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Aircrew Training Manual, OH-58D Kiowa Warrior

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Aircrew Training Manual, OH 58D Kiowa Warrior

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Preface

The aircrew training manual (ATM) standardizes aircrew training programs (ATPs) and flight evaluation procedures. This manual provides specific guidelines for executing OH-58D aircrew training. It is based on battle-focused training principles outlined at the Army Training Network located on the web at https://atn.army.mil/index.aspx, under the Training Management tab. It establishes crewmember qualification, refresher, mission, and continuation training and evaluation requirements. This manual applies to all OH 58D crewmembers and their commandersin the Active Army, the United States Army National Guard(ARNG), the Army National Guard of the United States (ARNGUS), and the United States Army Reserve (USAR) unless otherwise stated.

This manual is not a stand-alone document; all requirements of Army Regulation (AR) 600-105, National Guard Regulation (NGR) 95-210, and Training Circular (TC) 3-04.11 to the ATP must be met. If differences exist between the maneuver description in the operator's manuals, this manual is the governing authority for training and flight evaluation purposes only. The operator's manual is the governing authority for operations of the aircraft. Implementation of this manual conforms to AR 95-1 and TC 3-04.11. If a conflict exists between this manual and TC 3-04.11, then TC 3-04.11 will take precedence.

This manual will help aviation commanders, at all levels; develop a comprehensive ATP. By using the ATM, commanders ensure that individual crewmember and aircrew proficiency is commensurate with their units' mission and that aircrews routinely employ standard techniques and procedures.

Standardization officers, evaluators, and unit trainers (UTs) will use this manual and TC 3-04.11 as primary tools to assist the commander in developing and implementing the ATP. Crewmembers will use this manual as a "how to" source for performing crewmember duties. It provides performance standards and evaluation guidelines so that crewmembers know the level of performance expected. Each task provides a description of how the task should be completed to meet the standard. ATP commanders of active Army, National Guard, and Army Reserve units operating the OH-58D will use this ATM and TC 3-04.11 to develop individual commander's task lists for assigned aviators. ATP commanders with assigned contract pilots will develop individual commander's task lists tailored to the current contract position using this ATM, TC 3-04.11, AR 95-20, current flight training guides and/or local command directives.

The proponent of this publication is United States Army Training and Doctrine Command. Send comments and recommendations on Department of the Army (DA) Form 2028 (Recommended Changes to Publications and Blank Forms) through the aviation unit commander to Commander, United States Army Aviation Center of Excellence (USAACE), ATTN: ATZQ-TDT-F, Building 4507, Andrews Ave., Fort Rucker, AL 36362-5263. Recommended changes may also be e-mailed to: RUCK.ATZQ-TDT-F@conus.army.mil.

This publication has been reviewed for operations security considerations.

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Chapter 1
Introduction

This ATM describes training requirements for OH-58D crewmembers. It will be used with AR 95-1, AR 600-105, NG Sup 1 to TC 1-210, TC 3-04.11, and other applicable publications. The tasks in this ATM enhance training in both individual crewmember and aircrew proficiency. The training focuses on the accomplishment of tasks that support the unit's mission. The scope and level of training to be achieved individually by crewmembers and collectively by aircrews will be dictated by the mission essential task list (METL). Commanders must ensure that aircrews are proficient in mission-essential tasks.

1-1. CREW STATION DESIGNATION. The commander will designate a crew station for each aviator. Aviators will be trained and must maintain proficiency in each of the pilot's stations they are designated to occupy. Aviators designated to fly from both pilot's seats will be evaluated in each seat during readiness level (RL) progression and annual proficiency and readiness test (APART) evaluations. It is not required to evaluate every task from each pilot station.

1-2. SYMBOL USAGE AND WORD DISTINCTIONS

a. **Symbol Usage.** The diagonal (/) indicates "or" or "and." For example, instructor pilot (IP)/standardization instructor pilot (SP) may mean IP or SP or may mean IP and SP.

b. **Word Distinctions.**

(1) Warning, caution, and note. These words emphasize important and critical instructions.

(a) A warning identifies and highlights an essential operating or maintenance procedure, practice, condition, statement, which if not strictly observed, could result in injury to, or death of, personnel or long term health hazards to the person performing that procedure.

(b) A caution identifies and highlights an essential operating procedure or maintenance procedure, practice, condition, statement, which, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.

(c) A note highlights an essential operating procedure or maintenance procedure, condition, or statement.

(2) Will, must, should, can, and may. These words distinguish between mandatory, preferred, and acceptable methods of accomplishment.

(a) Will or must indicates a mandatory requirement.

(b) Should indicate a preferred, but not mandatory, method of accomplishment.

(c) Can/may indicate an acceptable method of accomplishment.

(3) Night vision goggles (NVG). This refers only to the night vision goggle imaging system.

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Chapter 2
Training

This chapter describes requirements for qualification, RL progression, and continuation training. Crewmember qualification requirements will be according to AR 95-1, TC 3-04.11, and this ATM.

2-1. QUALIFICATION TRAINING

a. **Aircraft qualification.** Initial qualification training in the OH-58D is conducted at USAACE according to an established program of instruction. Units are not authorized to conduct this training.

b. **NVG Qualification.** Initial NVG and aircraft NVG qualification will be conducted at the USAACE or DA-approved training site, according to the USAACE approved program of instruction.

c. **OH-58D series qualification.** In accordance with appendix A-1.

2-2. REFRESHER TRAINING. This paragraph lists aircraft and NVG refresher training requirements. The refresher training program is designed to enable crewmembers to regain proficiency in all base tasks. A crewmember having not flown within the previous 180 days in the aircraft mission type and design must be designated RL-3 for refresher training. A crewmember having not completed a one-hour NVG flight within the previous 180 days must be designated NVG RL-3 for NVG refresher training. During integration into the unit ATP crewmembers may be designated RL-3 for refresher training following the commander's evaluation. Gunnery training requirements during RL progression are outlined in TC 3-04.11 and Field Manual (FM) 3-04.140.

a. **Aircraft Refresher Training.**

(1) Academic training. The crewmember will receive training and demonstrate a working knowledge of the applicable topics in paragraph 3-4b. Complete the operator's manual written examination if not completed within the previous ATP year.

(2) Flight training. The crewmember will receive training and demonstrate proficiency from either crew station in each performance task and in the modes of flight marked with a **bold "X"** in the D, Night, and Instr columns of table 2-1, page 2-4. The crewmember will receive training and demonstrate proficiency from either crew station in each technical task in any mode of flight marked with an unbold "x" in table 2-1, page 2-4.

(3) Crewmembers must demonstrate proficiency in required base tasks and be designated RL-2 prior to undergoing mission training.

(4) Minimum flight hours. There are no minimum flight hour requirements. The training is proficiency based determined by the crewmember's ability to satisfactorily accomplish the designated tasks.

b. **NVG Refresher Training.**

(1) Academic training. The crewmember will receive training and demonstrate a working knowledge of the applicable topics in paragraph 3-4b. Academic training must be completed prior to flight training.

(2) Flight training. The crewmember will receive training and demonstrate proficiency from either crew station in each performance task marked with a Bold "**X**" in the NVG column of table 2-1, page 2-4, and any other base tasks specified by the commander for NVG on the task list. The crewmember will receive training and demonstrate proficiency from either crew station in each technical task in any mode of flight marked with an unbold "x" in table 2-1, page 2-4.

(3) Minimum flight hours. There are no minimum flight hour requirements. The training is proficiency based determined by the crewmember's ability to satisfactorily accomplish the designated tasks.

(4) Crewmembers must demonstrate proficiency in required base tasks and be designated NVG RL-2 prior to undergoing NVG mission training.

(5) Before conducting NVG training, units must have a written NVG standing operating procedure (SOP) addressing specific crewmember requirements not specified in this ATM or as outlined in TC 3-04.11.

2-3. MISSION TRAINING. Mission training develops the crewmember's ability to perform specific mission/additional tasks selected by the commander to support the unit's METL. Mission training should be conducted during actual mission support or collective training.

a. **Training Requirements**.

(1) Academic training. The crewmember will receive training and demonstrate a working knowledge of the applicable mission topics in paragraph 3-4b.

(2) Flight training. The crewmember will receive flight training and demonstrate proficiency in the mission and additional tasks, in each mode of flight, as specified on the commander's task list for the crewmember's position.

(3) Minimum flight hours. There are no minimum flight hour requirements. The training is proficiency based determined by the crewmember's ability to satisfactorily accomplish the designated tasks.

(4) Before undergoing NVG mission training, the aviator must be NVG current in the OH-58D.

b. **Maintenance test pilot (MTP) and maintenance test pilot evaluator (ME) training.**

(1) The tasks shown in table 2-4, page 2-7, and outlined in chapter 5 are mandatory tasks for aviators designated to perform maintenance test flights. Commanders are not authorized to delete any maintenance test flight (MTF) tasks. Personnel performing as MTPs should be limited to duties in a maximum of two aircraft. The MTP must be a pilot in command (PC) to conduct MTP duties.

(2) If unit mission dictates performance of maintenance operations during other than daylight hours and if the individual MTP/ME is selected to perform operations during night unaided and/or NVG conditions, then maintenance test flight training and evaluation of tasks listed in table 2-4, page 2-7, in those modes of flight is required. Commanders must specify the modes of flight the MTP/ME are authorized to perform. The tasks listed in table 2-4, page 2-7, will only be trained under NVG modes of flight upon completion of individual NVG mission training.

2-4. CONTINUATION TRAINING. This paragraph outlines the tasks and aircraft flight hours that crewmembers must complete to support the unit's METL. TC 3-04.11 lists the requirements for maintaining RL-1. The required performance standards are specified in chapters 4 and 5 of this manual.

a. **Semiannual flying-hour requirements-aircraft**. The minimum requirements for crewmembers are as follows:

(1) Flight activity category (FAC) 1-70 hours.

(2) FAC 2-50 hours.

(3) FAC 3-not applicable.

(4) NVG-9 hours.

(5) Hood-3 hours.

Note. The aviator may be required to fly additional hours if directed by the commander.

b. **Annual task and iteration requirements.** The minimum requirements are—

(1) One iteration of all performance tasks marked with a **bold "X"** under the mode of flight column (Day, Night, NVG, or Instr) in table 2-1, page 2-7, except as modified in paragraph (4) and (5) below. One iteration of all technical tasked marked with an unbold "x" in table 2-1, page 2-4, that may be performed in any mode of flight.

(2) Any iterations of mission tasks listed in table 2-2, page 2-4, as determined by the commander.

(3) Any iterations of additional tasks as determined by the commander.

(4) Two iterations, semiannually, of—

- Task 1074, Respond to Engine Failure at Cruise Flight.
- Task 1103, Respond to Full Authority Digital Electronic Control (FADEC) Failure.

(5) In addition to the required minimum annual tasks and iterations, MPs will perform annually a minimum of four iterations of the MTF tasks listed in table 2-3, page 2-7. MEs will perform two iterations from each flight crew station annually. Each MTF task listed is mandatory for an MTF standardization evaluation. Personnel who are required to perform MTF duties in an additional or alternate aircraft will perform four iterations of the required tasks in each additional or alternate aircraft. If unit mission dictates performance of maintenance operations during other than daylight hours and the MTP/ME has been trained for night unaided and NVG maintenance test flights, then one annual iteration of all tasks listed in table 2-3, page 2-7, is required in the mode of flight that was trained.

Note. The requirement to perform instrument tasks in additional aircraft, in category, will be at the discretion of the commander.

2-5. TASK LISTS

a. **Base tasks.** Table 2-1, page 2-4, lists the crewmember base tasks. Performance tasks are listed in **bold** text; technical tasks are indicated as unbold text throughout this manual.

b. A **bold "X"** under the mode of flight column (Day, Night, NVG, or Instr) denotes a performance task that is mandatory for RL progression and annual task iteration requirements in that mode of flight.

c. An unbold "x" under the mode of flight column (Day, Night, NVG, or Instr) denotes a technical task that is mandatory for RL progression and annual task iteration requirements that may be performed in any mode of flight.

d. **Mission tasks.** Table 2-2, page 2-7, lists the mission tasks. The commander will select mission and any additional tasks that support the unit's METL.

e. **Maintenance test pilot tasks.** Table 2-3, page 2-7, lists the maintenance test pilot tasks.

f. **Task groups.**

(1) Performance task. For the purpose of clarifying mode and conditions, a performance task is differentiated from a technical task. An ATM performance task is defined as a task primarily designed to measure the crewmembers ability to perform, manipulate, and respond to tasks primarily affected by the mode of flight. These tasks are significantly affected by the conditions and the mode of flight; therefore, the mode and condition under which the task must be performed is specified.

(2) Technical task. Technical tasks may be performed under all conditions regardless of the listed task iteration requirements. Technical tasks are characterized as those tasks that measure the crewmember's ability to plan, preflight, brief, run-up, shutdown, debrief, or operate onboard systems, sensors, and avionics, while in flight or on the ground. These tasks are not significantly affected by the mode of flight and may be performed in any mode.

Table 2-1. Base task list

Legend:			
D	Day mode of flight	Eval	Mandatory for selected flight evaluations listed below
Night	Night unaided mode of flight	S	Standardization flight evaluation (mandatory)
NVG	Night vision goggle mode of flight	NG	Night vision goggle evaluation (mandatory)
Instr	Instrument mode of flight	I	Instrument flight evaluation (mandatory)

Task	***Title***	***D***	***Night***	***NVG***	***Instr***	***Eval***
1000	Participate In A Crew Mission Briefing	x	x	x	x	S, NG, I*
1004	Plan A Visual Flight Rules Flight	x	x	x		S, NG*
1010	Prepare A Performance Planning Card	x	x	x	x	S, NG, I*
1012	Verify Aircraft Weight And Balance	x	x	x	x	S, NG, I*
1013	Operate Mission Planning System	x	x	x	x	
1014	Operate Aviation Life Support Equipment	x	x	x	x	S, NG I*
1022	Perform Pre-flight Inspection	x	x	x	x	S, NG, I*
1024	Perform Before Starting Engine Through Before Leaving Helicopter Checks	x	x	x	x	S, NG*
1026	**Maintain Airspace Surveillance**	**X**	**X**	**X**	**X**	**S, NG, I**
1028	**Perform Hover Power Check**	**X**	**X**	**X**	**X**	**S, NG, I**
1030	**Perform Hover Out-of-Ground Check**	**X**		**X**		**S, NG**
1032	Perform Radio Communications Procedures	x	x	x	x	S, NG, I*
1038	**Perform Hovering Flight**	**X**	**X**	**X**		**S, NG**
1040	**Perform Visual Meteorological Conditions Takeoff**	**X**	**X**	**X**		**S, NG**
1047	**Perform Aircraft Navigation**	**X**	**X**	**X**	**X**	**S, NG**
1048	Perform Fuel Management Procedures	x	x	x	x	S, NG, I*
1052	**Perform Visual Meteorological Conditions Flight Maneuvers**	**X**	**X**	**X**		**S, NG**

Table 2-1. Base task list

Legend:			
D	Day mode of flight	Eval	Mandatory for selected flight evaluations listed below
Night	Night unaided mode of flight	S	Standardization flight evaluation (mandatory)
NVG	Night vision goggle mode of flight	NG	Night vision goggle evaluation (mandatory)
Instr	Instrument mode of flight	I	Instrument flight evaluation (mandatory)

Task	*Title*	*D*	*Night*	*NVG*	*Instr*	*Eval*
1058	**Perform Visual Meteorological Conditions Approach**	**X**	**X**	**X**		**S, NG**
1062	**Perform Slope Operations**	**X**		**X**		**S, NG**
1066	**Perform Running Landing**	**X**				**S**
1070	Respond to Emergencies	x	x	x	x	S, NG, I*
1072	**Respond to Engine Failure at a Hover**	**X**				**S**
1074	**Respond to Engine Failure at Cruise Flight**	**X**				**S**
1078	**Respond to Stability and Control Augmentation System Malfunction**	**X**				**S**
1082	**Perform Autorotation**	**X**				**S**
1103	**Respond to Full Authority Digital Electronic Control Failure**	**X**				**S**
1142	Perform Digital Communication	x		x		S, NG*
1155	**Negotiate Wire Obstacles**	**X**		**X**		**S, NG**
1170	**Perform Instruments Takeoff**				**X**	**I**
1176[1]	**Perform Nonprecision Approach**				**X**	**I**
1178	**Perform Precision Approach**				**X**	**I**
1180[1]	**Perform Emergency Global Positioning System Recovery Procedure**				**X**	**I**
1182	**Perform Unusual Attitude Recovery**				**X**	**I**
1184	Respond To Inadvertent Instrument Meteorological Conditions	x	x	x	x	S, NG, I*
1188	Operate Aircraft Survivability Equipment /Operate Transponder	x	x	x	x	S, NG*
1194	Perform Refueling/Rearming Operations	x	x	x		S, NG*
1300	Perform Mast-Mounted Sight Operations	x		x		S, NG*
1304	**Operate Aviator's Night Vision System Display Symbology Subsystem**			**X**		
1402	Conduct Tactical Flight Mission Planning	x		x		

Table 2-1. Base task list

Legend:			
D	Day mode of flight	Eval	Mandatory for selected flight evaluations listed below
Night	Night unaided mode of flight	S	Standardization flight evaluation (mandatory)
NVG	Night vision goggle mode of flight	NG	Night vision goggle evaluation (mandatory)
Instr	Instrument mode of flight	I	Instrument flight evaluation (mandatory)

Task	*Title*	*D*	*Night*	*NVG*	*Instr*	*Eval*
1405	Transmit Tactical Reports	x		x		S, NG*
1407	**Perform Terrain Flight Takeoff**	**X**		**X**		**S, NG**
1408	**Perform Terrain Flight**	**X**		**X**		**S, NG**
1409	**Perform Terrain Flight Approach**	**X**		**X**		**S, NG**
1411	**Perform Terrain Flight Deceleration**	**X**		**X**		**S, NG**
1416	Perform Weapons Initialization Procedures	x		x		S, NG*
1422	**Perform Firing Techniques**	**X**		**X**		**S, NG**
1456[2]	**Engage Target with 50-Caliber**	**X**		**X**		**S, NG**
1458[2]	**Engage Target with the Hellfire**	**X**		**X**		**S, NG**
1462[2]	**Engage Target with 2.75-Inch Folding Fin Aerial Rockets**	**X**		**X**		**S, NG**
1472	Perform Aerial Observation	x		x		S, NG*
1473	Call For Indirect Fire	x		x		S, NG*
1474	**Respond to Night Vision Goggle Failure**			**X**		**NG**

Notes:
* Task may be evaluated on any of the selected flight evaluations.
[1] Either task may be performed during the instrument evaluation.
[2] Two of the three weapon system tasks must be evaluated during the APART.

Table 2-2. Mission task list

Task	*Title*
2010	**Perform Multiaircraft Operations**
2043	Perform Downed Aircraft Procedures
2050	Develop An Emergency Global Positioning System Recovery Procedure
2067	Select Landing Zone/Pickup Zone/Holding Area
2125	**Perform Pinnacle or Ridgeline Operations**
2127	**Perform Combat Maneuvering Flight**
2128	**Perform Close Combat Attack**
2129	**Perform Combat Position Operations**
2133	**Engage Target with M4 Series Carbine**
2164	Call for Tactical Air Strike
2410	**Perform Masking and Unmasking**
2412	**Perform Evasive Maneuvers**
2413	**Perform Actions on Contact**
2471	Perform Target Handover

Table 2-3. Maintenance test pilot task list

Task	*Title*
4000	Perform Prior-To-Maintenance Test-Flight Checks
4084	Perform Before-Starting Engine Checks
4088	Perform Starting Engine Checks
4090	Perform Engine Runup Checks
4094	Perform System Checks
4128	Perform Before Hover Checks
4132	Perform Takeoff to Hover Checks
4140	Perform Power Assurance Check
4142	Perform Hover Power Check
4156	Perform Hovering Control Rigging Check
4166	Perform Stability And Control Augmentation System Check
4168	Perform Heading Hold Check
4170	Perform Power Cylinder Check
4172	Perform Engine Response Check

Table 2-3. Maintenance test pilot task list

Task	*Title*
4176	Perform Throttle Warning Message Check
4178	Perform Manual Throttle Operations Check (Full Authority Digital Electronic Control)
4186	Perform Hover/Hover Bob Up-Check
4210	Perform Takeoff and Climb Checks
4232	Perform Control Rigging Check
4236	Perform Autorotation Revolutions Per Minute Check
4244	Perform Hydraulics Off-Check
4250	Perform Collective Anticipator Check
4252	Perform Vibration Analysis Checks
4272	Perform Communication Checks
4276	Perform Special/Detailed Procedures
4280	Perform Before Landing Checks
4282	Perform After Landing Checks
4284	Perform Engine Shutdown Checks

2-6. CURRENCY REQUIREMENTS

a. **Aircraft Currency.** Aircraft currency will be per AR 95-1 and this paragraph. A crewmember whose currency has lapsed must complete a proficiency flight evaluation given in the aircraft by an IP/SP. The commander will designate the tasks for this evaluation.

b. **NVG Currency.**

(1) To be considered NVG current, an aviator must take part every 60 consecutive days in at least a one-hour flight in the aircraft, while wearing NVG.

(2) A crewmember whose currency has lapsed must complete, at a minimum, a one-hour NVG proficiency evaluation given at night in the aircraft by an NVG IP or SP. Minimum tasks to be evaluated are listed below. To reestablish currency, an NVG IP may evaluate an NVG IP or SP. An IP may not evaluate an IP or SP for APART purposes.

- **Task 1026, Maintain Airspace Surveillance.**
- **Task 1028, Perform Hover Power Check.**
- **Task 1030, Perform Hover Out-of-Ground Check.**
- **Task 1038, Perform Hovering Flight.**
- **Task 1040, Perform Visual Meteorological Conditions Takeoff.**
- **Task 1052, Perform Visual Meteorological Conditions Flight Maneuvers.**
- **Task 1058, Perform Visual Meteorological Conditions Approach.**
- **Task 1062, Perform Slope Operations.**
- **Task 1407, Perform Terrain Flight Takeoff.**
- **Task 1408, Perform Terrain Flight.**

- **Task 1409, Perform Terrain Flight Approach.**
- **Task 1411, Perform Terrain Flight Deceleration.**
- **Task 1474, Respond to Night Vision Goggle Failure.**

c. **Iteration Currency.** In order to maintain currency in Task 1074 and Task 1103**,** IPs/SPs must perform one iteration of each task every 90 days. If more than 90 days have passed, the IP/SP must demonstrate proficiency in the task(s) to an IP/SP who meets currency requirements. To reestablish currency, an IP may evaluate an IP or SP; an IP may not evaluate an IP or SP for APART purposes.

2-7. CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR TRAINING. The commander evaluates the unit mission and determines if chemical, biological, radiological, and nuclear (CBRN) training is required. If the commander determines that the unit requires CBRN training, he or she will train all FAC 1 and selected FAC 2 aviators. Commanders will also determine the mission-oriented protective posture (MOPP) level required during CBRN training. At a minimum, the protective mask must be worn.

a. **Crewmembers will receive CBRN training in the base tasks listed below and will perform at least one iteration annually.** The commander selects mission/additional tasks based on the unit's mission. One iteration of any two weapon system tasks must be performed annually.

- Task 1024, Perform Before Starting Engine Through Before Leaving Helicopter Checks.
- **Task 1030, Perform Hover Out-of-Ground Effect Check.**
- Task 1032, Perform Radio Communication Procedures.
- **Task 1407, Perform Terrain Flight Takeoff.**
- **Task 1408, Perform Terrain Flight.**
- **Task 1409, Perform Terrain Flight Approach.**
- **Task 1411, Perform Terrain Flight Deceleration.**
- **Task 1456, Engage Target with the 50-Caliber Machine Gun.**
- **Task 1458, Engage Target with Hellfire.**
- **Task 1462, Engage Target with the 2.75-Inch Folding Fin Aerial Rockets.**

b. While conducting CBRN training, the commander will ensure that—

(1) Aircrews use extra care when performing flight duties or training in aircraft cockpits when the wet bulb globe temperature is above 75 degrees Fahrenheit.

(2) Aircrews will not receive emergency procedures training in flight while wearing MOPP gear. (They may complete this training in static aircraft.)

(3) CBRN training is coordinated closely with the local flight surgeon.

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Chapter 3
Evaluation

This chapter describes evaluation principles and grading considerations. It also contains guidelines for conducting academic and hands-on performance testing. Evaluations are a primary means of assessing flight standardization and crewmember proficiency. Evaluations will be conducted per AR 95-1, TC 3-04.11, and this ATM.

3-1. EVALUATION PRINCIPLES. The value of any evaluation depends on adherence to fundamental evaluation principles. These principles are described below.

a. **Selection of evaluators.** The evaluators must be selected not only for their technical qualifications but also for their demonstrated performance, objectivity, and ability to observe and to provide constructive comments. These evaluators are the SPs, IPs, instrument flight examiners (IEs), and MEs who assist the commander in administering the ATP.

b. **Method of evaluation.** The method used to conduct the evaluation must be based on uniform and standard objectives. In addition, it must be consistent with the unit's mission and must strictly adhere to the appropriate SOPs and regulations. The evaluator must ensure a complete evaluation is given in all areas and refrain from making a personal “area of expertise” a dominant topic during the evaluation.

c. **Participant understanding.** All participants must completely understand the purpose of the evaluation.

d. **Participant cooperation.** Cooperation by all participants is necessary to guarantee the accomplishment of the evaluation objectives. The emphasis is on all participants, not just on the examinee.

e. **Identification of training needs.** The evaluation must produce specific findings to identify training needs. The examinee needs to know what is being performed correctly or incorrectly, and how improvements can be made.

f. **Purpose of evaluation.** The evaluation will determine the examinee's ability to perform essential tasks to prescribed standards. Flight evaluations will also determine the examinee’s ability to exercise crew coordination in completing these tasks.

g. **Crew coordination.** The guidelines for evaluating crew coordination are based on a subjective analysis of how effectively a crew performs together to accomplish a series of tasks. The evaluator must determine how effectively the examinee employs aircrew coordination as outlined in chapter 6.

h. **Evaluator role as crewmember.** In all phases of evaluation, the evaluator is expected to perform as an effective crewmember. At some point during the evaluation, circumstances may prevent the evaluator from performing as a crewmember. In such cases, a realistic, meaningful, and planned method should be developed to pass this task back to the examinee effectively. During the conduct of the flight evaluation, the evaluator will normally perform as outlined in the task description or as directed by the examinee. At some point, the evaluator may perform a role reversal with the examinee. The examinee must be made aware of both the initiation and termination of role reversals. The examinee must know when a fully functioning crewmember is supporting the examinee.

Note. When evaluating a PC, UT, IP, SP, ME, or IE, the evaluator must advise the examinee that, during role-reversal, the evaluator may deliberately perform some tasks or crew coordination outside the standards to check the examinee's diagnostic and corrective action skills.

3-2. GRADING CONSIDERATIONS

a. **Academic evaluation.** The examinee must demonstrate a working knowledge and understanding of the appropriate subject areas. Some tasks are identified in **TRAINING AND EVALUATION REQUIREMENTS** as tasks that may be evaluated academically. The examinee must demonstrate a working knowledge of the tasks. Evaluators may use computer based instruction, mock-ups, or other approved devices to assist in determining the examinee's knowledge of the task.

b. **Flight evaluation.** Tasks that require evaluation under these conditions must be performed in the aircraft. Task standards are based on an ideal situation. Grading is based on meeting the minimum standards. The evaluator must consider deviations (high wind, turbulence, or poor visibility) from the ideal conditions during the evaluation. If other than ideal conditions exist, the evaluator must make appropriate adjustments to the standards.

Note. During an evaluation, a task iteration performed in a more demanding mode of flight may suffice for an iteration performed in a less demanding mode of flight. The commander determines which mode of flight is more demanding.

3-3. CREWMEMBER EVALUATION. Evaluations are conducted to determine the crewmember's ability to perform the tasks on the commander's task list (CTL) and check understanding of required academic subjects listed in the ATM. When the examinee is an evaluator/trainer, the recommended procedure is for the evaluator to reverse roles with the examinee. When the evaluator uses this technique, the examinee must understand how the role-reversal will be conducted and when it will be in effect. Initial validation of an aviator's qualifications following a military occupational specialty producing course of instruction/school (for example, OH-58D instructor pilot course, maintenance test pilot course, and instrument flight examiners course) will be conducted in the aircraft upon return from that course.

a. **Recommended performance and evaluation criteria.**

(1) Pilot (PI). The PI must demonstrate a working knowledge of the appropriate academic subjects from paragraph 3-4b. In addition, the PI must be familiar with the individual aircrew training folder (IATF), and understand the CTL requirements.

(2) PC/MTP. The PC/MTP must meet the requirements in paragraph 3-3a(1). In addition, the PC/MTP must demonstrate sound judgment and technical/tactical proficiency in the employment of the aircraft, the unit's mission, the crew, and assets.

(3) Trainers and evaluators. The SP/IP/IE/ME/UT will be evaluated on their ability to apply the learning and teaching process outlined in the instructor pilot handbook.

(a) UT. The UT must meet the requirements in paragraph 3-3a(2). In addition, the UT must be able to instruct in the appropriate tasks and subjects, recognize errors in performance or understanding, make recommendations for improvement, and train to standards and document training. This individual should possess knowledge of the fundamentals of instruction and

understand the requirements and administration of the ATP. The UT is not authorized to conduct evaluations.

(b) IP or IE. The IP or IE must meet the requirements in paragraph 3-3a(2). In addition, the IP or IE must be able to objectively train, evaluate, and document performance of the PI, PC, MTP, and UT, using role-reversal for UT training, as appropriate. This individual must possess a thorough knowledge of the fundamentals of instruction and evaluation, be able to develop and implement an individual training plan, and possess a thorough understanding of the requirements and administration of the ATP.

(c) SP. The SP must meet the requirements in paragraph 3-3a(2) and (4). The SP must be able to instruct and evaluate IPs, SPs, UTs, PCs, as appropriate, using role-reversal. The SP must also be able to develop and implement a unit-training plan and administer the commander's ATP.

(d) ME. The ME must meet the requirements in paragraph 3-3a(2). The ME must be able to instruct and evaluate other MEs and MTPs using role reversal when required.

b. **Academic evaluation criteria.**

(1) Proficiency flight evaluation (PFE). The commander or representative selects the appropriate topics to be evaluated from paragraph 3-4b that applies.

(2) APART standardization evaluation. The SP/IP evaluates a minimum of two topics from the subject areas in paragraph 3-4b that apply.

(3) APART instrument evaluation. The IE evaluates a minimum of two topics from the subject areas in paragraphs 3-4b (1) through (3) relative to instrument meteorological conditions (IMC) flight.

(4) Annual NVG evaluation. The NVG SP/IP evaluates a minimum of two topics from the subject areas in paragraph 3-4b that apply.

(5) APART MTP/ME evaluation. The ME evaluates a minimum of two topics from the subject areas in paragraphs 3-4b(1) through (4) and (8) with specific emphasis on how they apply to maintenance test flights.

(6) Other ATP evaluations. The SP/IP will evaluate a minimum of two topics from the subject areas in paragraph 3-4b that apply.

3-4. EVALUATION SEQUENCE.

a. **Phase l—Introduction.** In this phase, the evaluator will—

(1) Review the examinee's individual flight records folder and IATF to verify that the examinee meets all prerequisites for designation and has a current DA Form 4186 (Medical Recommendation for Flying Duty).

(2) Confirm the purpose of the evaluation, explain the evaluation procedure, and discuss the evaluation standards and criteria to be used.

(a) If the evaluation is for an evaluator, the individual conducting the evaluation must explain that the examinee’s ability to apply the learning and teaching process outlined in the instructor pilot handbook will be evaluated.

(b) For UTs, the evaluation will include special emphasis on the examinee’s performance in those areas in which UT duties are performed. The evaluation should ensure that the examinee can safely and effectively perform UT duties.

b. **Phase 2—academic evaluation topics**.

(1) Regulations and publications (AR 40-8, AR 95-1 and AR 95-2; Department of the Army Pamphlet [DA Pam] 738-75l; Department of Defense [DOD] flight information publication [FLIP]; FM 3-04.140, TC 3-04.11, and local SOPs and regulations). Topics in this subject area are—

- ATP requirements.
- Aviation life support equipment.
- SOP/tactical standing operating procedure requirements.
- Flight plan preparation and filing.
- DOD FLIP and maps.
- Range operations and safety.
- Visual flight rules (VFR) minimums and procedures.
- Local airspace usage.
- Publications required in the aircraft.

(2) Operating limitations and restrictions (Technical Manual [TM] 1-1520-248-10). Topics in this subject area are—

- General.
- System limits.
- Power limits.
- Loading limits.
- Airspeed limits.
- Maneuvering limits.
- Environmental restrictions
- Airworthiness release (AWR) limits.
- Performance chart interpretation.
- Weight and balance requirements.
- Weapon systems limitations.
- Laser limitations.
- Notes, cautions, and warnings.

(3) Aircraft emergency procedures and malfunctions (TM 1-1520-248-10). Topics in this subject area are—

- Definition of emergency terms.
- Engine malfunctions and restart procedures.
- Rotor, transmission, and drive systems.
- Tail rotor malfunctions.
- Chip detectors.
- Smoke and fume elimination.
- Hydraulic system malfunction.
- Fuel system malfunction.
- Electrical system malfunctions.
- Caution and warning emergency procedures.
- Landing and ditching procedures.

- Flight controls malfunctions.
- Weapon systems malfunctions.

(4) Fundamentals of Flight (FM 3-04.203 and TM 1-1520-248-10). Topics in this subject area are—

- Transient torque.
- Dynamic rollover.
- Settling with power.
- Mushing.

(5) Tactical and mission operations (FM 3-04.126, ATP 3-09.32, FM 3-20.96, FM 3-04.140 FM 3-04.203, FM 1-02, TC 3-04.11, and unit SOP). Topics in this subject area are—

- Reconnaissance operations (purpose and fundamentals).
- Security operations (purpose and fundamentals).
- Attack planning and terrain analysis.
- Tactical formations and fire control.
- Fire support and joint air attack operations.
- Interpretation of tactical overlays.
- Identification of major United States or allied equipment and major threat equipment expected to be in the area of operation.

(6) Weapon system operation and deployment (FM 3-04.126, FM 3-04.140, and TM 1-1520-248-10). Topics in this subject area are—

- Hellfire weapon system (lock-on before launch [LOBL]/lock-on after launch [LOAL]).
- 50-caliber system.
- 2.75-inch rocket system.
- Hellfire missile characteristics.
- 50-caliber ammunition characteristics.
- Hydra 70 rocket characteristics.
- Ballistics.
- Laser operations (range/designator).

(7) Night/NVG mission operation and deployment (FM 3-04.140 and FM 3-04.203; TM 1-1520-248-10). Topics in this subject area are—

- Aircrew night/NVG requirements.
- Night vision limitations and techniques.
- Distance estimation and depth perception.
- Infrared characteristics.
- NVG operational considerations
- Aviator's night vision imaging system display symbology subsystem (ADSS) flight symbology and modes.

(8) Maintenance test pilot (TM 1-1520-248-MTF, TM 1-1520-248-23, TM 1-1500-328-23, TM 1-2840-263-23, DA Pam 738-751, AR 700-138, TC 3-04.7, and TM 1-1500-204-23-4). Topics in this subject area are—

- Maintenance management.

- Functional flight checks.
- Maintenance operational checks.
- Maintenance test flights.
- Maintenance test flight forms and records.
- Test flight weather requirements.
- Local airspace usage.
- Power train.
- Hydraulic system.
- Flight controls.
- Main rotor smoothing.
- Tail rotor balancing.
- Communication and navigation equipment.
- Compass calibration.

c. **Phase 3—Flight evaluation.** This phase consists of a crew briefing, a preflight inspection; engine-start, runup, and hover procedures; flight tasks; and engine shutdown and after-landing tasks.

(1) Briefing. The evaluator will explain the flight evaluation procedure and tell the examinee which tasks to perform. When evaluating an evaluator, the individual conducting the evaluation must advise the examinee that the evaluator may deliberately perform some tasks not according to standard to check the examinee's diagnostic and corrective action skills. In addition, the evaluator will conduct or have the examinee conduct a crew briefing that includes, as a minimum, the items listed below.

(a) Mission.

(b) Weather.

(c) Flight route.

(d) Performance data.

(e) Transfer of flight controls.

(f) Crew duties, to include emergency duties.

(g) Procedures for conducting simulated emergencies.

(h) Postcrash rendezvous point.

Note. Refer to TM 1-1520-248-10 and local directives for additional crew briefing requirements.

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(2) Preflight inspection and engine-start, runup, hover, and before-takeoff checks. The evaluator will evaluate the examinee's use of TM 1-1520-248-CL or TM 1-1520-248-MTF. The evaluator also will have the examinee properly identify at least two aircraft components and two weapon system components, if installed, and discuss their functions.

(3) Flight tasks. As a minimum, the evaluator will evaluate those tasks identified in chapter 2 as mandatory for the designated crew station and those mission or additional tasks selected by the commander for evaluation. The evaluator may randomly select for evaluation any tasks listed on the mission or additional task list established by the commander. An evaluator must demonstrate an ability to evaluate and instruct appropriate flight tasks. When used as part of the proficiency flight evaluation, the evaluation may include an orientation of the local area, checkpoints, weather, and other pertinent

information. All MTF tasks are mandatory for an MTF standardization evaluation.

(4) Engine shutdown and after-landing tasks. The evaluator will evaluate the examinee's use of TM 1-1520-248-CL or TM 1-1520-248-MTF.

d. **Phase 4—debriefing.** During this phase, the evaluator will—

(1) Discuss, with the examinee, the examinee's strengths and weaknesses.

(2) Offer the examinee recommendations for improvement.

(3) Inform the examinee whether the evaluation was a pass or fail.

(4) Complete the applicable DA forms per instructions in TC 3-04.11.

3-5. PROFICIENCY FLIGHT EVALUATION. This evaluation is conducted per AR 95-1. Tasks to be completed during a PFE are those designated by the commander. After the evaluation, the IP/SP will debrief the examinee and complete the applicable forms per instructions in TC 3-04.11.

3-6. ANNUAL NIGHT VISION GOGGLES FLIGHT EVALUATION. This evaluation is conducted per this manual, TC 3-04.11 and the commander's task list. The evaluation will include all base tasks indicated by an “NG” in the Eval column of table 2-1 and any iterations of mission tasks listed in table 2-2, page 2-7, and any additional tasks as determined by the commander. Crewmembers designated NVG RL-1, to include those removed from RL-1 due to a training deficiency must complete the annual NVG flight evaluation as established by the commander and listed on the CTL. After the evaluation, the IP or SP will debrief the examinee and complete the applicable forms per instructions in TC 3-04.11.

3-7. POST ACCIDENT FLIGHT EVALUATION. This evaluation is conducted per AR 95-1 and TC 3-04.11. After the evaluation, the IP or SP will debrief the examinee and complete the applicable forms per instructions in TC 3-04.11.

3-8. MEDICAL FLIGHT EVALUATION. This evaluation is conducted per AR 95-1 and TC 3.04.11 and measures the examinee's ability to perform ATM tasks after incurring a disability. The IP or SP, on the recommendation of the flight surgeon, will require the examinee to perform a series of tasks most affected by the examinee's disability. After the examinee has completed the medical flight evaluation, the evaluator will document the evaluation per TC 3-04.11 and provide the results to the commander and flight surgeon for appropriate disposition.

3-9. NO-NOTICE EVALUATION. This evaluation is conducted per AR 95-1 and TC 3-04.11. After the evaluation, the evaluator will debrief the examinee and complete the applicable forms per instructions in TC 3-04.11.

3-10. COMMANDER'S EVALUATION. This evaluation is conducted per TC 3-04.11. After the evaluation, the evaluator will debrief the examinee and complete the applicable forms per the instructions in TC 3-04.11.

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Chapter 4
Crewmember Tasks

This chapter implements portions of Standardization Agreement 3114.

This chapter describes those maneuvers and procedures that are essential for maintaining crewmember skills. It does not contain all the maneuvers that can be performed in the aircraft. Some tasks that must be done during required training or evaluation flights may not be mandatory for other flights.

Note. Task 1304 is not mandatory for all flights; however, aviators must complete this task when their training/mission involves it or when the instructor or evaluator requires it.

4-1. TASK CONTENTS.

a. **Task number.** Each ATM task is identified by a ten-digit systems approach to training number. The first three digits of each task in this ATM are 011 (U.S. Army Aviation School); the second three digits are 248 (OH-58D Kiowa Warrior). For convenience, only the last four digits are listed in this training circular. The last four digits of—

- Base tasks are assigned 1000-series numbers.
- Mission tasks are assigned 2000-series numbers.
- Maintenance tasks are assigned 4000-series numbers.

Note. Additional tasks designed by the commander as mission essential are not included in this ATM. The commander will develop conditions, standards, and descriptions for those additional tasks.

b. **Conditions.** The conditions specify the situation in which the task will be performed. They describe the important aspects of the performance environment. References to OH-58D helicopters apply to all OH-58D design helicopters. Reference will be made to a particular helicopter within a design series when necessary. All conditions must be met before task iterations can be credited.

(1) Common conditions are—

(a) In a mission aircraft with mission equipment and crew, items required by AR 95-1 and required publications (operator's manual, checklist, navigational and terrain maps).

(b) Under visual or instrument meteorological conditions.

(c) Day, night, and night vision device employment.

(d) In any terrain or climate.

(2) Common training/evaluation conditions are—

(a) When a UT, IP, SP, IE, or ME is required for the training of the task, then that individual will be at one set of the flight controls while the training is performed. References to IP in the task conditions

include SP.

(b) The following tasks require an IP or SP for training/evaluation in the aircraft.

- **Task 1072, Respond to Engine Failure at a Hover.**
- **Task 1074, Respond to Engine Failure at Cruise Flight.**
- **Task 1078, Respond to Stability and Control Augmentation System Malfunction.**
- **Task 1082, Perform Autorotation.**
- **Task 1103, Respond to Full Authority Digital Electronic Control Failure.**

(3) Unless otherwise specified in the conditions, all in-flight training and evaluation will be conducted under visual meteorological conditions (VMC). Simulated IMC denotes flight solely by reference to flight instruments/symbology.

(4) Tasks requiring specialized equipment do not apply to aircraft that do not have the equipment installed.

(5) NVG use may be a condition for any flight task, unless otherwise noted. When NVG are listed as a condition, task standards will be the same as those described for performance of the task without using NVG.

c. **Standards.** The standards describe the minimum degree of proficiency or standard of performance to which the task must be accomplished. The terms, "without error," "properly," and "correctly" apply to all standards. The standards are based on ideal conditions. Task descriptions may contain required elements for satisfactory completion of a given task. Crew actions specified in the description are required to satisfactorily perform crew coordination. **It is essential for the PC to brief specific duties before entering the aircraft. The ability for either crewmember to perform most aircraft/system functions breaks down the standard delineation of duties. This could mean that during an unforeseen event, one crewmember might attempt to resolve the situation alone rather than by seeking assistance from the other crewmember.** Some standards are common to several tasks. The following standards apply to all tasks:

(1) All tasks.

(a) Perform crew coordination actions per chapter 6 and the task description.

(b) Apply appropriate environmental considerations.

(2) All tasks with the engine operating.

(a) Maintain airspace surveillance.

(b) The pilot on the controls (P*) will announce intent to perform a specific maneuver or aircraft movement.

(c) The P* will announce all takeoff and landings.

d. **Description.** The description explains the required method for accomplishing the task to meet the standards. This manual cannot address all situations and alternate procedures that may be required. Tasks may be accomplished using other techniques, as long as the task is done safely and the standards are met. These actions apply in all modes of flight during day, night, IMC, NVG, or CBRN operations. When specific crew actions are required, the task will be broken down into crew actions and procedures as follows:

(1) Crew actions. These define the portions of a task performed by each crewmember to ensure safe,

efficient, and effective task execution. The designations for P*and pilot not on the controls (P), do not refer to PC duties. When required, PC responsibilities are specified. For all tasks, the following responsibilities apply:

(a) Both crewmembers. Perform crew coordination actions and announce malfunctions or emergency conditions. Monitor engine and system operations and avionics (navigation and communication), as necessary. During VMC, focus attention primarily outside the aircraft, maintain airspace surveillance, and clear the aircraft. Provide timely warning of traffic and obstacles by announcing the type of hazard, direction, distance, and altitude. Crewmembers also announce when attention is focused inside the aircraft (except for momentary scans for example, during crosschecks) and when attention is focused back outside. Chapter 6 contains examples of crew callouts and guidance on cockpit coordination.

(b) The PC. The PC is responsible for the overall conduct of the mission, as well as for operating, securing, and servicing the aircraft he or she commands. The PC will ensure that a crew briefing is accomplished and that the mission is performed per air traffic control (ATC) instructions, regulations, and SOP requirements.

(c) The PI. The PI is responsible for completing tasks as assigned by the PC.

(d) The P*. The P* is responsible for aircraft control, obstacle avoidance, and the proper execution of emergency procedures. The P* will announce any deviation, and the reason, from instructions issued from ATC. The P* will announce changes in altitude, attitude, airspeed, or direction.

(e) The P. The P is responsible for navigation, in-flight computations, and assisting the P* as requested. When duties permit, assist the P* with obstacle avoidance.

(f) The trainer/evaluator. When acting as PI during training and evaluations, the trainer/evaluator will act as a functioning crewmember and perform as required, unless he is training or evaluating crewmember response to an ineffective crewmember. In the aircraft, this individual will ensure safe landing areas are available for engine failure training and that aircraft limits are not exceeded.

(g) Additional crew actions. The tasks specify additional crew actions, if any, necessary to successfully accomplish the task.

(2) Procedures. This section explains the portions of a task that an individual or crew accomplishes. The procedures are an important element in standardization and training; however, they should not be construed to be the grading standard, but rather a means to meet the standard. Procedures are flexible enough to allow the P* to use judgment for minor deviations as long as the standards are met.

e. **Considerations.** This section defines considerations for task accomplishment under various conditions (for example, night or NVG, or snow/sand/dust). The inclusion of environmental considerations in a task does not relieve the commander of the requirement for developing an environmental training program per TC 3-04.11. Common night/NVG considerations are listed below and will be applied to tasks conducted in N/NVG environments. Training considerations establish specific actions and standards used in the training environment.

(1) Night and NVG. Wires and other hazards are much more difficult to detect and must be accurately marked and plotted on maps. Use proper scanning techniques to detect traffic and obstacles and to avoid spatial disorientation. The P should make all internal checks (for example, computations and frequency changes). Visual barriers (areas so dimly viewable that a determination cannot be made if they contain barriers or obstacles) will be treated as physical obstacles. Altitude and ground speed are difficult to detect and use of artificial illumination may sometimes be necessary. Determine the need for artificial lighting prior to descending below barriers. Adjust search/landing light for best illumination angle without causing

excessive reflection into the cockpit. Entering IMC with artificial illumination may induce spatial disorientation. Cockpit controls will be more difficult to locate and identify. Take special precautions to identify and confirm the correct switches/buttons.

(2) Night unaided. Use of the white light or weapons flash will impair night vision. The P* should not view white lights, weapons flash, or ordnance impact directly. Allow time for dark adaptation or, if necessary, adjust altitude and airspeed until adapted. Exercise added caution if performing flight tasks before reaching full dark adaptation. Dimly visible objects may be more easily detected using peripheral vision, but may tend to disappear when viewed directly. Use proper viewing techniques to locate and orient on objects.

