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AIRCREW TRAINING MANUAL
OH-58A/C KIOWA

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AIRCREW TRAINING MANUAL
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Preface

The aircrew training annual (ATM) standardizes aircrew training programs and flight evaluation procedures. This manual provides specific guidelines for executing OH-58 aircrew training. It is based on the battle-focused training principles outlined in FM 7-1. It establishes crewmember qualification, refresher, mission, and continuation training and evaluation requirements. This manual applies to all OH-58 crewmembers and their commanders.

This is not a stand-alone document. All of the requirements of the AR 600-105, AR 600-106, NGR 95-210, and TC 1-210, must be met. Implementation of this manual conforms to AR 95-1 and TC 1-210.

This manual (in conjunction with the AR 600-105, AR 600-106, NGR 95-210, and TC 1-210) will help aviation commanders, at all levels; develop a comprehensive aircrew training program. 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.

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 has a description that describes how it should be done to meet the standard.

Standardization officers, evaluators, and unit trainers will use this manual and TC 1-210 as the primary tools to assist the commander in developing and implementing the aircrew training program.

This manual applies to the Active Army, the Army National Guard (ARNG)/Army National Guard of the United States (ARNGUS), and the U.S. Army Reserve (USAR) unless otherwise stated. The proponent of this publication is U.S. Army Training and Doctrine Command (TRADOC). Send comments and recommendations on DA Form 2028 (*Recommended Changes to Publications and Blank Forms*) through the aviation unit commander to Commander, U.S. Army Aviation Center, ATTN: ATZQ-ES (OH-58 Branch), Building 4503, Kingsman Avenue, Fort Rucker, AL 36362-5263. Recommended changes may also be e-mailed to: ATZQES@rucker.army.mil.

This publication implements portions of STANAG 3114 (Edition Seven).

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

This publication has been reviewed for operations security considerations.

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Chapter 1
Introduction

This aircrew training manual (ATM) describes training requirements for OH-58C crewmembers. It will be used with AR 95-1, AR 600-105, AR 600-106, NGR 95-210, TC 1-210, 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 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 standardization evaluations. It is not required to evaluate every task from each pilot station.

1-2. SYMBOL USAGE AND WORD DISTINCTIONS.

a. **Symbol Usage.**

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

(2) P* indicates the pilot on the controls. P indicates the pilot not on the controls.

b. **Word Distinctions.**

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

(a) A warning indicates an operating procedure or a practice, which if not correctly followed, could result in personal injury or loss of life.

(b) A caution indicates an operating procedure or a practice, which if not strictly observed, could result in damage to or destruction of equipment.

(c) A note highlights essential information that is not of a threatening nature.

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

(a) Will or must indicates a mandatory requirement.

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

(c) May indicates an acceptable method of accomplishment.

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

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Chapter 2
Training

This chapter describes requirements for qualification, readiness level (RL) progression, and continuation training. Crewmember qualification requirements will be according to AR 95-1, TC 1-210, and this ATM.

2-1. QUALIFICATION TRAINING.

a. **Aircraft qualification.** Initial qualification training in the OH-58 may be conducted by select aircraft (A/C) units approved by headquarters, Department of the Army (HQDA). United States Army Aviation Center (USAAVNC) approved programs of instruction (POIs) and lesson plans must be used to conduct academic training. Although the hour requirements in the POIs do not apply, the training objectives do. During flight training, the aviator is trained to proficiency in the base tasks identified in chapter 4. A minimum of one hour of night and one hour of hooded flight instruction will be conducted in the aircraft.

b. **NVG qualification.** Initial NVG and aircraft NVG qualification will be per this manual and TC 1-210.

(1) Initial NVG qualification. Initial qualification will be conducted at the U.S. Army Aviation Center or DA-approved training site, according to the USAAVNC approved Program of Instruction, or locally using the USAAVNC NVG ETP. The USAAVNC NVG ETP may be obtained by writing to the Commander, U.S. Army Aviation Center, ATTN: ATZQ-TDS-O, Fort Rucker, AL 36362-5000.

(2) Aircraft NVG qualification.

(a) Academic training. The crewmember will receive training and demonstrate a working knowledge of the topics of paragraph 3-4b(6).

(b) Flight training. The crewmember will receive training, and demonstrate proficiency, in all base tasks marked with an X in the NVG column of table 2-2. The crewmember will also receive training and demonstrate proficiency in any other base tasks specified for NVG on the task list.

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

c. **Maintenance test pilot (MP), unit trainer (UT), and evaluator prerequisites and requirements.** Personnel in these categories must meet the requirements stated in AR 95-1.

2-2. REFRESHER TRAINING. The refresher training program is designed for readiness level (RL) 3 aviators. It enables them to regain proficiency in all base tasks. This paragraph lists refresher training requirements and provides guidelines for developing refresher training programs. Table 2-1 shows a guide for developing a refresher flight training program.

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, and complete the operator's manual written examination.

(2) Flight training. The crewmember will receive training and demonstrate proficiency from either crew station in each base task and in the modes marked with an X in the D, Night, NVG, and Instr columns of table 2-2.

Table 2-1. Refresher flight training guide

Flight Instruction	***Hours***
Local area orientation	2.0
Demonstration and practice of base tasks	8.0
Flight evaluation	2.0
Total hours	***12.0***
Note: Refresher flight training is proficiency-based.	

b. **NVG refresher training.**

(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 training and demonstrate proficiency in all base tasks marked with an X in the NVG column of table 2-2, and any other base tasks specified for NVG on the task list.

(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.

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 crew member 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, as specified on the task list for the crew member's position.

b. **NVG mission training.** NVG mission training will be per the commander's training program specifying tasks and flight hours. When commanders determine a requirement for using NVG in mission profiles, they must develop a mission training program, specify mission tasks, and determine the minimum number of NVG training hours required. Mission training may be conducted in conjunction with aircraft NVG qualification, NVG refresher, or currency training and evaluations.

(1) **Academic training.** The crewmember will receive training and demonstrate a working knowledge of the subject areas designated by the commander.

(2) **Flight training.** The crewmember will receive flight training and demonstrate proficiency in the mission and additional NVG tasks as specified on the task list for the crew member'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. NVG mission training may be included as part of refresher training.

c. **Maintenance test pilot (MTP) and maintenance test flight evaluator mission training.** The tasks shown in table 2-4 and outlined in chapter 5 are mandatory tasks for aviators designated to perform maintenance test flights; the tasks will be included on the individual's commander's task list. 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.

2-4. CONTINUATION TRAINING. This paragraph outlines the tasks and aircraft flight hours that aviators must complete to support the unit's METL. TC 1-210 lists the requirements for maintaining RL 1. The required performance standards are specified in chapters 4 and 5 of this manual.

a. **Training requirements.**

(1) Semiannual flying-hour requirements—aircraft. The minimum requirements for aviators are as follows—

(a) FAC 1–40 hours.

(b) FAC 2–30 hours.

(c) FAC 3–not applicable due to the lack of a compatible flight simulator for the OH-58.

(d) Night Vision Goggles–9 hours.

(e) Hood–3 hours.

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

(2) Annual task and iteration requirements. The minimum requirements are—

(a) One iteration of all base tasks during the day.

(b) One iteration of mandatory NVG tasks as indicated in table 2-2. (An X in the NVG column of table 2-2 indicates mandatory NVG tasks for crewmembers in designated NVG positions and aviators who maintain NVG currency.).

(c) An NVG annual evaluation of all base tasks indicated by an NG in the EVAL column of table 2-2 for those aviators in designated NVG positions and aviators who maintain NVG currency.

(d) Any iteration of additional tasks as determined by the commander.

Note 1: 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 2-4. MEs will perform two iterations from each flight crew station annually. Each MTF mission 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.

Note 2: The requirement to perform instrument tasks in additional aircraft, in category, will be at the discretion of the commander.

b. **Currency requirements.** Currency requirements are per AR 95-1.

2-5. TASK LISTS.

a. **Base tasks.** Table 2-2 lists the crewmember base tasks. An "X" under the mode of flight column denotes the task as a mandatory task for RL progression in that mode of flight.

b. **Tactical/mission tasks.** Table 2-3 lists the tactical/mission tasks that may be selected by the commander based upon the unit's mission requirements.

c. **Maintenance test pilot tasks.** Table 2-4 lists the maintenance test pilot tasks.

d. **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 P*s ability to perform, manipulate the controls, and respond to tasks that are 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. For example: 1) takeoff; 2) landing; 3) hover power check; 4) simulated engine failure; 5) terrain flight. (These tasks are listed in UPPER CASE and BOLD throughout this manual.)

(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 pilot's (PLT's) ability to plan, preflight, brief, perform radio communications, perform a fuel check, and so forth, while in flight or on the ground. These tasks are not significantly affected by the mode of flight and may be performed or evaluated in any mode. These tasks are in lower case and plain type throughout this manual.

Table 2-2. Base task list

Legend:			
D	Day mode of flight	Night	Night unaided mode of flight
NVG	Night vision goggle mode (NVG) of flight	Instr	Instrument mode of flight
S	Standardization flight evaluation (mandatory)	I	Tasks that are mandatory for instrument flight evaluations
NG	Tasks that are mandatory for NVG annual evaluation	Eval	Mandatory for selected flight evaluations

Task	Title	D	Night	NVG	Instr	Eval
1000	Participate in a Crew Mission Briefing	X	X	X	X	S, I, NG
1004	Plan a Visual Flight Rules (VFR) Flight	X				S
1006	Plan an Instrument Flight Rules (IFR) Flight				X	I
1010	Prepare a Performance Planning Card (PPC)	X			X	S, I
1011	Determine Aircraft Performance Parameters with Tabular Data	X				S, I
1012	Prepare/Validate Aircraft Weight and Balance	X				S
1014	Operate Aviation Life Support Equipment (ALSE)	X	X	X	X	S
1022	Perform Preflight Inspection	X	X			S
1024	**PERFORM BEFORE STARTING THRU BEFORE LEAVING AIRCRAFT 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		S, I, NG
1030	**PERFORM HOVER OUT-OF-GROUND (OGE) CHECK**	X		X		S, NG
1032	**PERFORM RADIO COMMUNICATIONS PROCEDURES**				X	I
1038	**PERFORM HOVERING FLIGHT**	X	X	X	X	S, NG
1040	**PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF**	X	X	X		S, I, NG
1044	**NAVIGATE BY PILOTAGE AND DEAD RECKONING**	X	X	X		S, NG
1046	**PERFORM RADIO NAVIGATION**				X	I
1048	**PERFORM FUEL MANAGEMENT PROCEDURES**	X	X	X	X	S, I, NG
1052	**PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT MANEUVERS**	X	X	X		S, NG
1058	**PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) APPROACH**	X	X	X		S, NG
1062	**PERFORM SLOPE OPERATIONS**	X	X	X		S, NG
1070	Respond to Emergencies	X	X	X		S
1072	**RESPOND TO ENGINE FAILURE AT A HOVER**	X				S
1074	**RESPOND TO ENGINE FAILURE AT CRUISE FLIGHT**	X				S or I
1076[2]	**RESPOND TO HYDRAULIC SYSTEM MALFUNCTION**	X				S
1082[2]	**PERFORM AUTOROTATION**	X				S
1155	**NEGOTIATE WIRE OBSTACLES**	X	X	X		S, NG
1170	**PERFORM INSTRUMENT TAKEOFF**				X	
1174	**PERFORM HOLDING PROCEDURES**				X	

Table 2-2. Base task list

Legend:			
D	Day mode of flight	Night	Night unaided mode of flight
NVG	Night vision goggle mode (NVG) of flight	Instr	Instrument mode of flight
S	Standardization flight evaluation (mandatory)	I	Tasks that are mandatory for instrument flight evaluations
NG	Tasks that are mandatory for NVG annual evaluation	Eval	Mandatory for selected flight evaluations

Task	Title	D	Night	NVG	Instr	Eval
1176	**PERFORM NONPRECISION APPROACH**				**X**	**I**
1178	**PERFORM PRECISION APPROACH**				**X**	**I**
1182*	**PERFORM UNUSUAL ATTITUDE RECOVERY**				**X**	**S or I**
1184*	**RESPOND TO INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS** (IIMC)	**X**		**X**		**S or I, NG**
1321	**PERFORM ANTI-TORQUE MALFUNCTION**	**X**				**S**
1323	**PERFORM HOVERING AUTOROTATION**	**X**				**S**
1327[2]	**PERFORM LOW-LEVEL AUTOROTATION**	**X**				**S**
1333[2]	**PERFORM LOW-LEVEL/LOW-AIRSPEED AUTOROTATION**	**X**				**S**
1335[2]	**PERFORM AUTOROTATION WITH TURN**	**X**				**S**
1472	Perform Aerial Observation	**X**		**X**		**S**
1474	**RESPOND TO NIGHT VISION GOGGLE (NVG) 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]Task authorized only during initial aircraft qualification and for IPs/SPs designated to conduct touchdown emergency procedures. Task is a required annual proficiency and readiness test (APART) evaluation maneuver for those IPs/SPs designated to conduct touchdown emergency procedures training. Emergency procedures training criteria outlined in AR 95-1 must be met before this maneuver is performed.

