosewheel or tailwheel locked if applicable. Recovery spot configurations are depicted in Annex 4 to Appendix B.

WARNING

While aircraft are landing, all nonessential personnel will remain clear of flight deck landing area.

j. Night launch and recovery operations are the same as for day operations except that the volume and speed must be reduced. Helicopters without instrument flight capability should not be flown at night unless operational conditions require it. During night flight operations, optimum wind, pitch, and roll conditions will be provided for launch and recovery evolutions.

(1) Shipboard lighting systems are depicted in the Naval Air Warfare Center Aircraft Division,

Lakehurst, NJ (NAWCAD) Shipboard Aviation Facilities Resume. A stabilized glide slope indicator (SGSI) is provided on most air-capable ships to aid night shipboard landings. See Figure V-1.

(2) The LSE will use lighted wands.

(3) Flight deck personnel will use a clear lens in goggles.

k. Night-Vision Device Operations

(1) NVD operations are authorized and should be conducted in accordance with the ship's helicopter operating procedures and the aircraft's parent Service directives. The use of NVDs may require emission control, blacked-out operations that include startup, launch, recovery, and various approaches and maneuvers. All nonstandard NVD operations will be thoroughly briefed to the ship's CO and Air Officer. The unique nature of these operations requires a higher degree of coordination and planning between aviation units and ship's personnel.

(2) All ship lighting that may affect the safe operations of NVDs will be filtered or extinguished. Aircrews will identify lighting hazards to the helicopter detachment OIC or ship's personnel immediately.

WARNING

If the ship's stern position light significantly impairs aircrew ability to safely conduct NVD operations, it will be extinguished during flight operations. Flight deck edge lights are required to be on, at minimum intensity, during NVD DLQ and other exercises where NVDs will be used during flight operations.

l. Ordnance Loading and Downloading. See Chapter VI.

2. Flight Operations

a. Helicopter Readiness Conditions. Flight crews assigned alert conditions will be notified early enough to permit normal preflight inspection, start, warmup, and completion of the takeoff check list. Conditions will be defined by the JFC in the operations order.

b. Air Traffic Control Procedures. Weather in the ship's control area or zone is the most prominent factor affecting the degree of aircraft control necessary. The type of aircraft control to be employed during departures and recovery is determined by the ship's commanding officer unless otherwise specified by higher authority. Helicopters may be required to operate under positive control. The controlling agency will establish radar and radio contact with the aircraft being controlled. The aircraft will comply with published approach or departure procedures. Positive control of helicopters will be used under the following conditions unless otherwise prescribed:

(1) Ceiling less than 500 feet above ground level (AGL).

(2) Forward flight visibility less than 1 mile.

(3) All flight operations between 1/2 hour before sunset and 1/2 hour after sunrise except for Coast Guard cutters and as modified by the operational commander or ship's commanding officer.

c. All helicopters will be under positive communications control at sea unless otherwise directed. Pilots will not shift frequencies without notifying and/or obtaining permission from the controlling agency.

d. Departure Procedures

(1) Visual Meteorological Conditions (VMC). Helicopters will clear the control zone at or below 300 feet or as directed by the tower or HCO. When IMC are not anticipated during departure and subsequent rendezvous, it is known as a "Case 1" departure.

(2) Instrument Meteorological Conditions (IMC) and Night Unaided Operations. The helicopter will depart on the stipulated departure course, climbing to a minimum of 300 feet before commencing a turn, unless otherwise directed.

(3) IMC Case Departures. Aviation and amphibious aviation ships normally engage in multiaircraft operations. Departures are coordinated in accordance with the following:

(a) Case II. Weather at ship not less than 500 feet ceiling and 1 mile visibility. Helicopters will depart via Case I departure and remain below the clouds. If unable to maintain VMC, helicopters will proceed in accordance with Case III.

(b) Case III. Whenever weather conditions at the ship are below Case II minimums or when directed by the commanding officer, helicopters will launch at not less than 1-minute intervals, climb straight ahead to 500 feet, and intercept the 3-mile arc in the direction given by control. At the 3-mile point, helicopters will arc to intercept the assigned departure radial. Upon reaching the assigned departure radial, departure helicopters shall turn outbound and commence climb to assigned altitude. Both ship and helicopter must be equipped with tactical air navigation (TACAN) to execute a Case III departure. If either is not TACAN equipped, then the procedure (and weather conditions) in subparagraph 2d(3)(a) applies. Helicopters should be IMC-equipped to fly during Case III conditions.

e. Takeoff Minimums. Takeoff is authorized in weather conditions down to published minimums for the available instrument approach or parent Service regulation. Takeoff minimums may be determined using approach minimums for an approach to another ship within the operating range of the helicopter if the alternate ship is at flight quarters or on alert for short-notice operations. Positive control must be available for all operations conducted in weather below 500-foot ceiling, 1 mile visibility.

f. Departure Communications Procedures. The helicopter will launch with radios tuned to predetermined frequency and will be under the control of the combat information center (CIC), helicopter direction center (HDC), or carrier air traffic control center (CATCC) immediately following launch. If operating aircraft are not NVD-or IMC-equipped, the aircraft will not be required to change frequencies or identification friend or foe (IFF) codes until at least a 300-foot altitude and level flight configuration have been attained.

g. Arrival Procedures

(1) Inbound helicopters will check in with the CIC, HDC, or CATCC upon entering the control area (50 miles, if able) and provide the following information.

(a) Call sign.

(b) Position (relative to the ship).

(c) Altitude.

(d) Fuel state.

(e) Souls on board.

(f) Other pertinent information that might affect recovery. (See Chapter VI for procedures to follow with hung or unexpended weapons.)

(2) Visual Flight Rules (VFR) Descent and Approach. If descent and approach can be accomplished in VMC, the pilot will be passed to primary flight control (PriFly) or HCS (both equivalent to a control tower) at 5 miles, and the LSE or LSO shall aid in recovery. Aboard aviation ships and amphibious assault aviation ships, helicopters will possibly be held in delta or plane guard patterns before final landing clearance. The starboard (right hand side) delta pattern for all ships is flown at 300 feet between the 045 and 110 degree radial relative to the BRC. Occasionally, a port (left hand side) delta may be assigned and is flown in a similar fashion on the port side of the ship.

(a) Standard Helicopter Landing Patterns

1. The standard landing pattern (Charlie pattern) is the Case I VMC helicopter landing pattern. The landing patterns for all ship types are essentially the same. Principal differences to plan for are flight deck elevations and obstructions in proximity to the landing area that become factors in transitioning from the approach to landing profile. The Charlie pattern is flown at 300 feet at 80 knots indicated airspeed. The landing approach starts not later than on the downwind leg abeam the

intended point of landing. The left or right turn to final will be made to intercept the 45 degree line at the 90 degree position for ships with offset landing centerlines, or to intercept the ship's wake for an up-the-stern final approach. The approach is then continued straight in to the spot for landing. Annex B-1 depicts the typical landing pattern and control zones and restrictions for LPH/LHA/LHD class ships, which is a slight modification to the approach used for smaller, single-spot ships. Landing a helicopter on a spot to the immediate front of another helicopter should be avoided when possible.

WARNING

When helicopters approach on the 45 degree bearing to land immediately in front of a spot occupied by another helicopter (on LHD/LHA/LPH class ships), rotor clearances (main and tail) between the two aircraft during the final portion of a 45 degree approach are significantly reduced.

2. When approaching a spot immediately in front of a spot occupied by another helicopter, the final portion of the approach on the 45 degree bearing should terminate at a point directly abeam the intended landing spot. From this point the final transition is flown by sliding sideways to a hover over the landing spot. The landing should be made by the pilot in the right seat.

3. The Charlie pattern and the Helicopter Night Case I recovery pattern are the standard Case I night helicopter landing patterns. The air officer shall ensure that all airborne aircraft and the squadron duty officer are informed when changing from one night landing pattern to another. Simultaneous use of the Charlie and the Night Case I recovery patterns is not authorized.

4. On multispot ships, completion of the night recovery pattern depends on the location of aircraft and other obstructions on the flight deck. If the landing spots aft of the assigned landing spot are clear, the helicopter may complete a straight-in approach over the stern and air-taxi to the landing spot. When there are obstructions between the stern and the landing spot, the air officer shall direct the pilot to adjust his pattern to fly close aboard the port side and intercept the 45 degree lineup for the assigned landing spot.

(3) Instrument Flight Rules (IFR) Approach Procedures. Helicopter operations are not normally conducted when weather is below a ceiling of 500 feet and/or less than 1 mile visibility, unless a carrier-controlled approach (CCA) or precision approach radar (PAR)-equipped facility is available within the operating range of the helicopter. Air-capable ships use TACAN primarily or nondirectional radio beacon (NDB), if equipped, for approaches under instrument conditions (See Annex B). The emergency low visibility approach (ELVA) and the smokelight approach are available for use under emergency conditions when a CCA or PAR-equipped facility is not available and weather at the ship is below minimums for TACAN or NDB approaches. (See Annex 2 to Appendix A for ELVA patterns, smokelight procedures, and emergency marshal patterns.)

Note

NDB approaches are based on very high frequency (VHF) or direction finder (UHF/DF) equipment. Aircraft must be properly equipped to conduct VHF or DF approaches to use the NDB overhead approach.

(a) Case Arrivals. Arrivals to aviation and amphibious assault aviation ships are coordinated into the following cases:

1. Case I. Visual Descent and Approach. Weather minimum 1000-feet ceiling and 3 miles visibility. Pilots will report "ship in sight" when visual contact is made with the ship. HDC approach control will switch the helicopter to the tower at 5 miles for landing clearance.

2. Case II. Controlled Descent and Visual Approach. Weather minimum 500-feet ceiling and 1 mile visibility. Positive control will be used until the pilot reports "ship in sight." HDC or approach control will be ready to assume control of Case III recovery if the weather deteriorates below Case II minimums.

3. Case III. Case III will be used whenever weather conditions at the ship are below Case II minimums and at night unless otherwise directed. A straight-in, single-frequency approach will be provided in all cases. Precision radar will be used whenever available. Marshals are assigned using TACAN approach charts. Pilots will adjust patterns to depart the marshal at the assigned expected approach time. When the pilot is established on final approach course, heading and glide slope information will be passed, if available.

(b) Visual Landing Aids. Availability of visual landing aids by ship type will be depicted in the ship's facility resume. (See NAWCAD-ENG-7576, "Shipboard Aviation Facilities Resume.")

1. Stabilized Glide Slope Indicator. The SGSI (Figure V-1) provides a single bar of green light (1-1/2 degrees), amber light (1 degree), or red light (6-1/2 degrees). The color of the light indicates whether the aircraft is above (green), below (red), or on (amber), the proper glide slope. An aircraft executing an SGSI approach would normally intercept the glide slope path at an altitude of 350 feet and a distance of 1 mile, and should fly the amber-red interface.

2. Horizon Reference System (HRS). The HRS is a 10 foot electroluminescent bar designed to be used in the deck environment to provide an artificial horizon during night operations.

3. Fresnel Lens Optical Landing System (FLOLS). FLOLS is installed aboard

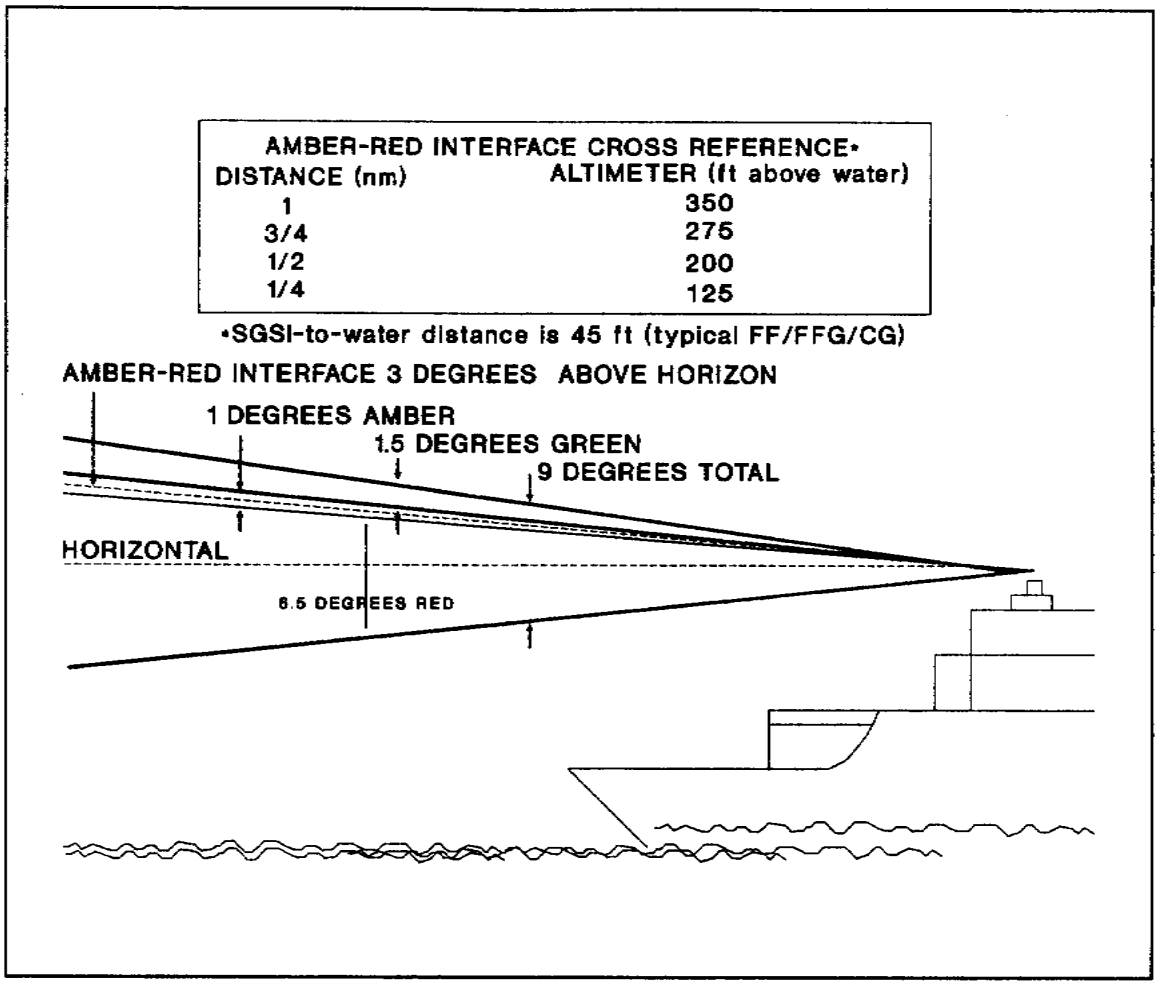


Figure V-1. Stabilized Glide Slope Indicator Tricolor Beam

Figure V-1. Stabilized Glide Slope Indicator Tricolor Beam

CV-class ships. It is an electro-optical gyro-stabilized pilot landing aid. The system presentation is a central amber light (ball) and a green cross bar (datum). The position of the ball relative to the datum line is indicative of the aircraft position relative to the selected glide slope.

4. Vertical Short Takeoff and Landing (VSTOL) Optical Landing System (VOLS). VOLS is installed aboard LHA- and LHD-class ships. It is an electro-optical gyrostabilized pilot landing aid. The presentation is a central amber light (ball)

and a green cross bar (datum). The position of the ball relative to the datum line is indicative of the aircraft position relative to the selected glide slope.

3. Specific Mission Area Operations. Specific mission area operations or specific tactics between USA, USN, USMC, USAF, and USCG helicopters may be further delineated in tactical memorandums. These documents are specific in scope and are to be used in conjunction with this instruction.

4. Emission Control (EMCON). When the use of radio communications is not authorized because of the EMCON condition in effect, routine helicopter operations may be conducted by the use of visual signals. Helicopter control ships will notify receiving ships by visual means that helicopter operations will be conducted with sufficient lead time to ensure that the receiving ship will be ready for helicopter arrival. Large cards displaying the ship's tactical call, communication frequency, and hull number will be used by the control ship to inform the helicopter pilot of his destination and bearing and distance (pigeons) to the aircraft destination. Signals shown in Table V-2 and Appendix F will be used for helicopter operations. The controlling ship will guard the helicopter frequency, and radio transmissions will not be authorized unless safety of flight or an emergency situation requires violating EMCON.

Table V-2. Signal Flag Display

EVOLUTION	SIGNAL FLAG DISPLAY	MEANING
1. Setting "helo detail."	HOTEL (HOTEL ONE) at the dip (1/3 mast).	Ship is preparing to conduct helo ops. Display a red signal in helo ops area.
2. Ready to conduct helo ops.	HOTEL (HOTEL ONE) closed up (full mast).	Ship is ready to conduct ops. Display a green signal in helo ops area.
3. A delay or in interruption of the will the evolution.	HOTEL (HOTEL ONE) at the dip (1/3 mast).	A temporary delay ops. The LSE will give a waveoff to the helo and a red signal will be displayed in the helo ops area.

Table V-2 (Con't). Signal Flay Display

4. Helo ops are complete.	HOTEL (HOTEL ONE) hauled down (no flag).	Ops (transfer) complete.

HOTEL FLAG (HELO OPS)

NOTE: HOTEL flag is displayed on the ship's mast.

a. Visual communications are extremely important to joint shipboard helicopter operations. Proper use of the HOTEL flag, deck status lights, and flight deck status signaling system lamp signals are a valuable backup to radio communications. In the event of radio failure, routine helicopter missions can be completed by the use of visual signals.

b. An overdue helicopter, unplanned position and intended movement change, rapidly deteriorating weather, or other safety-of-flight factors justify termination of the prescribed peacetime EMCON condition until the cause for termination is no longer a factor. The ship will be prepared to operate radar, TACAN, and radios on short notice.

(1) Launch. During communications-silent launch operations, aircrews will communicate with the LSE, LSO, or HCO (if required) via intercom or light signals. The LSE or LSO will then relay information to the tower or helicopter control station.

(2) Recovery. During communications-silent recovery operations, aircrews will follow flashing ship's position lights and/or mast lights when recovery is cleared.

(3) LSE or LSO. The LSEs or LSOs should be present during NVD operations. The LSEs or LSOs should use chemical lights or NVD-compatible light wands, and the signals of "wave off" or "hold" are still mandatory. When LSEs or LSOs are not required, they may be used as safety observers.

5. Military Air Distress (MAD) Frequency. Officers in tactical command (OTCs) will include in their communications plan the requirement that all ships with helicopters operating will monitor the ultra high frequency (UHF) Guard or MAD frequency. This will allow a pilot out of UHF range with the controlling ship to attempt to communicate with any monitoring ship in the event of an emergency.

6. General Fueling Procedures. The following constitute general fueling procedures. Specific fuel-handling precautions are delineated in Chapter VIII.

WARNING

Mixing JP-5 with other types of aviation jet fuels results in a fuel flash point that poses significant firefighting problems onboard CV/LHA/LPH and other air-capable ships. Tests have confirmed that available fire extinguishment systems are essentially ineffective against a JP-4 running source, debris-pile type of fuel fire. This is true for any fuel mixture with as little as 5 percent JP-4.

Simple fuel systems require at least two subsequent refuelings with JP-5 to increase the flash point to 140 degrees fahrenheit. Complex systems require as many as five subsequent refuelings to reach acceptable levels. However, an aircraft fueling system is only considered purged when a fuel sample passes flash-point test.

A reduction in flash point can also result with mixing of JP-8 or commercial jet A-1 fuels. These fuels have higher flash points than JP-4 (approximately 100 degrees fahrenheit) and do not create dangerous vapor pressure problem. However, any fuel flash point below 140 degrees fahrenheit is considered dangerous and special attention is necessary.

a. Fuel Planning. JP-4 is not allowed to be stored or defueled into any storage or service fuel tank aboard ship. The low flash point temperature of JP-4 or Jet B fuel constitutes a severe fire hazard aboard ship. JP-4 and JP-5 mixtures, even with very low percentages of JP-4, assume the characteristics of JP-4. To minimize the JP-4 hazard aboard ship, one of the following

procedures will be followed before the shipboard operation:

(1) Preferred Procedure. Defuel aircraft completely and refuel with JP-5 prior to deployment and shutdown aboard ship.

(2) Alternate Procedure. Burn down to minimum fuel and refuel with JP-5 upon landing. If the aircraft containing JP-4, or the procedure in subparagraph (1) was not completed, or if there is the potential of JP-4 being in the aircraft fuel system, the pilot will notify the ship of the situation upon initial contact.

(3) JP-8 or Jet A may be substituted for JP-5 in Procedure (1). However, if this substitution is made, Procedure (2) will also be complied with. Also, if this substitution is made, low flash point procedures in Chapter VIII apply.

b. Fueling. Pressure refueling with the aircraft shut down is the normal procedure. However, hot refueling (See Chapter VIII for hot refueling definition) may be conducted by those aircraft so equipped during training, operational, and combat situations. Hot refueling will not be conducted on aircraft requiring gravity refueling. Hot refueling of aircraft with ordnance aboard is authorized and approved only by the ship's commanding officer. Hot refueling shall only be performed using the standard NATO single-point pressure refueling system and is not authorized for helicopters not so equipped.

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CHAPTER VI

AVIATION ORDNANCE

1. Purpose. This chapter amplifies NWP-42, CV NATOPS, and LPH/LHA/LHD NATOPS when engaged in supporting joint shipboard aviation ordnance evolutions, and provides the ship's commanding officer (CO) and aviation detachments with predeployment requirements and standard operating procedures (SOP) when operating from USN and USCG vessels. The necessity to train for and conduct combat operations requires the acceptance of certain risks that cannot be avoided in the handling of explosive weapons. Because weapon handling evolutions introduce risk, they require careful planning and preparation. Commanding officers will continually weigh the requirement to conduct each weapon evolution against additional risk being interjected and accept only those evolutions in which the need clearly outweighs the risk. Procedures prescribed are not intended to be all inclusive, but rather a reference guide to be used by embarked helicopter detachments when assigned to and operating from USN and USCG vessels. All publications and technical manuals referenced are official directives as depicted in NAVSEA OP-4, "Ammunition Afloat." Deviations from stowage and compatibility requirements aboard USN ships will not occur without prior approval of a waiver or exemption by the Chief of Naval Operations (CNO). All requests for waivers or exemptions will be submitted in accordance with OPNAVINST 8023.20 (series), via the appropriate organizational chain of command and Commander, Naval Sea Systems Command (COMNAVSEASYSCOM), for approval.

2. Introduction. The movement, handling, and stowage of explosive ordnance carried aboard ships and aircraft is inherently dangerous. Therefore, shipboard handling and stowage of explosives and ammunition are governed by the most definitive and restrictive DOD regulations and precautions (See Appendix D for permissible stowage matrix.). Because of the confined environment on board ship, what might be considered a relatively minor explosive incident ashore could be catastrophic under way. Safety must not be jeopardized by the introduction of weapons not designed for shipboard environment or the introduction of personnel unfamiliar with the shipboard environment. The destructive capacity of explosives has the potential to severely cripple or destroy a ship and her company in seconds. It is therefore imperative that authorized safety procedures be exercised at all times

by qualified and certified personnel involved in ordnance handling and stowage operations and only weapon systems approved for shipboard use are used (inert warheads will be used to the maximum extent possible during training). Safety is the responsibility of all levels of command, and understanding the risk is paramount. Sound knowledge and a healthy respect for ordnance operations will help ensure that safety requirements are met. The following describe the essential elements in ensuring safe shipboard aviation ordnance operations:

a. Weapon System Explosives Safety Review Board (WSESRB). The WSESRB, designated by the CNO, reviews safety aspects of weapons or explosive systems and makes recommendations to the CNO and the originating Service regarding acceptance or rejection for use on Navy ships. NAVSEAINST 8020.6 (series) describes the WSESRB program. The WSESRB is headed by a representative of COMNAVSEASYSCOM (SEA-06) and staffed by safety representatives of other Naval commands. Service representatives participate as required. All weapon systems and launch platform weapon control systems employed on ships will be reviewed by the WSESRB before their use aboard ship. WSESRB responsibility includes review of all mechanical, chemical, biological, and electrical hazards associated with a weapon system. NAVSEAINST 8020.6 (series) provides a list of information and data required for consideration by the WSESRB.

b. NAVSEA OP-4, "Ammunition Afloat," is a document that prescribes the minimum safety requirements and regulations for the issue, receiving, handling, stowage, surveillance, maintenance, and return of conventional ammunition along with the preparation of associated reports by units afloat and their certification.

c. Commander, Naval Air Systems Command (COMNAVAIRSYSCOM). CNO has directed that COMNAVAIRSYSCOM review all loading procedures and checklists. COMNAVAIRSYSCOM, through messages, notices of ammunition reclassification, and technical publications, places restrictions on the use of munitions (live or inert) for operations ashore and afloat. Restrictions are applicable to all Services aboard naval vessels.

3. Responsibilities. Ships designated to support helicopter detachments involving aviation ordnance will provide approved stowage areas, security, and appropriate armament weapons support equipment (AWSE). Qualified and certified aviation ordnance supervisors, as identified in subparagraph 5(a),

will support all evolutions involving movement or use of aviation ordnance munitions and associated materials. Each Service is responsible for ensuring the WSESRB has completed review of all munitions assigned to the mission.

a. The ship's commanding officer is responsible for:

(1) Providing safe ordnance operations and verification of helicopter detachment and personnel ordnance certifications.

(2) Maintaining a technical publications library (TPL), as listed in Appendix D, of aviation ordnance handling, safety, and security publications; checklists; and associated Navy type command instructions. These publications will normally be made available as a predeployment package by the TYCOM.

(3) Stowing all ammunition in accordance with NAVSEA OP-4, and if required, submitting waivers for stowage of ammunition and obtaining approval prior to loading on board.

(4) Verifying that all ordnance for use by the helicopter detachment has been approved by the WSESRB and reported to the TYCOM on initial receipt of all ammunition brought aboard for the aviation detachment. Monthly reports reflecting air detachment inventory will be submitted until the detachment departs. A final report will then be submitted.

(5) Ensuring that a hazards of electromagnetic radiation to ordnance (HERO) or emissions control (EMCON) bill is promulgated before arrival of a helicopter detachment. Information from publications listed in Joint Pub 3-04.11 provide the technical guidance to be used for the ship's HERO or EMCON bill. Commanding officers will ensure that electromagnetic radiation hazards that have the potential to affect electro-explosive ordnance devices, fuel, and assigned personnel are controlled during shipboard helicopter operations. The ship's HERO or EMCON bill should depict individual HERO or EMCON conditions to be set before each specific operational condition (e.g., arming or de-arming, aviation ordnance movements, fueling operations).

(6) Establishing an aviation ordnance qualification or certification board in accordance with Appendix D to certify the combined ship or detachment aviation ordnance team (USA and USAF only). When a USMC detachment is on board, qualification or certification will be maintained in accordance with current USN and USMC programs.

b. Helicopter Detachment Responsibilities. The detachment officer in charge (OIC) is responsible to the ship's CO for safe aviation ordnance operations as they relate to the helicopter detachment.

(1) Helicopter detachment personnel will use parent-Service and WSESRB-approved aircraft system checklists and ordnance loading and downloading procedures.

(2) The OIC is responsible for the qualification of assigned detachment personnel to conduct aviation ordnance operations aboard ship. The detachment is also responsible for assisting the ship's ordnance personnel in the handling and movement of aviation ordnance and related materials from the ship's magazines to designated assembly, staging or ready service, or flight deck areas as appropriate.

(3) The OIC is responsible for providing the ship with an ammunition embarkation plan that identifies the types, quantities, number of pallets, weight, and cube of ammunition. The OIC will present qualification or certification documentation to the ship's commanding officer when requested.

(4) The OIC is responsible to provide an inventory of all personal and individual weapons.

(5) The OIC, upon receipt of the WSESRB list of approved weapons and explosives, will certify to the ship's CO that all detachment ordnance meets WSESRB requirements for shipboard operations.

(6) The OIC will comply with the ship's qualification or certification board in accordance with Appendix D to certify the combined ship or detachment aviation ordnance team (USA and USAF only). USMC detachments will comply with current directives.

4. Personnel Qualification and Certification. All ordnance personnel handling aviation ordnance will be qualified and certified in the applicable families of explosives. The ship's ordnance qualification and certification board will certify the ship and validate the embarked detachment's aviation ordnance handling teams. When the detachment is provided from the USMC, current directives provide adequate guidance for the administration of this program. However, when the detachment is comprised of US Army or USAF personnel, Appendix D will be used to qualify and certify personnel.

5. Aviation Ordnance Safety Supervisors (AOSS). The aviation ordnance safety supervisor is the direct representative of the ship's commanding officer. The aviation ordnance safety supervisor:

a. Will be assigned by the combatant commander and provided by the appropriate TYCOM.

b. Will be a qualified and certified shipboard aviation ordnance safety supervisor (E-7 or above).

c. Will be thoroughly familiar with the provisions of this and all other instructions promulgating explosive safety regulations.

d. Will act as a staff adviser to the ship's CO on matters relating to aviation explosive safety and be a member of the ship's aviation qualification and certification board.

e. Will act as a safety observer and will not assist in the loading or arming of ordnance evolutions.

f. Will act, in the absence of an ordnance officer, as the senior Naval enlisted aviation ordnance person. May be designated as the ship's aviation ordnance officer for the certification board.

g. Will have no authority to waive or alter safety regulations, or to permit violations of such regulations by others.

h. Will ensure that units do not conduct joint shipboard ordnance evolutions unless a qualified and certified AOSS is present.

6. Conventional Weapons Safety Assistance Teams. There are two conventional weapons safety assistance teams; one is

assigned to the Pacific Fleet and one to the Atlantic Fleet. These teams are composed of specially trained and experienced ordnancemen who provide assistance to fleet activities in all areas of conventional ordnance handling, stowage, and safety. The teams are available to make visits to commands during aviation ordnance evolutions and predeployment training involving ordnance. Their assistance will be requested by individual units requiring or desiring assistance in any operational or training ordnance evolution. Requests for assistance visits should be submitted to the appropriate combatant commander. See CINCLANTFLTINST 8020.2 (series) and COMNAVSURFPACINST 8023.1 (series).

7. Weapons Handling and Movement. The number of personnel engaged in ammunition handling operations will be limited to the minimum necessary for safe and efficient performance of work. Ship or detachment personnel certified by the ship's CO are responsible for the movement of ordnance from a ship's magazine to designated assembly and buildup areas (detachment aviation ordnance personnel may assist as necessary). Aviation ordnance detachment personnel are required to handle and move all weapons from assembly and buildup areas to aircraft and return to assembly or buildup area.

8. Weapons Staging and Ready Service. Staging areas designated by COMNAVSEASYSCOM will be used for ready service only. Weapons located within staging areas will be loaded on authorized or approved AWSE configured for its own particular weapons configuration. All aviation ordnance within the staging area will be positioned and readily available to afford adequate time for safe aircraft loading. Unprotected stowage in the staging and ready service area should be kept to the absolute minimum. Long-term stowage will be restricted to primary magazines.

9. Weapons Assembly and Disassembly. All aviation weapons unpacking, assembly and disassembly, loading, and unloading will be done in accordance with NAVSEA OP-4, NAVSEA OP-3565/NAVAIR 16-1-159/NAVLEX 0967-LP-624-6010 (RADHAZ manual), and appropriate checklists and technical manuals. Ordnance will be assembled and disassembled and loaded into launchers and magazines only by personnel who have been properly qualified and certified in the type or family of ordnance they are working with. The assembly area will be maintained HERO SAFE whenever HERO SUSCEPTIBLE or HERO UNSAFE ordnance is present. If HERO SUSCEPTIBLE or UNSAFE ordnance must be moved outside normal HERO SAFE assembly areas, the ship's operations officer will ensure that the appropriate HERO or EMCON condition has been set. A visual display

indicating the HERO or EMCON condition in effect will be prominently displayed so assembly personnel can readily ascertain HERO or EMCON condition status.

10. Loading and Downloading. Aircraft loading and downloading will be accomplished in accordance with the approved conventional weapons checklist for the specific aircraft and weapons. The flight deck is the only approved area for loading and downloading aircraft with forward-firing weapons. Loading in the hangar is only authorized in accordance with Appendix D. All aircraft being loaded with forward-firing ordnance, e.g., rockets, missiles, and guns, will be positioned so that accidental discharge will minimize danger to personnel, the ship, or other aircraft. Mechanical latching during loading operations on aircraft, racks, or launchers will be completed before aircraft engines are started or electrical power is applied. Downloading of aircraft will not commence until the aircraft engines or rotors are secured. Simultaneous fueling and ordnance-loading operations are prohibited unless authorized by the ship's commanding officer. Hot reloading, or reloading weapons with the rotor system or engine turning, is normally prohibited aboard ship.

11. Hangaring Aircraft With Loaded Armament. Hangaring of alert-loaded aircraft may be authorized by the ship's CO when operational necessity dictates the acceptance of the additional risk of fire with fuel and explosives in a confined area. Aircraft loaded with rockets and/or missiles will be positioned so that accidental discharge will minimize danger to personnel, the ship, or other aircraft.

12. Arming and De-arming. Ordnance teams assigned to arm or de-arm weapon systems will position themselves so as to accomplish this mission and avoid delaying launching and/or recovery evolutions. Arming and de-arming of weapons will be conducted using the current weapons and stores arming checklists or applicable Service regulations. Arming or de-arming safety pins will be removed only after the aircraft rotors are engaged and the aircraft is ready for launch, and they will be reinstalled prior to rotor disengagement. Aircraft will not be fueled and armed simultaneously unless authorized by the ship's commanding officer. Arming will be accomplished after fueling operations have been completed. Arming and safety signals used will be in accordance with Appendix A. All Master Arm weapon system switches will be in the SAFE/OFF or normal position before launch and recovery as required. All weapons will be safed whenever in the ship's control zone.

13. Maintenance on Ordnance-Loaded Aircraft. General maintenance will not be conducted on ordnance-loaded aircraft. Routine servicing and minor maintenance to ready the aircraft for the next launch may be conducted with the following restrictions:

a. Weapons will be made safe to the maximum degree possible as specified in applicable weapons and stores checklists.

b. A "WARNING--WEAPONS LOADED" placard must be prominently displayed in the cockpit of aircraft loaded with weapons. When displayed, the maintenance or servicing requiring application of electrical power is limited to:

(1) Refueling.

(2) Replacement or checkout of communications, sighting, and navigational equipment.

(3) Engine or rotor turn up for checkout.

(4) Flight control and hydraulic system checks.

(5) Replacement or checkout of engine performance or flight instruments.

c. Maintenance that requires application of electrical power to armament or weapons release and control circuitry will not be performed while weapons are loaded or being loaded or downloaded. Aircraft that require extensive maintenance (e.g., engine removal, blade removal, or jacking) are not considered readily available for flight and will be downloaded.

14. Emergency Procedures. Every emergency situation is different and all contingencies cannot be anticipated. However, certain general guidelines are appropriate for shipboard aviation ordnance evolutions.

a. Shipboard Fires. Shipboard fires are most hazardous and require immediate action to preclude undue damage to the ship and embarked aircraft (see Appendix D for minimum fast cookoff times.). In the case of fire or danger of a fire near a weapons staging or ready service area, the staged weapons will be moved to a safe area or jettisoned over the side of the ship as the situation dictates. Explosive ordnance disposal (EOD) personnel or other ordnance-qualified personnel will take the

necessary on-scene action to dispose of the most hazardous ordnance first.

b. Unexpended Weapons. Weapons and stores not authorized for recovery are delineated in Appendix D. Hung or unexpended weapons not authorized for recovery must be jettisoned. When this cannot be accomplished, a divert to a shore installation will be made if feasible. The following guidelines will be used when recovering aircraft must return to the ship with hung weapons:

(1) In-flight Procedures. Pilots will accomplish the following before entering the ship's landing pattern:

(a) Safe all weapons systems.

(b) Visually check to ensure ordnance fired was actually expended and to verify the remaining ordnance is still properly loaded on the aircraft.

(c) Attempt to jettison hung ordnance.

(d) Notify the ship of any ordnance still loaded on the aircraft and whether it is hung or not.

(2) Shipboard Procedures

(a) Air officer or HCO notify the bridge and all other appropriate stations.

(b) Set the proper HERO condition.

(c) De-arming crews stand by on station.

(3) Ship's Air Officer or HCO

(a) Clear landing spot for recovery.

(b) Before recovery, announce "Stand by to recover helicopter with hung ordnance on spot. Hung ordnance is (amount and type). All personnel remain well clear of the flight deck area."

(c) Ensure that rapid response firefighting equipment is manned and ready.

(d) Ensure that the ordnance safety supervisor and the unit de-arming team are on station before recovery.

(e) Ensure all aircraft on the flight deck have secured HF and FM transmitters, IFF, TACAN, and radar altimeters.

(f) Commence downloading of hung ordnance only after the aircraft engines or rotors are secured, aircraft power is off, and the de-arm checklist is completed.

(g) Before jettisoning any ordnance from the ship, receive approval from the CO.

CHAPTER VII

HAZARDS OF ELECTROMAGNETIC RADIATION TO ORDNANCE, ELECTROMAGNETIC COMPATIBILITY, AND ELECTROMAGNETIC VULNERABILITY

1. Introduction. The trend in radar and communications equipment toward greater radiated power has resulted in growing concern with electromagnetic radiation hazards to ordnance, and the potential upset, degradation (also called dudding), or damage to avionics and armament systems. These hazards are created when electro-explosive devices (EEDs), installed in modern ordnance are initiated by spurious electromagnetic energy emitted by microelectronic circuits and components installed in modern aircraft and weapon systems. For classified and detailed aircraft systems vulnerability, see Joint Pub 3-04.11, "HERO/EMI Susceptibility Matrices."

2. Standards and Procedures. The shipboard standards for hazards of electromagnetic radiation to ordnance (HERO), electromagnetic compatibility (EMC), and electromagnetic vulnerability (EMV) are MIL-STD-1385 (series), and MIL-E-6051 (series), respectively. Compliance with these standards is established through testing by the Naval Air Test Center, Patuxent River, Maryland, and the Naval Surface Warfare Center, Dahlgren, Virginia. US Navy and US Coast Guard aircraft are tested and discrepancies corrected as part of the shipboard qualification process. When joint-Service operations are contemplated, unit commanders will consult the appropriate tables to determine which HERO or EMV vulnerabilities exist and set HERO and EMCON conditions accordingly. In cases where data do not exist, prudent choices regarding restrictive HERO and EMCON conditions will be required. Because these choices may be operationally debilitating, it is imperative that aircraft types with the potential for shipboard deployment be identified and tested before embarkation. Coordination for testing can be accomplished through Commander, Naval Air Systems Command (AIR-5161).

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CHAPTER VIII

SAFETY

1. Responsibility for Safety. The commanding officer (CO) of the ship has supervisory responsibility for the safety of embarked helicopters at all times. The helicopter unit CO or detachment OIC and the individual aircraft pilots are directly responsible for the safety of assigned aircraft and personnel. In questionable circumstances, the unit CO or detachment OIC will make the final determination concerning flight safety of aircraft, crew, and passengers.

2. General Safety Measures. The squadron CO or detachment OIC and ship personnel will evaluate the hazards involved in all phases of shipboard helicopter operations and develop appropriate safety measures. Shipboard personnel will be trained in safe operating procedures before commencement of helicopter operations.

a. During flight operations, only those personnel whose presence is required will be allowed in the flight deck area. All other personnel will remain clear or below deck.

WARNING

Under no circumstances will flash pictures be taken of the helicopter because the flash may temporarily blind the pilots.

b. Personnel engaged in flight operations will wear approved head and ear protection, sound suppressors, safety goggles, steel toe safety shoes, flotation devices, long-sleeved shirts or flight deck jerseys, and long trousers. Reflective tape will be applied to headgear and/or the upper body area of flight deck personnel clothing or equipment (see Appendix E for a listing of flight deck clothing.). All personnel on exposed decks will remove their hats (except for approved fastened safety helmets) while helicopter operations are being conducted. All personnel on the flight deck must be trained to take cover immediately on command of the flight deck officer, air officer, LSE, or LSO.

c. Personnel working near helicopters must be instructed to observe aircraft carefully for any sign of malfunction (such as smoke or leaking fluids) and report any such condition to the helicopter crew, or if the helicopter is airborne, to the flight deck officer or air officer.

d. Personnel are allowed to transit the area under the rotor arc of an operating helicopter only with the permission of the pilot (who will signal the LSE or LSO before permitting such passage). For operating helicopters configured with a tail rotor, persons transiting from one side to the other will do so via the nose of the aircraft. The use of a guide to move personnel around turning aircraft should be considered.

e. Pilots of engaged helicopters should maintain eye contact with LSEs or LSOs.

f. Helicopters shall not be launched or recovered or perform rotor engagement or disengagement with the ship in a turn, unless specifically directed to by the ship's commanding officer.

g. A helicopter will not be flown over another aircraft when landing or taking off.

h. Head and ear protection, along with lifevests, will be worn by all personnel working on elevated sections of the aircraft.

3. Passengers

a. Arriving aircraft containing passengers (passengers are personnel on board the aircraft that are not the primary aircrew) will notify the ship upon initial contact that they have passengers to unload. Upon landing, the pilot will keep the passengers on board until a guide is in position to escort the passengers from the aircraft across the flight deck. Passengers should keep protective headgear and hearing protection on until clear of the flight deck area. The guide will return headgear and sound protection to the aircraft, if required.

b. Passengers departing the ship will muster and manifest with the ship's air department. A guide will escort passengers to the flight deck and the aircraft. Head protection, flotation devices, and sound protection will be provided to the passengers prior to being escorted onto the flight deck.

c. Night Overwater Passenger Transfer. Night overwater passenger flights will be conducted for reasons of operational necessity only. This does not preclude movement of troops or personnel in support of operational exercises.

4. Foreign Object Damage (FOD). All-weather deck areas, and particularly the flight deck, will be inspected before and monitored throughout all helicopter operations to ensure that they are clear of FOD. FOD-producing material includes rags, paper, line, ball caps, hardware, and other matter that can be caught by air currents and can subsequently cause damage to the aircraft or injure personnel. Ground support equipment, forklifts, tiedown equipment, and chocks will be properly secured to prevent missile hazards. Trash will not be dumped or burned during helicopter operations. In addition, smoking is not authorized, except in designated spaces, to prevent cigarette butts from reaching the flight deck.