(3) NVG. Use of NVG degrades distance estimation and depth perception. Aircraft in flight may appear closer than they actually are, due to the amplification of navigation lights and the lack of background objects to assist in distance estimation and depth perception. If possible, confirm the distance unaided. Weapons flash may temporarily impair or shut down NVG.

(4) Snow/sand/dust. FM 3-04.203 outlines procedures for reducing hazards associated with the loss of visual references during takeoff or landing due to blowing snow, sand, or dust (or any other obscuration).

(5) Mountainous terrain. FM 3-04.203 outlines procedures and techniques associated with high altitude mountainous terrain and hazards associated with aircraft performance, high winds and navigation.

f. **Training and evaluation requirements.** Training and evaluation requirements define whether the task will be trained or evaluated such as in the aircraft, or academic environment. Training and evaluations will be conducted only in the listed environments, but may be done in any or all combinations. Listing aircraft and/or simulator under evaluation requirements does not preclude the IP from evaluating elements of the task academically to determine depth of understanding or planning processes. The evaluation must include hands-on performance of the task. Table 2-1, page 2-4, lists the modes of flight in which the task must be evaluated. The commander may also select mission and/or additional tasks for evaluation.

g. **References.** The references are sources of information relating to that particular task. Many references are common to several tasks. Unless otherwise specified in the individual task, the references below apply. Alternate or additional references will be listed in individual tasks.

(1) All flight tasks (with engine operating).

(a) AR 95-1.

(b) TM 1-1520-248-10.

(c) TM 1-1520-248-CL.

(d) DOD FLIP.

(e) Title 14 Code of Federal Regulation (CFR)/host country regulations.

(f) Unit/local SOPs.

(g) Aircraft logbook.

(2) All instrument tasks.

(a) AR 95-1.

(b) FM 3-04.240.

(c) DOD FLIP.

(d) Aeronautical Information Manual.

(3) All tasks with environmental considerations. FM 3-04.203.

(4) All tasks used in a tactical situation.

(a) FM 1-02.

(b) FM 3-04.126.

(c) FM 3-04.140.

(d) ATP 3-09.32.

(e) FM 3-25.26.

(f) FM 6-30.

(g) FM 3-20.96.

4-2. TASKS

a. **Standards versus descriptions.** Descriptions contain required elements for satisfactory completion of a given task. Crew actions specified in the description are required to satisfactorily perform crew coordination. Attention to the use of the words will, should, shall, must, can, or may throughout the text of a task description is crucial.

b. **Critical tasks.** The following numbered tasks are OH-58D aviator critical tasks.

TASK 1000

Participate in a Crew Mission Briefing

CONDITIONS: Before flight in an OH-58D with a completed DA Form 5484 (Mission Schedule/Briefing) and a unit-approved crew briefing checklist.

STANDARDS:

1. The PC will actively participate in and acknowledge an understanding of DA Form 5484.

2. The crewmember receiving the crew/mission brief will verbally acknowledge a complete understanding of the crew/mission briefing.

3. The PC will conduct or supervise a crew briefing using a unit-approved crew briefing checklist.

DESCRIPTION:

1. Crew actions.

   a. A designated briefing officer will brief key areas of the mission to the PC in accordance with AR 95-1. The PC will acknowledge a complete understanding of the mission brief and initial DA Form 5484. The PC has overall responsibility for the crew mission briefing.

   b. The crewmember being briefed will address any questions to the briefer and will acknowledge understanding of the assigned actions, duties, and responsibilities. Lessons learned from previous debriefings should be addressed as applicable during the crew briefing.

2. Procedures. The PC and/or crew will receive the mission briefing/DA Form 5484 from a designated briefing officer. The PC will ensure that a crew briefing is completed prior to the mission/flight. Table 4-1 provides the suggested format for a crew briefing checklist. Identify mission and flight requirements that will demand effective communication and proper sequencing and timing of actions by the crewmembers.

Table 4-1. Crew briefing checklist

1. Mission overview.
2. Flight route.
3. Weather. Departure, en route, destination, and void time.
4. Required items, mission equipment, and personnel.
5. Analysis of the aircraft.
a. Logbook and preflight deficiencies.
b. Performance planning.
c. Mission deviations required based on aircraft analysis.
6. Crew actions, duties, and responsibilities.
a. Transfer of flight controls and two challenge rule P*.
b. Assign scan sectors.
c. Mission considerations.
d. Emergency actions

Table 4-1. Crew briefing checklist

(1) Actions to be performed by P* and P.
(2) Inadvertent instrument meteorological conditions (IIMC).
(3) Egress procedures and rendezvous point.
(4) Injured crewmember removal.
(5) NVG failure.
(6) Weapons malfunctions.
(7) Mission considerations.
7. General crew duties.
a. Pilot on the controls.
(1) Fly the aircraft-primary focus outside when VMC, inside when IMC.
(2) Avoid traffic and obstacles.
(3) Cross-check systems and instruments.
(4) Monitor/transmit on radios as directed by the PC.
b. Pilot not on the controls.
(1) Assist in traffic and obstacle avoidance.
(2) Tune radios and set transponder.
(3) Navigate.
(4) Copy clearances, automatic terminal information service, and other information.
(5) Cross-check systems and instruments.
(6) Monitor/transmit on radios as directed by the PC.
(7) Read and complete checklist items as required.
(8) Set/adjust switches and systems as required.
(9) Announce when focused inside for more than five seconds under VMC.
8. Risk assessment considerations.
9. Crewmembers' questions, comments, and acknowledgment of mission briefing.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

TASK 1004

Plan a Visual Flight Rules Flight

CONDITIONS: Before flight in an OH-58D helicopter and given access to weather information; notices to airmen (NOTAMs); flight planning aids; necessary charts, forms, publications; and weight and balance information.

STANDARDS:

1. Determine if the aircrew and aircraft are capable of completing the assigned mission.

2. Determine if the flight can be performed under VFR conditions per AR 95-1, applicable CFRs/host nation regulations, local regulations and unit SOP.

3. Determine the correct departure, en route, and destination procedures.

4. Select route(s) and altitudes that avoid hazardous weather conditions; do not exceed aircraft or equipment limitations and conform to VFR cruising altitudes per DOD FLIP.

5. For cross-country flights, determine the distance ±1 nautical mile, true airspeed ±5 knots, ground speed ±5 knots, and estimated time en route (ETE) ±3 minutes for each leg of the flight. Compute magnetic heading(s) ±5 degrees.

6. Determine the fuel required per AR 95-1, ±25 pounds.

7. Ensure that the aircraft weight and center of gravity (CG) will remain within allowable limits for the entire flight.

8. Complete and file the flight plan per AR 95-1 and DOD FLIP.

9. Perform mission risk assessment per unit SOP.

DESCRIPTION:

1. Crew actions.

   a. The PC will ensure that the PI is current and qualified to perform the mission, and that the aircraft is equipped to accomplish the assigned mission. The PC may direct the PI to complete some portions of the VFR flight planning.

   b. The PI will complete all assigned elements and report the results to the PC.

2. Procedures. Using appropriate military, Federal Aviation Administration (FAA), or host-country weather facilities, obtain information about the weather. After ensuring that the flight can be completed under VFR, check NOTAMs, chart updating manuals (CHUMs), and other appropriate sources for any restrictions that may apply to the flight. Obtain navigational charts that cover the entire flight area, and allow for changes in routing that may be required because of weather or terrain. Select the course(s) and altitude(s) that will best facilitate mission accomplishment. Use a CPU-26A/P computer, flight planning software, or aviation mission planning system (AMPS) to determine the magnetic heading, ground speed, and ETE for each leg. Compute total distance and flight time, and calculate the required fuel using the appropriate charts in TM 1-1520-248-10. Determine if the duplicate weight and balance forms in the aircraft logbook apply to the aircraft configuration. Verify that the aircraft weight and CG will remain within allowable limits for the entire flight. Complete the flight plan and file it with the appropriate agency.

NIGHT OR NVG CONSIDERATIONS: Checkpoints used during the day may not be suitable for night or NVG use.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

TASK 1010

Prepare a Performance Planning Card

CONDITIONS: Given a completed DD Form 365-4 (Weight and Balance Clearance Form); TM 1-1520-248-10; environmental conditions at departure, cruise, maximum during the mission, and landing; and a blank performance planning card (PPC).

STANDARD: Complete the PPC according to procedures given in TM 1-1520-248-10, current airworthiness release (AWR) instructions, and the description below.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will ensure that the necessary performance data is available to complete the mission. The PC must ensure that aircraft limitations and capabilities are not exceeded.

   b. The pilot (PI) will assist the PC as directed.

2. Procedures. The PPC is used as an aid to organize performance planning data. Current aviation and missile command (AMCOM) approved PPC programs may be used to obtain performance planning data. The aircraft's performance planning software does not preclude the need for the crew to assess performance planning during the mission planning sequence. The crew will assess performance planning prior to launch. The software in the aircraft can be used for confirming previously calculated data, to update data during flight, and for mission changes. Figure 4-1, page 4-13, depicts a sample OH-58D PPC.

   a. Departure/maximum data.

      Item 1–Take off Pressure altitude (PA). Record the pressure altitude at the departure point at the estimated time of departure.

      Item 2–Take off Free air temperature (FAT). Record the temperature at the departure point at the estimated time of departure.

      Item 3–Maximum PA. Record the forecasted maximum pressure altitude for the duration of the mission.

      Item 4–Maximum FAT. Record the forecasted maximum temperature for the duration of the mission.

      Item 5–Planned T/O weight. Record the gross weight of the aircraft at departure.

      Item 6–Planned max weight. Record the heaviest gross weight that may occur for the duration of the mission. For example, if the mission includes forward arming refueling point (FARP) operations, the maximum weight would include the ammunition and fuel that may be loaded. This may or may not be the same as the takeoff gross weight.

      Item 7–Fuel required. Record the estimated fuel required (including reserve) at takeoff to complete the mission.

      Item 8–(Optional) Used to record the maximum allowable fuel weight at takeoff if fuel must be limited to meet takeoff IGE maximum gross weight requirements.

      Item 9–(Optional) Used to record the maximum allowable fuel weight at takeoff if fuel must be limited to meet takeoff OGE maximum gross weight requirements.

Item 10–(Optional) Circle the appropriate lateral center of gravity (CG) condition.

Item 11–Maximum torque available—30 minutes at take off (T/O). Using the maximum PA and maximum FAT, determine and record the maximum torque available for 30 minute operation.

Item 12–Maximum torque available—–continuous. Using the maximum PA and maximum FAT, determine and record the maximum torque available for continuous operation.

Item 13–Predicted hover torque—at takeoff—in ground effect (IGE). Using the departure conditions and the takeoff gross weight, determine the estimated mast torque required to hover in ground effect (3 feet).

Item 14–Predicted hover torque—max condition—IGE. Using the maximum PA, maximum FAT, and the maximum weight (Item 6), determine the estimated mast torque required to hover in ground effect (3 feet).

Item 15–Predicted hover torque—at takeoff—out of ground effect (OGE). Using the departure conditions and the takeoff gross weight, determine the estimated mast torque required to hover out of ground effect.

Item 16–Predicted hover torque—max condition—OGE. Using the maximum PA, maximum FAT, and the maximum weight (Item 6), determine the estimated mast torque required to hover out of ground effect.

Item 17–Maximum allowable gross weight—at takeoff—IGE. Using the departure conditions and the maximum torque available, determine the maximum allowable gross weight. (This may be limited by torque available or by aircraft structural limits.)

Item 18–Maximum allowable gross weight—max condition—IGE. Using the maximum PA, maximum FAT, and the maximum torque available, determine the maximum allowable gross weight. (This may be limited by torque available or by aircraft structural limits.)

Item 19–Maximum allowable gross weight—at takeoff—OGE. Using the departure conditions and the maximum torque available, determine the maximum allowable gross weight. (This may be limited by torque available or by aircraft structural limits.)

Item 20–Maximum allowable gross weight—max condition—OGE. Using the maximum PA, maximum FAT, and the maximum torque available, determine the maximum allowable gross weight. (This may be limited by torque available or by aircraft structural limits.)

b. Cruise data.

Item 21–Altitude. Record the planned cruise altitude.

Item 22–FAT. Record the forecasted or estimated temperature at cruise altitude.

Item 23–Drag square foot (Sq. Ft). Record the net change in square feet of flat plate drag between the standard drag configuration and the configuration to be flown.

Item 24–Torque change for cruise airspeed. Record the predicted increase or decrease in mast torque necessary to maintain cruise airspeed as required for nonstandard drag configurations.

Item 25–Cruise Indicated Airspeed (IAS). Record the planned indicated airspeed for cruise.

Item 26–Cruise Torque. Record the mast torque required to maintain cruise airspeed. This value should be the cruise torque required after the adjustment is made for a nonstandard drag configuration.

Item 27–Cruise Fuel Flow. Record the predicted fuel flow at the torque setting (Item 26) to maintain cruise airspeed.

Item 28–Max Range IAS. Record the indicated airspeed for maximum range. This value is only valid for the standard drag configuration. For nonstandard drag configurations the maximum range torque (Item 29) should be maintained to achieve maximum range.

Item 29–Max Range Torque. Record the mast torque required to maintain maximum range airspeed. Do not adjust this value for nonstandard drag configurations.

Item 30–Max Range Fuel Flow. Record the predicted fuel flow at the torque setting (Item 29) to maintain cruise airspeed.

Item 31–Max Rate of Climb (R/C) or Endurance IAS. Record the indicated airspeed for maximum rate of climb or maximum endurance. For all drag configurations, the maximum endurance torque (Item 32) should be maintained to achieve maximum endurance.

Item 32–Max R/C or Endurance Torque. Record the mast torque required to maintain maximum endurance airspeed. The torque required to achieve maximum rate of climb is this airspeed used with maximum torque available.

Item 33–Max R/C or Endurance Fuel Flow. Record the predicted fuel flow at the torque setting (Item 32) to maintain cruise airspeed.

Item 34–Velocity never exceed (V_{NE})—IAS. Record the indicated airspeed for V_{NE}.

Item 35–(Optional) Velocity never exceed (V_{NE})—Torque. Record the predicted mast torque required to maintain V_{NE} airspeed.

Item 36–(Optional) Velocity never exceed (V_{NE})—Fuel Flow. Record the predicted fuel flow at the torque setting (Item 35) to maintain maximum V_{NE} airspeed.

c. Arrival data. Compute data for separate arrival locations, such as FARP's, airports or other desired locations, if environmental conditions there are higher by 5 degrees C, 500 feet PA, or if aircraft weight will/has increased by 200 pounds. Three separate areas are provided on the performance planning card.

Note. The same PPC will suffice for consecutive takeoffs and landings when the load or environmental conditions have not increased by: 5°C, 500 feet PA, or 200 pounds. The aircraft performance software should be used as necessary to update and assess performance data.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

OH 58D PERFORMANCE PLANNING CARD

For use of this form, see TC 3-04.44; the proponent agency is TRADOC.

Point Name:	DEPARTURE	DTD ID:

CONDITIONS

TAKEOFF PA:	(1)	MAX PA:	(3)
TAKEOFF FAT:	(2)	MAX FAT:	(4)
PLANNED T/O WEIGHT:	(5)	FUEL REQUIRED:	(7)
PLANNED MAX WEIGHT:	(6)	MAX FUEL ALLOWED	
C.G. CONDITION: A. ☑ B. ☐ C. ☐ (10)		IGE: (8)	OGE: (9)

MAX TQ AVAIL		PREDICTED HOVER TQ		MAX ALLOWABLE G.W.	
T/O	MAX	T/O	MAX	T/O	MAX
30 MIN: (11)		IGE: (13)	(14)	IGE: (17)	(18)
CONT: (12)		OGE: (15)	(16)	OGE: (19)	(20)

Point Name:	CRUISE DATA	DTD ID:

CRUISE CONDITIONS		DRAG CORRECTIONS	
ALTITUDE:	(21)	Δ DRAG SQ. FT.	(23)
FAT:	(22)	TQ Δ FOR CRUISE AIRSPEED	(24)

AIRSPEED DATA				NOTES
	IAS	TORQUE	FUEL FLOW	
CRUISE:	(25)	(26)	(27)	
MAX RANGE:	(28)	(29)	(30)	
MAX R/C or END:	(31)	(32)	(33)	
VNE:	(34)	(35)	(36)	

Point Name:	ARRIVAL DATA	DTD ID:

CONDITIONS - PA:	FAT:	LDG GROSS WT:
MAX TQ AVAIL	PREDICTED HOVER TQ	MAX ALLOWABLE G.W.
30 MIN:	IGE:	IGE:
CONT:	OGE:	OGE:

Point Name:	ARRIVAL 2 DATA	DTD ID:

CONDITIONS - PA:	FAT:	LDG GROSS WT:
MAX TQ AVAIL	PREDICTED HOVER TQ	MAX ALLOWABLE G.W.
30 MIN:	IGE:	IGE:
CONT:	OGE:	OGE:

Point Name:	LOCATION DATA	DTD ID:

CONDITIONS - PA:	FAT:	LDG GROSS WT:
MAX TQ AVAIL	PREDICTED HOVER TQ	MAX ALLOWABLE G.W.
30 MIN:	IGE:	IGE:
CONT:	OGE:	OGE:

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Figure 4-1. Sample of DA Form 5701-58-R, page 1

TASK 1012

Verify aircraft weight and balance

CONDITIONS: Given crew weights, aircraft configuration, and aircraft weight and balance information.

STANDARDS:

1. Verify that center of gravity (CG) and gross weight (GWT) remain within aircraft limits for the duration of the flight per TM 1-1520-248-10.
2. Identify all mission or flight limitations imposed by weight or CG.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will brief the pilot (PI) on any limitations.

   b. The PI (if directed) will verify or complete the DD Form 365-4 (*Weight and Balance Clearance Form F-Transport*) and report the results to the PC.

   c. Both crewmembers will continually monitor aircraft loading during the mission (for example, fuel and weapons loading/expenditure) to ensure CG remains within limits.

2. Procedures. Using the completed DD Form 365-4, verify that aircraft GWT and CG will remain within the allowable limits for the entire flight. Note all GWT, loading task/maneuver restrictions/limitations. If there is no completed DD Form 365-4 that meets mission requirements, refer to the unit weight and balance technician, TM 55-1500-342-23, or complete a new DD Form 365-4.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

REFERENCES: Appropriate common references.

TASK 1013

Operate Mission Planning System

CONDITIONS: Given a mission briefing, mission planning system, signal/communications information, weather information, navigational maps, DOD FLIP, intelligence data, and other materials as required.

STANDARDS:

1. Configure and operate the mission planning system.
2. Conduct a map reconnaissance and terrain analysis.
3. Select and enter appropriate navigational data.
4. Select and enter appropriate communication and improved data modem (IDM)/Blue Force Tracker (BFT) data.
5. Enter appropriate weapons data.
6. Enter any additional data to include laser codes, mast-mounted sight (MMS) prepoints, and notebook information.
7. Load mission data to the PC-MCIA card.
8. Print out time, distance, and heading (TDH) cards, waypoint lists, crew cards, communication cards, and kneecards as required.

DESCRIPTION:

1. Crew actions. The PC will assign tasks. The crew receives the mission briefing. Mission data from higher headquarters may be received digitally, in the form of overlay or on paper. One or both crewmembers may enter data into the aviation mission planning system.

2. Procedures. Analyze the mission and mission data. Plan the flight by conducting a map reconnaissance and terrain analysis using the available map database. Terrain analysis may be accomplished by using the topographic view with either the intervisibility plot or height above terrain feature. The profile view and alternate profile view in the mission dialog boxes may be used in this analysis. If mission independent data is provided, waypoint, target, battlefield graphics list, and route information is most easily input via the map. Threat data, if available, should be entered with appropriate values for radius of detection and radius of kill. When detailed information is required for a waypoint or target (for example, an update point or a named area of interest), the mission dialog boxes allow the most precise information to be entered by grid coordinate. Ensure the correct datum is being used on the map and in the mission dialog boxes. IDM/BFT and communication databases should remain relatively unchanged after initial input of unit data. Enter appropriate frequencies, callsigns, and expanders or select them from the appropriate database. Determine communications requirements and build radio presets, IDM/BFT initialization information, and HaveQuick frequencies. Enter laser codes, MMS prepoints, notebook data, and appropriate weapons data. The input of weapons data does not reduce the need for a weapons initialization once the crew is in the aircraft. Ensure the correct aircraft software version is selected, and download mission(s) to the PC-MCIA cards. Print out waypoint cards, communication cards, kneecards, and TDH cards as required.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

TASK 1014

Operate Aviation Life Support Equipment

CONDITIONS: Given the appropriate ALSE for the mission.

STANDARDS: Inspect/perform operational checks on ALSE IAW operator's manual and unit SOP.

DESCRIPTION:

1. Crew actions. PC will verify that all required ALSE equipment is onboard the aircraft before takeoff.

2. Procedures. Based on mission requirements, obtain the required ALSE to include personal flight gear (helmet, vest, survival radio, and any other required items). Verify equipment serviceability and current inspection dates. Perform required operational checks. Secure the required ALSE in the aircraft per the operator's manual and the unit SOP.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.

2. Evaluation will be conducted academically.

TASK 1022

Perform Pre-Flight Inspection

CONDITIONS: Given an OH-58D helicopter and log book.

STANDARDS:

1. Perform the pre-flight inspections of the aircraft and armament per the appropriate technical manuals.

2. Follow armament safety and aircraft grounding procedures.

3. Review and enter the appropriate information on DA Form 2408-12 (Army Aviator's flight Record, DA Form 2408-13 (Aircraft Status Information Record), DA Form 2408-13-1 (Aircraft Maintenance and Inspection Record), DA Form 2408-18 (Equipment Inspection List), and local forms as required.

DESCRIPTION:

1. Crew actions.

   a. The PC is responsible for ensuring that a preflight inspection is conducted using the TM 1-1520-248-10/TM 1-1520-248-CL. The PC may direct the PI to complete elements of the aircraft preflight inspection as applicable, and will verify that all checks have been completed. The PC will report any aircraft discrepancies that may affect the mission and enter appropriate information on DA Form 2408-12, DA Form 2408-13, DA Form 2408-13-1, and local forms as required. The PC will perform a walk around inspection prior to aircraft start.

   b. The PI will complete the assigned elements and report the results to the PC.

2. Procedures.

   a. Consider the helicopter armed and approach it from the side to avoid danger areas. Ensure that the aircraft is in an armament safe status and follow grounding procedures prior to continuing further with the preflight.

   b. Ensure the preflight inspections are conducted per the TM 1-1520-248-10/TM 1-1520-248-CL. Verify that all preflight checks have been completed and appropriate information is reviewed and entered on DA Form 2408-12, DA Form 2408-13, DA Form 2408-13-1, DA Form 2408-18, and local forms as required. If circumstances permit, accomplishing preflight inspection during daylight hours allows for a more thorough preflight of the aircraft and equipment. The crew performing the preflight should be aware of any recent maintenance that has occurred and should consider examining those areas in greater detail. For single pilot operations the PC will complete all tasks.

NIGHT OR NVG CONSIDERATIONS: A white or clear lens flashlight should be used if performing the preflight inspection during the hours of darkness. Hydraulic leaks, oil leaks, and other defects are difficult to see using a flashlight with a colored lens.

SNOW/SAND/DUST CONSIDERATIONS: If an aircraft is preflighted other than immediately prior to flight, consideration should be given to reinstalling aircraft covers to prevent accumulation of snow/sand/dust in aircraft and equipment. Ensure all ice/snow accumulations are removed from the aircraft before starting engine.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted at the aircraft.
2. Evaluation will be conducted at the aircraft.

TASK 1024

Perform Before Starting Engine through Before Leaving Helicopter Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS:

1. Perform procedures and checks in accordance with TM 1-1520-248-10/TM 1-1520-248-CL.

2. Enter appropriate information on DA Form 2408-12 (Army Aviator's flight Record, DA Form 2408-13 (Aircraft Status Information Record), DA Form 2408-13-1 (Aircraft Maintenance and Inspection Record), and local forms as required.

3. Complete postflight inspection and ensure the aircraft is secure IAW unit or local SOP.

DESCRIPTION:

1. Crew actions.

   a. Both crewmembers will complete the required checks pertaining to the assigned crew duties using TM 1-1520-248-CL. One or both will clear the area around the aircraft before starting engine.

   b. The P* will announce when starting engine.

   c. The PC will ensure the appropriate information is entered on DA Form 2408-12, DA Form 2408-13, DA Form 2408-13-1, and local forms as required.

   d. The PC will ensure aircraft is secure before departing.

2. Procedures. Perform the before starting engine checks through before leaving helicopter checks per TM 1-1520-248-CL. Crewmembers will use the checklist to complete checks and procedures appropriate to their crew station. Crewmembers will announce any check that involves an action by the opposite crewmember. The opposite station crewmember will reply with an answer that conveys understanding of the check and status in relation to that specific check. Responses that do not clearly communicate action completion or system status should not be used. Upon mission completion, ensure appropriate information is entered on DA Form 2408-12, DA Form 2408-13, DA Form 2408-13-1, and local forms as required and the postflight inspection is completed. Secure the aircraft IAW the unit or local SOP. For single pilot operations the PC will complete all tasks.

NIGHT OR NVG CONSIDERATIONS: Before starting the engine, ensure that all internal and external lights are set. Internal lighting levels must be high enough to easily see the instruments and to start the engines without exceeding operating limitations.

SNOW/SAND/DUST CONSIDERATIONS: Ensure all rotating components and inlets/exhausts are clear of ice and/or snow prior to starting engine.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

TASK 1026

Maintain Airspace Surveillance

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Appropriate common standards and the following:

1. Clear the aircraft and immediately inform the other crewmember of all air traffic, targets, or obstacles that pose a threat to the aircraft.
2. Announce heading, altitude or position changes.
3. Alert wingman and team to all sightings of other aircraft, obstacles, or unknowns that may pose a threat.
4. Acknowledge alerts of aircraft, obstacles or unknowns.
5. Announce when attention will be focused inside the aircraft.

DESCRIPTION:

1. Crew actions.

   a. The PC will brief airspace surveillance performance prior to the flight. The briefing will include areas of responsibility and scan sectors.

   b. The P will inform the P* of any unannounced heading, altitude, attitude or position changes. The P will announce his inability to assist due to concentration inside the aircraft.

   c. When landing, the crew will confirm the suitability of the area and that the aircraft is clear of barriers.

2. Procedures.

   a. Maintain close surveillance of the surrounding airspace. Keep the aircraft clear from other aircraft and obstacles by maintaining visual (close, mid, and far areas) surveillance of the surrounding airspace. Inform the opposite crewmember or other aircraft by voice radio immediately of any air traffic or obstacles that pose, or may pose a threat. Call out the location of traffic or obstacles by the clock position, altitude, and distance method. (The 12 o'clock position is at the nose of the aircraft.) Give distance in kilometers or fractions of kilometers. When reporting air traffic, specify the type of aircraft (fixed-wing [FW] or helicopter) and, if known, the model. Given direction of travel; for example, left to right, right to left, climb, or descent. The altitude of the air traffic should be reported as the same, higher, or lower than the altitude at which you are flying.

   b. Prior to changing altitude or heading, visually clear the aircraft for hazards and obstacles. Hazards and obstacles will be noted by each crewmember and information shared.

   c. Prior to performing a descending flight maneuver, it may sometimes be desirable to perform a clearing "S" turn to the left or right. The clearing "S" turn will provide the aircrew with a greater visual scan area.

NIGHT OR NIGHT VISION DEVICE CONSIDERATIONS: The use of proper scanning techniques will assist in detecting traffic, obstacles, and in avoiding spatial disorientation. Hazards such as wires are difficult to detect.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1028

Perform Hover Power Check

CONDITIONS: In an OH-58D helicopter with performance planning information available.

STANDARDS:

1. Perform the hover power check near the takeoff point and in the direction of takeoff.

2. Maintain a stabilized 3-foot hover, ±1 foot, and determine that sufficient power is available to complete the mission.

DESCRIPTION:

1. Crew actions.

   a. The PC will determine if the aircraft is capable of completing the assigned mission and ensure that aircraft limitations will not be exceeded.

   b. The P* will remain primarily focused outside the aircraft to maintain clearance and announce when the aircraft is stabilized at the appropriate hover height.

   c. The P will monitor the aircraft instruments. The P will announce hover torque and maximum torque available and alert the P* of the difference. The P will announce when the power check is complete.

2. Procedures. Anytime the load or environmental conditions increase by 5 degrees Celsius, 500 feet PA, or 200 pounds aircraft weight, additional hover power checks must be performed. While near the intended takeoff point and in the direction of takeoff, establish a stabilized 3-foot hover. Compare the actual mast torque required to hover with the predicted maximum torque available. Depending on the torque differential, the following maneuver restrictions apply:

   a. Less than 5 percent torque differential. Ensure that adequate room exists for takeoff with minimum or existing power. The destination must allow a normal or shallower-than-normal approach to landing areas with a surface, which will permit a descent to the ground if necessary.

   b. A 5 to 9 percent torque differential. Normal approaches and takeoffs may be performed.

   c. A 10 to 14 percent torque differential. Steep approaches and instrument takeoffs may be performed.

   d. A 15 percent or more torque differential. Takeoff and landing restrictions do not apply.

   e. The aircrew will not attempt the tasks or task elements (or perform any other maneuver requiring an OGE hover) listed below when the torque differential is less than 15 percent unless an OGE hover power check is successfully completed.

   - **Task 1407, Perform Terrain Flight Takeoff.**
   - **Task 1408, Perform Terrain Flight** (Nap of the earth flight altitudes only)**.**
   - **Task 1409, Perform Terrain Flight Approach.**
   - **Task 1411, Perform Terrain Flight Deceleration** (Nap of the earth flight altitudes only)**.**
   - **Task 2125, Perform Pinnacle Ridgeline Operations.**
   - **Task 2129, Perform Combat Position Operations.**
   - **Task 2410, Perform Masking And Unmasking.**

NIGHT OR NVG CONSIDERATIONS: Use proper scanning techniques to avoid spatial disorientation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1030

Perform Hover Out-of-Ground Effect Check

CONDITIONS: In an OH-58D with the aircraft heading into the wind.

STANDARDS:

1. Do not allow drift to exceed 10 feet during the ascent, descent, or while at a hover.
2. Maintain heading ±10 degrees.
3. Establish a hover altitude of 50 feet or above surrounding obstacles, whichever is higher, ±10 feet.
4. Maintain a constant rate of turn, not to exceed 90 degrees in 4 seconds, while performing the required 360-degree left pedal turn.
5. Determine if aircraft power and controllability are sufficient.
6. Do not exceed 200 feet per minute (fpm) during the vertical descent.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will acknowledge all drift and obstacle clearance advisories given by the P.

   b. The P will provide drift and obstacle information to the P* and will note the mast torque, engine torque, and target (TGT) values observed. The P will warn the P* if it appears that limitations may be exceeded.

2. Procedures. An OGE hover check should be verified anytime aircraft controllability or power is in doubt. Vertically ascend to 50 feet or above surrounding obstacles, whichever is higher. This is to ensure that the aircraft is OGE, and that it is in the full effects of the wind. Constantly monitor TGT, mast torque, engine torque, and aircraft instruments while not exceeding any limitations. Execute a constant 360-degree left pedal turn while checking aircraft power and controllability. During descent do not allow rate to exceed 200 fpm to avoid unwanted power applications or abrupt ground contact. Terminate the maneuver at an IGE hover, on the ground, or as required.

> ***Note.*** The position box is not adequate for obstacle avoidance and should not be used as the sole position reference.

NIGHT OR NVG CONSIDERATIONS: If possible, select an area with good ground contrast and several reference points that are of the same height or higher than the OGE hover. Under NVG, this procedure helps in maintaining a constant altitude and position over the ground during turns. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1032

Perform Radio Communication Procedures

CONDITIONS: In an OH-58D helicopter.

STANDARDS:

1. Check and operate aircraft radios.
2. Establish and maintain radio contact with the desired unit or ATC facility using standard phraseology.
3. Operate the intercom system.
4. Recognize and respond to incidents of interference, jamming or intrusion.
5. Describe the procedures for two-way radio failure per the flight information handbook (FIH), host country regulation, or unit SOP as applicable.

DESCRIPTION:

1. Crew actions.

   a. The PC will assign radio frequencies per mission requirements during the crew briefing and will indicate which crewmember will establish and maintain communications.

   b. For multiaircraft operations the air mission commander (AMC) will assign radio frequencies per mission requirements during the team briefing.

   c. The P* remains focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will maintain communications on the assigned radios.

   d. he P will monitor radios and perform frequency changes as directed and will copy/read pertinent information as requested by the P*. In case of two-way radio failure, the P will attempt to reestablish communication.

2. Procedures.

   a. Set radios, frequencies, and digital nets as required. Copy pertinent information. Select the proper frequency on the remote frequency display or satellite communication (SATCOM) radio as required/directed. Continuously monitor the radios as directed by the PC. Monitor the frequency before transmitting. Use the correct radio callsign when acknowledging each communication. When advised to change frequencies, acknowledge the instructions. Select, or request the other crewmember to select, the new frequency as soon as possible unless instructed to do so at a specified time, control measure, fix, or altitude. Use standard radio communication procedures, terms, and phraseology as appropriate for the area and type of operations.

   b. Tactical considerations. Operational environments require aircrews to maintain communications with tactical units and ATC using both secure and nonsecure communications. The best method for voice communication in a tactical environment is to operate using frequency modulated (FM) frequency hopping secure mode, however it will likely not be possible to maintain all internal and external communications on FM radios alone. The unit SOP and crew/team briefing should address the division of radio responsibilities for the team as well as primary and alternate internal radios/frequencies and other contingencies. In a high OPTEMO environment the ability to transmit clearly and concisely will eliminate confusion and reduce transmission times. Using approved communication phraseology, code words and brevity is also required.

As a general rule transmission times should be limited to ten seconds which exercises good radio discipline and allows for other urgent transmissions on the net. If it is necessary to use nonsecure radios avoid transmitting friendly force information such as unit identification, frequencies, callsigns, locations, and names of personnel. If unexplained or suspected enemy interference, jamming or intrusion is encountered keep accurate and detailed accounts of the incidents and use a secure communication means to report the incident as soon as practicable. Antijamming procedures will depend on the type of jamming encountered and may include using FM frequency hopping, HaveQuick, SATCOM, or digital communications. In situations where jamming is encountered aircrews will need to coordinate with other aircraft per the unit SOP to ensure positive communications are maintained.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1038

Perform Hovering Flight

CONDITIONS: In an OH-58D helicopter, with before takeoff check completed and aircraft cleared.

STANDARDS:

1. Takeoff to a hover.
   a. Perform a smooth, controlled ascent to hover.
   b. Establish a hover altitude of 3 feet, ±1 foot.
   c. Maintain heading ±10 degrees.
   d. Do not allow drift to exceed 1 foot.
2. With the aid of TM 1-1520-248-CL, perform the hover checks in the correct sequence.
3. Hovering flight. Maintain a constant rate of movement for existing conditions and maintain a hover altitude of 3 feet, ±1 foot for hover taxi.
4. Hovering turns.
   a. Maintain a constant rate of turn not to exceed 90 degrees in 4 seconds.
   b. Maintain position over pivot point ±2 feet.
5. Landing from a hover.
   a. Maintain heading ±10 degrees.
   b. Perform a smooth, controlled descent with minimal drift at touchdown.

DESCRIPTION:

1. Crew actions.
   a. The P* will announce intent to perform a specific hovering flight maneuver and will remain focused outside the aircraft. The P* will announce the termination of the maneuver.
   b. The P will assist in clearing the aircraft and will provide adequate warning of obstacles and unannounced or unusual drift/altitude changes. The P will announce when attention is focused inside the cockpit and again when attention is focused outside.
2. Procedures. Control heading, direction of turn, and rate of turn with the pedals. Control altitude, rate of ascent, and rate of descent with the collective. Control position and direction of movement with cyclic.
   a. Takeoff to a hover. With the collective full down, place the cyclic in a neutral position. Increase the collective until the aircraft becomes “light on the skids”; apply pressure and counterpressure on the pedals to ensure the aircraft is free to ascend. Apply pedals as necessary to maintain heading and coordinate the cyclic for a vertical ascent. As the aircraft leaves the ground, check for proper control response and aircraft CG. Upon reaching the desired hover altitude, adjust the flight controls to maintain position over the intended hover point. If sloping conditions are suspected, see **Task 1062**.
   b. Hovering flight. Adjust the cyclic to maintain a stationary hover or to move in the desired direction. Control heading with pedals and maintain altitude with the collective. Maintain a constant hover speed. To

return to a stationary hover, apply the cyclic in the opposite direction while maintaining altitude with collective and heading with the pedals. The normal height for IGE hover is 3 feet for normal hover taxi for training and evaluating purposes.

c. Hovering turns. Clear the aircraft. Apply pressure to the desired pedal to begin the turn. Use pressure and counter pressure on the pedals to maintain a constant rate of turn. Coordinate cyclic to maintain position over the pivot point while maintaining altitude with the collective. Hovering turns can be made around the vertical axis, nose, or tail of the aircraft.

d. Landing from a hover. From a stationary hover, lower the collective to affect a smooth descent to touchdown. Make necessary corrections with the pedals and cyclic to maintain a constant heading and position. On ground contact, ensure that the aircraft remains stable. If uneven surface conditions are suspected, use pedals to perform a suitability check prior to lowering the collective full down. Continue decreasing the collective smoothly and steadily until the entire weight of the aircraft is on the ground. Neutralize the pedals and cyclic, and reduce the collective to the fully down position.

NIGHT OR NVG CONSIDERATIONS: Movement over areas of limited contrast, such as tall grass, water, or desert tends to cause spatial disorientation. To avoid spatial disorientation, seek hover areas that provide adequate contrast and use proper scanning techniques. If disorientation occurs, apply sufficient power and execute a takeoff. If a takeoff is not feasible, try to maneuver the aircraft forward and down to the ground to limit the possibility of touchdown with sideward or rearward movement. Maintain a proper scanning technique to avoid spatial disorientation. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

SNOW/SAND/DUST CONSIDERATIONS: During ascent to a hover, if visual references deteriorate to an unacceptable level, continue ascent to a hover altitude above the blowing conditions. The P should keep the P* informed of the location of the snow/sand/dust cloud. Consider the effects of the snow/sand/dust cloud on personnel and equipment in/around the landing area:

1. A 10-foot hover taxi. During takeoff to a hover, simultaneously accelerate the aircraft to a ground speed that keeps the snow/sand/dust cloud behind the main rotor mast. Maintain optimum visibility by observing references close to the aircraft. Exercise caution when operating in close proximity to other aircraft or obstacles. When visual references deteriorate making a 10-foot hover taxi unsafe, determine whether to abort the maneuver, ground taxi, air taxi, or perform a takeoff.

2. A 20- to 100-foot air taxi. Use this maneuver when it is necessary to move the aircraft over terrain that is unsuitable for hover taxi. Initiate air taxi the same as for a 10-foot hover, but increase altitude to not more than 100 feet and accelerate to a safe airspeed above effective translational lift (ETL). Ensure that an area is available to safely decelerate and land the aircraft. Under certain conditions such as adverse winds and poor visibility, it may be necessary to perform a traffic pattern to optimize conditions at the desired termination point.

3. Hovering OGE in reduced visibility reduces available ground references and may increase the possibility of spatial disorientation. Be prepared to transition to instruments and execute an instrument takeoff if ground reference is lost. At night, use of the searchlight may cause spatial disorientation while in blowing snow/sand/dust.

MUD/MUSKEG/TUNDRA CONSIDERATIONS: Smoothly increase the collective until the crew confirms that the landing gear is free. Before performing operations in a mud/muskeg/tundra environment, it is important to understand dynamic rollover characteristics.

CONFINED AREA CONSIDERATIONS: Select good references to avoid unanticipated drift. All crewmembers must be focused primarily outside for obstacle avoidance.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1040

Perform Visual Meteorological Conditions Takeoff

CONDITIONS: In an OH-58D helicopter with hover power and before takeoff checks complete.

STANDARDS:

1. Evaluate winds and determine takeoff direction.
2. Maintain ground track alignment in the takeoff direction with minimum drift.
3. Maintain the aircraft in trim above 50 feet above ground level (AGL).
4. Accelerate to desired airspeed ±10 knots indicated airspeed (KIAS).
5. Maintain desired rate of climb ±100 fpm.
6. Maintain takeoff power until reaching desired airspeed for mode of flight.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused outside the aircraft during the maneuver and is responsible for clearing the aircraft and obstacle avoidance. The P* will announce whether the takeoff is from the ground or from a hover and intent to abort or alter the takeoff. The P* will consider snow, sand, and obstacle barrier clearance when evaluating the power required versus power available.

   b. The P will complete the before-takeoff checks and announce when ready for takeoff. The P will remain focused primarily outside the aircraft to assist in clearing the aircraft and to provide adequate warning of obstacles. The P will assist in monitoring power requirements and advise the P* if power limits are being approached.

2. Procedures.

   a. VMC takeoff from the ground. Evaluate the winds and determine direction of takeoff. Select reference points to maintain ground track. With the cyclic in the neutral position, increase the collective until the aircraft becomes "light on the skids." Apply pressure and counterpressure on the pedals to ensure the aircraft is free to ascend. Maintain heading with the pedals. Continue increasing the collective until the aircraft leaves the ground. As the aircraft leaves the ground, apply forward cyclic as required to accelerate through ETL at an altitude to clear terrain and obstacles. As the aircraft reaches ETL, adjust the cyclic to obtain the desired climb airspeed. If greater than hover power is used for takeoff; maintain that power setting until approximately 10 knots prior to reaching climb airspeed. Then adjust power as required to establish the desired rate of climb and airspeed. Maintain ground track and keep the aircraft aligned with takeoff direction below 50 feet; then place the aircraft in trim above 50 feet AGL. Position the collective to establish the desired rate of climb.

   b. VMC takeoff from a hover. Evaluate the winds and determine direction of takeoff. Select reference points to maintain ground track. Apply forward cyclic to accelerate the aircraft while maintaining altitude with the collective. Perform the rest of the maneuver the same as a takeoff from the ground.

   c. 60 KIAS and 500 fpm rate of climb is generally used in a training environment.

NIGHT OR NVG CONSIDERATIONS:

1. If sufficient illumination or NVG resolution exists to view obstacles, the P* can accomplish the takeoff in the same way as a normal VMC takeoff during the day. Visual obstacles, such as shadows, should be treated the same as physical obstacles. If sufficient illumination or NVG resolution does not exist, the P* should perform an altitude-over-airspeed takeoff to ensure obstacle clearance. The P* may perform the takeoff from a hover or from the ground, but should increase their scan rate and be aware of drift in low illumination conditions.

2. Reduced visual references during the takeoff and throughout the ascent at night may make it difficult to maintain the desired ground track. The crew should know the surface wind direction and velocity. This will assist the P* in establishing the crab angle required to maintain the desired ground track. The crew must use proper scanning techniques to avoid spatial disorientation. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

SNOW/SAND/DUST CONSIDERATIONS:

1. As the aircraft leaves the surface, maintain heading with the pedals and a level attitude with the cyclic. As the aircraft clears the snow/sand/dust cloud and all barriers, accelerate to climb airspeed and trim the aircraft. In some cases, applying collective to blow away loose snow/sand/dust from around the aircraft is beneficial before performing this maneuver.

2. In low visibility/low illumination conditions, the P* should be prepared to transition to instruments if ground reference is lost. The P should have vertical situation display (VSD) selected and also be prepared to transition to instruments if ground references are lost to aid the P* as necessary. At night, use of the searchlight may cause spatial disorientation while in blowing snow/sand/dust.

MUD/MUSKEG/TUNDRA CONSIDERATIONS: Smoothly increase the collective until the crew confirms that the landing gear is free. Adjust controls as necessary to perform a VMC takeoff. Before performing operations in a mud/muskeg/tundra environment, it is important to understand dynamic rollover characteristics.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

TASK 1047

Perform Aircraft Navigation

CONDITIONS: In an OH-58D helicopter given the appropriate maps, plotter, flight computer, and flight log or utilizing the AMPS and navigation system or both.

STANDARDS:

1. Utilize standard terminology and provide accurate navigational information.
2. Use the appropriate navigation technique as directed:
   a. Pilotage and dead reckoning.
      (1) Maintain orientation within 1/4 mile or 400 meters.
      (2) Arrive at checkpoints/destination ±3 minutes of estimated time of arrival.
   b. Electronically aided navigation.
      (1) Correctly enter navigation data and prepare the system for operation.
      (2) Identify all check points.
      (3) Locate the final objective or destination.
   c. Terrain flight navigation.
      (1) During nap-of-the-earth (NOE) flight—
         (a) Know the en route location within 200 meters.
         (b) Identify all check points.
         (c) Locate the final objective.
      (2) During low-level or contour flight—
         (a) Know the en route location within 500 meters.
         (b) Identify all check points.
         (c) Locate the final objective.

DESCRIPTION:

1. Crew actions.
   a. The PC will assign navigation programming or map preparation duties as required.
   b. The P* or P will perform route navigation and position verification as required. The P* will fly the navigation course using appropriate programmed navigation cues provided through the multifunction display (MFD) or by the direction of the P. The P* will acknowledge and verify the new navigation heading.
   c. The P will announce all navigation destination changes and verify the heading. Only the P will perform in-flight time/labor intensive navigation programming duties. Whenever possible, the P should perform most navigation programming duties before departure.
2. Procedures.

a. Pilotage and dead reckoning.

(1) Pilotage refers to the use of fixed visual references on the ground by means of sight to navigate to a destination with the help of a map. Dead reckoning uses the calculations performed during premission planning for time, distance, heading for course legs and applies corrections based on known values from completed legs. Pilotage and dead reckoning navigation will normally be performed at greater than terrain flight altitudes allowing intervisibility with fixed references and when the aircraft navigation system is unreliable.