Table 2-3. Tactical/mission task list

Task	Title
2010	**PERFORM MULTI-AIRCRAFT OPERATIONS**
2012	Perform Tactical Flight Mission Planning
2025	**PERFORM TERRAIN FLIGHT TAKEOFF**
2026	**PERFORM TERRAIN FLIGHT**
2030	**PERFORM TERRAIN FLIGHT APPROACH**
2034	**PERFORM MASKING AND UNMASKING**
2036	**PERFORM TERRAIN FLIGHT DECELERATION**
2042	**PERFORM ACTIONS ON CONTACT**
2049	**PERFORM GLOBAL POSITIONING SYSTEM (GPS) AIDED NAVIGATION**
2050	Develop an Emergency Global Positioning System (GPS) Recovery Procedure.
2051	**PERFORM EMERGENCY GLOBAL POSITIONING SYSTEM (GPS) RECOVERY PROCEDURE**

Table 2-4. Maintenance test pilot task list

Task	Title
4000	**PERFORM PRIOR-TO-MAINTENANCE TEST FLIGHT CHECKS**
4084	**PERFORM BEFORE-STARTING ENGINES CHECKS**
4088	**PERFORM STARTING ENGINE CHECKS**
4090	**PERFORM ENGINE RUN-UP CHECKS**
4128	**PERFORM BEFORE-TAKEOFF CHECKS**
4132	**PERFORM TAKEOFF TO A HOVER CHECKS**
4142	**PERFORM HOVER POWER CHECKS**
4156	**PERFORM HOVERING CONTROL RIGGING CHECK**
4165	**PERFORM PYLON ISOLATION MOUNT CHECK**
4170	**PERFORM POWER CYLINDER CHECK**
4172	**PERFORM ENGINE RESPONSE CHECK**
4194	**PERFORM FLIGHT INSTRUMENTS CHECK**
4210	**PERFORM TAKEOFF AND CLIMB CHECK**
4232	**PERFORM CONTROL RIGGING CHECK**
4236	**PERFORM AUTOROTATION ROTOR REVOLUTIONS PER MINUTE (RPM) CHECKS**
4238	**PERFORM ENGINE PERFORMANCE CHECK**
4244	**PERFORM HYDRAULICS-OFF CHECK**
4272	**PERFORM COMMUNICATIONS CHECK**
4276	**PERFORM SPECIAL/DETAILED PROCEDURES**
4280	**PERFORM BEFORE-LANDING CHECK**
4282	**PERFORM AFTER-LANDING CHECK**
4284	**PERFORM ENGINE SHUTDOWN CHECK**

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 NVGs.

(2) A crewmember whose currency has lapsed must complete, as 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 re-establish currency, an NVG IP may evaluate an NVG IP or SP. An IP may not evaluate an IP or SP for APART purposes.

(a) **TASK 1007, PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS.**

(b) **TASK 1016, PERFORM HOVER POWER CHECK.**

(c) **TASK 1017, PERFORM HOVERING FLIGHT.**

(d) **TASK 1018, PERFORM VISUAL METEOROLOGICAL CONDITIONS TAKEOFF.**

(e) **TASK 1023, PERFORM FUEL MANAGEMENT PROCEDURES.**

(f) **TASK 1024, RESPOND TO NIGHT VISION GOGGLE FAILURE.**

(g) **TASK 1028, PERFORM VISUAL METEOROLOGICAL CONDITIONS APPROACH.**

(h) **TASK 1032, PERFORM SLOPE OPERATIONS.**

(i) **TASK 1036, PERFORM HOVER OUT-OF-GROUND EFFECT CHECK.**

(j) Task 1068, Perform or describe emergency procedures.

2-7. CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR TRAINING REQUIREMENTS. The commander evaluates the unit mission and determines if chemical, biological, radiological, and nuclear (CBRN) training is required. All FAC 1 and selected FAC 2 aviators will be trained. Aviators must wear full mission-oriented protective posture (MOPP) gear (MOPP level 4) during CBRN training.

a. Aviators 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.

(1) Task 1022, Perform Preflight Inspection.

(2) **TASK 1024, PERFORM BEFORE-STARTING ENGINE THROUGH BEFORE-LEAVING HELICOPTER CHECKS.**

(3) **TASK 1028, PERFORM HOVER POWER CHECK.**

(4) **TASK 1040, PERFORM VISUAL METEOROLOGICAL CONDITIONS APPROACH.**

(5) **TASK 1030, PERFORM HOVER OUT-OF-GROUND EFFECT (OGE) CHECK.**

(6) **TASK 1032, PERFORM RADIO COMMUNICATIONS PROCEDURES.**

(7) **TASK 1040, PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF.**

(8) **TASK 1044, NAVIGATE BY PILOTAGE AND DEAD-RECKONING**.

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) A qualified and current aviator, NOT wearing protective mask, CBRN gloves or CBRN boots, is at one set of the flight controls at all times.

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

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

2-8. NIGHT UNAIDED TRAINING REQUIREMENTS. Annual night unaided training is mandatory for all aviators. The following tasks will be evaluated during RL progression/refresher training, and a minimum of one iteration of each task will be performed annually. The commander may designate any of the following tasks for evaluation during the APART period.

(1) Task 1000, Participate in a crew mission briefing.

(2) Task 1022, Perform preflight inspection.

(3) **TASK 1024, PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS**

(4) **TASK 1028, PERFORM HOVER POWER CHECK.**

(5) **TASK 1038, PERFORM HOVERING FLIGHT.**

(6) **TASK 1040, PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF.**

(7) **TASK 1044, NAVIGATE BY PILOTAGE AND DEAD-RECKONING.**

(8) **TASK 1048, PERFORM FUEL MANAGEMENT PROCEDURES.**

(9) **TASK 1052, PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT (VMC) MANEUVERS.**

(10) **TASK 1058, PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) APPROACH.**

(11) **TASK 1062, PERFORM SLOPE OPERATIONS.**

(12) Task 1070, Respond to emergencies.

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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 1-210, 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 standardization instructor pilot (SP), instructor pilot (IP), instrument flight examiner (IE), and maintenance examiner (ME) who assist the commander in administering the aircrew training program (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 standing operating procedures (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 roll reversal with the examinee. The examinee must be made aware of both the initiation and termination of roll reversals. The examinee must know when he is being supported by a fully functioning crewmember.

Note: When evaluating a pilot in command (PC), IP, SP, ME, IE, or a unit trainer (UT), the evaluator must advise the examinee that, during role-reversal, he 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.

b. **Flight evaluation.**

(1) Academic. Some tasks are identified in TRAINING AND EVALUATION REQUIREMENTS as tasks, which may be evaluated academically. The examinee must demonstrate a working knowledge of the tasks. Evaluators may use computer based instruction (CBI), mock-ups, or other approved devices to assist in determining the examinee's knowledge of the task.

(2) In the aircraft. Tasks, which 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 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 (MOS) producing course of instruction/school (for example, OH-58 instructor pilot course, maintenance test pilot course and instrument flight examiners course) will be conducted in the aircraft upon return from that course and in the aircraft at each new duty station. Commanders may forward a request for a commander's evaluation to be conducted concurrently with the end of course evaluation.

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

(1) 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 requirements of the CTL.

(2) PC/MP. The PC/MP must meet the requirements in a(1). Additionally, he must demonstrate sound judgment, and technical/tactical proficiency in the employment of the aircraft, the unit's mission, the crew, and assets.

(3) UT. The UT must meet the requirements in a(2). In addition, he must be able to instruct in the appropriate tasks and subjects, recognize errors in performance or understanding, make recommendations for improvement, train to standards and document training.

(4) IP or IE. The IP must meet the requirements in a(2). In addition, he must be able to objectively train, evaluate, and document performance of the PI, PC, 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.

(5) SP. The SP must meet the requirements in paragraph a(2) and a(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.

(6) ME. The ME must meet the requirements in a(1) and a(2). The ME must be able to instruct and evaluate other MEs and MPs using role reversal when required.

Note: SP/IP/IE/ME/UT will be evaluated on their ability to apply the learning and teaching process outlined in the instructor pilot handbook.

b. **Academic evaluation criteria.**

(1) Proficiency flight evaluations (PFE). The commander or his representative will select appropriate topics to be evaluated from paragraph 3-4b that apply.

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

(3) APART instrument evaluation. The IE or IP designated by the commander will evaluate a minimum of two topics from the subject areas in paragraphs 3-4b(1) through (3) relative to IMC flight.

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

(5) APART MP/ME evaluation. The ME will evaluate 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 each subject area in paragraphs 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 (IFRF) and IATF records 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, explains the evaluation procedure, and discusses the evaluation standards and criteria to be used.

Note 1: If the evaluation is for an evaluator, the individual conducting the evaluation must explain that he will evaluate the examinee’s ability to apply the learning and teaching process outlined in the instructor pilot handbook.

Note 2: For UT’s, 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; DA Pamphlet 738-751; DOD FLIP; TC 1-210; TM 55-1520-228-23, and local SOPs and regulations). Topics in this subject area are—

- ATP requirements.
- SOP requirements.
- DOD FLIP and maps.
- VFR minimums and procedures.
- Aviation life support equipment.
- Flight plan preparation and filing.
- Weight and balance requirements.
- Local airspace usage.
- Publications required in the aircraft.
- IFR minimums and procedures.
- Inadvertent IMC procedures.
- Flight restrictions due to exogenous factors.

(2) Operating limitations and restrictions (TM 55-1520-228-10). Topics in this subject area are—

- Wind limitations.
- Rotor limitations.
- Power limitations.
- Engine limitations.
- Weather limitations.
- Pressure limitations.
- Airspeed limitations.
- Temperature limitations.
- Flight envelope limitations.
- Aircraft systems limitations.
- Performance chart interpretation.
- AWR restrictions (as applicable).
- Weight and balance limitations/restrictions.

(3) Aircraft emergency procedures and malfunctions (TM 55-1520-228-10). 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.
- Fires and hot starts.
- 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.

(4) Aerodynamics (FM 1-203 and TM 55-1520-228-10). Topics in this subject area are (*IPs/SPs only) —

- Loss of tail rotor effectiveness.
- Dynamic rollover.
- Settling with power.
- Relative wind.
- Total aerodynamic force.
- Airflow during hover.
- Airflow in forward flight.
- Translating tendency.
- Transverse flow.
- Dissymmetry of lift.
- Autorotation in forward flight.*

(5) Mission operations (FM 1-400, TC 1-201, TC 1-204, and unit SOP). Topics in this subject area are—

- Tactical communication procedures and electronic counter-countermeasures.
- Hazards to terrain flight safety
- Terrain flight mission planning.
- Interpretation of navigational charts (maps).

(6) Night mission operations and deployment (TC 1-204; TM 55-1520-228-10, TM 11-5855-263-10, FM 3-04.301). Topics in this subject area are—

- Unaided night flight.
- Night vision limitations and techniques.
- Visual illusions.
- Use of lights (internal and external)
- Types of vision.
- Distance estimation and depth perception.
- Dark adaptation, night vision protection, and night blind spot.
- Aircrew night and NVG requirements.
- NVG operational considerations/ characteristics.

(7) Aeromedical (AR 40-8; FM 3-04.301, TC 1-204). Topics in this subject area are—

- Spatial disorientation
- Self-imposed stresses

(8) Maintenance test pilot (TM 55-1520-228-23, TM 1-1520-228-MTF and TM 1-1520-228-MTF).

- Engine start.
- Instrument indications.
- Electrical system.
- Warning, caution, and advisory indications.
- Power plant.
- Engine performance check.
- Power train.
- Fuel system.
- Hydraulic system.
- Flight controls.
- Rotor smoothing.
- Mission equipment.
- Communication and navigation equipment.
- Maintenance operational check requirements.
- Maintenance test flight requirements.
- Maintenance test flight forms and records.
- Test flight weather requirements.

c. **Phase 3—flight evaluation.** This phase consists of a crew briefing, a preflight inspection; engine-start, run-up, 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 he will perform. When evaluating an evaluator, the individual conducting the evaluation must advise the examinee that he 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) Post-crash rendezvous point.

Note: Refer to TM 1-1520-228-10 and local directives for additional crew briefing requirements.

(2) Preflight inspection and engine-start, run-up, hover, and before-takeoff checks. The evaluator will evaluate the examinee's use of TM 1-1520-228-CL or TM 1-1520-228-MTF. The evaluator also will have the examinee properly identify at least two aircraft components 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 1-1520-228-CL or TM 1-1520-228-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) Tell the examinee whether he passed or failed the evaluation.

(4) Complete the applicable DA forms per instructions in TC 1-210.

3-5. PROFICIENCY FLIGHT EVALUATION. This evaluation is conducted per AR 95-1. After the evaluation, the IP or SP will debrief the examinee and complete the applicable forms per instructions in TC 1-210.

3-6. ANNUAL NIGHT VISION GOGGLE STANDARDIZATION FLIGHT EVALUATION. This evaluation is conducted per TC 1-210, this manual, and the commander's task list. After the evaluation, the IP or SP will debrief the examinee and complete the applicable forms per instructions in TC 1-210.

3-7. POSTACCIDENT FLIGHT EVALUATION. This evaluation is required by AR 95-1. After the evaluation, the IP or SP will debrief the examinee and complete the applicable forms per instructions in TC 1-210.

3-8. MEDICAL FLIGHT EVALUATION. This evaluation is conducted per AR 95-1. 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. The evaluation should measure the examinee's potential to perform ATM tasks despite a disability. It should not be based on current proficiency.

a. After the examinee has completed the medical flight evaluation, the evaluator will prepare a memorandum. The memorandum will include—

(l) A description of the environmental conditions under which the evaluation was conducted (for example, day, night, or overcast).