5. Helicopter Equipment Hazards. Equipment aboard helicopters can present dangers to ship personnel. For instance, the ALQ-157 electronic countermeasures equipment on MH-53J helicopters emits invisible infrared light energy; personnel should stay at least 12 feet from the transmitters and not look into the filter windows. In addition, the infrared lamp operates at extremely high temperatures which makes the external surfaces of the covert filter and transmitter very hot. These surfaces should be allowed to cool for 30 minutes before personnel are allowed to handle the transmitters.

6. Weapon Hazards

a. Helicopters parked or operating in the vicinity of ship's weapons are subject to damage from rocket blast, gunfire concussion, and FOD damage from materials scattered when ship's weapons are fired. All appropriate measures should be taken to preclude the firing of any weapon in the vicinity of the helicopter operating area when an aircraft is parked on deck or when flight operations are in progress. When ship's weapons firing is anticipated, aircraft will be positioned outside the weapons blast or concussion range. If this is not possible, aircraft should be secured as far as is practical from the firing mounts, with doors and hatches open.

b. Procedures for the custody and security of personal small arms (i.e., 9mm and .38 cal. pistol and M16 rifle)

will be in accordance with the ship's current small arms (weapons) instruction.

7. Aviation Ordnance Safety

a. The aviation ordnance safety supervisor is a direct representative of the ship's commanding officer.

b. All aviation detachment ordnance and procedures will be approved for use by the Weapons System Explosive Safety Review Board (WSESRB).

c. All ordnance will be properly stowed in accordance with appropriate Service directives governing ship operations. If ammunition cannot be stored in accordance with appropriate Service directives, a waiver must be submitted by the ship and approved prior to loading of subject ordnance.

d. Personnel involved in aviation ordnance operations will be qualified and certified as outlined in Annex C to Appendix D of this publication.

e. Additional specific ordnance safety precautions are provided in Chapter VI.

8. Aircraft Movement and Respotting

a. Officer of the deck (OOD) approval is required before helicopter movement. The ship will maintain a steady course during aircraft respots except when faced with an emergency. Personnel effecting aircraft movement will be prepared to promptly secure the aircraft should the ship be required to maneuver unexpectedly. Timely requests for permission to move aircraft are necessary so that the OOD can maneuver the ship to achieve the most stable deck. All requests to respot aircraft on aviation and amphibious assault aviation ships will be coordinated through the aircraft handling officer.

b. Helicopters, with rotors engaged, will not be pushed or towed on the flight deck. Helicopters are not allowed to be repositioned by taxiing on the flight deck.

c. The following personnel are required for helicopter movement:

(1) Director (1) (with whistle or other communications capability).

(2) Brake rider (1) (if aircraft is so equipped).

(3) Steering bar operator or tow tractor driver (as applicable).

(4) Main landing gear chock or chain men (2).

(5) Tail or nose safety observers or chain men (1 or 2).

(6) Pushers (as required).

WARNING

Only essential personnel should be involved with aircraft movement; all others must remain clear. The move team shall be briefed concerning their duties and responsibilities, maintain a safe distance from the moving helicopter, and have the prescribed equipment for training operations.

d. The director will maneuver the aircraft at a slow and controllable rate of speed (no faster than a person can walk). When the ship is unstable, consideration should be given to alternately attaching and removing the chains during helicopter movement. A brake check will be performed immediately after initial helicopter movement on all aircraft so equipped.

9. Aviation Fuel Handling

a. The following precautions will be observed when handling aviation fuel, with the exception of fuel sampling:

(1) Aviation fuel will not be handled in open containers.

(2) Waste or rags soaked in aviation fuel will be properly disposed of as soon as possible and will not be left about the deck.

(3) No lights, except for properly certified for use in flammable environment lights, will be introduced into any compartment or space where aviation fuel or flammable fumes are present.

(4) Aviation fuel will not be discharged overboard without the permission of the ship's commanding officer.

(5) If aviation fuel is spilled on the deck, it will immediately be mopped, and the incident reported to the helicopter control officer or aircraft handling officer.

(6) Lighted cigarettes or exposed flames of any kind will not be permitted within 50 feet of tanks, pipes, or containers carrying aviation fuel.

(7) Personnel will avoid breathing aviation fuel vapors.

(8) Fuel will not be issued for any purpose other than fueling.

(9) If skin or clothing has come in contact with aviation fuel, personnel will wash with soap and water and change fuel-soaked clothing as soon as possible.

(10) Personnel handling fuel will wear protective goggles to prevent eye injury.

(11) Refueling will be secured when any fuel spillage is noted and not resumed until the cause is corrected and the residue cleaned up.

b. Hot refueling is refueling aircraft with engines, APUs, and/or rotors in operation. Aircraft equipped for pressure refueling may be hot refueled during training, operational, and combat situations. Hot refueling will not be used on aircraft that require gravity refueling. During hot refueling, the LSE or LSO will position himself where he can see the pilot(s), fueling station operator, and nozzlemen. Hot refueling of aircraft with ordnance aboard is authorized only when required by operational necessity and approved by the ship's commanding officer. Simultaneous ordnance loading and fueling operations are prohibited unless otherwise authorized by the ship's commanding officer. Any passengers on board the aircraft will be debarked before hot refueling.

c. JP-5 (or commercial equivalent) is the only common turbine engine fuel whose flash point is compatible with the shipboard environment. Every effort should be made to fuel aircraft with JP-5 before embarkation.

WARNING

Under no circumstances may aircraft containing JP-4 or other low flash point fuels be defueled into the ship's service system. Aircraft arriving at a ship with other than JP-5 should endeavor to burn or dump down to the lowest practical fuel state before final landing and promptly fuel with JP-5. An aircraft will only be considered purged of alternative fuels when a fuel sample passes flash point test.

10. Helicopter Fire Party. The fire party is the ship's primary means of combating a flight deck fire. The fire party is composed of two initial response aqueous film forming foam (AFFF) hose teams and a backup team. The fire party will be composed of ship's company personnel during initial or transient operations; however, during sustained operations it may be augmented with helicopter detachment personnel.

11. Mishap Investigation

a. Navy and Marine Aircraft. Naval aircraft mishap investigation procedures are in OPNAVINST 3750.6 (series).

b. Coast Guard Aircraft. Coast Guard mishap investigation procedures are in COMDTINST M5100.47 (series).

c. Army Aircraft. Army mishap investigation procedures are in AR 385-40.

d. Air Force Aircraft. Air Force mishap investigation procedures are in AFR 127-4 (safety) and AFR 110-4 (accident).

e. Judge Advocate General (JAG) Manual or Legal (USCG) Investigation. In the event of an aircraft mishap, the commanding officer of the host ship will initiate a JAG manual or Legal investigation where required. If unusual circumstances require, a senior in the chain of command may assume that responsibility. If a mishap should occur during transient operations, the responsibility for JAG manual or Legal investigation remains with the commanding officer of the aviation unit.

f. Explosive Mishap Reporting. Explosive mishaps will be reported in accordance with the governing directives of each Service involved. Copies will be provided as necessary to all concerned.

12. Emergency Procedures. Each emergency situation is unique. Therefore, advance formulation of procedures may not hold in every instance, but the following general guidelines are appropriate for shipboard helicopter operations.

a. General Information

(1) Helicopter emergency information will be passed to the flight deck crew and fire party either over the general announcing system (1MC) or the flight deck crew announcing system (5MC), whichever is most expedient.

(2) When the flight deck has an emergency and a crash alarm is sounded, unnecessary personnel will be cleared from the flight deck and surrounding area.

(3) During any emergency, the first consideration of the ship should be to close the distance to the helicopter and prepare for immediate recovery. If the emergency is single engine or power loss, optimum relative wind for recovery is required. If a flight control malfunction is indicated, a stable flight deck with acceptable winds is warranted. Specific actions are outlined in aircraft flight manuals.

b. Airborne Aircraft Emergencies. These fall into three basic categories: (1) cases that cause an aircraft to ditch or crash, (2) cases that require an immediate landing, and (3) cases that require a precautionary shipboard landing.

(1) In the event of a crashed or ditched aircraft, the ship will:

(a) Plot the position of a crash or ditching.

(b) Close on the crash site at best speed.

(c) Assemble the rescue boat or rescue helicopter team(s) as appropriate.

(d) Station and brief additional lookouts.

(e) Recover personnel.

(f) Recover aircraft or debris.

(g) Execute search and rescue (SAR) plans in accordance with Joint Publication 3-50, "National Search and Rescue Manual," and other applicable directives.

(2) Certain aircraft emergencies may necessitate an immediate landing. If an immediate shipboard landing is required, the ship will:

(a) Maintain radar or radio contact if possible. If all contact is lost, commence crash or ditch procedures.

(b) Head for the helicopter at best speed.

(c) Obtain amplifying information from the pilot regarding the nature of the emergency and intentions.

(d) Set emergency flight quarters. Emergency flight quarters entail, as a minimum, expeditiously stationing both fire parties, stationing the pilot rescue detail, and setting material condition ZEBRA in the effected part of the ship.

(e) Request required assistance from accompanying units.

(f) Turn to base recovery course (BRC) and adjust speed to provide a steady deck 2 minutes before helicopter arrival (3 minutes for night or IMC).

(g) Clear all unnecessary personnel from the flight deck area before establishing a green deck. The crash or fire party will move as far away as possible from the landing site but remain at a quick access location, ready to use crash, fire, or rescue equipment as directed.

(h) Chock and tie down the aircraft (as for a normal recovery) once it is resting safely on the deck and ordnance or weapons have been de-armed.

(3) Situations in which continued flight presents a moderate hazard to the aircraft or crew, but the

aircraft's condition is stable, require a precautionary landing. Such a situation is an emergency when declared; however, proper preparation for recovery is more important than immediate termination of the flight. The ship will be alert to the possibility that the situation may deteriorate such that an immediate landing is required. The ship will execute the following procedures:

(a) Maintain radar or radio contact.

(b) Set flight quarters as soon as practical without interfering with urgent ship evolutions. The fire parties will be fully formed and additional alert conditions will be set as dictated by the circumstances.

(c) Turn to BRC and adjust speed to recover aircraft at the earliest opportunity.

(4) Engine Failure or Power Loss. Generally speaking, multiengine helicopters can fly safely when one engine has failed, but their ability to hover is very limited. Helicopters experiencing engine power loss must be afforded the maximum amount of available deck space for a run-on or no-hover landing, along with optimum relative wind. A waveoff may be impossible; therefore, approach and landing should be planned and executed with the utmost care.

c. Flight Deck Emergencies

(1) Helicopter Engine Fires on Deck. The LSE or LSO will be alert at all times for fire and will give the appropriate hand signals to the pilot if fire indications are observed. If the fire is internal to the engine, generally the operator will attempt to extinguish the fire by motoring the engine. If the fire is external to the engine, the engine will be secured and firefighting efforts initiated. Initially, installed aircraft systems or CO2 should be used. Large or persistent fires will require the use of dry-chemical and/or foam agents.

(2) Other Aircraft Fires. Shipboard fires are most hazardous and immediate action is required to prevent even the smallest of fires from growing and doing extensive damage. In the event of an aircraft fire, the first priorities are rescue of personnel and the prevention of ordnance detonation. All possible

steps will be taken to minimize damage to aircraft and the ship consistent with these priorities and ensure prompt control of the fire.

(3) Landing Gear Emergencies. If a helicopter returns with inoperative landing gear, maintenance personnel should inspect the aircraft in a low hover (See Appendix F for appropriate emergency hand signals.) and attempt to lower the landing gear manually after the aircraft is properly grounded. If this fails, the aircraft may be landed with suitable portions of the structure resting on a stack of pallets, preferably banded together, secured to the deck and padded with mattresses. The ship should be maneuvered for an optimum combination of relative wind and deck stability.

(4) Hung Droop Stops. If one of the mechanical droop stops fails to seat during disengagement, the LSE or LSO will signal the pilot to reengage the rotor system. Disengagement should be reattempted using a different control position and relative wind combination. If this fails, the flight deck area around the aircraft will be evacuated of all (nonessential personnel. The pilot will communicate the requirements dictated by aircraft-type operational manuals to tower and the LSE or LSO as appropriate, and make a shutdown in accordance with aircraft-type operational manuals.

(5) Aircraft Jettison. If a situation arises that requires a damaged or burning helicopter be jettisoned overboard, the decision to jettison and selection of procedures to use will be made by the ship's commanding officer or OOD.

13. Aircraft Emergencies. The nature of some emergencies requires priority and/or diversionary measures. The ultimate resolution of these emergencies involves a command decision, based on the type of emergency and weather conditions in the recovery area. All pertinent details must be collected that might aid in the evaluation of an emergency, and the command and other interested agencies must be kept properly informed. Search and rescue (SAR) action should be executed when reasonable doubt exists as to the safety of the aircraft. From a control standpoint, aircraft emergencies fall into four categories:

a. Communication failures.

b. Navigational aid failures.
c. Crewmember injuries.

d. Other aircraft systems failure.

e. Lost Communications Emergency Squawks

(1) Mode III. An aircraft with radio difficulties (transmitter and/or receiver) should squawk Mode III Code 7600 or emergency Code 7700 as appropriate. (Code 7700 first, followed by Code 7600, will assist in alerting approach control.)

(2) Mode I. The following codes will amplify difficulties in conjunction with a Code 7600 or 7700. No receiver will mean that the primary UHF, auxiliary receiver, and UHF/VHF Guard receiver are inoperative. If any receiver is operative, the controller is capable of controlling the aircraft using IFF standby squawks and/or aircraft turns to acknowledge receipt of instructions.

(3) WMEC 210 and WAGB-400 class Coast Guard cutters are unable to interrogate IFF transponders.

(4) If aircraft is in radar contact and lost communications, use fire control radar to "lock up" aircraft equipped with AN/APR-39, 1 minute on and 1 minute off cycle.

TABLE VIII-1. HYDRAULIC ELECTRICAL FUEL OXYGEN ENGINE (HEFOE) SQUAWK TABLE

Mode I		Mode III
First Digit	Second Digit	
0 - ok		
1 - Hydraulic	1 - No Receiver, TACAN ok	
2 - Electrical	2 - No Receiver, ADF ok	7700/7600
3 - Fuel	3 - Receiver ok, no NAVAID(s)	(with HEFOE code, use Code 7700)
4 - Oxygen		
5 - Engine		

TABLE VIII-2. ASSISTANCE REQUIRED SQUAWKS TABLE. All 7 Mode I squawks indicate no receiver and no NAVAID(s).

Mode I	Mode III
70 - Desire tanker to join	Fuel onboard (up to 7,500 lb)
71 - Intend bingo	
72 - Desire aircraft to assist	

TABLE VIII-3. LIMITED COMMUNICATIONS SQUAWKS TABLE. Requires a 1-minute cycling of Mode III from 7600 or 7700 to desired channel.

Mode I	Mode III
60 - Auxiliary Receiver (ADF) channel_____	Channel usable (0100-2000, and 2100 = Guard)
61 - No NAVAID(s). Receiver on channel_____	
62 - TACAN ok, Receiver on channel_____	

14. Basic Emergency Procedures. Emergencies where navigation aids and/or communications are available should be handled according to procedures prescribed in this publication. Emergency procedures for aircraft system failures are covered in the appropriate aircraft flight operations manual.

15. Lost Aircraft Procedures. When the position of an aircraft is in doubt, the controller must immediately commence the following procedure.

a. If there is no contact:

(1) Obtain radar and radio contact as soon as possible. Take control of the circuit in use and use relay aircraft. Continue to send information in the blind and search all IFF modes. Commence communications search and monitor guard channel (243.0 MHz) for emergency aircraft calls.

(2) Inform the officer in tactical command (OTC).

(3) Keep an up-to-date estimate of the aircraft's fuel state.

(4) Call for TACAN and UHF or DF and electronic warfare support measures (ESM) watch to be set immediately.

(5) Alert the command for the possible use of other aids to lost aircraft, such as black smoke, vertical searchlights, antiaircraft bursts, starshells, fire control tracking balloons, energized prebriefed sonobuoy channel, and other navigation aids.

b. Once contact is regained:

(1) Vector the aircraft to nearest airfield or back to the force.

(2) Ensure that the position of aircraft is recorded.

(3) Check fuel state.

(4) Vector nearest aircraft to act as escort if necessary.

(5) Have the aircraft gain altitude, fuel state permitting, if communications are still unsatisfactory.

16. Lost Communications During Instrument Flight Rules (IFR). If under IFR conditions, the pilot will follow procedures set forth in the prebriefed assigned marshall or TACAN approach and plan the flight in order to commence the approach at the prebriefed recovery time.

17. Lost Communications While on Filed Flight Plan. The pilot will proceed in accordance with prescribed air traffic control (ATC) procedures.

18. Communications or Navigation Aids Failure During Approach. In the event of communications failure, if navigation aids are available, the pilot will continue the approach to the missed approach point (MAP). If VMC exist at the MAP, the aircraft commander will decide whether to land the aircraft. If VMC do not exist at the MAP, or if in the aircraft commander's judgment a safe landing cannot be completed, the aircraft will execute the missed approach and proceed via parent Service directives or as briefed.

a. If navigation aids failure is experienced, the ship will vector the helicopter for a radar-controlled approach.

b. If an approach is mandatory, the pilot may execute one of the following procedures, as applicable.

(1) Navigation aids failure. The ship will vector the aircraft for a radar-controlled approach, except the pilot will continue his descent until visual contact is achieved with the ship or wake.

(2) Communications failure. The pilot will execute the appropriate approach as outlined above.

c. All ships at sea will monitor UHF Guard frequency because a pilot may attempt to communicate using his personal survival radio. Transmission may be made to an aircraft through voice channels available on some NAVAIDS (ILS, NDB, VOR, or UHF).

19. Emergency Landings

a. As much deck as possible will be made available for emergency helicopter landings. The senior helicopter squadron or unit officer on board should take station in the PriFly, AOCC, HDC, or CIC as appropriate. The optimum relative wind should be determined, and the ship maneuvered as necessary. Once the aircraft is on final approach, it is imperative that the ship hold a steady course.

b. Certain types of emergencies may permit use of an LSE or LSO, in which case his position should be such as to minimize his exposure to danger. The LSE or LSO will give a waveoff only in case of fouled deck or if directed to do so by the tower or bridge.

20. Emergency Signals. The aircraft will squawk IFF emergency as appropriate. The CIC will be alert for IFF

emergency squawk and immediately alert the bridge. Priority will be given to effected aircraft and all emergency procedures used.

21. Aircraft Carrier Procedures. The following safety procedures apply specifically to operations from aircraft carriers (CVs).

a. Night and IMC helicopter recoveries should be conducted to the angled deck, from astern, using the optical landing system (OLS), with the wind oriented to the centerline of the angled deck and within the wind envelope of the particular aircraft model. During night VMC recoveries on CVs equipped with operating sodium vapor floodlights, and when the after portion of the flight deck is not clear, helicopters may make an approach using the OLS and centerline of the angle deck. After reaching the fantail, and, when the deck and LSE or LSO have been visually acquired, the helicopter can then slide left, fly up the port side, and slide right to the landing spot on the flight deck under LSE direction.

b. Helicopters will not cross within 5 miles of the ship's bow or stern without specific clearance from the tower or controlling unit because of the hazards associated with fixed-wing launch and recovery operations.

CHAPTER IX

LOGISTICS

1. Background. The purpose of this chapter is to outline general procedures for providing material support for helicopter units assigned to joint operations. The scope and details of the implementation of these procedures are highly dependent on the duration and circumstances of a particular exercise or mission. A short-duration detachment will usually draw the bulk of its supply material from a parent-Service-provided packup kit (PUK). Resupply of drawn material will occur on an as-needed basis. Material support for detachments of longer duration will be better served by establishing an independent unit identity, especially when shipboard operations will be conducted outside the umbrella of the parent-Service support infrastructure. Establishment of independent unit identity will provide the most flexible support if a helicopter detachment is to relocate from ship to ship or ship to shore. It is recommended that the detachment bring as many consumable items as possible.

2. Funding. The parent organization of a helicopter detachment is responsible for funding the expenses associated with aircraft maintenance and operation. Ships' commanding officers are responsible for funding shipboard operating and maintenance costs from the operating target (OPTAR) allowance. Unless specified, funding will be provided by the parent organization or groups performing travel under joint travel regulations (JTR). Units required to purchase supplies or fuel from ships stores will be required to provide appropriate accounting data.

3. Meals. Shipboard meals for officers are normally handled by an independent fund to which individual officers contribute. Officers can expect to pay directly or be billed for meals consumed. Enlisted members eat in a dining facility operated by the ship's supply officer and funded from the ration allowances of the members. Orders for enlisted members should reflect rations in kind for the duration of shipboard embarkation. Coast Guard cutters will treat meals provided to detachment personnel as reimbursable issues and submit forms DD-1149 in accordance with COMDTINST M4061.3 (series).

4. Supply. The ship's supply officer can provide assistance in preparing and transmitting properly formatted supply

requisitions into the system; however, the helicopter detachment unit is responsible for providing the technical, identification, and funding data for the required material.

5. Cargo Routing. Procedures to ship material to units deployed worldwide exist within the defense transportation system and Military Standard Transportation and Movement Procedure (MILSTAMP) as outlined in DOD Instruction 4500.32 series. The Shipper's Service Control Office (SSCO) for all US Navy units is the Naval Material Transportation Office (NAVMTO) in Norfolk, Virginia. NAVMTO maintains a cargo routing information file (CRIF) that contains up-to-date information on how to route material to covered mobile units. Detachments possessing individual unit identification codes (UIC) and desiring to avail themselves of this service should make arrangements with NAVMTO and their parent SSCO to be included in the CRIF. Ships will keep NAVMTO and other cognizant SSCO's apprised of consignment instructions for embarked detachments. Alternatively, material for an embarked detachment may be consigned to the host. Detachments operating from Coast Guard cutters should contact the cutter's supply officer before deployment to coordinate cargo routing.

6. Aviation Fuel. If reimbursement is required, helicopter detachments will reimburse ships for aviation fuel at the established DOD price. Selected ships may be capable of processing a DOD fuel identification plate, however; use of a DD-1348 form is more common. For continuing operations, fuel may be billed on the 10th, 20th, and last day of the month to coincide with ship's fuel usage reports. Because many ships are not equipped with meters, aircrew should be prepared to determine the quantity delivered, in pounds, using aircraft fuel gauges.

7. Hazardous and Flammable Material. Stowage and disposal will be in accordance with current directives provided by the host activity.

8. Ammunition

a. Issuing Activities. Issuing activities will ensure that only authorized and fully serviceable ammunition is used. This will be accomplished by checking the mark and modification of weapons and/or weapon systems, their ammunition and ammunition component requirements, containers, powder indexes, ammunition lot numbers, charge weights, grade classifications, and the external conditions of the items. Ammunition items issued will be complete as identified by a DOD identification code

(DODIC) or Navy ammunition logistics code (NALC), ammunition assembly sheet, complete round chart, or other approved publication. Ammunition or components without DODIC or NALCs will not be issued to combatant ships.

b. Shipment of Explosives. Ammunition or other hazardous materials to be shipped to ships by a DOD component or a common (commercial) carrier will be packed, marked, and labeled in accordance with NAVSEA OP 2165 regulations for rail, motor vehicle, water, or air shipment.

c. Allowance Lists. Ammunition requirements for units afloat are established to provide a basic authorization by quantity and type to suit the applicable mission and armament of the unit. Normally, these authorizations are in the form of allowance lists.

d. Mission Load Allowances. The mission load allowance is the allowance of ammunition carried by certain amphibious warfare and auxiliary ships in support of their assigned mission, exclusive of the ship's own armament.

e. Replenishment. Weapons expended from allowance will be replenished using existing supply procedures. In many instances, Service units will be obliged to use ammunition from Naval or Marine Corps stock. When this occurs, the Navy or Marine Corps is entitled to replacement or reimbursement from the parent Service.

9. Mail. The military postal service is a method for delivery of moderate-sized parts and supplies as well as personal and official mail. Helicopter detachments may obtain a mobile unit APO or FPO address from the US Military Postal Service Agency, Washington, D.C., in accordance with the DOD Postal Manual (DOD Instruction 4525.6). Establishment of an address and ZIP code is required approximately 60 days in advance. Ships will update mail routing instructions for embarked detachments.

10. Aircraft Maintenance. Available aviation maintenance facilities vary widely with ship class. The Air-Capable Ships Facilities Resume provides guidance regarding air-capable ships. Aviation and amphibious aviation ships have extensive maintenance facilities, including an aircraft intermediate maintenance department (AIMD), which is capable of a wide range of functions. These functions include, but are not limited to, electronics repair, tire and wheel buildup, composite material repair, oxygen servicing, and

inspection and repair of aircrew survival equipment. However, support for particular joint-Service systems is not assured and should be determined in advance. Joint force commanders are responsible for coordinating required maintenance infrastructure.

APPENDIX A

SAMPLE FORMATS

ANNEXES:

A. Sample Letter of Instruction (LOI)
B. Sample Currency Waiver Request Format
C. Sample Waiver Request Format (for other than currency)
D. Sample Urgent Change Recommendation Format

(INTENTIONALLY BLANK)

A-2

SAMPLE LETTER OF INSTRUCTION (LOI)

3120
Ser

From: Commander, Naval Surface Force, US _____ Fleet
To: Commanding Officer, USS
Commander,

Subj: LETTER OF INSTRUCTION (LOI)

Ref: (a) Joint Pub 3-04.1, "JTTP for Shipboard Helicopter Operations"
(b) [CINC EMPLOYMENT SCHEDULE]
(c) [SURFACE TYCOM DIRECTION TO CONDUCT US ARMY DLOs]

Encl: (1) Presail Conference Checklist

1. Summary. In accordance with reference (a), this LOI describes the concept of operations and assigns responsibility for Commanding Officer, USS _____ and assigned detachment [(unit designation)], for deck landing qualification (DLQ) training exercises.

2. Mission. USS_____ will provide underway platform services in the conduct of DLQ training exercises (references (b) and (c) refer). Individual ship routine and exercises may be conducted consistent with attainment of DLQ training goals, safety, and operational security.

3. Concept of Operations. A detachment of helicopters from (unit/location) will conduct a series of DLQ training exercises consisting of day or VFR landings on the flight deck.

4. Command Relationships and Responsibilities

a. COMNAVSURF _____ is the officer scheduling the exercise (OSE).

b. Commanding Officer, USS _____ , is assigned as officer in tactical command (OTC) for scheduled DLQ training exercises and will coordinate with area and shore commands for appropriate OPAREA clearances. The host ship can provide limited administrative, logistic, material, material, maintenance, and repair support. The

flight deck safety and indoctrination brief is provided to aircrews prior to the scheduled operations.

c. Officer in charge of [(unit designation)] is assigned as the officer conducting the exercise (OCE) and is directed to conduct training exercises and pre-exercise training and planning and to convene a presail briefing conference for major participants. The OCE will ensure prerequisites for shipboard helicopter operations are satisfied, coordinate and supervise training exercises as they pertain to helicopters, and conduct appropriate preflight briefs.

5. Helicopter Operations. Shipboard Prerequisites for helicopter operations include the following:

a. Training requirements and personnel qualifications to conduct deck landing operations (reference (a)) will be attained prior to actual helicopter DLQ training exercises.

b. Helicopter detachment will initiate coordination for a presail conference approximately 4 weeks prior to actual operation. A sample Presail Conference Checklist is provided in this letter.

c. Helicopter detachment will provide an officer onboard ship for liaison between the ship and helicopter aircrews during DLQs.

d. Liaison officer will provide diagrams of pertinent aircraft depicting aircraft egress, fuel cell locations, tie down points, and desired wind envelopes for the HCO and crash or fire crew during the presail conference.

e. Aircrew personnel will brief flight deck and fire party personnel on Army or Air Force helicopter orientation and safety requirements to include a walk through of the aircraft. Aircraft orientation can be conducted following the first landing per type aircraft during DLQ operations.

f. The low flash point temperature of JP-4 and Jet B fuel constitutes a severe fire hazard aboard ship. In addition, JP-4 and JP-5 mixtures assume the characteristics of JP-4 even with very low percentages of JP-4. To minimize the JP-4 hazard aboard ship, one of the following procedures shall be followed prior to first shipboard operation (listed in order of desirability):

(1) Defuel aircraft completely and refuel with JP-5.

(2) Burn down to minimum fuel and refuel with JP-5 at least five (5) times. JP-8 or Jet A may be substituted for JP-5 in above procedures for shipboard flight operations. However, JP-8 or Jet A still reduces the flash point to a level unacceptable for hangaring. Therefore, aircraft shall not be hangared if JP-8 or Jet A has been substituted. Fuels other than JP-5 shall not be defueled into ship fuel systems. In an emergency, such fuels must be discharged directly over the side.

g. Authority to conduct aircraft operations on US Navy ships must be granted by [FLEET CINC]. [SURFACE TYPE COMMANDER] will initiate the request and inform all units concerned.

h. Supported units should be familiar with pertinent US Navy shipboard aviation manuals:

(1) Joint Pub 3-04.11 and 3-04.11 (JTTP for Shipboard Helicopter Operations)

(2) NAWCAD-ENG-7576 (Shipboard Aviation Facilities Resume) shows deck markings and ship profile.

(3) Pertinent sections of NWP-42 series (Shipboard Helicopter Operating Procedures Manual): Launch/Recovery Procedures, Air Traffic Control, Aviation Fueling, General Helicopter Operations.

Note

Or the applicable CV/CVN, LPH/LHA/LHD NATOPS

i. Field deck landing requirements can be accomplished at the unit's home station if field deck markings are per Naval Air Engineering Center specifications (available from [SURFACE TYPE COMMANDER]). Use of US Naval field deck landing facilities at NAS Norfolk, VA; NAS Mayport, FL; NALF Imperial Beach, CA; or NAS Barbers Point, HI, may be requested. Ample lead time (3-4 weeks) is required to ensure reservation for use.

6. Administrative and Logistics. The OCE is responsible for coordinating and arranging shore-based administrative and logistic support. This support includes, but is not limited to, those suggested in item 22, sample presail checklist. Personnel and equipment support onboard ship will be

coordinated with host ship representatives and the OIC of the detachment.

7. Safety Reports. Actions to be taken in the event of an aircraft mishap or incident will be per parent-Service regulations. Initial message notification of aircraft mishap or incident OPREP 3 will also include as information addressees those Service commands deemed appropriate by the OIC of the detachment.

ASSISTANT CHIEF OF STAFF
AVIATION

Copy to:
GROUP
SQUADRON
Participating Army or Air Force Unit(s)

SAMPLE SHIPBOARD HELICOPTER OPERATIONS
PRESAIL CONFERENCE CHECKLIST

	UNIT	POC	AV PHONE:
AVIATION:	_____	_____	_____
SHIP:	_____	_____	_____

1. ESTABLISH: a. DLQ Date: _____

   b. Flight Schedule: _____

2. FIELD DECK LANDING QUAL RQMTS _____

3. DLQ CURRENCY RQMTS _____

4. TYPE AND NUMBER AIRCRAFT INVOLVED _____

5. # PILOTS NEEDING INITIAL QUAL/ CURRENCY _____

6. SURFACE/AIR CLEARANCES (Ship Responsibility) _____

7. AVIATION FACILITY WAIVER (Type Commander (N8) Will Coordinate) _____

8. TRANSIENT A/C LOCAL OPS BRIEF (Base OPS Provides) _____

9. TACAN/RADIO FREQUENCIES _____

10. SHIP Overhead MSG (Containing OPS/COMM Info) _____

11. SAFETY/OPERATIONS BRIEF (Ship) _____

12. CRASH RESCUE PROCEDURES AND POST CRASH FIRE PROCEDURES _____

13. SEARCH AND RESCUE (SAR) _____

14. SHIPS GLIDE SLOPE INDICATOR (SGSI) (DIFFERENT FROM ARMY GSI) _____

15. ENGAGE/DISENGAGE ENVELOPES (Shipboard) _____

16. NO ROTOR BRAKES ON-ARMY HELICOPTERS _____

17. TAKEOFF/RECOVERY ENVELOPES _____

18. BAD WEATHER PROCEDURES _____

19. FUEL REQUIREMENTS ONBOARD SHIPS _____

    a. JP 5 Only _____

    b. NATO D1 or Wiggins _____

20. FUEL REIMBURSEMENT (Standard Military Credit Card or DD Form 1348) _____

21. NAME OF LIAISON OFFICER (During Shipboard DLQ Period) _____

22. SHORE-BASED ADMINISTRATIVE/ LOGISTICS COORDINATOR _____

    a. HELO RAMP PARKING* _____

    b. FRESH WATER WASH _____

    c. ACCOMMODATIONS _____

       OFFICER _____

       ENLISTED _____

    d. MESS FACILITIES _____

    e. LOCAL TRANSPORTATION _____

    * Contact base Air Operations for transient parking and to obtain POC phone numbers for other logistic requirements.

NOTES:

SAMPLE CURRENCY WAIVER REQUEST FORMAT*

FROM (Air Force/Army originator)

TO For Air Force originator:
HQ USAF WASHINGTON DC//XOOM// (Thru appropriate channels)
For Army originator:
CSA WASHINGTON DC//DAMO-TRS// (Thru appropriate channels)

INFO CNO WASHINGTON DC//889F//
(Joint Force Commander)
(Joint Force Naval Component Commander)
(other appropriate agencies)

(Classification) //N03000//
MSGID/GENADMIN/(ORIGINATING COMMAND)/(OFFICE SYMBOL)//
SUBJ/DECK LANDING QUALIFICATION CURRENCY WAIVER REQUEST//
REF/A/PUB/JOINT PUB 3-04.1//
AMPN/JTTP FOR SHIPBOARD HELICOPTER OPERATIONS//
REF/B/MOU/ARMY AIR FORCE DECK LANDING OPERATIONS, JULY 88//
AMPN/MOU WITH NAVY FOR SHIPBOARD HELICOPTER OPERATIONS//
RMKS/
1. ( ) IAW REF A, REQUIRE DLQ CURRENCY WAIVER FOR
(specify--day/night/NVG) QUALIFICATIONS

2. ( ) QUALIFICATION EXPIRED ON (date) DUE TO
(reasons)

3. ( ) NO OTHER OPTIONS TO REQUALIFY EXIST WITHIN CURRENT TIME CONSTRAINTS. (i.e., using USN, USMC, or other Service unit IPs)

4. ( ) FOL INFO PROV:
A. (name/rank)
B. TOT HRS (insert #)
C. TOT NVD HRS (insert #) (if applicable)
D. TOT SHIP LDNGS (insert #)
E. TOT NVD SHIP LDNGS (insert #)

* Note. Waiver requests are handled on a case-by-case basis between USN (OP-889F) and the USA (DAMO-TRS) or USAF (XOOM) based on MOU between the Departments of the Navy, Air Force, and Army titled "Army/Air Force Deck Landing Operations," July 1988.

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SAMPLE WAIVER REQUEST FORMAT*
(For Other Than Currency Requirements)

FROM (Air Force/Army originator)

TO For Air Force originator:
HQ USAF WASHINGTON DC//XOOM// (Thru appropriate channels)
For Army originator:
CSA WASHINGTON DC//DAMO-TRS// (Thru appropriate channels)

INFO CNO WASHINGTON DC//593//
(Joint Force Commander)
(Joint Force Naval Component Commander)
(other appropriate agencies)

(Classification) //N03000//
MSGID/GENADMIN/(ORIGINATING COMMAND)/(OFFICE SYMBOL)//
SUBJ/ (specify) WAIVER REQUEST//
REF/A/PUB/JOINT PUB 3-04.1//
AMPN/JTTP FOR SHIPBOARD HELICOPTER OPERATIONS//
REF/B/MOU/ARMY AIR FORCE DECK LANDING OPERATIONS, JULY 88//
AMPN/MOU WITH NAVY FOR SHIPBOARD HELICOPTER OPERATIONS//
RMKS/
1. ( ) (specify waiver requested)

2. ( ) (specify reason for waiver request)

3. ( ) (provide data to support request)

* Note. Waiver requests are handled on a case-by-case basis between USN (OP-889F) and the USA (DAMO-TRS) or USAF (XOOM) based on MOU between the Departments of the Navy, Air Force, and Army titled "Army/Air Force Deck Landing Operations," July 1988.