(2) After obtaining current weather forecasts, plan the flight by marking the route and appropriate checkpoints. Compute the time, distance, and heading for each leg of the flight. Use both pilotage and dead reckoning to maintain the position of the aircraft along a planned route. Perform a ground speed check as soon as possible by computing the actual time required to fly a known distance. Adjust estimated times for subsequent legs of the route using actual ground speed. Determine correction for winds, if necessary, so that the airspeed or ground speed and heading can be computed for the remaining legs of the flight. Make heading corrections to maintain the desired course and/or ground track. More detailed flight planning is required when the flight is conducted at terrain flight altitudes or when visibility is reduced.

b. Electronically aided navigation. Electronically aided navigation provides the primary means for navigation in the aircraft and incorporates all the aircraft's navigation modes, functions and displays. During premission planning, the crewmembers determine the navigation data required for entry into the system. Use the waypoint, flight plan, and battlefield graphics pages or aviation mission planning system to enter the required waypoints and construct the flight plan. During aircraft runup, access the navigation (NAV) ALIGN page and verify data, change as necessary. Operate the navigation system in accordance with the operator's manual. During flight use all available navigation system information to include the flight plan, direct waypoint, heading indications/cues, rotorcraft mapping system (RMS), battlefield graphics, and target information to aid in orientation and navigation. Regardless of the amount of premission planning conducted crewmembers must be prepared to rapidly reconfigure the navigation system based on mission changes.

c. Terrain flight navigation. Terrain flight navigation is most effective with adequate premission planning completed and using the aircraft navigation system. Entering successive route checkpoints into the system and referencing the RMS will reduce pilot workload during the flight and aid in maintaining orientation. In some instances not all features of the aircraft's navigation system may be operational or available. For example in the early stages of an operation with rapid movement over large areas not all map data for the RMS may be available and loaded into the system. In these instances the aircrew may need to use standard map navigation or a combination of a standard map and the aircraft navigation system. Terrain flight navigation requires effective teamwork and good crew coordination. To remain continuously oriented during terrain flight, the crew should use successive checkpoints which clearly identify the route either entered in the navigation system or plotted on a map. If utilizing the navigation system reference the RMS and heading cues as required while observing the actual terrain features. All known terrain flight hazards should be entered into the aircraft's system. Regardless of the type of terrain flight being conducted the P* should remain primarily focused outside the aircraft and acknowledge instructions from the P for heading and airspeed changes to navigate the desired course. The P* should announce significant terrain features and other cues to assist in navigation as required. When forward visibility is restricted and frequent changes are necessary, controlled turning instructions are more appropriate. As a general rule, clock headings by themselves should be avoided. However, clock headings are recommended when associated

with a terrain feature and with controlled turning instructions. Announce any verified, plotted or perceived hazards to flight prior to reaching their location and provide instructions and perform actions for obstacle/hazard avoidance. Use standardized terms to prevent misinterpretation of information and unnecessary cockpit conversation. The crew must look far enough ahead of the aircraft at all times to avoid hazards. Aircrews should have a contingency plan if the embedded global positioning system/inertial navigation system (EGI) fails or is inaccurate. Options may include using standard map navigation only, conducting a lead change if operating multi-ship, or amending the mission.

NIGHT OR NVG CONSIDERATIONS: Conducting the flight in reduced visibility or at night (aided or unaided) requires more detailed flight planning system and map preparation. FM 3-04.203 contains details on night navigation. NVG navigation with standard maps can be difficult because of map colors and symbology. The crew must use proper scanning techniques to ensure obstacle avoidance.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

   a. During RL progression crewmembers will demonstrate proficiency in all navigation methods (pilotage and dead reckoning, electronically aided navigation and terrain flight navigation).

   b. Electronically aided navigation and terrain flight navigation will be evaluated during the APART/annual NVG evaluation.

TASK 1048

Perform Fuel Management Procedures

CONDITIONS: In an OH-58D helicopter utilizing the fuel management page or calculated manually.

STANDARDS:

1. Verify that the required amount of fuel is on board at the time of takeoff.
2. Initiate the fuel check after entry into mission profile.
3. Perform a fuel consumption check 30 to 60 minutes after initiating the fuel check.
4. Initiate an alternate course of action if actual fuel consumption varies from the planning value and the flight cannot be completed with the required reserve.
5. Monitor fuel quantity and consumption rate during the flight.

DESCRIPTION:

1. Crew actions.

   a. The PC will brief fuel management responsibilities before takeoff. The PC will initiate an alternate course of action during the flight, if the actual fuel consumption varies from the planning value and the flight cannot be completed with the required reserve.

   b. The P* will acknowledge the results of the fuel check.

   c. The P will record initial fuel figures, fuel flow computation, burnout, and reserve times if calculating manually or initiate and complete the fuel check using the fuel management page. The P will announce initiation, completion, and results of the fuel check.

2. Procedures.

   a. Before-takeoff fuel check. Determine the total fuel on board, and compare it with mission fuel requirements determined during premission planning. If the fuel on board is inadequate, have the aircraft refueled or abort/revise the mission.

   b. Initial fuel reading. After the aircraft has entered mission profile with appropriate power set initiate a fuel check utilizing the fuel management page IAW the operator's manual or record the total fuel quantity and the time of reading if computing manually.

   c. Fuel consumption check. Complete the fuel consumption check 30 to 60 minutes after initiating the fuel check. Record the remaining fuel and time of reading if calculating manually. Determine the rate of consumption, burnout, and reserve entry time manually or by using the aircraft's fuel management page. Determine if the remaining fuel is sufficient to complete the flight with the required reserve. If the fuel quantity is inadequate, initiate an alternate course of action.

   d. Fuel quantity and consumption. Periodically monitor the fuel quantity and consumption rate. If the fuel quantity or flow indicates a deviation from computed values, repeat the fuel consumption check to determine if the fuel quantity is adequate to complete the flight.

NIGHT OR NVG CONSIDERATIONS: The P should complete all duties associated with fuel management procedures.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1052

Perform Visual Meteorological Conditions Flight Maneuvers

CONDITIONS: In an OH-58D helicopter.

STANDARDS:

1. Turns.
    a. Clear the aircraft prior to and throughout the turn.
    b. Maintain aircraft in trim.
    c. Maintain selected airspeed ±10 KIAS.
    d. Maintain selected bank angle ±10 degrees.
    e. Maintain altitude ±100 feet.
    f. Roll out on desired heading ±10 degrees.
2. Climbs and descents.
    a. Maintain aircraft in trim.
    b. Maintain selected airspeed ±10 KIAS.
    c. Maintain rate of climb or descent ±100 fpm.
    d. Maintain desired heading ±10 degrees.
3. Straight and level flight.
    a. Maintain selected airspeed ±10 KIAS.
    b. Maintain aircraft in trim.
    c. Maintain altitude ±100 feet.
4. Traffic pattern flight. Enter, operate in, and depart a traffic pattern IAW ATC instructions, local or FAA procedures.

DESCRIPTION:

1. Crew actions.
    a. The P* will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance.
    b. The P will assist in clearing the aircraft and will provide adequate warning to avoid traffic and obstacles. The P will announce when attention is focused inside the cockpit.
2. Procedures.
    a. VMC climb. Increase collective to initiate climb. Adjust pedals to maintain aircraft in trim. Reduce collective to stop climb at desired altitude.

b. VMC climbing turns. Increase collective to initiate climb. Adjust pedals to maintain aircraft in trim. Apply cyclic in the desired direction of turn. Adjust cyclic as required to stop turn on heading. Reduce collective to stop climb at desired altitude.

c. VMC straight-and-level flight. Adjust collective to maintain altitude. Adjust pedals to maintain aircraft in trim. Maintain airspeed and heading.

d. VMC level turns. Apply cyclic in the desired direction of turn. Adjust collective to maintain altitude. Adjust pedals to maintain aircraft in trim. Apply cyclic opposite the direction of turn to stop the turn on the desired heading.

e. VMC descents. Decrease collective to initiate the descent. Adjust pedals to maintain aircraft in trim. Increase collective to stop rate of descent at the desired altitude.

f. VMC descending turns. Decrease collective to initiate descent. Adjust pedals to maintain aircraft in trim. Apply cyclic in the desired direction of turn. Adjust cyclic as required to stop turn on desired heading. Increase collective to stop descent at desired altitude.

g. Traffic pattern flight.

(1) Maneuver the aircraft into position to enter the downwind leg midfield at a 45-degree angle or according to local procedures, at traffic pattern altitude, and at the desired airspeed. A straight-in or base-leg entry may be used if approved by ATC. On downwind, complete the before-landing check. Prior to turning base, reduce power and airspeed as required and initiate a descent. If performing a straight-in or a base-leg entry, reduce airspeed at a point to facilitate a normal approach. Turn base and final leg, as appropriate, to maintain the desired ground track. Execute the desired approach. Announce and clear each turn in the pattern and the type of approach planned.

(2) For a closed traffic pattern after takeoff, climb straight ahead at climb airspeed to the appropriate altitude, turn to crosswind, and continue the climb. Initiate the turn to downwind as required to maintain the desired ground track. Adjust power and attitude, as required, to maintain traffic pattern altitude and airspeed. Complete the traffic pattern as stated above.

(3) The PC will ensure that the before landing check is completed. Perform the before-landing check and announce when it is completed. The other crewmember will acknowledge that the before-landing check is complete.

(4) For traffic pattern training, the recommended airspeed is 60 KIAS on crosswind and base legs and 80 KIAS on the downwind leg. For NVG training in the traffic pattern, the recommended maximum airspeed is 80 KIAS and the recommended maximum bank angle is 30 degrees.

NIGHT OR NVG CONSIDERATIONS: Maintain a continuous coordinated turn to the downwind leg and establish airspeed and altitude as required. Initiate the turn from downwind when in a position to make a continuous coordinated turn to the final approach course. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

OVERWATER/SNOW/SAND CONSIDERATIONS AND LIMITED CONTRAST AREAS: Flight over areas of limited contrast, especially at night, is characterized by a lack of visual cues and therefore has the potential of causing visual illusions. Be alert to any unannounced changes in the flight profile and be prepared to take immediate corrective actions. The radar altimeter low altitude warning may used to assist in altitude control. Hazards to terrain flight such as harbor lights, buoys, wires, and birds, must also be considered during overwater flight.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

3. Evaluation will be conducted in the aircraft.

TASK 1058

Perform Visual Meteorological Conditions Approach

> **CAUTION**
>
> When touching down with forward speed to other than a hard surface, a rapid reduction of the collective to the full down position, or partially reducing the collective too abruptly, can result in snagging the skid toes, resulting in excessive forward pitching motion. Touching down in this manner requires smooth, gradual reductions in the collective until the weight of the aircraft is firmly supported by the skids.

CONDITIONS: In an OH-58D helicopter with before landing checks complete.

STANDARDS:

1. Identify a suitable landing area.
2. Establish entry airspeed ±10 KIAS.
3. Maintain ground track alignment with the landing direction, as appropriate.
4. Select an appropriate approach angle to clear obstacles and rate of closure necessary for the conditions.
5. Perform a smooth and controlled termination to a hover or to the ground as announced or directed.
6. Announce and perform a go-around as required or directed.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will announce the beginning of the approach, whether the approach will terminate to a hover or to the ground, the intended point of landing, and any deviation to the approach.

   b. The P will confirm the suitability of the area, assist in clearing the aircraft, and provide adequate warning of traffic or obstacles. The P will acknowledge any intent to deviate from the approach and will announce when attention is focused inside the cockpit.

2. Procedures. Evaluate the winds and determine direction of landing. Select an approach angle that allows obstacle clearance while descending to the desired point of termination. Once the termination point is sighted and the approach angle is intercepted on base or final, adjust the collective as necessary to establish and maintain a constant angle. 60 KIAS is recommended for entry airspeed for training and evaluations. Maintain entry airspeed until the rate of closure appears to be increasing. Above 50-feet AGL, maintain ground track alignment and the aircraft in trim. Below 50-feet AGL, align the aircraft based on approach path, winds, and landing surface. Progressively decrease the rate of descent and rate of closure until reaching the termination point at a hover, touchdown, or until a decision is made to perform a go-around.

a. To a hover. The approach to a hover may terminate with a full stop over the planned termination point or continue movement to transition to hovering flight. Progressively decrease the rate of descent and rate of closure until an appropriate hover is established over the intended termination point.

b. To the surface. Proceed as for an approach to a hover, except determine an approach angle that allows obstacle clearance while descending to the desired point of touchdown. The decision to terminate to the surface with zero speed or with forward movement will depend on the aircraft's loading or environmental conditions. Touchdown with minimum lateral movement. After surface contact, ensure that the aircraft remains stable until all movement stops. Smoothly lower the collective to the full down position and neutralize the pedals and cyclic.

c. Go-around. Perform a go-around if a successful landing is doubtful or if visual reference with the intended termination point is lost. Once climb is established, reassess the situation and develop a new course of action. Hover OGE power may be required in certain situations. Evaluate power required versus power available. If OGE power is not available, a go-around may be difficult to perform, especially during brownout/whiteout conditions. The crew must take this into consideration and choose the landing area appropriately.

Note. Airspeed indications are unreliable below 20 knots. Steep approaches can place the aircraft in a potential power settling condition. The crew must be familiar with diagnosing and correcting these situations.

MUD/MUSKEG/TUNDRA CONSIDERATIONS: Select a suitable area and terminate the approach to a 10-foot hover over the intended touchdown point. Begin a vertical descent until the aircraft touches down. Check aircraft stability while lowering the collective. If the area is suitable, smoothly lower the collective to the full down position and neutralize the cyclic and pedals.

NIGHT OR NVG CONSIDERATIONS:

1. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. After establishing the descent, reduce airspeed to approximately 40 to 45 KIAS until apparent ground speed and rate of closure appear to be increasing. The rate of descent during the final 100 feet should be slightly less than during the day to avoid abrupt attitude changes at low altitudes. Progressively decrease the rate of descent and forward speed until termination.

2. Surrounding terrain or vegetation may decrease contrast and degrade depth perception during the approach. Before descending below obstacles, determine the need for artificial lighting.

3. Use proper scanning techniques to avoid spatial disorientation. At night, use of the landing light or IR light may cause spatial disorientation while in blowing snow/sand/dust.

4. Hazards, especially wires, are more difficult to detect at night. Thorough premission planning is required. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

SNOW/SAND/DUST CONSIDERATIONS:

1. Approach to a point OGE with a vertical descent. Approach to a stationary OGE hover over the touchdown area. This approach requires OGE power and may be used for most snow landings and some sand/dust landings. Slowly lower the collective and allow the aircraft to descend. The descent may be vertical or with forward movement. The rate of descent will be determined by the rate in which the snow/sand/dust is blown

from the intended landing point. During the descent, remain above the snow/sand/dust cloud until it dissipates and the touchdown point can be seen. Both crewmembers should be focused outside the cockpit. Be prepared to execute a go-around, takeoff, or ITO if visual contact with the surface is lost.

2. Termination to the surface with forward speed. This termination may be made to an improved landing surface or suitable area with minimal ground references. Once the appropriate approach angle is intercepted, adjust the collective as necessary to establish and maintain the angle. As the apparent rate of closure appears to increase, progressively reduce the rate of descent and closure to arrive at the touchdown area slightly above ETL. Maintain the minimum rate of closure that ensures that the snow/sand/dust cloud remains behind the pilot's station. When the skids contact the snow/ground, slowly reduce the collective and allow the aircraft to settle firmly onto the skids as it comes to a stop. Maintain proper alignment with the pedals throughout the landing and apply slight aft cyclic at touchdown to prevent snagging the skid toes. The P should keep the P* informed of the location of the snow/sand/dust cloud. Be prepared to execute a go-around.

3. Termination to the surface with no forward speed. This termination should be made to landing areas where slopes, obstacles, or unfamiliar terrain preclude a landing with forward speed. It is not recommended when new or powder snow or fine dust is present because whiteout/brownout conditions may occur. The termination is made directly to a reference point on the ground with no forward speed. The P should keep the P* informed of the location of the snow/sand/dust cloud. Be prepared to execute a go-around.

4. When landing in deep snow, the aircraft skids may settle at different rates and the aircraft will normally terminate in a tail low attitude. Hovering OGE reduces available ground references and may increase the possibility of spatial disorientation. Be prepared to transition to instruments and execute an instrument takeoff if ground reference is lost. At night, use of the landing light or IR light may cause spatial disorientation while in blowing snow/sand/dust.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

TASK 1062

Perform Slope Operations

CONDITIONS: In an OH-58D helicopter in an approved landing area with before take-off and before landing checks complete.

STANDARDS:

1. Describe aircraft slope limitations and select a landing area that does not appear to exceed limitations.
2. Abort landing if slope exceeds aircraft slope limits.
3. Maintain heading ±5 degrees.
4. Maintain position over the intended landing point ±1 foot.
5. Perform a smooth, controlled descent and touchdown.
6. Perform a smooth, controlled ascent.

DESCRIPTION:

1. Crew actions. Before conducting slope operations, the crew must understand dynamic rollover characteristics. The PC will ensure that the before landing and before take-off checks are complete at the appropriate time. If successful completion of the landing is in doubt at any time, abort the maneuver. Both crewmembers should focus outside the cockpit.

   a. The P* will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will announce his intent to perform a slope operation and should be aware of the common tendency to over control the aircraft during slope landings.

   b. The P will assist in clearing the aircraft and will provide adequate warning of obstacles, drift, or altitude changes. The P will assist in confirming the suitability of the intended landing area and will announce when attention is focused inside the cockpit.

2. Procedures.

   a. Landing. Select a suitable area for slope operations that appears to not exceed slope limitations. The degree of the slope should not be so great as to create a need for large cyclic inputs. If possible, orient the aircraft into the wind. Select a reference to determine the roll angle during the execution of the maneuver. Announce the initiation of the slope landing. Smoothly lower the collective until the upslope skid contacts the ground. Adjust the cyclic to maintain the aircraft in a level attitude while maintaining heading with the pedals. Coordinate the collective and cyclic to control the rate of attitude change to lower the down slope skid to the ground. With the entire weight of the aircraft on the ground, simultaneously lower the collective and neutralize the cyclic. **If cyclic or aircraft slope limits are reached before the aircraft is firmly on the ground, return the aircraft to a hover. Select a new area where the slope is less steep and attempt another slope landing.**

   b. Takeoff. Before takeoff, announce initiation of an ascent. Smoothly raise the collective and apply the cyclic into the slope to maintain the position of the upslope skid. Continue to raise the collective, maintain heading with the pedals, and simultaneously adjust the cyclic to level the aircraft laterally. As the aircraft leaves the ground, adjust the cyclic to accomplish a vertical ascent to a hover with minimum drift.

NIGHT OR NVG CONSIDERATIONS: The degree of slope is difficult to determine using the NVG. Select reference points to determine slope angles. References will probably be limited and difficult to ascertain. Determine the need for artificial illumination prior to starting the maneuver. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1066

Perform a Running Landing

CONDITIONS: In an OH-58D helicopter and an approved landing area with before landing check complete.

STANDARDS:

1. Identify a landing point and establish an approach angle to clear obstacles on final approach.
2. Establish entry airspeed ±10 KIAS.
3. Maintain heading control and ground track alignment with the landing direction ±10 degrees.
4. Execute a smooth and controlled termination.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused outside the aircraft during the maneuver.

   b. The P will remain focused outside the aircraft to assist in clearing and to provide adequate warning of obstacles or traffic. The P will announce when attention is focused inside the cockpit.

2. Procedures. On final approach, determine an approach angle, which allows safe obstacle clearance to arrive at the intended point of landing. Once the approach angle is intercepted, adjust the collective as necessary to establish and maintain the angle. Maintain entry airspeed until apparent ground speed and rate of closure appear to be increasing. Control the rate of descent at touchdown with the collective. Maintain aircraft attitude and landing alignment with the cyclic and heading with the pedals. The touchdown speed may vary from, at, above, or below ETL as dictated by landing area conditions. After ground contact, ensure the aircraft remains stable as the collective is lowered to reduce ground run. Once the aircraft has come to a complete stop, reduce the collective to the full down position and neutralize the pedals and cyclic.

NIGHT OR NVG CONSIDERATIONS: Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. The rate of descent during the final 100 feet should be slightly less than during the day to avoid abrupt attitude changes at low altitudes. After establishing the descent, reduce airspeed to approximately 40 to 45 KIAS until apparent ground speed and rate of closure appear to be increasing. Progressively decrease the rate of descent and forward speed until termination.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1070

Respond to Emergencies

CONDITIONS: In an OH-58D with a simulated emergency or academically given the indications of an emergency condition or specific malfunction.

STANDARDS:

1. Recognize, announce, and analyze indications of an emergency IAW TM 1-1520-248-10 and TM 1-1520-248-CL.

2. Perform or describe all immediate action procedures IAW TM 1-1520-248-10 and TM 1-1520-248-CL.

3. Make Mayday call, jettison weapon system if necessary, lock shoulder harness, and tune transponder to emergency if required based on type of emergency.

DESCRIPTION:

1. Crew actions. When either crewmember detects an emergency situation, one will immediately alert the other crewmember.

   a. The P* will perform or direct the P to perform the underlined steps IAW TM 1-1520-248-10 and TM 1-1520-248-CL and will initiate the appropriate type of landing, if required for the emergency.

   b. The P will perform as directed or briefed and if time permits, will verify all emergency checks with TM 1-1520-248-CL. The P will request appropriate emergency assistance.

2. Procedures. At the first indication of a warning/caution/advisory message, abnormal aircraft noise, and/or odor, make an announcement. Identify the malfunction and perform the appropriate emergency procedure.

TRAINING CONSIDERATIONS: This task is used for academic training and evaluation of emergency procedures from the operator's manual that do not have corresponding tasks in this ATM.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.

2. Evaluation may be conducted in the aircraft or academically.

TASK 1072

Respond to Engine Failure at a Hover

CONDITIONS: In an OH-58D helicopter with an IP, in an approved touchdown area, with the MMS off at hover altitude.

STANDARDS:

1. Execute the appropriate immediate action steps.
2. Maintain heading ±10 degrees.
3. Do not allow lateral drift to exceed 3 feet.
4. Execute a smooth, controlled descent and touchdown with no rearward drift.

DESCRIPTION:

1. Crew actions.

   a. The IP will confirm suitability of the landing area and comply with army regulations and local requirements prior to initiating the maneuver. The IP will announce "hovering auto" when retarding the throttle and will monitor the position of the aircraft and take corrective action if necessary.

   b. Upon detecting engine failure, the P* will focus outside the aircraft and adjust the flight controls as necessary to land.

   c. The P will assist the P* as directed.

2. Procedures. Upon detecting engine failure, maintain heading with the pedals and correct any lateral or rearward drift with the cyclic. If the maneuver is initiated while the aircraft is moving forward over a smooth or prepared surface, adjust the cyclic to attain a landing attitude while avoiding a tail-low condition. Make ground contact with some forward speed. When the helicopter is resting firmly on the ground, smoothly lower the collective to the full-down position while simultaneously neutralizing the pedals and cyclic. Do not use heading hold during this maneuver.

NIGHT OR NVG CONSIDERATIONS: Select an area with good contrast and several good reference points to assist in maintaining present position. Determine the need for artificial illumination prior to starting the maneuver. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1074

Respond to Engine Failure at Cruise Flight

CONDITIONS: In an OH-58D helicopter with an IP, MMS off, and minimum entry altitude of 1,200 feet AGL.

STANDARDS:

1. Recognize the emergency, determine the appropriate corrective action, and perform from memory, all immediate action procedures described IAW TM 1-1520-248-CL.

2. Select and maneuver the helicopter to a suitable landing area.

3. Correctly terminate the maneuver as directed by the IP.

DESCRIPTION:

1. Crew actions.

   a. The IP will confirm suitability of the landing area and comply with army regulations and local requirements prior to initiating the maneuver. The IP will announce "simulated engine failure" when retarding the throttle and will monitor the position of the aircraft and take corrective action if necessary. If time permits during the descent, the IP will announce, "**throttle confirmed**" when certain that the engine is back to operating revolutions per minute (RPM). The IP should continue checking the throttle throughout the maneuver to ensure it is full open. It is the IP's responsibility to manipulate the throttle during this task. However, provisions should be made during the crew briefing to allow the P* (as a backup) to verify the throttle is full open.

   b. Upon detecting engine failure, the P* will focus outside the aircraft and adjust the flight controls as necessary to land.

   c. The P will assist the P* as directed.

2. Procedures. Upon detecting engine failure, the P* will lower the collective to maintain rotor RPM within limits while simultaneously adjusting the pedals to trim the aircraft. The P* will select a suitable landing area and will also use turns and vary the airspeed between minimum rate of descent and maximum glide, as necessary, to maneuver the aircraft for a safe landing at the intended landing area. The final approach should be generally into the wind. The P* will call out the rotor RPM, gas producer, and acknowledging the aircraft is in trim. The P* will simulate or direct the setting of the emergency communications switch to emergency and making a Mayday call to the appropriate agency. The P* will complete or simulate emergency procedures outlined in TM 1-1520-248-CL and if time permits will direct the P to verify the procedures. The crew should plan each forced landing as continuing to the ground. With the aircraft in a safe autorotative profile, the IP will smoothly advance the throttle to the full open position prior to descending below 400 feet AGL and will state one of the two commands described below.

   a. Power recovery. Upon receiving the command "power recovery," the P* will maintain trim with pedals and continue autorotative descent as the IP confirms normal operating RPM by throttle pressure with springback and by visually checking that the NP RPM is at 100 percent. When operating RPM has been confirmed, the P* will apply sufficient collective to establish a normal climb. The P* will complete the recovery prior to reaching 200 feet AGL.

   b. Terminate with power. Upon receiving the command "terminate with power," the P* will continue the autorotative descent. The IP will confirm normal operating revolutions per minute with throttle pressure

with springback and visually checking that the NP RPM is at 100 percent. The P* will trim the aircraft with the pedals and continue autorotative descent. During the final portion of the approach, the P* will apply sufficient power and collective pitch to decrease the rate of descent to zero at 3 to 5 feet AGL with the aircraft in a landing attitude. The airspeed at this point should be the same as if an actual touchdown were to be effected. The P* will maintain proper trim throughout the maneuver with the pedals, and maintain an altitude of 3 to 5 feet until the aircraft is brought to a stationary hover.

NIGHT OR NVG CONSIDERATIONS: Altitude, apparent ground speed, rate of closure, and rate of descent are difficult to estimate during night and NVG flight modes. Aircraft altitude and rate of descent should be closely monitored by both the P* and the P. Determine the need for artificial illumination prior to starting the maneuver. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1078

Respond to Stability and Control Augmentation System Malfunction

CONDITIONS: In an OH-58D helicopter with an IP in a traffic pattern with before landing checks complete.

STANDARDS:

1. Maintain task standards as described for—

   - Task 1052, Perform Visual Meteorological Conditions Flight Maneuvers.
   - Task 1058, Perform Visual Meteorological Conditions Approach.

2. Respond to stability and control augmentation system (SCAS) failure IAW TM 1-1520-248-CL and land the helicopter with a shallow approach angle.

DESCRIPTION:

1. Crew actions.

   a. The IP will monitor the actions of the P*, may disengage the SCAS, and take corrective action, if necessary.

   b. The P* will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will announce if/when disengaging the SCAS.

   c. The P will assist the P* as directed.

2. Procedures. While on downwind disengage the SCAS. Respond to SCAS failure IAW TM 1-1520-248-CL. Adjust airspeed as necessary to attain the most comfortable level of control movements. Continue the traffic pattern until intercepting a shallow approach angle and then decrease the collective as required to establish and maintain the selected angle. Maintain entry airspeed until apparent ground speed and rate of closure appear to be increasing. At this time progressively decrease the rate of descent and forward speed to facilitate termination of the approach. Termination of the approach may be either to the ground or to a hover as appropriate. If to a hover, the aircraft will be landed prior to re-engaging the SCAS.

NIGHT OR NVG CONSIDERATIONS: Select an area with good contrast and several good reference points to assist in maneuvering the aircraft. Determine the need for artificial illumination prior to starting the maneuver.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1082

Perform Autorotation

CONDITIONS: In an OH-58D helicopter with an IP; aircraft heading into the wind; in an approved touchdown area; with the MMS off.

STANDARDS:

1. Establish an entry altitude of 3 feet, ±1 foot.
2. Maintain heading ±10 degrees and position over ground ±1 foot.
3. Execute a smooth and controlled descent and touchdown.

DESCRIPTION:

1. Crew actions.

   a. The IP will confirm suitability of the landing area, and ensure all army regulations and local requirements are met prior to the maneuver. The IP will brief the conduct of the maneuver and will ensure obstacle avoidance, monitor the aircraft position, and take corrective action if necessary.

   b. The P* will focus outside the cockpit and acknowledge the IP's briefing and will announce initiation of the maneuver. Upon completion of the autorotation, the P* will increase power turbine speed (N_P) to 100 percent and announce the throttle is full open.

   c. The P will assist the P* as directed.

2. Procedures. From a stabilized 3-foot hover into the wind, retard the throttle to engine idle stop. While retarding the throttle, do not raise or lower the collective. Apply right pedal as necessary to maintain heading and adjust the cyclic to maintain position over the ground. As the helicopter settles, apply sufficient collective to make a smooth descent and touchdown. Do not stop the descent by over applying the collective. The crew should be aware of the tendency for lateral or rearward drift. When the helicopter is resting firmly on the ground, smoothly lower the collective to the full-down position while simultaneously neutralizing the pedals and cyclic. Do not use heading hold during this maneuver.

NIGHT OR NVG CONSIDERATIONS: Select an area with good contrast and several good reference points to assist in maintaining present position. Determine the need for artificial illumination prior to starting the maneuver. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1103

Respond to Full Authority Digital Electronic Control Failure

WARNING

Underspeed below 93 percent rotor speed (N_R) can cause unrecoverable rates of descent. IPs must be prepared to take corrective action anytime it becomes apparent the standards will be exceeded.

CAUTION

Switching from manual to automatic mode in flight should not be accomplished with the N_R below 96 percent unless safe outcome of the maneuver is in doubt. This prevents rapid torque increases, which may exceed limitations.

CAUTION

N_R/power turbine speed (N_P) excursions into the lower limits of 100 percent ±5 percent (95 to 105 percent) while conducting operations with high density altitude may result in a loss of tail rotor authority.

CONDITIONS: In an OH-58D helicopter with an IP, with the MMS off, during the day only, surface winds 20 knots or less, maximum gust spread of 10 knots , and no more than light turbulence.

STANDARDS:

1. Recognize the emergency and perform from memory, all immediate action procedures described in TM 1-1520-248-CL.
2. Maintain RPM N_R/N_P 100 percent, ±5 percent (95 to 105 percent).
   a. Hover:
      (1) Maintain heading ±10 degrees.
      (2) Do not allow lateral drift to exceed ±3 feet.
      (3) Execute a smooth, controlled ascent and descent with minimal drift during takeoff and landing.
   b. Cruise flight:
      (1) Maintain altitude as directed ±200 feet.

(2) Maintain airspeed as directed ±10 KIAS.

(3) Smoothly coordinate throttle and collective controls.

c. Approach to running landing:

(1) Select a suitable landing area.

(2) Establish an approach angle to clear obstacles on final approach.

(3) Maintain heading control and ground track alignment with the landing direction.

(4) Execute a smooth and controlled touchdown with a running landing at or slightly above ETL.

d. Approach to a hover:

(1) Select a suitable landing area.

(2) Establish an approach angle to clear obstacles on final approach.

(3) Decelerate through ETL no higher than 250 feet AGL and not lower than 100 feet AGL.

(4) Execute a smooth and controlled termination to a 3 to 5 foot hover.

DESCRIPTION:

1. Crew actions.

a. The crew must divide their attention to maintain airspace surveillance, obstacle avoidance, and maintain RPM within limits. The IP/P will inform the P* of all obstacles, confirm aircraft clearance during all turns and announce when focused inside the aircraft. The IP/P will provide adequate warning for corrective action to ensure operating limits are not exceeded. The IP/P will manipulate the FADEC auto/manual switch as required.

b. The crew should ensure cockpit communications are limited to the minimum consistent with safe conduct of the maneuver and appropriate aircrew coordination elements (announce/acknowledge actions).

c. The P* will coordinate with the IP/P for manipulation of the FADEC auto/manual switch. If in flight or at a hover the throttle will not be advanced to full open or if the aircraft is on the ground the throttle will remain at idle until the auto/manual switch is **confirmed** in auto mode and then the P* will announce "advancing throttle".

d. The IP/P will assist the P* as directed.

e. The following IP actions are required to ensure the safe outcome of the maneuver:

(1) The IP will keep his hand wrapped lightly around the throttle so that he can both feel and correct throttle inputs made by the P* while in the manual mode.

(2) The IP should always be aware of the rate at which throttle is applied once the N_R is above 100 percent, never to exceed their own comfort level.

(3) The IP will ensure the aircraft is positioned over a suitable forced landing area when switching from automatic to manual mode.

(4) The IP will ensure the following is included in the crew briefing: If the IP takes the controls and announces "I have the controls" for any reason when the FADEC is in the MAN mode, the P will be

prepared to place the FADEC switch to automatic (AUTO) should the IP request that FADEC be placed back into the AUTO mode.

(5) The IP will emphasize basic flying skills by teaching the P* to anticipate power and control requirements and, whenever possible, by separating those requirements in order to simplify the task being flown. For example if the P* needs to descend and decelerate, the P* should attempt to accomplish one and then the other (descend and then decelerate, or decelerate then descend). The P* should be taught to anticipate power changes and demands and to adjust the throttle and N_R to lead those changes accordingly.

(6) The IP will ensure the suitability of the landing area and comply with Army Regulations and local requirements prior to initiating the maneuver.

(7) The IP will ensure that hover tasks are entered at no greater than a 5 foot hover, and if moving, then at a forward speed of no greater than 3 to 5 knots (normal walking pace) and over a level surface. The IP will also ensure that the area is suitable to attain a high hover if necessary during the initial phase of the emergency procedure. The conduct of this maneuver will be briefed by the IP in the vicinity of the intended area prior to performing it. Simply announcing the emergency immediately prior to execution does not fulfill this requirement.

(8) At a Hover-If during the performance of the procedure it becomes apparent that the aircraft will accelerate above ETL and enter free flight, the IP will recover the FADEC system to the AUTO mode and terminate the maneuver.

(9) The IP will conduct debriefing only after FADEC is returned to the auto mode.

(10) If at any time during manual throttle operations the P* allows the aircraft to get outside the following parameters, the IP will take the controls and terminate the maneuver:

(a) N_R is greater than 105 percent or less than 95 percent. IP recovery may take place prior to these standards being exceeded depending on the rate of RPM increase/decrease.

(b) Any time the safe outcome of the maneuver is in jeopardy.

(11) If at any time during the approach the aircraft exceeds the following parameters, the IP will take the controls and terminate the maneuver:

(a) Aircraft decelerates below ETL above 250 feet AGL.

(b) Rate of descent is greater than 300 FPM below 100 feet AGL (Approach to a hover).

(c) Aircraft accelerates above ETL below 100 feet AGL (Approach to a hover).

(d) If it appears touchdown will be beyond the second one-third of the landing area.

2. Procedures. The FADEC system may fail to a fixed fuel flow mode or may fail directly to the manual mode. Regardless of the type of failure that occurs, it is imperative that the crew responds appropriately with the same published emergency procedure. In both failures, the failure will be accompanied by the FADEC audio tone. Immediate emergency procedure response to the audio tone is critical to success.

a. Ground.

(1) Begin on level ground at engine idle. The IP/P will place the FADEC AUTO/MAN switch to MAN and verify indications. After switching to MAN the IP will direct the P* to achieve/maintain 100 percent N_R.

(2) The IP will then direct the P* to increase the collective while maintaining 100 percent N_R and perform a takeoff from the ground, maintain an IGE hover, and perform left and right 360 degree turns. The IP will then direct the P* to land the aircraft and return the collective to the full down position, reduce the throttle to idle and return to the AUTO mode. The IP will ensure that the P* does not dump the collective when contact is made with the ground which will result in an overspeed.

b. Hover.

(1) FADEC failure at a hover-training. From an IGE hover in the AUTO mode, the IP will direct the P* to observe the throttle while the P* makes a throttle reduction to the appropriate position using the index mark for reference. Once the P* can make a smooth, quick reduction to the correct position while looking at the throttle, the IP will direct the P* to practice the initial reduction without looking and then glance down to "fine tune." The IP will place the FADEC switch from AUTO to MAN. The P* will react by making the necessary throttle and collective inputs to gain N_R control and maintain it within standards. After the P* has established positive control of N_R, hovering flight and landing from a hover may be practiced to teach correlation of throttle and collective inputs to changing power requirements.

(2) Respond to FADEC failure at a hover. From an IGE hover in the AUTO mode the IP/P will announce–"FADEC MANUAL" while simultaneously placing the FADEC AUTO/MAN switch to the MAN position. The P* will react to the FADEC warning audio tone by reducing the throttle to the index mark and smoothly adjusting the collective as necessary to gain control of the N_R/N_P. The P* will then instruct the P to identify the FADEC AUTO/MAN switch, and simulate pressing the AUTO/MAN switch, regardless of switch indication. The P* will then coordinate the throttle and collective as necessary to maintain N_R/N_P within limits and adjust the flight controls as necessary to land. Once the weight of the aircraft is firmly on the skids, the P* will reduce the throttle to the idle position, and then reduce the collective to the full down position to complete the landing. **The IP will ensure that the P* does not dump the collective when contact is made with the ground which will result in an overspeed.**

Note. At a hover: if hover altitude has been maintained and RPM is allowed to droop, it is recommended to close the throttle and enter a hovering autorotation.

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c. Cruise flight.

(1) FADEC failure in flight-training. While in level flight with cruise power applied at an altitude that will allow sufficient time to recover should the need arise. (The same approximate altitude that would be used to conduct a simulated engine failure at altitude would be appropriate. Not lower than 500 feet AGL.) The IP will direct the P* to maintain the collective position and reduce the throttle to the index mark. The crew will verify position of the throttle. The IP/P will place the FADEC AUTO/MAN switch to the MAN position and verify indications. The P* will smoothly adjust the collective as necessary to gain control of N_R/N_P and then adjust the throttle and collective as necessary to maintain N_R/N_P within limits. The IP will then instruct the pilot to accelerate and decelerate to directed airspeeds (not lower than 40 KIAS), climb and descend to directed altitudes (not lower than 500 feet AGL), and turn to directed headings while maintaining RPM within limits. After completing these maneuvers while the aircraft is in straight and level flight return to the AUTO mode.

(2) Respond to FADEC failure in flight. While in level flight with cruise power applied at an altitude that will allow sufficient time to recover should the need arise. (The same approximate altitude that would be used to conduct a simulated engine failure at altitude would be appropriate. Not lower than 500 feet AGL.) The IP/P will announce "FADEC MANUAL" while simultaneously placing the FADEC AUTO/MAN switch to the MAN position. The P* will react to the FADEC WARNING audio tone by reducing the throttle to the index mark and smoothly adjusting the collective as necessary to gain control of the N_R/N_P. The P* will then instruct the P to identify the FADEC AUTO/MAN switch, and simulate pressing the AUTO/MAN switch, regardless of switch indication. The P* will then coordinate the throttle and collective as necessary to maintain N_R/N_P within limits and adjust the flight controls as necessary for an approach and landing.

d. Approach and landing. Upon identifying the FADEC malfunction that has been initiated by the IP/P, the P* will react to maintain N_R/N_P within limits by adjusting the flight controls as necessary and ensure the FADEC AUTO/MAN switch is in the MAN position. The P* will maintain N_R/N_P within limits and select a suitable landing area. The P* should maneuver the aircraft so that it is at approximately 40 to 45 KIAS on final, and determine an approach angle which allows safe obstacle clearance to arrive at the intended point of landing. Once the approach angle is intercepted, coordinate throttle and collective to maintain appropriate approach angle and maintain operating limits. The exact approach angle and speed used during the approach will be dependent upon the suitability of the landing area and conditions. The final approach should be generally into the wind. The P* will complete the emergency procedure outlined in TM 1-1520-248-CL and if time permits will direct the IP/P to verify the procedures. Terminate the approach to a running landing or to a hover as described below.

(1) Approach to a running landing. Maintain apparent ground speed and rate of closure to arrive at approximately two feet above the intended touchdown area at or slightly above ETL. Reduce throttle to the engine idle position, (the throttle must be at the idle detent prior to touchdown or overspeed may occur), maintain heading with pedals, and apply collective to accomplish a smooth and controlled touchdown.

(2) Approach to a hover. Maintain apparent ground speed and rate of closure. Decelerate through ETL no higher than 250 feet AGL and not lower than 100 feet AGL regardless of the approach angle used. Once the P* negotiates ETL and the corresponding power change, the P* need only hover down the approach path to the desired termination point to a 3 to 5 foot hover.

Note. In the manual mode the collective is the most effective means of controlling N_R due to reduced throttle response rates.

Note. A common tendency is to apply aft cyclic as the throttle is being reduced. The crew must be aware of this tendency and guard against it.

Note. While operating at a high torque requirement the index mark may not provide adequate fuel flow to maintain RPM within limits. Throttle should be initially reduced to the appropriate position for the current torque demand, but no lower than the index mark.

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3. Additional IP/SP training. These role reversal exercises are designed to be performed ONLY by an IP or SP that are fully briefed on the task to be performed and are strictly designed to build confidence in the instructor pilot's ability to recover the aircraft.

a. IGE Hover (3 feet, ±1 foot).

(1) Underspeed. While performing the procedures listed for respond to a failure at a hover, the IP/SP (P*) will begin to intentionally decrease the throttle until N_R decreases to 95 percent. Extreme care shall be observed to not exceed any operating limits. As the IP(P) detects the underspeed condition, the IP(P) will retard the throttle to the idle stop and announce "Hovering Auto". The IP/SP(P*) will terminate the maneuver as Task 1072 terminates.

(2) Overspeed. While performing the procedures listed for respond to a failure at a hover, the IP/SP(P*) will begin to gradually increase the throttle until N_R increases to 105 percent. After the IP(P) detects the overspeed condition, the IP(P) will announce “I have the controls” and increase collective then direct IP/SP(P) to place the FADEC AUTO/MAN switch to the AUTO position. Visually confirm AUTO is illuminated, once AUTO is visually confirmed, the IP(P*) shall return the throttle to the full-open position.

b. Flight.

(1) Underspeed. While performing the procedures listed for respond to a failure in flight, the IP/SP(P*) will begin to intentionally decrease the throttle until N_R decreases to 95 percent. As the IP(P) detects the underspeed condition, the IP(P) will announce, "I have the controls," and smoothly adjust the throttle to the index mark (approximately 75 percent power level angle). The IP(P*) will adjust the collective as necessary to achieve N_R of 96 percent or greater and direct the IP/SP(P) to place the FADEC AUTO/MAN switch in the AUTO mode. Once the IP(P*) has visually confirmed FADEC is in AUTO, the IP(P*) will open the throttle to the full-open position, and terminate the maneuver.

(2) Overspeed. While performing the procedures listed for respond to a failure in flight, the IP/SP(P*) will begin to gradually increase the throttle until N_R increases to 105 percent. After the IP(P) detects the overspeed condition, the IP(P) will announce “I have the controls” and increase collective then direct IP/SP(P) to place the FADEC AUTO/MAN switch to the AUTO position. Visually confirm AUTO is illuminated, once AUTO is visually confirmed, the IP(P*) shall return the throttle to the full-open position, and terminate the maneuver.

c. The intent of these exercises is to demonstrate an appropriate recovery technique to an unintentional overspeed/underspeed condition during FADEC manual throttle training.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft. This task is intended to be progressive in nature IPs should not continue to more demanding elements of the task until the crewmember demonstrates proficiency.

2. Only the following maneuvers may be performed while conducting FADEC manual mode training/evaluations:

a. Hovering flight.

b. VMC flight maneuvers.

c. VMC approach to a hover.

d. Running landing as described in the procedure.

3. Evaluations will be conducted in the aircraft. For the approach and landing crewmembers must demonstrate proficiency to terminate with both a running landing and a VMC approach to a hover.

TASK 1142

Perform Digital Communication

CONDITIONS: In an OH-58D helicopter.

STANDARDS:

1. Configure the IDM/BFT for desired operations.
2. Access and review situational awareness (SA) displays provided by IDM/BFT.
3. Operate the IDM/BFT messaging systems.

DESCRIPTION:

1. Crew actions.
   a. The P* is primarily responsible for obstacle avoidance and clearing the aircraft.
   b. The P in the left seat will operate the system and announce when focused inside the cockpit.

2. Procedures. Configure the IDM/BFT in accordance with the unit SOP and operate it in accordance with the operator's manual. When operating the system, the P must not distract the P*'s attention away from flying the aircraft. The P should assist the P* with obstacle avoidance and clearing the aircraft and announce when doing so.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1155

Negotiate Wire Obstacles

> **WARNING**
>
> **During multiaircraft operations, wires may be spotted by trailing aircraft first. It is the responsibility of all aircraft within the flight to maintain SA, update one another and do not assume that all aircraft have observed the hazard.**

CONDITIONS: In an OH-58D helicopter in the vicinity of actual or simulated wire obstacles.

STANDARDS:

1. Locate and determine the height of wires.
2. Determine the method to negotiate the wire obstacle.

DESCRIPTION:

1. Crew actions.

   a. The PC will determine if under flight of the wire obstacles will be performed.

   b. The P* will focus primary attention scanning outside the aircraft and will confirm visual contact with wires and supporting structures. The P* is responsible for clearing the aircraft and obstacle avoidance.

   c. The P will assist with clearing the aircraft and will announce adequate warning to avoid hazards, wires, and poles or supporting structures. The P also will announce when the aircraft is clear, and when focused inside the aircraft.

2. Procedures.

   a. Program known wire hazards and other obstacles through the aviation mission planning system and download to the PC DTS-V before flight. During terrain/tactical flight, display wire hazards on the horizontal situation display (HSD) as much as practicable. Do not solely rely on the HSD for information relating to the location of wires. Not all wires may be plotted or the accurately displayed. During the mission search for wires and other hazards to flight.

   b. Announce wires/obstacles that could potentially affect the flight when they are seen and specify the direction, distance, and approximate altitude of them. Any terminology or brevity that is used to denote the height of wires must be commonly understood by the entire flight.

   c. Determine the method of negotiating the wires and initiate the maneuver.

   d. Overflight. Identify the top of the pole and the highest wire. Be aware that the highest wire may not be the most visible wire and scanning should be continual as they are approached. If the tactical situation allows, cross near a pole to aid in estimating the highest point. Minimize the time that the aircraft is unmasked.

e. Underflight. Locate guy wires and supporting poles. Accurately determine the amount of clearance between the wires and the ground. When crossing under wires, the lowest point of the wire must be at least 25 feet plus hover height above the ground. This means if hovering at 5 feet above the ground or obstacles, the lowest point of the wire must be 30 feet above the ground or obstacles. Ground speed will be as appropriate for given conditions. Ensure lateral clearance from guy wires and poles. Since the aircraft is approximately 13 feet in height from the skids to the top of the MMS, there will be at least 12 feet of clearance from the lowest point of the wires to the MMS when crossing under wires. The P can use the MMS and radar altimeter as aids in determining the height of the wires.

NIGHT OR NVG CONSIDERATIONS: Wires are difficult to detect at night with NVG. For training, under flight of wires will not be performed unless the location has been checked during daylight conditions and all hazards have been identified. Both crewmembers should be focused outside the cockpit. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1170

Perform Instrument Takeoff

CONDITIONS: In an OH-58D helicopter with reference to flight instruments only and hover power and before takeoff checks complete.

STANDARDS:

1. Confirm adequate power margin exists IAW the hover power check to perform the maneuver.
2. Set or confirm that the attitude indicator is approximately 4 degrees high.
3. Maintain established takeoff power ±2 percent mast torque once set.
4. Maintain accelerative climb attitude ±1 bar width once established.
5. Maintain takeoff heading ±10 degrees.
6. Maintain aircraft in trim after passing through ETL.

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily inside the aircraft on the instruments. The P* will follow the heading/course, altitude, issued by ATC or the P. The P* will announce any deviation not directed by ATC or the P and will acknowledge all navigation directives.

   b. The P will assist the P* by warning of drift or excessive roll of the aircraft. The P will verify a positive climb is established and the airspeed and assist the P* as necessary to prevent fixation and spatial disorientation. The P will perform duties as directed and will acknowledge any unannounced deviations. During simulated IMC, the P will remain focused outside the aircraft to provide adequate warning for avoiding obstacles and hazards detected.

2. Procedures. Takeoff power will be a minimum of 10 percent above mast torque required for hover. Crosscheck the VSD with the standby flight instruments throughout the maneuver. Practicing this task at night provides greater benefit since external cues are less visible.

   a. From the ground.