(2) A list of tasks performed during the evaluation.

(3) A general statement of the individual's ability to perform with the disability and the conditions under which he can perform.

b. The unit commander will then forward the memorandum and the applicable forms to Commander, U.S. Army Aviation Center, ATTN: HSXY-AER, Fort Rucker, AL 36362-5333.

3-9. NO-NOTICE EVALUATION. This evaluation is conducted per TC 1-210. After the evaluation, the evaluator will debrief the examinee and complete the applicable forms per instructions in TC 1-210.

3-10. COMMANDER'S EVALUATION. This evaluation is conducted per TC 1-210. After the evaluation, the evaluator will debrief the examinee and complete the applicable forms per the instructions in TC 1-210.

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Chapter 4
Crewmember Tasks

This chapter implements portions of STANAG 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. (For example, Task 1010 is not mandatory for all flights.) However, aviators must complete the performance planning card when their training/mission involves this task 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 (SAT) 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-58 Kiowa Warrior). For convenience, only the last four digits are listed in this training circular. The last four digits of—

- Individual tasks are assigned 1000-series numbers.
- Mission tasks are assigned 2000-series numbers.
- Commander's essential to mission tasks 3000-series numbers.
- Maintenance tasks are assigned 4000-series numbers.

The commander will develop conditions, standards, and descriptions for these tasks. An information copy of each additional task should be forwarded to Director, Directorate of Evaluation and Standardization, ATZQ-ES, (OH-58 Branch), Building 4503, Kingsman Avenue, Fort Rucker, AL 36362-5263, for use by other units.

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-58 helicopters apply to all OH-58A/C 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 simulated instrument meteorological conditions.

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

(d) In any terrain or climate.

(e) In a nuclear, biological and chemical environment with mission protective posture equipment used.

(f) In an electromagnetic environment.

(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 1076, RESPOND TO HYDRAULIC SYSTEM MALFUNCTION.**
- **TASK 1082, PERFORM AUTOROTATION.**
- **TASK 1327, PERFORM LOW-LEVEL AUTOROTATION.**
- **TASK 1333, PERFORM LOW-LEVEL/LOW-AIRSPEED AUTOROTATION.**
- **TASK 1335, PERFORM AUTOROTATION WITH TURN.**
- **TASK 1321, PERFORM ANTI-TORQUE MALFUNCTION.**

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

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

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

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. Some standards are common to several tasks. The following standards apply to all tasks—

Note: 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 on their own rather than seeking assistance from the other crewmember.

(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 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 preferred 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, simulated IMC, NVG, or NBC 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 P* (pilot on the controls), P

(pilot not on the controls), do not refer to PC (pilot in command) 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 systems 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 conduct of the mission, and for operating, securing, and servicing the aircraft PC commands. The PC will ensure that a crew briefing is accomplished and that the mission is performed per 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 from instructions issued. 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 1-210. 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 switches and knobs will be more difficult to locate and identify. Take special precautions to identify and confirm the correct switches/knobs.

(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 scanning techniques to locate and orient on objects.

(3) NVG. Use of NVGs 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 NVGs.

(4) Snow/sand/dust. FM 1-202 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).

f. **Training and evaluation requirements.** Training and evaluation requirements define whether the task will be trained or evaluated 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 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. Chapter 2, table 2-4 lists the modes of flight in which the task must be evaluated. The commander may also select crew 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) FM 1-203.
- (c) FM 1-230.
- (d) TM 55-1520-228-10.
- (e) TM 1-1520-228-CL.
- (f) DOD FLIP.
- (g) Title 14 CFR/host country regulations.
- (h) Unit/local SOPs.
- (i) Aircraft logbook (DA Form 2408 series).

(2) All instrument tasks.
- (a) AR 95-1.
- (b) FM 1-240.
- (c) DOD FLIP.
- (d) Aeronautical Information Manual.

(3) All tasks with environmental considerations.
- (a) FM 1-202.
- (b) TC 1-204.

(4) All tasks used in a tactical situation.
(a) TC 1-201.
(b) FM 3-25.26.

4-2. TASKS.

a. **Standards versus descriptions.** Descriptions contain preferred 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, or may throughout the text of a task description is crucial.

b. **Aviator base tasks.** The following numbered tasks are OH-58 aviator base tasks.

TASK 1000

Participate in a Crew Mission Briefing

CONDITIONS: Before flight in an OH-58 and given DA Form 5484-R (*Aircrew Mission Briefing*) and a unit-approved crew briefing checklist.

STANDARDS: The pilot in command (PC) will actively participate in and acknowledge an understanding of DA Form 5484-R. The PC will conduct or supervise a crew briefing using a unit-approved crew briefing checklist. The crewmember receiving the crew/mission brief will verbally acknowledge a complete understanding of the crew/mission briefing.

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-R. 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 that the crewmember understands 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-R) from a designated briefing officer. The PC will ensure that a crew briefing is completed prior to the mission/flight. Figure 4-1 shows a 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.

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. (Pilot on the controls [P*])
b. Assign scan sectors.
c. Emergency actions.
(1) Mission considerations.
(2) Inadvertent instrument meteorological conditions (IMC).
(3) Egress procedures and rendezvous point.
(4) Actions to be performed by P* and pilot not on the controls (P).
(5) Night vision goggles (NVG) failure.
d. Crew coordination elements.

CREW BRIEFING CHECKLIST
7. General crew duties. a. Pilot on the controls (P*). (1) Fly the aircraft - primary focus outside when visual meteorological conditions (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 (P). (1) Assist in traffic and obstacle avoidance. (2) Tune radios and set transponder. (3) Navigate. (4) Copy clearances, automatic terminal information service (ATIS), 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 2 to 3 seconds (VMC). 8. Risk assessment considerations. 9. Crewmembers' questions, comments, and acknowledgment of mission briefing.

Figure 4-1. Suggested format of a crew mission briefing checklist.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1004

Plan a Visual Flight Rules (VFR) Flight

CONDITIONS: Before flight in an OH-58 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 visual flight rules (VFR) per AR 95-1, applicable Federal Aviation Regulations, host nation regulations, and local regulations and standing operating procedures (SOPs).
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 Department of Defense (DOD) flight information publication (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. Complete and file the flight plan per AR 95-1 and DOD FLIP.
8. Perform mission risk assessment per unit SOP.

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (PC) will ensure that the pilot (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 central processing unit (CPU)-26A/P computer/Weems plotter (or equivalent) or air mission planning system 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 55-1520-228-10. Determine if the duplicate weight and balance forms in the aircraft logbook apply to the aircraft configuration. Verify that the aircraft weight and center of gravity (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 night vision goggles (NVG) use.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1006

Plan an Instrument Flight Rules Flight

CONDITIONS: In a classroom environment and given access to weather information; notices to airmen (NOTAMs); flight planning aids; necessary charts, forms, and publications.

STANDARDS: Appropriate common standards plus the following additions/modifications:

1. Determine if the aircrew and aircraft are capable of completing the assigned mission.
2. Determine if the flight can be performed under instrument flight rules (IFR) per AR 95-1 and applicable Federal Aviation Regulations, host-nation regulations, local regulations, and standing operating procedures (SOPs).
3. Determine the proper 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 IFR cruising altitudes per Department of Defense flight information publication (DOD FLIP).
5. If off airway, determine the course(s) ±5 degrees.
6. Select an approach that is compatible with the weather, approach facilities, and aircraft equipment; determine if an alternate airfield is required.
7. Determine distance ±1 nautical mile, true airspeed ±5 knots, ground speed ±5 knots, and estimated time en route (ETE) ±1 minutes for each leg of the flight.
8. Determine the fuel required per AR 95-1 and FM 1-240, ±25 pounds.
9. Complete and file the flight plan per AR 95-1 and the DOD FLIP.
10. Perform mission risk assessment per unit SOP.

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (PC) may direct the other rated crewmember (RCM) to complete some elements of the IFR flight planning.
   b. The other RCM will complete the assigned elements and report the results to the PC.
2. Procedures. Using appropriate military, Federal Aviation Administration (FAA), or host-nation weather facilities, obtain information about the weather. Compare destination forecast and approach minimums, and determine if an alternate airfield is required. Ensure that the flight can be completed per AR 95-1. Check the NOTAMs and other appropriate sources for any restrictions that apply to the flight. Obtain navigation charts that cover the entire flight area, and allow for changes in routing or destination that may be required because of the weather. Select the route(s) or course(s) and altitude(s) that will best accomplish the mission. When possible, select preferred routing. Determine the magnetic heading, ground speed, and ETE for each leg, to include flight to the alternate airfield if required. Compute the total distance and flight time. Calculate the required fuel using a CPU-26A/P computer/Weems plotter (or equivalent) or approved mission planning software. Complete the appropriate flight plan and file it with the appropriate agency.

Note. Crews should consider and plan to use global positioning system (GPS) as an emergency backup system only. FAA-approved IFR GPS possess specific noncorruptible terminal instrument procedure data that cannot be altered by the aircrew.

Note. Crewmembers must be proficient in using all IFR navigation equipment installed in the aircraft they are operating (such as distance measuring equipment [DME], tactical air navigation [TACAN]). The proper use may include operating capabilities and restrictions that must be considered during the flight planning process.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1010

Prepare a Performance Planning Card (PPC)

CONDITIONS: Given a completed DD Form 365-4 (*Weight and Balance Form F-Transport/ Tactical*); TM 55-1520-228-10; environmental conditions at takeoff, en route, and landing; and a blank performance planning card (PPC).

STANDARD: Complete the PPC according to procedures given in TM 55-1520-228-10, current airworthiness release (AWR) instructions, and the description below.

Note: Current aviation and missile command (AMCOM) approved PPC programs may be used to obtain performance planning data.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will determine and have available aircraft performance data necessary 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 performance planning card is used as an aid to organize performance planning data. Instructions for obtaining performance planning data are described below. Figure 4-2 is the only authorized OH-58 PPC.

   a. Hover Data.

Item 1— AIRCRAFT GWT. Record the aircraft gross weight (GWT) at the departure point. If during the mission, the aircraft gross weight significantly increases from the departure point, enter this weight also.

Item 2 — FUEL. Record fuel loading restrictions due to maximum allowable gross weight and loading configuration.

Item 3 — FUEL. Record the estimated fuel (including reserve) required for the mission at the point of departure.

Item 4 — PA. Record the actual or forecast pressure altitude (PA) for the departure point at the time of departure. Record the maximum PA forecast for the duration of the mission.

Item 5 — FAT. Record the actual or forecast FAT for the departure point at the time of departure. Record the maximum forecast FAT for the duration of the mission.

Item 6 — LOAD AVAIL. Subtract the difference between the maximum weight recorded in 1 and the maximum allowable GWT recorded in 11 or 12 (as applicable to the mission profile) and record this value.

Item 7 — MAXIMUM TORQUE AVAILABLE. Compute and record the maximum torque available using the applicable MAXIMUM TORQUE AVAILABLE (30 MINUTE OPERATION) chart and the departure information recorded in 4 and 5. If a significant increase exists between the departure and maximum recorded in 4 and 5, then also compute and record this torque value using maximum conditions.

Item 8 — CONTINUOUS TORQUE AVAILABLE. Compute and record the continuous torque available using the applicable TORQUE AVAILABLE - CONTINUOUS OPERATION chart and the maximum recorded in 4 and 5. If a significant increase exists between the departure and maximum in 4 and 5, then also compute and record this torque value using maximum conditions.

Item 9 — HOVER IGE TORQUE. Compute and record the torque required to hover at 2 feet using the HOVER chart and the departure conditions found in 4 and 5. If a significant increase exists between the departure and maximum recorded in 4 and 5, then also compute and record this torque value using maximum conditions.

Item 10 — HOVER OGE TORQUE. Compute and record the torque required to hover at 50 feet using the HOVER chart and the departure conditions found in 4 and 5. If a significant increase exists between the departure and maximum recorded in 4 and 5, then also compute and record this torque value using maximum conditions.

Item 11 — MAX ALLOWABLE GWT IGE. Compute and record the maximum allowable gross weight at 2 feet using the HOVER or HOVER CEILING chart and the departure conditions found in 4 and 5. If a significant increase exists between the departure and maximum in 4 and 5, then also compute and record this maximum allowable gross weight using maximum conditions.

Item 12 — MAX ALLOWABLE GWT OGE. Compute and record the maximum allowable gross weight at 50 feet using the HOVER or HOVER CEILING chart and the departure conditions found in 4 and 5. If a significant increase exists between the departure and maximum recorded in 4 and 5, then also compute and record this maximum allowable gross weight using maximum conditions.

Note: A significant increase is defined as an increase of 5 degrees or greater Celsius, 500 feet or greater PA, or 100 pounds or greater increase in aircraft gross weight.

Item 13 — SAFE PEDAL— Using the HOVER chart and the maximum values recorded in 1, 4, and 5, determine if a 10 percent directional control margin exists. Circle YES if the directional control margin exists at 35 knots or greater. Circle NO if the directional control margin is less than 35 knots and record the maximum permissible right crosswind to the right of the circle.

b. Cruise Data.

Item 14 — ALT. Record the planned cruise altitude (ALT).

Item 15 — FAT. Record the forecast or estimated free air temp (FAT) at the planned cruise altitude.