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SAMPLE URGENT CHANGE RECOMMENDATION FORMAT

FROM (originator)

TO CNO WASHINGTON DC//889F//
JOINT STAFF WASHINGTON DC//J7-JDD//

INFO AIG 7029
COMNAVAIRPAC
CINCPACFLT PEARL HARBOR or CINCLANTFLT NORFOLK VA
NAVSAFECEN NORFOLK VA
NAVTACSUPPACT WHITE OAK MD
(other appropriate agencies)

(Classification) //N03000//
MSGID/GENADMIN/(ORIGINATING COMMAND)/(OFFICE SYMBOL)//
SUBJ/URGENT CHANGE RECOMMENDATION FOR JOINT PUB _
(specify--3-04.1 or 3-04.11) //
REF/A/PUB/JOINT PUB 3-04.1//
AMPN/JTTP FOR SHIPBOARD HELICOPTER OPERATIONS//
RMKS/
1. IAW REF A URGENT (SAFETY) CHANGE IS RECOMMENDED FOR JOINT PUB (specify--3-04.1 or 3-04.11)

2. PAGE _____, PARAGRAPH, _____, LINE NO. _____
FIGURE NO. _____

3. PROPOSED NEW TEXT

4. JUSTIFICATION

(INTENTIONALLY BLANK)

APPENDIX B

CONTROL AREAS AND APPROACH CHARTS

ANNEXES:

A. Standard Patterns and Zones
B. Approach Charts for Air-Capable Ships
C. Emergency Patterns and Procedures
D. Typical Landing Procedures

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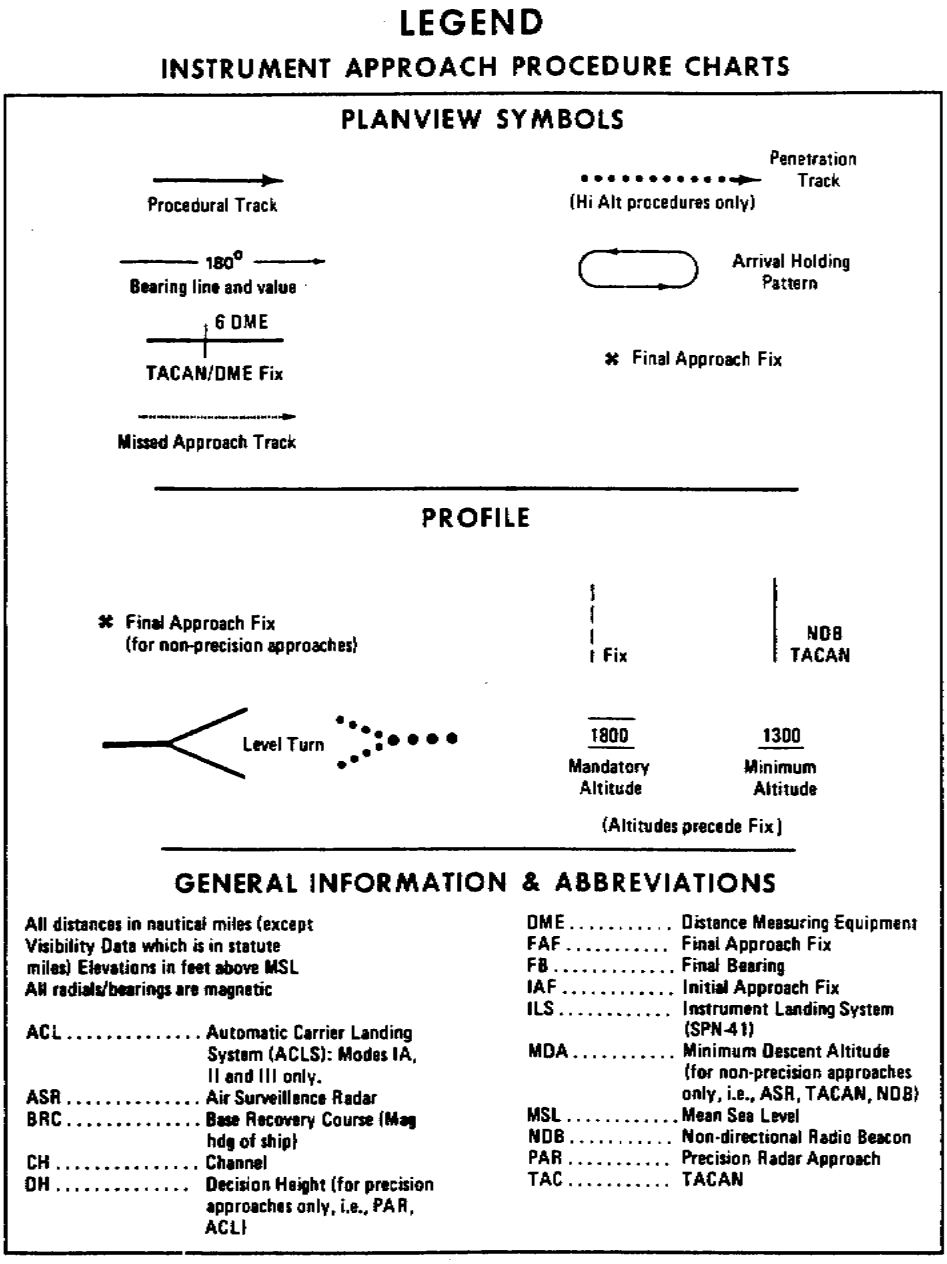


Figure B-A-1. Legend--Instrument Approach Procedures Charts
B-A-1

Figure B-A-1. Legend--Instrument Approach Procedures Charts

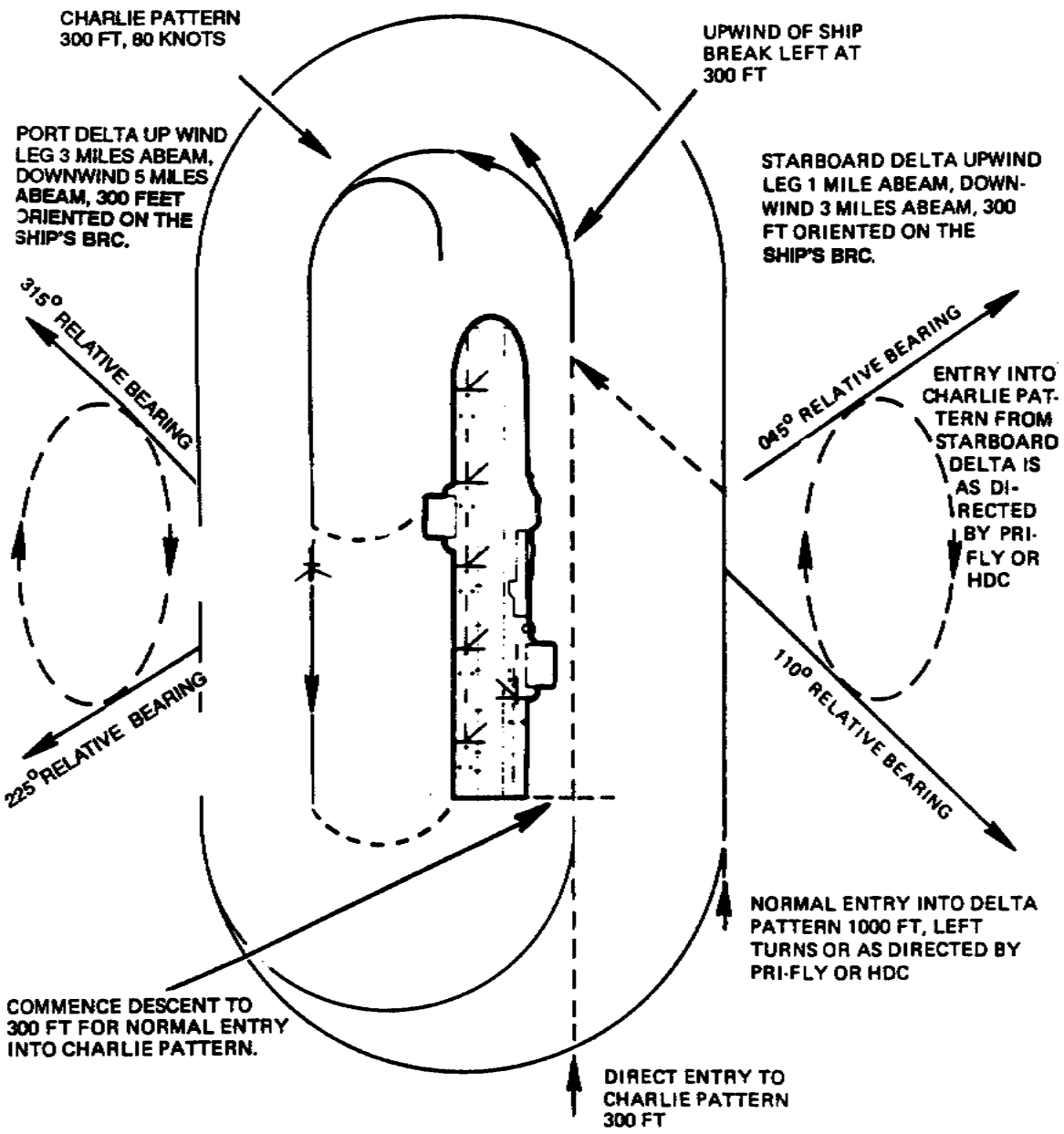


Figure B-A-2. Delta and Charlie Patterns for Helicopters
B-A-2

Figure B-A-2. Delta and Charlie Patterns for Helicopters

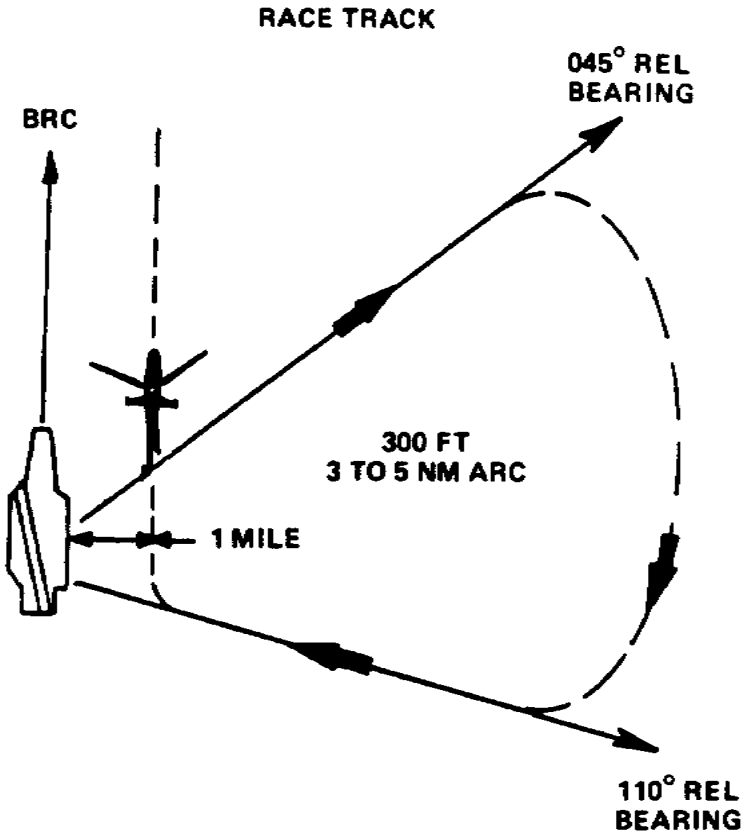


Figure B-A-3. Plane Guard Pattern

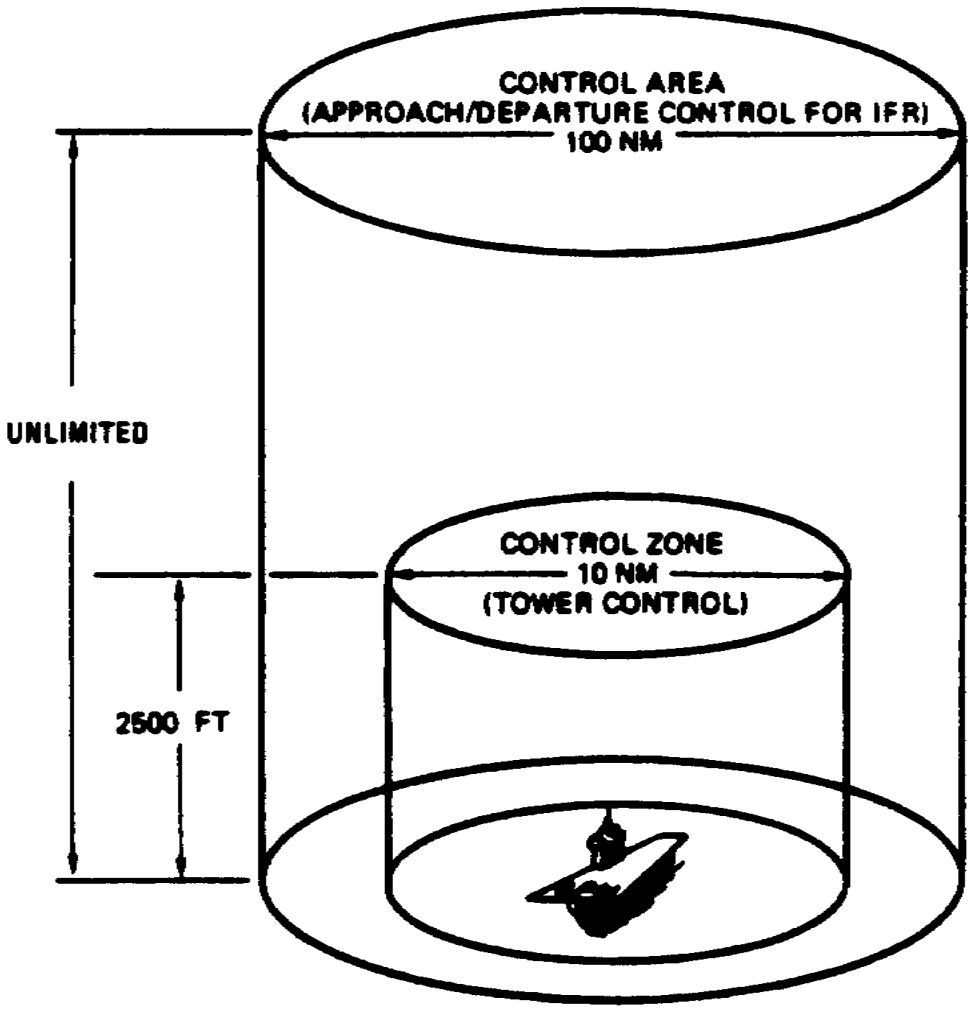
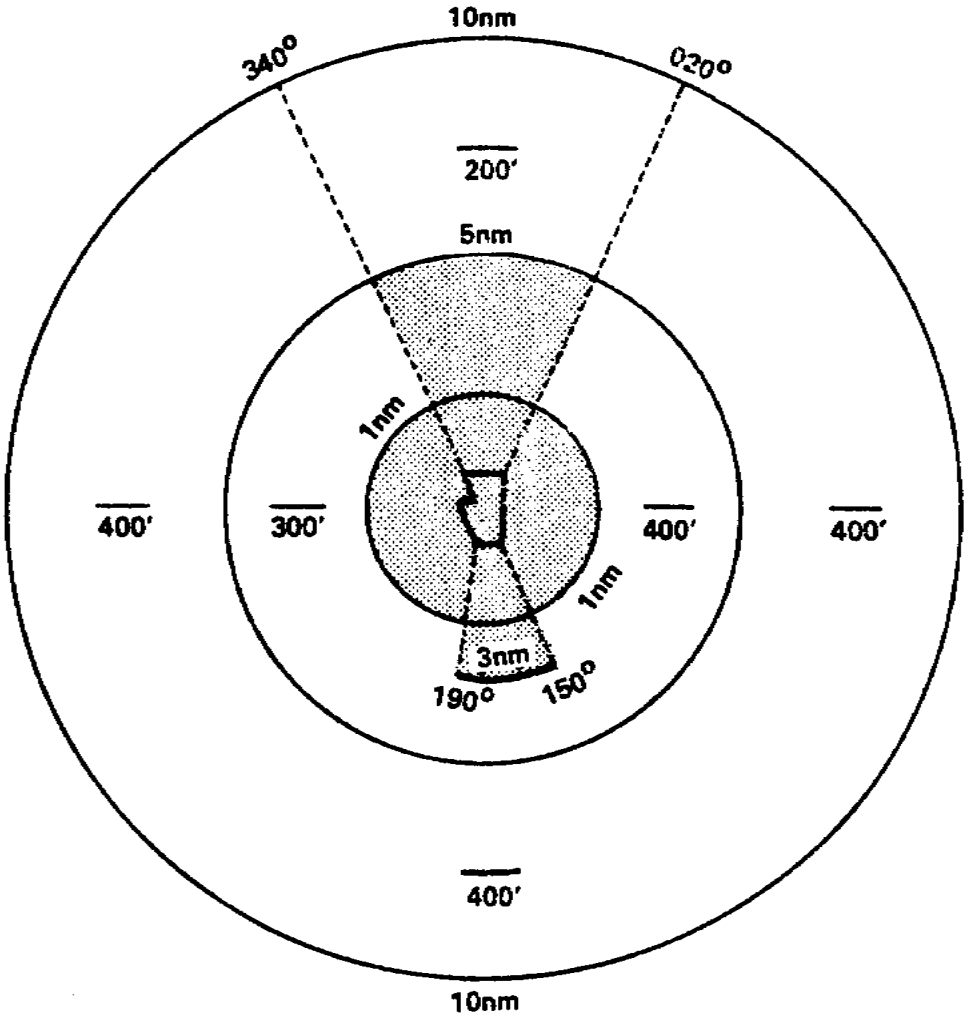


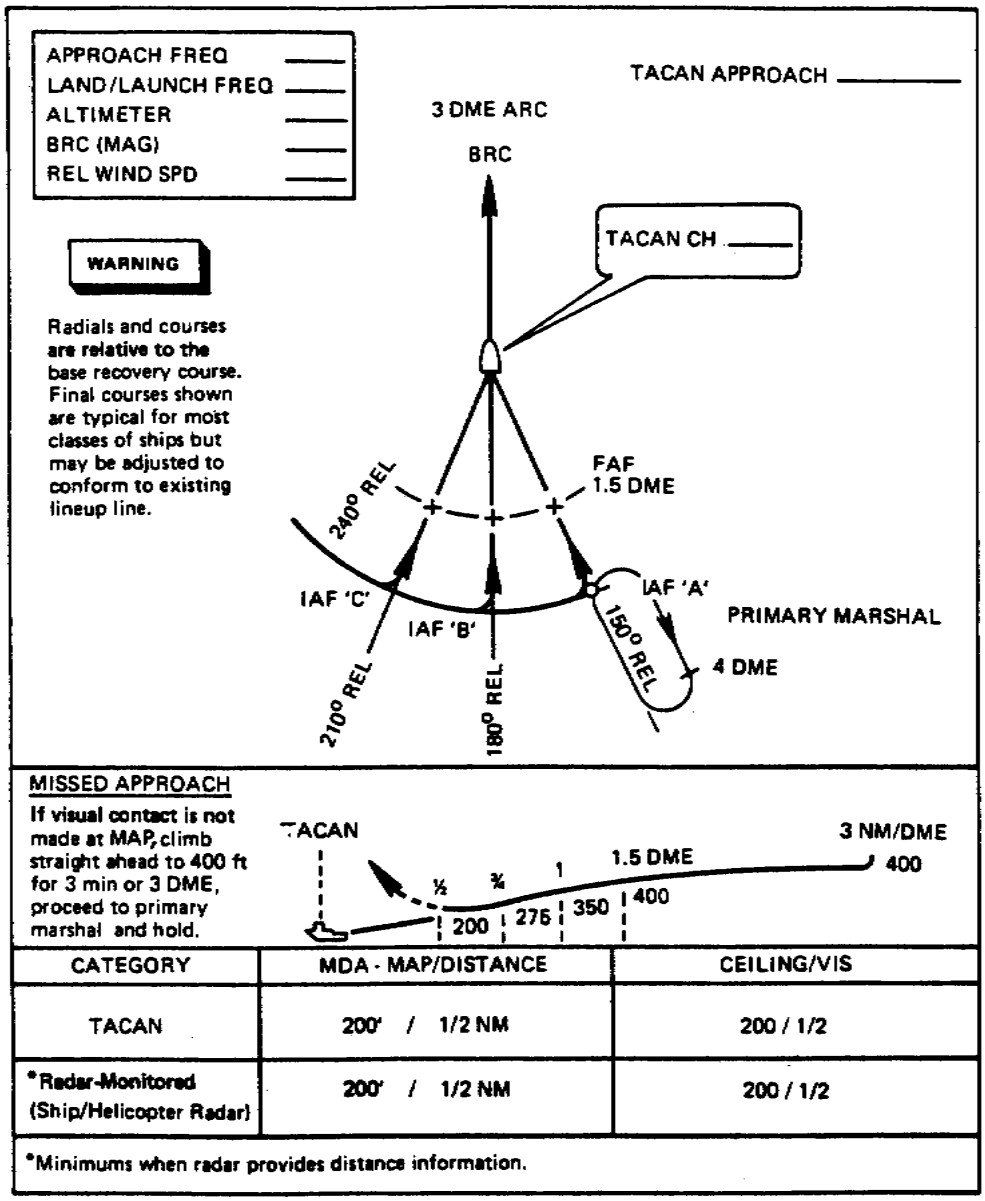
Figure B-A-4. Control Area and Control Zone Dimensions



Note: All bearings are relative to the base recovery course.

Figure B-A-5. Helicopter Restrictions During CV Launch

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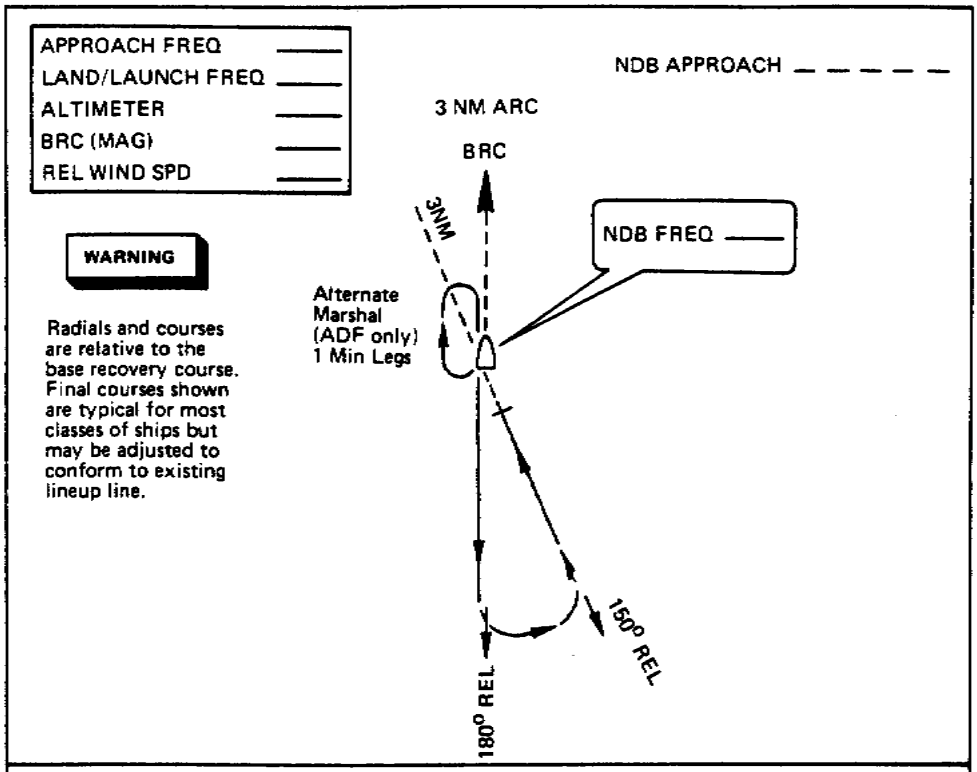


CATEGORY	MDA - MAP/DISTANCE	CEILING/VIS
TACAN	200' / 1/2 NM	200 / 1/2
*Radar-Monitored (Ship/Helicopter Radar)	200' / 1/2 NM	200 / 1/2

*Minimums when radar provides distance information.

Figure B-B-1. Approach Chart Air-Capable Ships TACAN (Helicopter)
B-B-1

Figure B-B-1. Approach Chart Air-Capable Ships TACAN (Helicopter)



CATEGORY	MDA - MAP/DISTANCE	CEILING/VIS
NDB	200' / 1/2 NM	200 / 1/2

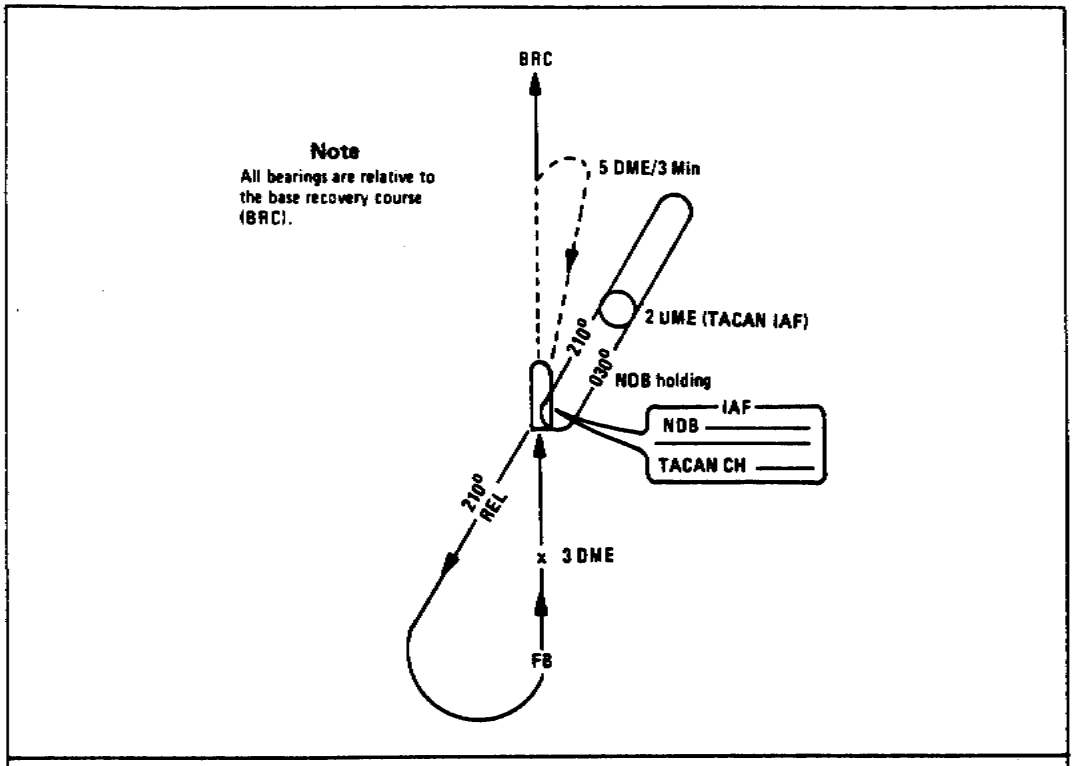
NDB APPROACH

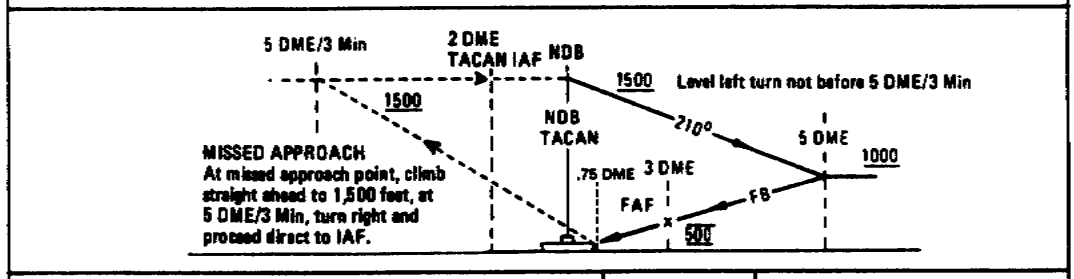
Time: High Sta to 3 NM Arc							Time: 3 NM Arc to MAP (1/2 NM)						
Relative Wind Spd		0	5	10	20	30	Relative Wind Spd		0	5	10	20	30
A/C	70	2:34	2:24	2:14	2:00	1:47	A/C	70	2:08	2:16	2:25	2:53	3:30
SPD	90	2:00	1:53	1:47	1:38	1:30	SPD	90	1:39	1:44	1:50	2:05	2:23

Figure B-B-2. Approach Chart Air-Capable Ships NDB (Helicopter)
B-B-2

Figure B-B-2. Approach Chart Air-Capable Ships NDB (Helicopter)

NBD/TACAN Overhead HELICOPTER





LANDING MINIMA				FLIGHT DECK ELEVATION	HIGHEST OBSTRUCTION
CATEGORY	LHA	LPH			
S-PAR	270-¾	250-¾	200(200-¾)	LPH-50'	LPH-150'
S-ASR S-NBD/TAC	370-¾	350-¾	300(300-¾)	LHA-70'	LHA-200'

LPH/LHA/LHD NBD/TACAN Overhead
N3/96

Figure B-B-3. Approach Chart LPH/LHA/LHD NDB and TACAN Overhead (Helicopter)
B-B-3

Figure B-B-3. Approach Chart LPH/LHA/LHD NDB and TACAN Overhead (Helicopter)

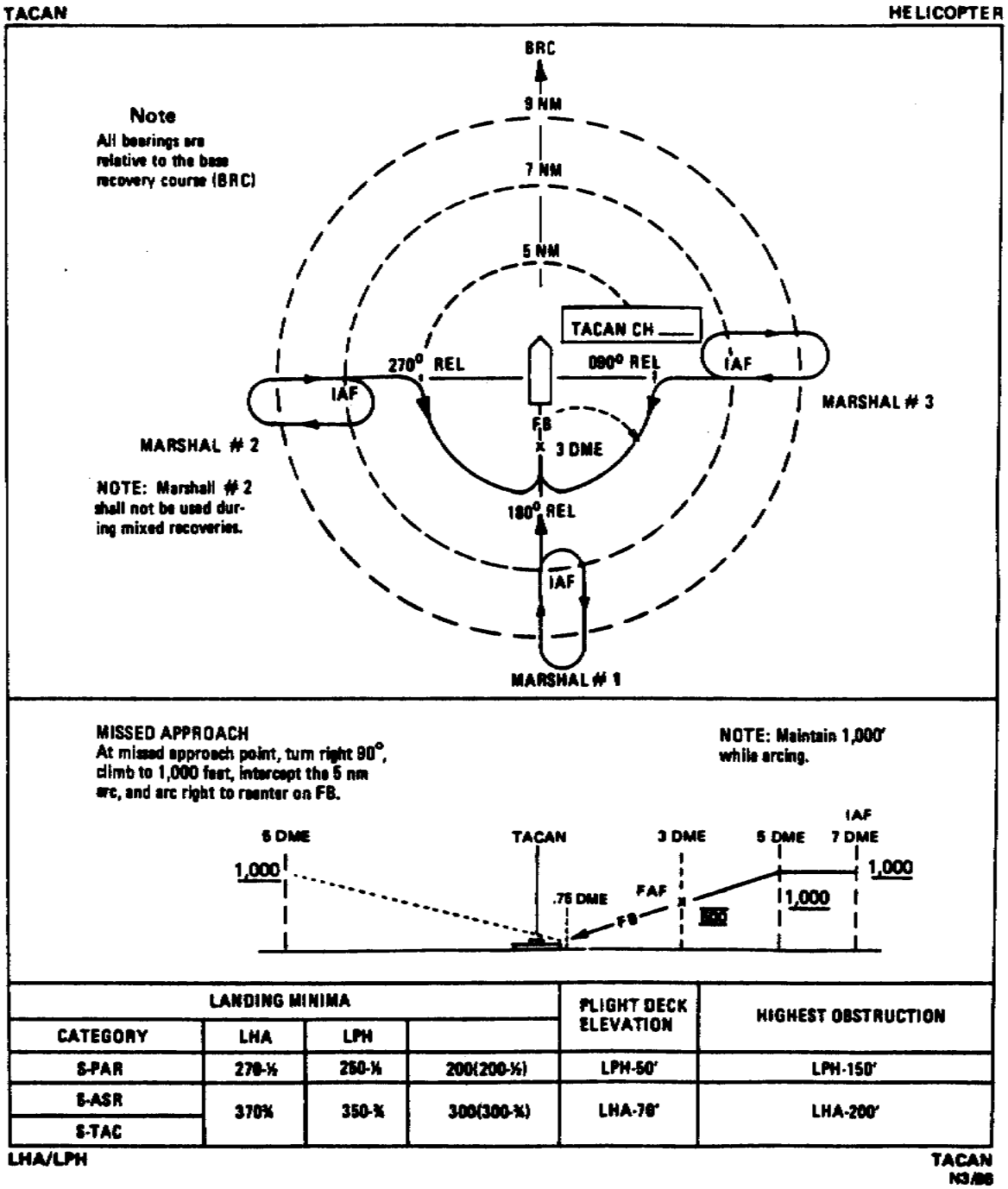


Figure B-B-4. Approach Chart LPH/LHA/LHD TACAN (Helicopter)

Figure B-B-4. Approach Chart LPH/LHA/LHD TACAN (Helicopter)

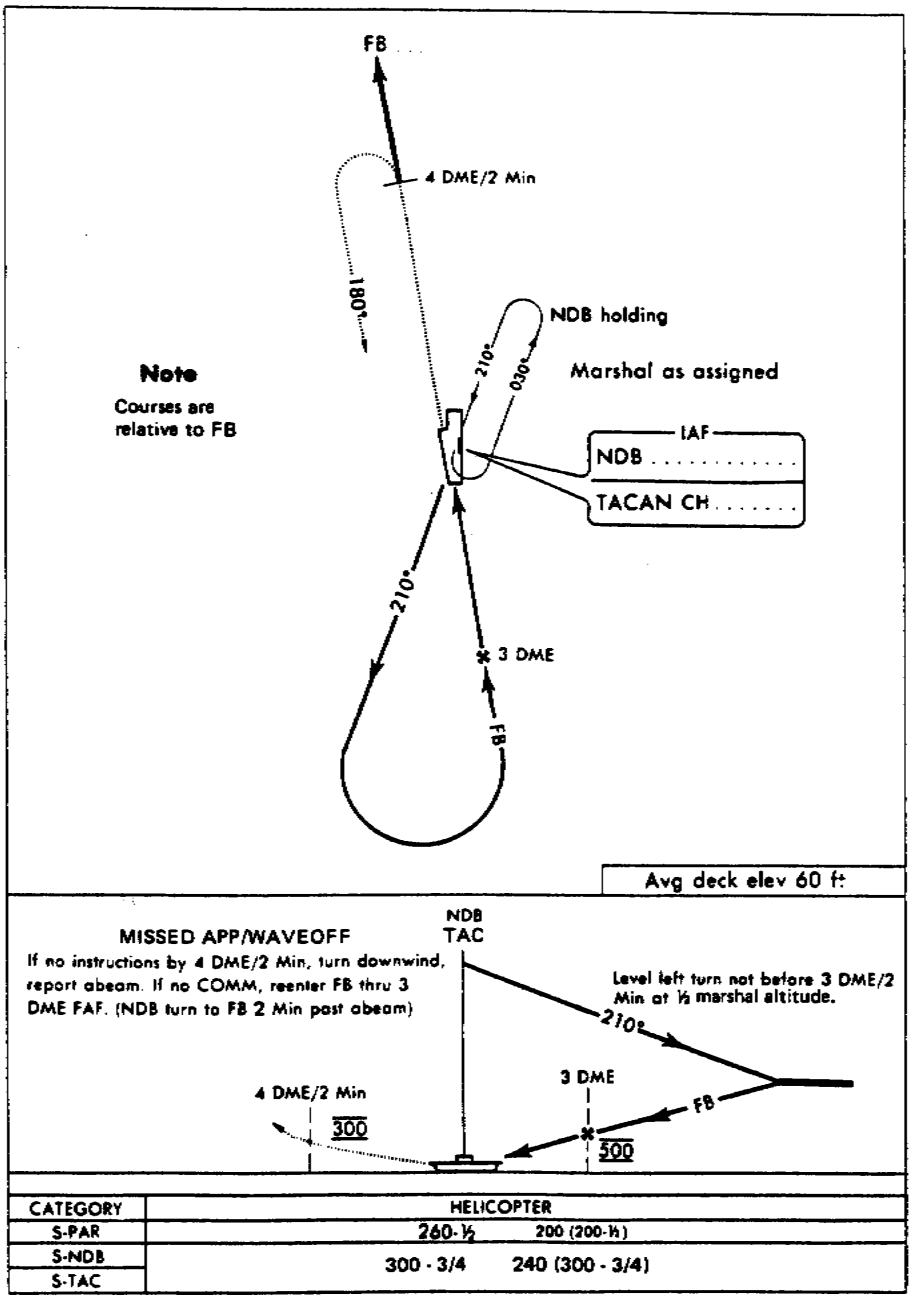
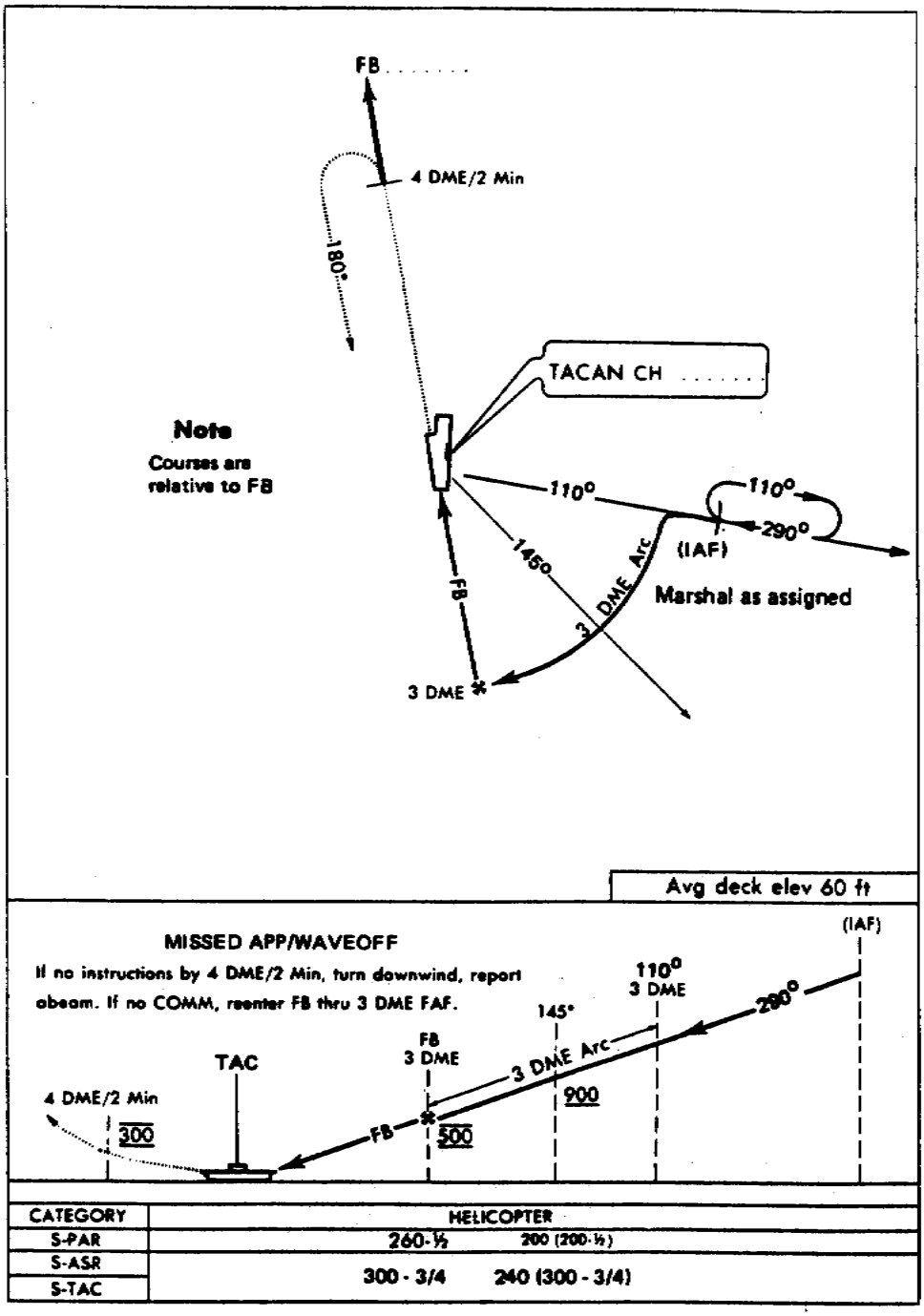


Figure B-B-5. Approach Chart CV-8 NDB and TACAN Overhead (Helicopter)
B-B-5

Figure B-B-5. Approach Chart CV-8 NDB and TACAN Overhead (Helicopter)



CATEGORY	HELICOPTER
S-PAR	260-½ 200 (200-½)
S-ASR	300 - 3/4 240 (300 - 3/4)
S-TAC	

Figure B-B-6. Approach Chart CV-7 TACAN (Helicopter)
B-B-6

Figure B-B-6. Approach Chart CV-7 TACAN (Helicopter)

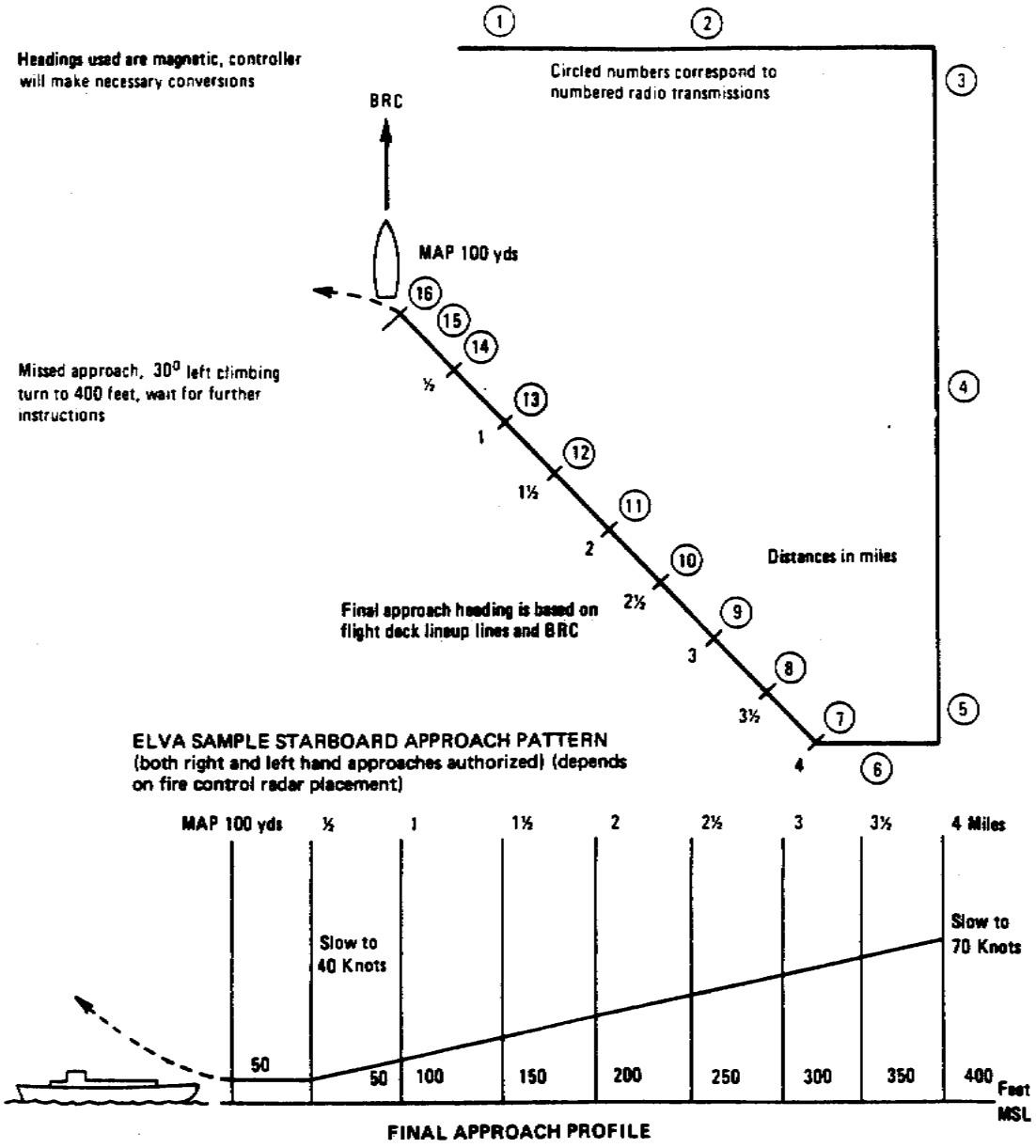


Figure B-C-1. Emergency Low Visibility Approach (ELVA) Pattern (Sheet 1 of 2)
B-C-1

Figure B-C-1. Emergency Low Visibility Approach (ELVA) Pattern (Sheet 1 of 2)

1. (Initial Check-in). This will be a radar-assisted approach. Hold your radar contact on the ___ radial, ___ miles from the ship. Altimeter setting is ___. Weather is ceiling ___, visibility ___. Final approach heading will be ___. Winds are ___ degrees port/starboard at ___ knots. Maximum pitch and roll are ___. Read back altimeter setting.

2. Descend/climb and/or maintain 400 feet. Assigned heading is ___.

3. Lost communications procedures follow: If no transmissions are received for 1 minute in the pattern or 15 seconds in final, climb to and maintain 400 feet. Attempt contact on (Secondary). If unable to make contact, squawk Mode III Code 7700 for 1 minute, then Mode III Code 7600. Alternate approach will be tacan channel ___ commencing at 3 miles and 400 feet on the ___ radial. Acknowledge.

4. Missed approach procedures follow: If ship or wake not in sight at missed approach point, turn left 30 degrees immediately; climb to 400 feet and increase airspeed to 90 knots. Report level and on speed and stand by for further instructions.

5. Perform landing checks. Report gear down and locked.

6. Turn right/left to the final bearing ___, maintain 400 feet and slow to 70 knots.

7. Do not acknowledge further transmissions. On final, 4 miles. Commence gradual rate of descent to arrive at 1/2 mile at 50 feet. Maintain 70 knots. Assigned heading is ___. Report ship in sight.

8. (Call sign) 3-1/2 miles, left/right/on/approaching centerline. Turn left/right (Corrective heading) or assigned heading is ___. Altitude should be 350 feet.

9. (Call sign) 3 miles, left/right/on approaching centerline. Turn left/right (Corrective heading) or assigned heading is ___. Altitude should be 300 feet.

10. (Call sign) 2-1/2 miles, left/right/on approaching centerline. Turn left/right (Corrective heading) or assigned heading is ___. Altitude should be 250 feet.

11. (Call sign) 2 miles, left/right/on approaching centerline. Turn left/right (Corrective heading) or assigned heading is ___. Altitude should be 200 feet.

12. (Call sign) 1-1/2 miles, left/right/on approaching centerline. Turn left/right (Corrective heading) or assigned heading is ___. Altitude should be 150 feet.

13. (Call sign) 1 mile, left/right/on approaching centerline. Turn left/right (Corrective heading) or assigned heading is ___. Altitude should be 100 feet. Slow to 40 knots.

14. (Call sign) 1/2 mile. Assigned heading is ___. Maintain 50 feet and 40 knots.