      (1) Identify and align the aircraft with the desired takeoff heading. Set or confirm the attitude indicator for takeoff at approximately 4 degrees nose high. With the cyclic in the neutral position, smoothly increase the collective until the aircraft becomes light on the skids.

      (2) Use outside visual references to prevent movement of the aircraft and check controls for proper response. Apply pressure and counter-pressure on the pedals to ensure the aircraft is free to ascend. Transition to the flight instruments, smoothly increase the collective to obtain takeoff power.

      (3) As the collective is increased, cross-check the attitude and heading indicators to ensure the helicopter remains at an attitude of approximately 4 degrees nose high and constant heading. When takeoff power is reached and the altimeter shows a positive climb, adjust to level pitch attitude for the initial acceleration. Maintain heading with pedals until airspeed increases through ETL or approximately 20 to 30 KIAS and then make the transition to coordinated flight.

(4) Upon reaching climb airspeed of approximately 60 KIAS, adjust the controls as required to maintain desired climb airspeed.

b. From a hover.

(1) On the runway or takeoff pad, identify and align the aircraft with the desired takeoff heading. Set or confirm the attitude indicator for takeoff at approximately 4 degrees nose high and check the controls for proper response.

(2) With primary focus outside the cockpit, establish the aircraft at a 3 foot hover. Initiate the takeoff by smoothly and steadily increasing the collective until takeoff power is reached. Simultaneously adjust pitch attitude as necessary to establish initial accelerative climb attitude. Visually maintain runway clearance and alignment on takeoff until the aircraft accelerates through ETL. At that time the P* will direct attention to the flight instruments and establish an instrument cross-check.

SNOW/SAND/DUST CONSIDERATIONS: An instrument takeoff may provide an effective method for departure in a sand/dust/snow environment. The departure is typically initiated from the ground. For an effective takeoff under these conditions the crew must carefully evaluate winds and make every effort to depart with favorable winds regardless of how light winds are estimated. Both crew members should have the VSD selected in preparation for transferring the controls in the event of disorientation and to aid in maintaining the attitude of the aircraft. Based on the environmental conditions and maximum torque available aircrews should plan to use greater than 10 percent above hover power to ensure a positive climb is established. During a takeoff under these conditions good crew coordination is essential to maintaining orientation and clearing the sand/dust/snow cloud effectively. If the selected power setting fails to produce a positive climb aircrews must be aware that prolonged hovering in the sand/dust/snow cloud without visible reference will likely result in disorientation regardless of the best efforts of the pilots. The decision must be made to either commit to the takeoff or if the P has visual reference with the ground to transfer the controls and land. If both crew members are IIMC then a decision should be made to commit to the takeoff using the power required to ensure a positive climb and maintain the power setting until the aircraft is clear of the sand/dust/snow cloud.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1176

Perform Nonprecision Approach (Ground-Controlled Approach)

CONDITIONS: In an OH-58D helicopter with reference to flight instruments only. Given the appropriate DOD FLIP, an approach clearance, and with before-landing check complete.

STANDARDS:

1. Perform the approach per AR 95-1, FM 3-04.240, and the DOD FLIP.
2. Maintain desired or directed airspeed ±10 KIAS.
3. Maintain assigned altitude ±100 feet.
4. Maintain heading ±5 degrees.
5. Make immediate corrections issued by ATC.
6. Comply with descent minimums prescribed for the approach.
7. Execute the correct missed approach procedure immediately upon reaching the missed approach point (MAP) if a landing cannot be accomplished.

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily inside the aircraft on the instruments and perform the approach. The P* will follow the heading/course, altitude, and missed approach instructions issued by ATC or P and will announce any deviation not directed by ATC or P and will acknowledge all navigation directives. If visual contact with the landing environment is not made by the MAP or a safe landing cannot be made, the P* will announce and execute a missed approach.

   b. The P will perform duties as directed by the P* and will call out the approach procedure to the P* and will acknowledge any unannounced deviations. The P will monitor outside for visual contact with the landing environment and will complete the approach as briefed, if VMC are encountered. During simulated IMC, the P will remain focused outside the aircraft to provide adequate warning for avoiding obstacles and hazards detected. The P will announce when attention is focused inside the cockpit.

2. Procedures. Follow all ATC instructions. If compliance with ATC is not possible inform them. Review approach and missed approach instructions before initiating the task. Conduct copilot briefing and designate crew responsibilities for the approach. FM 3-04.240 describes approach procedures. The crew should plan to use the EGI as an emergency backup for the approach. Practicing this task at night provides greater benefit since external cues are less visible.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1178

Perform Precision Approach (Ground-Controlled Approach)

CONDITIONS: In an OH-58D helicopter with reference to flight instruments only. Given the appropriate DOD FLIP, an approach clearance, and with the before-landing check complete.

STANDARDS:

1. Perform the approach per AR 95-1, FM 3-04.240, and the DOD FLIP.
2. Maintain desired or directed airspeed ±10 KIAS.
3. Maintain assigned altitude ±100 feet.
4. Maintain heading ±5 degrees.
5. Make immediate corrections issued by ATC.
6. Comply with descent minimums prescribed for the approach.
7. Execute the correct missed approach procedure immediately upon reaching the MAP if a landing cannot be accomplished.

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily inside the aircraft on the instruments and perform the approach. The P* will follow the heading/course, altitude, and missed approach instructions issued by ATC or the P and will announce any deviation not directed by ATC or the P, and will acknowledge all navigation directives. If visual contact with the landing environment is not made at decision height or safe landing cannot be made, the P* will announce and execute a missed approach.

   b. The P will perform duties as directed by the P* and will call out the approach procedure to the P* and acknowledge any unannounced deviations. The P will monitor outside for visual contact with the landing environment and will complete the approach as briefed, if VMC are encountered. During simulated IMC, the P will remain focused outside the aircraft to provide adequate warning for avoiding obstacles and hazards detected. The P will announce when attention is focused inside the cockpit.

2. Procedures. Follow all ATC instructions. If compliance with ATC is not possible, inform them. Review approach and missed approach instructions before initiating the task. Conduct copilot briefing and designate crew responsibilities for the approach. FM 3-04.240 describes approach procedures. The crew should plan to use the EGI as an emergency backup for the approach. Practicing this task at night provides greater benefit since external cues are less visible.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1180

Perform Emergency Global Positioning System Recovery Procedure

CONDITIONS: In an OH-58D helicopter with reference to flight instruments only, given a copy of the approach procedure, and the waypoints required to perform the approach entered into the navigation system.

STANDARDS:

1. Maintain selected cruise and final approach airspeed ±10 KIAS.
2. Maintain altitude within ±100 feet.
3. Intercept and maintain the final approach course within.±10 degrees of course centerline.
4. Arrive at the minimum descent altitude (MDA) prior to reaching the MAP.
5. At the MAP, execute the missed approach if unable to establish visual contact with the landing zone or a safe landing cannot be made.

DESCRIPTION:

1. Crew actions.

   a. The PC will review the approach with, and brief the other crewmember before initiating the procedure. The crew brief should include actions if VMC is encountered. The PC will confirm the correct communication frequencies are set, and the approach is entered in the navigation system and selected. The PC may assign the PI to perform these duties.

   b. The P* will focus primarily inside the aircraft on the instruments. The P* will follow the heading/course, altitude, and missed approach directives issued by ATC. The P* performing this procedure will not rely on outside references to complete this task.

   c. The P will call out the approach procedure to the P* as requested and will announce changes to ATC communication frequencies and ATC information not monitored by the P*. The P will announce when attention is focused inside the cockpit. **The P will maintain orientation primarily outside the aircraft to provide warning of obstacles and other aircraft to the P*.**

2. Procedures. Comply with ATC instruction, FAA procedures, local regulations and the published emergency global positioning system (GPS) recovery procedures. After establishing the aircraft on the final approach course, cross the initial approach fix (IAF) and begin descent to the published MDA, adhering to any step down fixes on the approach. Maintain aircraft ground track by cross-checking the VSD and HSD. Arrive at MDA prior to the MAP. Execute the missed approach if unable to establish visual contact with the landing zone or a safe landing cannot be made. If executing the approach for training ensure coordination with ATC prior to execution of published missed approach procedures. Practicing this task at night provides greater benefit since external cues are less visible.

NIGHT OR NVG CONSIDERATIONS: The P may be able to see the landing area through the NVG during conditions of light obscuration. During night unaided flight, consider using the searchlight to identify the landing environment.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1182
Perform Unusual Attitude Recovery

CONDITIONS: In an OH-58D helicopter with reference to flight instruments only and with an IP or authorized IE.

STANDARDS:

1. Detect that the aircraft is in an unusual attitude.
2. Without delay, use correct recovery procedures in the proper sequence.
3. Recover with a minimum loss of altitude.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused inside the aircraft during recovery if IMC. The P* will advise the P of an unusual attitude and request assistance. The P* will be prepared to relinquish the controls, if necessary.

   b. The P will advise the P* if they notice the aircraft in an unusual attitude and be prepared to assume the controls if necessary. The P is responsible for clearing the aircraft and obstacle avoidance and will monitor the aircraft attitude and the P* to help detect an unusual attitude. The P will assist in monitoring the aircraft instruments and call out unannounced changes in attitude, torque, and trim. The P will provide adequate warning for corrective action if aircraft operating limitations may be exceeded and will be prepared to take the controls if needed. The P will report any deviation from the assigned altitude to ATC.

2. Procedures. Upon detecting an unusual attitude, immediately initiate a recovery to straight and level flight with a minimum loss of altitude by—

   - Attitude. Establishing a level bank and pitch attitude.
   - Heading. Establishing and maintaining a heading.
   - Torque. Adjusting the torque to the appropriate setting.
   - Airspeed. Establishing and maintaining the appropriate airspeed.
   - Trim. Trimming the aircraft.
   - Cross-check the VSD with the standby flight instruments throughout the maneuver. Practicing this task at night provides greater benefit since external cues are less visible**.** Communication in the cockpit is essential.

NIGHT OR NVG CONSIDERATIONS: IMC is not a prerequisite for an unusual attitude. Low-level ambient light may induce spatial disorientation. During NVG operations, video noise may contribute to loss of visual cues.

SNOW/SAND/DUST CONSIDERATIONS: Loss of visual contact can be induced by obscurants other than weather. At low altitudes where these conditions would be encountered it is extremely important that these procedures be initiated immediately to prevent ground contact. Communication in the cockpit is essential.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1184

Respond to Inadvertent Instrument Meteorological Conditions

CONDITIONS: In an OH-58D helicopter.

STANDARDS:

1. Maintain aircraft control, announce IIMC and make the transition to instrument flight immediately.
2. Initiate IIMC procedural steps IAW this task.
3. Comply with all ATC procedural instructions, local regulations, and unit SOP.

DESCRIPTION:

1. Crew actions.
   a. The P* will—
      (1) Announce IIMC.
      (2) Transition to instrument flight.
      (3) Perform procedural steps without delay.
      (4) Announce if disoriented and unable to recover.
   b. The P* will call out—
      (1) Desired heading.
      (2) Desired torque.
      (3) Desired airspeed.
   c. The P will—
      (1) Announce IIMC if first to observe, be prepared to take the controls if the P* becomes disoriented, and monitor the attitude indicator, heading, torque, and airspeed as announced by the P* and immediately alert the P* of any unusual attitude condition or deviation from the announced information. The P may need to take the controls and implement recovery procedures.
      (2) Tune the radios to the appropriate frequencies, make the appropriate radio calls, and set transponder to the appropriate code.
      (3) Request ATC assistance, acknowledge ATC instructions, and record ATC information.
      (4) Perform any other crew tasks as directed by the P*.
2. Procedures.
   a. If IIMC is encountered by both crewmembers, the crew will announce they are IIMC, transition to instrument flight, and perform the following:
      - Attitude. Level the wings on the VSD or standby attitude indicator.
      - Heading. Maintain announced heading; turn only to avoid known obstacles.
      - Torque. Adjust the collective to the desired climb power torque.

- Airspeed. Adjust the airspeed to the desired climb airspeed.
- Trim. Maintain the aircraft in trim.
- Set the transponder to emergency once the aircraft is under control.
- Complete the procedure per local regulations and policies.

b. Maintaining aircraft control and initiating a climb is extremely important to avoid ground, obstacle, or other aircraft contact. The P* should announce if spatial disorientation occurs and the P should always be prepared to take the controls and recover the helicopter. Crosscheck the VSD with the standby flight instruments throughout the maneuver. Do not become fixated on any one instrument or indication, a continuous scan and cross-check and understanding the correlation between indications will provide better results. **Once committed to IMC, do not attempt to regain VMC until the aircraft is under control. Rapid changes in attitude and bank angle can induce spatial disorientation causing loss of aircraft control**. Tune the radios to the appropriate frequencies, make the appropriate radio calls, and set transponder to the appropriate code. Request ATC assistance. Comply with all ATC procedural instructions, local regulations, and unit SOPs for recovery procedures. Practicing this task at night provides greater benefit since external cues are less visible.

NIGHT OR NVG CONSIDERATIONS: Entering IIMC with the searchlight on may induce spatial disorientation. The NVG may be removed or flipped up once stable flight is established. When using NVG, it may be possible to see through thin obscuration such as fog and drizzle with little or no degradation. It may be beneficial for the P not to completely remove the NVG. The NVG may assist in recovery by allowing the P to see through thin obscuration that would otherwise prevent seeing the landing environment.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1188

Operate Aircraft Survivability Equipment/Operate Transponder

CONDITIONS: In an OH-58D helicopter with installed and operational aircraft survivability equipment (ASE)/transponder equipment or academically using computer based aircraft survivability equipment training (CBAT).

STANDARDS:

1. Prepare equipment for operation.
2. Perform self-test, if required.
3. Identify the threat from the visual display or audio warning and take appropriate action.

DESCRIPTION:

1. Crew actions.

   a. The P* is responsible for clearing the aircraft and obstacle avoidance. When maneuvering the aircraft in response to ASE indications the P* must consider obstacles and other aircraft.

   b. The P will operate the ASE/transponder. They will announce when his attention is focused inside the cockpit. The P should assist the P* with obstacle avoidance and clearing the aircraft and announce when doing so.

2. Procedures. Conduct preflight inspection of the installed ASE and transponder equipment IAW TM 1-1520-248-10 and TM 1-1520-248-CL. Using the checklist, turn-on, self-test, and conduct operational checks. The crew will determine what effect an ASE/transponder system malfunction will have on the assigned mission. Employ the equipment as directed by the unit SOP or as briefed. In the event of a failure or partial failure of any ASE/transponder equipment inform appropriate personnel and record any discrepancies on DA Form 2408-13. In the event of a laser or radar indication displayed by the ASE systems transmit the appropriate report in accordance with unit SOP. Upon mission completion use the check list to perform shutdown procedures.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically using CBAT.
2. Evaluation will be conducted in the aircraft.

TASK 1194

Perform Refueling/Rearming Operations

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Ensure that refueling and rearming procedures are performed in accordance with the operator's manual, TM 1-1520-248-CL, SOPs, and local directives.

DESCRIPTION:

1. Crew actions.

   a. The PC will verify that the proper types and quantities of ordnance are loaded to meet the mission profile. Once refueled or rearmed, the PC will determine if there will be any limitations imposed on the flight as a result of the ordnance and fuel loads. When IGE power is available, the PC will ensure another hover power check is performed after rearm/refuel checking CG and controllability.

   b. The P* will position the aircraft to the refueling point and will perform refuel and rearm procedures IAW TM 1-1520-248-CL.

   c. The P will call out the applicable refuel and rearm checks and items required by TM 1-1520-248-CL and unit SOP. The P will monitor the aircraft position and will provide adequate warning for obstacle avoidance.

2. Procedures.

   a. Ensure that FARP personnel properly ground and refuel the aircraft. Ensure that the tank is filled to the required level. When the refueling is completed, ensure that the cap is secured and grounding cables removed. Ensure coordination between crewmembers and armament personnel prior to manipulating weapons switches during continuity checks, stray voltage checks, and when loading the 50-caliber machine gun.

   b. The closed circuit refuel nozzle assembly provides an indication to refuel personnel when the fuel tank is full. A visual signal from the pilot during hot refuel indicating a full fuel tank is not necessary. A visual signal from the pilot may be necessary only when the pilot wants to take on a certain amount of fuel. Risk assessment must be factored in the mission briefing when hot rearm/refuel is to be accomplished. Make appropriate logbook entries.

NIGHT OR NVG CONSIDERATIONS: Supplement aircraft lighting at the refueling station by using an explosion-proof flashlight with an unfiltered lens to check for leaks and fuel venting.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1300

Perform Mast-Mounted Sight Operations

WARNING

Use of the LRF/D laser must be conducted on an approved range/area.

CAUTION

When operating the MMS, the P must not distract the P* from flying the aircraft.

CONDITIONS: In an OH-58D helicopter.

STANDARDS:

1. Perform all MMS procedures/functions without assistance in accordance with TM 1-1520-248-10.
2. Operate personal computer data transfer system-video (PC DTS-V) in accordance with TM 1-1520-248-10.

DESCRIPTION:

1. Crew actions.

   a. The P* in the right seat is primarily responsible for obstacle avoidance and clearing the aircraft. The P* will maintain aircraft orientation and provide local security during MMS operations.

   b. The co-pilot/gunner (CPG)/P in the left seat will operate the system and announce when focused inside the cockpit. The CPG/P will assist the P* to remain oriented on the target and help with obstacle avoidance and clearing the aircraft duties permitting.

2. Procedures.

   a. MMS. Configure and operate the MMS according to TM 1-1520-248-10. Adjust the thermal imaging sensor (TIS)/thermal imaging sensor upgrade (TISU) as necessary to obtain the best picture. Enter the correct laser codes for the mission. Perform boresight and airborne calibration procedures as required. Select the appropriate sensor and the proper field of view to search for, and acquire targets. Use the laser range finder/designator (LRF/D) to range, locate, and designate a target. Use the prepoint mode as an aid in maintaining orientation. The P* may override the CPGs use of the MMS by pressing the fixed forward switch located on the cyclic grip controls.

   b. PC DTS-V. Configure and operate the PC DTS-V according to TM 1-1520-248-10. During the preflight, ensure that a personal computer memory card international association (PC MCIA) card is correctly installed into the video card slot. The CPG/P should initialize the video card IAW the unit SOP.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial. When maneuvering the aircraft to maintain the MMS on target, the P* must consider obstacles and other aircraft. The P should assist the P* with obstacle avoidance and clearing the aircraft and announce when doing so.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1304

Operate Aviator's Night Vision Imaging System Display Symbology Subsystem

CONDITIONS: In an OH-58D helicopter at night with NVG and an ADSS.

STANDARDS:

1. Perform checks and operate the system according to TM 1-1520-248-10.
2. The crew will perform operational checks and brief the other crewmember on the status of the ADSS.

DESCRIPTION: Procedures. Visually inspect the optical display assembly (ODA) prior to use. Any discrepancy should be reported as directed by the unit SOP. During runup per the checklist, turn on the ODA using the pilots cyclic ODA switch as applicable. Access the ADSS test page and adjust the brightness. Select the desired mode and declutter level.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1402

Perform Tactical Flight Mission Planning

CONDITIONS: Before a tactical flight in an OH-58D helicopter and given a mission briefing, navigational maps, an aviation mission planning system or a navigational computer, and other materials as required.

STANDARDS:

1. Analyze the mission using the factors of mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC).

2. Perform a map/photo reconnaissance using the available map media, aviation mission planning system video map terminal, or photos. Ensure that all known hazards to terrain flight are plotted on the map or into the aviation mission planning system.

3. Select the appropriate flight modes.

4. Select appropriate primary and alternate routes and enter all of them on a map, route sketch, or into the aviation mission planning system as required.

5. Determine the distance within 1 kilometer, ground speed ±5 knots, and ETE ±1 minute for each route leg of the flight as required.

6. Determine the fuel required ±25 pounds and reserve in accordance with AR 95-1.

7. Obtain and evaluate the weather briefing.

8. Perform risk assessment per unit SOP.

9. Conduct a thorough crew/team mission briefing per the unit SOP and Task 1000.

DESCRIPTION:

1. Crew actions.

   a. The PC will ensure that all necessary tactical flight information is obtained and will conduct a thorough crewmember briefing in accordance with the unit SOP and Task 1000. The PC may delegate mission planning tasks to the other crewmember but retains overall responsibility for mission planning. The PC will analyze the mission in terms of METT-TC.

   b. The PI will perform the planning tasks directed by the PC/AMC.

2. Procedures. Analyze the mission using the factors of METT-TC. Conduct a map or aerial photo reconnaissance. Obtain a weather briefing that covers the entire mission. Include sunset and sunrise times, density altitudes, ceilings, winds, and visibility restrictions. If the mission is to be conducted at night, the briefing should also include moonset and moonrise times, ambient light levels, and an electro-optical forecast, if available. Evaluate weather impact on the mission. Considerations should include aircraft performance, limitations on visual sensors, and weapons employment. Determine primary and alternate routes as required, flight modes, and movement techniques. Determine the time and distance for route legs as required, fuel requirements for the mission, refuel locations and contingencies. Annotate the map, overlay, or aviation mission planning system with sufficient information to complete the mission. Include waypoint coordinates that define the routes for entry into the aviation mission planning system. Consider such items as hazards, checkpoints, observation posts, and friendly and enemy positions. Review contingency procedures.

NIGHT OR NVG CONSIDERATIONS: More detailed flight planning is required when the flight is conducted in reduced visibility, at night, or in the NVG flight environment. FM 3-04.203 contains details on night navigation.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted academically.
2. Evaluation will be conducted academically.

TASK 1405

Transmit Tactical Reports

CONDITIONS: In an OH-58D helicopter or academically and given sufficient information to compile a tactical report.

STANDARD: Transmit appropriate report using the proper format.

DESCRIPTION:

1. Crew actions.

   a. The P* is responsible for aircraft control and obstacle avoidance. The P* will coordinate with the P as to who will make the report. When maneuvering the aircraft to maintain the MMS on target, the P* must consider obstacles and other aircraft.

   b. The P will prepare the information for the report and coordinate with the P* prior to sending it. The P should assist the P* with obstacle avoidance and clearing the aircraft and announce when doing so.

2. Procedures. Reports must be timely and concise. To save time, reduce confusion, and ensure completeness, information should be reported according to an established format.

   a. **Spot report**. A spot report is used to report timely intelligence or status regarding events that could have an immediate and significant effect on current and future operations. This is the initial means for reporting troops in contact and event information. Determine the level of detail based on factors of METT-TC. The minimum report elements (size, activity, location, time, what you are doing [SALT-W]) are discussed below:

      (1) **Size.** Estimate the number of—

         (a) Persons: military, civilian.

         (b) Vehicles: military, civilian.

         (c) Equipment: military, civilian.

      (2) **Activity.** Describe the activity—

         (a) Attacking (direction from).

            - Air defense artillery (ADA) (engaging).
            - Aircraft (engaging) (rotary wing, FW).
            - Ambush (IED [exploded], IED [unexploded], sniper, anti-armor, other).
            - Indirect fire (point of impact, point of origin).
            - CBRN.

         (b) Defending (direction from).

         (c) Moving (direction from/to).

         (d) Stationary.

         (e) Cache.

         (f) Civilian (criminal acts, unrest, infrastructure damage).

         (g) Personnel recovery (isolating event, observed signal).

         (h) Other (Give name and description).

(3) **Location.** Grid coordinate of detected element activity or event.

(4) **Time.** Time of observation.

(5) **What you are doing?** Describe your actions taken related to the detected activity: attack, bypass, continue to observe, or other. When feasible, state potential for subsequent reports such as close air support request, battle damage assessment (BDA) report, call for fire, or medical evacuation.

b. **Medical evacuation request.** Use to request evacuation of sick and wounded personnel by other than United States Air Force FW assets.

(1) **Line 1.** Location. Grid coordinate of pickup site location.

(2) **Line 2.** Radio frequency and callsign. Radio frequency at pickup site; callsign/suffix.

(3) **Line 3.** Number of patients by precedence:

(a) A–URGENT.

(b) B–URGENT-SURG.

(c) C–PRIORITY.

(d) D–ROUTINE.

(e) E–CONVENIENCE.

(4) **Line 4.** Special equipment (brevity codes):

(a) A–None.

(b) B–Hoist.

(c) C–Extraction equipment.

(5) **Line 5.** Number of patients. Total number of patients by type:

(a) Litter.

(b) Ambulatory.

(6) **Line 6.**

(a) Security of pick up site-wartime (brevity codes):

- N–No enemy troops in area.
- P–Possibly enemy troops in area (approach with caution).
- E–Enemy troops in area (approach with caution).
- X–Enemy troops in area (armed escort required).

(b) Type of injury. Peacetime: Specific information regarding patient/wounds.

(7) **Line 7.** Method of marking at pickup zone (PZ) (brevity codes):

- A–Panels.
- B–Pyrotechnic signal.
- C–Smoke signal.
- D–None.
- E–Other.

(8) **Line 8**. Patient nationality. Number of patients in each category need not be transmitted:

- A–U.S./coalition military.
- B–U.S./coalition civilian.
- C–Non-U.S./coalition military.
- D–Non-U.S./coalition civilian.
- E–EPW.

(9) **Line 9**.

(a) CBRN contamination-wartime:

- N–Nuclear.
- B–Biological.
- C–Chemical.
- R–Radiological.
- U–Unknown.
- A–All Clear.

(b) Terrain description-peacetime. Description of terrain features at the proposed pick-up site.

c. **Battle damage assessment report.** Used to provide a timely and accurate estimate of damage resulting from the application of military force. Preplanned objectives may require more detailed reporting.

(1) **Line 1.** Unit/Callsign. Unit or callsign of element making report ("Bulldog TOC, Saber 11, BDA, over").

(2) **Line 2.** Target information. Target details/number, may reference previous spot report.

(3) **Line 3.** Location. Grid coordinate of target ("DF12345678").

(4) **Line 4.** TOT. Time on target of attack ("2125L").

(5) **Line 5.** Delivery system. Number and type of delivery system.("one AH-64").

(6) **Line 6.** Weapons. Number and type of weapons. ("100 rounds 30 mm").

(7) **Line 7.** BDA analysis. Narrative of target damage and munitions effects to include: number, type, and level of destruction; grid coordinates (If different than previous); physical damage; confidence level; and whether re-attack is required ("3 enemy dismounts KIA").

(8) **Line 8.** Narrative. Any additional information required for clarification.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.
2. Evaluation may be conducted in the aircraft or academically.

REFERENCES: ATP 3-09.32 and FM 6-99.2.

TASK 1407

Perform Terrain Flight Takeoff

CONDITIONS: In an OH-58D helicopter with the aircraft cleared and OGE hover power available.

STANDARDS:

1. Properly complete the ground reconnaissance and select a suitable takeoff path.
2. Perform a hover power check as required and complete the before-takeoff check without error.
3. Maintain takeoff heading ±10 degrees.
4. Maintain takeoff flight path until clear of obstacles.
5. Maintain power as required to clear obstacles safely while not exceeding aircraft limitations.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused primarily outside the aircraft during the maneuver. The P* will direct the other crewmember to maintain visual reference outside the aircraft to assist in clearing and will ensure that the aircraft is cleared and select reference points to assist in maintaining takeoff flight path. The P* will announce initiating the takeoff and whether the takeoff is from the ground or from a hover and will also announce intentions to abort or alter the takeoff.

   b. The P will maintain visual reference outside the aircraft, acknowledge when ready for takeoff and provide adequate warning of any obstacles or hazards in the flight path.

2. Procedures. Prior to takeoff perform a ground reconnaissance to determine the suitability of the area. Determine the takeoff direction by analyzing the tactical situation, wind, long axis of the takeoff area, and the lowest obstacles. Repositioning the aircraft downwind will minimize the power requirements on takeoff. Select reference points to assist in maintaining the takeoff flight path. Complete the before takeoff check and, if required, perform a hover power check. Coordinate the collective and cyclic controls as necessary to establish a climb angle that will clear any obstacles in the takeoff path. Maintain heading with the pedals and once the obstacles are cleared, smoothly adjust the flight controls to transition to the terrain flight mode (NOE, contour, or low level).

NIGHT OR NVG CONSIDERATIONS:

1. Before the aircraft leaves the ground, determine if the landing or IR light is required.
2. Treat visual obstacles, such as shadows, the same as physical obstacles. If sufficient illumination does not exist to view obstacles, an altitude-over-airspeed takeoff should be performed.
3. Maintain proper scanning techniques to avoid becoming spatially disoriented.

SNOW/SAND/DUST CONSIDERATIONS:

1. As the aircraft leaves the surface, maintain heading with the pedals and a level attitude with the cyclic. As the aircraft clears the snow/sand/dust cloud and all barriers, accelerate to climb airspeed and trim the aircraft. In some cases, applying collective to blow away loose snow/sand/dust from around the aircraft is beneficial before performing this maneuver.

Note. The P* should be prepared to transition to instruments if ground reference is lost.

2. At night, use of the landing light or IR light may cause spatial disorientation while in blowing snow/sand/dust. The P should have VSD selected and also be prepared to transition to instruments if ground references are lost to aid the P* as necessary.

MUD/MUSKEG/TUNDRA CONSIDERATIONS: Smoothly increase the collective until the crew confirms that the landing gear is free. Adjust controls as necessary to perform a VMC takeoff.

Note. Before performing operations in a mud/muskeg/tundra environment, it is important to understand dynamic rollover characteristics.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1408

Perform Terrain Flight

CONDITIONS: In an OH-58D helicopter with OGE hover power available for NOE flight.

STANDARDS:

1. NOE flight.

   a. Fly as close to the earth's surface as vegetation, obstacles, and ambient light will permit.

   b. Maintain airspeed appropriate for the terrain, enemy situation, weather, and ambient light.

2. Contour flight.

   a. Maintain an altitude that allows safe clearance of obstacles while generally conforming to the contours of the earth.

   b. Maintain airspeed appropriate for the terrain, enemy situation, weather, and ambient light.

   c. Maintain the aircraft in trim.

3. Low-level flight.

   a. Maintain selected altitude ±50 feet.

   b. Maintain selected airspeed ±10 KIAS.

   c. Maintain aircraft in trim.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will acknowledge all navigational and obstacle clearance instructions given by the P. The P* will announce the intended direction of flight and any deviation from instructions given by the P.

   b. The P will provide adequate warning to avoid obstacles detected in the flight path or identified on the map. Duties permitting, the P will assist with clearing the aircraft and obstacle avoidance and will announce when his attention is focused inside the cockpit.

2. Procedures. Terrain flight involves flying close to the earth's surface. The modes of terrain flight are NOE, contour, and low-level. The crew will seldom perform pure NOE or contour flight. Instead, they will alternate techniques while maneuvering over the desired route. During terrain flight, the crew's primary concern is the threat and obstacle avoidance.

   a. Terrain flight is conducted at one of, or a combination of, three distinct modes of flight as described below:

      (1) NOE flight. NOE flight is conducted at varying airspeeds and altitudes as close to the earth's surface as vegetation, obstacles, and ambient light will permit. For NVG training, operate with the skids up to 25 feet above trees and vegetation in the flight path.

      (2) Contour flight. Contour flight is characterized by varying altitude and relatively constant airspeed, depending on vegetation, obstacles, and ambient light. It generally follows the contours of the earth.

For NVG training, operate with the skids or wheels between 25 and 80 feet above highest obstacle (AHO).

(3) Low-level flight. Low-level flight is usually performed at a constant airspeed and altitude. It generally is conducted at an altitude that prevents or reduces the chance of detection by enemy forces. For NVG training, operate with the skids or wheels between 80 and 200 feet AHO.

NIGHT OR NVG CONSIDERATIONS: Terrain flight modes. Wires and other hazards are difficult to detect with the NVG. The crew must use proper scanning techniques to ensure obstacle avoidance. Clear communication in the cockpit is required. Each crewmember must know and understand what the other is doing.

OVERWATER CONSIDERATIONS: Overwater flight, at any altitude, is characterized by a lack of visual cues and therefore has the potential of causing spatial disorientation. Be alert to any unannounced changes in the flight profile and be prepared to take immediate corrective actions. The radar altimeter low altitude warning should be set to assist in altitude control. Hazards to terrain flight such as harbor lights, buoys, wires, and birds must also be considered during overwater flight. When possible both crewmembers should be focused outside the cockpit.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: FM 3-04.203.

TASK 1409

Perform Terrain Flight Approach

> **CAUTION**
>
> When touching down with forward speed to other than a hard surface, a rapid reduction of the collective to the full down position, or partially reducing the collective too abruptly, can result in snagging the skid toes, resulting in excessive forward pitching motion. Touching down in this manner requires smooth, gradual reductions of the collective until the weight of the aircraft is firmly supported by the skids.

CONDITIONS: In an OH-58D helicopter with the before-landing check completed and OGE hover power available.

STANDARDS:

1. Perform a landing area reconnaissance and select a suitable landing area.
2. Maintain an approach angle to clear obstacles.
3. Maintain ground track aligned with the selected approach path.
4. Maintain the appropriate rate of closure.
5. Make a smooth, controlled termination at the intended landing area to a hover or to the ground as desired or directed.

DESCRIPTION:

1. Crew actions.

   a. The P* will maintain visual reference outside the aircraft throughout the approach and landing to include the go-around if required. The P* will direct the P to maintain visual reference outside to assist in clearing the aircraft. The P* will announce intent to land, abort, or alter the approach, and will announce the beginning of the approach when intercepting an angle that assures obstacle clearance. The P* will announce his intended landing area, and whether the approach will terminate to a hover or to the ground, and any deviation to the approach.

   b. The P will remain focused outside the aircraft and confirm suitability of the area. The P will announce adequate warning to avoid obstacles or hazards detected in the flight path or identified on the map and will also announce if attention is focused inside the aircraft. If a go-around is required, the P will focus outside the aircraft to assist in obstacle avoidance, unless focus inside is required to monitor the aircraft instruments. The P should have VSD selected and also be prepared to transition to instruments if ground references are lost to aid the P* as necessary**.**

2. Procedures.

   a. Determine the landing direction by analyzing the tactical situation, wind, long axis of the landing area, and the lowest obstacles. Maneuver the aircraft as required (straight-in or circle) to intercept the desired

approach path. Adjust the flight path and airspeed as necessary and maintain orientation of the landing area. Coordinate the collective and cyclic as necessary to maintain an approach angle to ensure obstacle clearance and control the rate of closure. Approach speed on final can vary, and the exact speed used on final will depend upon the size of the landing area, obstacle height, and the exact approach angle used. Steeper approach angles require lower speeds.

b. The decision to terminate at a hover, to the ground with zero forward speed, or with a run-on landing will depend on aircraft loading, environmental conditions, and surface conditions at the landing area. Landing to the forward one third of the available landing area will reduce power requirements.

c. A go-around should be made when visual contact with the approach point is lost on final, during brownout, whiteout, or when other obscurants affect visibility or a safe landing cannot be made. If a go-around is to be performed, ideally it should be prior to descending below obstacles or decelerating below ETL. If at any time during the approach the P* loses visual contact or it becomes apparent visual contact will be lost with the intended landing area, the P* will inform the P and request assistance. If the P still has the intended landing area in sight, the P will take the controls and complete the approach. If the P does not have the intended landing area in sight, the P* will perform a go-around. Movement over areas of limited contrast, such as tall grass, water, or desert, tends to cause spatial disorientation. Seek hover areas that provide adequate contrast. If disorientation occurs, apply sufficient power and execute an instrument takeoff. If a takeoff is not feasible, attempt to maneuver the aircraft forward and down to the ground to limit the possibility of touchdown with sideward or rearward movement.

NIGHT OR NVG CONSIDERATIONS: Proper scanning techniques are necessary to avoid spatial disorientation. Before descending below obstacles, determine the need for use of the searchlight. The ADSS should be used as an aid to detect drift and help in maintaining attitude, airspeed, and altitude.

SNOW/SAND/DUST CONSIDERATIONS:

1. Termination to an OGE hover. Terminate to a stationary OGE hover over the touchdown area. This approach requires OGE power and may be used for most snow landings and some sand/dust landings. Slowly lower the collective and allow the aircraft to descend. The descent may be vertical or with forward movement. The rate of descent will be determined by the rate in which the snow/sand/dust is blown from the intended landing point. During the descent, remain above the snow/sand/dust cloud until it dissipates and the touchdown point can be seen. Both crewmembers should be focused outside the cockpit. Be prepared to execute a takeoff. Hovering OGE reduces available ground references and may increase the possibility of spatial disorientation. Be prepared to transition to instruments and execute an instrument takeoff if ground reference is lost.

2. Termination to the surface with forward speed. This termination may be made to an improved landing surface or suitable area with minimal ground references. Once the appropriate approach angle is intercepted, adjust the collective as necessary to establish and maintain the angle. As the apparent rate of closure appears to increase, progressively reduce the rate of descent and closure to arrive at the touchdown area slightly above ETL. Maintain the minimum rate of closure that ensures that the snow/sand/dust cloud remains behind the pilot's station. When the skids contact the snow/ground, slowly reduce the collective and allow the aircraft to settle firmly onto its skids as it comes to a stop. Maintain proper alignment with the pedals throughout the landing, and apply slight aft cyclic at touchdown to prevent snagging the skid toes. The P should keep the P* informed of the location of the snow/sand/dust cloud. Be prepared to execute a go round.

3. Termination to the surface with little or no forward speed. This termination should be made to landing areas where slopes, obstacles, or unfamiliar terrain preclude a landing with forward speed. It is not recommended when new or powder snow or fine dust is present because whiteout/brownout conditions may

occur. The termination is made directly to a reference point on the ground with no forward speed. The P should keep the P* informed of the location of the snow/sand/dust cloud. Be prepared to execute a go round. When landing in deep snow, the aircraft skids may settle at different rates and the aircraft will normally terminate in a tail-low attitude.

Note. At night, use of the searchlight may cause spatial disorientation while in blowing snow/sand/dust.

MUD/MUSKEG/TUNDRA CONSIDERATIONS: Select a suitable area and terminate the approach to a 10-foot hover over the intended touchdown point. Begin a vertical descent until the aircraft touches down. Check aircraft stability while lowering the collective. If the area is suitable, lower the collective to the full down position and neutralize the cyclic and pedals.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1411

Perform Terrain Flight Deceleration

CONDITIONS: In an OH-58D helicopter with OGE hover power available for NOE flight.

STANDARDS:

1. Maintain heading +10 degrees.
2. Maintain tail rotor clear of all obstacles.
3. Decelerate to the desired airspeed or to a full stop ±50 feet of the selected location.

DESCRIPTION:

1. Crew actions.

   a. The P* remains focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will announce intention to decelerate or come to a full stop, any deviation from the maneuver, and completion of the maneuver.

   b. The P will provide adequate warning to avoid obstacles detected in the flight path and will announce when attention is focused inside the cockpit.

   c. The crew must clear the area below the aircraft before descending.

2. Procedures: Consider variations in the terrain and obstacles when determining tail rotor clearance. With terrain and obstacle considerations made, increase the collective just enough to maintain the altitude of the tail rotor. Initially increasing the collective may not be necessary at higher airspeeds. Apply aft cyclic to slow down to the desired airspeed/ground speed or come to a full stop while adjusting the collective to maintain the altitude of the tail rotor. Maintain heading with the pedals and make all control movements smoothly. If the attitude of the aircraft is changed too much or too abruptly, returning the aircraft to a level attitude will be difficult and over controlling may result.

NIGHT OR NVG CONSIDERATIONS: Because of the limited field of view of the NVG, avoid making abrupt changes in aircraft attitude. An extreme nose-high attitude limits the forward field of view. Maintain proper scanning techniques to ensure obstacle avoidance and tail rotor clearance. If possible, both crewmembers should focus outside the cockpit.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1416

Perform Weapons Initialization Procedures

CONDITIONS: In an OH-58D helicopter.

STANDARDS:

1. Prepare the installed weapon system(s) for operation IAW TM 1-1520-248-10.
2. Determine the status of the weapon systems.

DESCRIPTION:

1. Crew actions. The crew will perform weapon system initialization procedures on all tactical flights/missions, or as directed by the commander IAW TM 1-1520-248-10. These procedures determine the status and operation of each weapon system. The aviation mission planning system may be used to program the weapon systems or the data may be manually entered into the system. Crewmembers will coordinate manipulation of armament switches and announce when they have completed weapons initialization procedures. The crew will determine what effect a weapon system malfunction will have on the assigned mission.

2. Procedures. Crews should evaluate the contents of the AMPS mission prior to arriving at the aircraft. Aircrews can verify how their weapons will initialize using the AMPS and loading the PC MCIA mission card during premission planning. This will reduce pilot workload during aircraft run up procedures. Selections for the default power-up configuration of each weapons system must be entered or verified for the mission load. Perform weapons initialization procedures in accordance with the operator's manual. Selections for the default power-up configuration of each weapons system should be entered or verified for the mission load.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1422

Perform Firing Techniques

WARNING

During diving and running fire aircrews must avoid target fixation and exercise good crew coordination to ensure the successful and safe outcome of the engagement.

WARNING

Aircrews must thoroughly understand recovery techniques and increase recovery altitudes as anyone or combination of dive angle, airspeed, density altitude, or gross weight increases.

WARNING

During diving fire engagements the minimum altitude the aircraft must be recovered in level flight or climbing out by is 100 ft AHO. This altitude must not be misconstrued by aircrews as the altitude to begin the recovery.

CAUTION

The crew must be aware of the effects of blade coning, mushing, transient torque, and environmental factors and their effect on dive recovery as outlined in FM-04.203.

CONDITIONS: In an OH-58D helicopter with aircraft weapons initialization procedures completed, and given a target to engage.

STANDARDS:

1. Determine the range to the target.
2. Determine the desired end state for the engagement.
3. Determine the ordnance based on the type of the target and desired endstate.
4. Determine the method of engagement to be used.

5. Properly employ firing techniques and procedures.

6. Use proper crew coordination techniques. This task requires coordination between crewmembers within the aircraft, as well as coordination between aircraft as part of a Scout Weapons Team (SWT) or Air Weapons Team (AWT).

DESCRIPTION:

1. Crew duties.

a. The P* will determine the range to the target using distance estimation techniques, navigation system or map reconnaissance.

b. The PC will evaluate the situation using the applicable factors of METT-TC and determine the desired end state for the engagement. The PC will select or supervise the selection of the appropriate weapon system and type of fire.

c. The CPG will assist with obstacle avoidance, target acquisition, and cross checking instruments. The CPG will, when directed, range the target with the MMS, navigation system, or using map reconnaissance.

2. Procedures. The "Four T's". Regardless of the engagement technique used, aircrews should use the "four T's"-Target, Torque, Trim, and Target. The following describes the sequence.

a. Target verified. Crews verify that they are engaging the correct target, with the desired weapon system, and that weapons symbology, if used, is correctly aligned. The pilot may select key terrain to assist in lining up on the target.

b. Torque verified. The pilot verifies the torque required and does not change it. Any torque changes during the firing sequence will affect the accuracy of firing. At a hover, changing the torque will change the amount of downwash produced by the rotor system, which affects the flight of rockets. Changing the torque setting will also impart motion to the aircraft, which can cause angular rate error. This affects all munitions, whether the aircraft is at a hover or moving forward in free flight.

c. Trim verified. The trim of the aircraft includes both horizontal and vertical trim. The pilot should verify and adjust the pitch attitude (vertical trim) with the cyclic. The pilot should verify and adjust the trim of the aircraft (horizontal trim) with the pedals before firing. During running and diving fire, an out-of-trim condition will deflect the rockets toward the trim ball. That is, if the nose of the aircraft is out of trim to the left (right sideslip), the rockets will plane into the relative wind to the right, and vice versa. During a hover in a crosswind, the aircraft may be allowed to drift in the direction of the wind in order to maintain proper trim.

d. Target re-verified. The crew re-verifies the correct target and symbology alignment if used.

e. Hover fire is a weapons delivery technique that is used during terrain flight at OGE or IGE altitudes. It can be performed while stationary or moving, but is always done at speeds below ETL. Because the aircraft is less stable at a hover, the accuracy of non guided weapons systems is reduced, especially fin stabilized projectiles. Weapons symbology should be used to increase the accuracy of first round target effects. When using this firing technique, station time or armament load may need to be reduced because of power limitations. When possible, move the aircraft between engagements and use point-type weapons as the preferred method of attack. Due to the ability to mask and low visual signature, hover fire provides protection against anti aircraft-artillery (AAA) and surface to air missile (SAM) threats; however, depending upon the tactical situation, hovering can leave the aircraft vulnerable to direct small arms fire

and armor threats. Care must be taken to ensure local security during hover fire. Movement of the aircraft either forward or backward helps to stabilize the platform, and greatly reduces accuracy errors caused by control input or wind. Allowing the aircraft to drift with the wind while firing also helps to stabilize the platform.

f. Running fire is a weapons delivery technique that can be used effectively during terrain flight, especially in regions where cover, concealment, and environmental conditions hamper or limit the effectiveness of hover fire, and where AAA and SAM threats prevent the use of diving fire. Running fire is performed at speeds above ETL. The increased speed eliminates rotor downwash error and provides increased accuracy, particularly for fin stabilized projectiles, while the lower altitude increases survivability.

(1) During running fire, the beaten zone tends to be more elliptical, with the long axis of the ellipse oriented longitudinally along the direction of flight. This is because stability in the vertical plane is less than what it would be during diving fire, due to the lower altitudes at which running fire is conducted. This can result in angular rate error, and relative wind effect in the vertical plane. Conducting running fire with a shallow descent of less than 10 degrees will help to stabilize the aircraft vertically.

(2) The minimum suggested aircraft speed for weapons delivery and maneuver is the maximum rate of climb airspeed. This will provide a stable munitions delivery platform while also allowing the aircrew to have sufficient power available to accelerate during evasive maneuvers. A higher airspeed will reduce the time the aircraft is exposed, but it will also reduce engagement time. The aircrew must use an airspeed that is appropriate for the tactical situation.

Note. Crew must have a good understanding of running fire per FM 3-04.140.

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g. Diving fire is generally initiated from higher altitude flight profiles. Diving fire offers the advantage of reduced vulnerability to small arms fire. Due to the presence of both lateral and vertical stability in the dive, diving fire produces a smaller beaten zone, which can result in improved accuracy. This firing technique increases vulnerability to AAA and SAM threats. The entry altitude, entry airspeed, dive angle, and recovery altitude will depend on the threat, desired flight profile, ambient weather conditions, aircraft gross weight, and DA. The P* will establish an entry altitude and airspeed that is commensurate with the type of dive being performed. Higher dive angles require lower entry airspeeds. A 10 to 15 degree dive angle is used for a normal dive, and 15 to 30 degrees for a steep dive. The crew must plan the recovery appropriately. Initiating a steep dive to engage a close target may not give sufficient time to properly engage the target and allow the crew to break from the engagement safely and at the appropriate altitudes. In this case, engaging the target at a longer distance may be more appropriate.

Note. Crew must have a good understanding of diving fire per FM 3-04.140.

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h. Diving/running fire target run in procedures. This procedure can be used to plan an engagement while in flight. The time available and the tactical situation will influence the level of detail in developing the direct fire plan.

(1) Select an engagement technique and pattern appropriate for the environmental and tactical situation. Select the appropriate weapon system for the target which gives the best opportunity to

achieve the desired end state. Select a weapons release point based on weapons parameters, threat acquisition ability, and target disposition. Select an egress route from the target area back to the initial point as needed.

(2) With pre-engagement planning completed, perform a final weapons systems check, ASE check, and a review of target run in and egress plans. Prepoint the MMS to the target area if needed. When ready for execution, depart the initial point at an altitude and airspeed as appropriate for the environmental conditions and tactical situation.