Item 16 — VNE. Compute and record the maximum indicated airspeed using the AIRSPEED OPERATING LIMITS chart and the conditions recorded in 14 and 15.

Item 17 — IAS. Enter the planned indicated airspeed (IAS) for the initial planned cruise altitude.

Item 18 — TAS. Compute and record the true airspeed (TAS) using the appropriate CRUISE chart and the information recorded in 14 and 15.

Item 19 — FUEL. Compute and record the cruise fuel flow using the appropriate CRUISE chart and the information recorded in 14 and 15. If the aircraft is configured other than clean, apply the fuel flow increase determined from the DRAG chart.

Item 20 — TORQUE. Compute and record the cruise torque using the appropriate CRUISE chart and the information recorded in14 and 15 above. If the aircraft is configured other than clean, apply the torque increase determined from the DRAG chart.

Item 21 — MAX R/C/END. Compute and record the maximum rate of climb/endurance airspeed using the appropriate CRUISE chart and the information in recorded 14 and 15 above. If a torque value is required for anticipated turbulence penetration, then also compute and record this torque value (apply the torque increase determined from the DRAG chart when aircraft is configured other than clean).

Item 22 — MAX RANGE. Compute and record the maximum range airspeed using the appropriate CRUISE chart and the information recorded in 14 and 15 above.

Note: Use the PA closest to the planned cruise altitude when computing CRUISE DATA.

c. Fuel Management.

Item 23 — START TIME/LBS. Record the current time upon initiating the in flight fuel check.

Item 24 — START TIME/LBS. Record the indicated fuel upon initiating the in flight fuel check.

Item 25 — STOP TIME/LBS. Record the current time upon concluding the in flight fuel check.

Item 26 — STOP TIME/LBS. Record the indicated fuel upon concluding the in flight fuel check.

Item 27 — RESERVE. Compute and record the time the aircraft will enter the reserve fuel time appropriate for the mission using the information recorded in 25, 26, and 28.

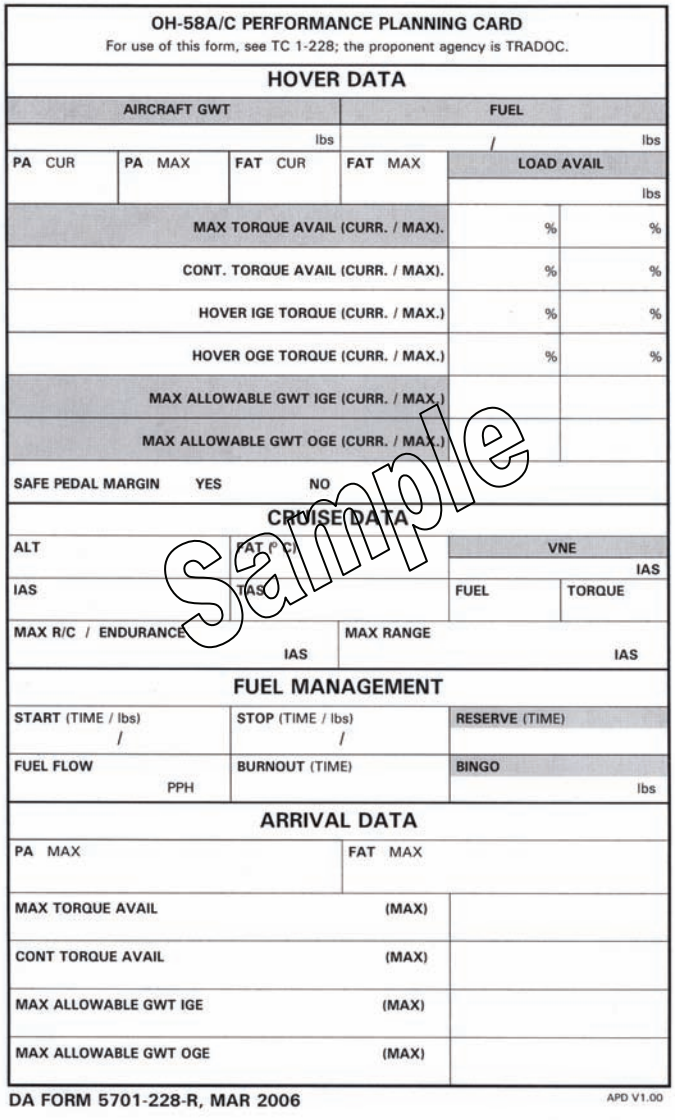
Item 28 — FUEL FLOW. Compute and record the fuel flow using the information derived from 23, 24, 25, and 26.

Item 29 — BURNOUT. Compute and record the time the aircraft will run out of fuel using the information derived from 25, 26 and 28.

Item 30 — BINGO. If the mission calls for loitering time on station, compute and record the minimum fuel required to fly from the loiter area to the planned refuel point using the information recorded in 28.

Note: The same performance planning card (PPC) will suffice for consecutive takeoffs and landings when the load or environmental conditions have not increased significantly (5°Celsius, 500 feet PA, or 100 pounds).

d. Arrival. Using aircraft performance charts or tabular data compute arrival data if environmental conditions are higher by 5 degrees C, 500 feet PA or if the aircraft weight increases 100 pounds from takeoff point.



OH-58A/C PERFORMANCE PLANNING CARD

For use of this form, see TC 1-228; the proponent agency is TRADOC.

HOVER DATA

AIRCRAFT GWT			FUEL	
lbs			/	lbs
PA CUR	PA MAX	FAT CUR	FAT MAX	LOAD AVAIL lbs

MAX TORQUE AVAIL (CURR. / MAX).	%	%
CONT. TORQUE AVAIL (CURR. / MAX).	%	%
HOVER IGE TORQUE (CURR. / MAX.)	%	%
HOVER OGE TORQUE (CURR. / MAX.)	%	%
MAX ALLOWABLE GWT IGE (CURR. / MAX.)		
MAX ALLOWABLE GWT OGE (CURR. / MAX.)		

SAFE PEDAL MARGIN YES NO

CRUISE DATA

ALT	FAT (° C)	VNE IAS	
IAS	TAS	FUEL	TORQUE
MAX R/C / ENDURANCE IAS	MAX RANGE IAS		

FUEL MANAGEMENT

START (TIME / lbs) /	STOP (TIME / lbs) /	RESERVE (TIME)
FUEL FLOW PPH	BURNOUT (TIME)	BINGO lbs

ARRIVAL DATA

PA MAX	FAT MAX	
MAX TORQUE AVAIL	(MAX)	
CONT TORQUE AVAIL	(MAX)	
MAX ALLOWABLE GWT IGE	(MAX)	
MAX ALLOWABLE GWT OGE	(MAX)	

DA FORM 5701-228-R, MAR 2006 APD V1.00

Figure 4-2. DA Form 5701-228-R performance planning card

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1011

Determine Aircraft Performance Parameters Using Tabular Data

CONDITIONS: In an OH-58 helicopter or in a classroom environment, given aircraft gross weight and pressure altitude and free air temperature; compute the aircraft maximum OGE gross weight, OGE torque required and IGE torque required from tabular data.

STANDARDS:

1. Compute maximum torque TQ ± 2 percent.
2. Compute maximum OGE weight ± 100 pounds.
3. Compute hover TQ ± 2 percent.

DESCRIPTION:

1. **Crew actions**. The pilot in command (PC) will compute or direct other crewmembers to compute the aircraft performance data. The PC will verify the accuracy of the computations, and ensure aircraft performance meets mission requirements. Limitations will not be exceeded.

2. **Procedures**.

Note: When significant changes in the mission conditions occur, recompute the values. A significant change is defined as an increase of +5 degrees, +500 feet Pressure Altitude or +100 pounds.

Hover Data

(1) PA – enter the Pressure altitude column

(2) FAT – enter the free air temperature column

(3) Maximum OGE weight – read the maximum out-of-ground-effect weight.

(4) OGE hover torque – read the out-of-ground-effect torque needed to lift the maximum OGE weight.

Note: If the OGE weight is less than the structural limit, then the OGE hover torque is also the maximum torque. The engine is limited by turbine outlet temperature.

(5) IGE hover torque – read the in-ground-effect torque needed to lift the maximum OGE weight.

(6) For training purposes your hover power will be 1 percent of TQ less/more for every 32 pounds difference between the OGE weight and the aircraft's actual gross weight.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Tabular Data (see pages 4-17 and 4-18).

	FREE AIR TEMP														
	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40
PA	281	277	272	267	262	255	250	245	240	235		OGE	GW-	10	LB
	85	84	83	81	79	77	75	73	71	69			%Q-	MAX	
140	85	83	81	80	79	76	74	73	70	68			%Q-	OGE	
	70	67	66	65	64	62	60	59	57	55			%Q-	IGE	
	287	282	278	272	267	262	255	250	245	240					
	86	85	84	83	81	79	77	75	73	71					
135	84	83	82	80	79	78	76	74	72	70					
	69	67	67	65	64	64	62	60	59	57					
	293	288	284	279	273	267	261	255	250	245	239				
	88	87	86	85	83	81	78	77	75	73	71				
130	87	86	85	84	82	80	78	76	74	73	70				
	71	70	69	69	67	65	64	62	60	60	57				
	298	294	290	285	279	272	267	261	256	251	245	237			
	90	89	88	86	85	83	80	78	77	75	73	70			
125	89	88	86	85	83	81	80	79	76	75	73	70			
	73	72	70	69	68	66	65	64	62	61	59	57			
	304	299	296	290	285	278	272	267	261	255	249	242	235		
	92	91	90	88	86	84	82	80	78	76	74	72	69		
120	91	89	88	87	85	83	81	79	78	75	74	72	68		
	75	73	72	71	70	68	66	64	63	61	60	59	55		
	310	305	302	296	291	284	278	273	267	261	255	247	240		
	93	93	92	90	88	86	84	82	80	78	76	73	71		
115	92	91	90	88	86	85	83	80	79	77	74	73	70		
	76	75	74	72	70	70	68	65	64	63	60	59	57		
	315	312	309	302	297	291	284	276	272	267	260	253	246	237	
	95	94	93	92	90	88	86	84	82	80	77	75	72	67	
110	94	93	92	91	90	87	85	83	81	79	77	75	72	68	
	77	76	75	75	74	71	70	68	66	64	63	61	59	55	
	320	320	315	309	304	298	291	285	279	273	266	259	251	243	234
	98	97	96	94	92	90	87	86	84	82	79	76	74	71	67
105	95	96	94	92	91	89	87	85	83	81	79	76	74	71	67
	78	78	77	75	75	73	71	70	68	66	64	62	60	58	54
	320	320	320	315	309	303	296	290	284	278	272	264	256	248	239
	100	99	98	96	94	92	90	88	86	84	81	78	76	72	69
100	94	95	97	94	92	91	89	87	85	82	80	78	75	72	68
	77	78	79	77	75	75	73	71	70	67	65	63	61	59	55
	320	320	320	320	316	309	303	297	291	285	278	270	262	255	245
	100	100	100	98	96	94	91	90	88	85	83	80	77	74	70
95	93	94	95	96	94	92	91	89	86	85	82	76	77	73	70
	76	77	78	78	77	75	75	73	70	70	67	64	63	60	57
	320	320	320	320	320	315	309	302	296	290	283	276	268	259	250
	100	100	100	100	98	96	93	91	89	87	85	82	79	75	72
90	92	93	94	95	96	94	92	91	89	86	84	80	78	74	71
	75	76	77	78	78	77	75	75	73	70	69	65	63	60	58
	320	320	320	320	320	320	316	309	303	296	290	282	274	265	256
	100	100	100	100	100	98	95	94	91	89	86	83	81	77	74
85	92	93	93	94	95	96	94	92	91	88	86	83	80	76	73
	75	76	76	77	78	78	77	75	75	72	70	68	65	62	60
	320	320	320	320	320	320	320	315	309	302	296	289	280	271	262
	100	100	100	100	100	100	98	96	93	91	88	85	83	79	76
80	91	91	92	93	94	95	96	94	92	91	88	86	82	78	75
	74	74	75	76	77	78	78	77	75	75	72	70	67	63	61
	320	320	320	320	320	320	320	320	316	309	301	294	287	278	268
	100	100	100	100	100	100	100	98	95	93	90	87	84	81	78
75	90	91	91	92	93	94	94	95	94	92	90	87	85	80	77
	74	74	74	75	76	77	77	78	77	75	74	71	70	65	63
	320	320	320	320	320	320	320	320	320	314	308	300	292	283	274
	100	100	100	100	100	100	100	100	97	95	92	89	86	83	79
70	89	90	91	91	92	93	94	94	95	93	91	89	85	82	78
	73	74	74	74	75	76	77	77	78	76	75	73	70	67	64

Figure 4-3. Tabular Performance Data (page 1)