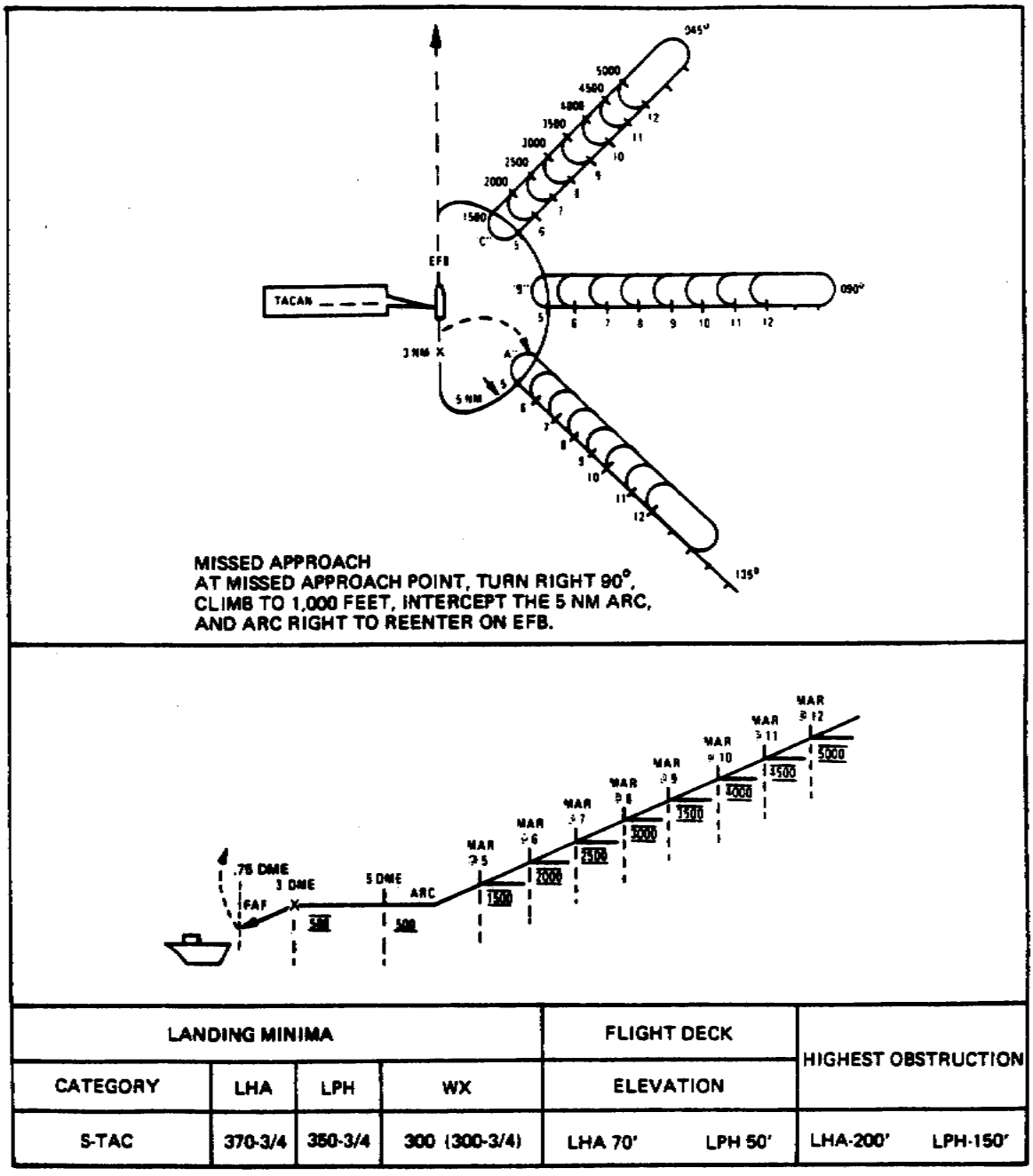
15. (Call sign) 800/600/400/200 yards. Left/right/on approaching centerline.

16. (Call sign) at missed approach point if ship or wake not in sight, execute missed approach.

Figure B-C-2. Emergency Low Visibility Approach (ELVA) Pattern--Radio Calls (Sheet 2 of 2)

SMOKELIGHT APPROACH PROCEDURES

Smokelight Approach. This approach is used as a last resort when available equipment will not allow ELVA procedures to be used, or when the ship cannot be visually acquired using ELVA procedures and ditching is considered imminent. Both the ship's commanding officer and the pilot in command (or detachment officer in charge) must have agreed to attempt the procedure. The aircraft will be positioned 2 miles behind the ship and proceeds inbound on the 180 degrees radial relative to the BRC. The aircraft will descend at the pilot's discretion to arrive at approximately 40 feet and 40 knots 1 mile behind the ship. Ship's personnel drop smoke or matrix lights every 15 seconds (or other prearranged intervals), and the pilot is kept informed of the number of smokelights in the water. The pilot at the controls follows the smokelights up the ship's wake, adjusting the closure rate until there is visual contact with the ship. HCS will receive a "gear down" report from the pilot before the aircraft maneuvers over the deck.

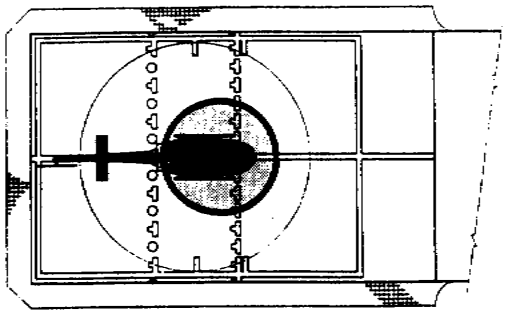


LANDING MINIMA				FLIGHT DECK		HIGHEST OBSTRUCTION	
CATEGORY	LHA	LPH	WX	ELEVATION			
S-TAC	370-3/4	350-3/4	300 (300-3/4)	LHA 70'	LPH 50'	LHA-200'	LPH-150'

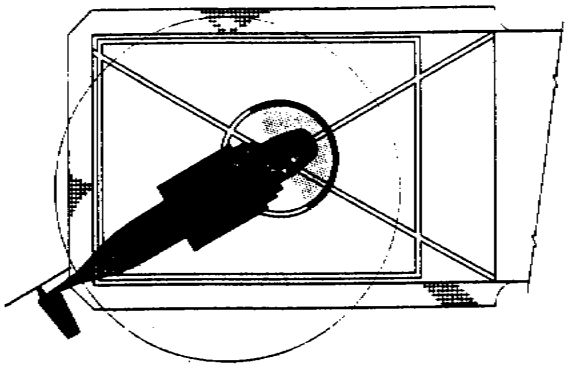
Figure B-C-3. Helicopter Emergency Marshal Pattern

Figure B-C-3. Helicopter Emergency Marshal Pattern

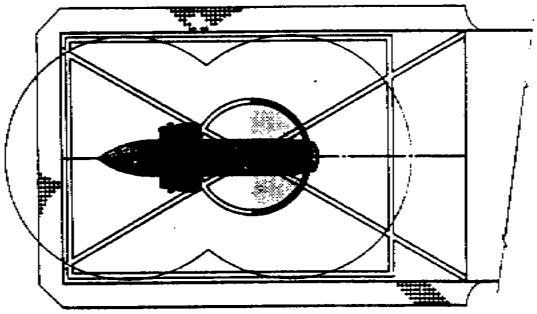
ANNEX D



TYPICAL FULL-CIRCLE LANDING:
HELICOPTER LANDS PARALLEL TO THE LANDING LINEUP LINE WITH THE FORWARD LANDING GEAR OR SKID SUPPORTS WITHIN THE INNER EDGE OF THE TOUCHDOWN CIRCLE.



TYPICAL H-46/H-53/H-3(CG) FORWARD HALF-CIRCLE LANDING RESTRICTION:
HELICOPTER LANDS PARALLEL TO THE LANDING LINEUP LINE WITH THE NOSE LANDING GEAR WITHIN THE FORWARD HALF OF THE TOUCHDOWN CIRCLE (RELATIVE TO THE LANDING LINEUP LINE) OR ON THE TOUCHDOWN SPOT.

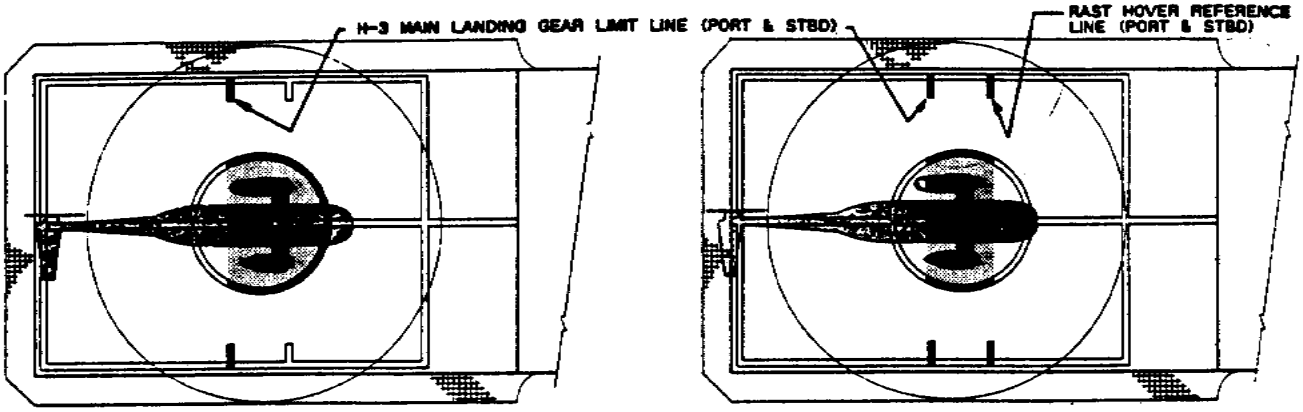


H-46 LANDING RESTRICTION ON LAMPS MK I/DD 963 AND DDG 993 SHIP CLASSES:
HELICOPTER LANDS PARALLEL TO THE SHIP'S CENTERLINE WITH THE NOSE LANDING GEAR WITHIN THE FORWARD HALF OF THE TOUCHDOWN CIRCLE (RELATIVE TO THE SHIP'S CENTERLINE) OR ON THE TOUCHDOWN SPOT.

NOTE: SHADED AREA INDICATES LANDING AREA REFERRED TO IN THE TEXT.

Figure B-D-1. Typical Landing Procedures
B-D-1

Figure B-D-1. Typical Landing Procedures



H-3 LANDING RESTRICTION ON LAMPS MK III/DD 963 CLASS SHIPS:
HELICOPTER LANDS PARALLEL TO THE LANDING LINEUP LINE WITH THE MAIN LANDING GEAR WITHIN THE TOUCHDOWN CIRCLE AND FORWARD OF THE MAIN LANDING GEAR LIMIT LINES.

H-3/H-46 LANDING RESTRICTION ON LAMPS MK III/CG 47 CLASS SHIPS:
HELICOPTER LANDS PARALLEL TO THE LANDING LINEUP LINE WITH THE MAIN LANDING GEAR (H-3)/ NOSEWHEEL (H-46) WITHIN THE TOUCHDOWN CIRCLE, AFT OF THE RAST HOVER REFERENCE LINES AND FORWARD OF THE LANDING GEAR LIMIT LINES.

Figure B-D-1 (Con't). Typical Landing Procedures

Figure B-D-1 (Con't). Typical Landing Procedures

OPERATION OF TWO HELICOPTERS FROM SINGLE-SPOT SHIP

1. Background. Operational necessity may require the operation of two OH-6 or OH-58 helicopters simultaneously from flight decks configured and marked for single-helicopter operations. Operation with two helicopters simultaneously can be accomplished safely with specific ship-helicopter combinations by spotting or landing the aircraft transversely on the deck in opposing directions. Because these operations entail minimum lateral separation and less than optimum relative wind for one or both of the involved aircraft, use of these procedures is restricted to units specifically identified by the parent Service as having the operational requirement and the requisite proficiency to conduct this operation.

2. Approved Combinations. The following aircraft-ship combinations are statically approved for dual-helicopter operations from a single operating spot.

a. OH-6 or 58 and FFG-7 Class.

b. OH-6 or 58 and DDG-993 Class.

c. OH-6 or 58 and DD-963 Class.

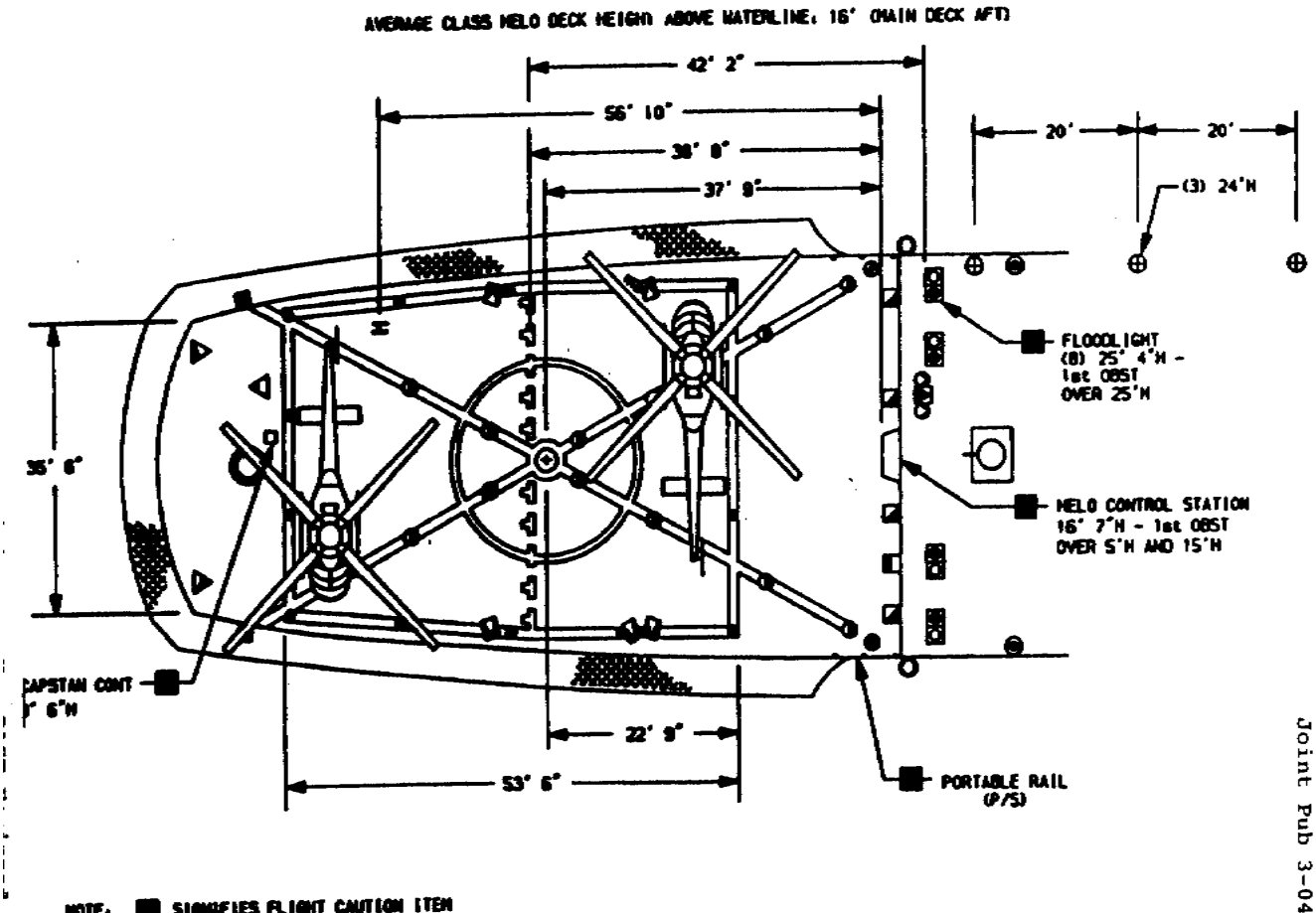
Note: Reference will be made to the resume for ship's flight deck marking on dual-helicopter, single-spot operations.

3. Restrictions. The following restrictions apply to simultaneous operation of two helicopters on a single-spot ship.

a. On departure, the aircraft spotted aft will lift and depart before the forward aircraft lifts off. On recovery, the first aircraft will touch down on the forward spot before the second aircraft hovers over the rear spot.

b. Operations will be conducted during daylight conditions or with night-vision devices (NVD). Dual-helicopter, unaided-vision night landings are not authorized.

c. When a flight of two AH/OH-58Ds is landing on a small deck, nonrecovery, assist, secure, and traversing (RAST)-equipped FFG, the first aircraft must land and fold aft-facing blades before the second aircraft lands. Operations must be conducted with relative winds within the general envelope. Operations outside the general envelope must be certified through testing or analysis.



MAIN DECK OPERATING AREA

Joint Pub 3-04.1

Figure B-D-2. OH-58D Positions on Non-RAST-Equipped Air-Capable Ships

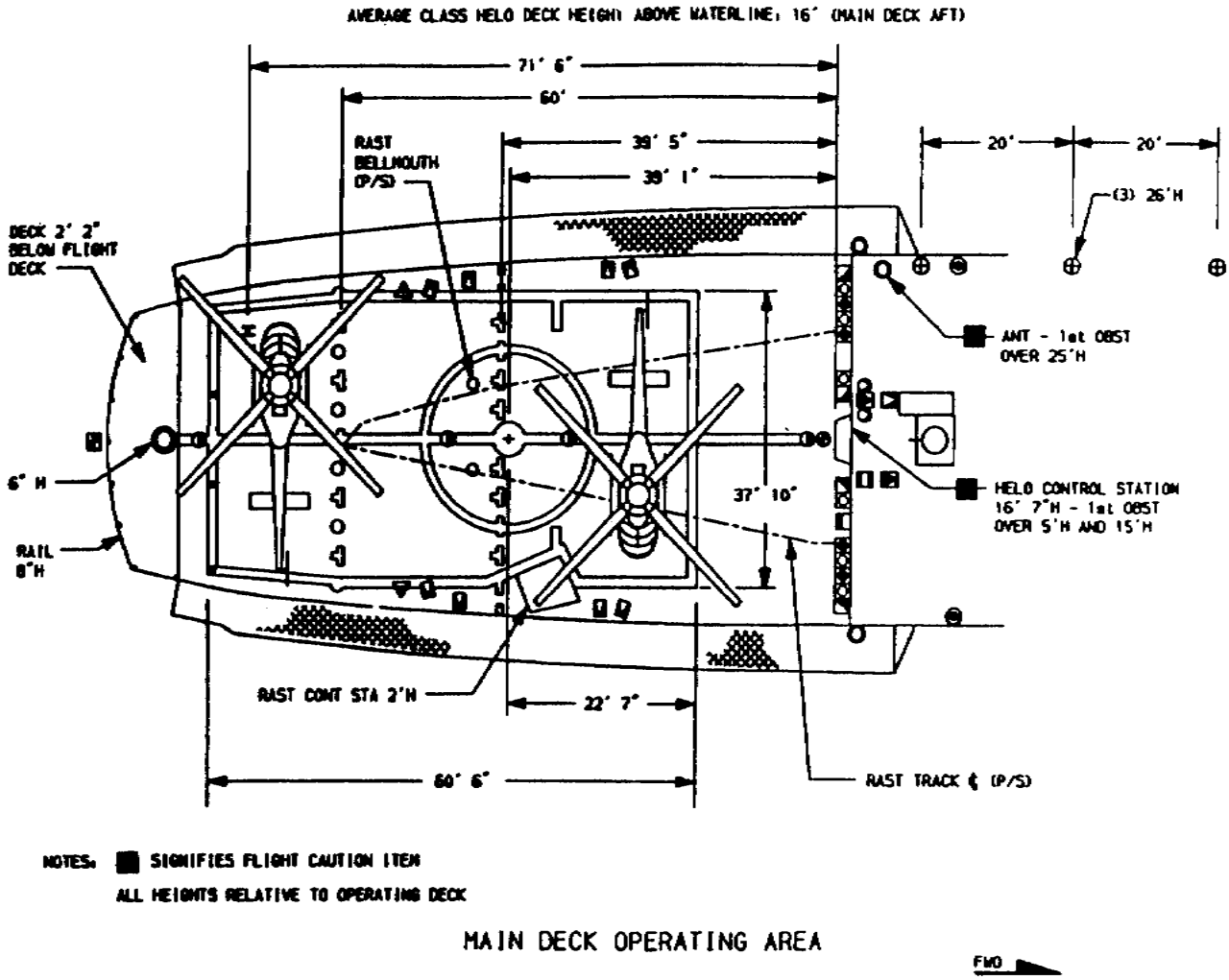


Figure B-D-3. OH-58D Positions for Takeoff and Landing on RAST-Equipped Air-Capable Ships

APPENDIX C

US NAVY SHIP AND MILITARY HELICOPTER INTERFACE AND WIND ENVELOPES

1. US Navy Ship USCG Cutters and Military Helicopter Interface. Figures C-1 through C-5 are copied from NWP-42 and are provided here for information only. If there are differences between NWP-42 and the information contained in this pub, NWP-42 takes precedence.

a. Figures C-1 through C-5 provide ship and helicopter combinations considering rotor diameter, fuselage configurations, landing gear arrangement, maximum gross weight, ship structures, and flight deck obstructions for safe operations during clear weather conditions without servicing facilities. The combinations depicted do not constitute authority to operate, nor do they imply certification of, various facilities for the helicopters noted. Within the figures, ships are listed based on their designed facilities. Certification of each individual facility must be verified prior to actual operations at that facility.

b. Notes for figure annotations

(1) For all cases, the operating helicopter is restricted to landing with the fuselage parallel to the landing lineup line and the forward landing gear or skid support within the touchdown circle inner edge.

(2) For Figures C-1 through C-3, in the "operating level" column:

(a) "I" denotes day/night instrument meteorological conditions (IMC) capability.

(b) "II" denotes day/night visual meteorological conditions (VMC) capability.

(c) "III" denotes day VMC capability (and are shown for reference only).

(3) For Figures C-1 through C-3, in the "VERTREP TYPE" column:

(a) For VERTREP Type 1 operations--the helicopter must hover with all rotor hubs above the segmented lineup line.

(b) For VERTREP Type 2 operations--the helicopter must hover with all rotor hubs above or aft of the "T" lineup line.

(c) For VERTREP Special Type 2 (SP2) operations--in general, helicopters having a rotor diameter less than 55 feet must follow the guidance for VERTREP Type 2 operations. Helicopters having a rotor diameter in excess of 55 feet must hover with all rotor hubs above or aft of the "T-ball" lineup line.

(d) For VERTREP Type 3 operations--the helicopter must hover will all rotor hubs above or between the dual "T" lineup lines.

(4) For Figures C-1 through C-3, in the "VERTREP HELICOPTER" columns:

(a) Class 4 VERTREP operations require the helicopter to hover at a minimum altitude in excess of 5 feet above the operating deck.

(b) Class 5 VERTREP operations require the helicopter to hover at a minimum altitude in excess of 15 feet above the operating deck.

(5) For Figures C-4 and C-5, the dual-circle, air capable ship matrix addresses all helicopters that may operate simultaneously on the same deck. Clearances for any particular helicopter landing at the aft circle are assured only when a parked helicopter or any other object remains forward of the safe park line.

WARNING

Some non-US Navy helicopters have not been tested in the electromagnetic environment of various ship classes. When conducting non-US Navy operations, consideration must be given to potential radiation hazards, electromagnetic interference, and electronic vulnerability effects.

2. Aircraft Wind Limitations.

a. The safe launch and recovery wind limitations are presented in NWP-42, "Shipboard Helicopter Operating Procedures" and COMDTINST M3710.2 (Series) "USCG Shipboard Helicopter Operational Procedures Manual." These publications can be obtained by the procedures delineated in Chapter I, subparagraph 2b. Figures C-6 and C-7 are to be used when specific flight limit envelopes are not available. Procedures should be agreed upon with the ship prior to commencing approach. The envelopes are for a normal approach to the spot, with the helicopter aligned with ship's centerline at touchdown. The two wind envelopes present wind-over-deck limitations relative to the ship and represent safe operating conditions as tested to date. Heavy lines on the envelopes denote where specific problems were encountered during testing, such as approaching a flight control limit, excessive turbulence, or the like. Ship pitch and roll limitations are left to the judgment of the ship's commanding officer and embarked squadron commander except where listed on the appropriate envelopes.

WARNING

Considerable difference may exist between the flight deck winds and those measured by bridge-level anemometers. However, aircraft wind limitations contained in the appendix and applicable shipboard operating bulletins are based on winds measured by the windward bridge-level anemometer. When operating at or near the outer wind limits the probability of damage increases sharply when wind gusts exceed 10 knots. Also the maximum safe wind in conjunction with excessive ship pitch and/or roll can make flight operations unacceptably hazardous; therefore, operations shall be adjusted accordingly. Common sources of turbulence are: (1) stack gasses and wash, (2) ship superstructures, (3) deck protrusions, and (4) rotor wash or jet blast caused by the takeoff and landing of adjacent aircraft.

b. The Naval Air Warfare Center, Aircraft Division (NAWCAD) Patuxent River, Maryland, conducts dynamic interface (DI) testing of all helicopter and ship class combinations to develop all aspects of shipboard helicopter dynamic operational compatibility. DI testing investigates the effects of ship airwake, ship motion,

ship lighting and marking, and effects of ship and helicopter operations. The significant result of DI testing is the development of operational launch and recovery, engage or disengage, and helicopter in-flight refueling (HIFR) envelopes, each of which depict the wind, speed, direction, and ship motion conditions conducive to producing consistently safe shipboard operations. DI certifications of each ship and helicopter combination are required before conducting any shipboard flight operations beyond the bounds of the DI general envelope. Aircraft that have not undergone DI testing or that do not have a DI-certified envelope are restricted to the use of the general launch and recovery wind limitation charts (Figures C-6 and C-7) for the appropriate class ship. Comments or questions about the wind envelopes should be addressed to:

Commander
Naval Air Systems Command (AIR-53011)
Naval Air Systems Command Headquarters
Washington, D.C. 20361-5300

SINGLE-CIRCLE AIR-CAPABLE SHIPS

SHIP	OPERATING AREA ②	SINGLE SHIP OR CLASS	OPERATING LEVEL	LANDING HELICOPTER ①															VERTREP TYPE	VERTREP HELICOPTER ①									
				UH-1	SH-2	HH-3	SH-3	OH-6	CH-46	CH-47	HH-53	CH-53E	CH-54	OH-58	SH-60	UH-60	AH-64	HH-65		H-1	H-2	H-3	H-46	H-47	H-53	H-53E	H-54	H-60	H-65
AD 15	AL	C	III		X			X										X	2	4	4	4	4	4	4	4	4	4	4
AD 18	AV	S	III																1	4	4	4	4	4	4	4	4	4	4
AD 19	AV	S	III																1	4	4	5	4	5	5	5	5	5	4
AD 37	AL	C	II	X	X	X	X	X	θ					X	X	X		X	SP2	4	4	4	4	4	4	4	4	4	4
AD 41	AL	C	II	X	X	X	X	X	θ					X	X	X		X	2	4	4	5	4	5	5	5	5	5	4
AE 21	AL	C	II	X	X	X	X	X						X	X	X	X	X	SP2	4	4	4	4	4	4	4	4	4	4
AE 23	AL	C	II	X	X	X	X	X	X					X	X	X	X	X	SP2	4	4	4	4	4	4	4	4	4	4
AE 27	AL	C	I	X	X	X	X	X	θ					X	X	X	X	X	SP2	4	4	4	4	4	4	4	4	4	4
AFS 1	AL	C	I	X	X	X	X	X	X					X	X	X	X	X	SP2	4	4	4	4	4	4	4	4	4	4
AFG 3	AL	S	I	X	X	X	X	X	X		X		θ	X	X	X	X	X	SP2	4	4	4	4	4	4	4	4	4	4
AO 98	FV	C	III																1	4	4	4	4	4	4	4	4	4	4
AO 177	AL	C	III	X	X	X	X	X	θ		θ	θ	θ	X				X	SP2	4	4	4	4	4	4	4	4	4	4
AOE 1	AL	C	I	X	X	X	X	X	θ					X	X	X		X	SP2	4	4	4	4	4	4	4	4	4	4
AOE 4	AL	S	I	X	X	X	X	X	X	X	θ	θ	θ	X	X	X		X	SP2	4	4	4	4	4	4	4	4	4	4
AOR 1	AL	C	I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	SP2	4	4	4	4	4	4	4	4	4	4
AR 5	AV	C	III																1	4	4	4	4	4	4	4	4	4	4
ARS 8	AV	S	III																1	4	4	4	4	4				4	4
ARS 38	AV	C	III																1	4	4	4	4	4				4	4
ARS 50	AV	C	III																1	4	4	5	4	5				5	4
AS 11	AV	S	III																1	4	4	4	4	4				4	4
AS 18	AV	S	III																2	5	5	5	5	5				5	5
AS 19	AV	S	III																1	4	4	4	4	4				4	4
AS 31	AV	C	III																2	4	4	4	4	4				4	4
AS 33	AV	C	III																2	4	4	4	4	4				4	4
AS 36	AV	C	III																2	4	4	4	4	4	5	5	4	4	4
AS 39	AV	C	III																2	4	4	4	4	4	5	5	5	4	4
ASR 21	AL	C	III	X	X			X						X				X	2	4	4	4	4	4				4	4
ATF 159	AV	S	III																1	4	4	4	4	4				4	4
ATF 160	AV	S	III																1	4	4	4	4	4				4	4
ATS 1	AV	C	III																1	4	4	4	4	4	4	4	4	4	4
BB 61	AL	C	I	X	X	X	X	X	θ		θ	θ	θ	X	X			X	SP2	4	4	4	4	4	4	4	4	4	4
CG 16	AV	C	III																2	4	4	4	4	4	4	4	4	4	4
	FV	C	III																1	4	4	4	4	4	4	4	4	4	4
CG 21	AL	S	I	X	X		X	X						X	X				2	4	4	4	4	4	4	4	4	4	4
	FV	S	III																1	4	4	4	4	4	4	4	4	4	4
CG 26	AL	S	I	X	X		X	X						X	X			X	1	4	4	4	4	4				4	4
	FV	S	III																1	4	4	5	4	4	5	5	5	4	4
CG 27	AL	C	I	X	X			X						X				X	1	4	4	4	4	4				4	4
	FV	C	III																1	4	4	4	4	4	4	4	4	4	4
CG 47③	AL	C	I	X	X	X	X	X	θ		θ			X	X			X	2	4	4	4	4	4				4	4
	AV	C	I																1	5	5	5	5	5	5	5	5	5	5
	FV	C	III																1	4	4	4	4	4	4	4	4	4	4
CGN 9	AL	S	I	X	X	X	X	X	θ					X	X			X	3	4	4	4	4	4	4	4	4	4	4
CGN 25	AL	S	I		X		X	X										X	2	4	4	4	4	4	4	4	4	4	4
	FV	S	III																1	4	4	4	4	4	4	5	4	4	4

Figure C-1. US Navy Air-Capable Ship and Military Helicopter Interface (Sheet 1 of 5)

Figure C-1. US Navy Air-Capable Ship and Military Helicopter Interface (Sheet 1 of 5)

SINGLE-CIRCLE AIR-CAPABLE SHIPS

SHIP	OPERATING AREA ②	SIINGLE SHIP OR CLASS	OPERATING LEVEL	LANDING HELICOPTER ①															VERTREP TYPE	VERTREP HELICOPTER ①									
				UH1	SH2	HH3	SH3	OH6	CH46	CH47	HH53	CH53E	CH54	OH58	SH60	UH60	AH64	HH65		H1	H2	H3	H46	H47	H53	H53E	H54	H60	H65
CGN 35	AL	S	I	X	X		X	X						X	X			X	2	4	4	4	4	4				4	4
CGN 36	AL	C	I		X	θ	X	X						X					2	4	4	4	4	4	4	4	4	4	4
	FV	C	III																1	4	4	4	4	4	4	4	4	4	4
CGN 38	AV	C	III																1	4	4	4	4	4	4	4	4	4	4
DD 963	AL	C	I	X	X		X	X	θ					X				X	2	4	4	4	4	4				4	4
DD 963③	AL	C	I	X	X	X	X	X	θ		θ			X	X			X	2	4	4	4	4	4				4	4
	AV	C	I																1	4	4	4	4	4	4	4	4	4	4
	FV	C	III																1	4	4	4	4	4	4	4	4	4	4
DDG 2	AV	C	III																1	4	4	5	4	5	5	5	5	5	4
	FV	C	III																1	5	5	5	5	5	5	5	5	5	5
DDG 37	AL	C	I		X			X											2	4	4	4	4	4	4	4	4	4	4
DDG 37	AV	C	III																1	4	4	4	4	4	4	4	4	4	4
DDG 993	AL	C	I	X	X		X	X						X	X			X	2	4	4	4	4	4				4	4
DDG 993③	AL	C	I	X	X	X	X	X	θ		θ			X	X			X	2	4	4	4	4	4				4	4
	AV	C	I																1	4	4	4	4	4	5	5	5	4	4
	FV	C	III																1	4	4	4	4	4	4	4	4	4	4
FF 1037	AV	C	III																1	4	4	4	4	4	4	4	4	4	4
FF 1052	AL	C	I	X	X			X						X				X	1	4	4	4	4	4	4	4	4	4	4
FF 1098	AV	S	III																1	4	4	4	4	4				4	4
FFG 7	AL	C	I		X		X	X										θ	2	4	4		4					5	4
FFG 7③	AL	C	I	X	X	X	X	X						X	X	X		X	SP2	4	4	4	4	4	4	4	4	4	4
	FV	C	III																1	5	5	5	5	5				5	5
IX 514	AL	S	II	X	X		X	X						X	X			X	SP2	4	4	4	4	4	4	4	4	4	4
LCC 19	AL	C	I	X	X	X	X	X	X	X	X		X	X	X	X	X	X	2	4	4	4	4	4	4	4	4	4	4
LKA 113	AL	C	II	X	X	X	X	X	X		X	X	X	X	X	X		X	2	4	4	4	4	4	4	4	4	4	4
LSD 28	AL	C	II	X	X	X	X	X	X					IX	X	X	X	X	2	4	4	4	4	4	4	4	4	4	4
LSD 36	AL	C	II	x	x	X	X	X	X	X	X	X	X	X	X	X	X	X	2	4	4	4	4	4	4	4	4	4	4
LST 1179	AL	C	II	X	X	X	X	X	X		X		X	X			X	X	1	4	4	4	4	4	4	4	4	4	4
T-AE 26	AL	S	I	X	X	X	X	X	X					X	X	X	X	X	SP2	4	4	4	4	4	4	4	4	4	4
T-AF 58 ④	AL	S	II	I			X	X	X									X	SP2	4	4	4	4	4	4	1	4	4	4
T-AFS 8	AL	C	I	X	X	X	X	X	X					X	X			X	SP2	4	A	A	A	A	A	4	4	A	4
T-AGS 39	AV	C	III																SP2	4	4	4	4	4	4	4	4	4	4
T-AH 19	ML	C	I	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3	4	4	4	4	4	4	4	4	4	4
T-AK(X) ④	AL	C	III	x	X	X	X	X	X		X	X	X	X	X			X	1	4	4	4	4	4	4	4	4	4	4
T-AK(X) ⑤	AL	C	III	X	1X	1X	1X	1X	1X		1X	1X	1X	1X			X	X	2 2	4	4	4	4	4	4	4	4	4	4
T-AKR 287	MV	C	III																3	4	4	4	4	4	4	4	4	4	4
T-AO 105	FL	C	II	X	X	X	X	X	X					X		X		X	1	4	4	4	4	4	4	4	4	4	4
T-AO 143	AL	C	II	X	X	X	X	X	X					X				X	2	4	4	4	4	4	4	4	4	4	4
	FV	C	III																1	4	4	4	4	4	4	4	4	4	4

Figure C-2. US Navy Air-Capable Ship and Military Helicopter Interface (Sheet 2 of 5)

SINGLE-CIRCLE AIR-CAPABLE SHIPS

SHIP	OPERATING AREA ②	SIINGLE SHIP OR CLASS	OPERATING LEVEL	LANDING HELICOPTER ①														VERTREP TYPE	VERTREP HELICOPTER ①									
				CH-1	SH-2	H-3	SH-3	OH-6	CH-46	CH-47	HH-53	CH-53E	CH-54	OH-58	SH-60	UH-60	AH-64	HH-65		H-1	H-2	H-3	H-46	H-47	H-53	H-53E	H-54	H-60	H-65
-AO 187	AL	C	II	X	X	X	X	X	X		X	X	X	X	X	X	X	X	SP2	4	4	4	4	4	4	4	4	4	4
-ATF 166	AV	C	III															2	4	4	4	4	4	4	5	4	4	4
-AVB 3	FL	C	III	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	4	4	4	4	4	4	4	4	4	4
/HEC 715	AL	C	I	X	X			X										X	2	4	4	4	4	4				4	4
/MEC 901-904	AL	C	I	X	X	X		X						X				X	2	4	4	4	4	4				4	4
/MEC 905-912	AL	C	I	X	X	X		X						X	X			X	2	4	4	4	4	4				4	4

Notes:

1. X: Full-circle landing
   & Less, than full-circle landing restriction.
   4: Low-hover Class 4 operation
   5: High-hover Class 5 operation
   Blank: Operational incompatability

2. AL: Aftmost landing area
   ML: Midship landing area
   FL: Forwardmost landing area
   AV: Aftmost VERTREP area
   MV: Midship VERTREP area
   FV: Forwardmost VERTREP area

3. LAMPS Mk III configured ship

4. Includes BRAINTREE and WATERMAN Classes

5. MAERSK Class

Figure C-3. US Navy Air-Capable Ship and Military Helicopter Interface (Sheet 3 of 5)

DUAL-CIRCLE AIR-CAPABLE SHIPS

IIP ASS	OPERATING LEVEL	HELICOPTER LANDING IN: ① FORWARD LANDING CIRCLE													AFT LANDING CIRCLE											
		H-1	H-2	H-3	H-6	H-46	H-47	H-53	H-53E	H-54	H-58	H-60	H-64	H-65	H-1	H-2	H-3	H-6	H-46	H-47	H-53	H-53E	H-54	H-58	H-60	H-64	H-65
'D 1	I	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	0	X	0		0	X	X		X
'D 4②	I	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	0	X	0		0	X	X	X	X
LSD 41	II	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

otes:

X: Full-circle landing
& Less than full-circle landing restriction
4: Low-hover Class 4 operation
5: High-hover Class 5 operation
Blank: Operational incompatibility

2. Include AGF II

Figure C-4. US Navy Air-Capable Ship and Military Helicopter Interface (Sheet 4 of 5)

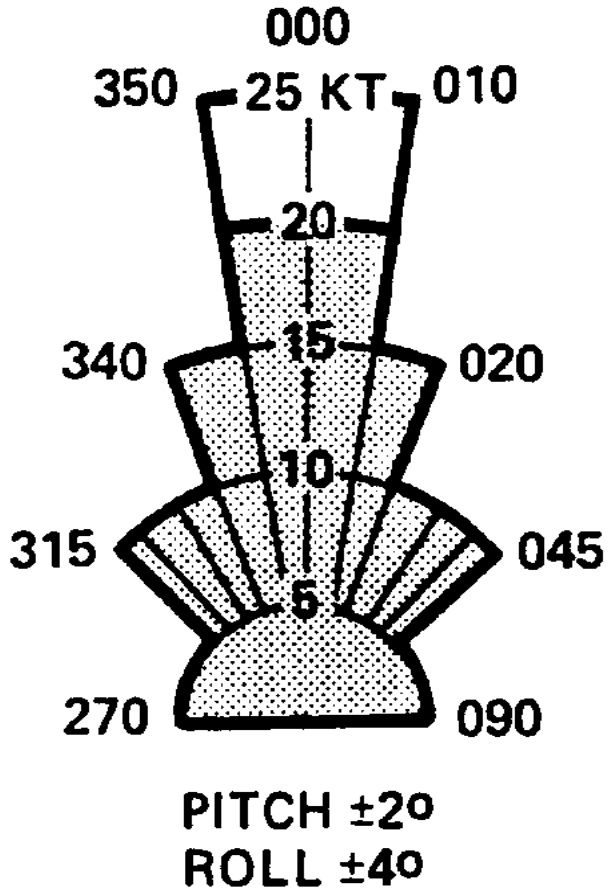
DUAL-CIRCLE AIR-CAPABLE SHIP/U.S. MILITARY HELICOPTER INTEROPERABILITY

HELO PARKED IN AFT CIRCLE	HELO IANDING IN FORWARD CIRCLE ①												
	H 1	H 2	H 3	H 6	H 46	H 47	H 53	H 53E	H 54	H 58	H 60	H 64	H 65
H-1	Bc	Bc	Bc	ABC	BC	B				ABC	Bc	Bc	Bc
H-2	ABC	ABC	Bc	ABC	Bc	B				ABC	Bc	ABC	ABC
H-3	Bc	Bc		Bc	c					Bc		Bc	Bc
H-6	ABC	ABC	BC	ABC	ABC	AB	Bc		Bc	ABC	ABC	ABC	ABC
H-46	Bc	Bc		ABC	BC					Bc	Bc	Bc	BC
H-47	Bc	BC		ABC	Bc					Bc	Bc	BC	Bc
H-53		c		Bc						Bc			
H-53E				c						c			
H-54		c		Bc						Bc			
H-56	ABC	ABC	Bc	ABC	ABC	B				ABC	ABC	ABC	ABC
H-60	Bc	Bc		ABC	Bc					ABC	Bc	Bc	Bc
H-64	Bc	Bc	Bc	BC	BC	B				Bc	Bc	Bc	Bc
H-65	Bc	ABC	Bc	ABC	BC	B				ABC	Bc	BC	ABC

Notes:

1. A: LPD I Class
   B: LPD4 Class
   C: LSD 41 Class

Figure C-5. US Navy Air-Capable Ship and Military Helicopter Interface (Sheet 5 of 5)

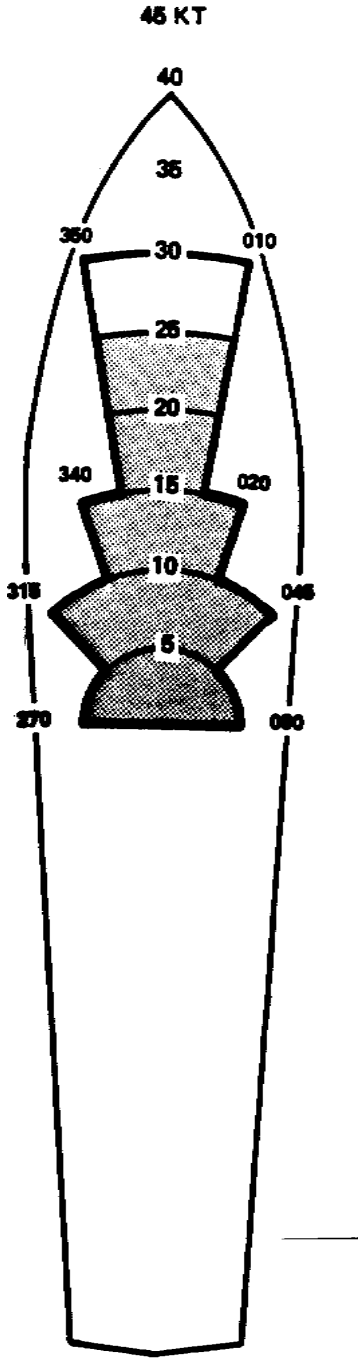


NOTES:

Helicopter aligned with ship's lineup line and wind shown relative to aircraft nose.