(3) The run in to the target can be offset or aligned with the initial point. The specific manner in which this is conducted is dependent upon the tactical situation. When the aircraft is stabilized, fire weapons at the appropriate ranges.

(4) Egress the target area at the selected egress point. Determine if the desired end state was achieved and assess whether it is necessary to perform an immediate re-attack, formulate a new attack plan, or to end the attack.

(5) During these maneuvers, ensure aircraft limitations are not exceeded, and ensure the aircraft is flown in accordance with the techniques established in Task 2127.

(6) A cyclic climb to a pushover break may be necessary in order to establish running or diving fire. The final run in to the target can be straight in or offset, prior to or after the pushover break, depending upon the tactical situation.

(7) During running/diving fire, how the break from the target is executed will depend upon several factors. Weapons systems should be used in the last one third of their range; however, a closer range will result in a smaller beaten zone and increased accuracy. Ideally, disengagement from the target should be executed in such a way as to prevent over flight of the target in order to avoid taking damage from munitions deployment and secondary explosions, while at the same time staying out of the enemy's engagement range. Factors to consider are the type of munitions being fired from the aircraft, composition of the surface, composition and disposition of the target, and overall tactical situation.

i. Dive Recovery Techniques. Aircrews must thoroughly understand recovery techniques and increase recovery altitudes as anyone or combination of dive angle, airspeed, density altitude, or gross weight increases. Aircrews must use good crew coordination and not allow dive airspeeds and angles to become excessive. Additionally, excessive bank angles during recovery offset lift from weight and may require additional recovery altitude. Straight ahead dive recovery is rarely tactically feasible. By incorporating a left or right turn into the dive recovery, descent arrest occurs with a change of aircraft direction thereby avoiding target over-flight. Prior to pulling aft or lateral cyclic causing G loading, the P* will lead with an increase in collective to avoid N_R increase. This maneuver is accomplished by turning the aircraft simultaneously as dive pull out is being accomplished. During minimum available power dive recovery, aft cyclic input is reduced as g-loading builds and the aircraft is allowed to fly out of a dive as opposed to attempting to establish a climb. Furthermore, a turn can be combined with a descent to terrain flight altitudes, if masking is desired due to enemy situation.

NIGHT OR NVG CONSIDERATIONS:

1. The crew must consider ambient light levels and available contrast when selecting the type of fire. Difficulty in determining aircraft altitude and rate of closure ,as well as obstacles, is more prevalent during

these conditions. The crew must use proper scanning techniques to avoid obstacles and to prevent spatial disorientation.

2. During NVG operations, use of a weapon mounted laser will greatly increase first round target effects.

3. Due to the effects of muzzle flash and rocket motors under NVG conditions, rates of closure, distance estimation, and depth perception are more difficult to determine than in the day. The Crew should consider this when selecting altitudes and airspeeds for each engagement. Flash signature from firing or adjusting artillery fire can momentarily degrade NVG.

4. Loss of SA can occur more easily at night. Crew coordination between crewmembers and with other aircraft in the team is of paramount importance in preventing a loss of SA that can result in contact with the ground, other aircraft, or obstacles. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

TASK 1456

Engage Target with the 50-Caliber Machine Gun

CONDITIONS: In an OH-58D helicopter on an approved range for live fire or simulated tactical environment.

STANDARDS:

1. Place the system into operation.
2. Engage the target using the appropriate techniques.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused outside the aircraft and oriented on the target and is responsible for clearing the aircraft and obstacle avoidance. The P* will acknowledge that P is ready to engage the target and maneuver the aircraft to align it for the engagement. The P* will announce firing, and will coordinate with the P when remasking or repositioning the aircraft, and will announce whether inside or outside the aircraft.

   b. The P will keep the MMS on target as required, prepare the gun system, and announce when ready to engage or ready for each firing and when the laser is on. The P will assist the P* by monitoring aircraft instruments and by clearing the aircraft duties, permitting. The P will monitor rounds impact, assist the P* to adjust them on target, record BDA data, and can visually check the ammunition chute for rounds. The P will announce whether focused inside or outside the aircraft, and in the event of a malfunction may troubleshoot the gun as briefed.

2. Procedures.

   a. MMS/symbology engagement. To engage the target, place the armament control panel (ACP) master arm switch in the arm position and the gun switch in the armed position. On the sparse weapons VSD the range information is displayed if the target has been lased. Align the line of sight (LOS) cue with the gun reticle. Pressing the weapons fire switch to the first detent causes the gun to fire up to a 1.0 second burst each time pressed and held. Pressing the weapons fire switch to the second detent causes the gun to fire until the weapons fire switch is released or the ammunition supply is depleted.

   b. UWP mounted laser engagement: The UWP laser may be used to assist in engaging targets. Place the ACP master arm switch in the arm position and the gun switch to the armed position. Turn on the UWP laser by pressing and holding the laser switch located on the pilot's collective. The laser spot can only be seen with NVG. Fly the aircraft to move the laser spot to the target and engage by depressing the weapons fire switch. The UWP laser is boresighted to the .50-caliber machine gun at 1,000 meters.

   c. Aerial ballistic reference mark (ABRM)/visual engagement:

      (1) Prior to flight: ABRM-pilot/co-pilot measures from the bottom seam of the windscreen (where the riveted metal strip meets the windscreen) and marks a point 24 inches up with a grease pencil. Then measure from the center seam of the windscreen outward 12 inches. This is the center point of the ABRM. Mark the point and make parallel 3/8ths inch wide by 3 inch long horizontal and vertical lines. It should look like the outline of a plus sign. To improve visibility during NVG operations fill the outlined ABRM with "red" grease pencil.

(2) In flight: Place the ACP master arm switch in the arm position and the gun switch to the armed position. Fly the aircraft to align the ABRM or visually align the aircraft to the target and engage by depressing the weapons fire switch. When using the ABRM mark do not move your head to move the mark onto the target but attempt to use the mark as the center point which aligns the helicopter with the target. Note the impact point of the rounds in relation to the target. Make adjustments as required to effectively place rounds on target.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial. Firing of the weapon system may cause the NVG to momentarily shut down. During periods of high illumination the laser spot may be difficult to see. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS: Live fire is not necessary to complete this task.

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1458

Engage Target with the Hellfire

CONDITIONS: In an OH-58D helicopter on an approved range for live fire or simulated tactical environment.

STANDARDS:

1. Select the appropriate missile delivery mode (lock-on before launch [LOBL], lock-on after launch [LOAL]).

2. Select the appropriate designation techniques (remote or autonomous).

3. Select the proper launch mode (manual, normal, or ripple).

4. Select and configure an appropriate constraints driver for the delivery mode and designation technique.

5. Engage targets with the Hellfire missile system based on the operational parameters of the missile and the tactical situation.

DESCRIPTION:

1. Crew actions. While maneuvering the aircraft into constraints the P* may divert attention inside the cockpit. The P* must coordinate with the P prior to doing so. Each crewmember must know where the other is focused during the weapon engagement.

   a. The P* will remain focused outside the aircraft and oriented on the target. The P* is responsible for clearing the aircraft and obstacle avoidance and will acknowledge that P is ready to engage the target and maneuver the aircraft into constraints. The P* will announce launching the missile and will coordinate with the P when remasking or repositioning the aircraft.

   b. The P will keep the MMS on target, prepare the missile system, and announce when ready to engage. The P will announce if the engagement is a single target or multiple targets and will announce ready for each firing and when the laser is on. The P will assist the P* into constraints and clear the aircraft duties permitting and will announce missile impact and record BDA data.

2. Procedures. Launch modes.

   a. Manual launch mode. The system selects, codes, and readies one missile at a time on the primary code. It will allow the system to step between missiles. These engagements may be employed for autonomous or remote engagements and for LOBL or LOAL engagements.

   b. Normal launch mode.

      (1) The firing of multiple missiles in flight simultaneously with the same laser code is called rapid fire. Normal mode is used to service multiple targets quickly. These engagements may be employed for autonomous or remote engagements and for LOBL or LOAL engagements.

      (2) If two or more missiles are loaded with the primary code, the recommended time interval between missile launches is 8 seconds. Determine the time of flight, maximum delay, laser turn-on time, and laser-on-target time.

      (3) During normal mode engagements, the remote Hellfire electronics (RHE) will automatically select, spin-up, and encode all primary coded missiles, until the inventory is exhausted. The RHE will not recode alternate coded missiles.

c. Ripple launch mode.

(1) The firing of multiple missiles in flight simultaneously with two separate laser codes is called ripple fire. Ripple fire engagements require two laser designators. It is employed during autonomous and remote or double-remote missions using LOBL, LOAL, or some combination thereof. As with any remote Hellfire engagement, close coordination is required with the remote designator air or ground. This coordination will ensure that the launcher designator angle (LDA), designator safety fan, laser code, and laser designation time requirements are met.

(2) Ripple fire engagements can be accomplished automatically if ripple is selected as the launch mode. In ripple fire engagements, selection of the initial missile code is vitally important. The primary and alternate coded missiles are automatically toggled without any action from the crew. The firing order is selected by the RHE.

d. Autonomous missile engagements. Track the target with the MMS, and designate the target with the laser.

(1) In LOBL mode, primary coded missiles will slave to the MMS LOS when the laser range finder/designator (LRF/D) is armed on the same code as the primary coded missiles. The laser is the constraints driver.

(2) For LOAL autonomous missile engagements- The LOAL constraint driver may be either the MMS LOS or the target location entered into the navigation system as a direct waypoint. To use the MMS LOS as the constraint driver the MMS mode selector switch must be rotated to prepoint (PREPT). The HSD direct waypoint will provide constraint information provided the MMS mode select switch is not in the PREPT position. When the missile system is ready, maneuver the aircraft within launch constraints and verify that all engagement conditions are met before the missile is launched. The range to the target may be obtained by using the laser, the HSD direct waypoint, or the BFT.

e. Remote missile engagements. Coordinate with the remote designator to ensure that the LDA, safety fan, laser code, and laser designation time requirements can be met. Code the missile to the remote designator's laser code. LOBL/LOAL remote constraints drivers are the same as autonomous missile launches. When the missile system is ready, maneuver the aircraft within launch constraints and verify that all engagement conditions are met before the missile is launched. If the MMS is fixed forward while using PREPT as the constraint driver the Hellfire system may indicate an in constraint condition regardless of aircraft orientation. Ensure the aircraft is oriented in the proper direction prior to launch. Figure 4-2, page 4-101, depicts the standard voice remote Hellfire call for fire.

Designator	“D25 this D15 remote Hellfire, over.”
Shooter	“D25 this D15 remote Hellfire, out.”
Designator	“Grid FV-1234-5678, over.”
Shooter	“Grid FV-1234-5678, out.”
Designator	“1 BMP stationary in the open, over.”
Shooter	“1 BMP stationary in the open, out.”
Designator	“1 missile, LOBL, code 1158, FV-2345-6789 or LTL 257º, range 3,000m, altitude 250 ft, over.”
Shooter	“1 missile, LOBL, code 1158, FV-2345-6789 or LTL 257º, range 3,000m, altitude 250 ft, out.”
Shooter	“Accept or reject, over.”
Designator	“Accept or reject,out.”
Shooter	“Ready, time of flight (TOF) 20 seconds, over.”
Designator	“Ready, TOF 20 seconds, out.”
Designator	“Fire, over.”
Shooter	“Shot, over.”
Designator	“Shot, out.”
Designator	“End of mission, 1 BMP destroyed, FV-1234-5678, over.”
Shooter	“End of mission, 1 BMP destroyed, FV-1234-5678, out.”

Figure 4-2. Voice remote Hellfire call for fire

f. The following checklist (figure 4-3, page 4-102) is an example of a standardized procedure for analyzing Hellfire engagements for the shooter to ensure that all items are systematically verified. This procedure can be used for remote or autonomous engagements, and LOAL or LOBL shots. Some steps are not required for some types of engagements as noted.

Analyze the mission.
LDA.
Number of missiles.
Minimum/maximum range.
Safety fan.
Obstacle clearance.
Cloud height.
Accept or reject mission.
Missile set-up.
Laser codes.
Launch mode.
Delivery mode.
Choose and set constraints driver(s).
Master arm switch–arm.
Constraints–verify.
Ready.
Shoot the mission.
Standby, reset Hellfire missile codes, remove constraints drivers.

Figure 4-3. Sample of a Hellfire engagement checklist

(1) Analyze the mission–Assuming the tactical decision to employ a Hellfire has already been assessed, the crew will determine if the particular target is a feasible Hellfire target based on the following technical parameters:

(a) Launcher/designator angle–Determine if the angle created by drawing a line between the observer/designator to the target and then back to the shooter is equal to or less than the maximum allowable. If the tactical situation allows, the shooter may have to reposition to meet requirements to accept the mission (remote engagements only, N/A for autonomous engagements).

(b) Number of missiles–Determine if the number of missiles requested or required are available. For a remote engagements if the requested number exceeds the number available, the mission may still be accepted with the number of missiles the shooter has available transmitted to the requestor in the accept message.

(c) Minimum/maximum range–Determine if the range to the target is within the allowable range for the type of shot to be performed. If the tactical situation allows, the shooter may have to reposition, or may adjust the type of shot (LOAL direct/low/high or LOBL) to meet requirements to accept the mission.

(d) Safety fan–The safety fan is predetermined, based on an angle either side of a line from shooter to target. Ensure that the designator is not within the shooters safety fan. If the tactical situation allows, the shooter may have to reposition to ensure the designator is outside the safety

fan. Table 4-2 and figure 4-4, page 4-104, are aids that can be utilized to determine the designator safety fan. Instructions for use of each chart are located below each chart respectively.

Table 4-2. Hellfire remote-engagement safety fan chart

	OFFSET ANGLE											
SHOOTER RANGE TO TARGET		10	15	20	25	30	35	40	45	50	55	60
	8	6223	5657	5222	4883	4619	4414	4257	4141	4062	4015	4000
	7.5	5834	5303	4895	4578	4330	4138	3991	3882	3808	3764	3750
	7	5445	4950	4569	4273	4041	3862	3725	3623	3554	3513	3500
	6.5	5056	4596	4243	3968	3753	3586	3459	3365	3300	3262	3250
	6	4667	4243	3916	3662	3464	3310	3193	3106	3046	3011	3000
	5.5	4278	3889	3590	3357	3175	3034	2926	2847	2792	2761	2750
	5	3889	3536	3264	3052	2887	2758	2660	2588	2539	2510	2500
	4.5	3500	3182	2937	2747	2598	2483	2394	2329	2285	2259	2250
	4	3111	2828	2611	2442	2309	2207	2128	2071	2031	2008	2000
	3.5	2723	2475	2284	2136	2021	1931	1862	1812	1777	1757	1750
	3	2334	2121	1958	1831	1732	1655	1596	1553	1523	1506	1500
	2.5	1945	1768	1632	1526	1443	1379	1330	1294	1269	1255	1250
	2	1556	1414	1305	1221	1155	1103	1064	1035	1015	1004	1000

1. During a remote Hellfire, the designator will give the target GRID, LTL, and DISTANCE to the target.
2. Enter the target grid to determine your HEADING and DISTANCE to the target.
3. Subtract your heading to the target (GTL) from the designator's heading to the target (LTL) to determine the OFFSET ANGLE.
4. Enter the top of the chart at the OFFSET ANGLE and follow the column down to intercept the designators range to target. If the exact range is not depicted on the chart, always round down to the nearest range. From that range follow the row to the outside of the chart to determine the shooters maximum distance in kilometers, from the target that the shooter can be to ensure the designator will remain outside of the 30 degree safety fan.

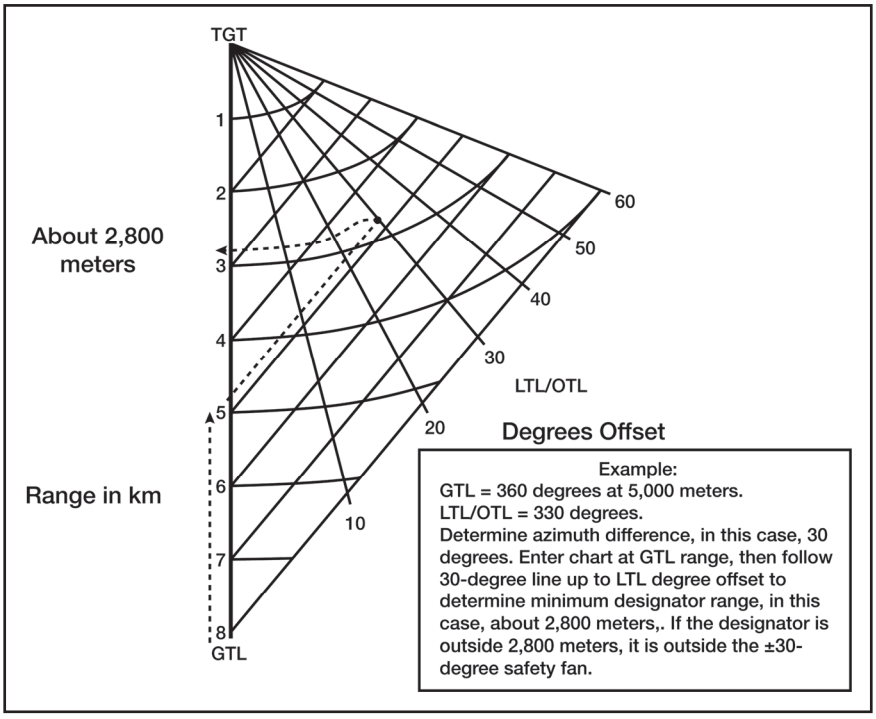

Figure 4-4. Hellfire remote-engagement safety fan chart

(e) Obstacle clearance–Determine if the missile can clear any obstacles on the gun target line for the type of shot to be performed. The shooter may have to reposition, if the tactical situation allows, or may adjust the type of shot (LOAL low/high) to meet requirements to accept the mission.

(f) Cloud height–The crew should attempt to determine if the missile will remain out of the clouds for the type of shot to be performed. This can be accomplished by visually confirming the cloud ceiling, based on the forecast. If cloud ceiling is a concern, the lowest trajectory can be achieved by shooting LOAL direct with maximum laser delay.

Note. If the shooter must reposition to meet the requirements to accept the mission, the accept message may be sent prior to moving.

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(2) Accept or reject mission–Based on the analysis of tactical considerations and technical parameters. For remote engagements, this is done by sending the accept or reject message, the accept message will include all changes made to meet the technical parameters verified in the analysis.

(3) Missile set-up–The following items must be verified:

(a) Laser codes–Ensure the missile(s) is/are coded to the match the laser code of the lasing participant.

(b) Launch mode–Choose manual, normal, or ripple based on the mission requirements.

(c) Delivery mode–Choose LOAL direct, LOAL low, LOAL high, or LOBL based on the mission requirements.

(d) Choose and set constraints driver(s)–The constraints driver(s) is what the weapon system uses to determine if the Hellfire missile is correctly pointed at the target. For LOAL shots the choices for the

azimuth constraints drivers include the MMS or navigation systems, for LOBL the properly coded laser energy will drive the in-constraints or out-of-constraints indication. Arm the armament control panel master arm switch if not already armed.

(e) Constraints–Verify on the pilot's sparse Hellfire VSD that there is an in constraints (solid box) indication. The Hellfire is now ready to be fired. For remote engagements the ready command can be sent. After the ready command the shooter must wait for the fire command from the observer. The observer must be prepared to LASE when the fire command is sent.

(f) Shoot the mission–After the fire command is received the launch aircraft will transmit voice "Shot, Over" and will launch the missile(s) only upon receipt of a "Shot, Out" from the designator.

(g) Standby–Reset switches (master arm, launch mode, laser) as required by the situation. Recode remaining Hellfire missiles as necessary. Remove unnecessary constraints drivers (direct waypoint/prepoint and so forth).

Note. Launch aircraft must be prepared to fire additional missiles due to a miss, malfunction, or multiple targets. Designator will transmit "Repeat, Over" to launch aircraft if another missile is required. If more than one additional missile is desired, the call should include the number of missiles and missile separation time (for example, "repeat, three missiles, 20 seconds, over").

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial. Firing of the weapon system may cause the NVG to momentarily shut down. The ADSS can aid in detecting drift and help in maintaining attitude and altitude.

TRAINING AND EVALUATION REQUIREMENTS: Live fire is not necessary to complete this task.

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1462

Engage Target with the 2.75-Inch Folding Fin Aerial Rockets

CONDITIONS: In an OH-58D helicopter on an approved range for live fire or in a simulated tactical environment.

STANDARDS:

1. Place the system into operation.
2. Engage the target using the appropriate techniques.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain focused outside the aircraft and oriented on the target and is responsible for clearing the aircraft and obstacle avoidance. The P* will acknowledge that the P is ready to engage the target and maneuver the aircraft to align it for the engagement. The P* will announce firing the rockets, will coordinate with the P when remasking or repositioning the aircraft, and will announce whether focused inside or outside the aircraft.

   b. The P will keep the MMS on target as required, prepare the rocket system and announce when ready to engage or ready for each firing and when the laser is on. The P will assist the P* by monitoring aircraft instruments and clear the aircraft duties permitting. The P will announce rocket impact and record BDA data, and keep track of the number of rockets fired, and announce whether focused inside or outside the aircraft.

2. Procedures.

   a. MMS/symbology engagement. Track the target using the MMS. From the sparse weapons VSD verify and change as necessary the rocket firing mode, fuze timing, cueing information, and selected zone. Use the pitch attitude cue driver which is selectable between laser information, navigation system range to waypoint, or a manually entered distance. Turn the aircraft to align the heading with the rocket steering cue. To engage the target, place the ACP master arm switch in the arm position.

   b. UWP mounted laser engagement: The UWP laser may be used to assist in engaging targets. From the sparse weapons VSD verify and change as necessary the rocket firing mode, fuze timing, and selected zone. Place the ACP master arm switch in the arm position. Turn on the UWP laser by pressing and holding the laser switch located on the pilot's collective. The laser spot can only be seen through NVG. Fly the aircraft to move the laser spot to the target and engage by depressing the weapons fire switch. The UWP laser is boresighted to the rockets at 1,000 meters.

   c. ABRM/visual engagement:

      (1) Prior to flight: ABRM-pilot/co-pilot measures from the bottom seam of the windscreen (where the riveted metal strip meets the windscreen) and marks a point 24 inches up with a grease pencil. Then measure from the center seam of the windscreen outward 12 inches. This is the center point of the ABRM. Mark the point and make parallel 3/8ths inch wide by 3 inch long horizontal and vertical lines. It should look like the outline of a plus sign. To improve visibility during NVG operations fill the outlined ABRM with "red" grease pencil.

      (2) In flight: From the sparse weapons VSD verify and change as necessary the rocket firing mode, fuze timing and selected zone. Place the ACP master arm switch in the arm position. Fly the aircraft to

align the ABRM or visually align the aircraft with the target and engage by depressing the weapons fire switch. When using the ABRM mark do not move your head to move the mark onto the target but attempt to use the mark as the center point which aligns the helicopter with the target. Note the impact of the rockets in relation to the target. Make adjustments as required to effectively place rockets on target.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial. Firing of the weapon system may cause the NVG to momentarily shut down.

TRAINING AND EVALUATION REQUIREMENTS: Live fire is not necessary to complete this task.

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 1472

Perform Aerial Observation

CONDITIONS: In an OH-58D helicopter or academically in the classroom.

STANDARDS:

1. Detect the target using visual search techniques or MMS.
2. Identify the target.
3. Locate the target.
4. Report the target as briefed.

DESCRIPTION:

1. Crew actions.

   a. The P* is responsible for clearing the aircraft and obstacle avoidance. The P* will maintain aircraft orientation and perform reconnaissance of the assigned sector as duties permit.

   b. The P will operate the MMS, navigation, and communications systems. When scanning the area, he should concentrate on avenues of approach while periodically scanning adjoining terrain. The P can use the prepoint mode to aid orientation and will select mutually supportive fields of view when working with other aircrews. This will ensure coverage of "dead spaces" that may exist in front of the aircraft. The P will perform reconnaissance of his assigned sector and announce when attention is focused inside the cockpit. Duties permitting, the P will assist the P* in clearing the aircraft.

2. Procedures.

   a. Visual/sensor search is the systematic search of a given area so that all parts of the area are observed or scanned. The purpose of visual/sensor search is to detect objects targets or activities.

   b. Detection. Detection requires determination that an object or an activity exists.

   c. Identification. Major factors in identifying a target are size, shape, and type of armament. Targets are classified as friendly or enemy.

   d. Location. Determining the exact location of targets is the objective of the mission. Depending on the nature of the targets, the P may be able to locate the center of mass or the boundaries of the entire area with the LRF/D.

   e. Reporting. Spot reports provide commanders with critical information during the conduct of missions. The method of spot reporting is specified by the requesting agency. Reports of no enemy sightings are frequently just as important as actual enemy sightings. The ability of a crewmember to search a given area effectively depends on several factors. In addition to the limitations of the human eye itself, the most important of these factors are altitude, airspeed, terrain and meteorological conditions, and visual cues.

   f. Altitude. Higher altitudes offer greater visibility with less detail. Lower altitudes are usually used because of survivability considerations.

   g. Airspeed. Selection of the airspeed is determined by the altitude, the terrain, the threat, and meteorological conditions.

h. Terrain and meteorological conditions. The size and details of the area that can be effectively covered largely depend on the type of terrain, such as dense jungle or barren wasteland. The prevailing terrain and meteorological conditions often mask objects and allow only a brief exposure period, especially at NOE altitudes.

i. Visual cues. In areas where natural cover and concealment make detection difficult, visual cues may indicate enemy activity. Some of these cues are as follows:

(1) Color. Foliage used for camouflage will differ from the color of natural foliage. Color cannot be detected with the MMS.

(2) Texture. Smooth surfaces, such as glass windows or canopies, will shine when reflecting light. Rough surfaces will not.

(3) Shadows. Man-made objects cast distinctive shadows characterized by regular shapes and contours, as opposed to the random patterns, which occur naturally. The TIS level may be increased to search in shadows.

(4) Trails. Trails leading into an area should be observed for cues as to the type and quantity of traffic, and how recently it passed. Vehicle trails, especially at night, can often be detected with the TIS for some time after a vehicle has passed.

(5) Smoke. Smoke should be observed for color, smell, and volume. The TIS can be used to determine the cause of the smoke.

(6) Movement and light. The most easily detectable sign of enemy activity is movement and, at night, light. Movement may include disturbance of foliage, snow, soil, or birds.

(7) Obvious sightings. The enemy is skillful in the art of camouflage. The P*/P must be aware that obvious sightings may be intentional because of high concentrations of antiaircraft weapons.

(8) Heat. Heat, especially at night, is normally a sign of man-made objects. The TIS can be used to detect heat from standoff ranges and through some obscurations.

j. The techniques that provide systematic methods for conducting visual aerial observation, with or without the use of the MMS, are motive and stationary. The technique used will depend on the altitude flown and the terrain encountered.

k. Motive technique. This technique is used when the aircraft is operating at forward airspeeds. The entire area on either side of the aircraft is divided into two major sectors: the nonobservation sector and the observation work sector. The nonobservation sector is the area where the crewmember's field of vision is restricted by the physical configuration of the aircraft. The observation work sector is that portion of the field of vision to which search activity is confined. The observation work sector is subdivided into two smaller sectors, the acquisition and recognition sectors.

l. The acquisition sector is the forward 45-degree area of the observation work sector. This is the primary area of search.

m. The recognition sector is the remainder of the observation work sector. In using the motive technique, the crewmember looks forward of the aircraft and through the center of the acquisition sector for obvious sightings. The crewmember then scans through the acquisition sector, gradually working back toward the aircraft.

n. Stationary technique. This technique is used at terrain flight altitudes with the helicopter hovering in a concealed position. When using the stationary technique, the crewmember makes a quick overall search for sightings, unnatural colors, outlines, or movements. The crewmember starts scanning to the immediate front, the depth of the search area will depend on the type of terrain. Continue to scan outward from the aircraft, increasing the depth until the entire search area is covered.

o. The factors of METT-TC will influence the altitudes to be flown. During flight the MMS can be used to observe terrain and to detect and identify targets. Maneuvering the aircraft in "figure 8 patterns" while making turns towards an area of interest will allow the MMS to maintain observation and not reach the azimuth stops over the tail. Conducting a target locate and using the prepoint mode will aid in maintaining orientation. Use the MMS to scan the area using the wide field of view (FOV) feature of the television sensor or TIS to detect targets. Use the narrow FOV to assist in identification.

p. The MMS has the following search capabilities, which should be used to the fullest advantage.

(1) Forward-manual search. The TIS/TISU wide FOV white hot/black hot can be used to initially scan the desired viewing area to detect obvious enemy sightings.

(2) Area track. This allows for viewing likely avenues of approach or target areas.

(3) Prepoint mode. Prepoint mode allows the MMS to be oriented on specific points on avenues of approach while periodically scanning the adjoining terrain. It can also be used to maintain orientation of the MMS as the aircraft maneuvers.

(4) Search mode. This is used to search large open areas, target areas, or avenues of approach in a predetermined search pattern.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial. Transfer of controls should be covered in detail. When maneuvering the aircraft the P* must consider obstacles and other aircraft. The P should announce when attention is focused inside or outside the cockpit and should ensure that the P* maintains attention outside the cockpit. All crewmembers must avoid fixation by using proper scanning techniques.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft or academically.
2. Evaluation will be conducted in the aircraft or academically.

TASK 1473

Call for Indirect Fire

CONDITIONS: In an OH-58D helicopter or academically in the classroom.

STANDARDS:

1. Remain oriented on the target while repositioning the aircraft.
2. Maneuver the aircraft as required to gain or maintain intervisibility with the target.
3. Transmit and process an indirect fire mission request.

DESCRIPTION:

1. Crew actions.

   a. The P* is responsible for clearing the aircraft and obstacle avoidance and will focus primarily outside the aircraft. The P* will announce any maneuver or movement before execution and inform the P if visual contact is lost with other aircraft. The P* will coordinate with the P as to who will make the call for fire.

   b. The P will operate the MMS and assist the P* as necessary. The P will announce when attention is focused inside the cockpit and will coordinate with the P* as to who will make the call for fire.

2. Procedure. Acquire and locate the target and relocate the aircraft as necessary. Prepare and transmit the fire order. Continue to relocate the aircraft as necessary while remaining oriented on the target. Fire direction center (FDC) should respond with a message to observer with the mandatory items to include the callsign of unit firing the mission, the number of rounds, TOF, and the target number. The "splash" call should come five seconds before impact.

   a. Call-for-fire elements:

      (1) Observer identification and warning order-adjust fire, fire for effect, suppression, immediate suppression. (“A95 this is B06, fire for effect, over”).

      (2) Method of target location. Target location is transmitted—

         (a) As a specific grid coordinate to the nearest 10 meters (for example, grid FV-1234-5678). (The target locate is the most accurate means of obtaining this information.)

         (b) As a known point (for example, those preplanned targets using the target designator [target AB 1002]).

         (c) As a shift from a known point (from target AB 1002, direction 030 degrees, right 400, add 400).

      (3) Target description (“infantry in the open”).

      (4) Method of engagement ([optional] danger close, mark, high angle, ammunition/fuze type).

      (5) Method of fire and control ([optional] at my command, cannot observe, time on target).

   b. Message to observer. After the FDC processes the call for fire, it should send the following:

      (1) Callsign of the unit firing the mission (mandatory). This is given as the last letter of the callsign of the unit firing the mission. If two letters are given, the first letter is the unit that will fire for effect and the second is the unit firing the adjusting rounds.

(2) Changes to the call for fire (if any are made).

(3) Number of rounds (mandatory). Number of rounds per tube that will fire for effect.

(4) Target number (mandatory). For tracking subsequent missions or to record as a target for future use.

(5) TOF. Time in seconds from shot to impact. Announced when time of flight is requested by observer or when firing high angle, aerial observer, moving target, or coordinated illumination missions.

Example, "H, 1 round, Target AA7742, 30, over."

c. Adjustments.

(1) Observer target-360 method. The CPG target locates the point of impact and then subtracts the easting and northing coordinates of the point of impact from the coordinates of the target.

(2) Map-Terrain association. This method may be required if the laser or other subsystem is not operational. Use a minimum of 1:50,000 standard map or RMS display. Enter the target into the navigation system or plot on the map. Observe the point of impact and the surrounding terrain. View the map and plot the impact point based on terrain association. Make the adjustment by calculating difference in the easting and northing of the two points.

d. When the target is neutralized request to, "record as target," if desired. Send an "end of mission" message with a BDA or an "unable to observe" message.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial. When maneuvering the aircraft to maintain the MMS on target, the P* must consider obstacles and other aircraft. The P should assist the P* with obstacle avoidance and clearing the aircraft and announce when doing so.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft or academically.
2. Evaluation will be conducted in the aircraft or academically.

TASK 1474

Respond to Night Vision Goggle Failure

CONDITIONS: In an OH-58D helicopter given an oral or visual cue that the NVG have failed.

STANDARDS:

1. Identify or describe indications of impending NVG failure.
2. Perform or describe emergency procedures for NVG failure.

DESCRIPTION: Impending NVG failure may be indicated by illumination of the 30-minute low-voltage warning indicator. It also may be indicated by one or both tubes flickering or blanking.

1. Crew actions.

   a. The P* will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. If the P*'s NVG fail or indicate impending failure, the P* will announce "GOGGLE FAILURE" and transfer the controls to the P.

   b. If the P's NVG fail or indicate impending failure, the P will announce "GOGGLE FAILURE." Switch batteries or troubleshoot the goggles. If the NVG are not restored to operation make the appropriate report and modify the mission as briefed.

2. Procedures.

   a. During NOE or contour flight, with a copilot, and with the CPG cyclic engaged, the P* will—

      (1) Immediately announce "GOGGLE FAILURE" and begin a climb at a rate that will ensure obstacle avoidance.

      (2) Transfer the flight controls, if necessary.

      (3) Discontinue the mission and attempt to restore the goggles. If NVG are restored, continue the mission. If not restored, lock the NVG in the up position and proceed as briefed.

   b. During NOE or contour flight with a copilot, and with the CPG cyclic disengaged, the P* will—

      (1) Immediately announce "GOGGLE FAILURE" and begin a climb at a rate that will ensure obstacle avoidance.

      (2) Look underneath the goggles and use aircraft lighting as appropriate to make the transition to unaided flight.

      (3) Discontinue the mission and attempt to restore the goggles. If NVG are restored, continue the mission. If not restored, lock the NVG in the up position and proceed as briefed.

   f. During low-level flight or flight conducted at higher altitude, use the procedure described in paragraph 2b above. A climb is not required.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: TM 11-5855-263-10.

TASK 2010

Perform Multiaircraft Operations

CONDITIONS: In an OH-58D helicopter, given a unit SOP and the mission briefing completed.

STANDARDS:

1. Participate in a formation flight/team briefing in accordance with the unit SOP and the mandatory items per the multiaircraft operations briefing checklist.
2. Perform fixed formation flight procedures as briefed.
3. Operate as part of a SWT using combat cruise flight and maneuver based on METT-TC.
4. React to loss of visual contact with other aircraft.
5. Perform crew coordination between aircraft in the flight.

DESCRIPTION:

1. Crew actions.

   a. The P* will focus primarily outside the aircraft, maintaining contact with the other aircraft in the flight. During formation flight, the P* will announce any maneuver or movement before execution. The P* will inform the P if visual contact is lost with other aircraft. If visual contact is lost with other the aircraft, the crew will immediately notify the flight and begin reorientation procedures. If IIMC are encountered execute IIMC breakup as briefed.

   b. The P will provide adequate warning of traffic or obstacles detected in the flight path and/or identified on the map. The P will assist in maintaining aircraft separation. He will inform the P* if visual contact is lost with other the aircraft, and if threat elements are detected or sighted. The P will perform duties as briefed and will notify the P* when attention is focused inside the aircraft. The P should frequently assist the P* by communicating his SA perceptions and formation/multiship observations. Additionally the P should assist the P* by monitoring aircraft systems, operating the navigation system, and by scanning the air route for possible enemy activity or other hazards and obstacles that could impact the integrity and security of the flight.

2. Procedures.

   a. Formation flight.

      (1) Fixed formations. Fixed formations are used when more control is required. The flight acts as one aircraft regardless of the number of aircraft in the flight, and the movements of lead are mirrored throughout the flight. Fixed formations are useful for departure and arrival at LZs and airfields, administratively transiting airspace, and when conditions do not require tactical separation. Fixed formations include staggered, trail, echelon, and V-formation. Separation in a fixed formation is measured in the number of rotor disks (diameter) between aircraft. Procedures for conducting fixed formation flight include maneuvering into the flight formation and changing position as required. Maintain horizontal and vertical separation as briefed and for the type of formation being flown.

      (2) Takeoff. If the conditions permit aircraft may leave the ground simultaneously. The trailing aircraft must remain at a level altitude or stack up 1 to 10 feet vertically to remain out of the disturbed air of the aircraft in front. The last aircraft in the flight will announce when the flight is formed. Power

limitations, environmental conditions or the tactical situation may not permit a synchronized formation takeoff. This situation may require aircraft to take off individually. The amount of spread and timing of each takeoff will depend on the conditions.

(3) Approach. The lead aircraft maintains a constant approach angle so other aircraft in the formation will not have to execute excessively steep, shallow, or slow approaches. Aircraft should not descend below the aircraft ahead of them in the formation and avoid entering their rotor-wash. This could result in an over-torque, loss of aircraft control, or power settling. Power limitations, environmental conditions or the tactical situation may not permit a synchronized formation landing. This situation may require aircraft to land individually. The amount of spread and timing of each landing will depend on the conditions.

b. Tactical operations.

(1) In addition to fixed formation flight multiaircraft operations encompass and relates to team employment in a tactical environment. Team operations are fundamental to accomplishing reconnaissance and security operations and are an integral part of nearly all tasks conducted in a combat environment.

(2) The SWT provides the framework for multiaircraft operations in a tactical environment and for supporting ground force counter-insurgency operations. A team of two scout aircraft operates with a lead aircraft (flight lead) focusing on a specific mission objective and the second trail aircraft (wingman) primarily providing security for the team. Depending on the mission the wingman may be tasked with providing both secondary reconnaissance and team security. The effectiveness of the SWT will depend greatly on the aircrew's ability to effectively incorporate the principles of crew coordination across the team. The unit SOP must address lead and wing duties and responsibilities for standardization as aircrews and teams change. The team briefing will emphasis the duties and responsibilities for the specific mission and include lead change procedures. If the team temporarily changes lead/wing roles based on the wingman's observation of an activity then the wingman may assume duties as "tactical lead". In these instances the briefed duties and responsibilities would not expect to change based on the temporary nature of the situation. If a permanent lead change is initiated then the duties and responsibilities for the new flight lead and wingman will also change. It is extremely important that all crewmembers in the team understand their assigned roles.

(3) An attack helicopter may replace the trail aircraft in a SWT or may be added as the third aircraft in the SWT. This can provide additional firepower and sensor capability if the mission dictates. In these teams the attack aircraft assumes the trail role. Operations with mixed airframes requires additional training and should be addressed in the higher headquarters SOP to ensure standardized duties and responsibilities. To operate effectively with mixed airframes aircrews must understand the other's capabilities and limitations.

(4) Full spectrum operations require the flexibility to operate with greater numbers of aircraft and teams to accomplish the mission. Examples may include the need to maximize the reconnaissance force or to mass firepower. The SWT still provides the basic framework for these missions with additional aircraft and teams added as the mission dictates. Aircrews may expect to operate with two SWTs operating as one flight and under the direction of one AMC or they may operate as two independent SWTs with separate AMCs both conducting the same mission while conducting multiple FARP rotations and reliefs on station (ROS). In other instances, a fifth aircraft may be added to assume command and control duties or to add an additional weapons capability. Other possibilities

include adding an unmanned aircraft system to the team through manned-unmanned teaming. The number of aircraft and team mixes will be based on the type of mission and specific requirements.

(5) Combat cruise and altitude selection. The standard formation for a SWT is combat cruise. The separation between aircraft will be influenced by the mission, environmental conditions, terrain and threat. While the separation in a fixed formation is measured by rotor disks the separation in a combat cruise formation is normally measured in meters or hundreds of meters. During the conduct of a mission the altitude selections for aircraft in the flight may vary depending on the same factors affecting lateral separation. In some instances the trail aircraft may elect to fly above or "stack" above lead to allow for greater visibility, maneuverability and to provide a more immediate profile for a suppressive fire engagement. This technique may be referred to as high-low. The altitude at which the trailing aircraft elects to "stack" may be a few feet or several hundred feet depending on the situation. The airspeeds and maneuver employed by a SWT are based on the factors of METT-TC.

c. Loss of visual contact.

(1) Takeoff. To prevent losing contact with other aircraft during takeoff during conditions of reduced visibility such as sand or dust conditions the aircraft should depart individually and conduct in-flight link up procedures IAW the unit SOP. The amount of spread and timing of each takeoff will depend on the conditions.

(2) In flight. When any aircraft in formation loses sight of the aircraft that it is following the crews should proceed as follows:

(a) Verbally announce loss of visual contact on the internal frequency.

(b) Aircraft with which visual contact has been lost will announce heading, airspeed, altitude, distance from a common reference point, and display appropriate trail aircraft lighting.

(c) Aircraft that has lost visual contact climbs to 200 feet above the announced altitude, parallels the announced heading and decelerates to10 knots less than the airspeed announced by the preceding aircraft.

(d) Subsequent aircraft follow the aircraft initiating lost visual contact procedures.

(e) Once visual contact is regained, accelerate to airspeed not more than 10 knots greater than the airspeed announced by the preceding aircraft to rejoin the formation and announces "closing".

(f) Aircraft with which visual contact has been lost return to the appropriate altitude and displays appropriate lighting.

(g) When join-up is complete, trail aircraft announces the flight is formed.

(h) If unable to regain visual contact, continue the mission as two flights and link-up on the ground at the next pickup or landing zone.

(3) Approach. In the event an aircraft in the flight loses visual contact with the formation during approach, they will immediately make a radio call to the formation and execute a go-around as briefed.

d. Aircrew briefing. All multi-aircraft operations will be briefed using a unit approved multi-aircraft/mission briefing checklist (table 4-3, page 4-116). The following are mandatory briefing items and must be included in all multi-aircraft briefings.

Table 4-3. Multi-aircraft operations briefing checklist

1. Formation type(s): takeoff, cruise, approach.
2. Altitude during each phase.
3. Airspeed during each phase.
4. Aircraft lighting.
5. Lost communications procedures.
6. Lead change procedures.
7. Loss of visual contact/in-flight link-up/rally points.
8. Actions on contact.
9. IIMC procedures.
10. Downed aircraft procedures/personnel recovery/combat search and rescue (CSAR).

NIGHT OR NIGHT VISION DEVICE CONSIDERATIONS: During formation flight, increase the interval between aircraft to a minimum of three to five rotor disks. Keep changes in the formation to a minimum. All crewmembers must avoid fixation by using proper scanning techniques.

1. Night. During unaided night flight, the crew should use formation and position lights to aid in maintaining the aircraft's position in the formation. Lighting will be in accordance with AR 95-1 and unit SOP.

2. NVG. When conducting NVG formation flight, the crew should use the formation lights and the IR anti-collision and position lights to maintain the aircraft's position in the formation. In a combat environment the crew must carefully weigh the benefits of maintaining infrared lighting and avoiding loss of visual contact versus the enemy’s NVG limitations or capabilities.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

TASK 2043

Perform Downed Aircraft Procedures

CONDITIONS: In an OH-58D helicopter, or academically in the classroom.

STANDARDS:

1. Downed aircraft:

   a. Zeroize system data in accordance with operator's manual as required.

   b. Remove, secure, or destroy critical items such as maps, signal/communication information and special equipment.

   c. Properly administer first aid to injured personnel.

   d. Secure immediate vicinity around the aircraft.

   e. Establish communications with wingman, other aircraft or ground forces and provide a situation report (SITREP).

   f. Know and implement the procedures outlined in any special instructions pertaining to CSAR as required.

2. Wingman:

   a. Provide security for the downed aircraft IAW the team briefing.

   b. Establish communications with the downed aircrew on the briefed frequency.

   c. Accurately report the situation to the higher headquarters (HQ) using established report formats.

   d. Know the criteria or circumstances for breaking station and conducting a self extraction.

DESCRIPTION:

1. Crew actions. The actions to be taken by the crew of a downed aircraft and the wingman will depend on the situation and circumstances at the time of the event. Considerations include the operational environment, intensity of the threat, the mission and status of the crew.

   a. The PC will ensure the crew briefing details crew duties and responsibilities in the event of a downed aircraft IAW the unit SOP and special instructions.

   b. The AMC of the team will ensure the team briefing encompasses the duties, responsibilities and actions of the downed aircraft crew and the wingman IAW the unit SOP.

2. Procedures.

   a. The procedures for a downed aircraft depend largely on the mission and the threat in vicinity of the downed aircraft.

   b. If the aircraft is forced to land in an unsecured location the crew executes the actions described below. The sequence, timing and importance given to the steps will be based on the crewmembers assessment of the situation.

      (1) Make a Mayday call/advise wingman.

(2) After landing zeroize aircraft system data and complete aircraft shutdown as required. If the situation permits consideration should be given to verifying the aircraft's exact grid location and transmitting an updated SITREP.

(3) Remove, secure or destroy as required critical items such as sensitive material and equipment.

(4) Administer first aid to injured personnel.

(5) Secure the immediate vicinity around the aircraft.

(6) Establish communications with wingman, other aircraft or ground forces in the area on the survival radio or multiband inter/intra team radio IAW unit SOP, special instructions, or mission briefing. Provide a SITREP.

(7) The crew's status with regard to injuries, enemy situation, recovery assets available, security situation, and mission will determine the follow on actions of the downed crew. Options may include remaining with the aircraft until recovered, moving to a more secure location or escape and evading IAW special instructions or the mission briefing.

c. The wingman of a downed aircraft executes the following actions.

(1) Provide security for the downed aircrew and aircraft IAW the team briefing. Advise the crew of observed threats in the area and neutralize as required. Request assistance from ground and air assets to aid in security or recovery operations as the situation dictates.

(2) Establish communications with the downed aircrew on the briefed frequency and receive/provide a SITREP.

(3) Send reports to the higher HQ using established formats and advise owning ground unit if applicable.

(4) Plan to remain on station maintaining security and communications and assisting in the recovery until relieved, the crew/aircraft are recovered, or bingo fuel. The crew must also take into consideration the overall threat and the accomplishment of the original mission based on the commander's intent. Upon reaching bingo fuel if no ground or air elements are available to provide security and the enemy situation dictates the crew should give consideration to conducting a self extraction IAW the unit SOP.

d. Use the fastest means available to report the situation to the aviation commander. Elements of information to include in the report are—

(1) Identification.

(2) Location.

(3) Personnel injured and personnel able to continue the mission.

(4) Condition of the aircraft.

(5) Evidence of CBRN contamination.

(6) Enemy situation, to include the air defense threat.

(7) Accessibility to the downed aircraft.

(8) Intentions.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.
2. Evaluation may be conducted in the aircraft or academically.

TASK 2050

Develop an Emergency Global Positioning System Recovery Procedure

CONDITIONS: This task should be selected for instrument examiners. Given a tactical or aeronautical map with current obstruction information. A mission planning system with digital maps and recent CHUM may be used to aid in developing this procedure.