PA	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40
	320	320	320	320	320	320	320	320	320	320	314	306	299	290	280
	100	100	100	100	100	100	100	100	99	97	94	91	88	85	81
65	88	89	90	90	91	92	92	93	94	95	93	90	88	85	80
	72	73	74	74	74	75	75	76	77	78	76	74	72	70	65
	320	320	320	320	320	320	320	320	320	320	320	312	305	296	286
	100	100	100	100	100	100	100	100	100	99	96	93	90	87	83
60	87	88	89	90	91	91	92	92	93	94	95	92	90	86	83
	71	72	73	74	74	74	75	75	76	77	78	75	74	70	68
	320	320	320	320	320	320	320	320	320	320	320	320	311	302	292
	100	100	100	100	100	100	100	100	100	100	98	95	92	89	85
55	87	88	88	89	90	90	91	92	92	93	94	95	91	89	84
	71	72	72	73	74	74	74	75	75	76	77	78	74	73	69
	320	320	320	320	320	320	320	320	320	320	320	320	317	307	298
	100	100	100	100	100	100	100	100	100	100	100	97	94	91	87
50	86	87	87	88	89	90	90	91	92	92	93	94	93	89	86
	70	71	71	72	73	74	74	74	75	75	76	77	76	73	70
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	305
	100	100	100	100	100	100	100	100	100	100	100	99	96	93	89
45	86	87	87	88	89	89	90	90	91	91	92	93	94	94	89
	70	71	71	72	73	73	74	74	74	74	75	76	77	77	73
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	311
	100	100	100	100	100	100	100	100	100	100	100	100	98	95	91
40	85	86	86	87	88	89	89	90	90	91	91	92	93	94	90
	70	70	70	71	72	73	73	74	74	74	74	75	76	77	74
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	317
	100	100	100	100	100	100	100	100	100	100	100	100	100	97	93
35	85	85	86	86	87	88	88	89	89	90	91	91	92	93	92
	70	70	70	70	71	72	72	73	73	74	74	74	75	76	75
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320
	100	100	100	100	100	100	100	100	100	100	100	100	100	99	95
30	84	85	85	86	86	87	87	88	89	89	90	91	92	92	93
	69	70	70	70	70	71	71	72	73	73	74	74	75	75	76
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	97
25	84	84	85	85	86	86	87	87	88	89	89	90	91	91	92
	69	69	70	70	70	70	71	71	72	73	73	74	74	74	75
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
20	83	84	84	85	85	86	86	87	87	88	89	89	90	91	91
	68	69	69	70	70	70	70	71	71	72	73	73	74	74	74
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
15	83	83	84	84	85	85	86	86	87	87	88	89	89	90	91
	68	68	69	69	70	70	70	70	71	71	72	73	73	74	74
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10	82	83	83	84	84	85	85	86	86	87	87	88	89	89	90
	67	68	68	69	69	70	70	70	70	71	71	72	73	73	74
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
5	82	82	83	83	84	84	85	85	86	86	86	87	88	88	89
	67	67	68	68	69	69	70	70	70	70	70	71	72	72	72
	320	320	320	320	320	320	320	320	320	320	320	320	320	320	320
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0	82	82	82	83	83	84	84	85	85	86	86	87	87	88	88
	67	67	67	68	68	69	69	70	70	70	70	71	71	72	72

Figure 4-3. Tabular Performance Data (page 2)

TASK 1012

Verify Aircraft Weight and Balance

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

STANDARDS:

1. Verify that center of gravity (CG) and gross weight remain within aircraft limits for the duration of the flight per TM 55-1520-228-10.
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. The PI (if directed) will verify or complete the DD Form 365-4 (*Weight and Balance Clearance Form F-Transport/Tactical*) and report the results to the PC.

   b. Both crewmembers will continually monitor aircraft loading during the mission to ensure CG remains within limits.

2. Procedures. Using the completed DD Forms 365-4, verify that aircraft gross weight and CG will remain within the allowable limits for the entire flight. Note all gross weight, 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 1014

Operate Aviation Life Support Equipment (ALSE)

CONDITIONS: Given the appropriate ALSE for the mission.

STANDARDS: Appropriate common standards plus these additions/modifications:

Inspect/perform operational checks on ALSE.

DESCRIPTION:

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

2. Procedures. Based on mission requirements, obtain the required ALSE. Inspect equipment for serviceability and perform required operational checks. Secure the required ALSE in the aircraft per FM 1-302, Operators manual, and the unit SOP.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1022

Perform Preflight Inspection

CONDITIONS: With an OH-58 helicopter.

STANDARDS:

1. Perform the preflight inspections of the aircraft, mission equipment, and personal flight gear (helmet, vest, and any other required equipment) per the appropriate training manuals.

2. Enter all appropriate information on DA Form 2408-12 (*Army Aviator's Flight Record*), DA Form 2408-13 (*Aircraft Status Information Record*), and DA Form 2408-13-1 (*Aircraft Maintenance and Inspection Record*).

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) is responsible for ensuring that a preflight inspection is conducted using the TM 1-1520-228-CL/ TM 55-1520-228-10. The PC may direct the pilot (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 will ensure that the appropriate information is entered on DA Form 2408-12, DA Form 2408-13, and DA Form 2408-13-1. 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. Ensure the preflight inspections are conducted per the TM 1-1520-228-CL/ TM 55-1520-228-10. Verify that all preflight checks have been completed and ensure that the crewmembers enter the appropriate information on DA Form 2408-12, DA Form 2408-13, and DA Form 2408-13-1.

Note 1: If circumstances permit, accomplish preflight inspection during daylight hours.

Note 2: The crew performing the preflight should be aware of any recent maintenance that has occurred and should consider examining those areas in greater detail.

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.

SNOW/SAND/DUST CONSIDERATIONS: If an aircraft is preflighted 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 will be conducted at the aircraft (for aircraft preflight) and academically (for personal gear).

2. Evaluation will be conducted at the aircraft (for aircraft preflight) and academically (for personal gear).

REFERENCES: Appropriate common references.

TASK 1024

PERFORM BEFORE STARTING ENGINE THROUGH BEFORE LEAVING HELICOPTER CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Perform procedures and checks in accordance with TM 1-1520-228-CL/TM 55-1520-228-10.
2. Enter appropriate information on DA Form 2408-12 (*Army Aviator's Flight Record*), DA Form 2408-13 (*Aircraft Status Information Record*), and DA Form 2408-13-1 (*Aircraft Maintenance and Inspection Record*).
3. Complete postflight inspection and secure the aircraft.

DESCRIPTION:

1. Crew actions.
   a. Both crewmembers will complete the required checks pertaining to assigned crew duties using TM 1-1520-228-CL/TM 55-1520-228-10. They will clear the area around the aircraft before starting engine.
   b. The pilot in command (P*) will announce when starting engine.
   c. Enter appropriate information on DA Form 2408-12, DA Form 2408-13, and DA Form 2408-13-1.
   d. Pilot in command (PC) ensures aircraft is secure before departing.
2. Procedures. Perform the BEFORE STARTING ENGINE CHECKS through BEFORE LEAVING HELICOPTER CHECKS per TM 1-1520-228-CL/TM 55-1520-228-10. 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.

Note: For single pilot operations, the PC will complete all the above 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 will be conducted in the aircraft.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1026

MAINTAIN AIRSPACE SURVEILLANCE

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards and the following:

1. Clear the aircraft and immediately inform the other crew member of all air traffic, targets, or obstacles that pose a threat to the aircraft.
2. Announce heading, altitude or position changes.
3. Alert wingman, team, section, and unit 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 crew member 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 or helicopter) and, if known, the model. Give 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 crew member 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 NVD 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.

REFERENCES: Appropriate common references.

TASK 1028

PERFORM HOVER POWER CHECK

CONDITIONS: In an OH-58 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 2-foot hover, ±1 foot, and determine that sufficient power is available to complete the mission.

DESCRIPTION:

1. Crew actions.

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

   b. The pilot on the controls (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 pilot not on the controls (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. Procedure. While near the intended takeoff point and in the direction of takeoff; establish the aircraft at a stabilized 2-foot hover. Compare the actual torque required to hover with the predicted maximum torque available. Depending on the torque differential, the following takeoff and landing 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. 5 to 9 percent torque differential. Normal approaches and takeoffs may be performed.

   c. 10 to 14 percent torque differential. Steep approaches, pinnacle/ridgeline, instrument takeoffs and confined area operations may be performed.

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

   e. The aircrew will not attempt the tasks listed below if the 2-foot hover power check indicates that out-of-ground (OGE) power is not available.

      (1) **TASK 1030, PERFORM HOVER OUT-OF-GROUND CHECK.**

      (2) **TASK 2025, PERFORM TERRAIN FLIGHT TAKEOFF.**

      (3) **TASK 2026, PERFORM TERRAIN FLIGHT (NAP OF THE EARTH/ CONTOUR ONLY).**

      (4) **TASK 2030, PERFORM TERRAIN FLIGHT APPROACH.**

      (5) **TASK 2034, PERFORM MASKING AND UNMASKING.**

      (6) **TASK 2036, PERFORM TERRAIN FLIGHT DECELERATION.**

Note: Anytime the load or environmental conditions increase significantly (5 degrees Celsius, 500 feet pressure altitude (PA), or 100 pounds aircraft weight), additional hover power checks must be performed.

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.

REFERENCES: Appropriate common references.

TASK 1030

PERFORM HOVER OUT-OF-GROUND EFFECT (OGE) CHECK

CONDITIONS: In an OH-58 with 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 300 feet per minute during the vertical descent.

DESCRIPTION:

1. Crew actions.
   a. The pilot on the controls (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 instructions given by the P.
   b. The pilot not on the controls (P) will provide drift and obstacle information to the P* and will note the highest torque and TOT values observed. The P will warn the P* if it appears that limitations may be exceeded.
2. Procedures. Vertically ascend to 50 feet or above surrounding obstacles, whichever is higher. Constantly monitor TOT, torque, and aircraft instruments while not exceeding any limitations. Execute a 360-degree left pedal turn while constantly checking aircraft power and controllability. Terminate the maneuver at an in-ground effect (IGE) hover, on the ground, or as required.

Note 1: An OGE hover check should be verified anytime aircraft controllability or power is in doubt.

Note 2: OGE hover power is required prior to performing an OGE check.

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 night vision goggles (NVG), this procedure helps in maintaining a constant altitude and position over the ground during turns.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1032

PERFORM RADIO COMMUNICATION PROCEDURES

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Check and operate aircraft radios.
2. Establish and maintain radio contact with the desired unit or air traffic control (ATC) facility.
3. Operate intercom system.
4. Describe two-way radio failure procedures per the FIH or host country regulations.

DESCRIPTION:

1. Crew actions.

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

   b. The pilot on the controls (P*) remains focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will maintain communications on his assigned radios.

   c. The P will monitor radios and perform frequency changes as directed. The P 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. Set radios and frequencies as required. Copy pertinent information. Select the proper frequency on the appropriate radio as required/directed. Continuously monitor the radios as directed by the PC. Monitor the frequency before transmitting. Use the correct radio call sign 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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1038

PERFORM HOVERING FLIGHT

CONDITIONS: In an OH-58 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.
    e. With the aid of TM 1-1520-228-CL, perform the hover checks in the correct sequence.
2. Hovering flight. Maintain a constant rate of movement for existing conditions.
3. 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.
4. 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 pilot on the controls (P*) will announce his 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 pilot not on the controls (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 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 counter-pressure 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 center of gravity (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.

    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 effect 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. If sloping conditions are suspected, see Task 1062.

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.

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.

1. 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.

Note: 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. 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 transitional lift (ETL). Ensure that an area is available to safely decelerate and land the aircraft. Under certain conditions (for example, adverse winds), it may be necessary to perform a traffic pattern to optimize conditions at the desired termination point.

Note 1: Hovering out-of-ground effect (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.

Note 2: At night, use of the searchlight may cause spatial disorientation while in blowing snow/sand/dust.

Note 3: Consider the effects of the snow/sand/dust cloud on personnel and equipment in/around the landing area.

MUD/MUSKEG/TUNDRA CONSIDERATIONS: Smoothly increase the collective until the crew confirms that the landing gear is free.

Note: 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. The normal height for in-ground effect (IGE) hover is 3 feet. The normal height for OGE hover is 50 feet or greater.

2. Evaluation will be conducted in the aircraft. The normal height for IGE hover is 3 feet. The normal height for OGE hover is 50 feet or greater.

REFERENCES: Appropriate common references.

TASK 1040

PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) TAKEOFF

CONDITIONS: In an OH-58 helicopter with a hover power and before take-off checks complete.

STANDARDS:

1. Initiate takeoff from an appropriate hover altitude or from the ground.
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.
5. Maintain desired rate of climb ±100 feet per minute.
6. Maintain takeoff power until reaching desired airspeed for mode of flight.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will remain focused outside the aircraft during the maneuver. The P* 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 his 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 pilot not on the controls (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 monitor power requirements and advise the P* if power limits are being approached.

2. Procedures.

   a. VMC takeoff from the ground. 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 counter-pressure 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 cyclic as required to accelerate forward through effective transitional lift (ETL) at an altitude to clear terrain and obstacles. As the aircraft reaches ETL, adjust the cyclic to obtain the desired climb 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.

Note: If more 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. Instruments should be cross-checked by the P.

   b. VMC takeoff from a hover. 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.

NIGHT OR NVG CONSIDERATIONS:

1. If sufficient illumination or night vision goggles (NVG) resolution exists to view obstacles, the P* can accomplish the takeoff in the same way as he does 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, he should perform an altitude-over-airspeed takeoff to ensure obstacle clearance. The P* may perform the takeoff from a hover or from the ground.

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.

Note: The crew must use proper scanning techniques to avoid spatial disorientation.

SNOW/SAND/DUST CONSIDERATIONS: 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.

Note 1: In some cases, applying collective to blow away loose snow/sand/dust from around the aircraft is beneficial before performing this maneuver.

Note 2: The P* should be prepared to transition to instruments if ground reference is lost.