Entire envelope -- day operations
Shaded area -- night operations

Figure C-6. General Launch and Recovery Wind Limits



ENTIRE ENVELOPE -- DAY
SHADED AREA -- NIGHT

PORT OR STARBOARD
APPROACH ONLY

Figure C-7. General Launch and Recovery Wind Limits for LHA- and LPH-Class Ships

APPENDIX D

ORDNANCE

ANNEXES:

A. Permissible Stowage of Ammunition and Explosives
B. Aviation Ordnance Technical Publications and Instructions Library Checklist
C. Joint Helicopter Handling, Qualification, and Certification for Conventional Aviation Ordnance Devices
D. Weapons Loading, Strikedown, Downloading, and Recovery
E. Munitions Cookoff Time Summary
F. Helicopter Weapons Configuration--By Service

(INTENTIONALLY BLANK)

TYPE OF AMMUNITION \ TYPE OF MAGAZINE	PROJECTILES & ROCKET HEADS	FIXED AMMO, GUN & ROCKET	PROPELLANT, ROCKET TYPE	PROPELLANT, GUN, BAG	PROPELLANT, GUN, CASED	PROPELLANT, LIQUID FUEL	FUZES	PYROTECHNIC	CHEMICAL	BOMB TYPE	SMALL ARMS	WARHEADS	MISSILES (ASSEMBLED)	GRENADE LOCKERS	DETONATOR LOCKERS	READY SERVICE	DEMOLITION MATERIAL	SPECIAL LOCKERS	REMARKS
Actuator, Torpedo, F/Arming Device MK 6 Mod 0	x						x	x			x								
Arming and Firing Mechanism MK-1 Mod 1							x	x			x								
Arming Device, MK-2 and -3, F/Torpedo							x				x								
Bag, Loading Assy F/4. 2" Mortar Cartridge							x	x			x								
Base Couplings, w/primer							x	x			x								
Bolts, Explosive	x						x	x			x								
Bombs, Chemical Agent									x										
Bombs, HE Loaded, Depth, Frag, GP, SAP										x		x							
Boosters and Auxiliary Boosters w/o Detonators, HE Loaded, All Types										x		x							
Boosters and Auxiliary Boosters w/ Detonators, HE Loaded, All Types							x												
Caps, Blasting														x					
Cartridges, 40mm, 3" and 5", Blank Saluting	x				x														
Cartridges, Delay, F/AC	x						x	x			x								
Cartridges, Engine Starter, MXU-4A/A		x	x	x							x								
Cartridges, Explosive, F/Torpedo MK-45	x						x	x			x								
Cartridges, Grenade, Rifle and Carbine	x						x	x			x								
Cartridges, Impulse, F/AC	x						x	x			x								
Cartridges, Impulse, 3" F/SDCP	x				x														
Cartridges, Impulse, F/Gas Gen, 25 Man Life Raft		x	x	x															
Cartridges, 20mm, AP-T, TP, LPT, FCT	x						x	x			x								
Cartridges, 20mm, Incend, API, HE Loaded	x															x			
Cartridges, Photoflash								x											Separate Stowage
Cartridges, Mortar, HE, Ill, TP, Leaflet and Window	x							x											
Cartridges, Mortar, WP Loaded									x										
Cartridges, 40mm Riot Control									x										
Cartridges, 3" 50 Cal, 76mm, Service and Training	x															x			

Table D-A-1. PERMISSIBLE STOWAGE OF AMMUNITION AND EXPLOSIVES (Cont'd)

TYPE OF AMMUNITION \ TYPE OF MAGAZINE	PROJECTILES & ROCKET HEADS	FIXED AMMO, GUN & ROCKET	PROPELLANT, ROCKET TYPE	PROPELLANT, GUN, BAG	PROPELLANT, GUN, CASED	PROPELLANT, LIQUID FUEL	FUZES	PYROTECHNIC	CHEMICAL	BOMB TYPE	SMALL ARMS	WARHEADS	MISSILES (ASSEMBLED)	GRENADE LOCKERS	DETONATOR LOCKERS	READY SERVICE	DEMOLITION MATERIAL	SPECIAL LOCKERS	REMARKS
Cartridges, 40mm, Service, Less Chemical		x													x				
Cartridge Sets, Impulse, F/CAD Devices		x						x	x		x								
Cartridges, 3, 5, 6, 8" Short			x	x	x										x				
Cartridges, Signal, F/Practice Bombs								x			x								
Cartridges, Small Arms, All Calibers and Types [1]		x					x	x			x								
Catapult, Aircraft Seat Ejection			x		x														
Cases, U/W Mines and Depth Charges, HE Loaded										x		x							
Charges, Demolitions, Assemblies, Blocks, Flex, Linear, & Sheet																x			
Charge, Demolition (Shaped) MK-45/-47/-74										x		x	x		x				
Charge, Propellant, Guns 5, 6, 8" Cased, Full, Reduced			x	x	x														
Charges, Propellant, Guns 8, 16" Bag, Full, Reduced			x	x	x														
Charges, Spotting, F/Practice Bombs and Mines		x					x	x			x								
Chemical Agent, FS Smoke									x										
Cluster, Canister, Chemical, Riot Control									x										
Cluster, Projector, Launcher, MK-14			x	x	x														
Container and Cartridge Set, Line Throwing, .45 Cal		x					x	x			x				x				
Container and Charge Set, Line Throwing, 2.75" Rocket		x	x	x	x														
Control Unit, Parachute		x					x	x			x								
Cord, Detonating, All Types		x					x	x			x		x		x				
Cryptographic Equipment Destroyers																		x	Separate Stowage
Cutters, Cartridge Actuated		x					x	x			x				x				
Cutter, HE, MK-3 Mod 1															x	x			
Demolition Kit, Bangalore Torpedo										x		x							
Depth Charge, Antipersonnel, MK-40										x		x							
Destructor Charges, Explosive		x					x	x			x				x				

[1] See Paragraph 3-57 NAVSEA OP4

Table D-A-1. PERMISSIBLE STOWAGE OF AMMUNITION AND EXPLOSIVES (Cont'd)

TYPE OF AMMUNITION \ TYPE OF MAGAZINE	PROJECTILES & ROCKET HEADS	FIXED AMMO, GUN & ROCKET	PROPELLANT, ROCKET TYPE	PROPELLANT, GUN, BAG	PROPELLANT, GUN, CASED	PROPELLANT, LIQUID FUEL	FUZES	PYROTECHNIC	CHEMICAL	BOMB TYPE	SMALL ARMS	WARHEADS	MISSILES (ASSEMBLED)	GRENADE LOCKERS	DETONATOR LOCKERS	READY SERVICE	DEMOLITION MATERIAL	SPECIAL LOCKERS	REMARKS
Destructor, Incendiary																		X	Separate Stowage
Detonation Simulators								X		X					X				Separate Stowage
Detonators, Detonators Assemblies, Electric Percussion,															X				
Dispensers, Chaffeye, MJU-5B		X					X	X			^								
Dispensers and Bombs, Complete, CBU, Less CBU-15,										X		X							
Dispensers and Bombs, Complete, CBU-15, -22, &	X								X										
Dispensers and Bombs, Practice Weapon, CBU M- 20		X					^	^			^								
Document Destroyers								X								X			
Dynamite, Military, M1																			
Dynamite, 40% Nitro Gel [2]																	X		Separate Stowage
Exercise Heads, Mk 10 Mod 0 F/GMS										^		^							
Exercise Heads F/GM, Less MK-10								X				X							
Exercise Sections Assembly, MK-17, F/GMS										X		X							
Exploder Mechs, MK-11 and Mods F/Torpedo MK-27							X									X			
Explosive Blocks, Torpedo							X												
Explosive Drivers		X					X	X			X								
Explosive Fittings, Less MK-26														X					
Explosive Fitting, MK-26 F/ SUBROC							X												
Explosive Switch, MK-17 Mods 1 and 2							X												
Explosive Train, F/Torpedo MK-46, Service & Practice							X												
Extensions, Fuse, Bomb, Tetryl or Comp B Loaded							X												
File Destroyer, Incendiary																		X	Separate Stowage
Firing and Arming Mechs, F/U/W Sound Signals							X									X			
Firing Devices, Firing Device Set, Demolitions		X					X	X			X								

[2] May be stowed, if authorized by COMNAVSEASYSCOM, in separate stowage only

Table D-A-1. PERMISSIBLE STOWAGE OF AMMUNITION AND EXPLOSIVES (Cont'd)

TYPE OF AMMUNITIO \ TYPE OF MAGAZINE	PROJECTILES & ROCKET HEADS	FIXED AMMO, GUN & ROCKET	PROPELLANT, ROCKET TYPE	PROPELLANT, GUN, BAG	PROPELLANT, GUN, CASED	PROPELLANT, LIQUID FUEL	FUZES	PYROTECHNIC	CHEMICAL	BOMB TYPE	SMALL ARMS	WARHEADS	MISSILES (ASSEMBLED)	GRENADE LOCKERS	DETONATOR LOCKERS	READY SERVICE	DEMOLITION MATERIAL	SPECIAL LOCKERS	REMARKS
Flares, All Types								--							x				
Fog Oil for Smoke Pots								x			x								
Fuze, Blasting, Time		^					--	x							x				
Types							--								x				
uzes Types Boos							x								x				
Fuzes, Hand Grenades and Mines AT Combination																			
Fuzes, Projectile, Base Det., MT w/ Boosters, PD Less MK-66 Mod 0, Aux Det. Less MK-89, Fuze and Adapter Assemblies							x												
Fuzes, Projectile, MT w/o, Boosters PD MK-66 Mod 0,		x					x	x			x				x				
Fuzes, U/W Sound Signal								x							x				
Generators, Catalyst, WMU-1/B, -2B, -6B																			
Generators, Gas Pressure			x	x	x														
Grenades, Hand, Chemical, Riot, Tear Gas, WP									x				x						
Grenades, Hand, Frag.		x								x	x		x						
Grenades, Hand, Ill, HC Smoke, Colored Smoke		x						x					x						
Grenades, Hand, Incendiary (Thermite)																		x	Separate Stowage. Refer to paragraph 3-87.
Grenades, Offensive, with or without Fuzes										x	x	x	x						
Grenades, Hand Practice and Rifle, AT Practice, Fuzed			x								x		x						[3]
Grenades, Hand and Rifle, Colored Smoke								x					x						
Grenades, Rifle, HEAT										x			x						
Grenades, Rifle, WP									x				x						

[3] If not assembled, fuses and charges will be segregated in individual lockers

Table D-A-1. PERMISSIBLE STOWAGE OF AMMUNITION AND EXPLOSIVES (Cont'd)

TYPE OF AMMUNITION \ TYPE OF MAGAZINE	PROJECTILES & ROCKET HEADS	FIXED AMMO. GUN & ROCKET	PROPELLANT, ROCKET TYPE	PROPELLANT, GUN, BAG	PROPELLANT, GUN, CASED	PROPELLANT, LIQUID FUEL	FUZES	PYROTECHNIC	CHEMICAL	BOMB TYPE	SMALL ARMS	WARHEADS	MISSILES (ASSEMBLED)	GRENADE LOCKERS	DETONATOR LOCKERS	READY SERVICE	DEMOLITION MATERIAL	SPECIAL LOCKERS	REMARKS
Guided Missiles, Practice and Tactical, Less TALOS		X											X			X		X	
Guided Missile, SHRIKE, Training		X											X			X			
Guided Missile, SHRIKE, Exercise													X			X			
Guided Missile, TALOS, Practice and Tactical													X			X			
Guided Weapon, HARPOON, Tactical [4]													X			X			
Guided Weapon, TOMAHAWK, Tactical [4]													X			X			
Guided Weapon, Tactical, WALLEYE										X		X							
Guided Weapon, WALLEYE, MK-2 Practice		X											X			X			
Guided Weapon, WALLEYE, MK-4 Practice		X											X			X			
Hellfire Missile													X						
Igniters, Bomb, WP									X										
Igniter Cylinders, Flame Throwers		X					X	X			X								
Igniters, Igniter Assemblies, F/Torpedoes							X												
Igniters, Sea Water Activated, F/Torpedo MK-46									X							X			
Igniters, Time Blasting Fuze		X					X	X			X								
Initiators, Cartridge		X					X	X			X								
Ignition Separation Assemblies, HE Loaded							X												
Igniters, JATO Units							X												
Initiator, Firebomb MK-13 Mod 0							X									X			
Launcher and Cartridges, Chemical Agent									X										
Lead, Flexible, Explosive, MK-11 Mod 0							X												
Marker Kit, Location, MK-19								X								X			
Markers, Location, Marine and Sub.								X								X			
Markers, Marine, MK-2 Mods 0 and 1									X							X			
Mines, AT, and AP, M18/T48 Type										X		X					X		
Mines, AP, M2, M16, M26 Types		X																	
Mines, Underwater, w/wo Detonators		X								X		X				X			
Primer Dets. F/Bomb Fuzes, All Types							X												

[4] Can be stowed with assembled, service torpedos on tenders

A M SIBL TOWAGE OF AMMUNITION AND EXPLOSIVES (Cont'd)

TYPE OF AMMUNITION \ TYPE OF MAGAZINE	PROJECTILES & ROCKET HEADS	FIXED AMMO, GUN & ROCKET	PROPELLANT, ROCKET TYPE	PROPELLANT, GUN, BAG	PROPELLANT, GUN, CASED	PROPELLANT, LIQUID FUEL	FUZES	PYROTECHNIC	CHEMICAL	BOMB TYPE	SMALL ARMS	WARHEADS	MISSILES (ASSEMBLED)	GRENADE LOCKERS	DETONATOR LOCKERS	READY SERVICE	DEMOLITION MATERIAL	SPECIAL LOCKERS	REMARKS
Primers, All Types											X								
Projectiles, 5-38, 5-54, 6-47 Cals., Ill., Chaff, Window, Non-Frag	X							X								X			
Projectiles, 5-38, 5-54 Cals. WP	X								X							X			
Projectiles, 5" thru 16", HE Loaded	X															X			
Projectiles, 5", 6" and 8", Smoke Puff	X							X								X			
Propellant Assembly F/Torpedo MK-46				X	X														
Removers, Aircraft Canopy		X					X	X			X								
Rocket, 66mm, Incendiary [5]																		X	
Rockets, Assembled, with/without Fuzes		X														X			
Rocket Engines, Liquid, All Types					X														
Rocket Motors, Solid, All Types				X	X	X													
Safety and Arming Devices, with less than 0.1 Pound HE		X					X	X			X								
Safety and Arming Devices, with more than 0.1 Pound HE							X												
Self-Destruct Charges (Destructor Charges F/GM)							X												
Signal, MK-25 f/Drill Mines									X							X			
Signals, Signal Kits, All Types, Except U/W Sound								X								X			
Signals U/W Sound, w/wo Fuzes, Except MK-64										X		X							
Signal, U/W Sound, MK-64 Mod 0							X												
Simulators, Other than Detonation Simulators								X											

[5] To be stowed above deck in dry jettisonable lockers only

Table D-A-1. PERMISSIBLE STOWAGE OF AMMUNITION AND EXPLOSIVES (Cont'd)

TYPE OF AMMUNITION \ TYPE OF MAGAZINE	PROJECTILES & ROCKET HEAD	FIXED AMMO, GUN & ROCKET	PROPELLANT, ROCKET TYPE	PROPELLANT, GUN, BAG	PROPELLANT, GUN, CASED	PROPELLANT, LIQUID FUEL	FUZES	PYROTECHNIC	CHEMICAL	BOMB TYPE	SMALL ARMS	WARHEADS	MISSILES (ASSEMBLED)	GRENADE LOCKERS	DETONATOR LOCKERS	READY SERVICE	DEMOLITION MATERIAL	SPECIAL LOCKERS	REMARKS
Simulator, Projectile, Air Burst f/Discharger, Smoke Puff								X											
Smoke Pots, Fog Oil, Fuel Oil, Ground or Floating								X								X			
Smoke Pots, HC Loaded Ground or Floating									X							X			
Smoke Tracking Devices, F/L.D. Bombs								X											
Spray Guns, CN, Training									X										
Squibs, Squib Assemblies		X					X	X			X								
STINGER Missile													X						
Thrusters, Cartridges Actuated		X					X	X			X								
Torpedoes, Assembled, Service										X		X	X						
Torpedoes, Assembled, Exercise MK-37, -44, and -45							X						X						
Torpedoes, ASROC, Exercise		X											X						
Toxic Gas Sets, Training									X										
~~War Gas, Identification Sets~~									X										
Warheads, Exercise, F/GMS										X		X				X			
Warheads, HE Loaded, F/GMS										X		X							
Warheads, Rockets, 5.00", Chaff, Ill.	X							X								^			
~~Warheads, Rockets, 2.75" and 5.00", Chemical, WP~~	X								X							X			
~~Warheads, f/RAP and Rockets, HE Loaded~~	X															X			
Warheads, Torpedo, HE Loaded										X		X				X			

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ANNEX B

AVIATION ORDNANCE TECHNICAL
PUBLICATIONS AND INSTRUCTIONS LIBRARY CHECKLIST

1. Instructions:

_____ Naval Warfare Publication 42 (series)
Shipboard Helicopter Operations Procedures.

_____ OPNAVINST 3120.32 (series)
Standard Organization and Regulations of the US Navy.

_____ OPNAVINST 5100.19 (series)
Navy Safety Precautions for Forces Afloat.

_____ OPNAVINST 5102.1 (series)
Mishap Investigation and Reporting.

_____ OPNAVINST 5530.1 (series)
Department of the Navy Physical Security Instruction for Sensitive Conventional Arms, Ammunition and Explosives (AA&E).

_____ OPNAVINST 8600.2 (series)
Naval Airborne Weapons Maintenance Manual.

_____ NAVSEAINST 8020.6 (series)
Weapon System Explosive Safety Review Program.

_____ Title 46 Code of Federal Regulations 146.29
Detailed Regulations Governing the Transportation of Military Explosives and Hazardous Munitions Onboard Vessels.

_____ SPCCINST 8010.12
Supply Management of Ammunition;Policy, Procedures and Responsibilities.

_____ COMNAVSURFLANTINST 8023.4/COMNAVSURFPACINST 8023.5
Non-Nuclear Ordnance/Explosive Handling Qualification and Certification Program.

_____ COMNAVSURFLANTINST 9093.3
Commander Naval Surface Force, US Atlantic Fleet Combat System Officers Manual.

_____ Naval Safety Center Instruction 8020.1
Ship/Submarine Explosives Safety Surveys and Checklist.

2. Bills:

_____ Ships EMCON Bill.

_____ Ships HERO Bill.

_____ Ships HERO Survey.

3. Publications:

_____ General Specifications for Ships, US Navy.

_____ Naval Ships Technical Manual (S9086-VG-STM-000) Chapter 7.

_____ NAVSEA SG522-AA-HBK-010
Instruction Book Magazine Sprinkler System.

_____ NAVSEA OP-4
Ammunition Afloat.

_____ NAVSEA OP-1014
Ordnance Safety Precautions.

_____ NAVSEA OP-2165 Volumes 1 and 2
Navy Transportation Safety Handbook.

_____ NAVSEA SW000-AA-MMA-010
Demolition Material.

_____ NAVSEA SE050-AB-MMA-010
Pyrotechnic Screening and Marking Devices.

_____ NAVSEA OP-2238
Identification of Ammunition.

_____ NAVSEA SW050-AC-ORD-010/NA-11-15-8
Toxic Hazard Associated with Pyrotechnic Devices.

_____ NAVSEA OP-3347
US Navy Ordnance Safety Precautions.

_____ NAVAIR 11-1-116B/TWO010-AA-ORD-030
Naval Ammunition Logistic Codes (NALC).

_____ NAVAIR 11-1F-2
Fuze Manual, Airborne Bomb and Rocket, Description and Characteristics.

_____ NAVAIR NA-00-80R-14
Aircraft Firefighting & Rescue Manual.

_____ NWP-42
Shipboard Helicopter Operating Procedures.

_____ NAVAIR 11-85-5
Airborne Rockets.

_____ NAVAIR 11-75A-61
2.75 Inch Airborne Rocket Launchers (LAU-61, 68 series).

_____ NAVAIR 11-120A-1.1/1.2
Airborne Weapons Packaging, Handling and Stowage.

_____ NAVAIR 19-15BC-12
AERO-12C, Bomb Skid.

_____ NAVAIR 19-600-96-6-4
Calendar Maintenance Requirement Cards Bomb Skid, AERO-12B/C.

_____ NAVAIR 19-95-1
Airborne Weapons/Stores Manual Checklist, Transportation and Loading Equipment Configuration.

_____ AW-820YB-MIB-000
HELLFIRE Missile, Fleet Missile Maintenance.

_____ TM 9-1425-429-12
STINGER Missile; Operational Organizational Maintenance Manual.

_____ TM 9-1005-213-25
.50 Caliber Machine Gun.

_____ TM 2.75 FFAR (Folding Fin Aerial Rocket)

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ANNEX C

JOINT HELICOPTER HANDLING, QUALIFICATION, AND CERTIFICATION FOR CONVENTIONAL AVIATION ORDNANCE DEVICES

1. Safe ordnance and explosive device handling requires the attention of all echelons of command. Qualification and certification of aviation personnel in the safe, efficient handling of ordnance and explosive devices should be structured around existing training programs.

2. Qualification Procedures. Qualification of personnel will be as a team member (TM), individual (I), team leader (TL), quality assurance (QA), instructor (IN), and safety observer (SO).

3. Certification. When qualified and recommended for certification, each person will be issued certification by the parent Service.

a. Team Member (TM) Qualification and Certification. All personnel whose duties require handling, packaging, unpacking, assembling or disassembling, fuzing, loading, downloading, arming, or de-arming of ordnance and explosive devices will be qualified and certified as team members. This level indicates an in-training status and applies to personnel that must be supervised in the performance of their duties.

b. Individual (I) Qualification and Certification. Personnel whose duties require that they individually inspect (including acting as safety observers), prepare, adjust, arm, or de-arm ordnance and explosive devices will be qualified and certified for such tasks. Personnel conducting magazine inspections; maintenance on aircraft, safety, and survival equipment; or performing any function that involves ordnance and explosive devices will be included in this program. Supervisors of ordnance and explosive device operations will be individually certified for evolutions that they may supervise or observe.

c. Team Leader (TL) Qualification Certification. Personnel who have been previously qualified and certified to the I level whose duties require that they direct and supervise others in safe and reliable operations may be designated as TL.

d. Quality Assurance (QA) Qualification and Certification. QA qualification and certification will be certified to the I or TL level and have detailed knowledge of applicable ordnance and explosive devices or systems inspection criteria to determine that the device or system will function properly. In addition, personnel must be able to determine that the necessary assembly or installation procedures have been completed using applicable directives. Personnel who are quality assurance representatives or collateral duty quality assurance representatives and perform functions involving explosive devices will also be qualified and certified as a minimum to QA level and as SOs as outlined in the following paragraph.

e. Safety Observer (SO) Qualification and Certification. The qualification and certification standards of the SO will ensure that the member has sufficient knowledge of applicable safety procedures, equipment, and devices under his observation to be able to recognize and react to violations.

f. Instructor (IN) Qualification and Certification. To obtain an IN qualification and certification, personnel will be qualified and certified as I or TL and have developed the necessary skills to instruct others using a command-approved course of instruction.

g. Duration and Revocation. The expiration date and cause for revocation will be determined by the parent Service of the embarked detachment.

4. Explosive Devices. Each type of explosive device will be considered as a separate family. The following list of types of explosive devices is considered representative, but not all inclusive:

a. High-explosive bombs and components.

b. Cluster bomb units (CBUs).

c. Special-purpose bombs (practice bombs with marker charges, leaflet chaff).

d. Pyrotechnics.

e. Chemical ammunition.

f. Underwater sound signals.

g. Demolition explosive and material.

h. Mines and components.

i. Cartridges and cartridge-actuated devices.

j. Rocket warheads and components.

k. Small arms and landing force ammunition.

l. Aircraft gun ammunition.

m. Air-launched guided missiles and components.

n. Targets and components.

o. Aircrew escape propulsion systems (AEPS).

p. Guided weapons (LGB, WALLEYE).

q. Destructors.

5. Explosive Operations. Each type of explosive operation will be considered as a separate family. The following list of explosive operations is considered representative but not all inclusive:

a. Ashore Operations

(1) Receipt, segregation, storage, and issue functions.

(2) Aircraft arming and de-arming.

b. Afloat Operations

(1) Aircraft release and control system checks.

(2) Aircraft loading and downloading.

(3) Aircraft arming and de-arming.

(4) Installation or removal of AEPS or CADS.

(5) Ordnance and explosive device handling and transporting.

(6) Ordnance and explosive device unpackaging and packaging.

(7) Ordnance and explosive device inspection, assembly, or disassembly.

(8) Aircraft gun handling, loading, or jam clearing.

(9) Storage.

6. Record of Certification. Documentation of certification will be accomplished using Figure D-C-1. The following notes will be used in its preparation.

CERTIFICATION LEVELS

TM	TEAM MEMBER	TL	TEAM LEADER	SO	SAFETY OBSERVER
I	INDIVIDUAL	QA	QUALITY ASSURANCE	IN	INSTRUCTOR

WORK TASK CODES

1.	STORAGE/STOWAGE	5.	ARM/DE-ARM	9.	AIRCRAFT RELEASE & CONTROL
2.	HANDLING	6.	TRANSPORTING		
3.	ASSEMBLY/ DISASSEMBLY	7.	MAGAZINE INSPECTION		
4.	LOAD/DOWNLOAD	8.	INSTALL/REMOVE		

EXPLOSIVE DEVICE	WORK TASK FORCE	CERT LEVEL	INDIVIDUAL SIGNATURE	APPROVAL AUTHORITY	DATE CERT

CERTIFICATIONS ABOVE HAVE BEEN REVIEWED AND RECERTIFIED AS PER DATES AND SIGNATURE INDICATED BELOW. EFFECTIVE FOR ___ MONTHS (NOTE: ITEMS NOT REQUIRED FOR RECERTIFICATION WILL BE LINED OUT.).

INDIVIDUAL BEING CERTIFIED		APPROVAL AUTHORITY	
SIGNATURE	DATE	SIGNATURE	DATE
SIGNATURE	DATE	SIGNATURE	DATE
SIGNATURE	DATE	SIGNATURE	DATE
NAME	GRADE	SSN/MOS	ACTIVITY

Figure D-3-1. Joint Shipboard Helicopter Operations Manual Conventional Aviation Ordnance Devices Certification/Qualification Sheet

Notes:

1. The following list of definitions and guidelines is provided to assist in preparation of the record of certification:

a. Explosive Device. Applicable explosive device for which the person is being certified.

b. Individual Signature. Signature of person being certified. Signing acknowledges certification level and work task code for the explosive device or family; therefore, a signature is required for each line entry.

c. Conventional Ordinance Handling and Certification Board Chairman Signature. Signature of the commanding officer, officer in charge, or department head designated to act as board chairman.

d. Date Certified. Date certification is effective.

e. Recertification. Recertification or acceptance of certification from other commands may be accomplished using the space provided. Once the individual has been recertified or accepted and the board chairman signs and dates the form, the certification duration will be determined by the parent Service.

f. Corrections. The use of whiteout or correction tape or a single line through the entire entry and signature by the individual and board chairman for revocation of certification for cause.

g. Delays. Normally, certification will occur within 30 days of the demonstrated proficiency dates.

h. Family Groups. Family groups are explosive devices with similar characteristics as represented in paragraph 4.

i. Certification Levels. List the highest certification level applicable. TM, I, TL, and QA are interrelated. For example, an individual certified to the QA level is also qualified and certified to perform as a TM, I, or TL.

ANNEX D

Table D-D-1. Weapons Loading, Strikedown, Downloading, and Recovery Guide

Table D-D-1. Weapons Loading, Strikedown, Downloading, and Recovery Guide

WEAPON	HANGAR		RECOVERY[1]	
WEAPON	LOAD	STRIKEDOWN DOWNLOAD	UNEXPENDED	HUNG
GENERAL PURPOSE BOMBS	YES[2,3]	YES[4]	YES[5]	YES[5]
DST	YES[3]	YES[4]	YES[5]	YES[5]
CBU-55 FAE	NO	NO	NO	NO
2.75 INCH ROCKETS	NO	NO[6]	YES	YES
5.0 INCH ROCKETS	NO	NO[6]	YES	YES
A/C PARACHUTE FLARE (MK-45)	NO	NO	YES	YES
A/C PARACHUTE FLARE (LUU-2B/B)	YES[7]	YES[7]	YES[7]	YES[7]
FLARE DISPENSER (LOADED WITH MK-45)	NO	NO	YES	YES
FLARE DISPENSER (LOADED WITH LUU-2B/B)	YES[7]	YES[7]	YES[7]	YES[7]
20MM GUNS/GPU-2A	YES	YES[8,9]	YES	YES
SIDEWINDER MISSILES	NO[10]	YES	YES	YES
MAVERICK	NO[10]	YES	YES	YES
MK-46 DECOY FLARES	NO	NO	YES	YES
TORPEDOES (ALL)	YES[3]	YES[4]	YES	YES
SUS CHARGE (MK-46)	YES	YES	YES	YES
SIDEARM MISSILES	NO[4]	YES	YES	YES
MARINE MARKER	YES	YES	YES	YES
PRACTICE BOMBS	YES[5]	YES[6]	YES	YES
JAU-1B/JAU-22/B	YES	YES[11]	YES	YES
CARTRIDGE TOW MISSILES	NO[4]	YES	YES	YES
AN/ALE-X DISPENSER	YES	YES	YES	YES
AIR SHAFT CARTRIDGE	NO	NO	YES	YES
HELLFIRE MISSILES	NO	YES	YES	YES
.50-CAL MACHINE GUN	NO	NO	YES	YES
STINGER MISSILES	NO[4]	YES	YES	YES
7.62MM GUNS	NO	NO	YES	YES
M118 GRENADE LAUNCHER	NO	NO	YES	YES

Table D-D-1. Weapons Loading, Strikedown, Downloading, and Recovery Guide (Con't)

Notes:

1. Guidance provided in this Annex is subject to individual aircraft tactical manual limitations.

2. No mechanical nose fuzes will be installed on the hangar deck.

3. Ejector cartridges will not be installed on the hangar.

4. In the event of strikedown of a loaded aircraft to the hangar, the nose fuzes (as applicable) and ejector and jettison cartridges will be removed immediately after the aircraft is in spot and tied down.

5. Arming wires and safety clips intact.

6. LHAs with centerline elevators may lower aircraft to the hangar deck only if downloading on the flight deck will delay the launch. Hangar deck downloading will be performed immediately after the aircraft is in the spot and tied down.

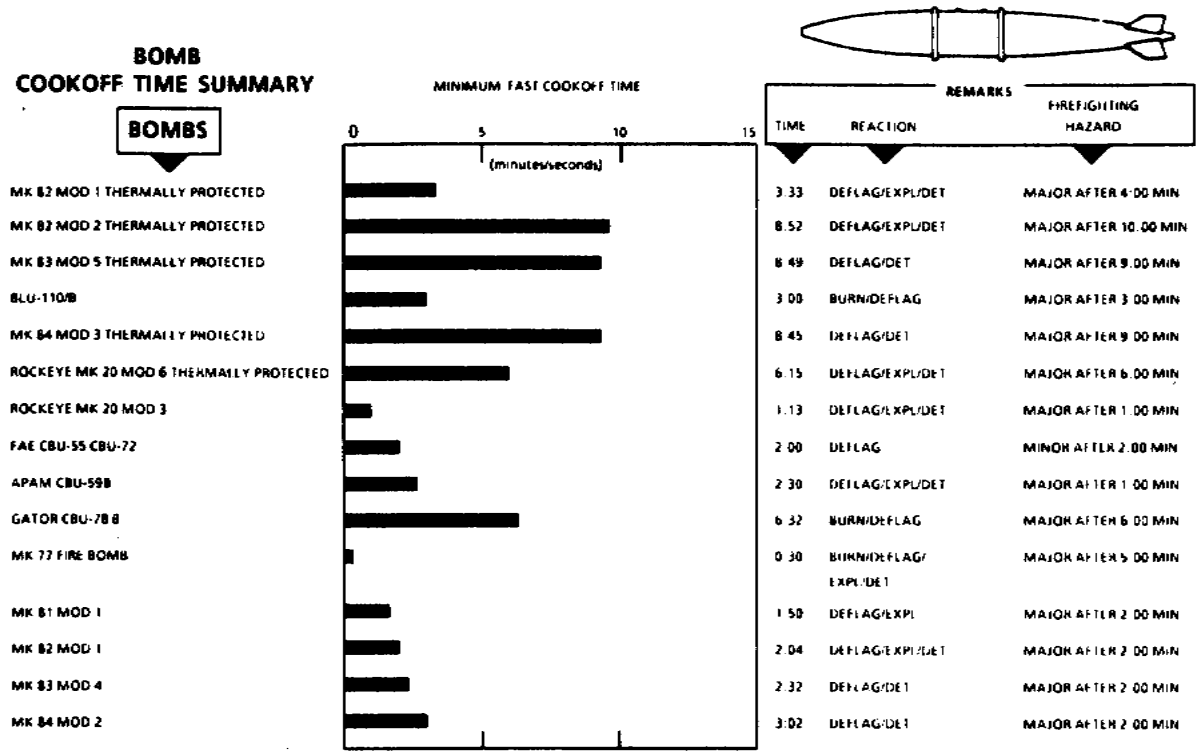
7. Impulse cartridges must be removed from dispensers loaded with LUU-2B/B parachute flares.

8. The GPU-2 gun pod is exempt from downloading requirements for up aircraft temporarily spotted in the hangar and aircraft undergoing limited maintenance, e.g., turnaround maintenance, providing compliance with all gun de-arm procedures has been accomplished.

9. Strikedown or download of aircraft with jammed 20mm gun pods is prohibited.

10. Air-launched missiles will not normally be loaded on the hangar deck except when operational commitments so dictate. Commanding officers may authorize loading of missiles on the hangar only up to the point of mechanical attachment of the weapon to the launcher or rack in accordance with the procedures prescribed in the appropriate Loading Checklists.

11. Normally, maintenance will not be conducted on aircraft loaded with weapons; however, routine servicing and minor maintenance that would ready the aircraft for the next launch may be conducted after all weapons are safed to the maximum degree possible.



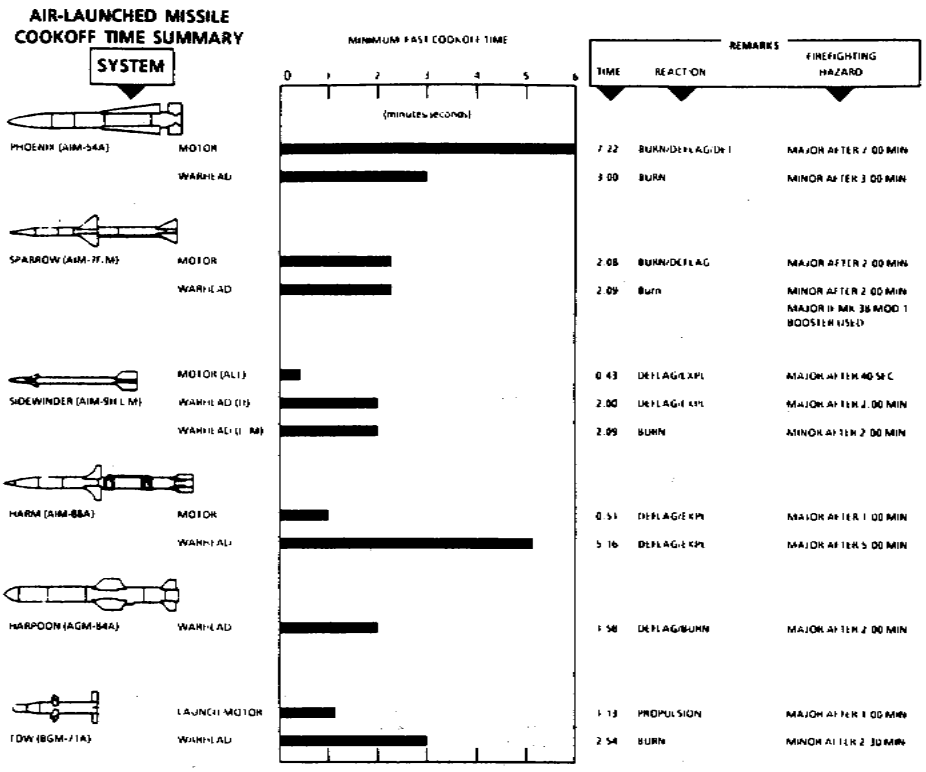
WARNING

ENSURE THAT AFFF IS CONTINUOUSLY APPLIED TO ALL WEAPONS EXPOSED TO FIRE. WATER HOSE LINES SHOULD NOT BE USED FOR ORDNANCE COOLING UNTIL AFTER THE FIRE IS EXTINGUISHED. THE USE OF WATER FOR ORDNANCE COOLING MAY DELAY EXTINGUISHMENT BY DILUTING OR WASHING AWAY THE AFFF BLANKET. POSTFIRE ORDNANCE COOLING (AFFF OR WATER) SHALL CONTINUE FOR A MINIMUM OF 15 MINUTES TO ALLOW THE WEAPONS CASES TO RETURN TO SAFE AMBIENT TEMPERATURES. POST AIRCRAFT FIRE OVERHAUL/SALVAGE EVENTS SHALL NOT BEGIN UNTIL ALL WEAPONS HAVE BEEN DETERMINED SAFE OR REMOVED BY EXPLOSIVE ORDNANCE DISPOSAL (EOD) PERSONNEL.

WARNING

WEAPONS WITH SUBMUNITIONS (I.E., ROCKEYE, GATOR. TOMAHAWK BGM-109D, AND APAM), WHEN EXPOSED TO FIRE, DISBURSE UNREACTED BOMBLETS/MINES TO DISTANCES GREATER THAN 1/4 MILE. LOOSE BOMBLETS/MINES MAY BE ARMED AND ARE EXTREMELY DANGEROUS AND SHOULD BE DISPOSED OF BY EOD PERSONNEL ONLY.

Figure D-E-1. Bomb Cookoff Time Summary



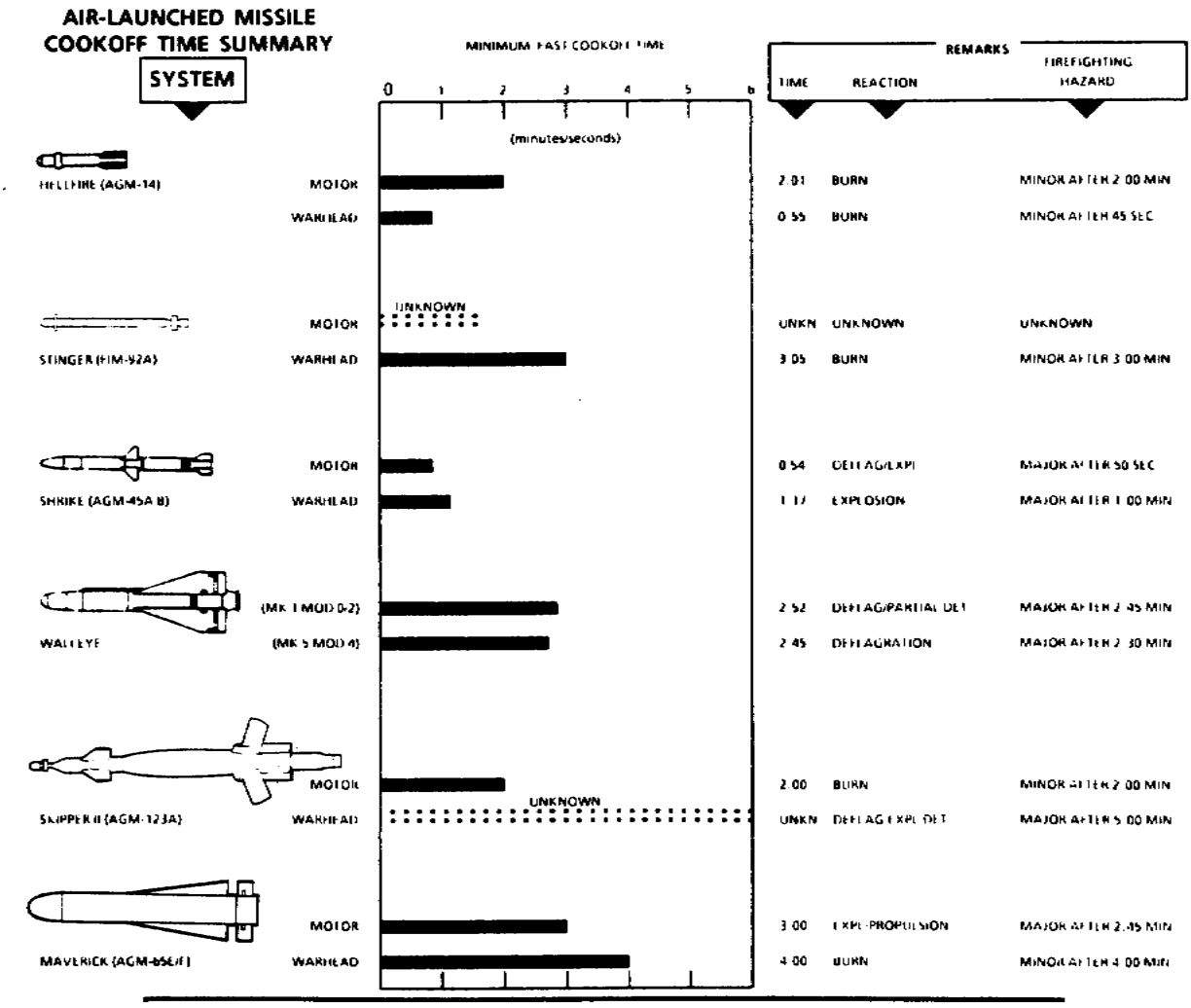
WARNING

ENSURE THAT AFFF IS CONTINUOUSLY APPLIED TO ALL WEAPONS EXPOSED TO FIRE. WATER HOSE LINES SHOULD NOT BE USED FOR ORDNANCE COOLING UNTIL AFTER THE FIRE IS EXTINGUISHED. THE USE OF WATER FOR ORDNANCE COOLING MAY DELAY EXTINGUISHMENT BY DILUTING OR WASHING AWAY THE AFFF BLANKET. POSTFIRE ORDNANCE COOLING (AFFF OR WATER) SHALL CONTINUE FOR A MINIMUM OF 15 MINUTES TO ALLOW THE WEAPONS CASES TO RETURN TO SAFE AMBIENT TEMPERATURES. POST AIRCRAFT FIRE OVERHAUL/SALVAGE EVENTS SHALL NOT BEGIN UNTIL ALL WEAPONS HAVE BEEN DETERMINED SAFE OR REMOVED BY EXPLOSIVE ORDNANCE DISPOSAL (EOD) PERSONNEL.