STANDARDS:

1. Select a suitable recovery/landing area and coordinate, if required, airspace de-confliction.
2. Select an approach course in degrees magnetic, a missed approach course, final approach fix (FAF), missed approach point (MAP), intermediate approach fix (IF), IAF and missed approach holding fix (MAHF).
3. Determine obstacle clearance for the FAF, MAHF, MAP, IF, IAP, and minimum safe altitude (MSA).
4. Determine altitudes based on obstacle clearance for FAF, MAHF, MAP, IF, IAP, and MSA.
5. Determine the appropriate obstacles in the missed approach segment and determine 20:1 slope penetration.
6. Establish a 3NM holding pattern at the MAHF.
7. Prepare an emergency recovery procedure diagram per the example.
8. Complete a suitability/flyability check, to include loading waypoints, under VMC to validate the procedure.

Note. All altitudes are in feet MSL, all waypoints are latitude/longitude, all distances are nautical miles (NM) and visibility is statute miles (SM). All obstacles are MSL unless otherwise noted. The FIH has the necessary conversion tables.

DESCRIPTION:

1. Select the most suitable recover/landing area.
2. Select an area based on METT-TC and obstacles. Ensure proper coordination for airspace de-confliction has been accomplished.
3. Final approach segment (figure 4-5, page 4-122).
   a. The final approach segment begins at the FAF and ends at the MAP.
   b. Determine the MAP which is normally associated with the landing area or threshold.
   c. Determine the FAF. The minimum distance is 3NM from the MAP. The maximum length is 10NM. The optimum length is 5NM. The width is 2.4NM and will be 1.2NM on either side of centerline.

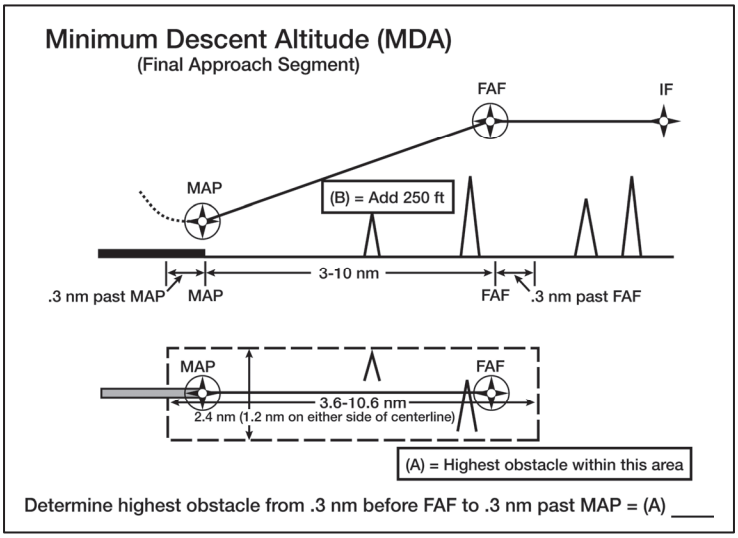

Figure 4-5. Final approach segment

a. Determine the MAHF(figure 4-6):

MAHF altitude calculation

Solution: (A) (rounded up nearest 100 feet) + (B) 1000' = (C)(MAHF altitude)
(A) = Highest obstacle within 10NM centered on the MAHF

Figure 4-6. Missed approach holding fix altitude calculation

b. Determine the MAHF for the landing area. The minimum distance is 3NM and the maximum distance is 7.5NM from the MAP. The optimum distance is 5NM. The holding pattern leg will not exceed 3NM. The width is 4NM, 2NM on either side of the course line.

4. Missed approach segment (figure 4-7, page 4-123):

a. The missed approach segment will start at the MAP and ends at a holding point designated by a MAHF.

b. Optimum routing is straight ahead within 15 degrees of the final approach course to a direct entry. A turning missed approach may be designated if needed for an operational advantage, but is not discussed in this task due to the complexity of determining obstacle clearance.

c. The area of consideration for missed approach surface and the 20 to 1 obstacle clearance evaluation for all rotary wing.

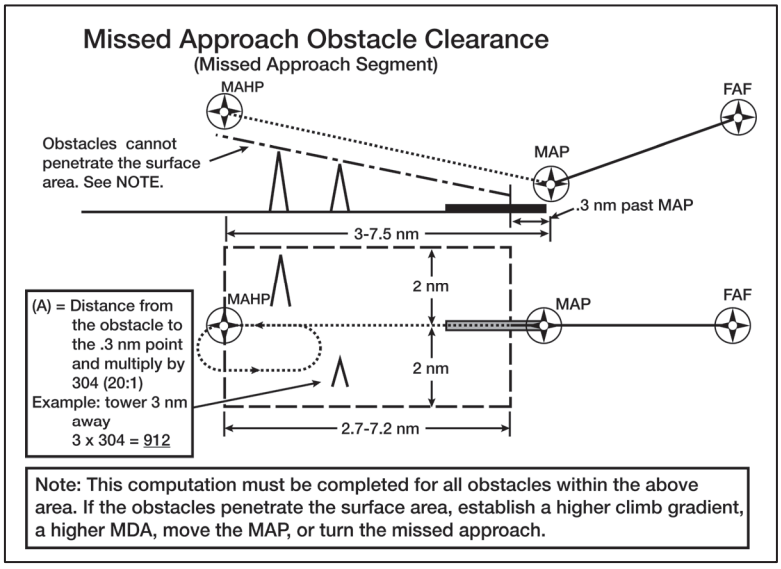

Figure 4-7. Missed approach segment

5. Intermediate approach segment (figure 4-8):

   a. The intermediate segment begins at the IF and ends at the FAF.

   b. Determine the IF. The minimum distance is 3NM and the maximum distance is 5NM from the IF to the FAF. The width is 4NM which will be 2NM on either side of the course line.

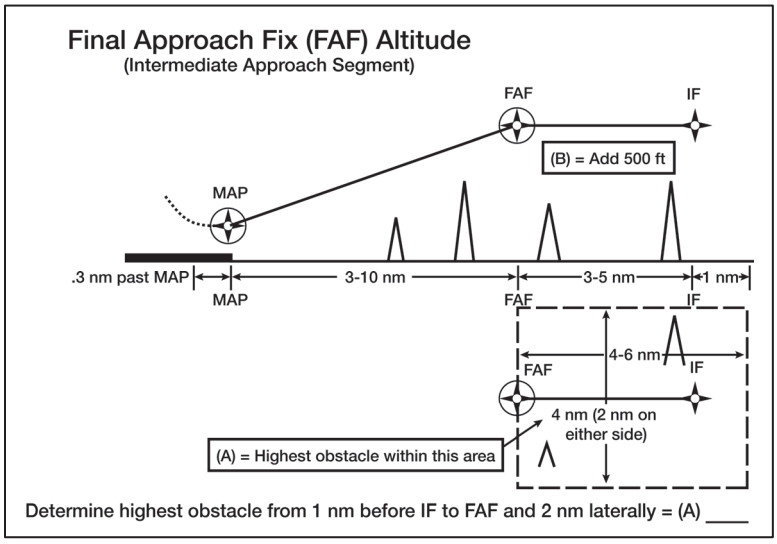

Figure 4-8. Intermediate approach segment

6. Initial approach segment (figure 4-9, page 4-124):

   a. The initial approach segment begins at the IAF and ends at the IF.

   b. Determine the IAF. Up to three IAFs are allowed. The minimum distance is 3NM from the IF and the maximum distance is 10NM. The width is 4NM, 2NM on either side of the course line.

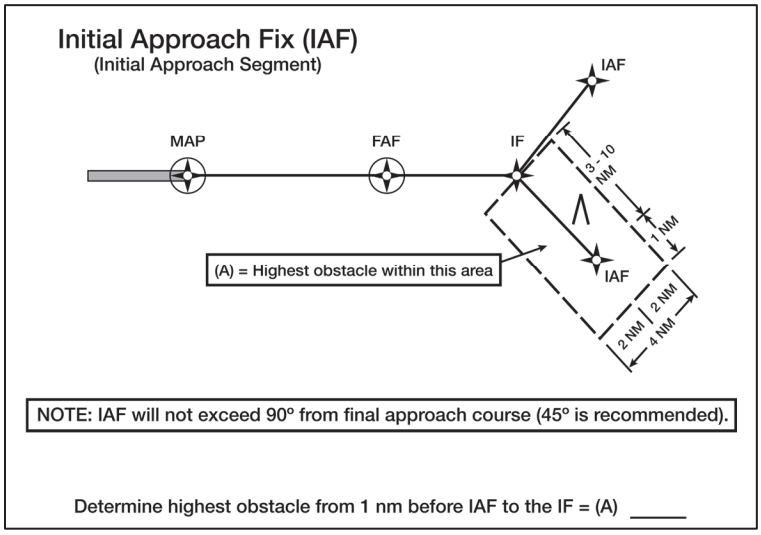

Figure 4-9. Initial approach segment

c. Determine the MSA for the landing area (figure 4-10).

MSA calculation

Solution: (A) (rounded up nearest 100 ft) + (B) 1,000 ft = (C) (MSA)

(A) = Highest obstacle within 30NM centered on the MAP

Figure 4-10. Minimum safe altitude calculation diagram

(1) Use the off-route obstacle clearance altitude or off-route terrain clearance altitude elevation from the en route low altitude (ELA) chart for the area of operations, if available.

(2) Select the highest altitude within 30NM of the MAP.

(3) If an ELA is not available, the minimum sector altitude will be determined by adding 1,000 feet to the maximum elevation figures (MEF). When a MEF is not available, apply the 1,000 feet rule to the highest elevation within 30NM of the MAP.

(4) Minimum sector altitudes can be established with sectors not less than 90 degrees and with sector obstacle clearance having a 4NM overlap. Use the figure below for determining MSA.

7. The procedures diagram (figure 4-11, page 4-125). The procedure diagram may be computer generated or hand sketched. The diagram need not be as detailed as a DOD-approved chart, but must provide all data as outlined in the example to execute the procedure.

8. The plan view. The plan view will include the following:

a. The highest obstacle altitude in MSL, BOLDED.

b. The approach course in degrees magnetic, IAF, IF, FAF, MAP, MAHF holding pattern, obstacles, and MSA. It also includes the terms:

- "For VFR Training and Emergency Use Only" twice.
- "Precise positioning service (PPS) Required."

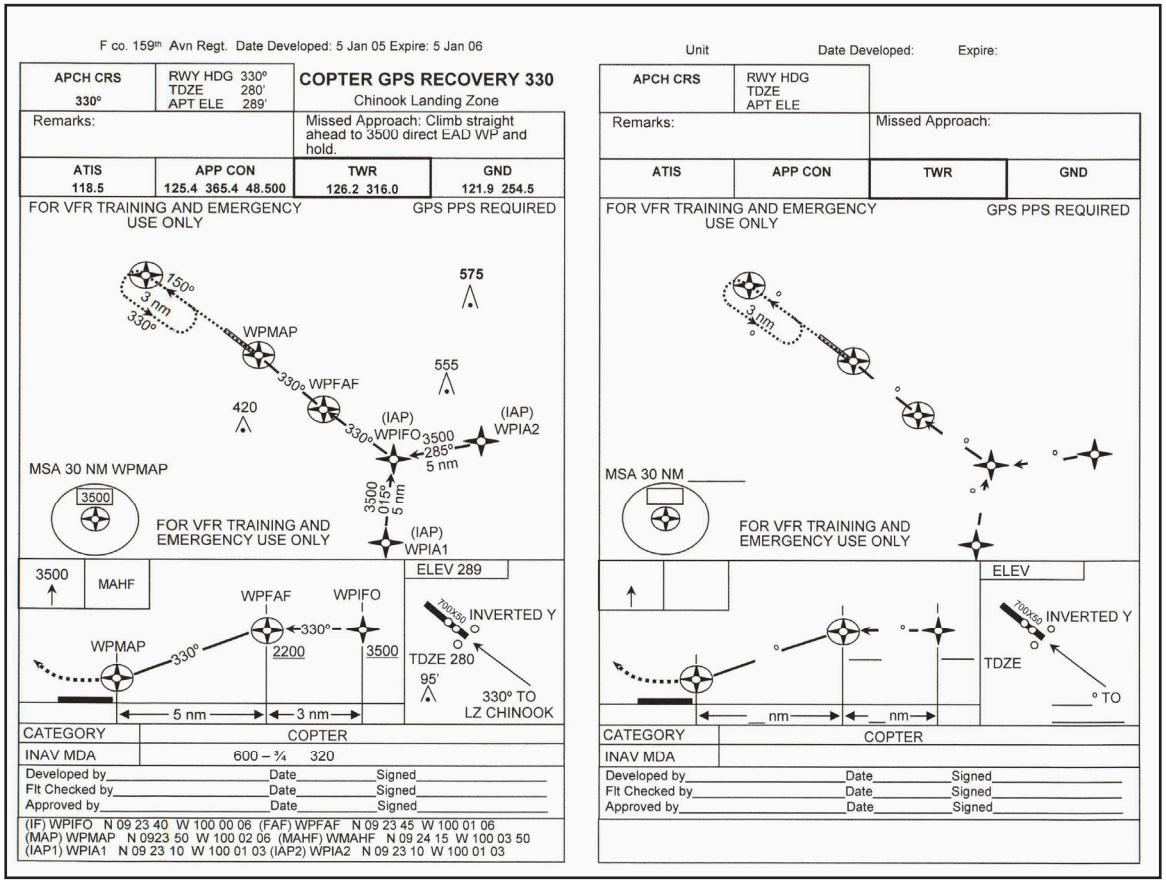

Figure 4-11. Sample of emergency global positioning system diagram

c. Minimums section. The minimums section will include the following. The minimum descent altitude, visibility, and the height above landing (HAL). Table 4-4, page 4-126, provides information for computing landing visibility minimums based on HAL.

d. Landing area sketch. The landing area sketch includes a drawing/diagram of the landing area and the elevation of the highest obstacle within the landing area if applicable.

e. Prior to publication, the diagram will include, at a minimum, all items included in the example diagram.

Table 4-4. Height above landing diagram

HAL	250 – 475 ft	476 – 712 ft	713 – 950 ft
Landing Visibility Minimum (SM)	½	¾	1.0

9. Flight check. Complete a flight check under VMC in an aircraft to finalize the procedure and validate the diagram. Once a successful flyability/suitability check has been completed, the diagram will be validated by the developer in the lower marginal data area. Once validated by the developer the procedure must be approved by the appropriate authority in the lower marginal data area prior to publication. The flight should validate the following:

a. Locations–IAF, IF, FAF, MAP, and MAHF.

b. Obstacles.

c. Approach course.

d. Obstacle clearance.

e. Altitudes-MDA, FAF, IF, IAF, MSA/holding pattern altitude.

Note. All waypoints (IAF, IF, FAF, MAP, and MAHF) will be verified by two separate GPS NAV systems, such as Doppler global postioning system navigation system, EGI, precision light weight global positioning system receiver. At least one will have PPS. If unable to complete a suitability/flyability check due to the operational environment, the commander should consider an elevated risk when using this recovery procedure.

REFERENCES: FAA Handbook 8260.3, FAA Order 8460.42a, and FAA Order 7130.3.

TASK 2067

Select Landing Zone/Pickup Zone/Holding Area

> **WARNING**
>
> **Not all hazards will be depicted on a map. When using a map reconnaissance to determine suitability, the added risk of unknown hazards must be addressed during the mission risk assessment process.**

CONDITIONS: In an OH-58D helicopter for training and evaluations, or in the classroom academically for training.

STANDARDS:

1. Landing zone/pickup zone.

   a. Perform map, photo, or visual reconnaissance of the assigned area.

   b. Determine that the landing zone (LZ)/PZ is suitable for the mission (size, number of aircraft, type cargo).

   c. Provide accurate and detailed information to organic or supported unit.

2. Holding area (HA). Confirm suitability of a holding area IAW selection criteria.

DESCRIPTION:

1. Crew actions.

   a. The crew will confirm location of plotted hazards and call out the location of unplotted hazards. They will perform the reconnaissance using the appropriate aircraft sensors or visual means. The PC will confirm suitability of the area.

   b. The P* will remain focused outside the aircraft to avoid obstacles and will remain oriented on the proposed holding area or landing zone. The P* is responsible for clearing the aircraft and obstacle avoidance.

   c. The P will assist in reconnaissance of the LZ/PZ/HA, aircraft orientation, and obstacle avoidance. The P will announce when attention is focused inside the aircraft, will operate the PC DTS-V, MMS, and take notes as necessary to accomplish the reconnaissance.

2. Procedures.

   a. Landing zone/pickup zone. The initial selection or reconnaissance of an LZ/PZ/HA begins with the analysis of maps, photos, and intelligence preparation of the battlefield. If maps, photos or other images are unreliable, in accordance with METT-TC, a fly-by may be performed while using the video recorder or photo reconnaissance to allow for a detailed analysis of the area. When a fly-by is executed, the aircrew will not normally loiter and will make minimum essential passes over the area. Determine the suitability of the LZ/PZ/HA by considering applicable tactical, technical, and meteorological elements. The fly-by video or photo reconnaissance and aircrew debrief can be used to strengthen the premission analysis. The

reconnaissance data should be recorded on a worksheet. Target store can be used to record primary and secondary routes for approach and departure.

b. Tactical.

(1) Mission. Whether the LZ or PZ will facilitate the supported unit's ability to accomplish the mission.

(2) Location. If conducting a reconnaissance for an insertion mission, consider distance of LZ/PZ/HA from supported unit or objective, and supported unit's mission, equipment, and method of travel to and from the LZ/PZ/HA.

(3) Security. Consider size and proximity of threat elements versus availability of security forces. Consider cover and concealment, key terrain, and avenues of approach and departure. The area should be large enough to provide dispersion.

c. Technical characteristics of the LZ or PZ include:

(1) Landing formation. Determine if the shape and size of the LZ/PZ/HA are suitable for the formation to be flown.

(2) Obstacles. Hazards within the LZ/PZ that cannot be eliminated must be plotted.

(3) Number of aircraft. Determine if the size of the LZ/PZ/HA will support the type and amount of aircraft that will be landing to the ground or hovering, as part of multi-ship operations. It may be necessary to provide an additional LZ/PZ nearby, or land aircraft at the same site in successive flights.

(4) Ground slope of the landing area. Normally if ground slope is greater than 15 degrees, helicopters cannot land safely.

(5) Load suitability. When high density altitude or GWT operations are conducted, determine if the LZ/PZ/HA shape, size, vertical obstacles, and actual landing area surface condition will support operations by aircraft at/near their maximum operational GWT.

(6) Approach or departure direction. The direction of approach or departure should be over the lowest obstacles and generally into the wind with METT-TC considered.

(7) Size of landing zone or holding area. The area around the LZ/PZ/HA should be clear of obstacles that could cause aircraft damage. Situation depending, consideration should be given to plotting obstacles. Target locate and target store may be used to determine the size of the LZ/PZ/HA.

(8) Surface conditions. Consider blowing sand, snow, or dust. Be aware that vegetation may conceal surface hazards such as large rocks, ruts, or stumps. Areas selected should also be free of sources of rotor wash signature. If the area is wet, consider the effects of mud and aircraft weight.

(9) Vulnerability. Consideration must be given to the vulnerability of ground troops in the LZ/PZ during air assault operations and to helicopters in the HA.

d. Meteorological.

(1) Ceiling and visibility. Must be considered in order to prevent IMC.

(2) Winds. Determine approach and departure paths.

(3) Density altitude. High density altitude may limit loads and therefore require more sorties.

e. Holding area. Holding areas are usually selected primarily by the map reconnaissance and it may not be feasible to conduct a reconnaissance by aircraft prior to arrival. If it is determined to be unsuitable for use after arrival, an alternate area may be chosen. The following items will be considered when selecting a holding area.

(1) Cover and concealment.

(2) Obstacles within the holding area.

(3) Key terrain should be avoided.

(4) Avenues of approach and departure to or from the LZ/PZ in case sequencing in or out is required.

(5) Security requirements for the HA as well as the LZ/PZ. Do aircraft in the HA require security or are aircraft required to hold and wait for armed escort into the LZ/PZ?

Note. Avoid planning approach or departure routes into a rising or setting sun or moon.

NIGHT OR NVG CONSIDERATIONS: Unimproved and unlit areas are more difficult to evaluate at night because of low contrast. Knowledge of the various methods for determining the height of obstacles is critical to successfully completing this task. Visual obstacles should be treated the same as physical obstacles. LZ/PZ/HA will require a larger area at night. Details of the landing area will be more difficult to see.

CONFINED AREA CONSIDERATIONS: Determine a suitable axis and path for a go-around. For multi-aircraft operations, determine the number of aircraft that the area can safely accommodate at one time.

SNOW/SAND/DUST CONSIDERATIONS: Be prepared for possible whiteout/brownout upon entry into the LZ/PZ/HA. Evaluate surface conditions for the likelihood of the using unit encountering a whiteout/brownout and IMC recovery. Determine a suitable path for a go-around.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft, or academically.
2. Evaluation will be conducted in the aircraft.

TASK 2125

Perform Pinnacle or Ridgeline Operations

CONDITIONS: In an OH-58D helicopter with before-landing check completed and hover OGE power available.

STANDARDS:

1. Perform a high reconnaissance which will confirm the suitability of the landing area and ensure that the helicopter has sufficient power for the maneuver. Identify an approach and departure path along with a planned escape routes for aborted approaches.

2. On approach, maintain ground track alignment on the selected approach path with a constant approach angle. Perform a continuous low reconnaissance to the intended touchdown in the forward one-third of the landing area. Once ETL is decelerated through, constantly reduce airspeed to the appearance of a brisk walk on approach. Execute a go-around before descending through ETL or escape if a safe approach or landing cannot be made.

3. Confirm suitability of landing area prior to touchdown and perform a stability check upon landing. Prior to takeoff, clear the aircraft, perform a hover power check and complete a before take-off check. Perform and airspeed over altitude takeoff along the departure path as required.

DESCRIPTION:

1. Crew actions.

   a. The PC will ensure that the aircraft will have sufficient power to land as well as take-off prior to attempting an approach. Recomputing a PPC inflight will assist in assuring the helicopter has sufficient power for this maneuver.

   b. The P* will remain focused outside the aircraft to evaluate suitability of the terrain throughout the approach and landing. The P will announce their intention to terminate the approach to a hover or to the ground and will announce any deviation from the tentative flight path. The P* will identify an escape route if the approach is to be aborted and announce if it is to be executed.

   c. The P will assist the P* in performing the high reconnaissance. The P will confirm suitability of the area, assist in clearing the aircraft, and provide adequate warning of obstacles. The P will announce when attention is focused inside the aircraft.

2. Procedures.

   a. Select a flight path, an airspeed, and an altitude that afford best observation of the landing area. When practical, position the aircraft on the windward side of the pinnacle or ridgeline. Remain focused outside the aircraft to evaluate suitability of the area, evaluate the effects of wind, and clear the aircraft throughout the approach and landing. Identify an escape route when selecting the approach path which will allow an aborted approach with existing or reduced power. Select a touchdown point in the forward one-third of the landing area and announce termination of the approach to a hover or to the ground. Announce any deviation from the approach and a tentative flight path for the departure. The approach angle can vary from a shallow to a steep angle, depending on the wind, DA, GWT, and availability of forced landing areas. Continue the reconnaissance on the final approach to confirm suitability of the area and effects of wind. Reduce airspeed to slightly above ETL until the rate of closure can be determined and then adjust the rate

of closure to no faster than a brisk walk. Execute a go-around before going below ETL if the reconnaissance reveals that a safe landing cannot be accomplished.

b. To successfully operate into small areas, it may be necessary to place the nose of the aircraft over the edge of the landing area or maintain the nose of the helicopter into the wind and crab the aircraft along the approach. This may cause a loss of important visual references when on final approach. The P must assist the P* in providing information on aircraft position in the landing area.

c. Perform a ground reconnaissance and clear the aircraft just prior to touchdown to confirm a safe landing area exists. After touchdown, conduct a stability check before lowering the collective to the full-down position. Accomplish this by slowly moving the cyclic and pedals while lowering the collective. If movement is detected, reposition the aircraft.

d. Perform the before-takeoff check and verify a hover power check if required. Clear the aircraft during takeoff. Announce the intent and the direction of takeoff. Execute an airspeed-over-altitude takeoff as required. If the takeoff requires clearing obstacles, use power as necessary to clear the obstacles while maintaining a constant climb angle and ground track. After clearing the obstacles, adjust attitude to gain forward airspeed.

NIGHT OR NVG CONSIDERATIONS:

1. Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. The rate of descent during the final 100 feet should be slightly less than during the day to avoid abrupt attitude changes at low altitudes. After establishing the descent, reduce airspeed to approximately 40 to 45 KIAS until apparent ground speed and rate of closure appear to be increasing. Progressively decrease the rate of descent and forward speed until termination.
2. Use proper scanning techniques to avoid spatial disorientation.
3. Treat visual obstacles, such as shadows, the same as physical obstacles.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 2127

Perform Combat Maneuvering Flight

CAUTION

Prior to conducting these maneuvers aircrews must understand maneuvering flight aerodynamics as outlined in FM 3-04.203 to include but not limited to transient torque, mushing and environmental factors affecting performance.

CAUTION

Close attention must be paid to rotor RPM to prevent rotor over-speed or droop. This is aggravated by high gross weight, high DA, and high G-loading.

CAUTION

Rapid collective applications with NG<78% may result in NR droop activating low rotor RPM warning message and audio.

CAUTION

In flight attitudes with high nose-up pitch angles and airspeeds below 35 knots, recovery shall be with forward or forward lateral cyclic. Applications of aft cyclic and/or pedal input could result in damage to the aircraft.

CONDITIONS: In an OH-58D in an approved training area or simulated tactical environment, and aircraft cleared.

STANDARDS:

1. Establish entry altitude ±100 feet.
2. Establish entry airspeed ±10 KIAS.
3. Maintain the aircraft in trim.
4. Maintain aircraft within limits and flight envelope.
5. Understand and apply maneuvering flight aerodynamics IAW FM 3-04.203 as required.

DESCRIPTION:

1. Crew actions.

   a. The P* will remain primarily focused outside the aircraft throughout the maneuvers. The P* will make smooth and controlled inputs. Desired pitch and roll angles are best determined by referencing aircraft attitude with the outside horizon and/or flight symbology. The P* will only momentarily divert focus during critical portions of the maneuver to ensure trim, torque, and rotor control are maintained. He will announce the maneuver to be performed and any deviation from the maneuver. He also will announce recovery from the maneuver.

   b. The P will provide adequate warning to avoid enemy, obstacles, or traffic detected in the flight path and any deviation from the parameters of the maneuver. He will also announce when his attention is focused inside the cockpit; for example, when monitoring airspeed, altitude, attitude, or rotor RPM.

2. Procedures.

   a. Decelerating turn.

      (1) The decelerating turn is used to rapidly change the direction of the aircraft at low level altitudes while trading energy to maintain safe operational altitude. The angle of bank, airspeed, gross weight, and environmental conditions at the initiation of the maneuver will determine the amount of deceleration necessary to maintain altitude. During flight with lower forward airspeed, typically below maximum rate of climb airspeed, the deceleration will require an increase of collective, resulting in an increase in torque. While at airspeeds greater than maximum rate of climb, the airspeed may be traded off while adjusting collective to maintain torque within limits and maintain altitude.

      (2) Apply directional cyclic to initiate turn. As aircraft begins to move about the roll axis, apply aft cyclic as necessary to maintain altitude by trading airspeed. Apply pedal as necessary to maintain aircraft in trim. Adjust collective as necessary to maintain altitude and rotor within limits. To recover apply opposite and forward cyclic while adjusting collective to maintain torque within limits as the rotor system unloads.

      (3) For initial training enter the maneuver at 80 KIAS and appropriate torque.

   b. Break turn.

      (1) The break turn is used at terrain and cruise flight altitudes to rapidly change the direction of the helicopter while maintaining or gaining airspeed. As altitude allows, this turn also enables a simultaneous three axis change of position and direction.

      (2) At cruise altitudes apply directional cyclic to initiate turn. As roll rate and angle increases the nose will begin to fall. Allow this to occur while maintaining trim with pedals. Recovery is affected by applying opposite cyclic when reaching desired heading. Once the aircraft is wings level in roll, apply collective and aft cyclic when reaching desired airspeed/altitude.

      (3) At terrain flight altitudes initiate with aft cyclic to ensure adequate obstacle clearance followed immediately by directional cyclic. Angles of bank are much lower than those utilized during cruise flight, as much less recovery altitude is available. Adjust collective as necessary to maintain altitude and compensate for transient torque. Maintain trim with pedals. Do not allow the nose to fall far below the horizon, as this is conducive to sink rate build up. Consider desired direction of turn before initiating and seek masking terrain if evading enemy fire. To recover apply opposite and forward cyclic.

(4) This maneuver is typically initiated at airspeeds of 40 to 90 KIAS. For initial training enter the maneuver at 80 KIAS at terrain flight altitudes and 50 KIAS at cruise altitudes.

c. Cyclic climb to a push-over break.

(1) This maneuver is used in conjunction with complex terrain or close-range running fire engagements to rapidly reposition the aircraft and reorient the aircraft weapons on the enemy. Initiate the maneuver from cruise airspeed. Apply aft cyclic to attain sufficient altitude for intervisibility with target. Adjust collective as necessary to compensate for transient torque and main rotor loads while maintaining trim with pedals. Upon attaining intervisibility with target, adjust the controls to align aircraft with target and maintain required torque. Initiate a break turn in the desired direction, upon completing or aborting engagement to mask aircraft from threat fires or reorient on appropriate gun-target line.

(2) Initiate the maneuver for training at 80 KIAS.

d. Pitch back turn.

(1) Pitch back turn is employed to rapidly enable aircraft longitudinal alignment for maneuvering engagement when targets are acquired substantially off the nose of the aircraft. It may be initiated from terrain flight or tactical cruise altitudes. It improves the efficiency of off-axis engagements and decreases the aircrew's vulnerability to enemy fire. The forward airspeed at maneuver initiation is again attained at maneuver completion. The maneuver adds stability to the helicopter and reduces engagement times of weapon systems, particularly rockets. Use of the vertical component in the maneuver results in negligible energy loss and a smaller beaten zone in the target area. This maneuver can also be used as an alternate dive entry technique to align the aircraft with an off axis target. This allows inter-visibility with target and dive angle assessment throughout the maneuver.

(2) The maneuver is initiated from the appropriate airspeed (greater than maximum rate climb/ maximum endurance airspeed) based on tactical requirements. Initiation airspeeds less than 50 KIAS may not provide sufficient energy to perform this maneuver at terrain flight altitudes. Lower airspeeds result in a reduced climb out, as available energy is lost sooner. This is best accomplished by directing the turn to an easily distinguishable terrain feature, target, or manmade structure.

(3) Initiate the maneuver with aft cyclic to attain the desired climb-out angle. As airspeed approaches current maximum endurance/maximum rate of climb airspeed, apply cyclic in the desired direction of turn while maintaining trim with pedals. As bank angle is increased the nose will begin to fall. Adjust cyclic to place aircraft in desired dive angle while continuing the turn to the desired heading. Maintain trim with pedals. Once the desired heading is attained, roll out on selected target. Allow airspeed to build to maneuver initiation airspeed while adjusting controls to keep aircraft on target. Terminate maneuver as in recovery from diving flight.

(4) For initial training initiate from 70 KIAS while using 90 degrees for the target heading change. As proficiency is gained, initiate from 90 KIAS (DA permitting) and use 180 degrees as the target heading change.

e. Dive recovery techniques. Aircrews must use good crew coordination and not allow dive airspeeds and angles to become excessive. Aircrew must thoroughly understand recovery techniques and increase initial and recovery altitudes as anyone or combination of dive angle, airspeed, density altitude, or gross weight increases. Additionally, excessive bank angles during recovery offset lift from weight and may require additional recovery altitude. Straight ahead dive recovery is rarely tactically feasible. By incorporating a

left or right turn into the dive recovery, descent arrest occurs with a change of aircraft direction thereby avoiding target over-flight. Prior to pulling aft or lateral cyclic causing G loading, the P* will lead with an increase in collective to avoid N_R increase. This maneuver is accomplished by turning the aircraft simultaneously as dive pull out is being accomplished. During minimum available power dive recovery, aft cyclic input is reduced as g-loading builds and the aircraft is allowed to fly out of a dive as opposed to attempting to establish a climb. Furthermore, a turn can be combined with a descent to terrain flight altitudes, if masking is desired due to enemy situation.

NIGHT/NVG CONSIDERATIONS:

1. Rapid evasive maneuvers will be more hazardous due to division of attention and limited visibility. Be particularly aware of aircraft altitude and 3-dimensional position in relation to threat, obstacles, and hazards. Proper sequence and timing is critical in that the P* must announce prior to initiating any maneuvers that might cause spatial disorientation.

2. As airspeed increases, altitude above the obstacles should also increase. Bank angles should be commensurate with ambient light and altitude above the terrain. During use of NVG without ODA symbology, greater crew coordination will be required to monitor torque, airspeed, trim, and rates of descent.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluations will be conducted in the aircraft.

TASK 2128

Perform Close Combat Attack

CONDITIONS: In an OH-58D helicopter in a tactical or simulated tactical environment. Live fire is not required to complete this task.

STANDARDS:

1. Participate in a close combat attack (CCA) briefing for the mission.
2. Correctly transmit the check in briefing and receive the CCA briefing.
3. Correctly identify friendly and enemy locations.
4. Transmit to team members the attack plan using unit SOP.

DESCRIPTION:

1. Crew actions.

   a. Throughout the CCA mission, the P* will remain focused outside the aircraft to avoid obstacles.

   b. The P will assist the P* as necessary and will announce when his attention is focused inside the cockpit.

   c. The crew will establish communications with ground forces in contact on a predetermined frequency and transmit and receive CCA information.

   d. The crew will positively identify friendly and enemy locations.

   e. The crew will formulate an attack plan and transmit it to other team members. At a minimum techniques, patterns, munitions, and ranges (TPM-R) will be briefed and understood.

2. Procedures.

   a. CCA is a coordinated attack by Army aircraft against targets that are in close proximity to friendly forces. During CCA, the attack team engages enemy units with direct fires that impact near friendly forces. CCA is coordinated and directed by a team, platoon, or company-level ground unit using the standard CCA brief. Once the aircrews receive the brief from the ground commander, they develop a plan then engage the enemy force, while maintaining freedom to maneuver. The ground commander must be informed and accept responsibility when a target is danger close.

   b. A CCA engagement may be conducted as part of hasty or deliberate attack plan. The critical tasks associated with a CCA are:

      (1) Conduct check-in brief and receive CCA brief to gain friendly and enemy SA.

      (2) Positively identify friendly and enemy positions and develop hasty fire plan.

      (3) Synchronize attack with ground elements to ensure mutually supporting fires and maneuver.

      (4) Maintain standoff outside effective range of predominant enemy weapon system.

      (5) Use terrain to vary headings of attack runs to remain unpredictable.

      (6) Conduct or receive BDA as situation dictates and provide follow-on recommendations.

   c. The following standardized briefings are utilized for CCA engagements:

(1) Scout Weapons Team check-in.

(a) Identification. Ground unit in contact/aircraft callsign (“Bulldog 16, this is Saber 11”).

(b) Aircraft team composition and location (“One SWT, located 1 kilometer to the south”).

(c) Munitions available, rockets/.50 cal/missiles (“14 high explosive rockets and 600 rounds of .50 cal”).

(d) Station time in minutes (“30 minutes station time”).

(e) Request for SITREP as required (“Request SITREP”).

(2) Close combat attack briefing–ground to air (5-Line).

(a) Observer/Warning Order (“Saber 11, this is Bulldog 16, Request CCA or Fire Mission, over”).

(b) Friendly Location/Mark (“My position DF12345678, marked by VS17 panel”).

(c) Target Location (“Target-360 degrees, 300 meters”).

(d) Target Description/Mark (“3 enemy dismounts with AK-47s in the tree line marked with smoke”).

(e) Remarks (threats, danger close, clearance, restriction, at my command).

Note. Transmission of the CCA brief is clearance to fire (unless danger close). Danger close ranges are in accordance with ATP 3-09.32. For closer fire, the observer/commander must accept responsibility for increased risk. State “cleared danger close” on line 5. This clearance may be preplanned.

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d. The lead aircraft or the AMC must have direct communication with the ground commander on the scene to provide direct fire support. The AMC will have the responsibility and final authority for weapons release. After receiving the CCA brief from the ground troops, the aircrews must be able to positively identify the location of all the friendly elements in the area prior to engaging. After the crew has gained situation awareness and identified both the enemy and friendly locations, flight lead or the AMC will formulate a direct fire plan and brief the other team members. At a minimum the elements of TPM-R should be briefed. Using the unit SOP will aid in conveying the plan to other team members. The direct fire plan should address a realistic end state/desired target effects for the engagement. This will influence the force required and will be based on the ground commander’s intent, weapons and ordnance available, and the nature of the threat. Additional considerations in the plan will include fratricide prevention, preventing or minimizing collateral damage, and environmental considerations. After a CCA engagement target effects or corrections may be received from the ground force for adjustments for a re-attack and to maximize ammunition distribution. If subsequent engagements are required to achieve the planned end state crews should consider adjusting attack patterns and/or ordnance selections. The revised plan will be briefed for the re-attack. BDA should be received or given, if requested provided the aircrew is able to observe the target area. Aircrews should not assume that all enemy are neutralized or that other enemy positions do not exist. Overflight of engagement areas may expose the crew to greater risk and the AMC must analyze the rewards before allowing the team to perform a visual BDA.

e. Techniques and patterns. Techniques of fire will be IAW Tasks 1422 and 2010 and attack patterns are outlined in FM 3-04.126.

f. Munitions. Munitions selected must be appropriate for the target and provide standoff capability. Accuracy and reliability must be considered when firing near friendly troops. Collateral damage could be another consideration in some areas of operation. Ammunition conservation should be considered against the possibility of multiple engagements, ROS, and self protection ammunition for the flight back to the FARP.

g. Ranges. Accurate range to the threat is needed for the crew to select where to begin an engagement. Factors affecting the range include the firing techniques and weapons/munitions selected, threat weapons ranges, crew proficiency, and environmental and terrain considerations. Briefing the range allows each aircrew to select the appropriate bump/initiation point, start/stop fire point, and breakpoint for the engagement.

h. Air-ground integration (AGI). AGI briefings at all levels are essential to effective and safe CCA engagements. These briefings in addition to conducting CCA call for fire and engagement training helps to expedite CCA engagements at critical moments on the battlefield.

NIGHT/NIGHT VISION GOGGLE CONSIDERATIONS: Situational awareness becomes more difficult. NVG will aid in identifying friendlies and several means exist for marking and identifying friendly troops at night. These means include, but are not limited to: individual weapons lasers, laser pointers, glint tape, IR lighting, and friendly tracer fire. Methods to be used for marking must be clearly understood by the aircrew and the supported ground unit. Every effort must be made to avoid fratricide. The crew must exercise care when observing the impact of rounds because the flash signature may momentarily degrade the capability of the NVG.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: ATP 3-09.32.

TASK 2129

Perform Combat Position Operations

CONDITIONS: In an OH-58D helicopter with OGE hover power available. Live fire is not needed to complete this task.

STANDARDS:

1. Apply the proper criteria in selecting the combat position.
2. Acquire and engage the target or objective from the combat position.

DESCRIPTION:

1. Crew actions.

   a. The P* will maintain visual reference outside the aircraft to ensure that the aircraft is clear of all obstacles and will maintain orientation toward the objective. The P* will announce any maneuver/movement prior to execution.

   b. The P will direct the P* to position the aircraft to maintain visual/ MMS reference on the objective by announcing, “slide/move right,” “slide/move left,” “come up,” or “come down.” If visual/MMS contact can be maintained, The P will announce “HOLD.” If duties permit, the P will assist clearing the aircraft.

2. Procedures.

   a. A combat position is a specified point or area within the battle space which is occupied by reconnaissance/attack helicopters. Select the position based on the tactical mission requirements. This position is normally a concealed position that provides observation and fields of fire into an objective area. Selection of the combat position should be based on the following considerations:

      (1) Background. The combat position should be located so that the helicopter will not be silhouetted if possible.

      (2) Range. Ideally, the combat position should be located so that the kill zone is within the last one-third of the weapon range but may be highly dependent on the position of friendly forces in the area and the required target effects. Longer ranges afford greater survivability. Depending on the weapons system selected closer ranges may allow more accurate fires but with greater potential to exposure to enemy fire.

      (3) Altitude. The combat position should be level with or higher than the target area, if possible. The altitude where the engagement is initiated will depend on the type of weapon system and ordnance selected and the firing technique performed.

      (4) Sun or full moon. The combat position should, when possible, be located so that the sun or full moon is behind or to the side of the helicopter.

      (5) Shadow. If the terrain and situation permit, the combat position should be within an area covered by shadows. This will prevent glint off the airframe windscreens and provide better camouflage.

      (6) Concealment. Vegetation and terrain surrounding the combat position should allow the helicopter to remain masked until just prior to engaging the target.

(7) Rotor wash. The location of the combat position should be such that the effect of rotor wash on surrounding debris, trees, snow, and dust is reduced.

(8) Maneuver area. The area surrounding the combat position should permit easy ingress and egress. Consideration should be made for possible enemy support by fire positions as well as ambush positions.

(9) Field of fire. The combat position should permit target visibility throughout the kill zone. Not every aspect of the selection criteria will/can be made in the selection of a combat position. Experience, training and knowledge of the enemy will allow the crewmember to analyze which factors will take precedence in the selection of a combat position.

b. Engage the target or objective using procedures outlined in Tasks 1422, 1456, 1458, 1462 as required.

NIGHT OR NVG CONSIDERATIONS: Maintaining altitude and position is more difficult when hovering above 25 feet without aircraft lights. Use the radar altimeter to assist in maintaining altitude and the position box to assist in maintaining aircraft position. Use references such as lights, tops of trees, or man-made objects above and to the front and sides of the aircraft. By establishing a reference angle to these objects, the P* can detect altitude changes by changing viewing perspective. Hovering near ground features, such as roads, provides ideal references for judging lateral movement. However, the P* may become spatially disoriented when alternating his viewing perspective between high and low references. Therefore, the P* must rely on the P for assistance if disoriented. Regardless of the mission the P* must fly the aircraft first and then observe the sector.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 2133

Engage Target with the M4 Series Carbine

WARNING

Observe all safety precautions for uploading ammunition in accordance with appropriate operators manual.

To prevent accidental firing, ensure the weapon is on safe and properly stowed when not in use.

CAUTION

P must maintain SA of aircraft attitude in relation to the target to prevent firing into aircraft components such as rotor system, aircraft weapons systems, or skids. Additionally, the P must remain aware of possible interference with the flight controls due to the M4 or any restraining straps.

CONDITIONS: In an OH-58D helicopter with an M4 series carbine, crew doors removed on an approved range or in a simulated/actual tactical environment with rifle marksmanship Phase I-III training completed. Live fire is not necessary to complete this task.

STANDARDS: Preflight and store the weapon prior to flight. Place the weapon system into operation and engage the target using the appropriate techniques.

DESCRIPTION:

1. Crew actions.

   a. While maneuvering the aircraft each crewmember must know where the other is focused during the weapon engagement.

   b. The P* will remain focused outside the aircraft and oriented on the target and is responsible for clearing the aircraft and obstacle avoidance. The P* will acknowledge that the P is ready to engage the target and maneuver the aircraft as necessary to allow the P to obtain line of sight with the target.

   c. The P will secure and prepare the weapon system and announce prior to each engagement and when the engagement is complete. The P will coordinate with P* to maneuver aircraft in order to allow the P to obtain line of sight with the target and remain within the maximum effective range of the weapon system.

2. Procedures.

   a. Prior to flight the crew will PMCS their respective M4 series carbine to ensure that the weapon is loaded, safed, and properly secured into the approved weapons mount. To engage a target the P will remove the M4 from its mount and ensure it is secured to the crewmember throughout the engagement in order to prevent accidental weapon loss. The P will ensure line of sight to the target is clear of all

obstructions and aircraft components. The P* will avoid excessive maneuvering in order to prevent the possibility of causing the P to fire into any aircraft components or any other undesired locations. The P will conduct weapon engagements in accordance with the mission briefing, rules of engagement (ROE), crew brief and the weapons maximum effective range. The P will perform immediate action steps in the event of a weapons malfunction in accordance with operators manual. After target engagement is complete the P will announce "engagement complete" to allow the P* to maneuver as necessary. The P will safe the weapon system and properly return the M4 into its mount.

b. Consideration must be given to maintaining intervisibility with friendly and enemy positions in order to preclude any undesirable collateral damage or fratricide incidents.

c. Crews will conduct a thorough post-flight, to ensure brass is clear of all flight controls.

d. During non-NVG firing both crewmembers should use their visors to prevent injury from ejected brass.

e. Primary use of the M-4 is for personal protection. The M-4 can be used against targets of opportunity based on the Commander's intent, tactical situation, and rules of engagement. Aircrews should keep in mind if they are within range for an effective M-4 engagement they are also in the enemy's range for small arms weapons.

NIGHT OR NVG CONSIDERATIONS:

1. A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial.

2. During night or NVG operations, range estimations will be more difficult which will require proper scanning technique utilization.

3. Use of aiming lasers, such as the AN/PAQ-4-series and the AN/PEQ-2A, emit a highly collimated beam of IR energy that allows for quick "point and shoot" capability at night. During periods of high illumination the laser spot may be difficult to see. Even though the aiming lasers provide a quick and easy means of engaging the enemy at night special attention must be given to the following:

   a. A 10-meter boresight/25-meter zeroing procedure should be accomplished in accordance with FM 3-22.9.

   b. Momentary target loss due to muzzle flash or tracers.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.

2. Evaluation will be conducted in the aircraft.

REFERENCES: FM 3-22.9.

TASK 2164

Call for a Tactical Air Strike

CONDITIONS: In an OH-58D helicopter for training and evaluations or classroom for training.

STANDARDS:

1. Transmit a request for close air support (CAS).
2. Perform a CAS briefing on the mission.
3. Transmit a BDA report as required.

DESCRIPTION:

1. Crew actions.

   a. The P* is responsible for clearing the aircraft and obstacle avoidance and will focus primarily outside the aircraft. The P* will announce any maneuver or movement before execution and inform the P if visual contact is lost with other aircraft. The P* will coordinate with the P as to who will coordinate with the joint terminal attack controller (JTAC) or CAS aircraft.

   b. The P will operate the MMS and assist the P* as necessary. The P will announce when his attention is focused inside the cockpit. He will coordinate with the P* as to who will coordinate with the JTAC or directly with CAS aircraft.

2. Procedures. Ground commanders are the ultimate authority for use of all supporting fires in their AO and decide the priority, effects, and timing of CAS. They make decisions with the advice and guidance of the JTAC who is a specially trained and qualified service member authorized to perform terminal attack control of CAS aircraft. Aircrews normally request air support through the ground unit and coordination with the JTAC. In certain circumstances, the ground commander or aircrew might require air support when a JTAC or other qualified person is not available. In these instances the individual making the CAS request must make it clear to the attacking aircraft they are non-JTAC qualified. Provide as much of the 9-Line briefing that is possible or required. * Indicates minimum essential information.