Note 3: 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.

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. 60 knots indicated airspeed (KIAS) and 500 feet per minute rate of climb is generally used in a training environment.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1044

NAVIGATE BY PILOTAGE AND DEAD RECKONING

CONDITIONS: In an OH-58 helicopter, given the appropriate maps, plotter, flight computer, and flight log.

STANDARDS:

1. Maintain course orientation within 500 meters (1000 night/night vision goggles [NVG]).
2. Arrive at checkpoints/destination ±3 minutes of estimated time of arrival (ETA).

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will acknowledge commands issued by the pilot not on the controls (P) for the heading, altitude and airspeed changes necessary to navigate the desired course. The P* will announce significant surface features to assist in navigation.

   b. The P will direct the P* to change aircraft heading and airspeed as appropriate to navigate the desired course. The P will use rally terms, specific headings, relative bearings, or key terrain features in accomplishing this task. The P will announce all plotted hazards prior to approaching their location. The P, as workload permits, will assist in clearing the aircraft and will provide adequate warning to avoid traffic and obstacles.

2. Procedures. 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 (ground track).

NIGHT OR NVG CONSIDERATIONS: More detailed flight planning is required when the flight is conducted at terrain flight altitudes, when visibility is reduced, or in the night or NVG environment. TC 1-204 contains details about night and NVG navigation. Interior cockpit lighting should be considered when selecting colors for preparing navigational aids (for example, maps and knee board notes). Select prominent terrain features as turning points and barriers.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1046

PERFORM RADIO NAVIGATION

CONDITIONS: With the appropriate navigational publications, in an OH-58 helicopter under simulated instrument meteorological conditions (IMC).

STANDARDS:

1. Pilot on the controls (P*).
   a. Maintain altitude ±100 feet.
   b. Maintain airspeed ±10 knots indicated airspeed (KIAS).
   c. Correctly tune and identify the appropriate navigational aids (NAVAIDs).
   d. Correctly determine aircraft position.
   e. Correctly intercept and maintain the desired course.
   f. Correctly identify station passage.
2. Pilot not on the controls (P).
   a. Without error, request, acknowledge, and record air traffic control (ATC) clearance information.
   b. Without error, tune and identify the appropriate NAVAID with the aid of the navigational chart.
   c. Correctly determine the position of the aircraft and station passage.
   d. Be sufficiently familiar with navigational charts and the instrument flight rules (IFR) supplement so that required in-flight information can be obtained in a timely manner.
3. Crew. Correctly perform crew coordination actions.

DESCRIPTION:

1. P*.
   a. Equipment check. Check all radio navigation equipment to be used during the mission. Equipment must be operable and within accuracy tolerances, if applicable, as specified in FM 1-240 and the aircraft operator's manual.
   b. Station identification. Obtain the correct frequency for the desired navigational station, and then tune the equipment. Make a positive identification of the station.
   c. Aircraft position. Determine the position of the aircraft with respect to a specified navigational ground station according to the procedures in FM 1-240.
   d. Course interception. After identifying the desired station, determine the location of the aircraft in relation to the desired course. Turn the aircraft 45 degrees toward the course (90 degrees to expedite). Maintain intercept heading until approaching an on-course indication. Depending on the rate of closure, start a turn to intercept the desired track on course.
   e. Course tracking. Maintain the desired heading until navigational instruments show an off-course condition; then turn 30 degrees toward the course to re-intercept. If navigational instruments do not indicate movement toward the course within a reasonable time, increase the intercept angle. When the course is re-intercepted, toward the course and apply the appropriate drift correction (normally one-half of the intercept angle). Continue to bracket the course by decreasing corrections until a heading is obtained that will maintain the aircraft on course.
   f. Intersection arrival. Determine arrival at radio intersections according to the procedures in FM 1-240.

g. Station passage. Identify station passage by observing the first complete reversal of the indicator needle or the TO-FROM indicator.

2. P assist the P* with radio navigation tasks during the flight. These tasks will include requesting, acknowledging, and recording the initial ATC clearance and en route changes and tuning and identifying NAVAIDs. They also will include knowing the position of the aircraft at all times, determining station passage, and locating the proper navigational charts when requested by the P*.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1048

PERFORM FUEL MANAGEMENT PROCEDURES

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Verify that the required amount of fuel is on board at the time of takeoff.
2. Complete the in-flight fuel consumption check 30 to 60 minutes after level off or entry into mission profile.
3. 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.
4. Monitor fuel quantity and consumption rate during the flight.

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (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 pilot on the controls (P*) will acknowledge the results of the fuel check.
   c. The pilot not on the controls (P) will record initial fuel figures, fuel flow computation, and burnout and reserve times. The P will announce when initiation and completion of the fuel check and the 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 pre-mission planning. If the fuel on board is inadequate, have the aircraft refueled or abort/revise the mission.
   b. Initial airborne fuel reading. After the aircraft has leveled off or entered mission profile and appropriate power is set, record the total fuel quantity and the time of reading.
   c. Fuel consumption check. With the aircraft in mission/cruise profile, 30 to 60 minutes after performing the initial airborne fuel reading, record the remaining fuel and time of reading. Compute and record the rate of consumption, burnout, and reserve entry time. 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.

REFERENCES: Appropriate common references.

TASK 1052

PERFORM VISUAL METEOROLOGICAL CONDITIONS FLIGHT MANEUVERS

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Turns.
    a. Properly clear the aircraft.
    b. Maintain aircraft in trim.
    c. Maintain selected airspeed ±10 knots.
    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 knots.
    c. Maintain rate of climb or descent ±100 feet per minute.
    d. Maintain desired heading ±10 degrees.
3. Straight and level flight.
    a. Maintain selected airspeed ±10 knots.
    b. Maintain aircraft in trim.
    c. Maintain altitude ±100 feet.
4. Traffic pattern flight. Enter, operate in, and depart a traffic pattern.

DESCRIPTION:

1. Crew actions.

    a. The pilot on the controls (P*) will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance.

    b. The pilot not on the controls (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. Visual meteorological conditions (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 air traffic control [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 VMC 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.

h. Before-landing check.

(1) Ensure that the before-landing check is completed.

(2) Call out the before-landing check and announce when it is completed. The other crewmember will acknowledge that the before-landing check is complete.

NIGHT OR NVG CONSIDERATIONS: Maintain a continuous coordinated turn to the crosswind or 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.

OVERWATER/SNOW/SAND CONSIDERATIONS (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 (for example, harbor lights, buoys, wires, and birds) must also be considered during overwater flight.

TRAINING AND EVALUATION REQUIREMENTS:

Note: VMC flight maneuvers can be trained and evaluated completely separate from, or as components of, a traffic pattern.

1. Training will be conducted in the aircraft. For traffic pattern training, the recommended airspeed is 60 knots indicated airspeed (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.
2. Evaluation will be conducted in the aircraft.

REFERENCES: Appropriate common references.

TASK 1058

PERFORM VISUAL METEOROLOGICAL CONDITIONS (VMC) APPROACH

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Perform a landing area reconnaissance and select a suitable landing area.
2. Establish the proper altitude to clear obstacles on final approach. Maintain altitude ±100 feet.
3. Establish entry airspeed ±10 knots.
4. Maintain ground track alignment with the landing direction, as appropriate.
5. Maintain the appropriate approach angle and rate of closure necessary for the conditions.
6. Perform a smooth and controlled termination to a hover or to the ground.

DESCRIPTION:

1. Crew actions.

   a. The crew will conduct a continuous reconnaissance by analyzing the winds, obstructions, and long axis of the landing area.

   b. The pilot on the controls (P*) will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will announce when 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.

   c. The pilot not on the controls (P) will 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 his attention is focused inside the cockpit.

2. Procedures. Evaluate the suitability of the landing area. 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. Maintain entry airspeed until the rate of closure appears to be increasing. Above 50-feet above ground level (AGL), maintain ground track alignment and the aircraft in trim. Below 50-feet AGL, align the aircraft with the landing direction. Progressively decrease the rate of descent and rate of closure until reaching the termination point (hover or touchdown). If landing to a confined area, terminating the approach to the forward one-third of the landing area will minimize power requirements.

   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 aircraft loading, environmental, and surface 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 out-of-ground effect (OGE) power may be required in certain situations. Evaluate power required versus power available.

Note 1: Airspeed indications are unreliable below 20 knots.

Note 2: Steep approaches can place the aircraft in potential settling-with-power conditions. The crew must be familiar with diagnosing and correcting these situations.

PINNACLE APPROACH CONSIDERATIONS:

1. Select a flight path, 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. 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, density altitude, gross weight, 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 effective transitional lift (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.

Note: To successfully operate into small areas, it may be necessary to place the nose of the aircraft over the edge of the landing area. 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.

2. Touchdown. Perform a ground reconnaissance and clear the aircraft. 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.

3. Takeoff. 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 and announce the intent to abort or alter the takeoff. 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.

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.

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 knots until apparent ground speed and rate of closure appear to be increasing. Progressively decrease the rate of descent and forward speed until termination.

2. For landings with forward movement, rate of descent at touchdown must not exceed 300 FPM.

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

4. Use proper scanning techniques to avoid spatial disorientation.

5. Hazards, especially wires are more difficult to detect at night. Thorough pre-mission planning is required.

SNOW/SAND/DUST CONSIDERATIONS:

1. Termination to a point OGE. 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 take off.

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 effective translational lift. 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, lower the collective and allow the aircraft to settle. Apply slight aft cyclic at touch down 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 round.

Note 1: 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 2: 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.

Note 3: At night, use of the searchlight may cause spatial disorientation while in blowing snow/sand/dust.

TRAINING AND EVALUATION REQUIREMENTS:

1. Training will be conducted in the aircraft. 60 knots is recommended for entry airspeed.
2. Evaluation will be conducted in the aircraft. 60 knots is recommended for entry airspeed.

REFERENCES: Appropriate common references.

TASK 1062

PERFORM SLOPE OPERATIONS

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Select a suitable landing area.
2. Do not exceed aircraft slope limits.
3. Maintain heading ±5 degrees.
4. Maintain drift within ±1 foot.
5. Perform a smooth, controlled descent and touchdown.
6. Perform a smooth, controlled ascent.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will remained 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 pilot not on the controls (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 downslope skid to the ground. With the entire weight of the aircraft on the ground, (collective in the full down position) neutralize the cyclic and pedals. 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, the P* will announce his intent and direct his attention outside. Apply the cyclic into the slope to maintain the position of the upslope skid. The P* will smoothly increase the collective to raise the down slope skid while maintaining heading with the pedals. 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.

Note: Before conducting slope operations, the crew must understand dynamic rollover characteristics.

NIGHT OR NVG CONSIDERATIONS: The degree of slope is difficult to determine using the night vision goggles (NVG). Select reference points to determine slope angles. (References probably will be limited and difficult to ascertain.) Determine the need for artificial illumination prior to starting the

maneuver. If successful completion of the landing is doubtful at any time, abort the maneuver. 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.

REFERENCES: Appropriate common references.

TASK 1070

Respond to Emergencies

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

STANDARDS:

1. Recognize, announce, and analyze indications of an emergency. Perform or describe all immediate action procedures in TM 1-1520-228-CL/TM 55-1520-228-10.
2. Perform appropriate emergency procedure.
3. Make mayday call, 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, he will immediately alert the other crewmember.
    a. The pilot on the controls (P*) will perform or direct the pilot not on the controls (P) to perform the underlined steps in TM 55-1520-228-10 and will initiate the appropriate type of landing if required for the emergency.
    b. The P will perform as directed or briefed. If time permits, the P will verify all emergency checks with TM 1-1520-228-CL and will request appropriate emergency assistance as described in the Flight Information Handbook (FIH).
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 aviation training manual (ATM). This task does not prevent the conduct of any training in the aircraft that is not specifically prohibited by this ATM or the operator's manual.

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: Appropriate common references and the FIH.

TASK 1072

RESPOND TO ENGINE FAILURE AT A HOVER

CONDITIONS: In an OH-58 helicopter with an instructor pilot (IP); in an approved touchdown area; at hover altitude that does not exceed 5 feet.

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 pilot on the controls (P*) will focus outside the aircraft and adjust the flight controls as necessary to land.

   c. The pilot not on the controls (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.

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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1074

RESPOND TO ENGINE FAILURE AT CRUISE FLIGHT

CONDITIONS: In an OH-58 helicopter with an instructor pilot (IP); minimum entry altitude; and termination as directed (power recovery or terminate with power).

STANDARDS:

1. Recognize the emergency, determine the appropriate corrective action, and perform or simulate as required, from memory, all immediate action procedures described in TM 1-1520-228-CL.
2. Select a suitable landing area.
3. Correctly terminate the maneuver as directed by the IP.
4. Correctly perform crew coordination actions.

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 he retards the throttle and will monitor the position of the aircraft and take corrective action if necessary.

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

   c. The pilot not on the controls (P) will assist the P* as directed.

2. Procedures. Upon detecting engine failure, the P* will lower the collective to maintain rotor revolutions per minute (RPM) within limits while simultaneously adjusting the pedals to trim the aircraft. The P* will select a suitable landing area. The P* 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 rotor RPM, gas producer, and aircraft in trim. The P* will complete or simulate emergency procedures outlined in TM 1-1520-228-CL/TM 55-1520-228-10,:if time permits, the P* will direct the P to verify the procedures. The crew should plan each simulated 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 above ground level (AGL) and will state one of the three 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 and by visually checking that the N_2 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 RPM with throttle pressure with springback and visually checking that the N_2 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.