WARNING

WEAPONS WITH SUBMUNITIONS (I.E., ROCKEYE, GATOR. TOMAHAWK BGM-109D, AND APAM), WHEN EXPOSED TO FIRE, DISBURSE UNREACTED BOMBLETS/MINES TO DISTANCES GREATER THAN 1/4 MILE. LOOSE BOMBLETS/MINES MAY BE ARMED AND ARE EXTREMELY DANGEROUS AND SHOULD BE DISPOSED OF BY EOD PERSONNEL ONLY.

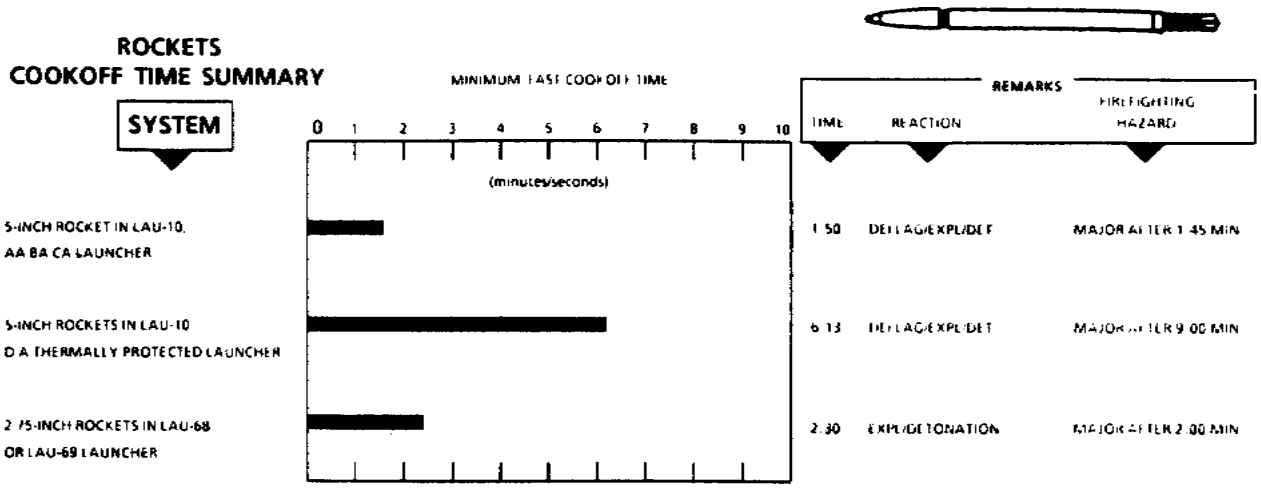
Figure D-E-2. Air-Launched Missile Cookoff Time Summary



WARNING

ENSURE THAT AFFF IS CONTINUOUSLY APPLIED TO ALL WEAPONS EXPOSED TO FIRE. WATER HOSE LINES SHOULD NOT BE USED FOR ORDNANCE COOLING UNTIL AFTER THE FIRE IS EXTINGUISHED. THE USE OF WATER FOR ORDNANCE COOLING MAY DELAY EXTINGUISHMENT BY DILUTING OR WASHING AWAY THE AFFF BLANKET. POSTFIRE ORDNANCE COOLING (AFFF OR WATER) SHALL CONTINUE FOR A MINIMUM OF 15 MINUTES TO ALLOW THE WEAPONS CASES TO RETURN TO SAFE AMBIENT TEMPERATURES. POST AIRCRAFT FIRE OVERHAUL/SALVAGE EVENTS SHALL NOT BEGIN UNTIL ALL WEAPONS HAVE BEEN DETERMINED SAFE OR REMOVED BY EXPLOSIVE ORDNANCE DISPOSAL (EOD) PERSONNEL.

Figure D-E-2. Air-Launched Missile Cookoff Time Summary



WARNING

ENSURE THAT AFFF IS CONTINUOUSLY APPLIED TO ALL WEAPONS EXPOSED TO FIRE. WATER HOSE LINES SHOULD NOT BE USED FOR ORDNANCE COOLING UNTIL AFTER THE FIRE IS EXTINGUISHED. THE USE OF WATER FOR ORDNANCE COOLING MAY DELAY EXTINGUISHMENT BY DILUTING OR WASHING AWAY THE AFFF BLANKET. POSTFIRE ORDNANCE COOLING (AFFF OR WATER) SHALL CONTINUE FOR A MINIMUM OF 15 MINUTES TO ALLOW THE WEAPONS CASES TO RETURN TO SAFE AMBIENT TEMPERATURES. POST AIRCRAFT FIRE OVERHAUL/SALVAGE EVENTS SHALL NOT BEGIN UNTIL ALL WEAPONS HAVE BEEN DETERMINED SAFE OR REMOVED BY EXPLOSIVE ORDNANCE DISPOSAL (EOD) PERSONNEL.

Figure D-E-3. Rocket Cookoff Time Summary

ANNEX F

TABLE D-F-1. US MARINE CORPS HELICOPTER WEAPONS CONFIGURATION

US MARINE CORPS	
WEAPONS	AIRCRAFT
TOW MISSILES	AH-lT/AH-lW
HELLFIRE MISSILES	AH-lW
SIDEWINDER MISSILES	AH-1T/AH-1W/OH-6/ MH-60 A/L
SIDEARM MISSILES	PRELIMINARY AH-1W/ OH-6/MH-60 A/L
2.75-INCH ROCKETS	AH-1T/AH-1W/UH-1N/ OH-6/MH-60 A/L
5.00-INCH ROCKETS	AH-1T/AH-1W
SUU-25F/A FLARE DISPENSER	AH-1T/AH-1W
SUU-44/A FLARE DISPENSER	AH-1T/AH-1W
M118 SMOKE GRENADE DISPENSER	AH-1T/AH-1W
PRACTICE BOMBS (MK-76, BDU-33, MK-106, BDU-48)	AH-1T/AH-1W
GPU-2A GUN POD 20MM	AH-1T/AH-1W
M197 20MM TURRET	AH-1T/AH-1W
ALE-39 CHAFF/DECOY FLARE DISPENSER	AH-1T/AH-1W/UH-1N/ CH-46/CH-53
CBU-55 FUEL AIR EXPLOSIVE	AH-1T/AH-1W
MK-77 FIREBOMBS	AH-1T/AH-1W
GAU-2B 7.62MM MINI-GUN	UH-1N
M60 7.62MM MACHINE GUN	UH-1N
GAU-16 .50-CAL MACHINE GUN	UH-1N
XM-218 .50-CAL MACHINE GUN	CH-46/CH-53

TABLE D-F-2. US ARMY HELICOPTER WEAPONS CONFIGURATION

us ARMY	
WEAPON	AIRCRAFT
M-130 FLARE/CHAFF	AH-1/AH-64/CH-47/EH-60/ UH-1/UH-60
M-60 7.62 MACHINE GUN	UH-60/CH-47
STINGER MISSILES	AH-1/AH-64/CH-47/EH-60/ UH-1/UH-60/OH-58C/OH-58D
2.75-INCH ROCKETS	OH-58D/AH-1/AH-64
HELLFIRE MISSILES	OH-58D/AH-64
.50-CAL MACHINE GUN	OH-58D
TOW MISSILES	AH-1
7.62 TURRET	AH-1
20MM TURRET	AH-1E/AH-1F
40MM GRENADE LAUNCHER	AH-1E/AH-1F
30MM RAPID FIRE CHAIN GUN	AH-64
7.62 MINI GUN	OH-6/MH-60 A/L

TABLE D-F-3. US AIR FORCE HELICOPTER WEAPON CONFIGURATION

US **AIR FORCE**	
WEAPON	**AIRCRAFT**
M-60 7.62 MACHINE GUN	C/HH-3 **(USAF-RESCUE)**/ MH-60G **(USAF-RESCUE** & **SOF)**
M-130 FLARE DISPENSER	MH-60G **(USAF-RESCUE)**
2.75-INCH ROCKETS	MH-60G (USAF-SOF)
.50-CAL MACHINE GUN	MH-53J (USAF-SOF)/ MH-60G (USAF-SOF)
7.62 MINI GUN (GUA-2B)	MH-53J (USAF-SOF)/ MH-60G (USAF-SOF)
AN/ALE-40 DECOY CHAFF/FLARE DISPENSER	C/HH-3 **(USAF-RESCUE)**/ MH-60G (USAF-SOF)/ MH-53J (USAF-SOF)

TABLE D-F-4. US NAVY HELICOPTER WEAPONS CONFIGURATION

US NAVY	
WEAPON	AIRCRAFT
M60 7.62MM MACHINE GUN	HH-60/SH-60B/MH-53/ SH-2/SH-3/UH-lN
.50-CAL MACHINE GUN	MH-53/UH- 1N
ALE-39 CHAFF/DECOY FLARE DISPENSER	HH-60/SH-60B/MH-53/ SH-2/SH-3
M-130 FLARE/CHAFF	HH-60/SH-60B/MH-53/ SH-2/SH-3
MK-46/50	SH-60B/SH-60F/SH-2/SH-3
19-SHOT ROCKET POD, 2.76	UH-1N

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APPENDIX E

Table E-1. FLIGHT DECK CLOTHING COLOR CODING

PERSONNEL	HELMET[2]	JERSEY	SYMBOLS
Aircraft Handling Crew and Chockmen	Blue	Blue	Crew Number
Aircraft Handling Officers, CPO, LPO	Yellow	Yellow	Billet Title
Elevator Operators	White	Blue	E
LSE (Crew Directors)	Yellow	Yellow	Crew Number
Maintenance Crews	Green	Green	Black Stripe and Squadron Designator
Medical	White	White	Red Cross
Messengers and Telephone Talkers	White	Blue	T
Photographers	Green	Green	P
Plane Captains	Brown	Brown	Squadron Designator
Ordnance	Red	Red	Black Stripe and Squadron Designator/ ship's billet title
Crash and Salvage Crews ,	Red	Red	Crash/Salvage
Tractor Driver	Blue	Blue	Tractor
Maintenance Crews	Green	Green	Black Stripe broken by abbreviation of specialty (that is, P/P (Power Plants)
Aviation Fuel Crew	Purple	Purple	F
Aviation Fuel Officer	Purple	Purple	Fuel Officer
Combat Cargo	White	White	Combat Cargo
Safety Observer	White	White	Green Cross

1 USCG flight deck clothing does not include symbols.

2 Combination cranial.

Table E-2. FLIGHT DECK CLOTHING STOCK NUMBER TABLE

CHARACTERISTICS	NOMENCLATURE	NATIONAL STOCK NUMBER (NSN)
TOTAL-QTY	JERSEY-FLDK BLU SEL	1HM0000-LL-CJ6-3648
TOTAL-QTY	JERSEY-FLDK BRN SEL	1HM0000-LL-CJ6-3648
SMALL	JERSEY-FLDK CREW BLUE	9D 8415-00-914-0312
MEDIUM	JERSEY-FLDK CREW BLUE	9D 8415-00-914-0313
LARGE	JERSEY-FLDK CREW BLUE	9D 8415-00-914-0314
X-LARGE	JERSEY-FLDK CREW BLUE	9D 8415-00-914-0315
SMALL	JERSEY-FLDK CREW BROWN	9D 8415-00-914-0316
MEDIUM	JERSEY-FLDK CREW BROWN	9D 8415-00-914-0317
LARGE	JERSEY-FLDK CREW BROWN	9D 8415-00-914-0318
X-LARGE	JERSEY-FLDK CREW BROWN	9D 8415-00-914-0319
TOTAL-QTY	JERSEY-FLDK CREW GREEN	1HM0000-LL-CJ6-3649
SMALL	JERSEY-FLDK CREW GREEN	9D 8415-00-914-0321
MEDIUM	JERSEY-FLDK CREW GREEN	9D 8415-00-914-0322
LARGE	JERSEY-FLDK CREW GREEN	9D 8415-00-914-0323
X-LARGE	JERSEY-FLDK CREW GREEN	9D 8415-00-914-0324
SMALL	JERSEY-FLDK CREW PURPLE	9D 8415-00-914-0325
MEDIUM	JERSEY-FLDK CREW PURPLE	9D 8415-00-914-0326
LARGE	JERSEY-FLDK CREW PURPLE	9D 8415-00-914-0327
X-LARGE	JERSEY-FLDK CREW PURPLE	9D 8415-00-914-0328
TOTAL-QTY	JERSEY-FLDK CREW RED	1HS0000-LL-CJ6-3651
SMALL	JERSEY-FLDK CREW RED	9D 8415-00-914-0329
LARGE	JERSEY-FLDK CREW RED	9D 8415-00-914-0331
X-LARGE	JERSEY-FLDK CREW RED	9D 8415-00-914-4143
MEDIUM	JERSEY-FLDK CREW RED	9D 8415-00-914-9481
SMALL	JERSEY-FLDK CREW WHITE	9D 8415-00-914-0333
MEDIUM	JERSEY-FLDK CREW WHITE	9D 8415-00-914-0334
LARGE	JERSEY-FLDK CREW WHITE	9D 8415-00-914-0335

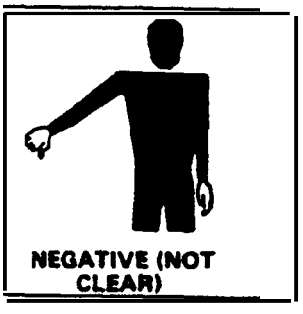
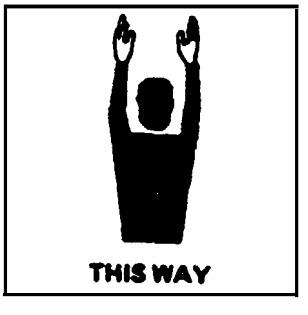
Table E-2. FLIGHT DECK CLOTHING STOCK NUMBER TABLE (Cont'd)

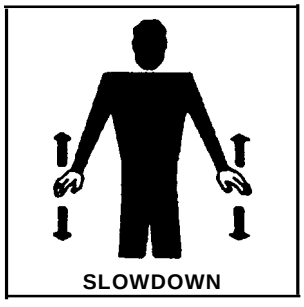
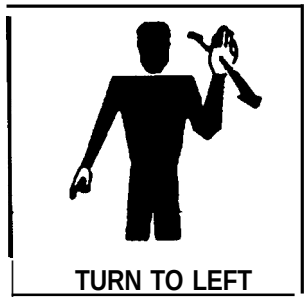
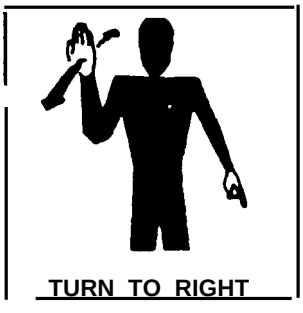
CHARACTERISTICS	NOMENCLATURE	NATIONAL STOCK NUMBER (NSN)
X-LARGE	JERSEY-FLDK CREW WHITE	9D 8415-00-914-0336
SMALL	JERSEY-FLDK CREW YELLOW	9D 8415-00-914-0337
MEDIUM	JERSEY-FLDK CREW YELLOW	9D 8415-00-914-0338
LARGE	JERSEY-FLDK CREW YELLOW	9D 8415-00-914-0339
X-LARGE	JERSEY-FLDK CREW YELLOW	9D 8415-00-914-0340
TOTAL-QTY	JERSEY-FLDK PRPL SEL	1HS0000-LL-CJ6-3650
TOTAL-QTY	JERSEY-FLDK WHT SEL	1HS0000-LL-CJ6-3652
TOTAL-QTY	JERSEY-FLDK YEL SEL	1HS0000-LL-CJ6-3653
TOTAL-QTY	HELMET ASSY SEL	1HS0000-LL-CJ6-3646
SPHPG1	HELMET ASSY SZ 6-3/4	9D-8415-00-961-3527
SPHPG2	HELMET ASSY SZ 7	9D-8415-00-071-8785
SPHPG3	HELMET ASSY SZ 7-1/4	9D-8415-00-071-8786
SPHPG4	HELMET ASSY SZ 7-1/2	9D-8415-00-071-8787

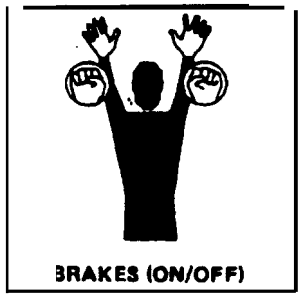
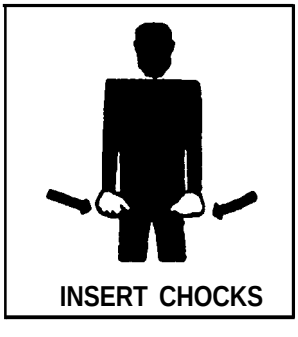
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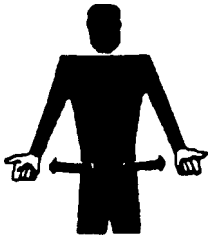
APPENDIX F

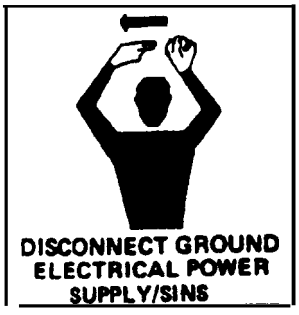
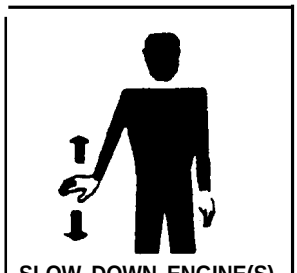
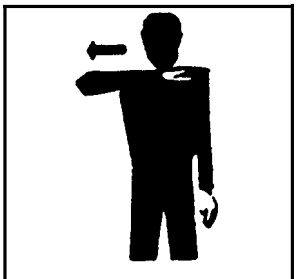
AIRCRAFT HANDLING SIGNALS

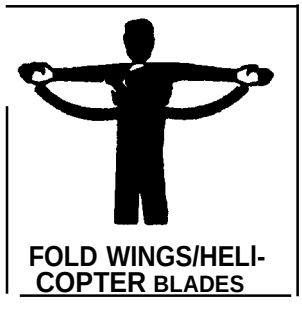
SIGNAL	DAY	NIGHT	REMARKS
 AFFIRMATIVE (ALL CLEAR)	Hand raised, thud up.	Same as day, except with wands,	Conforms to ICAO signal.
 NEGATIVE (NOT CLEAR)	Arm held out, hand below waist level, thumb turned downward.	Same as day, except with wands.	
 PROCEED TO NEXT MARSHALER	Right or left arm down, other arm moved across the body and extended :0 indicate direction to next marshaler.	Same as day, except with wands.	:onforms to ICAO signal.
 THIS WAY	Arms above head in vertical position with palms facing inward.	Same as day, except with wands.	:onforms to ICAO Signal.

SIGNAL	DAY	NIGHT	REMARKS
 SLOWDOWN	Arms down with palms toward ground, then moved up and down several times.	**Same as day,** except with wands.	Conforms to ICAO Signal.
 TURN TO LEFT	point right arm downward, left arm is repeatedly moved upward-backward. Speed of arm movement indicates rate of turn.	**Same as day,** except with wands.	Also used for spot turns for airborne aircraft. Conforms to ICAO signal.
 TURN TO RIGHT	Point left arm downward, right hand repeatedly moved upward-backward. Speed of arm movement indicates rate of turn.	Same as day, except with wands,	Also used for spot turns for airborne aircraft. Conforms to ICAO signal.
 MOVE AHEAD	Arms extended from body and held horizontal to shoulders with hands upraised and above eye level, palms facing backward. Execute beckoning arm motion angled backward. Rapidity indicates speed desired of aircraft.	**Same as day,** except with wands	

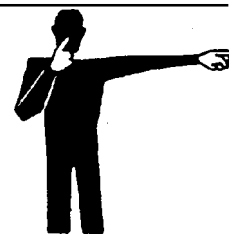
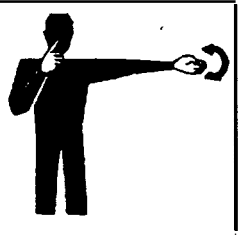
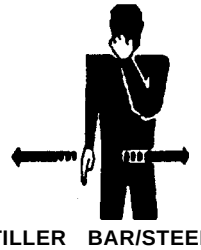
SIGNAL	DAY	NIGHT	REMARKS
 STOP	Arms crossed above the head, palms facing forward.	Same as day, except with wands.	
 BRAKES (ON/OFF)	"ON"- Arms above head, open palms and fingers raised with palms toward aircraft, then fist closed. "OFF"-Reverse of above.	"ON"-Arms above head then wands crossed. "OFF"-Crossed wands, then uncrossed.	
 PERSONNEL APPROACHING THE AIRCRAFT	Left hand raised vertically overhead, palm toward aircraft. the other hand indicates to personnel concerned and gestures toward aircraft.	Same as day, except with wands.	
 INSERT CHOCKS	Arms down, fists closed, thumbs extended inward, swing arms from extended position inward.	Same as day, except with wands.	Conforms to ICAO signal.

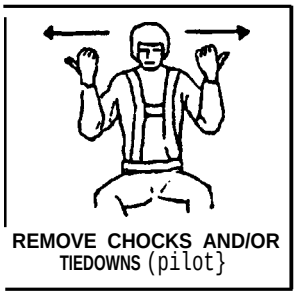
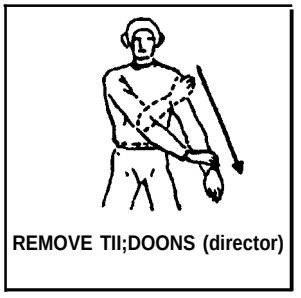
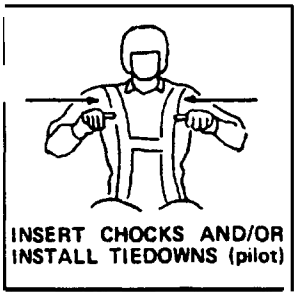
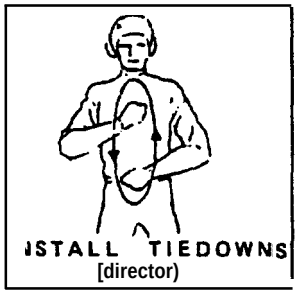
SIGNAL	DAY	NIGHT	REMARKS
 REMOVE CHOCKS	Arms down, fists closed, thumbs extended outward, swing arms outward.	**Same as day**, except with wands.	Conforms to ICAO signal.
 INSTALL DOWN LOCKS/ UNDERCARRIAGE PINS	With arms above head, the right hand clasps left forearm and the left fist is clenched.	Similar to the day signal except the right wand is placed against left forearm. The wand in the left hand is held vertical.	
 REMOVE DOWN LOCIS/ UNDERCARRIAGE PINS	With arms and hands in "INSTALL DOWN LOCKS" position, the right hand unclasps the left forearm.	Similar to day, except with wands.	
 CONNECT GROUND ELECTRICAL POWER SUPPLY/SINS	Hands above head, left fist partially clenched, right hand moved in direction of left hand with first two fingers (one finger for SINS) extended and inserted into circle made by fingers of the left hand.	**Same as day**, except with wands,	

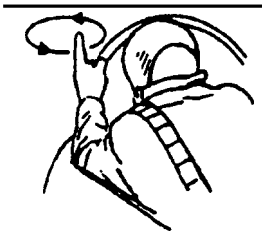
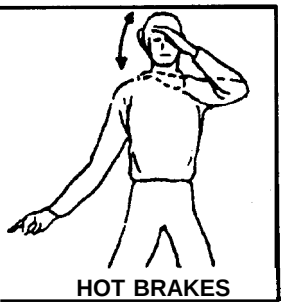
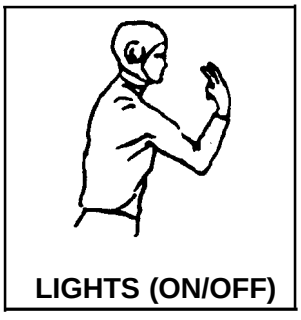
SIGNAL	DAY	NIGHT	REMARKS
 DISCONNECT GROUND ELECTRICAL POWER SUPPLY/SINS	Hands above head, left fist partially clenched, right hand moved away from left hand, withdrawing first two fingers (one finger for SINS) from circle made by fingers of the left hand.	Same as day, except with wands.	
 START ENGINE(S)	Left hand overhead with appropriate number of fingers extended, to indisate the number of the engine to be started, and circular motion of right hand at head level.	similar to day, except that the wand in the left hand will be flashed to indicate the engine to be started.	Conforms to ICAO signal.
 SLOW DOWN ENGINE(S) ON INDICATED SIDE	Arms down with palms toward ground, then either right or left arm waved up and down indicating that left or right side engines respectively should be slowed down.	Same as day, except with wands.	Conforms to ICAO signal.
 CUT ENGINE(S)	Either arm and hand level with shoulder, hand moving across throat, palm downward. The hand is moved sideways with the arm remaining bent.	Same as day, except with wands	Conforms to ICAO signal.

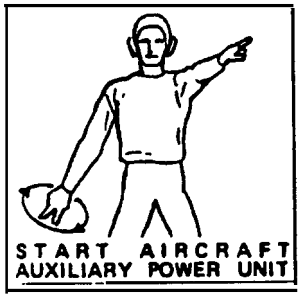
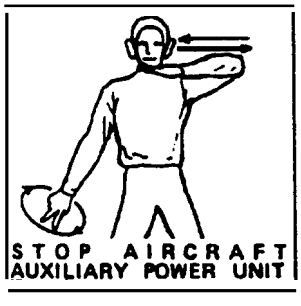
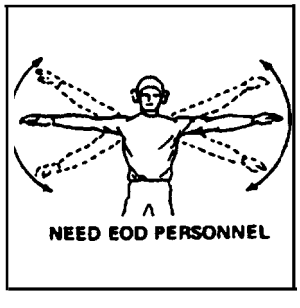
SIGNAL	DAY	NIGHT	REMARKS
 LOCK TAIL WHEEL	Hands together overhead, opened from the wrists in a "V", then closed suddenly.	**Same as day,** except with wands.	
 UNLOCK TAIL WHEEL	Hands overhead, palms together, then hands opened from the wrists to form a "V", wrists remaining together.	Same as day, except with wands.	
 FOLD WINGS/HELI-COPTER BLADES	Arms straight out at sides, then swept forward and hugged around shoulders.	**Same as day,** except with wands.	
 SPREAD WINGS/HELI-CDPTER BLADES	Arms hugged around shoulders, then swept straight out to the sides.	Same as day, except with wands.	

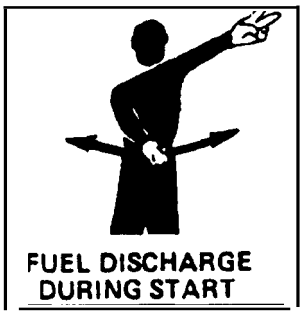
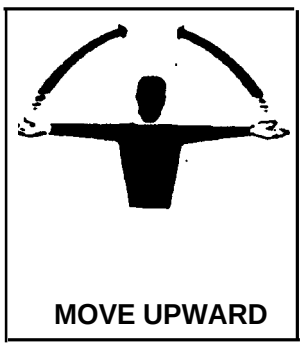
SIGNAL	DAY	NIGHT	REMARKS
 LOCK WINGS/HELI-COPTER BLADES	Hit right elbow with palm of left hand.	Same as day, except with wands.	
 OPEN WEAPON BAY(S) DOOR(S)	Body bent forward at the waist, hands held with fingertips touching in front of body and elbows bent at approximately 45 degrees then arms swing downward and outward.	Same as day, except with wands.	
 CLOSE WEAPON BAY(S) DOOR(S)	Body bent forward at the waist and arms extended horizontally, the arms swing downward and in until fingertips touch in front of the body with elbows bent at approximately 45 degrees	Same as day, except with wands.	
 TAKEOFF	Director conceals left hand and makes circular motion of right hand over head in horizontal plane ending in a throwing motion of arm towards direction Of takeoff.	Same as day, except with wands	

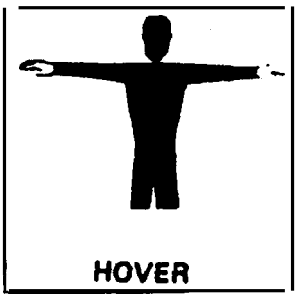
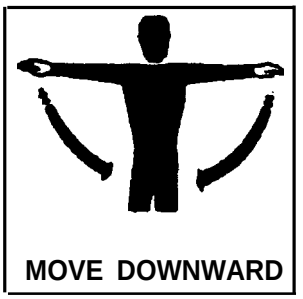
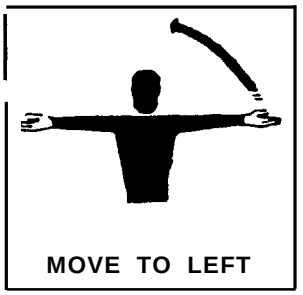
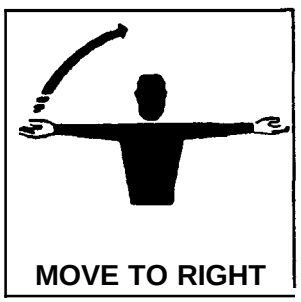
SIGNAL	DAY	NIGHT	REMARKS
 ENGINE FIRE	Describes a large figure eight with one hand and points to fire area with the other hand.	**Same as day**, except with wands.	Signal is meant for information only. Pilot should be given a "CUT ENGINE" or continuous "TURNUP" signal, as appropriate.
 ENGAGE NOSE GEAR STEERING	Point to nose with index finger while indicating direction of turn with other index finger.	**Same as day**, except with wands.	
 DISENGAGE NOSE GEAR STEERING	Point to nose with index finger, lateral wave with open palm of other hand at shoulder height.	**Same as day**, except with wands.	
 TILLER BAR/STEERING ARM IN PLACE	Hold nose with left hand, right hand moving horizontally at waist level. a. Affirmative signal immediately following means: MAN IS TENDING BAR. b. A negative signal immediately following means: NO ONE TENDING BAR.	**Same as day**, except with wands.	

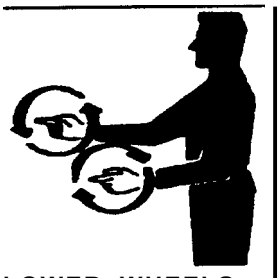
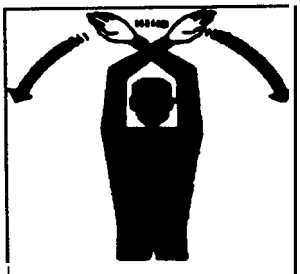
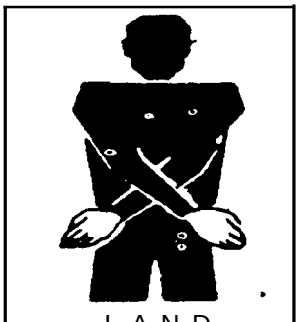
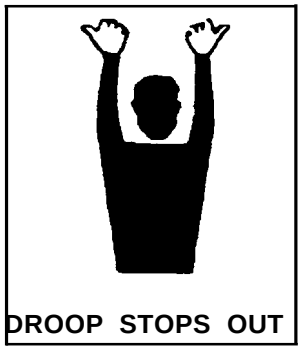
SIGNAL	DAY	NIGHT	REMARKS
 REMOVE CHOCKS AND/OR TIEDOWNS (pilot}	Swings arms apart, thumbs extended outward.	Using hand held Light or Flashlight, gives on/off signals at one second intervals.	
 REMOVE TII;DOONS (director)	To tiedown crew: Makes wiping notion down left arm with right hand.	**Same as day**, except with wands.	
 INSERT CHOCKS AND/OR INSTALL TIEDOWNS (pilot)	Swings arms together, thumbs extended inward. In single piloted aircraft, pilot may swing one arm alternately from each side, thumb extended inward.	Moves hand held light or flashlight at eye level in a horizontal plane alternately inward from each side.	
 JSTALL TIEDOWNS [director)	TO tiedown crew: Rotates hands in a circle perpen- dicular to and in front of his body.	**Same as day**, except with wands.	

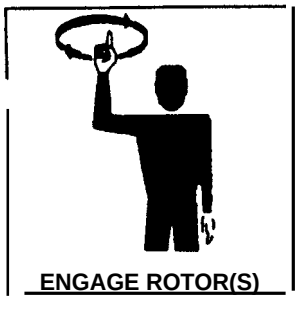
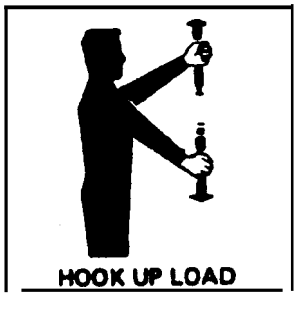
SIGNAL	DAY	NIGHT	REMARKS
 IEDOWNS IN PLACE (director)	Same signal as "INSTALL TIEDOWN " , followed by "thumbs Up" .	Same as day, except with wands.	
 ENGINE RUN UP (pilot)	Moves forefinger in a circular notion in view of director to indicate that he is ready to run up engines.	MMakes circular motion with hand held light.	Director responds with same signal (wand at night) to indicate "clear to run up".
 HOT BRAKES	Makes rapid fanning motion with one hand in front of face and points to wheel with other hand.	**Same as day,** except with wands.	
 LIGHTS (ON/OFF)	Points to eyes with two fingers to signal "lights on".	Flashing wands.	When lights are already on, same signal is used to signal "lights off".

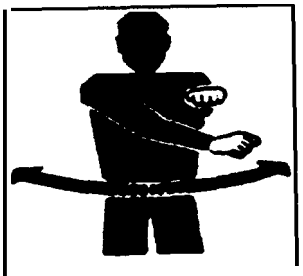
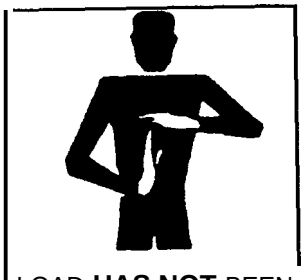
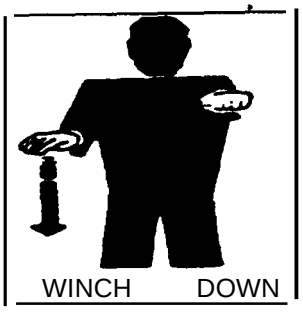
SIGNAL	DAY	NIGHT	REMARKS
	HHold one hand open, motionless and high above head, with palm forward.	SSame as day, except with wand.	
	points to power unit exhaust with left hand index finger; moves right hand in horizontal circle, index and middle finger pointing downward.	Same as day, except with wands.	
	Makes “throat cutting” action with left hand; moves right hand in horizontal circle, index and middle fingers pointing downward.	Sme as day, except with wands.	
	Extend arms sideways from body and parallel to deck; then move them up and down.	Same as day, except with wands.	

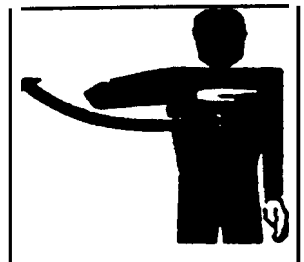
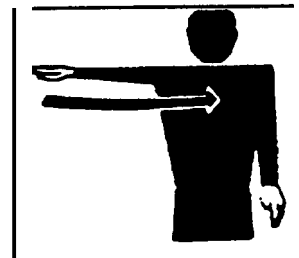
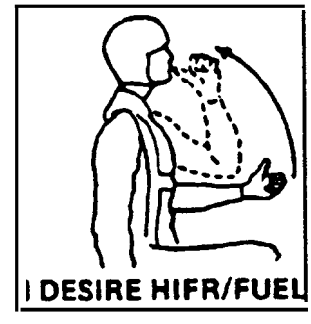
SIGNAL	DAY	NIGHT	REMARKS
 FUEL DISCHARGE DURING START	Left arm raised above shoulder with number of fingers extended to indicate affected engine; right hand describes pendulum motion between waist and knees.	Similar to day signal except that wand in left hand Will be flashed to indicate the number of the affected engine.	Signal is for information only; pilot should be given "CUT ENGINE" or continuous "TURNUP" signal as appropriate.
 LANDING DIRECTION	Marshaler stands with arms raised vertically above head and facing toward the point where the aircraft is to land. The arms are lowered repeatedly from a vertical to a horizontal position, stopping finally in the horizontal position.	Same as day, except with wands.	
 MOVE UPWARD	Arms extended horizontally sideways beckoning upwards, with palms turned up. Speed of movement indicates rate of ascent.	Same as day, except with wands.	Conforms to ICAO signal.

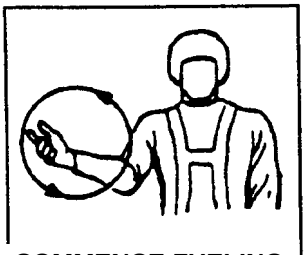
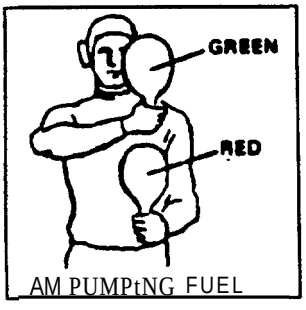
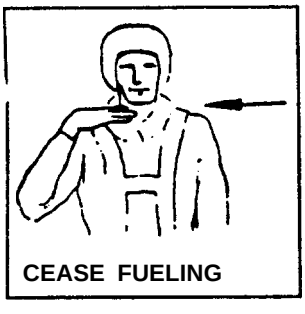
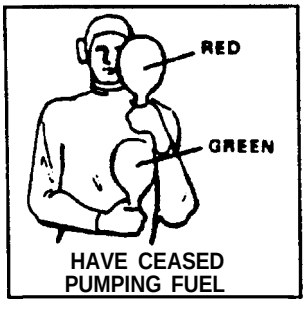
SIGNAL	DAY	NIGHT	REMARKS
 HOVER	Arms extended horizontally sideways, palms downward.	Same as day, except with wands.	Conforms to ICAO signal.
 MOVE DOWNWARD	Arms extended horizontally sideways beckoning downwards, with palms turned down. Speed of movement indicates rate of descent.	Same as day, except with wands.	Conforms to ICAO signal.
 MOVE TO LEFT	Right arm extended horizontally sideways in direction of movement and other arm swung over the head in same direction, in a repeating movement.	Same as day, except with wands.	
 MOVE TO RIGHT	Left arm extended horizontally sideways in direction of movement and other arm swung over the head in same direction, in a repeating movement.	Same as day, except with wands.	

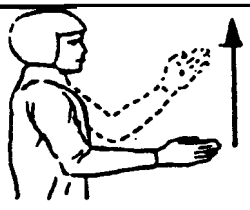
SIGNAL	DAY	NIGHT	REMARKS
 LOWER WHEELS	When aircraft approaches director with landing gear retracted, marshaler gives signal by side view of a cranking circular motion of the hands.	same as day, except with wands.	
 WAVE OFF	Waving of arms over the head.	Same as day, except with wands.	
 LAND	Arms crossed and extended downwards in front of the body.	Same as day, except with wands.	Conforms to ICAO signal.
 DROOP STOPS OUT	When rotor starts to "run down" marshaler stands with both hands raised above head, fists closed, thumbs pointing out.	Same as day, except with wands.	

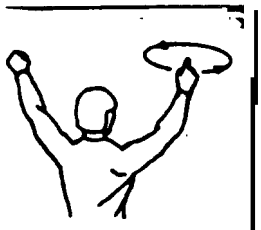
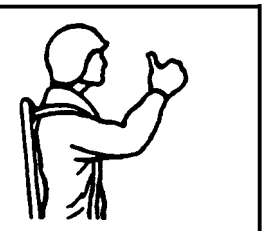
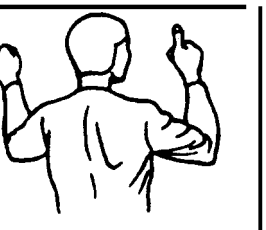
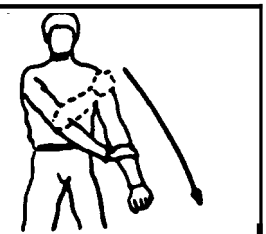
SIGNAL	DAY	NIGHT	REMARKS
 DROOP STOPS IN	When droop stops go in, marshaler turns thumbs inward.	Same as day, except with wands.	
 REMOVE BLADE TIEDOWNS	Left hand above head, right hand pointing to individual boots for removal.	Same as day, except with wands.	
 ENGAGE ROTOR(S)	Circular motion in horizontal plane with right hand above head.	Same as day, except with wands.	
 HOOK UP LOAD	Rope climbing notion with hands.	Same as day, except with wands.	