   - Line One: Initial point. The initial point is the starting point for the run-in to the target.
   - Line Two: Heading and offset in magnetic degrees from the initial point to the target. Offset allows the attack aircraft to maneuver on that side inbound to the target and is given in “Offset left or right”.
   - Line Three: Distance in NM accurate to the tenth from the initial point to the target.
   - Line Four: Target elevation in feet above MSL.
   - *Line Five: Target description specific enough for target recognition.
   - *Line Six: Target location in grid, lat/long, or talk-on from a reference point.
   - *Line Seven: Target marks such as laser code, smoke, munitions and so forth.
   - *Line Eight: Friendly location(s), including observing aircraft from the target in cardinal heading and distance in meters (“NW 2500 meters”).
   - Line Nine: Egress instructions in cardinal directions away from the target area.
   - Remarks (as appropriate).

- Restrictions. Ordnance delivery, threats, final attack heading, hazards, weather, additional target information, SEAD, LTL/GTL [degrees magnetic], night vision, danger close with commander's initials, and time on target.

NIGHT OR NVG CONSIDERATIONS: A thorough crew briefing should be conducted prior to NVG operations; crew coordination is crucial. When maneuvering the aircraft to maintain the MMS on target, the P* must consider obstacles and other aircraft. The P should assist the P* with obstacle avoidance and clearing the aircraft and announce when doing so.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.
2. Evaluation will be conducted in the aircraft.

REFERENCES: ATP 3-09.32.

TASK 2410

Perform Masking and Unmasking

CONDITIONS: In an OH-58D helicopter with OGE hover power available.

STANDARDS:

1. Perform a map reconnaissance.
2. Mask the aircraft from enemy visual and electronic detection.
3. When using the MMS, unmask the MMS only.
4. Maintain a sufficient distance behind obstacles to allow for safe maneuvering.
5. Move to a new location, if available, before subsequent unmasking.

DESCRIPTION:

1. Crew actions.

   a. The PC will assign observation sectors to the other crewmember to maximize the areas scanned during the time unmasked. The PC will also ensure observations are reported.

   b. The P* will remain focused outside the aircraft. The P* is responsible for clearing the aircraft and obstacle avoidance and will announce the type of masking and unmasking before executing the maneuver. The P* may elect to utilize the heading hold mode during the maneuver. The primary concern will be aircraft control while viewing the assigned sector.

   c. The P will initially focus attention inside the aircraft. The P will perform a map reconnaissance to identify natural and man-made features before the unmasking (may be accomplished in premission planning or in the aircraft), brief the P* and announce when ready. Visually the P will primarily view the assigned sector, overlap the P* sector, and warn the P* of obstacles or unanticipated drift and altitude changes. The P will announce when focused inside the cockpit. When operating the MMS, the P will scan the primary sector using all sensors as appropriate.

2. Procedures.

   a. Masking in flight. Fly to the destination with the aid of the navigation system or a map. Take maximum advantage of terrain and vegetation to prevent exposure of the aircraft to enemy visual observation or electronic detection. Maintain orientation at all times and look far enough ahead on the map or RMS for hazards.

   b. Unmasking in flight. Keep aircraft exposure time to a minimum to prevent enemy visual observation or electronic detection. Depending on METT-TC, only the MMS may need to be exposed.

   c. Unmasking at a hover vertically. Ensure that sufficient power is available to unmask. Heading hold may be used during the maneuver. Apply collective until sufficient altitude is obtained to either see or expose the MMS over the mask without exceeding aircraft limitations. Maintain horizontal main rotor blade clearance from the mask in case of a power loss or a tactical need to mask the aircraft quickly. Keep aircraft exposure time to a minimum.

Note. There is a common tendency to move forward or rearward while vertically unmasking and remasking.

d. Unmasking at a hover (laterally). Unmasking may be accomplished by moving laterally from the mask. Hover the aircraft sideward to provide the smallest silhouette possible to enemy observation or fire. Keep aircraft exposure time to a minimum.

Note. When unmasking the helicopter, select a new location that is a significant distance from the previous location and where the target area can still be observed. If the target area is a long distance (2,000 to 3,000 meters) away, moving only 100 meters will still keep the aircraft in the same field of view from the target. However, if the target area is close to the unmasking position, a drift of 100 meters will make a significant difference.

NIGHT OR NVG CONSIDERATIONS: Maintaining altitude and position is more difficult when hovering above 25 feet without aircraft lights. Use the radar altimeter to assist in maintaining altitude and the position box to assist in maintaining aircraft position. Use references such as lights, tops of trees, or man-made objects above and to the front and sides of the aircraft. By establishing a reference angle to these objects, the P* can detect altitude changes by changing the viewing perspective. Hovering near ground features, such as roads, provides ideal references for judging lateral movement. However, the P* may become spatially disoriented when alternating viewing perspective between high and low references. Therefore, the P* must rely on the P for assistance if disoriented. Regardless of the mission the P* must fly the aircraft first and then observe the sector.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 2412

Perform Evasive Maneuvers

CONDITIONS: In a OH-58D in a tactical or simulated tactical environment.

STANDARDS: Perform appropriate evasive maneuvers (EVM) for the type of threat given.

DESCRIPTION:

1. Crew actions.

   a. EVMs consist of a combination of classified and unclassified tactics, techniques, and procedures (TTP) used to defeat enemy surface-to-air fire (SAFIRE) and aircraft threats. When specific strengths and weaknesses of U.S. aircraft and survivability equipment are tied to a specific threat weapon system, the information is classified "Secret, No Foreign Release" (SECRET NOFORN). A complete discussion of EVM requires aircrews to consult critical additional classified information. Aircrews should train TTP prior to entering an area of operations with known threat systems and plan to update TTP based on changing threats. If an EVM is classified failing to acquire the most recent information and attempting to use an outdated TTP may expose the aircrew to greater risk.

   b. Consult with local tactical operations officer for latest area of operations threat systems. If the enemy cannot be avoided through tactical flight procedures, then EVMs are used to avoid or minimize exposure in the enemy's weapon engagement zone (WEZ). The WEZ is defined by the four dimensions of the weapon's maximum and minimum range and maximum and minimum altitude. The weapon's TOF is also considered. Traditionally, Army helicopters employ tactical flight mission planning, tactical flight procedures, and standoff to avoid the enemy WEZ by staying outside the threat's maximum range. Where the enemy locations are unpredictable, other aspects of the WEZ must be exploited to improve aircraft survivability. Once engaged, the crew's primary goal should be to limit enemy weapon effectiveness, and exit the WEZ as quickly as possible by applying the appropriate EVM, and suppress the system if able. Aircrews should anticipate the possibility of multiple weapons systems arrayed with interlocking fields of fire when conducting EVM.

   c. When tactics are insufficient, the crew will select and apply the appropriate EVM. Any EVM must be used in concert with ASE, onboard weapon systems, and other TTP to minimize the SAFIRE threats to the aircraft. EVM are broadly categorized by whether the enemy weapon is guided or unguided. Generally, the aircrew must defeat the weapon system for guided weapons and defeat the gunner for unguided weapons. The TOF for both guided and unguided weapons are based on weapon to target range and projectile velocity. At some ranges, the TOF can be exploited to allow the pilot to maneuver the aircraft out of danger. However, the time required varies greatly depending on the type of weapon and TOF. Tank main gun rounds and AAA cannons have extremely high velocities and very short TOF whereas rocket propelled grenades (RPGs) and certain antitank guided missiles (ATGMs) have comparatively slow TOF.

   d. Communication. Intra-cockpit and inter-flight communication during a SAFIRE or air attack event are critical in performing EVM in a timely manner. Alerting the rest of the flight maximizes mission survivability by providing early warning and reaction time, and perhaps maneuver space, with the goal of minimizing other aircrews exposure to the WEZ if not enabling them to avoid the WEZ altogether. The "threat call" must be both directive (telling the flight what you want them to do) and descriptive (telling the flight why) to build the flight's SA. Always preface threat calls with the flight callsign to avoid potential confusion in situations where multiple flights are using the same frequency.

(1) Aircrew coordination throughout the EVM sequence is of paramount importance. Crews should brief and practice actions during EVM to ensure efficiency and communication effectiveness. In any case, the person observing the enemy fire must communicate to the P* in order for the P* to be able to effectively execute EVM. The aircrew must communicate the threat information to other aircraft in the flight, and after the immediate danger is past, to the appropriate outside agencies for battlefield SA.

(2) The first crewmember to realize enemy fire will announce the nature and direction of the threat by the most immediate means available.

(3) The pilot on the controls (P*) will announce the direction of threat to other aircraft and his intent. The P* will remain focused outside the aircraft during the event and should be aware that crewmembers involved in returning suppressive fire may be unavailable for assisting in obstacle avoidance or noting other threat sources. The P* is responsible for safe performance of evasive maneuvers and aircraft control.

(4) The P will be alert for obstacles and new threat sources encountered during the event. The P will remain oriented on threat location and assist clearing the aircraft and will announce warning to avoid obstacles and when attention is focused inside the aircraft. The P should note location of the threat quickly and as accurately as the situation allows. It is imperative that all applicable crewmembers are able to quickly and accurately locate and transmit threat data in order to maintain individual and collective situational awareness during quickly changing situations. Not storing/reporting an enemy location may be more detrimental than the risk of taking time to note the location when contact occurs. The crew will transmit a report, (as required) to other aircraft within the flight, higher HQ, and the owning ground unit/tactical commander.

(5) Other crewmembers will remain oriented on the threat location and employ appropriate countermeasures or suppressive fire as appropriate. They will announce when their attention is focused inside the cockpit; for example, when firing the weapons.

Note. Crewmembers will not use friendly affiliated graphic control measures/icons/symbols to mark enemy locations and vice-versa to avoid fratricide and other unnecessary confusion.

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2. Procedures.

a. Unguided weapons. Unguided weapons (such as small arms, unguided rockets, AAA guns without radar) require the enemy gunner to predict an intercept point by estimating where the target aircraft will be at the TOF of the projectiles. Once fired, the rounds cannot be corrected. The two basic strategies of defeating unguided weapons are to present the most difficult targeting (ballistic) solution possible and then to change the enemy's ballistic solution as often as possible. The pilot presents the enemy with the most difficult target by maneuvering in three dimensions. Unguided weapons are generally employed in three basic methods: aimed fire, curtain fire, and barrage fire requiring different countermeasures. Curtain and barrage fire may not be specifically aimed at an individual aircraft but rather fired into a predicted or suspected air avenue of approach that the enemy believes will be over flown by the aircraft.

(1) Countering aimed fire: When encountering accurate aimed fire, the crew should immediately alert the flight, jink until the aircraft exits the enemy WEZ, while suppressing with organic weapons if feasible. Jinking is defined as deliberate, controlled changes of multiple axes in order to elude effective enemy fire. Turns can be lateral or vertical, and are most effective when combined; i.e., changing direction and altitude simultaneously. Jinking is used to disrupt/deny the enemy a weapon's

firing solution by moving the aircraft away from the predicted point of impact/intercept. Properly executed, jinking maximizes errors in the enemy weapon system's firing solution by forcing the gunner to correct for azimuth, range, altitude, and changing velocity constantly and simultaneously. This maneuver incorporates a change in direction with a (optional) climb or descent every several seconds. Jinks should be random in direction so as not to become predictive. The jinking maneuver is accomplished with positive flight control inputs, but should not be a violent maneuver. Jinking will be ineffective if the helicopter does not displace over the ground and cause the enemy to shift his aiming point. Therefore, excessively tight turns should normally be avoided as they result in the helicopter failing to displace out of the enemy's weapon's field of view.

Note. Prolonged jinking may dissipate the aircraft's kinetic energy and may make the aircraft an easier target.

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(2) Countering barrage and curtain fire: If engaged by accurate barrage or curtain fire, depart the area of fire as quickly as possible via the most direct path. Barrage fire is being aimed into a 'box,' turn only to avoid areas of concentrated fire. Do not "jink" as this will delay departure from the barrage.

b. Artillery countermeasures procedure. Artillery can pose a threat to slow-speed helicopters particularly operating at a readily identifiable firing position. Artillery takes time to shift fires; this time interval can be used by helicopters to stay ahead of the enemy's ability to target/shift fires onto them. If two or more unexplained explosions occur within 500 meters of the aircraft, suspect enemy artillery and proceed as follows:

(1) Depart the impact area by 500 meters.

(2) Reposition every 20 seconds to avoid enemy adjusting (shifting) fire onto your new location.

(3) Report receiving enemy artillery/mortar fire to facilitate timely counter battery fire from friendly field artillery.

c. Tank main gun. Tank fire control systems and turret slew rates in azimuth and elevation combined with the limited field of view on the tank gunner's weapon sight make it very difficult to track aircraft with high relative velocity. Jinking normally provides an effective countermeasure and tank gunners are particularly vulnerable to aircraft displacing in the vertical plane. Tanks may also carry semi-automatic command to line of sight (SACLOS) missiles.

d. SACLOS missiles. SACLOS weapon systems include ATGM and certain anti-aircraft missiles. The missile may be fired from a ground based platform or vehicle based platform such as a tank or armored personnel carrier. These systems can vary from slow speed ATGMs (~100 meters per second) to very high-speed anti-aircraft missiles (700 meters per second) and may use wires, radio, or laser for the command link. These systems are countered by departing the missile engagement zone or WEZ prior to weapons impact. Regardless of the type of SACLOS missile, the weakest part of the guidance system is the enemy gunner. Older ATGMs glide during most of their flight resulting in low energy and poor missile maneuverability. This combined with relatively high latency within the guidance systems means the missile can be readily out flown by the targeted aircraft. With high-speed/high-G SACLOS anti-aircraft systems, the missiles themselves are more difficult to be out flown by a helicopter due to its maneuverability/speed and decreased reaction time by the aircrew. In these cases, the enemy gunner needs to be defeated.

e. FW. Fighter aircraft are characterized by their high performance with high attack speeds. Their ability to move vertically in excess of 40,000+ fpm means that fighter aircraft can easily come and go from the area without detection by the helicopter crew. Fighters can work independently or in a minimum of two aircraft section. If one is detected, expect another enemy aircraft nearby. When operating in an area of possible enemy fighter activity be unpredictable to enemy fighters by using night and/or adverse weather to avoid detection when possible and in daylight avoid flying over areas of high contrast such as bodies of water or open fields if possible. If hostile fighter activity is observed:

(1) Air-to-ground gun/rocket evasive maneuvers. Fighters normally carry limited cannon ammunition with its high performance working against rocket or gun attack accuracy against helicopter targets. The enemy fighter will have as little as 0.5 to 3 seconds to execute a gun or rocket engagement due to their high speed and the limited effective range of their gun or rockets.

(2) Air-to-ground bomb passive countermeasures. Once dropped, the fighter's bomb will fall on a ballistic flight path that can be avoided or mitigated if detected in time. The time of fall of the bombs can be exploited by the attack helicopter crew to avoid the heart of the enemy's weapons effect zones. To avoid being hit by their own fragments, bombs are equipped with time-delayed fuzes of 4 to 6 seconds minimum. At 100 knots ground airspeed, a helicopter can displace over 300 meters in 6 seconds. Once bombs depart the fighter, the helicopter should fly perpendicular to the bomb's line of fall and proceed at maximum speed and minimum altitude. This will place the helicopter at the edge of the fragment envelope where fragment density will be at a minimum.

f. Helicopters. Due to their limited performance differential and inability to accelerate out of enemy weapons range, once engaged it is impractical for helicopters to break contact from one another. Consequently, the success of helicopter evasive maneuvers will likely depend on seeing the enemy aircraft first and avoiding its WEZ. The most effective means of avoiding a helicopter WEZ is to achieve "rotor blade masking" by operating above the enemy helicopter.

(1) Maintain maximum maneuver energy and do not decelerate below "bucket speed" (approximately maximum endurance/maximum rate of climb airspeed).

(2) Maintain the enemy helicopter in sight until it is destroyed if able and appropriate.

(3) Vector other friendly helicopters onto the enemy.

(4) Deny or limit enemy shooting opportunities by exiting the enemy weapon system WEZ and then climb above the enemy helicopter and force rotor blade masking.

(5) All organic weapons systems should be considered based on their individual characteristics and effectiveness against mobile thin-skinned targets.

g. The following weapons systems require referral to classified aviation TTP for the most current EVN information:

(1) Radar guided weapons (AAA with radar, enemy fighter aircraft with radar missiles).

(2) Heat seeking (infrared) missiles (man-portable air defense system or enemy fighter aircraft with infrared missile).

NIGHT OR NVG CONSIDERATIONS: Threat elements will be harder to detect. Crewmembers must maintain SA.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references, FM 3-90, ATP 1-02.1, and FM 3-04.140.

TASK 2413

Perform Actions on Contact

CONDITIONS: In an OH-58D with a completed mission briefing.

STANDARDS:

1. Use the correct actions on contact consistent with the mission briefing.
2. Transmit a tactical report for confirmed enemy contact.

DESCRIPTION:

1. Crew actions.

   a. Aircrew coordination throughout the actions on contact sequence is of paramount importance. Crews should brief and practice actions on contact to ensure efficiency and communication effectiveness. In any case, the person observing the enemy must communicate to the P* in order for the P* to be able to effectively maneuver. The aircrew must communicate the threat information to other aircraft in the flight, and after the immediate danger is past, to the appropriate outside agencies for battlefield SA.

   b. The first crewmember to realize enemy contact will announce the nature and direction of the threat by the most immediate means available.

   c. The P* will announce the direction of threat to other aircraft and his intent. The P* will remain focused outside the aircraft during the event and should be aware that crewmembers involved in returning suppressive fire may be unavailable for assisting in obstacle avoidance or noting other threat sources. The P* is responsible for safe performance of evasive maneuvers and aircraft control.

   d. The P will be alert for obstacles and new threat sources encountered during the event. The P will remain oriented on threat location and assist clearing the aircraft and will announce warning to avoid obstacles and when attention is focused inside the aircraft. The P should note location of the threat quickly and as accurately as the situation allows. It is imperative that all applicable crewmembers are able to quickly and accurately locate and transmit threat data in order to maintain individual and collective SA during quickly changing situations. Not storing/reporting an enemy location may be more detrimental than the risk of taking time to note the location when contact occurs. The crew will transmit a report, (as required) to other aircraft within the flight, higher HQ, and the owning ground unit/tactical commander.

   e. Other crewmembers will remain oriented on the threat location and employ appropriate countermeasures or suppressive fire as appropriate. They will announce when their attention is focused inside the cockpit; for example, when firing the weapons.

   Note. Crewmembers will not use friendly affiliated graphic control measures/icons/symbols to mark enemy locations and vice-versa to avoid fratricide and other unnecessary confusion.

2. Procedures.

   a. Actions on contact are a series of combat actions taken to develop the situation upon contact with the enemy or situation that warrants or demands action. Due to the fluid nature of tactical situations, it is impossible to give a “one size fits all” prescriptive solution for all types of contact. The actions on contact performed during a mission will depend largely on the bypass and engagement criteria described in the

operation order (OPORD)/fragmentary order/mission briefing and framed in terms of the mission objective and commander's intent (for example end state, task, or expanded purpose). The bypass criteria are established by the higher HQ and are important because they allow the mission to maintain its tempo of operation. The engagement criteria also helps to maintain the tempo of the operation by allowing the aircrews to rapidly develop the situation and take action before the threat can gain the initiative and force friendly forces to react. Considerations for engagement criteria include ROE, type of weapons systems available, target types, and the unit's mission. The engagement criteria establishes what the unit is expected to engage and what it is expected to hand over to the follow-on ground forces. The desired outcome of the mission will often dictate the bypass and engagement criteria and the type of actions to perform on contact.

b. Contact can be defined as confirmed awareness of enemy/threat presence through any detection method. Contact can be detected and announced through any crewmember, another aircraft in the flight, or onboard sights/sensors/systems. Defensive and offensive postures are described below and are based on the bypass and engagement criteria outlined in the OPORD/mission briefing.

c. Bypass (defensive posture). A defensive posture is independent of mission type and based on the mission aircrews may be briefed and expected to bypass certain enemy elements to and from their objective. Proper pre-mission planning and intelligence data may aid in developing flight profiles and route selection to avoid hostile fire. The bypass criteria established in the OPORD and confirmed in the mission briefing will assist in determining the crew's actions. A threat encountered which falls within the bypass criteria and, if undetected by the enemy, will usually result in the crew providing a standard spot report and continuing with the mission. Detection by the threat is usually determined by threat actions ranging from hostile fire to a change in threat disposition—deploying to cover or orienting on the aircraft. For a threat that falls within the established bypass criteria proceed as follows:

(1) Alert and threat description. Alert crewmember and wingman.

(2) Detection by threat:

(a) Undetected. Continue to avoid enemy detection within capabilities.

(b) Detected. If fired upon, execute evasive maneuvers IAW Task 2412 suppressing as appropriate. Prevent enemy's capability to engage aircraft while deploying to cover or concealment, if available or to safe area or distance.

(3) Locate threat. Perform a target locate/acquire grid coordinates. Dropping a target reference point upon initial contact may aid in maintaining orientation on the threat area.

(4) Report SALT-W. Send a spot report to the higher HQ.

(5) Recommend or execute a course of action (COA). The COA will be influenced by the report to the higher HQ, the bypass criteria and the commander's intent. If the bypass criteria has been met and undetected by threat the selected COA will likely be to continue mission. If detected by the threat the decision to bypass may require additional approval of the commander.

d. Hasty attack or screen (offensive posture). An offensive posture is independent of mission type. If the aircrew encounters a threat that meets the engagement criteria defined by the mission briefing and the commander's intent the most likely course of action will be to execute an attack. Sighting the enemy can be a trigger for offensive actions ranging from a hasty attack to initiation of massed fires depending on the mission and phase of the operation. Different phases of the mission may require different actions. If the aircrew encounters a threat that meets the engagement criteria proceed as follows:

(1) Alert and threat description. Alert crewmember and wingman.

(2) Detection by threat.

(a) Undetected. Continue to avoid enemy detection within capabilities.

(b) Detected. If fired upon, execute evasive maneuvers IAW Task 2412 suppressing as appropriate. Prevent enemy's capability to engage aircraft while deploying to cover or concealment, if available or to safe area or distance.

(3) Locate threat. Perform a target locate/acquire grid coordinates. Dropping a target reference point upon initial contact may aid in maintaining orientation on the threat area.

(4) Report (SALT-W). Send a spot report to the higher HQ.

(5) Maintain contact and develop the situation. Determine the enemy's composition, disposition and strength and do not assume the initial contact is the only threat in the area.

(6) Recommend or execute a course of action. The selected COA will be influenced by the report to the higher HQ, the engagement criteria, the commander's intent, the situation development and the team's offensive capabilities compared to the nature of the threat.

(a) Hasty attack. If the engagement criteria has been met and the threat is within the team's capabilities to meet the desired engagement endstate then the selected COA will likely be a hasty attack. This may be may be performed by the team in contact or additional options may include: conducting a target handover to attack aircraft, calling for a tactical air strike or artillery, maneuvering ground units to the area or any combination.

(b) Hasty screen. If the team is unable to conduct a hasty attack it may establish a hasty screen. The team focuses on maintaining contact with the threat and fixing it in place with indirect and direct fires until additional support is available.

NIGHT OR NVG CONSIDERATIONS: Threat elements will be harder to detect. Crewmembers must maintain SA.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: FM 5-0, FM 3-90, and FM 3-04.126.

TASK 2471

Perform Target Handover

CONDITIONS: In an OH-58D helicopter or classroom environment.

STANDARD: Use the proper communications procedure to accomplish a target handover.

DESCRIPTION:

1. Crew actions.

   a. The P* is responsible for aircraft control and obstacle avoidance. The P* will coordinate with the P as to who will make the handover.

   b. The P may use the MMS to locate and identify the target and will prepare the information for the handover and coordinate with the P* prior to sending it. The P will assist in clearing the aircraft and obstacle avoidance as duties permit.

2. Procedures.

   a. The target handover is a voice call to an attack or scout aircraft to relay target information. The standard elements for the target handover are:

      (1) Alert and target description. ("Topgun 16 this is Saber 11, 5 enemy dismounts armed with AK-47s and RPGs.")

      (2) Target location in clock position, distance and direction, grid coordinates, type of mark ("12 o'clock, 1,000 meters, 360 degrees).

      (3) Attack instructions (optional) (for example: recommended/requested ordnance, at my command).

      (4) Additional information as required (for example: further description/walk on of target area, clearance of fires, friendly locations). ("Enemy is located in the tree line on the north side of the route.")

   b. If the attack aircraft is equipped with a laser spot tracker, the target location may be identified by passing the observer's laser code to the attack aircraft and lasing the target.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted in the aircraft or academically.
2. Evaluation may be conducted in the aircraft or academically.

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Chapter 5
Maintenance Test Pilot Tasks

This chapter describes the tasks that are essential for maintaining maintenance crewmember skills. It defines the task title, number, conditions, and standards by which performance is measured. A description of crew actions, along with training and evaluation requirements is also provided. Tasks described in this chapter are to be performed by qualified OH-58D MTPs in accordance with AR 95-1. This chapter contains tasks and procedures to be used by contractor MTPs in accordance with AR 95-20. If discrepancies are found between this chapter and TM 1-1520-248-MTF, the MTF checklist takes precedence.

5-1. TASK CONTENTS

a. Task number and title. Each ATM task is identified by a number and title that corresponds to the MTP tasks listed in chapter 2.

b. Conditions. The conditions specify the situation in which the task will be performed. They describe the important aspects of the performance environment. All conditions must be met before task iterations can be credited.

(1) Common conditions are—

(a) In a mission aircraft with mission equipment and crew, items required by AR 95-1, required publications (operator's manual, checklist, navigational and terrain maps), and special test flight equipment required by the appropriate technical manuals.

(b) Under visual meteorological conditions.

(c) Day, night, and night vision device employment.

(d) In any terrain or climate.

(e) In CBRN environment with mission protective posture equipment used.

(f) In an electromagnetic environment.

(2) Common training/evaluation conditions are—

(a) When a ME is required for the training of the task, then that individual will be at one set of the flight controls while the training is performed.

(b) Unless otherwise specified in the conditions, all in-flight training and evaluation will be conducted under VMC.

(c) Night unaided and NVG use may be a condition for any flight task. When NVG are listed as a condition; task standards will be the same as those described for performance of the task without using NVG.

c. Standards. The standards describe the minimum degree of proficiency or standard of performance to which the task must be accomplished. Standards are based on ideal conditions to which the task must be accomplished. The following common standards apply to all MTP tasks:

(1) Perform procedures and checks in sequence per TM 1-1520-248-MTF, as required.

(2) Brief the rated crewmember (RCM) or nonrated crewmember (NCM) (if applicable) on the procedures and applicable warnings, cautions, and notes for the task to be performed.

(3) Perform crew coordination actions per the task description and chapter 6.

(4) Assess and address any malfunctions or discrepancies as they occur and apply appropriate corrective actions or troubleshooting procedures.

(5) If the RCM or NCM is available, use the call and response method when performing checks and announce check completion.

(6) Upon completion of all tasks record required data on the MTF check sheet.

d. **Description.** The description explains how the elements of the task should be done to meet the standards. When specific crew actions are required, the task will be broken down into crew actions and procedures as follows:

(1) Crew actions. These define the portions of a task to be performed by each crewmember to ensure safe, efficient, and effective task execution. The P* indication does not imply PC or MTP duties. When required, P* or MTP responsibilities are specified. All tasks in this chapter are to be performed only by qualified MEs, MTPs, or student maintenance test pilots undergoing qualification training as outlined in AR 95-1. The MTP is the PC in all situations, except when undergoing training or evaluation by a ME. For all tasks, MTP actions and responsibilities are applicable to MEs. When two MEs are conducting training/evaluation together, or two MTPs are jointly performing test flight tasks, the mission brief will designate the aviator assuming PC responsibilities.

(2) Procedures. This section describes the actions that the MTP/ME performs or directs the RCM/NCM to perform in order to execute the task to standard.

e. Considerations. This section defines training, evaluation, and other considerations for task accomplishment under various conditions.

(1) Hover work at night or with NVG: Movement over areas of limited contrast, such as tall grass, water, or desert tends to cause spatial disorientation. To avoid spatial disorientation and unanticipated drift, seek hover areas that provide adequate contrast with good references and apply proper scanning techniques. When possible designate a specific area clear of obstacles or hazards that far exceeds the required space to perform the hover checks. Hovering OGE reduces available ground references and may increase the possibility of spatial disorientation. Use of the IR searchlight in areas of low contrast may be necessary if tactical conditions permit. When use of the white light is anticipated, its positioning should be taken into consideration to ensure the P* does not focus his attention directly where the light is pointed. Hover Bob Up and Heading Hold may be used to assist the P* in maintaining a constant position during selected tasks. Be prepared to transition to instruments and execute an instrument takeoff if ground reference is lost. The crewmember not on the controls should assist in completing all required checks. Visual obstacles, such as shadows, should be treated the same as physical obstacles.

(2) Inflight work at night or with NVG: All crewmembers must be focused primarily outside for obstacle avoidance. Due to the intensity of crew coordination required during certain checks, a qualified RCM or NCM must be utilized to record the numerical data gathered and perform airspace surveillance duties as required. Due to the speeds involved while performing these checks; select altitudes that allow for obstacle avoidance. Use of proper scanning techniques will minimize the probability of disorientation. Identification of forced landing areas during certain checks is highly recommended. To better maintain aircraft control during certain maneuvers, unaided flight is recommended when altitude is available.

(3) Snow/sand/dust: If visual references deteriorate to an unacceptable level, apply sufficient power and execute a takeoff. If a takeoff is not feasible, try to maneuver the aircraft forward and down to the ground to limit the possibility of touchdown with sideward or rearward movement. To avoid spatial disorientation and unanticipated drift, seek hover areas that provide adequate contrast with good references and apply proper scanning techniques. The P should keep the P* informed of the location of the snow/sand/dust cloud. Consider the effects of the snow/sand/dust cloud on personnel and equipment in/around the landing area. Use of the searchlight may cause spatial disorientation while in blowing snow/sand/dust.

Note. Use of in-cockpit supplemental lighting to acquire specific measurements may be required.

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f. **Common single pilot considerations.** The following common single pilot considerations apply to all tasks in this chapter where specific single pilot considerations have not been identified:

(1) Single pilot NVG MTF operations are prohibited.

(2) When a NCM is on board, the MTP will brief and assign duties appropriate to the proficiency level.

(3) Except for rated aviator duties, the RCM crew actions described in the task may be accomplished by the NCM at the direction of the MTP.

(4) The MTP will periodically scan the surrounding area to ensure the aircraft remains clear throughout all checks.

(5) If the MTP is the only RCM on board, the MTP will land the aircraft prior to comparing aircraft data to chart data, for example power assurance data.

g. Training and evaluation requirements. Some of the tasks incorporate more than one check from TM 1-1520-248-MTF. The evaluator may select additional checks for evaluation.

(1) Training and evaluation requirements define whether the task will be trained or evaluated in the aircraft, simulator, or academic environment.

(2) Training and evaluations will be conducted only in the listed environments, but they may be done in any or all combinations. Listing only “aircraft” under evaluation requirements does not preclude the ME from evaluating elements of the task academically to determine depth of understanding or planning processes. However, the evaluation must include hands-on performance of the task in the listed environment(s). If one or more checks are performed unsatisfactorily, the task will be graded unsatisfactory. However, when the task is reevaluated, only those unsatisfactory checks must be reevaluated.

h. References. The references are sources of information relating to that particular task. In addition to the common references listed in chapter 4, the following references apply to all MTP tasks:

(1) Aircraft logbook and historical records.

(2) TM 1-1500-328-23.

(3) DA Pam 738-751.

(4) TM 1-1520-248-10.

(5) TM 1-1520-248-CL.

(6) TM 1-1520-248-MTF.

(7) TM 1-1520-248-23 series manuals.

(8) TM 1-2840-263-23&P.

(9) TM 11-1520-248-23 series manuals.

(10) TM 1-6625-724-13&P.

(11) Applicable airworthiness directives or messages from AMCOM.

5-2. TASKS

a. **Standards versus descriptions.** MTPs and MEs are reminded that task descriptions may contain required elements for successful completion of a given task. For example, when part of the description for the task is to "brief the RCM on the conduct of the maneuver," those crew actions specified in the description are required. Attention to the use of the words will, should, or may throughout the text of a task description is crucial.

b. **Critical tasks.** The following numbered tasks are OH-58D maintenance test pilot critical tasks.

TASK 4000

Perform Prior to Maintenance Test Flight Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS:

1. Perform the preflight inspection of the aircraft, logbook and/or laptop computer, armament, personal flight gear, and special test fight equipment (if installed) in accordance with the appropriate technical manuals.

2. Determine the suitability of the aircraft for flight and the mission to be performed.

3. Determine required maintenance operational checks (MOCs) and/or MTF checks to be completed.

DESCRIPTION:

1. Crew actions.

   a. The MTP will ensure that a thorough preflight inspection is conducted. The TM 1-1520-248-CL may be used to conduct the preflight inspection; however, the inspection will be conducted to the detail level in TM 1-1520-248-10, chapter 8. The MTP may direct the RCM if available, to complete such elements of the aircraft preflight inspection as are appropriate, but will verify that all checks have been completed. The MTP will ensure that the aircraft logbook and/or laptop computer forms and records are reviewed and appropriate entries made per DA Pam 738-751. The MTP will determine the required MOCs and/or MTF checks to be completed. The MTP will brief the RCM or NCM and any additional support personnel concerning operation on or around the helicopter during ground operations and will ensure that ground communication capability is adequate. Additionally, the MTP will stress any applicable ground or airborne safety considerations or procedures during the briefing and will ensure that a final walk-around inspection is completed prior to flight.

   b. The RCM should complete the assigned elements and report the results to the MTP.

2. Procedures. Review the aircraft logbook and/or laptop computer forms and records to determine the necessary checks and tasks to be performed. Use additional publications and references as necessary. Conduct a risk assessment of the mission. Preflight the aircraft with special emphasis on areas or systems where maintenance was performed. Verify all test equipment is correctly installed and secured as applicable. Brief the RCM or NCM, if available, on crew coordination responsibilities and conduct of the mission. Emphasize safety procedures to be performed during maintenance tasks or maneuvers the RCM or NCM may be unfamiliar with.

NIGHT OR NVG CONSIDERATIONS: A white lens flashlight should be used if performing the preflight inspection during the hours of darkness. Hydraulic leaks, oil leaks, and other defects are difficult to see using a flashlight with a colored lens. If circumstances permit, accomplish preflight inspection during daylight hours.

SNOW/SAND/DUST CONSIDERATIONS: If the aircraft preflight has been conducted any time other than immediately prior to flight, consideration should be given to reinstalling aircraft covers to prevent accumulation of snow/sand/dust in aircraft and equipment. Ensure all ice/snow accumulations are removed from the aircraft before starting engine.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4084

Perform Before Starting Engine Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the before starting engine checks to be performed IAW TM 1-1520-248-MTF.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM, NCM, and/or ground support personnel if available. Additionally the MTP will brief all *warnings, cautions*, and *notes* that may impact upon the checks to be performed. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Brief the RCM, NCM, and/or ground support personnel as necessary, if available. Perform the required checks in sequence. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: Before starting the engine, ensure that all internal and external lights are operational and properly set. Internal lighting levels must be high enough so the crew can easily see the instruments.

SNOW/SAND/DUST CONSIDERATIONS: Ensure all rotating components, inlets and exhausts are clear of ice and/or snow prior to starting engine.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4088

Perform Starting Engine Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the starting engine checks to be performed IAW TM 1-1520-248-MTF.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM, NCM, and/or ground support personnel, if available. Additionally the MTP will brief all *warnings, cautions,* and *notes* that may impact upon the checks to be performed. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Brief the RCM, NCM, and/or ground support personnel as necessary, if available. Ensure the fireguard is posted. The MTP will ensure the area surrounding the aircraft is clear before engine start. Perform the required checks in sequence. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: Before starting the engine, ensure that all internal and external lights are operational and properly set. Internal lighting levels must be high enough so the crew can easily see the instruments, and the aviator can start the engine without exceeding operating limitations. The crewmember not on the controls should assist in clearing the aircraft and assist in completing all required checks.

SNOW/SAND/DUST CONSIDERATIONS: Ensure all rotating components and inlets/exhausts are clear of ice and/or snow prior to starting engine.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4090

Perform Engine Run Up Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the engine run-up checks to be performed IAW TM 1-1520-248-MTF.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM, NCM and/or ground support personnel, if available. Additionally the MTP will brief all *warnings, cautions,* and *notes* that may impact upon the checks to be performed. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Brief the RCM, NCM and/or ground support personnel as necessary, if available. Perform the required checks in sequence. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: The MTP will periodically scan the surrounding area to ensure the aircraft remains clear throughout the checks.

SNOW/SAND/DUST CONSIDERATIONS: Ensure a buildup of ice and/or snow has not occurred directly affecting the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4094

Perform System Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the aircraft systems checks to be performed IAW TM 1-1520-248-MTF.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM, NCM, and/or ground support personnel, if available. Additionally the MTP will brief all *warnings, cautions,* and *notes* that may impact upon the checks to be performed. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Brief the RCM, NCM, and/or ground support personnel as necessary, if available. Perform the required checks in sequence. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: The MTP will periodically scan the surrounding area to ensure the aircraft remains clear throughout the checks.

SNOW/SAND/DUST CONSIDERATIONS: Ensure a buildup of ice and/or snow has not occurred directly affecting the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4128

Perform Before Hover Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the before hover checks to be performed IAW TM 1-1520-248-MTF.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM, NCM, and/or ground support personnel, if available. Additionally the MTP will brief all *warnings, cautions,* and *notes* that may impact upon the checks to be performed. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Brief the RCM, NCM, and/or ground support personnel as necessary, if available. Perform the required checks in sequence. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: The MTP will periodically scan the surrounding area to ensure the aircraft remains clear throughout the checks.

SNOW/SAND/DUST CONSIDERATIONS: Ensure a buildup of ice and/or snow has not occurred directly affecting the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4132

Perform Takeoff-to-a-Hover Checks

CONDITIONS: In an OH-58D helicopter with before-hover checks completed.

STANDARDS: Identify, perform and record the result of the takeoff-to-a-hover checks to be performed IAW TM 1-1520-248-MTF while establishing and maintaining a 3-foot hover altitude, ±1 foot.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM intention to bring the aircraft to a hover. Confirm the aircraft maneuver area is sufficient and clear. Bring the aircraft to a stabilized 3-foot hover, ±1 foot, and check the following:

   a. Cyclic, collective and pedal control response and that no excessive control displacement is required.

   b. Apparent center of gravity is normal (cyclic and pedal positions are normal for the conditions).

   c. Verify that all system instruments are in the normal ranges for conditions and verify corresponding changes of information on CPG MFD as appropriate.

   d. Check for correlation and function on flight instruments.

   e. Before proceeding to the test flight hover area, check the parking area for indications of fluid leakage from the aircraft or FOD.

   f. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: If sufficient illumination or NVG resolution does not exist creating a reduction in visual references during the takeoff and throughout the ascent, the MTP should perform an altitude-over-airspeed takeoff to ensure obstacle clearance and reposition to an area that provides better contrast. The crew should know the surface wind direction and velocity to maintain the desired ground position.

SNOW/SAND/DUST CONSIDERATIONS: As the aircraft leaves the surface, maintain heading with the pedals and a level attitude with the cyclic to maintain a vertical ascent. In some cases, applying collective to blow away loose snow/sand/dust from around the aircraft is beneficial before performing this maneuver. The MTP should be prepared to transition to instruments if ground reference is lost at night, use of the searchlight may cause spatial disorientation while in blowing snow/sand/dust. The RCM and/or NCM should be prepared to transition to instruments if ground references are lost to aid the MTP as necessary.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4140

Perform Power Assurance Check

CONDITIONS: In an OH-58D helicopter with takeoff-to-a-hover check completed.

STANDARDS: Identify, perform and record the result of the power assurance checks to be performed IAW TM 1-1520-248-MTF while maintaining a 3-foot hover altitude, ±1 foot. The MTP will:

1. Perform automatic power assurance check.

2. Determine the readings are within normal limits by comparing aircraft data to the appropriate power assurance chart.

3. Take appropriate action if readings are outside normal limits or if aircraft will not pass power assurance check.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. Additionally the MTP will brief all Warnings, Cautions, and Notes that may impact upon the checks to be performed. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear. With aircraft at approximately 3-foot, ±1 foot, hover into the wind with the engine gas generator speed (N_G) stabilized, check the following:

   a. Verify the heater (HTR) and engine (ENG) anti-ice switches are OFF.

   b. Perform automatic power assurance check. Check status line for “GO” condition. If initial results indicate a NO-GO, repeat the check twice to verify results.

   c. Record the FAT, TGT, PA, ENG torque (actual), ENG torque (chart), and ETF value.

   d. Determine if the readings are within normal limits by comparing the aircraft data to the appropriate power assurance chart. Refer to appropriate TM/AWR for actions required if readings are outside normal limits or if aircraft will not pass power assurance check.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training should be conducted academically and in the aircraft.

2. Evaluation will be conducted in the aircraft.

TASK 4142

Perform Hover Power Check

CONDITIONS: In an OH-58D helicopter, and power assurance check completed.

STANDARDS: Identify, perform and record the result of the hover power checks to be performed IAW TM 1-1520-248-MTF while maintaining a 3-foot hover altitude, ±1 foot into the wind.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear. With aircraft stabilized at 3-foot, ±1 foot, hover into the wind, check the following:

   a. Record the mast torque, TGT, and N_G. Confirm that readings are normal for the conditions.

   b. Compare the recorded data with the PPC in accordance with the pilot hover power check.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4156

Perform Hovering Control Rigging Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: dentify, perform and record the result of the hovering control rigging checks to be performed IAW TM 1-1520-248-MTF. The MTP will check the following:

1. Hovering turns.
    a. Maintain a 3-foot hover altitude, ±1 foot.
    b. Turns not to exceed the rate of 22.5 degrees in 1 second (90 degrees 4 seconds).
2. Sideward flight checks.
    a. Maintain heading into the wind.
    b. Maintain a 3-foot hover altitude, ±1 foot.
    c. Limit ground speed to a maximum of 5 knots (9 kilometers per hour) for sideward hovering flight.
3. Forward hovering flight checks. Maintain an approximate 5-foot altitude during check.

DESCRIPTION:

1. Crew actions.

    a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. The MTP will ensure the results of the checks are recorded to include any specific readings.

    b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

    a. Hovering turns. Establish a stabilized 3-foot hover into the wind and reference the aircraft heading. Make a smooth and controlled pedal turn 90 degrees from the initial heading at a constant rate of turn. Smoothly return the aircraft to the initial heading. During the maneuver monitor that excessive pedal input, relative to current wind conditions, is not required during the maneuver. Repeat the check in the opposite direction. Announce when check is complete.

    b. Sideward hovering flight checks. Re-establish as necessary, a stabilized 3-foot hover into the wind. Smoothly initiate sideward flight to either side. During the maneuver observe that no excessive control inputs are required relative to current wind conditions and that desired aircraft response is achieved. Neutralize the cyclic and observe the aircraft should drift to a stop. Repeat the check to the opposite side.

    c. Forward hovering flight checks. Establish an approximate 5-foot hover into the wind. While maintaining a 5-foot hover height, apply sufficient forward cyclic to accelerate to ETL. Check cyclic, collective and pedal response, rigging, abnormal vibrations, and/or displacement. Return the aircraft to a stabilized 3-foot hover.

d. Record the results of checks as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4166

Perform Stability And Control Augmentation System Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the SCAS checks to be performed IAW TM 1-1520-248-MTF. The MTP will perform the pitch, roll and yaw checks with and without the SCAS engaged while maintaining a 10-foot hover altitude, +5 feet, -2 feet.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear. With aircraft stabilized at 10-foot (+5 feet, -2 feet) hover into the wind, check the following:

   a. In one continuous movement, smoothly displace the cyclic approximately 1-inch aft of center, 1-inch forward of center (or forward then aft) and then return the cyclic to center. Stabilize the aircraft. Check for a constant rate during the pitching motion of the fuselage and observe an almost immediate damping of the fuselage moment when the flight controls are neutralized.

   b. In one continuous movement, smoothly displace the cyclic approximately 1-inch right of center, 1-inch left of center (or left then right) and then return the cyclic to center. Stabilize the aircraft. Check for a constant rate during the rolling motion of the fuselage and observe an almost immediate damping of the fuselage moment when the flight controls are neutralized.

   c. In one continuous movement, displace the left (or right) pedal approximately 1-inch forward of the hover pedal position, and then return the pedal to the original position. Return the aircraft to a stabilized hover into the wind. Check for a constant rate during the yaw motion of the fuselage and observe an almost immediate damping of the fuselage moment when the flight controls are neutralized. Repeat the check using the other pedal.

   d. Select SCAS release switch and acknowledge the SCAS disengage audio. Repeat the pitch, roll, and yaw checks with SCAS disengaged. Observe that the resultant movement of the fuselage will be more pronounced and usually tend to continue after the displaced control is centered. Compare the flight characteristics and handling qualities between the two test states.

   e. Reengage SCAS pitch/roll and yaw switches. Verify the SCAS disengage message deletes. Return to 3-foot hover.

   f. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: The lack of visual references at night reduces the aviator's ability to estimate height above ground and drift.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4168

Perform Heading Hold Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the heading hold checks to be performed IAW TM 1-1520-248-MTF. The MTP will check the heading hold mode (HHM) while maintaining the appropriate hover altitude of either 3 foot ±1 foot or 10 foot ±2 feet, as appropriate.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. Additionally, the MTP will direct the rated RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear. With aircraft stabilized at 3-foot (±1 foot) hover into the wind, check the following:

   a. On CPG MFD, select ground setup. Engage heading hold. Check HHM displays on MFD(s).

   b. While guarding, but without applying pressure to the anti-torque pedals, verify on the that the heading is maintained within ±2 degrees of the initial reference heading using.

   c. Continue guarding the anti-torque pedals and moderately increase the collective to bring the aircraft to a stabilized 10-foot hover. Verify HHM remains engaged following the ascent. When the aircraft is stabilized, observe CPG MFD at R2, and verify the aircraft heading is re-established to within ±2 degrees of the initial 3-foot hover height reference.

   d. While guarding the anti-torque pedals, lower the collective to re-establish a 3-foot stabilized hover.

   e. Displace the heading (HDG) HOLD engage/disengage trim switch to either right or left to change the aircraft heading at least 10 degrees from the initial reference heading. Observe the aircraft maintains the new heading by referencing the CPG MFD at R2. Return the aircraft to the original reference heading by displacing the HDG HOLD engage/disengage trim switch in the appropriate direction. Repeat the check in the opposite direction.

   f. Apply slight pressure (either left or right) to the anti-torque pedals and observe that heading hold disengages, the HHM message deletes from the MFD, and an advisory audio is heard in both headsets.

   g. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: The lack of visual references at night reduces the aviator's ability to estimate height above ground and drift.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4170

Perform Power Cylinder Check

CONDITIONS: In an OH-58D helicopter with an additional crewmember, either a RCM or a NCM will be on board to assist with hydraulic system (HYD SYS) switch functions.