Note 1: If time permits during the descent, the IP will announce, "THROTTLE CONFIRMED" when certain that the engine is back to operating RPM.

Note 2: 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 back-up) to verify the throttle is full open.

c. "Touchdown". The IP may elect to continue the maneuver and terminate with a touchdown autorotation. (Emergency procedure training criteria outlined in AR 95-1 must be met before performing touchdown autorotations.)

NIGHT OR NVG CONSIDERATIONS: Altitude, apparent ground speed, rate of closure, and rate of descent are difficult to estimate during night and night vision goggles (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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references and:

AR 95-1

FM 1-203

TM 55-1520-228-10

TM 1-1520-228-CL

TASK 1076

RESPOND TO HYDRAULIC SYSTEM MALFUNCTION

CONDITIONS: In an OH-58 helicopter with an instructor pilot (IP), with emergency procedures training criteria outlined in AR 95-1 met, and given entry altitude and airspeed.

STANDARDS:

1. Execute emergency procedures for hydraulic failure per the aircraft operator's manual.
2. Establish entry altitude as directed ±100 feet.
3. Establish entry airspeed as directed ±10 knots indicated airspeed (KIAS).
4. Maintain heading control ±10 degrees and ground track alignment with landing direction.
5. Maintain a constant shallow approach angle.
6. Perform a smooth and controlled termination.
7. Correctly perform crew coordination actions.

DESCRIPTION:

1. The pilot on the controls (P*) will place the hydraulic control switch in the OFF position on the downwind leg or request that the pilot not on the controls (P) place the switch in the OFF position. The P* will maintain the desired heading, airspeed, and altitude while simulating the emergency procedure actions outlined in the aircraft checklist. When a shallow approach angle is intercepted, the P* will decrease the collective, as required, to establish and maintain that angle. The P* will maintain airspeed until the apparent ground speed and rate of closure appear to be increasing. The P* will progressively decrease the airspeed and rate of descent to touch down at, or slightly above, ETL. After touchdown, the P* will maintain ground track alignment with the cyclic, heading with the pedals, and slowly decrease the collective to slow forward speed.
2. The crewmember not on the controls will assist the P* as directed.

Note: During training, 80 KIAS is recommended on the downwind leg and 60 KIAS is recommended on crosswind and base legs.

NIGHT OR NVG CONSIDERATIONS: Use of the landing light should be evaluated based on ambient light conditions.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1082

PERFORM AUTOROTATION

CONDITIONS: In an OH-58 helicopter with an IP, the emergency procedures training criteria outlined in AR 95-1 met, the before-landing check completed, and given entry altitude and airspeed.

STANDARDS:

1. Establish entry altitude as directed ±100 feet.
2. Establish entry airspeed as directed ±10 knots indicated airspeed (KIAS).
3. Determine the correct entry point.
4. Make the required verbal call outs at the proper time.
5. Establish airspeed 60 KIAS, +10, –5 KIAS before reaching 100 feet AGL.
6. Perform a smooth, progressive deceleration.
7. Apply initial pitch at 10 feet, ± 3 feet, above ground level (AGL).
8. Maintain heading alignment at touchdown ±10 degrees.
9. Perform a smooth, controlled termination.
10. Correctly perform crew coordination actions.

DESCRIPTION:

1. The pilot on the controls (P*) will maintain entry altitude and airspeed as directed until reaching the entry point. The P* will initiate the maneuver by lowering the collective to the full-down position, retard the throttle to engine-idle stop, and adjust the pedals to maintain trim. The P* will maintain ground track while crabbing (above 50 feet) and slipping (below 50 feet) the helicopter. The P* will adjust the cyclic to attain a 60-knot attitude. The P* will call out rotor revolutions per minute (RPM), gas producer, and aircraft in trim, and check the circle of action. Before reaching 100 feet AGL, the P* will ensure that a steady-state autorotation is attained. If it is not attained, the P* will execute a power recovery or terminate with power, as appropriate. A steady-state autorotation means that—

   a. Rotor RPM is within limits.
   b. The aircraft is at the correct airspeed.
   c. The aircraft is descending at a normal rate.
   d. The aircraft is in a position to terminate in the intended landing area.

2. At approximately 50 feet AGL, the P* will apply aft cyclic to initiate a smooth, progressive deceleration. The P* will maintain aircraft alignment with the touchdown area by properly applying the pedals and the cyclic. The P* will adjust the collective, as required, to prevent excessive rotor RPM. At approximately 10 feet AGL, the P* will apply sufficient collective to minimize the rate of descent and the ground speed. The amount of collective applied and the rate of application will depend on the rate of descent and the ground speed. The P* will adjust the cyclic to attain a level landing attitude and, before touchdown, apply collective as necessary to cushion the landing. After touchdown, the P* will slowly lower the collective to the full-down position while maintaining ground track alignment with the pedals. When the aircraft comes to a complete stop, the P* will neutralize the pedals and the cyclic.

3. The crewmember not on the controls will assist the P* as directed. The crewmember will monitor the aircraft instruments and advise the P* if any unsafe condition develops.

NIGHT OR NVG CONSIDERATIONS: Attitude control is critical during night autorotations. Reduced visual references at night limit the aviator's ability to estimate airspeed, altitude, and alignment with the touchdown area. To compensate for the reduced visual references, the aviator will attain a steady-state autorotation before descending through 200 feet AGL. Selecting ground references that provide high visual contrast or that are of a known height in the vicinity of the touchdown area will help in judging the approach. If the searchlight or landing light is used, it should be turned on before descending through 100 feet AGL.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1155

NEGOTIATE WIRE OBSTACLES

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Locate and determine the height of wires.
2. Determine the method to (underflight or overflight) negotiate the wire obstacle.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will determine if under flight of the wire obstacles will be performed.

   b. The pilot on the controls (P*) will focus his 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 pilot not on the controls (P) will assist 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. Plot known wire hazards and other obstacles on tactical/navigation maps. During the mission search for wires and other hazards to flight.

   b. Announce when wires/obstacles are seen and specify the direction and distance to them.

   c. Accurately determine the amount of clearance between the wires and the ground. Locate guy wires and supporting poles. Determine the method of negotiating the wires and initiate the maneuver.

      (1) Overflight. Identify the top of the pole and the highest wire. Cross near a pole to aid in estimating the highest point. Minimize the time that the aircraft is unmasked.

      (2) Underflight. When crossing under wires, the lowest point of the wire must be at least 20 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 25 feet above the ground or obstacles. Ground speed will be as appropriate for given conditions. Ensure lateral clearance from guy wires and poles.

Note: The crew must maintain proper scanning techniques to ensure obstacle avoidance and aircraft clearance.

NIGHT OR NVG CONSIDERATIONS: Wires are difficult to detect at night with night vision goggles (NVGs). 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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1170

PERFORM INSTRUMENT TAKEOFF

CONDITIONS: In an OH-58 helicopter with reference to flight instruments only.

STANDARDS:

1. Set attitude indicator. (OH-58A: on horizon; OH-58C: 5 degrees above horizon.)
2. Maintain required takeoff power ±2 percent torque.
3. Maintain accelerative climb attitude ±1 bar width.
4. Maintain takeoff heading ±10 degrees.
5. Maintain aircraft in trim after effective transitional lift (ETL).
6. Maintain appropriate rate of climb ±100 feet per minute.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will focus primarily inside the aircraft on the instruments. The P* will follow the heading/course, altitude, issued by air traffic control (ATC)/pilot not on the controls (P). The P* will announce any deviation not directed by ATC/P and 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 climb and airspeed and assist the P* as necessary to prevent fixation and spatial disorientation. The P will perform duties as directed and acknowledge any unannounced deviations. During simulated instrument meteorological conditions (IMC), the P will remain focused outside the aircraft to provide adequate warning for avoiding obstacles and hazards detected.

2. Procedures.

   a. From the ground. Align the aircraft with the desired takeoff heading. Set/confirm the attitude indicator for takeoff. With the cyclic in the neutral position, smoothly increase the collective until the aircraft becomes light on the skids. 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. While referring to the flight instruments, smoothly increase the collective to obtain takeoff power. As the collective is increased, cross-check the attitude indicators to ensure proper attitude and constant heading. When takeoff power is reached and the altimeter shows a positive climb, adjust the pitch attitude 2 bar-widths below the horizon for the initial acceleration. Maintain heading with pedals until airspeed increases (generally 20 to 30 knots indicated airspeed [KIAS]) and then make the transition to coordinated flight. Upon reaching climb airspeed (approximately 60 KIAS), adjust the controls as required to maintain desired climb airspeed.

   b. From a hover. On the runway or takeoff pad, align the aircraft with the desired takeoff heading. Set/confirm the attitude indicator for takeoff and check the controls for proper response. Establish the aircraft at 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.

Note 1: Takeoff power will normally be 10 percent above torque required for hover.

Note 2: 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.

REFERENCES: Appropriate common references.

TASK 1174

PERFORM HOLDING PROCEDURES

CONDITIONS: In an OH-58 helicopter under simulated instrument meteorological conditions (IMC) and given an altitude, holding instructions, and appropriate navigational publications.

STANDARDS:

1. Maintain altitude ±100 feet.
2. Maintain airspeed ±10 knots indicated airspeed (KIAS).
3. Correctly tune and identify the appropriate navigational aids (NAVAIDS).
4. Correctly enter the holding pattern.
5. Correctly time and track holding pattern legs.

DESCRIPTION:

1. Before arrival at the holding fix, the pilot on the controls (P*) will analyze the holding instructions to determine holding pattern location and proper entry. Upon arrival at the holding fix, turn (if required) to the predetermined outbound heading. Check the inbound course. Maintain the outbound heading per the Department of Defense (DOD) flight information publication (FLIP) or as directed by air traffic control (ATC). After the appropriate time outbound, turn to the inbound heading. Apply normal tracking procedures to maintain the inbound course. Note the time required to fly the inbound leg. Adjust subsequent outbound leg elapsed time to obtain the desired inbound leg time. When holding at a NAVAID, begin the outbound time when abeam the station. When holding at an intersection, begin the outbound time upon establishing the outbound heading.
2. The crewmember not on the controls will assist the P* as directed.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1176

PERFORM NONPRECISION APPROACH

CONDITIONS: In an OH-58 helicopter under simulated instrument meteorological conditions (IMC) and with the appropriate Department of Defense (DOD) flight information publication (FLIP) and the approach clearance received.

STANDARDS:

1. Pilot on the controls (P*).
   a. Execute the approach according to AR 95-1, FM 1-240, and the DOD FLIP.
   b. Maintain airspeed ±10 knots indicated airspeed (KIAS).
   c. Maintain altitude ±100 feet.
   d. Maintain prescribed courses as follows:
      (1) Non-directional (radio) beacon (NDB) courses: ±5 degrees.
      (2) Very high frequency omni-directional range radio beacon (VOR) courses: Within a 1/2 scale deflection of the course deviation indicator (CDI) or ±5 degrees using the radio bearing and heading indicator (RBHI).
      (3) Location (LOC) courses: Within a full-scale deflection of the CDI.
   e. During airport surveillance radar (ASR) approaches, make immediate heading and altitude changes issued by the air traffic control (ATC) and maintain heading ±5 degrees.
   f. Comply with descent minimums prescribed for the approach.
   g. Execute the correct missed approach procedure immediately upon reaching the missed approach point (MAP) if a landing cannot be accomplished.
2. Pilot not on the controls (P).
   a. Without error, request, acknowledge, and record ATC information.
   b. Without error, tune the avionics to the appropriate frequencies with the aid of the DOD FLIP.
   c. Provide the P* with the correct approach minimums as listed in the appropriate DOD FLIP.

DESCRIPTION: The P* will perform the approach as described in FM 1-240. The P will assist the P* by—

1. Tuning the avionics to the proper frequencies and providing the instrument approach minimums listed in the DOD FLIP.
2. Maintaining communications with ATC and recording ATC information when appropriate.
3. Keeping a sharp lookout and informing the aviator immediately of any observed aircraft by using clock positions, distance, and the terms “high,” “low,” or “level.”
4. Announcing the minimum decision altitude (MDA) and performing other duties as requested by the P*.

Note 1: The P must notify the P* and receive acknowledgement before changing frequencies or tuning the navigational aids (NAVAIDs).

Note 2: When an observer occupies the second crew position, practice hooded approaches may not be made lower than that prescribed in AR 95-1.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1178

PERFORM PRECISION APPROACH

CONDITIONS: In an OH-58 helicopter with reference to flight instruments only. Given the appropriate Department of Defense (DOD) flight information publication (FLIP), approach clearance, and before-landing check complete.

STANDARDS:

1. Perform the approach per AR 95-1, FM 1-240, and the DOD FLIP.
2. Maintain airspeed ±10 knots indicated airspeed (KIAS).
3. Maintain assigned altitude ±100 feet.
4. Maintain heading ±5 degrees.
5. Make immediate corrections issued by air traffic control (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.
8. For an instrument landing system (ILS) approach, maintain the course deviation bar within a full-scale deflection of the course deviation indicator (CDI); for final approach, maintain the glide slope indicator within a full-scale deflection.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (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/pilot not on the controls (P). The P* will announce any deviation not directed by ATC/P, and will acknowledge all navigation directives. If visual contact with the landing environment is not made at decision height, he will announce and execute a missed approach.

   b. The P will perform duties as directed by the P*. The P will call out the approach procedure to the P* and acknowledge any unannounced deviations. The P will correctly tune and identify the appropriate navigational aids (NAVAIDs). 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 his 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 a co-pilot briefing and designate crew responsibilities for the approach.