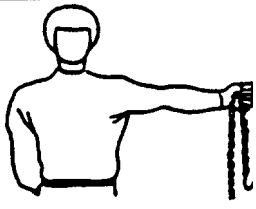
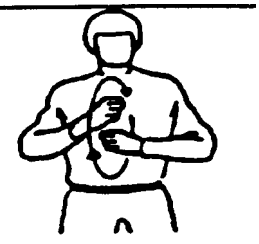
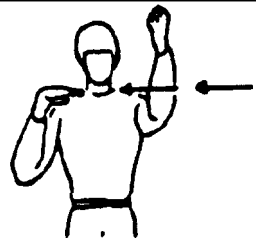
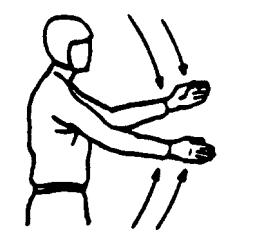
SIGNAL	DAY	NIGHT	REMARKS
 RELEASE LOAD	Left arm extended forward horizontally, fist clenched, right hand making horizontal slicing movement below the left fist, palm fownward.	Same as day, except with wands.	
 LOAD **HAS NOT** BEEN	Bend left arm horizontally across chest with fist clenched, palm downward; open right hand pointed up vertically to center of left fist .	**Same as day,** except with wands.	
 WINCH UP	Left arm horizontal in front of body, fist clenched, right hand with palm turned upwards making upward motion.	Same as **day,** except with wands.	
 WINCH DOWN	Left arm horizontal in front of body, fist clenched, right hand with palm turned downwards making downward motion.	**Same as day,** except with wands	

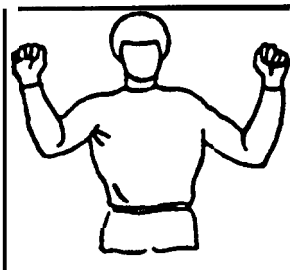
SIGNAL	DAY	NIGHT	REMARKS
 CUT CABLE	signal similar o "RELEASE LOAD" except that the right hand has the palm downward and not clenched. RRapid repetition of right hand movement indicates urgency.	**Same as day,** except with wands.	
 SREAD PYLON	BBend elbow across chest, palm downward. Extend arm outward to horizontal position, keeping palm open and facing down.	**Same as day,** except with wands.	
 FOLD PYLON	EExtend right arm horizontally, pain downward. Bend rm keeping palm down.	Same as day, except with wands.	
 I DESIRE HIFR/FUEL	Helicopter crewmember brings thumb to mouth as if drinking from a glass.	Same as day, except use RED lens flashlight.	

SIGNAL	DAY	NIGHT	REMARKS
 COMMENCE FUELING	Helicopter Crewmember makes Circular motion With right hand.	Helicopter crewmember makes circular motion with RED lens Flashlight.	
 AM PUMPtNG FUEL	Ship's fuel crew-member holds GREEN device vertically over RED device.	Ship's fuel crew-member holds GREEN wand vertically over RED wand.	
 CEASE FUELING	Helicopter rewmember makes Horizontal cutting motion of right hand across throat.	Helicopter crew-member makes horizontal motion with RED lens flashlight.	
 HAVE CEASED PUMPING FUEL	Ship's fuel crew-member holds RED device over GREEN device.	Ship's fuel crewmember holds RED wand vertically over GREEN wand.	

SIGNAL	DAY	NIGHT	REMARKS
 DESIRE TO MOVE OVER DECK AND RETURN HOSE	Helicopter crew-member makes vertical motion of hand.	HHelicopter crew-member makes vertical motion with RED lens flashlight.	
 EXECUTE EMERGENCY **BREAKAWAY**	LSE/Director makes "WAVE OFF" signal.	LSE/Director makes "WAVE OFF" signal with wands.	signal is mandatory.
 **READY To** START **ENGINE** **(pilot)**	Moves hand in a circle perpen-dicular to the deck; follows with a "thumbs up" signal. Signify by number of fingers engine to be started.	Turns on flash-light or movable light and moves it in a circle perpendicular to the deck.	The air officer shall signal authority to start engines by illumi-nating a RED rotating beacon.
 **R** READY TO ENGAGE ROTORS (pilot)	Moves hand in horizontal circle at eye level, index finger extended. Aircraft lights "flashing bright"	Same as day except holds RED light in hand. Aircraft Lights 'flashing dim".	At night, aircraft lights should be on "flashing dim" until aircraft is declared up and ready for takeoff by the pilot.

SIGNAL	DAY	NIGHT	REMARKS
 READY TO ENGAGE ROTORS (LSE)	Faces Pri-Fly: Holds left fist above head; gives circular motion of right hand above head, index finger extended.	Rotates one wand at chest level; holds other wand above head.	The air officer shall signal authority to engage rotors by illuminating a YELLOW rotating beacon.
 READY FOR TAKEOFF (pilot)	Gives "thumbs up" signal at eye level. Aircraft lights "steady bright".	Places running and formation lights on "steady dim". May give "thumbs up" signal by turning on flash-light or other moveable lights and moving it up and down.	
 READY FOR TAKEOFF (LSE)	Faces Pri-Fly: Holds right thumb up at eye level; holds left fist at eye level.	Signal not required. Pilot's "steady dim" indicates readi-ness to Pri-Fly.	The air officer shall signal authority for launch of helicopters by illuminating a GREEN rotating beacon.
 REMOVE TIEDOWNS (LSE)	To tiedown crew: Makes wiping motion down left arm with right hand.	Same as day, except holds AMBER wands.	

SIGNAL	DAY	NIGHT	REMARKS
 ITEDOWNS REMOVED (deck crew)	Stands in full view of pilot and LSE and holds tiedown and chocks extended to side.	**Same as day,** except illuminates tiedown with AMBER flashlight.	
 INSTALL TIEDOWNS	To tiedown crew: Rotates hands in a circle perpendicular to and in front of his body.	Same **as day,** sxcept with AMBER wands.	Give “HOLD" signal as soon as first tiedown is attached.
 DISENGAGE ROTORS (LSE)	Holds left fist above head; makes throat cutting action with right hand.	Same as day, except with AMBER wands.	Give “HOLD” signal as soon as first tiedown is attached. The air officer shall signal authority to disengage rotors by illuminating a YELLOW rotating beacon.
 HOOK NOT DOWN/UP	Arms extended, makes short up and down chopping action, alternating hands.	Same as day, except with AMBER wands.	

SIGNAL	DAY	NIGHT	REMARKS
Same as turn left/right signal	Use standard Fixed-wing aircraft turn signal, pointing with hand to wheel to be pivoted and giving 'come-on" with other hand.	Same as day, except with AMBER wands.	
 HOLD POSITION	Makes clenched fists at eye Level.	hold crossed wands (any color) overhead.	Signal is mandatory.

SIGNAL	FROM	TO	EXECUTION
TILLER BAR IN PLACE 	Director	ilot	›ay: Touch end of nose with forefinger. Then, give "thumbs up" signal with same hand. Night: Touch end of nose with wand. Then, give "up" signal with same wand.
TILLER BAR REMOVED 	Director	ilot	Day: Touch end of nose with forefinger. Then, sweep arm downward in direction of aircraft movement. Night: Touch end of nose with wand. Then, sweep wand downward in direction of aircraft movement.
WING RIDER 	Director	›eck Crew, ›ilot	Day: Position forearms flat against each other in front of and perpendicular to body. Night: Same as day, except with wands.

REFUELING SIGNALS

1. TOP OFF



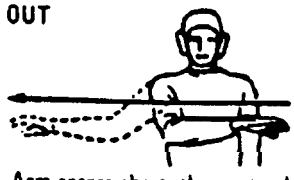
Pat top of head.

2. FUEL STATUS



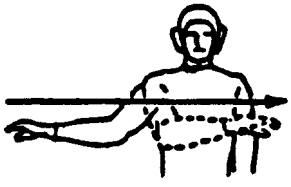
Movment of thumb to mouth for requesting fuel on board.

3. PROBE OUT



Arm across chest, then extend out horizontally.

4. PROBE IN



Arm extendcd out horizorrteJly, then brought in to cross chest.

5. CLOSE DUMP VALVE



Point finger at elbow.

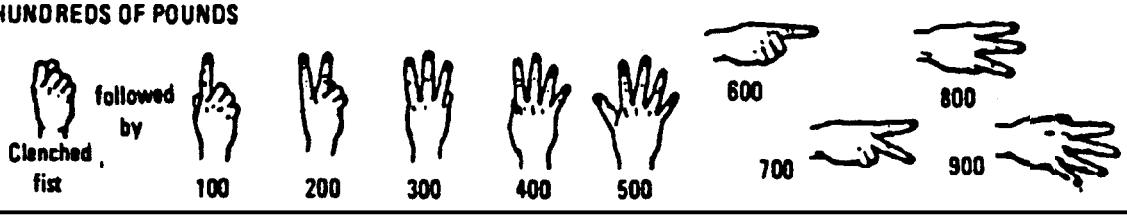
6. CUT FUEL



Fingers point at throat, moving hand sideways.

FUEL QUANTITY SIGNALS

FOR HUNDREDS OF POUNDS



FOR EVEN THOUSANDS OF POUNDS

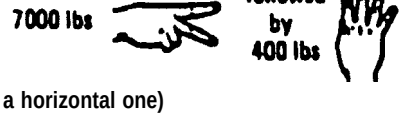


FOR LOADS THAT 0F NOT FALL ON EVEN THOUSANDSOF POUNDS

Example 1500 lbs



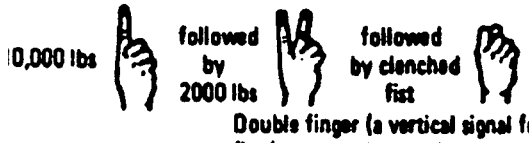
Example: 7400 lbs



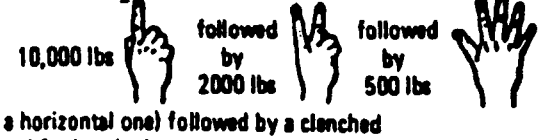
Double finger (s verticle signal follow by a horizontal one)

FOR LOADS OF TEN THOUSANDS OF POUNDS AND OVER

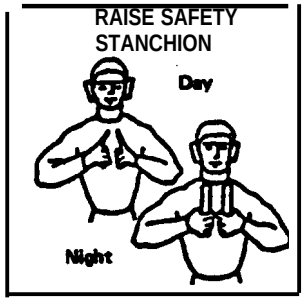
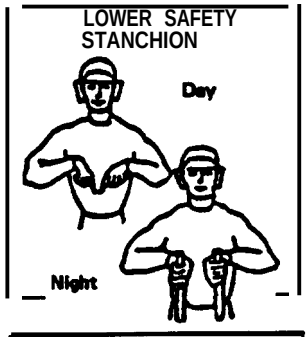
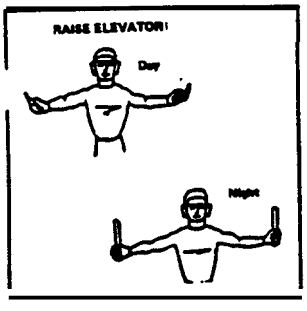
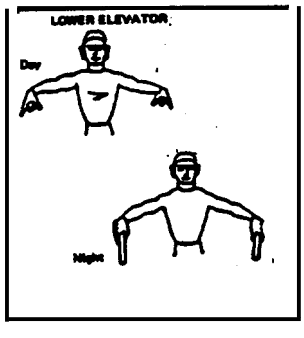
Example: 12OOO lbs

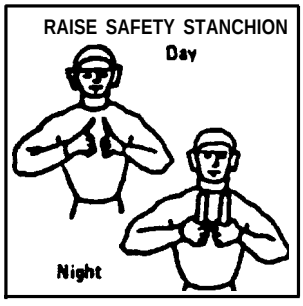
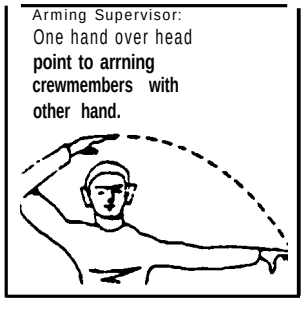
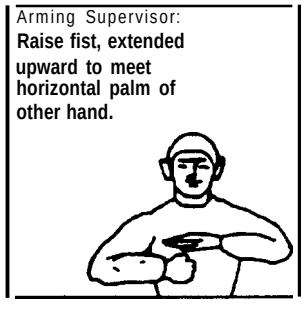


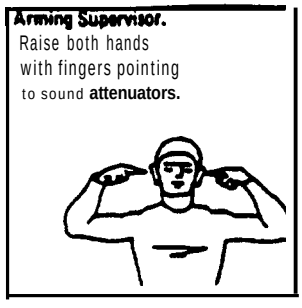
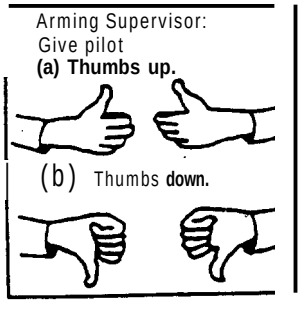
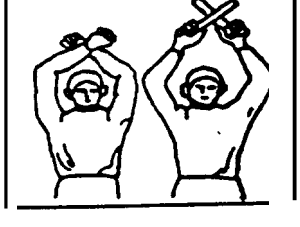
Example 12,500 lbs

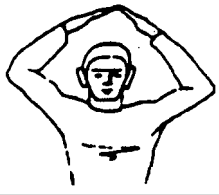


Double finger (a vertical signal followed by a horizontal one) followed by a clenched fist for exact thousands, or a third finger signal for hundreds.

SIGNAL	FROM	TO	EXECUTION
	Elevator afety etty fficer/ Director	Elevator Operator	Day: Raise both index fingers extended upward chest level, in close together, near body. Night: Raise both wands pointed upward at shoulder level, close together, and near body.
	Elevator afety etty fficer/ irector	elevator Operator	Day: Lower both index fingers, extended downward, chest level, close together, and near body. light: Lower both wands pointed downward at waist level, in close together, and near **body.**
	levator afety etty fficer/ irector	Elevator Operator	**Day:** Fully extend both arms with index finger pointing upward. Night: Fully extend both arms with wands pointing upward.
	Elevator Safety Petty Officer/ Director	Elevator Operator	**Day:** Fully extend both arms with index finger pointing downward. Night: Fully extend both arms with **wands** pointing downward.

SIGNAL		MEANING	RESPONSE
DAY	NIGHT		
	RED banded wands overhead with tips touching.	pilot/Copilot/NFO: Check all armament switches OFF or SAFE.	Pilot/Copilot/NFO: Raise both hands into view of arming supervisor after checking switch positions. (Hands remain in view during check and hookup) .
	Same as day but with RED banded wands.	Arming Crew: Perform stray voltage checks.	Arming Crew: Give "thumbs up" to arming supervisor if no stray voltage exists. “Thumbs down” indicates stray voltage problems. Night: Vertical sweep with flash-light indicates no stray voltage. Horizontal sweep indicates stray voltage.
	Form a tee with RED banded wands.	Arming Crew: Arm weapons (as applicable) .	Arming Crew: Give arming supervisor “thumbs up” when arming completed and clear immediate area. “Thumbs down” if malfunction exists. Night: Vertical sweep with flash-light indicates arming completed. Horizontal sweep indicates malfunction.

SIGNAL DAY	SIGNAL NIGHT	MEANING	RESPONSE
 Arming Supervisor. Raise both hands with fingers pointing to sound attenuators.	Same as day. Tips of RED banded wands touching sound attenuators.	Arming Crew: erform missile heck.	Pilot: Give arming supervisor "thumbs up" if tone is heard. 'Thumbs down" if no tone. NNight: Same as signal 3 above.
 Arming Supervisor: I nsert finger of one hand into clenched fist of othe hand and give extracting motion.	ouch tips of RED banded wands in rent of body. hen move one wane laterally in a weeping motion.	Arming Crew: Remove bomb rack/ pylon safety pins.	Arming Crew: shows pins to arming supervisor and clear immediate area. light: Same as signal 3 above.
 Arming Supervisor: Give pilot (a) Thumbs up. (b) Thumbs down.	(a) Vertical sweep with RED banded wand. (b) Horizontal sweep with RED banded wand.	pilot: (a) Aircraft armed and all personnel and equipment clear. (b) Aircraft down for weapons.	Pilot: (a) Acknowledge with similar signal. (b) Acknowledge with similar signal.
 Arming Superviser/Observer: Crossed arms overhead. fists Clenched.	CRossed standard RED wands held overhead.	Suspend all arming/safety operations on aircraft.	Suspend arming and await further instructions.

SIGNAL	DAY	NIGHT	REMARKS
Saling Supervisor: Hands Over head with finger tips touching. 	RED banded wands overhead with tips touching.	Pilot /Copilot /NFO: Check all armament switches OFF or SAFE.	Pilot/Copilot/NFO: Raise both hands into view of safing supervisor after checking switch position. (Hands remain in view during safing.)

APPENDIX G

TECHNICAL PUBLICATIONS AND INSTRUCTIONS LIST

1. International Publication. NATO-APP 2C, "Helicopter Operations From Ships Other Than Aircraft Carriers (HOSTAC)."

2. US Publications

a. Joint Pub 0-2, "Unified Action Armed Forces (UNAAF)."

b. Joint Pub 1-02, "DOD Dictionary of Military and Associated Terms."

c. Joint Pub 3-0, "Doctrine for Unified and Joint Operations."

d. Joint Pub 3-04, "Doctrine for Joint Maritime Operations (Air)."

e. Joint Pub 3-50, "National Search and Rescue Manual Volume I: National Search and Rescue System."

f. Joint Pub 3-05.1, "National Search and Rescue Manual Volume II: Planning Handbook."

g. Naval Warfare Publication 42 (series), "Shipboard Helicopter Operations Procedures."

h. NAVAIR 00-80T-105, "CV Naval Training and Operating Procedures."

i. NAVAIR 00-80T-106, "LHA/LPH/LHD Naval Training and Operating Procedures."

j. NAVAIR NA-00-80R-14, "Aircraft Firefighting & Rescue Manual."

k. NAWCAD ENG-7576, "Shipboard Aviation Facilities Resume."

l. NAVSEA S9086-XG-STM-000, "Naval Ships Technical Manual, Chapter-700."

m. NAVSEA S9522-AA-HBK-010, "Instruction Book Magazine Sprinkler System."

n. NAVSEA OP-4, "Ammunition Afloat."

o. NAVSEA OP-1014, "Ordnance Safety Precautions."

p. NAVSEA OP-2165 Volumes 1 & 2, "Navy Transportation Safety Handbook."

q. NAVSEA OP-2212 SW060-AA-MMA-010, "Demolition Material."

r. NAVSEA SW050-AB-MMA-010, "Pyrotechnic Screening and Marking Devices."

s. NAVSEA OP-2238, "Identification of Ammunition."

t. NA 11-15-8/NAVSEA SW050-AC-ORD-010, "Toxic Hazard Associated with Pyrotechnic Devices."

u. NAVSEA OP-3347, "US Navy Ordnance Safety Precautions."

v. NAVAIR 11-1-116B/TWO010-AA-ORD-030, "Naval Ammunition Logistic Codes (NALC)."

w. NAVAIR 11-1F-2, "Fuze Manual, Airborne Bomb and Rocket, Description and Characteristics."

x. NAVAIR 11-75A-61, "2.75 Inch Airborne Rocket Launchers (LAU-61, 68 series)."

y. NAVAIR 11-85-5, "Airborne Rockets."

z. NAVAIR 11-120A-1.1/1.2, "Airborne Weapons Packaging, Handling and Stowage."

aa. NAVAIR 16-1-529, "Radiation Hazards."

bb. NAVAIR 19-15BC-12, "AERO-12C, Bomb Skid."

cc. NAVAIR 19-600-96-6-4, "Calendar Maintenance Requirement Cards Bomb Skid, AERO-12B/C."

dd. NAVAIR 19-95-1, "Airborne Weapons/Stores Manual Checklist, Transportation and Loading Equipment Configuration."

ee. AW-820YB-MIB-000, "HELLFIRE Missile, Fleet Missile Maintenance."

ff. TM 9-1425-429-12, "STINGER Missile; Operational Organizational Maintenance Manual."

gg. TM 9-1005-213-25, ".50 Caliber Machine Gun."

3. Instructions

a. COMDTINST M3710.2 (series), "USCG Shipboard Helicopter Operational Procedures Manual."

b. OPNAVINST 3120.32 (series), "Standard Organization and Regulations of the US Navy."

c. OPNAVINST 5100.19 (series), "Navy Safety Precautions for Forces Afloat."

d. OPNAVINST 5102.1 (series), "Mishap Investigation and Reporting."

e. OPNAVINST 5530.1 (series), "Department of the Navy Physical Security Instruction for Sensitive Conventional Arms, Ammunition and Explosives (AA&E)."

f. OPNAVINST 8600.2 (series), "Naval Airborne Weapons Maintenance Manual."

g. NAVSEAINST 8020.6 (series), "Weapon System Explosive Safety Review Program."

h. CFR46 Code of Federal Regulations 146.29, "Detailed Regulations Governing the Transportation of Military Explosives and Hazardous Munitions Onboard Vessels."

i. SPCCINST 8010.12, "Supply Management of Ammunition; Policy, Procedures and Responsibilities."

j. COMNAVSURFLANTINST 8023.4/COMNAVSURFPACINST 8023.5, "Non-Nuclear Ordnance/Explosive Handling Qualification and Certification Program."

k. COMNAVSURFLANTINST 9093.3, "Commander Naval Surface Force, US Atlantic Fleet Combat System Officers Manual."

l. Naval Safety Center Instruction 8020.1, "Ship/Submarine Explosives Safety Surveys and Checklist."

4. Bills. Ship's Bills are specific to individual ships and held onboard by each ship.

a. Ship's EMCON Bill.

b. Ship's HERO Bill.

c. Ship's HERO Survey.

d. Ship's Fire Bill.

e. (Helicopter) Flight Quarters Bill

f. General Quarters Bill

g. Ship's Helicopter Certification

APPENDIX H

ARMY / AIR FORCE DECK LANDING OPERATIONS

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE DEPARTMENT OF THE NAVY

AND

THE DEPARTMENTS OF THE ARMY AND AIR FORCE

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE DEPARTMENT OF THE NAVY

AND

THE DEPARTMENTS OF THE ARMY

AND

THE AIR FORCE

Subj: DECK LANDING OPERATIONS FOR U.S. ARMY AND U.S. AIR FORCE HELICOPTER PILOTS

PURPOSE

1. To provide Department of the Navy, Department of the Army, and Department of the Air Force policy and procedures for Army and Air Force helicopter deck landing training and operations.

BACKGROUND

2. The Departments of the Army and the Air Force receive deck landing/training services in support of specific USA/USAF helicopter operations on U.S. Navy ships. Support for a broader spectrum of joint operations and contingency plans may require joint training programs and Interservice Support Agreements.

DISCUSSION

3. Lessons learned from joint operations have shown the need for, and numerous contingency plans require, non-USN/USMC helicopters to operate from USN ships for Combat Search and Rescue (CSAR), combat support operations, medical evacuation (MEDEVAC), personnel transfer, and logistic support.

4. While there is no intent to provide deck landing training for all USA and USAF helicopter pilots who may be required to conduct operations on USN ships, this agreement approves developing a combined training program to qualify selected USA and USAF helicopter pilots for certain contingencies.

GENERAL PROVISIONS

5. ISAs and implementing procedures promulgated in a Letter of Instruction shall be provided by appropriate Naval, Army, and Air Force commands within the guidelines contained in the following attachments.

a. General - Attachment 1.

b. Initial qualification and currency requirements - Attachment 2.

c. Aircrew Requirements - Attachment 3.

d. Ship certification and waiver - Attachment 4.

e. Forecasting and scheduling - Attachment 5.

f. Cost responsibility - Attachment 6.

g. References - Attachment 7.

h. Glossary - Attachment 8.

i. Sample letter of instruction - Attachment 9.

6. Waivers and exceptions to the provisions outlined within this MOU will be handled on a case by case basis between USN (OP-593) and USA (DAMO-TRS) or USAF (XOOTA). Requests for waivers or exceptions should be routed through appropriate service command channels for action.

7. This MOU shall remain in effect until amended by mutual written agreement between the Department of the Navy, the Department of the Army and the Department of the Air Force or until terminated in writing by the Department of the Navy, the Department of the Army, or the Department of the Air Force.

Department of the Navy	Department of the Army
[signature]	[signature]
R.P. ILG, RADM, USN	LARRY G. LEHOWICZ
Assistant Deputy Chief of	Brigadier General, GS
Naval Operations (Air Warfare)	Director of Training
Date 18 JULY 1988	Date 19 JULY 1988

GENERAL

1. All aviation operations shall be fully coordinated with each ship during a presail conference. Direct liaison is authorized (DIRLAUTH) between the ship scheduled to provide deck services, and the participating U.S. Army or U.S. Air Force aviation unit.

2. Operations will be covered by an LOI published by the applicable U.S. Navy type commander, and must be conducted IAW this MOU, the LOI and references d thru j.

INITIAL QUALIFICATION AND CURRENCY REQUIREMENTS

1. Single/dual (herein after referred to as single) spot ships:

a. Initial day qualification consists of:

(1) Flight training conducted by either a USA/USAF Deck Landing Qualification (DLQ) Instructor Pilot (IP) or a USN Helicopter Aircraft Commander (HAC) who is current on single-spot decks.

(2) Ground School training per Attachment 3, para 4.

(3) Six field deck landings prior to six single-spot shipboard landings, all within a ten consecutive day period.

b. Currency requirements: Four single-spot shipboard landings within 90 days.

(1) Pilots whose currency has lapsed, but have made four single-spot landings within the last 180 days, shall:

(a) Undergo training conducted by either a current DLQ Pilot-in-Command (PC) or DLQ IP.

(b) Perform four field deck landings prior to six shipboard landings, all within a ten consecutive day period.

(2) Pilots whose currency has lapsed and have not made 4 single-spot landings within the last 181 days shall undergo initial qualification training.

c. Night single-spot helicopter operations require significantly more training and specialized equipment than day operations and may not be conducted except for life-threatening emergencies or operational necessity. Requests for this type of training will not normally be approved. Exceptions will be handled on a case basis by USN (OP-593) and USA (DAMO-TRS), or USAF (XOOTA).

2. Multi-spot ships (LPH/LHA/LHD):

a. Initial day qualification consists of:

(1) Flight training conducted by a USA/USAF IP or unit Trainer (UT) who is day current or a current USN HAC.

(2) Ground School training per Attachment 3, para 5.

(3) Five day-field deck landings prior to five day-shipboard landings, all within a ten consecutive day period.

b. Day currency requirements: Four shipboard landings within the preceding nine months. Pilots whose day currency has lapsed shall undergo initial day qualification; requalification shall be conducted by a USA IP, UT or PC. USAF requalification shall be conducted by a USAF IP.

c. Initial night qualification:

(1) The pilot shall be day-qualified and current.

(2) Ground School training per Attachment 3, para 4.

(3) Flight training shall be conducted by a night-current USA/USAF DLQ IP or USN HAC.

(4) Six night-field deck landings prior to six night-shipboard landings, all within a ten consecutive day period. Pilots must also comply with the 72 hour requirement of para 2d.

d. Night currency requirements: six night shipboard landings within the preceding 90 days are required to maintain currency. If more than 72 hours have elapsed since the last night shipboard landing, one day shipboard landing shall be performed within 24 hours prior to the next night shipboard landing.

3. Pilots qualified on single spot ships are qualified on multispot ships, but the reverse is not true.

4. Aircraft carriers (CV): Routine DLQ training and operations normally will not be conducted on CV class ships. Operations on CV class ships will be on a case basis and require a special ground brief by U.S. Navy personnel, or Army/Air Force personnel designated by the Navy to give the briefing. Pilots qualified and current on single and multi-spot ships shall be considered qualified and current on CV class ships.

5. Pilots performing Logistics-over-the-shore (LOTS) or vertical replenishment (VERTREP) operations that involve external loads without a shipboard landing shall be deck landing qualified and current. Pilots scheduled to participate in LOTS/VERTREP operations must receive a familiarization of the designated ship by U.S. Navy personnel or a previously familiarized U.S. Army IP/PC or U.S. Air Force IP/FE.

ATTACHMENT 2

1. U.S. Army:

a. Pilots shall be qualified and current IAW AR 95-1.

b. PC shall be deck landing qualified and current.

c. The pilot performing the deck landing shall be deck landing qualified and current, except when undergoing training.

2. U.S. Air Force

a. Pilots shall be qualified and current IAW AFR 60-1.

b. The aircraft commander shall be deck landing current and qualified.

3. USN DLQ Instructors:

a. Shall be a DLQ current Helicopter Aircraft Commander (HAC).

b. Shall be authorized by HQ DA (DAMO-TRS) or HQ USAF (XOOTA) to perform instructor pilot duties.

4. Ground School Training:

a. USA/USAF aircrews shall receive instruction to familiarize them with the mandatory operational procedures and training requirements for shipboard helicopter operations.

b. The Ground School course shall include but not be limited to:

(1) Landing Signals (Ref (k))

(2) Deck Markings (Refs (d) and (e))

(3) Emergency Procedures (Ref (e))

(4) Communications/NAVAIDS (Refs (d) and (e))

(5) Fuel/Maintenance support and Procedures (Ref (d))

(6) Landing Patterns/Approaches and Ship Control Zones (Refs (e), (f), and (g))

(7) VERTREP Procedure (if applicable) (Ref (e))

(8) Presail Conference Procedures/LOI

SHIP CERTIFICATION AND WAIVER

1. Waiver to conduct Army/Air Force helicopter operations is granted by Fleet Commanders, via Type Commanders (TYCOMs), on an individual basis.

2. Day VFR shipboard operations may be conducted by USA/USAF pilots on USN ships waivered for such operations.

3. Night VFR shipboard operations may be conducted by USA/USAF pilots on multi-spot ships waivered for such operations.

4. The Shipboard Aviation Facilities Resume (reference(d)) lists all USN ships (including CVs); describes and depicts aircraft landing, vertrep and hover facilities, flight deck marking, and lighting arrangements; and indicates US helicopters for which deck certification is granted.

ATTACHMENT 4

FORECASTING AND SCHEDULING

1. In order for the Navy to program for sufficient resources over the long term, estimates for annual training requirements will be provided to the Fleet Commanders by Headquarters, Department of the Army (DAMO-TRS) and Department of the Air Force (XOOTA) with copy to the Chief of Naval Operations (OP-593F).

2. Normal training requirements shall be submitted in time for inclusion in the Fleet Commanders' quarterly employment scheduling conference.

3. Unscheduled training requirements shall be handled on a case by case basis in accordance with procedures established by the Fleet CINC's.

ATTACHMENT 5

COST RESPONSIBILITY

1. The Navy shall schedule deck time to support USA/USAF DLQ training requirements. Demands for ship deck time beyond scheduled Fleet operations may require these ship services to be on a reimbursable basis.

2. The Army/Air Force shall provide the helicopters in which to conduct the training and will be responsible for helicopter operating costs.

3. Expenses for Navy personnel who are required to perform TAD/TDY in order to provide DLQ training for Army aviators/Air Force pilots under the auspices of this MOU, will be borne by the U.S. Army/U.S. Air Force. When such travel is required, funding data shall be provided in advance of orders.

ATTACHMENT 6

REFERENCES

a. Unified Action Armed Forces (JCS Pub No. 2), October 1974.

b. Department of Defense Directive 4000.19, "Basic Policies and Principles for Interservices, Interdepartmental and Interagency Support Manual," October 1974.

c. Department of Defense Manual 4000.19 "Defense Retail Interservices Support Manual," October 1974.

d. NAVAIRENGCEN Pub 7576, "Shipboard Aviation Facilities Resume" - Lists all aviation capable ships, deck markings, fuel navigation aids and support facilities for U.S. helicopters.

e. NWP-42, "Shipboard Helicopter Operating Procedures" - Standardizes ground, flight, and operating procedures for single/double deck ships.

f. NAVAIR 00-80T-106, "LHA/LPH NATOPS Manual" - Standardizes ground, flight and operating procedures for LHA/LPH ships.

g. NAVAIR 00-8OT-105, "CV NATOPS Manual Standardizes ground, flight and operating procedures for CV ships.

h. Army General Provisions and Flight Regulations (AR 95-1).

i. CNO Washington, DC 191736Z April 1981, Subj: Mixing Aviation Fuels.

j. Air Force Regulation 60-1, Flight Management, 28 May 1985.

k. NAVAIR 00-80T-113, "Aircraft Signals NATOPS Manuals" - Standard shipboard aircraft handling signals.

ATTACHMENT 7

GLOSSARY

Ship Certification - Certification of ships as categorized by "levels" and "classes" of required helicopter support facilities. The "level" identifies the environmental conditions under which the helicopter is authorized to operate and the "class" identifies the type of operations permitted and services available from the host ship.

waiver - Authority granted by appropriate commanders to conduct operations and/or training not routinely authorized.

Aircrew - Pilots and crew members required to operate a helicopter.

Deck Landing Qualification (DLQ) Instructor Pilot (IP), Unit Trainer (UT), Pilot-in-Command (PC) - An IP, UT, or PC qualified and current in deck landings and designated in writing by the Unit Commander for such operations.

Shall - Indicates a mandatory procedure.

Operational Necessity - This term applies to missions associated with war or peacetime operations in which the consequences of an action justify the risk of loss of aircraft and aircrew.

Vertical Replenishment (VERTREP)/Logistics Over The Shore (LOTS) - Missions involving the carrying of external loads/cargo to ships in which a landing is not anticipated.

Field Deck Landing - Practice shipboard landings performed at a shore facility with markings representative of a shipboard landing facility.

Deck Landing Qualifications - Landings performed on board ships for the purpose of qualifying pilots and aircrew for shipboard operations.

Pre-Sail Conference - Coordination meeting between host ship and operating unit for safety and operational planning.

Single/Dual-Spot Ships - Those certified ships having less than three adjacent landing areas.

Multi-Spot Ships - Those certified ships having three or more adjacent landing areas.

ATTACHMENT 8

SAMPLE LETTER OF INSTRUCTION

3120
Ser

From: Commander, Naval Surface Force, U.S._____ Fleet
To: Commanding Officer, USS
Commander,

Subj: LETTER OF INSTRUCTION (LOI)

Ref: (a) [CINC EMPLOYMENT SCHEDULE]
(b) [SURFACE TYCOM DIRECTION TO CONDUCT U.S. ARMY DLO's]
(c) MOU between the DON and DOA/DOAF
(d) CNO Washington, DC 191736Z Apr 83 NOTAL

Encl: (1) Presail Conference Checklist

1. Summary. This LOI describes the concept of operations and assigns responsibility for Commanding Officer, USS _____ and assigned detachment from [U.S. Army Command/U.S. Air Force MAJCOM] for Deck Landing Qualification (DLQ) training exercises. This LOI is effective for planning for day/VFR operations. Night or IFR operations are not authorized.

2. Mission. USS _____ will provide underway platform services in the conduct of DLQ training exercises (references (a) and (b) refer). Individual ship routine and exercises may be conducted consistent with attainment of DLQ training goals, safety, and operational security.

3. Concept of Operations. A detachment of helicopters from the U.S. Army/U.S. Air Force will conduct a series of DLQ training exercises consisting of day/VFR landings on the flight deck.

4. Command Relationships and Responsibilities:

a. COMNAVSURF _____ is the Officer-Scheduling-the-Exercise (OSE).

b. Commanding Officer, USS _____ is assigned Officer-in-Tactical-Command (OTC) for scheduled DLQ training exercises and will coordinate with area/shore commands for appropriate OPAREA clearances. The host ship can provide limited administrative, logistics, material, maintenance and repair support. The OTC will ensure a flight deck safety/indoctrination brief is provided to U.S. Army/U.S. Air Force aircrews prior to the scheduled operations.

c. Officer-in-Charge of the [U.S. Army helicopter detachment/U.S. Air Force unit] is assigned as the Officer-Conducting-the-Exercise (OCE) and is directed to conduct vigorous training exercises, pre-exercise training and planning, and to convene a presail briefing conference for major participants. The OCE will ensure prerequisites for shipboard helicopter operations are satisfied, will coordinate and supervise training exercises as they pertain to U.S. Army/U.S. Air Force helicopters and will conduct appropriate preflight briefs.

ATTACHMENT 9

Subj: LETTER OF INSTRUCTION (LOI)

5. Army/Air Force Helicopter Operations:

a. Shipboard Prerequisites for Helicopter Operations

(1) Army/Air Force training requirements and personnel qualifications to conduct deck landing operations (reference (c)) will be attained prior to actual helicopter DLQ training exercises.

(2) U.S. Army/U.S. Air Force helicopter detachment will initiate coordination for a presail conference approximately four weeks prior to actual operation. A Presail Conference Checklist is provided at enclosure (1).

(3) U.S. Army/U.S. Air Force helicopter detachment will provide an officer on board ship for liaison between the ship and helicopter aircrews during DLQs.

(4) Army/Air Force liaison officer will provide diagrams of pertinent aircraft depicting aircraft egress, fuel cell locations, tie down points, and desired wind envelopes for the HCO and crash/fire crew during the presail conference.

(5) Army/Air Force aircrew personnel will brief flight deck/fire party personnel on Army/Air Force helicopter orientation/safety requirements to include a walk through of the aircraft. Aircraft orientation can be conducted following the first landing per type aircraft during DLQ operations.

(6) The low flash point temperature of JP-4/Jet B fuel constitutes a severe fire hazard aboard ship. In addition, JP-4/JP-5 mixtures assume the characteristics of JP-4 even with very low percentages of JP-4. To minimize the JP-4 hazard aboard ship, one of the following procedures shall be followed prior to first shipboard operation (listed in order of desirability):

(a) Defuel aircraft completely and refuel with JP-5, or

(b) Burn down to minimum fuel and refuel with JP-5 at least five (5) times.

JP-8/Jet A may be substituted for JP-5 in above procedures for shipboard flight operations. However, JP-8/Jet A still reduces the flash point to a level unacceptable for hangaring. Therefore, aircraft shall not be hangared if JP-8/Jet A has been substituted. Fuels other than JP-5 shall not be defueled into ship fuel systems. In an emergency, such fuels must be discharged directly over the side. Reference (d) provides additional discussion of fuel hazards.

(7) Waiver authority to conduct U.S. Army/U.S. Air Force aircraft operations on U.S. Navy ships must be granted by [FLEET CINC]. [SURFACE TYPE COMMANDER] will initiate the waiver request and inform all units concerned.

ATTACHMENT 9

(8) Supported U.S. Army/U.S. Air Force units shall be familiar with pertinent U.S. Navy shipboard aviation manuals:

(a) NAEC-ENG-7576 (Shipboard Aviation Facilities Resume); shows deck markings/ship profile.

(b) Pertinent sections of NWP-42 series (Shipboard Helicopter Operating Procedures Manual): Launch/Recovery Procedures, Air Traffic Control, Aviation Fueling, General Helicopter Operations.

(9) Field deck landing requirements can be accomplished at Army/Air Force unit's home station if field deck markings are per Naval Air Engineering Center specifications (available from [SURFACE TYPE COMMANDER]). Use of U.S. Naval field deck landing facilities at NAS Norfolk, VA, NAS Mayport, FL, NALF Imperial Beach, CA or NAS Barbers Point, HI, may be requested. Ample lead time (3-4 weeks) is required to ensure reservation for use.

6. Administrative/Logistics. The OCE (U.S. Army detachment/U.S. Air Force Unit Officer-in-Charge) is responsible for coordinating and arranging shore based administrative and logistics Support. This support includes, but is not limited to, those suggested in item 22, enclosure (1).

7. Safety Reports. Actions to be taken in the event of aircraft mishap/incident will be per OPNAVINST 3750.6 (The Naval Aviation Safety Program). Initial message notification of aircraft mishap/incident will include as an information addressee, the [cognizant U.S. Army Headquarters: MESSAGE ADDRESS] or U.S. Air Force Headquarters; HQ USAF WASHINGTON DC //XOO//

ASSISTANT CHIEF OF STAFF
AVIATION

Copy to:
GROUP
SQUADRON
Participating Army/Air Force Unit(s)

ATTACHMENT 9

SHIPBOARD HELICOPTER OPERATIONS
PRESAIL CONFERENCE CHECKLIST

	UNIT:	POC:	AV PHONE:
AVIATION:	_____	_____	_____
SHIP:	_____	_____	_____

1. ESTABLISH: a. DLQ Date: _____

   b. Flight Schedule: _____

2. FIELD DECK LANDING QUAL RQMTS (Ref: ARMY/AIR FORCE/NAVY MOU) _____

3. DLQ CURRENCY RQMTS (Ref: ARMY/AIR FORCE/NAVY MOU) _____

4. TYPE AND NUMBER AIRCRAFT INVOLVED _____

5. # PILOTS NEEDING INITIAL QUAL/ CURRENCY (Ref: ARMY/AIR FORCE/ NAVY MOU)

6. SURFACE/AIR CLEARANCES (Ship Responsibility) _____

7. AVIATION FACILITY WAIVER (Type Commander (N8) Will Coordinate) _____

8. TRANSIENT A/C LOCAL OPS BRIEF (Base OPS Provides) _____

9. TACAN/RADIO FREQUENCIES _____

10. SHIP Overhead MSG (Containing OPS/COMM Info) _____

11. SAFETY/OPERATIONS BRIEF (Ship/NWP-42 _____

12. CRASH RESCUE PROCEDURES AND POST CRASH FIRE PROCEDURES _____

13. SEARCH AND RESCUE (SAR) _____

14. SHIPS GLIDE SLOPE INDICATOR (SGSI) (DIFFERENT FROM ARMY GSI) _____

15. ENGAGE/DISENGAGE ENVELOPES (Shipboard) _____

16. NO ROTOR BRAKES ON ARMY HELICOPTERS _____

17. TAKE OFF/RECOVERY ENVELOPES _____

18. BAD WEATHER PROCEDURES _____

19. FUEL REQUIREMENTS ON BOARD SHIPS _____

a. JP 5 Only _____

b. NATO D1 or Wiggins _____

20 FUEL REIMBURSEMENT (Standard Military Credit Card or DD Form 1348) _____

21 NAME OF ARMY/AIR FORCE LIAISON OFFICER (During Shipboard DLQ Period) _____

22. SHORE-BASED ADMINISTRATIVE/ LOGISTICS COORDINATOR _____

a. HELO RAMP PARKING* _____

b. FRESH WATER WASH _____

c. ACCOMMODATIONS

OFFICER _____

ENLISTED _____

d. MESS FACILITIES _____

e. LOCAL TRANSPORTATION _____

* Contact base Air Operations for transient parking and to obtain POC phone numbers for other logistic requirements.

NOTES:

COMNAVSURFLANT POC: N84 - COMM (804) 444-5340 or A/V 564-5340

COMNAVSURFPAC POC: N81 - COMM (619) 437-2393 or A/V 577-2393.