STANDARDS: Identify, perform and record the result of the power cylinder checks to be performed IAW TM 1-1520-248-MTF. The MTP will brief and direct the RCM or NCM on the duties to be performed. The MTP will perform the power cylinder checks while maintaining a 10-foot hover altitude, +5 feet, -2 feet.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance. Additionally the MTP will brief all Warnings, Cautions and Notes that may impact upon the checks to be performed. The MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will brief the RCM and/or NCM on the use of the terms "cycle," "off," and "check complete," and the emergency procedures to be performed in the event of a hydraulic system failure. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. The RCM and/or NCM will identify the HYD SYS switch, will maintain a hand on the switch until told to remove it, and will not select the system to either the off or on position until instructed by the MTP. Direct the RCM and/or NCM to confirm during the check that the low hydraulic press message does not display on the MFD. Confirm the aircraft maneuver area is sufficient and clear. With aircraft stabilized at 10-foot (+5 feet, -2 feet) hover into the wind, check the following:

   a. Check the right servo by smoothly and repeatedly displacing the cyclic at a moderate rate, approximately 3 inches to either side of center, diagonally from the left-rear to right-forward quadrant. During the maneuver, confirm that movement is unrestricted. Repeat the check for the left servo by displacing the cyclic from the right rear to the left-forward quadrant.

   b. Return the aircraft to a stabilized 3-foot hover.

   c. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: The lack of visual references at night reduces the aviator's ability to estimate height above ground and drift.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4172

Perform Engine Response Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the engine response checks to be performed IAW TM 1-1520-248-MTF. The MTP performs a positive increase in the collective from a 3 foot ±1 foot hover and does not exceed 50 feet AGL when confirming the engine response.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. Additionally the MTP will brief all Warnings, Cautions and Notes that may impact upon the checks to be performed. Additionally, the MTP may direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Do not exceed a 50-foot hover height during these flight maneuvers. Confirm the aircraft maneuver area is sufficient and clear. With aircraft stabilized at 3-foot (±1 foot) hover into the wind, check the following procedures for the appropriate aircraft type:

   a. Select the FADEC monitor page and verify if any ENG surge events have occurred.

   b. Make a positive increase in the collective pitch. Confirm that the engine responds smoothly and rapidly, and that N_G increases in less than 1 second, then stabilizes. Reestablish 3-foot hover.

   c. Reselect the FADEC monitor page to verify that ENG surge numbers have not incremented.

   d. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: Several attempts may be required to establish effective crew coordination measures to confirm proper aircraft and aircraft systems reactions and responses. Use of a call and response method may be required. The lack of visual references at night reduces the aviator's ability to estimate height above ground and drift.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4176

Perform Throttle Warning Message Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the throttle warning message checks to be performed IAW TM 1-1520-248-MTF. The MTP will maintain a 3-foot (±1 foot) hover into the wind while checking the throttle warning message.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. Additionally, the MTP may direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear. With aircraft stabilized at 3-foot (±1 foot) hover into the wind, check the following:

   a. Slowly reduce throttle to 92 degrees (±1 degree) TP and verify CHECK THROTTLE warning message displays.

   b. Slowly increase throttle to 93 degrees (±1 degree). CHECK THROTTLE warning and audio extinguishes.

   c. Return throttle to full open.

   d. Record the results of checks as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4178

Perform Manual Throttle Operations Check (Full Authority Digital Electronic Control)

CONDITIONS: In an OH-58D helicopter, over a level surface, heading into the wind, with the MMS off and IDM off, surface winds 20 knots or less, maximum gust spread of 10 knots, and no more than light turbulence.

STANDARDS: Identify, perform and record the result of the FADEC checks to be performed IAW TM 1-1520-248-MTF. The MTP will:

1. Maintain aircraft heading into the wind, ±10 degrees.
2. Smoothly coordinate throttle and collective controls.
3. Maintain a 3-foot hover, ±1 foot.
4. Maintain N_R 100, ±2 percent, at a hover.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. Additionally the MTP will brief all *warnings, cautions,* and *notes* that may impact upon the checks to be performed. Additionally, the MTP may direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he or she will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Land the aircraft and reduce the throttle to the engine idle position.

   b. Select the manual position on the FADEC auto/manual switch. Confirm that the manual legend illuminates, the FADEC manual caution message displays on the MFD, and the FADEC audio is heard in both headsets.

   c. Smoothly adjust the throttle to 100 percent N_R. Continue to carefully adjust the throttle while increasing collective to establish a stabilized 3-foot hover into the wind. Note that pounds per hour changes with throttle adjustment, but remains constant with collective only adjustment.

   d. While at a hover, maintain N_R at 100 percent (±2 percent), verifying proper operation of manual mode pistons by monitoring the correlation of the NG and coordinated throttle and collective inputs.

   e. Land the aircraft while continuously monitoring and maintaining RPM.

   f. With the aircraft skids firmly on the ground, reduce throttle to idle while decreasing the collective to the full down position.

g. Select the FADEC auto/manual push-button switch to the auto position. Confirm the auto legend on the switch is illuminated and FADEC manual message deletes from MFD. Check engine history pages for maintenance codes.

h. Increase the throttle to full open, and ensure that the FADEC system operates properly and maintains N_R at 100 percent.

i. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: Selection of a suitable take-off and landing area is crucial for this maneuver.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4186

Perform Hover/Hover Bob-Up Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the hover and hover bob-up checks to be performed IAW TM 1-1520-248-MTF. The MTP will perform the hover and hover bob-up checks while maintaining a 3-foot (±1 foot) hover into the wind.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance, if available. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear. With aircraft stabilized at 3-foot (±1 foot) hover into the wind over recognizable landmark, check the following:

   a. Select HOVER/HOVER BOB-UP page.

   b. Select hover position and enter 15 feet. Drop position box.

   c. Move helicopter and verify proper display reaction of velocity vector, acceleration cue, and position box on MFD. Verify hover drift advisory displays at set limit and remains active until helicopter position is 5 feet less than the drift limit set.

   d. Record the results of checks as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4210

Perform Takeoff and Climb Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the takeoff and climb checks to be performed IAW TM 1-1520-248-MTF. The MTP will conduct a before takeoff check and execute a normal takeoff IAW Task 1040.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Perform before takeoff checks and execute a normal takeoff.

   b. During the takeoff and climb, verify that flight control positions and instruments are normal for conditions and that there are no unusual vibrations.

   c. Check for correlation and function of rate of climb, airspeed indicators and altimeters on MFDs and standby indicators.

   d. Verify fuel burn rate and fuel time remaining display changes with collective position changes display.

   e. Initiate a fuel consumption check when in straight and level flight.

   f. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: Use of a call and response method may be required. The MTP must be prepared to increase their airspace surveillance requirements as the RCM and/or NCM may be focused on systems instruments during the maneuver. The MTP should know the surface wind direction and velocity as this will assist the MTP in establishing the crab angle required to maintain the desired ground track.

SNOW/SAND/DUST CONSIDERATIONS: As the aircraft clears the snow/sand/dust cloud and all barriers, accelerate to climb airspeed and trim the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4232

Perform Control Rigging Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the control rigging checks to be performed IAW TM 1-1520-248-MTF. The MTP will:

1. Maintain airspeed of 100 KIAS (±5 KIAS), into the wind.
2. Maintain mast torque at 70 percent (±2 percent).
3. Maintain the aircraft in trim.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. The MTP will brief all Warnings, Cautions, and Notes that may impact upon the checks to be performed. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Select an altitude that will allow for safe recovery.

   b. Establish trimmed flight into the wind at 70 percent mast torque and 100 KIAS.

   c. Select force trim to ON, select SCAS release switch, and acknowledge the SCAS disengage audio. Check that the cyclic is laterally centered and that it remains in place when hand pressure on cyclic is relaxed.

   d. When the cyclic check is complete, select the force trim to OFF.

   e. While maintaining the aircraft in trim, confirm the pilot's station anti-torque pedal position is neutral to 1.5 inches right pedal forward. Relax the pressure on the anti-torque pedals and check for pedal creep.

   f. Reengage the SCAS pitch/roll and yaw switches, and confirm that the SCAS disengage message is deleted from the MFD.

   g. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: The RCM and/or NCM must be prepared to provide supplemental lighting for the MTP to observe the anti-torque pedal measurements on the right side. The RCM or NCM must be prepared to increase their airspace surveillance requirements as the MTP may be focused on flight control displacements and system instruments during the maneuver.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4236

Perform Autorotation Revolution Per Minute Check

CONDITIONS: In an OH-58D helicopter with the MMS off and the IDM circuit breaker pulled.

STANDARDS: Identify, perform and record the result of the autorotational RPM checks to be performed IAW TM 1-1520-248-MTF. The MTP will:

1. Select a suitable autorotation area that will permit a safe descent and emergency touchdown landing.
2. Maintain airspeed of 55 KIAS (±5 KIAS), in trim, into the wind, during autorotation.
3. Establish a climb prior to 500 feet AGL while maintaining airspeed greater than 50 KIAS.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. **The MTP will brief all warnings, cautions, and notes that may impact upon the checks to be performed. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages.** The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Confirm that the HTR, ENG anti-ice, and MMS switches are OFF. IDM circuit breaker is pulled.

   b. Maneuver the aircraft to establish an upwind track to the selected area. Establish 55 KIAS, level flight, in trim, at an altitude that will allow safe recovery. Confirm the aircraft maneuver area is clear.

   c. Contact flight following as appropriate and announce initiation of the maneuver.

   d. Smoothly lower the collective to the full-down position and confirm that N_R remains within limits.

   e. Retard the throttle to the engine-idle position, confirm clutch disengagement, and that N_G stabilizes at 63 percent to 65 percent.

   f. Confirm the aircraft is in trim and that N_R is stabilized within the normal operating range.

   g. Verify the cyclic position is normal for conditions and sufficient right pedal remains. Note any increase or decrease in main rotor vibrations, and that mast torque/EQ indications are at or near 0 percent.

   h. Smoothly advance the throttle to full open, adjusting the collective as necessary to maintain N_R/N_P within limits. During power application, confirm clutch reengagement.

   i. Increase the collective and establish a climb prior to descending below 500 feet AGL.

   j. Contact flight following as appropriate.

k. Compare recorded N_R to N_R required for aircraft weight and DA; adjust, as required.

NIGHT OR NVG CONSIDERATIONS: Attitude control is critical during night autorotation due to lack of references. The RCM and/or NCM must be prepared to increase their airspace surveillance requirements as the MTP may be focused on flight control displacements and systems instruments during the maneuver.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4244

Perform Hydraulics-Off Check

CONDITIONS: In an OH-58D helicopter with either an additional RCM or a NCM is required to be on board to assist with HYD SYS switch functions. Except for rated aviator duties, the RCM crew actions may be accomplished by the NCM at the direction of the MTP.

STANDARDS: Identify, perform and record the result of the hydraulics off checks to be performed IAW TM 1-1520-248-MTF. The MTP will maintain airspeed of 80 KIAS (±10 KIAS), with the aircraft in trim.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. The MTP will brief all Warnings, Cautions, and Notes that may impact upon the checks to be performed. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will brief the RCM and/or NCM on the use of the terms "hydraulics off," "hydraulics on," "check complete," and the emergency procedures to be performed in the event of a hydraulic system failure. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. The RCM/NCM will identify the HYD SYS switch, will maintain a hand on the switch until told to remove it, and will not select the system to either the off or on position until instructed by the MTP. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Select an altitude that will allow for safe recovery in the event of a hydraulics failure. Establish level flight, in trim, into the wind at 80 KIAS noting cruise power.

   b. Direct the RCM/NCM to identify and move the HYD SYS switch to the OFF position using the briefed command.

   c. Confirm the low HYD PRESS and SCAS disengage caution messages displayed and acknowledge the audio. If pitch and roll attitude can be maintained by making shallow turns left and right without unusual effort, direct the RCM/NCM to remove his hand from the HYD SYS switch.

   d. Do not exceed any aircraft limitations during the following maneuvers. Confirm the aircraft maneuver area is clear. Establish level flight. Maintain the aircraft in trim during the following collective checks. Raise the collective to 83 percent mast torque to ensure the ability to increase collective is present prior to reduction, lower the collective and verify that mast torque can be decreased to 17 percent. Raise the collective and verify that mast torque can be increased to at least cruise power mast torque. Excessive force should not be necessary to achieve either of the mast torque settings.

   e. Upon completion of the collective checks, reestablish level flight.

f. Relax pressure on the flight controls. Direct the RCM/NCM to again identify and move the HYD SYS switch to the HYD SYS position using the briefed command. Re-engage the SCAS pitch/roll and yaw switches.

g. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: The RCM and/or NCM must be prepared to increase their airspace surveillance requirements as the MTP may be focused on flight control displacements and systems instruments during the maneuver.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4250

Perform Collective Anticipator Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the collective anticipator checks to be performed IAW TM 1-1520-248-MTF. The MTP will:

1. Select an area that will permit a safe descent and emergency touchdown landing.
2. Maintain airspeed of 80 KIAS (±10 KIAS), into the wind.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. The MTP will brief all Warnings, Cautions and Notes that may impact upon the checks to be performed. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Maneuver the aircraft to establish an upwind track to the selected area. Establish level flight, in trim, at 80 KIAS.

   b. Announce initiation of the maneuver and lower collective to attain 78 percent (±1 percent) NG, and allow to stabilize.

   c. Make a smooth increase of collective at a rate that will achieve 85 percent mast torque in not more than 5 seconds.

   d. Confirm that the N_R droop does not exceed 2 percent. If the N_R droop exceeds 2 percent, the MTP will terminate the test flight and return to the maintenance facility for corrective action.

   e. Record the results of checks as appropriate.

Note. The 5-second pull is the maximum, (and desired), length of time to attain 85 percent mast torque. As an example, if the N_R droop is only 2 percent in a 3-second pull, the system is functioning properly.

NIGHT OR NVG CONSIDERATIONS: Use of a call and response method may be required. The RCM or NCM must be prepared to increase their airspace surveillance requirements as the MTP may be focused on system instruments during the maneuver. The MTP must be prepared to increase their airspace surveillance requirements as the RCM and/or NCM may be focused on systems instruments during the maneuver.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4252

Perform Vibration Analysis

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the vibration analysis checks to be performed IAW TM 1-1520-248-MTF. The MTP will ensure that during 4/revolutions vertical vibration check, maintain torque required to induce the vibration during increasing airspeeds, does not exceed computed V_{NE}.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Analysis during increasing airspeeds. While maintaining straight and level flight, progressively increase the airspeed from 70 KIAS to V_{NE} in 10-knot increments. Note any increase or decrease in vibration levels.

   b. Perform a letdown check at airspeed where vibration is present to determine whether the vibration is mechanical (pitch change links), or aerodynamic (trim tabs). Terminate the maneuver if vibrations become severe.

   c. A 4/revolution vertical vibration check. A 1/revolution vibration will normally mask a 4/revolution vibration.

   d. Establish level flight, in trim, at the airspeed/mast torque where the 4/revolution is most pronounced, (use 70 KIAS to 80 KIAS for training and evaluation).

   e. Confirm the aircraft maneuver area is clear. While maintaining the aircraft in trim, and at the appropriate airspeed/mast torque, first execute a 45-degree right bank, followed by a left turn to establish a stabilized 45-degree left bank. Note any change in the 4/revolution vibration level. An increase or decrease in vibration will indicate the presence of a correctable condition. Correctable vibrations are determined as acceptable or unacceptable depending on the severity. If the 4/revolution vibration remains constant during the maneuvers, it is inherent, and therefore considered uncorrectable. If an intermittent 1/revolution is encountered, it is an indication of a product balance problem.

   f. Record the results of checks as appropriate.

Note. These procedures should be used to determine whether aviation vibration analysis equipment should be installed for further vibration analysis or rotor smoothing, or if other maintenance action is required.

NIGHT OR NVG CONSIDERATIONS: The RCM and/or NCM must be prepared to increase their airspace surveillance requirements as the MTP may be focused on flight control displacements and systems instruments during the maneuver.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4272

Perform Communication Checks

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the communications checks to be performed IAW TM 1-1520-248-MTF. The MTP will check all installed secure radio and transponder equipment for proper operation.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Verify that all radios are functioning properly on at least two frequencies. Confirm pilot press to talk switches as well as floor switches. Check all installed secure radio equipment for proper operation. Confirm proper operation of the transponder with the local ATC facility.

   b. Record the results of checks as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4276

Perform Special/Detailed Procedures

CONDITIONS: In an OH-58D helicopter and equipment installed.

STANDARDS: Identify, perform and record the result of the special/detailed procedures according to TM 1-1520-248-MTF as part of general maintenance test flights.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation any of the procedures. Check any equipment installed on the aircraft for which special detailed procedures are contained in section IV of the MTF. Use additional reference publications, as required.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.

2. Evaluation will be conducted in the aircraft or academically. If these checks are performed during an MTP or ME evaluation, the evaluated crewmember should demonstrate knowledge of the system, published operational checks, and knowledge of published charts, graphs, and worksheets.

TASK 4280

Perform Before-Landing Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the before landing checks to be performed IAW TM 1-1520-248-MTF.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions he will take. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Announce initiation of the before-landing checks. Perform the before-landing checks in sequence.

   b. Record the results of checks as appropriate.

NIGHT OR NVG CONSIDERATIONS: Altitude, apparent ground speed, and rate of closure are difficult to estimate at night. The rate of descent should be slightly less than during the day to avoid abrupt attitude changes at low altitudes. After establishing the descent, reduce airspeed to approximately 40 KIAS to 45 KIAS until apparent ground speed and rate of closure appear to be increasing. Before descending below obstacles, determine the need for artificial lighting.

SNOW/SAND/DUST CONSIDERATIONS: The rate of descent will be determined by the rate in which the snow/sand/dust is blown from the intended landing point. During the descent, remain above the snow/sand/dust cloud until it dissipates and the touchdown point can be seen. Be prepared to execute a go-around. Establish and discuss the environmental effects at the termination point.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4282

Perform After-Landing Check

CONDITIONS: In an OH-58D helicopter.

STANDARDS: Identify, perform and record the result of the after landing checks to be performed IAW TM 1-1520-248-MTF.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Coordinate with and brief the RCM and/or NCM on the maneuvers to be performed, commands expected to hear, and the resultant actions to be taken. Confirm the aircraft maneuver area is sufficient and clear prior to initiation of each of the following procedures:

   a. Announce initiation of the after-landing checks. Perform the after-landing checks in sequence.

   b. Record the results of checks as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

TASK 4284

Perform Engine Shutdown Checks

CONDITIONS: In an OH-58D helicopter with the after-landing check performed.

STANDARDS: Identify, perform and record the result of the after landing checks to be performed IAW TM 1-1520-248-MTF.

DESCRIPTION:

1. Crew actions.

   a. The MTP will identify and perform the required checks in this task applicable to the maintenance being performed in sequence. The MTP will direct assistance from the RCM and/or NCM to include clearing the aircraft and maintaining obstacle avoidance and airspace surveillance. Additionally, the MTP will direct the RCM and/or NCM to assist with monitoring and acknowledging MFD indications and messages. The MTP will ensure the results of the checks are recorded to include any specific readings.

   b. The RCM or NCM should assist the MTP as directed.

2. Procedures. Identify the checks to be performed. Brief the RCM, NCM, and/or ground support personnel as necessary, if available. The MTP will ensure the area surrounding the aircraft is clear. Perform the required checks in sequence. Record the results of checks as appropriate.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training may be conducted academically or in the aircraft.
2. Evaluation will be conducted in the aircraft.

Chapter 6

Aircrew Coordination

This chapter describes the background of aircrew coordination development. It also describes the aircrew coordination principles and objectives, as found in the Army Aircrew Coordination Training-Enhancement Program.

Note. Digitization of the crew compartments has expanded and redefined the lines of responsibility for each crewmember. The enhanced ability for either pilot to perform most aircraft/system functions from his or her crew station breaks down the standard delineation of duties and has added capabilities, and potential distractions, in training and in combat. This could mean that during an unforeseen event, one pilot may attempt to resolve the situation rather than seeking assistance from or even communicating that action with the other crewmember. It is essential for the PC to brief specific duties prior to stepping into the aircraft. Effective sharing of tasks relies on good crew coordination and information management.

6-1. AIRCREW COORDINATION BACKGROUND AND PLANNING STRATEGY. An analysis of U.S. Army aviation accidents revealed that a significant percentage of aircraft accidents resulted from one or more aircrew coordination errors committed during and even before the flight mission. Often, an accident was the result of a sequence of undetected crew errors that combined to produce a catastrophic result. Additional research showed that even when crews actually avoided potential accidents, these same errors could result in degraded *performance that jeopardized mission success*. A systematic analysis of these error patterns identified specific areas where crew-level training could reduce the occurrence of such faults and break the *chain of errors* leading to accidents and poor mission performance.

a. Aircrew coordination patterns begin with the accomplishment of crew-level pre-mission planning, rehearsal, and after-action reviews. Pre-mission planning includes all preparatory tasks associated with accomplishing the mission. This would include assigning crewmember responsibilities and conducting all required briefings and brief-backs. Pre-mission rehearsal involves the crew collectively visualizing and discussing expected and potential unexpected events for the entire mission. Through this process, all crewmembers discuss and think through contingencies and actions for difficult segments, equipment limitations and failures, or unusual events associated with the mission, and develop strategies to cope with possible contingencies (METT-TC).

b. Each crewmember must actively participate in the mission planning process to ensure a common understanding of mission intent and operational sequence. The PC prioritizes planning activities so that critical items are addressed within the available planning time. Crewmembers must then mentally rehearse the entire mission by visualizing and discussing potential problems, contingencies, and assigned responsibilities. The PC ensures that crewmembers take advantage of periods of low workload to review or rehearse upcoming flight segments. Crewmembers should continuously review remaining flight segments to identify required adjustments, making certain their planning is consistently ahead of critical lead times.

c. After a mission or mission segment, the crew should debrief, review, and critique major decisions, their actions, and task performance. This should include identifying options and factors that were omitted from earlier discussion and outline ways to improve crew performance in future missions. Remember, this discussion and critique of crew decisions and actions must remain professional. "Finger pointing" is not the intent and shall be avoided; the emphasis should remain on education with the singular purpose of improving crew and mission performance.

6-2. AIRCREW COORDINATION PRINCIPLES. Broadly defined, aircrew coordination is the cooperative interaction between crewmembers necessary for the safe, efficient, and effective performance of flight tasks. The essential principles and qualities of aircrew coordination are described in figure 6-1.

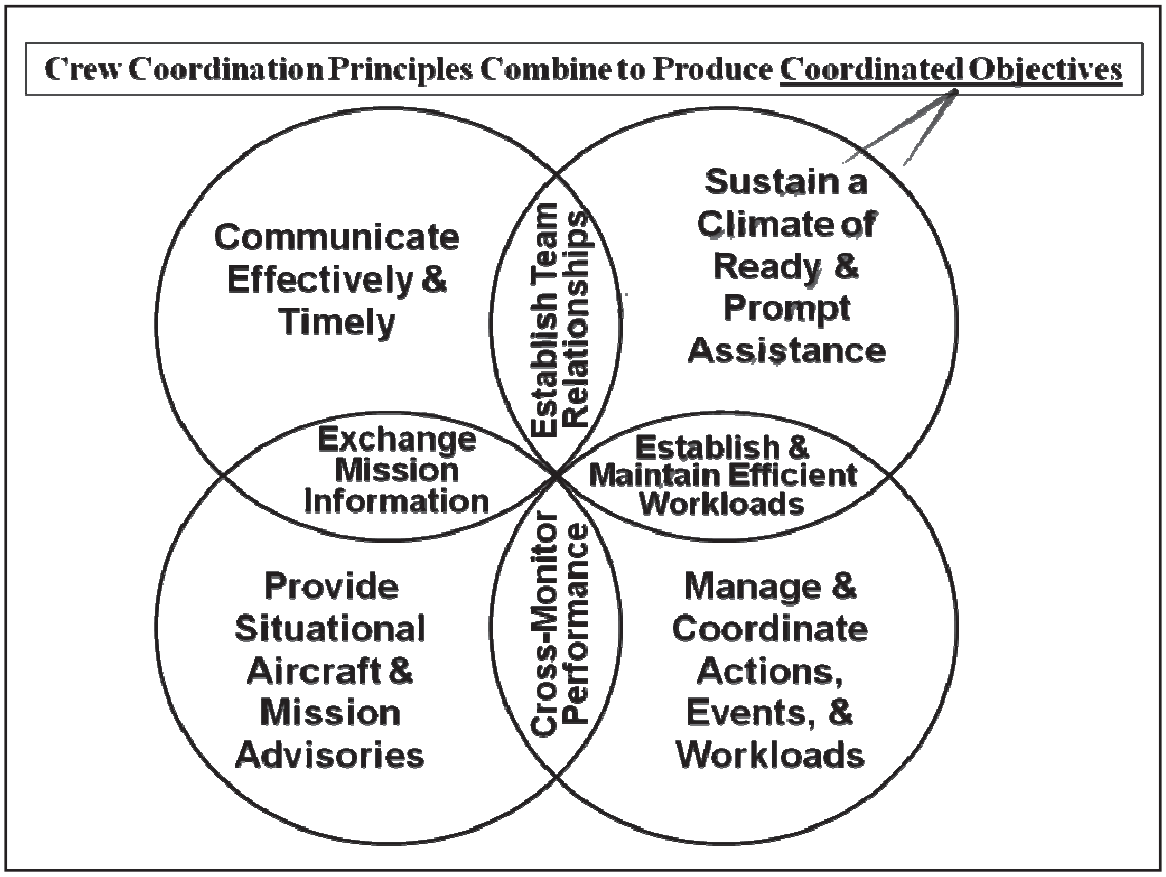

Figure 6-1. Aircrew coordination objectives

a. Communicate Effectively and Timely. Good team relationships begin with effective communication among crewmembers. Communication is effective when the sender directs, announces, requests, or offers information; the receiver acknowledges the information; and the sender confirms the receipt of information, based on the receiver's acknowledgment or action. This enables the efficient flow and exchange of important mission information that keeps a crew on top of any situation that arises.

(1) Announce and Acknowledge Decisions and Actions. To ensure effective and well-coordinated actions in the aircraft, all crewmembers must be kept informed and made aware of decisions, expected movements of crew and aircraft, and the unexpected individual actions of others. Each crewmember will announce any actions that may affect the actions of other crewmembers. In turn, COMMs in the aircraft must include supportive feedback that clearly indicates that crewmembers acknowledge and

correctly understand announcements, decisions, or directives of other crewmembers.

(2) Ensure that statements and directives are clear, timely, relevant, complete, and verified. These are qualities that must describe the kind of communication that is effective. Considering the fleeting moments of time in a busy aviation environment, only one opportunity may exist to convey critical and supporting information before tragedy strikes. That information must be clearly understood, not confusing, and said at the earliest opportunity possible. It must be applicable to the events at hand to support the needs and security of the mission. The information must include all elements needed to make the best decision based on its urgency; and the communication must come with ability of proven confirmation and without redundancy. It must also include the crew's use of standard terminology and feedback techniques that accurately validate information transfer. Emphasis is on the quality of statements associated with navigation, obstacle clearance, instrument readouts, and emergencies. Specific goals include—

(a) Crewmembers consistently make the required callouts. Their statements and directives are always timely. Their response to unexpected events is made in a composed, professional manner.

(b) Crewmembers actively seek feedback when they do not receive acknowledgment from another crewmember. They always acknowledge the understanding of intent and request clarification when necessary.

(c) Be explicit. Crewmembers should use clear, concise terms, standard terminology, and phrases that accurately convey critical information. They must avoid using terms that have multiple meanings, such as "right," "back up," or "I have it." Crewmembers must also avoid using indefinite modifiers such as, "Do you see that tree?" or "You are coming in a little fast."

b. Sustain a Climate of Ready and Prompt Assistance. The requirement to maintain a professional atmosphere by all members of the team begins with the team leadership of the PC. However, all crewmembers must equally respect the value of other crewmember's expertise and judgment regardless of rank, duty, or seniority. Every member has a responsibility to maintain situational awareness for mission requirements, flight regulations, operating procedures, and safety. Each crewmember must be willing to practice advocacy and assertiveness should the situation demand a different course of action, as time permits. It is critical to maintain this crew climate that enables opportunity to apply appropriate decision-making techniques for defining the best course of action when problems arise. Courses of action may demand that assistance be directed to other crewmembers or could be voluntary assistance that is offered in a timely manner, depending on time constraints and information available. All crewmembers must remain approachable, especially in critical phases of flight when reaction time is at a premium.

Note. The two-challenge rule allows one crewmember to assume the duties of another crewmember who fails to respond to two consecutive challenges automatically. For example, the P* becomes fixated, confused, task overloaded, or otherwise allows the aircraft to enter an unsafe position or attitude. The P first asks the P* if he is aware of the aircraft position or attitude. If the P* does not acknowledge this challenge, the P issues a second challenge. If the P* fails to acknowledge the second challenge, the P assumes control of the aircraft.

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c. Effectively Manage, Coordinate, and Prioritize Planned Actions, Unexpected Events, and Workload Distribution. The crew performing as a team should avoid distractions from essential activities while distributing and managing the workloads equally. Both the technical and managerial aspects of coping with normal and unusual situations are important. Proper sequencing and timing guarantees that the actions of

one crewmember support and mesh with the actions of the other crewmembers. Responsible effort must be used to ensure that actions and directives are clear, timely, relevant, complete, verified, and coordinated with minimal direction from the PC.

(1) Direct Assistance. A crewmember will direct or request assistance when he cannot maintain aircraft control, position, or clearance. A crewmember will also direct assistance when being overloaded with tasks or unable to properly operate or troubleshoot aircraft systems without help from the other crewmembers. The PC ensures that all crew duties and mission responsibilities are clearly assigned and efficiently distributed to prevent the overloading of any crewmember, especially during critical phases of flight. Crewmembers should also watch for workload buildup on others and react quickly to adjust the distribution of task responsibilities.

(2) Prioritize Actions and Equitably Distribute Workload. Crewmembers are always able to identify and prioritize competing mission tasks. They never ignore flight safety and other high-priority tasks. They appropriately delay low-priority tasks until those tasks do not compete with tasks that are more critical. Crewmembers consistently avoid nonessential distractions so that these distractions do not affect task performance (i.e. sterile cockpit) or ability to help another crewmember. Crew actions should reflect extensive review of procedures in prior training and pre-mission planning and rehearsal.

d. Provide Situational Aircraft Control, Obstacle Avoidance, and Mission Advisories. Although the P* is responsible for aircraft control, the other crewmembers may need to provide aircraft control information regarding aircraft position (airspeed, altitude, etc), orientation, obstacle avoidance, equipment and personnel status, environmental and battlefield conditions, and changes to mission objectives or evolving situations of the mission (situational awareness). Crewmembers must anticipate and offer supporting information and actions to the decision-maker, which is usually the PC or may be the AMC in a mission related situation. Specific goals include the following:

(1) Situational Awareness. Crewmembers must anticipate the need to provide information or warnings to the PC or P* during critical phases of the flight or mission. The PC must encourage crewmembers to exercise the freedom to raise issues or offer information about safety or mission related matters. In turn, the crewmembers will provide the required information and warnings in a timely and professional manner. None of this could be accomplished without cross-monitoring performance and crew tasks.

(2) Mission Changes and Updates. Crewmembers should routinely update each other while highlighting and acknowledging mission changes. They must take personal responsibility for scanning the entire flight environment, considering their assigned workload and areas of scanning. Each crewmember needs to appropriately adjust individual workload and task priorities with minimal verbal direction from the PC when responding to emergencies and unplanned changes of the mission.

(3) Offer Assistance. A crewmember will provide assistance, information, or feedback in response to another crewmember. A crewmember will also offer assistance when he detects errors or sees that another crewmember needs help. In the case where safety or mission performance is at risk, immediate challenge and control measures must be assertively exercised. A crewmember should quickly and professionally inform and assist the other crewmember committing the error. When required, they must effectively implement the two-challenge rule with minimal compromise to flight safety. This means that you must continually cross-monitor other crewmember's actions and remain capable of detecting each other's errors. Such redundancy is particularly important when crews are tired or overly focused on critical task elements and thus more prone to make errors. Crewmembers must discuss conditions and situations that can compromise situational awareness. These include, but are not limited to, stress,

boredom, fatigue, and anger.

6-3. AIRCREW COORDINATION OBJECTIVES. Aircrew coordination principles and objectives originate from and are fundamentally supported by a set of individual, professional skills. Each crewmember is responsible for attaining the leadership skills of effective communication, resource management, decision-making, situational awareness, team building, and conflict resolution. When crewmembers are actively using these skills and practicing aircrew coordination principles, results can be seen and measured to determine if the objectives of the aircrew coordination program are being met. The goals of the program have been defined by four aircrew coordination objectives. The four objectives are—

a. Establish and maintain team relationships. Establish a positive working relationship that allows the crew to communicate openly, freely, and effectively in order to operate in a concerted manner where a climate of professional assistance is easily found and promptly provided.

b. Establish and maintain efficient workloads. Manage and coordinate priorities and execute the mission workload in an effective and efficient manner with the redistribution of task responsibilities as the mission situation changes. Flight duty responsibilities are performed in a timely manner where mission needs are always anticipated.

c. Exchange mission information. Establish all levels of crew and mission COMMs using effective patterns and techniques that allow for the flow of essential data and mission advisories among all crewmembers in a timely and accurate manner.

d. Cross-monitor performance. Cross-monitor each other's actions and decisions to ensure workloads and crew actions are performed in a coordinated manner and to standard. Cross-monitoring crewmember performance keeps a crew ready to provide aircraft and mission advisories to each other and helps to reduce the likelihood of errors affecting mission performance and safety.

6-4. STANDARD CREW TERMINOLOGY. To enhance communication and aircrew coordination, crews should use words or phrases that are understood by all participants. They must use clear, concise terms that can be easily understood and complied with in an environment full of distractions. Multiple terms with the same meaning should be avoided. DOD FLIP contains standard terminology for radio COMMs. Operator's manuals contain standard terminology for items of equipment. Table 6-1, page 6-6, is a list of other standard words and phrases that crewmembers may use.

Table 6-1. Examples of standard words and phrases

Standard word or phrase	***Meaning of standard word or phrase***
Abort	Terminate a preplanned aircraft maneuver.
Affirmative	Yes.
Bandit	An identified enemy aircraft.
Bingo	Fuel state needed for recovery.
Blind	No visual contact of friendly aircraft/ground position. Opposite of VISUAL.
Break	Immediate action command to perform an emergency maneuver to deviate from the present ground track; will be followed by the word “right,” “left,” “up,” or “down.”
Call out	Command by the pilot on the controls for a specified procedure to be read from the checklist by the other crewmember.
target/object Captured	Specific surface target/object has been acquired and is being tracked with an on-board sensor.
Cease fire	Command to stop firing but continue to track.
Clear	No obstacles present to impede aircraft movement along the intended ground track. Will be preceded by the word “nose,” “tail,” or “aircraft” and followed by the direction (for example, “left,” “right,” “slide left,” or “slide right”). Also indicates that ground personnel are authorized to approach the aircraft.
Come up/down	Command to change altitude up or down; normally used to control masking and unmasking operations.
Contact	1) Establish communication with (followed by the name of the element). 2) Sensor contact at the stated position. 3) Acknowledges sighting of a specified reference point (either visually or via sensor). 4) Individual radar return within a GROUP or ARM.
Controls	Refers to aircraft flight controls.
Deadeye	Laser designator system inoperative.
Drifting	An alert of the unintentional or undirected movement of the aircraft; will be followed by the word “right,” “left,” “backward,” or “forward.”
Egress	Command to make an emergency exit from the aircraft; will be repeated three times in a row.
Execute	Initiate an action.
Expect	Anticipate further instructions or guidance.
Firing	Announcement that a specific weapon is to be fired.

Table 6-1. Examples of standard words and phrases

Standard word or phrase	***Meaning of standard word or phrase***
Fly heading	Command to fly an assigned compass heading. (This term generally used in low-level or contour flight operations.)
Go ahead	Proceed with your message.
Go AJ	Directive to activate anti-jam COMMs.
Go plain/red	Directive to discontinue secure operations.
Go secure/green	Directive to activate secure COMMs.
Hold	Command to maintain present position.
Hover	Horizontal movement of aircraft perpendicular to its heading; will be followed by the word “left” or “right.”
Inside	Primary focus of attention is inside the cockpit for longer than 5 seconds.
Jettison	Command for the emergency or unexpected release of an external load or stores; when followed by the word "door," will indicate the requirement to perform emergency door removal.
Laser On	Start/acknowledge laser designation.
Lasing	The speaker is firing the laser.
Maintain	Command to continue or keep the same.
Mask/unmask	To conceal aircraft by using available terrain features and to position the aircraft above terrain features.
Mickey	A HaveQuick time-synchronized signal.
Monitor	Command to maintain constant watch or observation.
Move back	Command to HVR back, followed by distance in feet.
Move forward	Command to HVR forward, followed by distance in feet.
Negative	Incorrect or permission not granted.
Negative contact	Unable to establish communication with (followed by name of element).
Negative laser	Aircraft has not acquired laser energy.
No joy	Aircrew does not have positive visual contact with the target/bandit/traffic/obstruction/landmark. Opposite of TALLY.
Now	Indicates that an immediate action is required.
Offset (direction)	Maneuver in a specified direction with reference to a target.
Outside	Primary focus of attention is outside the aircraft.
Put me up	Command to place the P* radio transmit selector switch to a designated position; will be followed by radio position numbers on the intercommunication panels (1, 2, 3). Tells the other crewmember to place a frequency in a specific radio.

Table 6-1. Examples of standard words and phrases

Standard word or phrase	***Meaning of standard word or phrase***
Release	Command for the planned or expected release of an external load.
Remington	No ordnance remaining except gun or self-protect ammunition.
Report	Command to notify.
Roger	Message received and understood.
Say again	Repeat your transmission.
Slide	Intentional horizontal movement of an aircraft perpendicular to its heading; will be followed by the word "right" or "left."
Slow down	Command to reduce ground speed.
Speed up	Command to increase ground speed.
Splash	1) (air-to-surface) Weapons impact. 2) (surface-to-surface) Informative call to observer or spotter five seconds prior to estimated time of impact. 3) (air-to-air) Target destroyed.
Stand by	Wait; duties of a higher priority are being performed and request cannot be complied with at this time.
Stop	Command to go no further; halt present action.
Strobe	Indicates that the aircraft AN/APR-39 has detected a radar threat; will be followed by a clock direction.
Tally	Sighting of a target, non-friendly aircraft, enemy position, landmark, traffic, or obstruction positively seen or identified; will be followed by a repeat of the word “target,” "traffic," or "obstruction" and the clock position. Opposite of No Joy.
Target	An alert that a ground threat has been spotted.
Target/object captured	Specific surface target/object has been acquired and is being tracked with an on-board sensor.
Traffic	Refers to friendly aircraft that present a potential hazard to the current route of flight; will be followed by an approximate clock position and the distance from your aircraft with a reference to altitude (high or low).
Transfer of controls	Positive three-way transfer of the flight controls between the crewmembers (for example, "I have the controls“, "You have the controls," and "I have the controls").
Turn	Command to deviate from present ground track; will be followed by words "right" or "left," specific heading in degrees, a bearing ("Turn right 30°"), or instructions to follow a well-defined contour ("Follow the draw at 2 O'clock").
Unable	Indicates the inability to comply with a specific instruction or request.
Up on	Indicates primary radio selected; will be followed by radio position numbers on the intercommunication panels ("Up on 1, up on 3").

Table 6-1. Examples of standard words and phrases

Standard word or phrase	***Meaning of standard word or phrase***
Visual	Sighting of a friendly aircraft/ground position. Opposite of BLIND.
Weapons hot/cold/off	Weapon switches are in the ARMED, SAFE, or OFF position.
Wilco	I have received your message, I understand and I will comply.
Winchester	No ordnance remaining.
Zoom In/Out	Increase/decrease the sensor's focal length. ZOOM IN/OUT is normally followed by "ONE, TWO, THREE or FOUR": to indicate the number of FOVs to change. (Note: It is recommended only one change in or out at a time be used for the FOV.)

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Appendix A
Aircraft Series Qualification

A-1. **OH-58D(R) SERIES QUALIFICATION**. A crewmember qualified in the OH-58D(I), but not qualified in the OH-58D(R) will receive the following training before performing crew duties in the OH-58D(R).

a. **Classroom system trainer.** Academic instruction as outlined in table A-1.

b. **Hot cockpit training.** 3.0 hours recommended training of the subjects in table A-1.

Table A-1. OH-58D(R) qualification classroom systems trainer, hot cockpit subjects

1. General	
Control and display subsystem (CDS)4 components	Warning message priority
CDS4 system architecture	Joint variable message format (JVMF) advisories
Initial page	Hover fail advisory
Zero switch	Ground setup page
Zeroization complete	Engine history page
Emergency switch up	GPS satellite data
Very high frequency and ultra high frequency set to “emergency”	Universal Transverse Mercator present position zone
EGI time figure of merit	Latitude/longitude zones
	Direct waypoint hot cursor
2. Weapons	
Normal weapons VSD	
Pilot's weapon select switch	Sparse VSD engagement circle
Rocket VSD	Rocket steering cue
CPG weapon select switch	MMS azimuth
Weapons page	Pitch cue
Range to target	Laser firing
Gun offset reticle	Laser reverts to previous selection
Sparse VSD gun select removed	MMS steering cue "boxed"
Sparse VSD enhanced reticle	MMS steering cue "unboxed"
Sparse VSD reticle	Machine gun ODA
Sparse gun VSD	LOAL in constraints
LOBL ±20 degrees	LOAL out of constraints

Table A-1. OH-58D(R) qualification classroom systems trainer, hot cockpit subjects

LOAL ±7.5°degrees	LOBL in constraints
Weapons page	LOBL out of constraints
Weapons bit/setup page	Rockets not armed sight displayed
3. Communication	Initial page 1
R3 single-channel ground and airborne radio system data mode	CPG cyclic
R3 enhanced data mode	JVMF initialization and usage
FM-1 control page flight hours	Prepoint list
FM-1 control page 2 flight hours	Software version page
Identification, friend, or foe, page 1-3	
AN/APX 118 CXP	

c. **Flight instruction.** A minimum of 6.0 hours in the OH-58D(R). Crewmembers will demonstrate proficiency in the tasks listed in table A-2.

Table A-2. OH-58D(R) qualification, flight tasks

TASK NUMBER	***TASK TITLE***
1022	Perform Preflight Inspection
1024	Perform Before Starting Engine Through Before Leaving Helicopter Checks
1032	Perform Radio Communications Procedures
1070	Respond To Emergencies
1072	Respond to Engine Failure at a Hover
1074	Respond to Engine Failure at Cruise Flight
1082	Perform Autorotation
1103	Respond to Full Authority Digital Electronic Control Failure
1142	Perform Digital Communication
1300	Perform Mast-Mounted Sight Operations

Glossary

SECTION I – ACRONYMS

AAA	anti-aircraft artillery
ABRM	aerial ballistic reference mark
ACP	armament control panel
ADA	air defense artillery
ADSS	aviator's night vision imaging system display symbology subsystem
AGI	air-ground integration
AGL	above ground level
AHO	above highest obstacle
AMC	air mission commander
AMCOM	aviation and missile command
AMPS	air mission planning system
APART	annual proficiency and readiness test
AR	Army regulation
ASE	aircraft survivability equipment
ATC	air traffic control
ATM	aircrew training manual
ATP	aircrew training program
AUTO	automatic
AWR	airworthiness release
AWT	Air Weapons Team
BDA	battle damage assessment
BFT	Blue Force Tracker
CAS	close air support
CBAT	computer based aircraft survivability equipment training
CBRN	chemical, biological, radiological, and nuclear
CCA	close combat attack
CDS	control and display subsystem
CFR	Code of Federal regulations
CG	center of gravity
CHUM	chart updating manual
CL	checklist
COA	course of action

CPG	co-pilot/gunner
CSAR	combat search and rescue
CTL	commander's task list
DA	Department of the Army
DD	Department of Defense
DOD	Department of Defense
EGI	embedded global positioning system/inertial navigation system
ELA	en route low altitude
ENG	engine
ETE	estimated time en route
ETL	effective translational lift
EVM	evasive maneuvers
FAA	Federal Aviation Administration
FAC	flight activity category
FADEC	full authority digital electronic control
FAF	final approach fix
FARP	forward arming and refueling point
FAT	free air temperature
FDC	fire direction center
FIH	flight information handbook
FLIP	flight information publication
FM	field manual, frequency modulated
FOM	figure of merit
FPM	feet per minute
FW	fixed-wing
GPS	global positioning system
GWT	gross weight
HA	holding area
HAL	height above landing
HDG	heading
HHM	heading hold mode
HQ	headquarters
HSD	horizontal situation display
HTR	heater
HYD SYS	hydraulic system

IAF	initial approach fix
IAS	indicated airspeed
IATF	individual aircrew training folder
IDM	improved data modem
IE	instrument flight examiner
IF	intermediate approach fix
IGE	in ground effect
IIMC	inadvertent instrument meteorological conditions
IMC	instrument meteorological conditions
IP	instructor pilot
JVMF	joint variable message format
KIAS	knots indicated airspeed
LOAL	lock-on after launch
LOBL	lock-on before launch
LOS	line of sight
LRF/D	laser range finder/designator
LTL	laser target line
LZ	landing zone
MAHF	missed approach holding fix
MAN	manual
MAP	missed approach point
ME	maintenance test pilot evaluator
METL	mission essential task list
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civil considerations
MFD	multifunction display
MMS	mast-mounted sight
MOC	mainenance operational check
MOPP	mission-oriented protective posture
MSA	minimum safe altitude
MTF	maintenance test flight
MTP	maintenance test pilot
NAV	navigation
NCM	nonrated crewmember
NGR	National Guard regulation
NOE	nap-of-the-earth

NOTAM	notice to airmen
NM	nautical miles
NVG	night vision goggles
ODA	optical display assembly
OGE	out-of-ground effect
OPORD	operation order
P	pilot not on the controls
P*	pilot on the controls
PA	pressure altitude
PC	pilot in command
PC DTS-V	Personal Computer Data Transfer System-Video
PC MCIA	Personal Computer Memory Card International Association
PFE	proficiency flight evaluation
PI	pilot
PPC	performance planning card
PPS	precise positioning service
PREPT	prepoint
PZ	pickup zone
R/C	rate of climb
RCM	rated crewmember
RHE	remote Hellfire electronics
RL	readiness level
RMS	rotorcraft mapping system
ROE	rules of engagment
ROS	relief on station
RPG	rocket propelled grenade
RPM	revolutions per minute
SA	situational awareness
SACLOS	semi-automatic command line of sight
SAFIRE	surface-to-air fire
SALT-W	size, activity, location, time, and what you are doing
SAM	surface-to-air missile
SATCOM	satellite communication
SCAS	stability and control augmentation system
SECRET NOFORN	secret, no foreign release

SITREP	situation report
SM	statute miles
SOP	standing operating procedure
SP	standardization instructor pilot
STANAG	standardization agreement
SWT	Scout Weapons Team
TC	training circular
TDH	time, distance, and heading
TGT	target
TIS	thermal imaging system
TISU	thermal imaging sensor upgrade
TM	technical manual
T/O	takeoff
TOF	time of flight
TPM-R	techniques, patterns, munitions, and ranges
TTP	tactics, tecniques, and procedures
U.S.	United States
USAACE	United States Army Aviation Center of Excellence
UT	unit trainer
VFR	visual flight rules
VMC	visual meteorological conditions
VSD	vertical situation display
VSI	vertical speed indicator
WEZ	weapons engagement zone

SECTION II –TERMS

Mayday	international radio-telephone distress signal
Muskeg	deep organic mud
N_G	engine gas generator speed
N_P	power turbine speed
N_R	rotor speed
V_{NE}	velocity never exceed

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