(INTENTIONALLY BLANK)

APPENDIX J

USERS EVALUATION REPORT ON JOINT PUB 3-04.1

1. Users in the field are highly encouraged to submit comments on this pub. Please fill out the following: Users' POC, unit address, and phone (DSN) number.

_____

_____

2. Content

a. Does the pub provide a conceptual framework for the topic?

_____

_____

b. Is the information provided accurate? What needs to be updated?

_____

_____

c. Is the information provided useful? If not, how can it be improved?

_____

_____

d. Is this pub consistent with other joint pubs?

_____

_____

e. Can this pub be better organized for the best understanding of the doctrine and/or JTTP? How?

_____

_____

3. Writing and Appearance

a. Where does the pub need some revision to make the writing clear and concise? What words would you use?

_____

_____

b. Are the charts and figures clear and understandable? How would you revise them?

_____

_____

4. Recommended urgent change(s) (if any).

_____

_____

5. Other

_____

_____

6. Please fold and mail comments to the Joint Doctrine Center (additional pages may be attached if desired) or FAX to DSN 564-3990 or COMM (804) 444-3990.

(FOLD)

FROM:

JOINT DOCTRINE CENTER
BLDG R-52,
1283 CV TOWWAY STE 100
NORFOLK, VA 23511-2491

(FOLD)

APPENDIX J

USERS EVALUATION REPORT
ON JOINT PUB 3-04.1

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_____
_____

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(FOLD)

FROM:

JOINT DOCTRINE CENTER
BLDG R-52,
1283 CV TOWWAY STE 100
NORFOLK, VA 23511-2491

(FOLD)

GLOSSARY

PART I--ABBREVIATIONS AND ACRONYMS

ADF	automatic direction finder
AEPS	Aircrew Escape Propulsion System
AFCS	Automatic Flight Control System
AFFF	aqueous film forming foam
AGL	above ground level
AIMD	aircraft intermediate maintenance department
AO	aviation ordnance person
AOCC	air operations control center
AOSS	aviation ordnance safety supervisor
APU	auxiliary power unit
ASC	Air Systems Command
ASE	automated stabilization equipment
ASW	anti-submarine warfare
ATA	airport traffic area
ATACO	air tactical actions control officer
ATC	air traffic control
AUX	auxiliary
AWCAP	airborne weapons corrective action program
AWSE	armament weapons support equipment
BIT	built-in test
BRC	base recovery course
CADS	cartridge actuated devices
CAIMS	Conventional Ammunition Integrated Management System
CATCC	carrier air traffic control center
CBU	cluster bomb unit
CCA	carrier-controlled approach
CDO	command duty officer
CG	guided missile cruiser
CGAS	Coast Guard air station
CIC	combat information center
CINCLANTFLT	Commander in Chief, Atlantic Fleet
CINCPACFLT	Commander in Chief, Pacific Fleet
CINCUSNAVEUR	Commander in Chief, US Naval Forces, Europe
CMC	Commandant of the Marine Corps
CNO	Chief of Naval Operations
CO	commanding officer
COCOM	Combatant Command (command authority)
COMDT COGARD	Commandant, US Coast Guard
COMDTINST	commandant instruction (Coast Guard)
COMLANTAREACOGARD	Commander, Coast Guard Atlantic Area

COMNAVAIRLANT	Commander, Naval Air Force, Atlantic
COMNAVAIRPAC	Commander, Naval Air Force, Pacific
COMNAVSEASYSCOM	Commander, Naval Sea Systems Command
COMNAVSURFLANT	Commander, Naval Surface Force, US Atlantic Fleet
COMNAVSURFPAC	Commander, Naval Surface Force, US Pacific Fleet
COMPACAREACOGARD	Commander, Coast Guard Pacific Area
CRIF	cargo routing information file
CV	aircraft carrier
CVN	aircraft carrier, nuclear
DDG	guided missile destroyer
DF	direction finder
DLQ	deck landing qualification
DODIC	Department of Defense identification code
DON	Department of the Navy
E3	electromagnetic environment effects
EEBD	emergency escape breathing device
EED	electro-explosive device
ELVA	emergency low visibility approach
EMC	electromagnetic compatibility
EMCON	emission control
EME	electromagnetic environment
EMI	electromagnetic interference
EMP	electromagnetic pulse
EMV	electromagnetic vulnerability
EOD	explosive ordnance disposal
FDLP	flight deck landing practice
FDO	flight deck officer
FDSSS	flight deck status and signaling system
FFG	guided missile frigate
FLOLS	Fresnel Lens Optical Landing System
FLTCINC	Fleet Commander in Chief
FM	frequency modulation
FOD	foreign object damage
GSI	glide slope indicator
HAC	helicopter aircraft commander
HCO	helicopter control officer
HCS	helicopter control station
HDC	helicopter direction center
HEC	helicopter employment coordinator
HEFOE	hydraulic electrical fuel oxygen engine
HEL	helicopter employment coordinator
HELO	helicopter
HERF	hazards of electromagnetic radiation to fuel

HERO	hazards of electromagnetic radiation to ordnance
HERP	hazards of electromagnetic radiation to personnel
HF	high frequency
HICAP	high-capacity firefighting foam station
HIFR	helicopter in-flight refueling
HOGE	hover out of ground effect
HOSTAC	helicopter operations from ships other than aircraft carriers (a Navy publication)
HRS	Horizon Reference System
I	individual
ICAO	International Civil Aviation Organization
ICS COM	internal communications system
IFF	identification, friend or foe
IFR	instrument flight rules
IMC	instrument meteorological conditions
IN	instructor
IP	instructor, pilot
JAG	Judge Advocate General
JFC	joint force commander
JMO(AIR)	joint maritime operations, Air
JTR	joint travel regulations
JTTP	joint tactics, techniques, and procedures
kW	kilowatt
LAMPS	Light Airborne Multipurpose System (helicopter)
LFORM	landing force operational reserve material
LGB	laser-guided bomb
LHA	amphibious assault ship (general purpose)
LHD	amphibious assault ship (multipurpose)
LPD	amphibious transport dock
LPH	amphibious assault ship (general purpose)
LSE	landing signal enlisted
LSO	landing safety officer; landing signal officer
MAD	military air distress
MAP	missed approach procedure
MCAS	Marine Corps air station
MCO	Marine Corps order
MILSTAMP	military standard transportation and movement procedures
MIM	maintenance instruction manual
MOA	military operating area
MSL	mean sea level

NAWCAD	naval air warfare center, aircraft division
NALC	naval ammunition logistics code
NAMTO	Navy material transportation office
NAR	notice of ammunition reclassification
NAS	naval air station
NATOPS	naval air training and operating procedures standardization
NAVAIDS	navigation aids
NAVAIRSYSCOM	Naval Air Systems Command. Also called NAVAIR
NAVMAG	naval magazine
NAVMTO	naval military transportation office
NAVORD	naval ordnance
NAVORDSTA	naval ordnance station
NAVSAFECEN	naval safety center
NAVSEALOGCEM	naval sea logistics center
NAVSEASYSCOM	Naval Sea Systems Command. Also called NAVSEA
NAVSUP	naval supply
NDB	nondirectional beacon
NFO	naval flight officer
nm	nautical mile
NRFI	not ready for issue
NSN	national stock number
NVD	night vision device
NWP	naval warfare publication
OBA	oxygen breathing apparatus
OBST	obstacle
OIC	officer in charge
OLS	Optical Landing System
OOD	officer of the deck
OP	ordnance pamphlet
OPCON	operational control
OPORD	operational order
OPS	operations
OPTAR	operating target
OTC	officer in tactical command
P-STATIC	precipitation static
PAR	precision approach radar
PLAT	pilot's landing aid television
POD	Plan of the Day
PRIFLY	primary flight control
PSE	peculiar support equipment
PUK	packup kit
QA	quality assurance
QDR	quality deficiency report

RADHAZ	hazards from electromagnetic radiation
RAST	Recovery Assistance, Securing, and Traversing Systems
REL	relative
RF	radio frequency
RFI	ready for issue
RFW	request for waiver
SAR	search and rescue
SCAS	Stability Control Augment System
SGSI	stabilized glide slope indicator
SIGINT	signals intelligence
SINS	Ship's Inertial Navigation System
SLOC	sea line of communication
SO	safety observer
SOP	standard operating procedures
SPCC	(Navy) ships parts control center
SSCO	shipper's service control office
TACAN	tactical air navigation
TAO	tactical actions officer
TDY	temporary duty
TL	team leader
TM	team member
TPL	technical publications list
TYCOM	type commander
UHF	ultra high frequency
UIC	unit identification code
UNAAF	Unified Action Armed Forces
USA	US Army
USAF	US Air Force
USMC	US Marine Corps
USN	US Navy
USCG	US Coast Guard
VERTREP	vertical replenishment
VFR	visual flight rules
VHF	very high frequency
VLA	visual landing aid
VMC	visual meteorological conditions
VOD	vertical onboard delivery
VOLS	Vertical Optical Landing System
V/STOL	vertical short take off landing
WAGB	icebreaker (Coast Guard)
WHEC	high endurance cutter (Coast Guard)
WMEC	medium endurance cutter (Coast Guard)
WSE	weapon support equipment
WSESRB	Weapon System Explosive Safety Review Board
XO	executive officer

PART II--DEFINITIONS*

absolute altitude. The height of an aircraft directly above the surface or terrain over which it is flying. (Joint Pub 1-02) Also called above ground level or AGL.

airborne stores.* Items intended for carriage internally or externally by aircraft, including racks, launchers, adapters, and detachable pylons, which are not normally separated from the aircraft in flight, such as tanks, pods, nonexpendable training weapons, and targets.

airborne weapons.* Items intended for carriage internally or externally by aircraft, which are normally separated from the aircraft in flight, such as missiles, rockets, bombs, mines, torpedoes, pyrotechnics, ammunition, and guns.

air-capable ship.* All ships other than CVs, CVNs, LPHs, LHAs, or LHDs from which aircraft can take off, be recovered, or routinely receive and transfer logistic support.

air-capable ship certification.* Requirement for air-capable ships to be formally inspected and certified to be able to provide proper, adequate, and safe aviation facilities and to meet the applicable requirements of Air-Capable Ships Aviation Bulletin No. 1F.

aircraft release and control.* Applies to those procedures in the Release and Control Section of the applicable aircraft loading manual or checklist.

air operations control center.* Collocated with helicopter direction center in LPH, LHA, or LPD ships and responsible for air operations when not in an amphibious objective area. Also called AOCC.

air operations section.* A section of the operations department on amphibious assault aviation-class ships that is responsible for coordinating all matters pertaining to flight operations, including the proper function of air operations control center, helicopter direction center, or carrier air traffic control center.

air tactical control officer.* Officer on board ship exercising tactical control of the Light Airborne Multipurpose System (LAMPS) weapon system during missions.

ambient temperature.* Outside temperature at any given altitude, preferably expressed in degrees centigrade.

amphibious assault aviation ship.* An LPH, LHD, or LHA.

antisubmarine air controller.* An individual especially trained for and assigned the duty of the control (by use of radio, radar, or other means) of such aircraft as may be allotted to him for operations of helicopters within an assigned antisubmarine warfare (ASW) area. Also called ASAC.

approach control.* A control station in an air operations control center, helicopter direction center, or carrier air traffic control center, which is responsible for controlling air traffic from marshal until handoff to final control.

arm or de-arm.* Applies to those procedures in the arming or de-arming section of the applicable aircraft loading manual or checklist that places the ordnance or explosive device in a ready or safe condition (i.e., rocket launchers, guided missiles, guns--internal and pods, paraflares--external and SUU-44/25 dispenser). (NOTE: The removal or installation of pylon or bomb rack safety pins from a nonordnance-loaded station is considered a function requiring certification within the purview of this publication.)

arming. As applied to explosives, weapons, and ammunition, the changing from a safe condition to a state of readiness for initiation. (Joint Pub 1-02)

arming area.* The area where ordnance is changed from a safe condition to a state of armed readiness; the area ahead of the aircraft must be cleared and maintained clear until after launch.

assembly or disassembly (ordnance).* An operation to facilitate the complete buildup or breakdown of ordnance or explosive devices.

aviation ship.* A CV or CVN.

ball.* A pilot voice report that the visual landing aid is in sight.

base recovery course.* A ship's magnetic heading for aircraft recovery. Also called BRC.

bill.* A ship's publication listing operational or administrative procedures.

bingo. 1. When originated by pilot, means, "I have reached minimal fuel for safe return to base or to designated alternate." 2. When originated by controlling activity, means, "Proceed to alternate airfield or carrier as specified." (Joint Pub 1-02)

carrier air traffic control center.* The centralized agency responsible for the status-keeping of all carrier air operations and control of all airborne aircraft under the operations officer's cognizance except those being controlled by the combat information center. Also called CATCC.

cartridge actuated device.* Small explosive devices used to eject stores from launched devices, actuate other explosive systems, or provide initiation for aircrew escape devices.

Combatant Command (command authority). Non-transferable command authority established by title 10, United States Code, section 164, exercised only by commanders of unified or specified combatant commands. Combatant Command (command authority) is the authority of a Combatant Commander to perform those functions of command over assigned forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction over all aspects of military operations, joint training, and logistics necessary to accomplish the missions assigned to the command. Combatant Command (command authority) should be exercised through the commanders of subordinate organizations; normally this authority is exercised through the Service component commander. Combatant Command (command authority) provides full authority to organize and employ commands and forces as the CINC considers necessary to accomplish assigned missions. Also called COCOM. (Joint Pub 1-02)

Commander, Naval Sea Systems Command OP-4.* NAVSEA OP-4 is a publication that prescribes the minimum safety and certification requirements for issue, receiving, handling, stowage, surveillance, maintenance, and return of conventional ammunition along with the preparation of associated reports by units afloat. Also called COMNAVSEASYSCOM OP-4.

control (radar).* 1. Advisory--Tactical control of an aircraft by a designated control unit where the aircraft receives direction and recommendations but does not relieve the aircraft commander of the responsibility for safety of flight. 2. Close--Tactical control of aircraft by a designated control unit, whereby the aircraft receives orders affecting its movements, and the pilot will not deviate from

instructions received unless given permission, or unusual circumstances require immediate action for the safety of flight. In either case, the pilot will inform the controller of action taken. This type of control requires two-way radio communications and positive radar contact. The controller is responsible for the safety of the aircraft, and the pilot must be informed whenever he is not held on the radar for periods in excess of 1 minute or five sweeps of the radar. The ultimate safety of the aircraft is the primary responsibility of the pilot. 3. Positive--Tactical control of an aircraft by a designated control unit, whereby the aircraft receives orders affecting movement and transfers responsibility for the safe navigation and clearance of the aircraft to the unit issuing such orders.

control area. A controlled airspace extending upwards from a specified limit above the Earth. (Joint Pub 1-02)

control zone. A controlled airspace extending upwards from the surface of the Earth to a specified upper limit. (Joint Pub 1-02)

de-arming.* An operation in which a weapon is changed from a state of readiness for initiation to a safe condition. Also called safing. Also see arm or de-arm.

de-arming area.* The area where ordnance is changed from a state of readiness to a safe condition.

deck status light.* A three-colored light (red, amber, green) controlled from the primary flight control. Navy--The light displays the status of the ship to support flight operations. USCG--The light displays clearance for a helicopter to conduct a given evolution.

Red deck status--The helicopter is not cleared for landing, takeoff, vertical replenishment, or helicopter in-flight refueling.

Amber deck status--The helicopter is cleared to start engine(s) and engage or disengage rotors.

Green deck status--The helicopter is cleared for landing, takeoff, vertical replenishment, or helicopter in-flight refueling.

density altitude. An atmospheric density expressed in terms of the altitude which corresponds with that density in the standard atmosphere. (Joint Pub 1-02)

departure control.* A control station in an AOCC, HDC, or CATCC that is responsible for the orderly flow of departing traffic.

downloading.* An operation that removes airborne weapons or stores from an aircraft.

droop stop. A device to limit downward vertical motion of helicopter rotor blades upon rotor shutdown. (Joint Pub 1-02)

electro-explosive device. An explosive or pyrotechnic component that initiates an explosive, burning, electrical, or mechanical train and is activated by the application of electrical energy. Also called EED. (Joint Pub 1-02)

electromagnetic compatibility. The ability of telecommunications equipment, subsystems, and systems to operate in their intended operational environments without suffering or causing unacceptable degradation because of electromagnetic radiation or response. Design compatibility is achieved by incorporation of engineering characteristics or features in all electromagnetic radiating and receiving equipment in order to eliminate or reject undesired signals and enhance operating capabilities. Operational compatibility is achieved by the equipment flexibility to ensure interference-free operation. It involves the application of sound frequency management and clear concepts and doctrines to maximize operational effectiveness. Also called EMC. (Joint Pub 1-02)

electromagnetic environment. The resulting product of the power and time distribution, in various frequency ranges, of the radiated or conducted electromagnetic emission levels that may be encountered by a military force, system, or platform when performing its assigned mission in its intended operational environment. It is the sum of electromagnetic interference; electromagnetic pulse; hazards of electromagnetic radiation to personnel, ordnance, volatile materials; and natural phenomena effects of lightning and p-static. Also called EME. (Joint Pub 1-02)

electromagnetic environmental effects. The impact of the electromagnetic environment upon the operational capability of military forces, equipment, systems, and platforms. It encompasses all electromagnetic disciplines, including electromagnetic compatibility/electromagnetic interference; electromagnetic vulnerability; electromagnetic pulse; electronic counter-countermeasures, hazards of electromagnetic radiation to personnel, ordnance, and

volatile materials; and natural phenomena effects of lightning and p-static. Also called E3. (Joint Pub 1-02)

electromagnetic interference. Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment. It can be induced intentionally, as in some forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and the like. Also called EMI. (Joint Pub 1-02)

electromagnetic pulse. The electromagnetic radiation from a nuclear explosion caused by Compton-recoil electrons and photoelectrons from photons scattered in the materials of the nuclear device or in a surrounding medium. The resulting electric and magnetic fields may couple with electrical/electronic systems to produce damaging current and voltage surges. May also be caused by nonnuclear means. Also called EMP. (Joint Pub 1-02)

electromagnetic vulnerability. The characteristics of a system that cause it to suffer a definite degradation (incapability to perform the designated mission) as a result of having been subjected to a certain level of electromagnetic environmental effects. Also called EMV. (Joint Pub 1-02)

emergency expected approach time.* The future time, assigned before launch, at which an aircraft is cleared to depart inbound or penetrate from a preassigned fix under lost communications conditions. Also called EEAT.

emergency marshal.* A marshal established by an air operations control center, helicopter direction center, or carrier air traffic control center and given to each pilot before launch with an altitude and an emergency expected approach time. The emergency marshal radial will have a minimum of 30 degree separation from the primary marshal.

final bearing.* The magnetic bearing assigned by an air operations center, helicopter direction center, or carrier air traffic control center for final approach; an extension of the landing area centerline.

final control.* The station that is responsible for controlling traffic to the approach minimums.

Flight Deck Officer.* Officer responsible for the safe movement of aircraft on or about the flight deck of an aviation-capable ship. Also called FDO.

flight deck status and signaling system.* A visual means of communications by light between the landing safety officer and the bridge, combat information center, helicopter direction center, and the helicopter. Also called FDSSS.

flight quarters. A ship configuration that assigns and stations personnel at critical positions to conduct safe flight operations. (Approved for inclusion into the next edition of Joint Pub 1-02.)

foreign object damage. Rags, pieces of paper, line, articles of clothing, nuts, bolts, or tools that when misplaced or caught by air currents normally found around aircraft operations (jet blast, rotor or prop wash, engine intake) cause damage to aircraft systems or weapons or injury to personnel. Also called FOD. (Approved for inclusion into the next edition of Joint Pub 1-02.)

free-deck recovery.* The launch or securing condition on the flight deck of a Recovery Assistance, Securing, and Traversing Systems (RAST)-equipped ship when that system is not used.

around resonance.* A condition of geometric rotor blade imbalance in helicopters caused by offset dynamic forces when the helicopter makes improper contact with the deck. If allowed to continue, destruction of the helicopter is imminent. Improper tiedown aggravates the onset of ground resonance.

guard.* A radio frequency that is normally used for emergency transmissions and is continuously monitored. UHF band: 243.0 MHZ; VHF band: 121.5 KHZ.

handling (ordnance).* Applies to those individuals who engage in the breakout, lifting, or repositioning of ordnance or explosive devices in order to facilitate storage or stowage, assembly or disassembly, loading or downloading, or transporting.

hazards of electromagnetic radiation to fuel.* The danger of igniting volatile combustibles by spark ignition because of radio-frequency electromagnetic fields of sufficient intensity. Also called HERF.

hazards of electromagnetic radiation to ordnance.* The danger of accidental actuation of electro-explosive devices or otherwise electrically activating ordnance because of RF electromagnetic fields. This unintended actuation could have

safety (premature firing) or reliability (dudding) consequences. Also called HERO.

hazards of electromagnetic radiation to personnel.* The danger of producing harmful biological effects in humans by exposure to radio-frequency electromagnetic fields. Also called HERP.

helicopter control officer.* In nonaviation facility ships, the helicopter control officer will be responsible for the supervision and direction of launching and landing operations and for servicing and handling of all embarked helicopters. Helicopter control officers will be graduates of the helicopter indoctrination course unless they are designated helicopter pilots. Also called HCO.

helicopter control station.* A shipboard aircraft control tower, or, on ships not equipped with a control tower, the communications installation that serves as such. On all Coast Guard cutters, the helicopter control station is located in the pilot house. Also called HCS.

helicopter direction center. In amphibious operations, the primary direct control agency for the helicopter group/unit commander operating under the overall control of the tactical air control center. (Joint Pub 1-02)

HERO SAFE ordnance.* Any ordnance item that is percussion initiated, sufficiently shielded or otherwise so protected that all electro-explosive devices contained by the item are immune to adverse effects (safety or reliability) when the item is employed in its expected radio frequency environment, provided that the general hazards of electromagnetic radiation to ordnance (HERO) requirements defined in the hazards from electromagnetic radiation (RADHAZ) manual are observed.

HERO SUSCEPTIBLE ordnance.* Any ordnance item containing electro-explosive devices proven by test or analysis to be adversely affected by radio frequency energy to the point that the safety and/or reliability of the system is in jeopardy when the system is employed in its expected radio frequency environment.

HERO UNSAFE ordnance.* Any ordnance item containing electro-explosive devices that has not been classified as HERO SAFE or HERO SUSCEPTIBLE ordnance as a result of a hazards of electromagnetic radiation to ordnance (HERO) analysis or test is considered HERO UNSAFE ordnance. Additionally, any ordnance item containing electro-explosive

devices, including those previously classified as HERO SAFE or HERO SUSCEPTIBLE ordnance, which has its internal wiring exposed; when tests are being conducted on the item that result in additional electrical connections to the item; when EEDs having exposed wire leads are present and handled or loaded in any but the tested condition; when the item is being assembled or disassembled; or when such ordnance items are damaged causing exposure of internal wiring or components or destroying engineered HERO protective devices.

hovering. A self-sustaining maneuver whereby a fixed, or nearly fixed, position is maintained relative to a spot on the surface of the Earth or underwater. (Joint Pub 1-02)

hung weapons. Those weapons or stores on an aircraft that the pilot has attempted to drop or fire but could not because of a malfunction of the weapon, rack or launcher, or aircraft release and control system. (Approved for inclusion into the next edition of Joint Pub 1-02.)

inbound bearing.* The magnetic heading assigned by an air operations center, helicopter direction center, or carrier air traffic control center that will ensure interception of the final bearing at a specified distance from the ship.

installation or removal ordnance.* Applies to those individuals whose responsibilities involve procedures that entail the installation or removal of cartridge or cartridge actuated devices associated with aircraft bomb racks or pylons, egress systems, electronic countermeasure dispensers, refueling stores (e.g., engine fire extinguisher system cartridges, aircrew survival distress signals, refueling store guillotine cartridges, explosive bolts, ECM dispenser cartridges).

instrument meteorological conditions. Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than minimums specified for visual meteorological conditions. Also called IMC. (Approved for inclusion into the next edition of Joint Pub 1-02.)

KILO report.* A pilot-coded report indicating aircraft mission readiness, typically given to the controlling agency after departure.

landing force operational reserve material.* Those supplies provided as a contingency package consisting of all required necessities to support combat. Also called LFORM.

landing signal officer.* Officer responsible for the visual control of aircraft in the terminal phase of the approach immediately prior to landing. Also called LSO.

landing signalman enlisted.* Enlisted man responsible for ensuring that helicopters, on signal, are safely started, engaged, launched, recovered, and shut down. Also called LSE.

loading (ordnance).* An operation that installs airborne weapons and stores on or in an aircraft and may include fuzing of bombs and stray voltage checks.

loading area (ordnance).* The area where replenishment of airborne weapons or stores and other armament on or in an aircraft is conducted. When handling weapons in this area, all fuzes and initiators will remain safe and all gun chambers clear.

loading or downloading (ordnance).* Refers to procedures contained in the load or download section of the loading manual or checklist for that particular ordnance or explosive device.

magazine inspection.* Refers to the close viewing and critical appraisal of existing conditions within ship, station magazines, or lockers, using standards established by NAVSEA OP 4 and OP 5.

marshal.* A bearing, distance, and altitude fix designated by an air operations center, helicopter direction center, or carrier air traffic control center on which the pilot will orientate holding, and from which initial approach will commence during an instrument approach.

marshal control.* A control station in an air operations center, helicopter direction center, or carrier air traffic control center, which is responsible for the orderly flow of inbound traffic.

multispot ship.* Those ships certified to have three or more adjacent landing areas.

Naval Air Training and Operating Procedures Standardization Manual.* Series of general and specific aircraft procedural manuals that govern the operations of naval aircraft. Also called NATOPS.

NAVSEA OP 4.* Publication that provides policy for ammunition evolutions afloat.

NAVSEA OP 5.* Publication that provides policy for ammunition evolutions ashore.

nonprecision approach. Radar-controlled approach or an approach flown by reference to navigation aids in which glide slope information is not available. (Approved for inclusion into the next edition of Joint Pub 1-02.)

officer of the deck.* The officer of the deck under way has been designated by the commanding officer to be in charge of the ship, including its safe and proper operation. The officer of the deck reports directly to the commanding officer for the safe navigation and general operation of the ship, to the executive officer (and command duty officer if appointed) for carrying out the ship's routine, and to the navigator on sighting navigational landmarks and making course and speed changes. Also called OOD.

operational necessity.* A mission associated with war or peacetime operations in which the consequences of an action justify the risk of loss of aircraft and crew.

optimum wind.* 1. Optimum wind for normal operations is wind down the ship's landing lineup line at approximately half the maximum speed allowed by the applicable wind envelopes. 2. Optimum wind for a single engine landing is relative wind as close as possible to the landing lineup line at the maximum windspeed allowed by the appropriate wind envelope. 3. Optimum wind for up-the-stern approach is 10 to 20 degrees off the port bow at one-half the maximum speed allowed. 4. Optimum wind for any flight control failure or degradation is wind in the appropriate emergency wind envelope giving the most stable deck.

packup kit.* Service-provided maintenance gear including spare parts and consumables most commonly needed by the deployed helicopter detachment. Supplies are sufficient for a short-term deployment but do not include all material needed for every maintenance task.

pilot's landing aid television.* A closed circuit presentation of air operations on a flight deck. Also called PLAT.

positive control. A method of airspace control which relies on positive identification, tracking, and direction of aircraft within an airspace, conducted with electronic means by an agency having the authority and responsibility therein. (Joint Pub 1-02)

precision approach. An approach in which range, azimuth, and glide slope information are provided to the pilot. (Approved for inclusion into the next edition of Joint Pub 1-02.)

presail.* The time prior to a ship getting under way used to prepare for at-sea events.

pressure-altitude. An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the standard atmosphere. (Joint Pub 1-02)

primary flight control.* The controlling agency on aviation ships and amphibious assault aviation ships that is responsible for air traffic control of aircraft within 5 nm of the ship. On Coast Guard cutters, primary flight control duties are performed by a combat information center, but the term PriFly is not used. Also called PriFly.

ramp time.* 1. Anticipated time designated by primary flight control when the flight deck will be ready to recover aircraft. 2. The time the first aircraft in a CASE III recovery is expected to be at the ramp.

single-spot ship.* Those ships certified to have less than three adjacent landing areas.

spot.* An approved shipboard helicopter landing site.

spotting.* An aircraft is parked in an approved shipboard landing site.

stabilized glide slope indicator.* An electrohydraulic optical landing aid for use on air-capable ships. With it, a pilot can visually establish and maintain the proper glide slope for a safe approach and landing. The visual acquisition range is approximately 3 miles at night under optimal conditions. Also called SGSI.

standard operating procedure. See standing operating procedure.

standing operating procedure. A set of instructions covering those features of operations which lend themselves to a definite or standardized procedures without loss of effectiveness. The procedure is applicable unless ordered otherwise. Also called standard operating procedure. (Joint Pub 1-02) Also called SOP.

storage or stowage.* Storage is the act of placing material or ammunition and other supplies onboard the vessel. Stowage

relates to the act of securing those items stored in such a manner that they do not shift or move during at-sea periods using methods and equipment as approved by higher authority.

strikedown.* A term used to describe the movement of aircraft from the flight deck to the hangar deck level.

tactical direction.* A form of nonradar control in which tactical information is passed on to an aircraft by the controlling unit, but the aircraft commander is responsible for navigation and safety.

transporting (ordnance).* The movement or repositioning of ordnance or explosive devices along established explosive routes (does not apply to the aircraft flight line).

type command. An administrative subdivision of a fleet or force into ships or units of the same type, as differentiated from a tactical subdivision. Any type command may have a flagship, tender, and aircraft assigned to it. (Joint Pub 1-02)

unexpended weapons or ordnance.* Airborne weapons that have not been subjected to attempts to fire or drop and are presumed to be in normal operating conditions and can be fired or jettisoned if necessary.

vertical onboard delivery.* Logistics movement of high-priority passengers, mail, or cargo to or from aviation and air-capable ships, normally by the CH-53E helicopter. Also called VOD.

vertical replenishment. The use of a helicopter for the transfer of material to or from a ship. (Joint Pub 1-02)

vertical replenishment control.* The station responsible for controlling the movement of cargo, passengers, and mail by vertical replenishment.

visual meteorological conditions. Weather conditions in which visual flight rules apply, expressed in terms of visibility, ceiling height, and aircraft clearance from clouds along the path of flight. When these criteria do not exist, instrument meteorological conditions prevail and instrument flight rules must be complied with. Also called VMC. (Approved for inclusion into the next edition of Joint Pub 1-02.)

warning.* Operating procedures, practices, or conditions that may result in injury or death if not carefully observed or followed.

wave-off.* An action to abort a landing, initiated by the bridge, primary flight control, landing safety officer or enlisted man, or pilot at his discretion. The response to a wave-off signal is mandatory.

Weapon System Explosives Safety Review Board. A board designated by the Chief of Naval Operations that reviews safety aspects of weapons or explosive systems and makes recommendations to the Chief of Naval Operations and originating Service regarding acceptance or rejection for use on Navy ships. Also called WSESRB.

ZEBRA.* Maximum integrity of material condition for ship, except for the closing of outside ventilation, to combat nuclear, chemical, or biological threats.

* This term and definition is applicable only in context of this pub and is not standardized for DOD.

PART III--BREVITY CODE

ABORT. Cancel mission or I am unable to continue mission.

ALERT _____. Weapons to be launched, fired, or to be airborne within _____ minutes.

ALPS. Estimated time of arrival at station.

ANGELS _____. Height of friendly aircraft in thousands of feet or fly (am flying at) height indicated in thousands of feet, angels TEN (10,000 feet). If other than whole thousands of feet are required, hundreds will be expressed as tenths of one thousand feet separated by the word point, e.g., ANGELS TWO POINT FIVE (2,500 feet), ANGELS POINT NINE (900 feet).

ASAC. Antisubmarine air controller.

ANGLE. Aircraft altitude in thousands of feet.

ARMAMENT (SAFE/HOT). Select armament (SAFE/HOT) or armament is (SAFE/HOT).

ATACO. Air tactical actions control officer.

_____ AWAY. Weapon indicated has been fired or released.

BALLBAT. Executive order to attack within limits.

BEADWINDOW. Your last transmission disclosed an essential element of friendly information (EEFI). The number that follows, taken from the EEFI list in force (see ACP 125), identifies the nature of the disclosure.

BENT. Equipment indicated is inoperative. Canceled by OKAY.

BINGO. Proceed/am proceeding to alternate or specified field or carrier.

BIRD. Surface-to-air missile.

BOGEY. An air contact that is unidentified and assumed to be enemy.

BOWWAVE:

B--Below or Base of cloud in thousands of feet. If below one thousand feet, use hundreds of feet but ADD THE WORD "HUNDRED."

O--Over or Top of cloud layer in thousands of feet. If unknown use word "unknown."

Note: If there is more than one cloud layer, report the base and top of the lower formation, followed by the base and top of progressively higher layers (e.g., "two, twelve, seventeen, twenty-five").

W--Wind (8 points, N, NE, E, S, SW, W, NW) plus the velocity in knots. When wind is missing, omit or use the word "unknown."

W--Weather. General description of weather in plain language; such as clear; partly cloudy; cloudy; overcast; light, moderate, or heavy rain; mist; haze; thunderstorm; and distant lightning. Amplification of the weather should be made at the end of the report under "E."

A--Amount of clouds in tenths.

V--Visibility in miles. Use a fraction if less than 1 mile.

E--Extra phenomena of significance such as turbulence, icing, heavy sea or swell, and description of front. This is an elaboration of the report that includes anything of interest in plain and concise language.

BREAKAWAY _____. Magnetic course to fly after attack or completion of intercept is (three-digit group).

BROWNIE. Photographic devices.

BRUISER. Air-to-surface missile.

BULLDOG. Surface-to-surface missile.

BULLY. Concentrate attack on enemy target.

BUSTER. Fly at maximum continuous speed (power).

CANARY. "I" Band transponder.

CANDLE. Night illumination device.

CAP. Combat air patrol.

CERTSUB. Contact classified as certain submarine.

CHARLIE. Clearance to land; a numbered suffix indicates time delay in minutes before landing may be expected.

CHAMP. Carrier-based ASW fixed-wing aircraft capable of search and attack.

CHATTER. Communications jamming.

CHERUBS. Aircraft altitude in hundreds of feet.

CHICKS. Friendly fighter aircraft.

CIPHER. UHF/HF voice encrypt or decrypt device.

CLAM. Cease all or indicated electromagnetic and/or acoustic emissions in accordance with national instructions and exercise orders. Potential intelligence collector(s) (PIC) in area (estimated duration of CLAM hours).

CONTACT. Contact of interest.

COWBOY(S). Ship(s) of search attack group.

DART. Aircraft rocket.

DATUM. Last known position of a submarine or suspected submarine after contact has been lost. Can also be used when referring to any target of interest's last known position on the ocean's surface, e.g., survivor, missile, mine, vessels.

DECK CLEAR. Deck is now ready to resume launching and landing operations.

DECK FOUL. Unable to launch or land aircraft (followed by a numeral to indicate minutes anticipated before ready to resume operations).

DELTA (_____). (_____) Hold and conserve fuel at altitude and position indicated.

DIP BOSS. ASW helicopter flight leader.

DITCHING. The forced alighting of an aircraft on water.

DIVERT. Proceed to alternate mission.

DROP POINT. Position of weapons release.

EMERGENCY STREAMER. Helicopter in forward flight effecting in-flight recovery of up to 450 feet of sonar cable.

FAMISHED. Have you any instructions or information for me?

FATHER. TACAN.

FEET DRY. I am, or contact indicated is, over dry land.

FEET WET. I am, or contact indicated, is over water.

FOX. Air-to-air missile.

FREDDIE. Controlling unit for aircraft.

FREELANCE. Advisory control of aircraft is being employed or operated under advisory control.

FREEZE. Executive order to designated helicopter(s) to remain hovering in present position (canceled only by MELT).

GADGET. Radar or emitter equipment (type of equipment may be indicated by a letter as listed in OPORD or appropriate publication).

GASMAN. Oil tanker.

GINGERBREAD. Voice imitative deception is suspected on this net.

HEADS UP. Enemy got through (part or all). Trouble headed your way. (May be followed by amplification as to type of threat: BOGIES, BIRD, etc.).

HEY RUBE. Need support. Come to my assistance.

HIGH DRINK. Helicopter in flight refueling from a surface vessel.

HIGHWAY. Search _____ degrees from _____ (reference point).

HOLDING HANDS. Aircraft are joined or in close formation.

HOMEPLATE. Home airfield or home carrier.

HOOKER. Fishing or other small craft.

HORNET. Floating or drifting mine.

IN THE DARK. Not visible on my scope and any position information is estimated.

INDIANS. Ships of a surface action group.

INTRUDER. Unknown warship.

JUDY. Have visual on the contact.

KINGPIN. Reference point or sonobuoy estimated for reporting the position.

LIFEGUARD. Submarine or surface ship designated for SAR operations or a submarine or surface ship stationed geographically for precautionary SAR assistance. Also, the name of the unit designated to recover a man overboard for vessels conducting alongside operations.

LOST TRACK. Previous contact lost, provide target information.

MARSHAL. Enter holding at specific point.

MAYDAY. The international radio telephone distress signal that indicates that a ship, aircraft, or other vehicle is threatened by grave and imminent danger and requests immediate assistance.

MEATBALL. Pilot has landing aid source light image.

MELT. Informs helicopters that their movements are no longer restricted by FREEZE order.

MOTHER. Parent ship.

MULE. Ocean tugboat.

MUSIC. Electronic jamming (hostile, unknown, or friendly).

NANCY. Infrared equipment.

NOCAN. Unable to comply.

NOJOY. I've been unsuccessful or have no info.

ON TOP. I am over the datum, target, objective, or position indicated.

OOD. Officer of the deck.

ORANGES SOUR. Weather is unsuitable for aircraft mission.

ORANGES SWEET. Weather is suitable for aircraft mission.

PAN. The international radiotelephone urgency signal meaning the calling station has a very urgent message to transmit concerning the safety of a ship, aircraft, or other vehicle or the safety of a person.

PANCAKE. Land, or I wish to land (reason may be specified, e.g., PANCAKE AMMO, PANCAKE FUEL).

PANTHER. Enemy nuclear submarine.

PARROT. A military IFF transponder.

PEDRO. USN rescue helicopter.

PELICAN. ASW long-range patrol aircraft capable of both search and attack.

PIGEONS ____. The magnetic bearing and distance of HOMEPLATE (or unit from you is _____ degrees _____ miles).

PIRATE. Fast-moving surface radar contact, unidentified but assumed hostile.

PLAYMATE. Friendly ship, submarine, or aircraft with which I am operating.

__ POGO __. Switch to communications channel number preceding POGO. If unable to establish communications, switch to channel number following POGO. If no channel number follows POGO, return to this channel.

POPEYE. In clouds or area of reduced visibility.

PREP CHARLIE. Carrier(s) addressed land aircraft when ready. (Relay to aircraft when ready).

PREVIEW. Advisory control of aircraft is being employed or operate under advisory control. The ACU requires notice from the aircraft of changes in heading, speed, and altitude.

PRONTO. As quickly as possible.

RAT. Enemy fighter.

RATFINK. Enemy bomber.

RECCO. Aircraft search units.

RED. Attack by enemy aircraft or missile is imminent.

RESCAP. Rescue combat air patrol; provides protection to rescue vehicles from hostile forces during all phases of SAR.

SAUNTER. Fly at best endurance.

SCAN. Search sector indicated and report any contacts.

SCRAM-(DIRECTION). Friendly unit is in immediate danger, withdraw or clear in the direction indicated for safety.

SEE ME/YOU. Visual sighting of ship or aircraft.

SKIP IT. Do not attack, cease attack, cease interception.

SKUNK. A surface contact that is unidentified but assumed to be enemy.

SLY. Enemy patrol boat.

SNEAKER. SIGINT-configured nonfriendly vessel.

SOLO. Aircraft proceed on independent operations.

SOUR. Equipment indicated is not operating efficiently.

SPRITE. LAMPS aircraft.

STATE. Fuel state in hours and minutes.

STEER _____. Set magnetic heading indicated to reach me (or_____).

STRANGER. An unidentified contact not associated with action in progress. (Bearing, range, and altitude relative to you).

STRANGLE. Switch off equipment indicated.

SWEET. Equipment indicated is operating efficiently.

TAKE WITH. Engage target (indicated) with weapon (indicated).

TALLY HO. Target visually sighted.

TRACKING ____ SPEED ____. By my evaluation, contact is steering true course and at speed indicated.

TROUT. Fishing trawler.

VAMPIRE. Hostile missile. (Amplifying information should follow as available.)

VAT "B." Short weather report giving:

V--Visibility in miles.

A--Amount of clouds in tenths.

T--Height of cloud top in thousands of feet.

B--Height of cloud base in thousands of feet.

VECTAC. Vectored attack. (Ordered by "Executive RADAR VECTAC" or "EXECUTE INFORMATIVE VECTAC.")

VECTOR ____. Alter heading to magnetic or true heading indicated. Heading indicated must be in three digits; e.g., VECTOR ZERO SIX ZERO (for homing, use STEER).

WARNING. Enemy attack.

WARNING RED. Attack by hostile aircraft or missile is imminent.

WARNING WHITE. Attack by hostile aircraft or missile is improbable.

WARNING YELLOW. Attack by enemy hostile aircraft or missile is probable.

WEAPONS FREE. Fire may be opened on all aircraft not recognized as friendly.

WEAPONS TIGHT. Do not open fire or cease firing on any aircraft (or on BOGEY specified or in section indicated) unless target(s) known to be hostile.

WHAT FUEL. Report amount of fuel remaining.

WHAT LUCK. What are/were the results of assigned mission?

WHAT STATE. Report amount of fuel and missiles remaining. Ammunition and oxygen are reported only when specifically requested or critical.

WHITE. Attack improbable.

YELLOW. Attack is probable.

ZIPLIP. A condition that can be prescribed in which flight operations conducted in VMC conditions have positive communications control waived and only radio transmissions required for flight safety are permitted.

ZIPPO. Alerts units that a missile attack is imminent or in progress.

ZOMBIE. An unidentified track observed adhering to the normal traffic pattern and whose behavior does not constitute a threat.