Note 1: FM 1-240 describes approach procedures.

Note 2: In the initial call to ATC advise them if the aircraft is equipped with any NAVAID receivers.

Note 3: 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.

REFERENCES: Appropriate common references.

TASK 1182

PERFORM UNUSUAL ATTITUDE RECOVERY

CONDITIONS: In an OH-58 helicopter, with reference to flight instruments only, with an instrument flight examiner (IE), or instructor pilot (IP).

STANDARDS:

1. Analyze aircraft attitude.
2. Without delay, use correct recovery procedures in the proper sequence.
3. Recover without exceeding aircraft limitations and with minimum loss of altitude.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will remain focused inside the aircraft during recovery if instrument meteorological conditions (IMC). The P* will advise the pilot not on the controls (P) if the P* detects an unusual attitude and request assistance. The P* will be prepared to relinquish the controls if necessary.

   b. The P is responsible for clearing the aircraft and obstacle avoidance. The P 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 attitude, torque, and trim. The P will provide adequate warning for corrective action if aircraft operating limitations may be exceeded. The P will be prepared to take the controls if needed and 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 by—

   a. Attitude. Establishing a level bank and pitch attitude.
   b. Heading. Establishing and maintaining a heading.
   c. Torque. Adjusting the torque to the appropriate setting.
   d. Airspeed. Establishing and maintaining the appropriate airspeed.
   e. Trim. Trimming the aircraft.

Note: Practicing this task at night provides greater benefit since external cues are less visible.

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: Obscurants other than weather can induce loss of visual contact. 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.

REFERENCES: Appropriate common references.

TASK 1184

RESPOND TO INADVERENT INSTRUMENT METEOROLOGICAL CONDITIONS (IIMC)

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Maintain aircraft control and make the transition to instrument flight immediately.
2. Initiate a climb immediately.
3. Comply with all air traffic control (ATC) procedural instructions, local regulations, and standing operating procedures (SOP).

DESCRIPTION:

1. Crew actions.
   a. The pilot on the controls (P*) will—
      (1) Announce inadvertent IMC.
      (2) Transition to instrument flight.
      (3) Begin recovery procedures.
      (4) Announce if disoriented and unable to recover.
      (5) The P* will call out—
         (a) Desired heading.
         (b) Desired torque.
         (c) Desired airspeed.
   b. The pilot not on the controls (P) will—
      (1) Announce IMC and monitor instruments to assist in recovery.
      (2) 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.
      (3) Tune the radios to the appropriate frequencies, make the appropriate radio calls, and set transponder to the appropriate code.
      (4) Request ATC assistance, acknowledge and record ATC information.
      (5) Perform any other crew tasks as directed by the P*.
2. Procedures. If inadvertent IMC are encountered by both crewmembers, perform the following:
   a. Attitude. Level the wings on the attitude indicator.
   b. Heading. Maintain heading; turn only to avoid known obstacles.
   c. Torque. Adjust the torque to climb power.
   d. Airspeed. Adjust the airspeed to climb airspeed.
   e. Trim. Maintain the aircraft in trim.
   f. Set the transponder to emergency once the aircraft is under control.
   g. Complete the procedure per local regulations and policies.

NIGHT OR NVG CONSIDERATIONS: Entering IMC with the search light on may induce spatial disorientation. The NVGs may be removed or flipped up once stable flight is established. When using NVGs, it may be possible to see through thin obscuration (for example, fog and drizzle) with little or no degradation. It may be beneficial for the P not to completely remove NVGs. The NVGs may assist in

recovery by allowing the P to see through thin obscuration that would otherwise prevent him from seeing the landing environment.

Note 1: 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.

Note 2: 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.

REFERENCES: Appropriate common references.

TASK 1321

PERFORM ANTI-TORQUE MALFUNCTION

CONDITIONS: In an OH-58 helicopter with an instructor pilot (IP), the emergency procedures training criteria outlined in AR 95-1 met, the before-landing check completed, and given entry altitude and airspeed.

STANDARDS:

1. Establish entry altitude as directed ±100 feet.
2. Establish entry airspeed as directed ±10 knots indicated airspeed (KIAS).
3. Maintain a constant approach angle.
4. Maintain ground track alignment with the landing direction.
5. Maintain landing area alignment at touchdown ±10 degrees.
6. Perform a smooth, controlled termination.
7. Correctly perform crew coordination actions.

DESCRIPTION:

1. Right pedal setting.

   a. On base leg, the pilot on the controls (P*) will descend to the appropriate altitude and decelerate to 60 KIAS. On final, he will ensure that the aircraft is at the proper altitude and airspeed and in trim with power set as necessary to maintain level flight at 60 KIAS. The IP will then establish a 10-degree nose-right, out-of-trim condition (not to exceed 20 degrees from the runway heading). After intercepting a shallow approach angle, the P*will adjust the collective as necessary to maintain the angle. The P* will maintain entry airspeed until the apparent ground speed and the rate of closure appear to be increasing. The P* will progressively decrease the rate of descent and the rate of closure.

   b. The P* will plan to arrive over the first one-third of the landing area approximately two feet above the ground at a minimum airspeed for directional control. The P* will reduce the throttle as necessary to overcome the yaw effect (nose right).

   c. When the aircraft is aligned with the intended landing direction, the P* will adjust the collective as necessary to cushion the landing. After ground contact, he will adjust the collective, cyclic, and throttle to maintain aircraft alignment with the landing direction and to minimize forward speed. When the aircraft comes to a complete stop, the P* will reduce the collective to the full-down position and neutralize the pedals and the cyclic.

2. Left pedal setting.

   a. On base leg, the P* will descend to the appropriate altitude and decelerate to 60 KIAS. On final, the P* will ensure that the aircraft is at the proper altitude and airspeed and in trim with power set as necessary to maintain level flight at 60 KIAS. The IP will then establish a 10-degree nose-left, out-of-trim condition (not to exceed 20 degrees from the runway heading). After intercepting a shallow approach angle, the P* will adjust the collective as necessary to maintain the angle. The P* will also maintain entry airspeed until the apparent ground speed and the rate of closure appear to be increasing. The P* will progressively decrease the rate of descent and the rate of closure.

   b. The P* will plan to arrive over the first one-third of the landing area approximately two feet above the ground at or slightly above effective transitional lift (ETL). If the nose of the aircraft is to the left, he will maintain altitude with the collective while decreasing forward speed until ETL is lost. (At this point, the nose of the aircraft should move to the right because of the

increased power required to maintain altitude.) The P* will continue the rest of the maneuver as in paragraph 1c.

Note 1: The crewmember not on the controls will assist the P* as directed.

Note 2: After touchdown, aircraft heading may not be controllable with the throttle and the collective. If this happens, position the cyclic to follow the turn while recovering the aircraft with pedal inputs.

Note 3: In case of an actual in-flight emergency that results in fixed tail rotor pitch settings, use the procedures outlined in the aircraft operator's manual.

NIGHT OR NVG CONSIDERATIONS: Use of the landing light should be evaluated based on ambient lighting conditions.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Aircraft operator's manual.

TASK 1323

PERFORM HOVERING AUTOROTATION

CONDITIONS: In an OH-58 helicopter with an instructor pilot (IP), with the aircraft headed into the wind, and in an approved touchdown area.

STANDARDS:

1. Establish an entry altitude of 3 feet, ±1 foot.
2. Maintain heading ±10 degrees.
3. Maintain position over ground ±1 foot.
4. Execute a smooth, controlled descent and touchdown.
5. Correctly perform crew coordination actions.

DESCRIPTION:

1. From a stabilized 3-foot hover, the pilot on the controls (P*) will retard the throttle to engine idle stop. (While retarding the throttle, do not raise or lower the collective.) Apply the right pedal to maintain heading and adjust the cyclic to maintain the position of the aircraft 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; be alert 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 the cyclic.
2. The crewmember not on the controls will monitor aircraft drift and obstacle clearance and advise the P* if any unsafe condition develops.

NIGHT OR NVG CONSIDERATIONS:

1. At night, proper scanning techniques are necessary to avoid spatial disorientation. Orient on areas of good contrast to help maintain the position of the aircraft over the ground.
2. Determine the need for the landing/searchlight before this maneuver is performed.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1327

PERFORM LOW-LEVEL AUTOROTATION

CONDITIONS: In an OH-58 helicopter with an instructor pilot (IP), the emergency procedures training criteria outlined in AR 95-1 met, the before-landing check completed, and given entry altitude.

STANDARDS:

1. Establish entry altitude as directed ±10 feet.
2. Establish entry airspeed 80 knots indicated airspeed (KIAS), ±10 KIAS.
3. Determine the correct entry point.
4. Perform a smooth and progressive deceleration.
5. Apply initial pitch at 10 feet, ±3 feet, above ground level (AGL).
6. Maintain heading alignment throughout the maneuver±10 degrees.
7. Perform a smooth, controlled termination.

DESCRIPTION:

1. On base leg, the pilot on the controls (P*) will establish an angle of descent to arrive at an altitude of 50 feet above highest obstacle (AHO) (or as directed) just before reaching the entry point. During the descent, the P* will maintain visual contact with the intended landing area and establish an entry point that ensures touchdown in the selected area. At the entry point, the P* will ensure that the aircraft is at the proper altitude and airspeed and in trim with cruise power applied. The P* will simultaneously lower the collective, retard the throttle to engine-idle stop, and apply aft cyclic to maintain entry altitude. The P* will visually check gas producer and rotor revolutions per minute (RPM) and maintain entry altitude until a standard autorotational descent profile is intercepted. As the aircraft begins to descend, the P* will decelerate as in a standard autorotation and maintain aircraft alignment with the touchdown area by properly applying the pedals and the cyclic. The P* will adjust the collective, if required, to prevent excessive rotor RPM. At approximately 10 feet AGL, the P* will apply sufficient collective to control the rate of descent and the ground speed. The amount of collective applied and rate of application will depend on the rate of descent and ground speed. Just before touchdown, the P* will adjust the cyclic to attain a level landing attitude and apply collective as necessary to cushion the landing. After touchdown, he will slowly lower the collective to the full-down position while maintaining ground track alignment with the pedals. When the aircraft comes to a complete stop, the P* will neutralize the pedals and the cyclic.

2. The crewmember not on the controls will assist the P* as directed. The crewmember will monitor the aircraft instruments and advise the P* if any unsafe condition develops.

NIGHT OR NVG CONSIDERATIONS: Attitude control is critical during night autorotations, especially at entry. Reduced visual references at night limit the aviator's ability to estimate airspeed, altitude, and alignment with the touchdown area. Proper scanning techniques and the use of the searchlight or landing light before entry will assist in avoiding spatial disorientation.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1333

PERFORM LOW-LEVEL/LOW-AIRSPEED AUTOROTATION

CONDITIONS: In an OH-58 helicopter with an instructor pilot (IP), the emergency procedures training criteria outlined in AR 95-1 met, the before-landing check completed, and given entry altitude.

STANDARDS:

1. Establish entry altitude as directed ±5 feet.
2. Establish entry airspeed 60 knots indicated airspeed (KIAS), ±5 KIAS
3. Determine the correct entry point.
4. Apply initial pitch at 10 feet, ±3 feet, above ground level (AGL).
5. Maintain heading alignment throughout maneuver ±10 degrees.
6. Perform a smooth, controlled termination.
7. Correctly perform crew coordination actions.

DESCRIPTION:

1. On base leg, the pilot on the controls (P*) will establish an angle of descent to arrive on final at an altitude of 40 feet AGL (or as directed) just before reaching the entry point. During the descent, the P* will maintain visual contact with landing area and establish an entry point that ensures touchdown in the selected area. At the entry point, the P* will ensure that the aircraft is at the proper altitude and airspeed and in trim with power applied to sustain level flight. The P* will retard the throttle to engine-idle stop while simultaneously lowering the collective to the full-down position. The P* will maintain aircraft alignment with the touchdown area with the pedals. As the aircraft begins to descend, he will initiate a smooth deceleration. At approximately 10 feet AGL, the P* will apply sufficient collective to control the rate of descent and the ground speed. The amount of collective applied and the rate of application will depend on the rate of descent and the ground speed. Just before the aircraft touches down, the P* will adjust the cyclic to attain a level landing attitude and apply collective as necessary to cushion the landing. After the aircraft touches down, the P* will slowly lower collective to the full-down position while maintaining ground track alignment with the pedals. When the aircraft comes to a complete stop, the P* will neutralize the pedals and the cyclic.
2. The crewmember not on the controls will assist the P* as directed. The crewmember will monitor the aircraft instruments and advise the P* if any unsafe condition develops.

NIGHT OR NVG CONSIDERATIONS: Attitude control is critical during night autorotations, especially at entry. Reduced visual references at night limit the aviator's ability to estimate airspeed, altitude, and alignment with the touchdown area. Proper scanning techniques and the use of the searchlight or landing light before entry will assist in avoiding spatial disorientation.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1335

PERFORM AUTOROTATION WITH TURN

CONDITIONS: In an OH-58 helicopter with an instructor pilot (IP), the emergency procedures training criteria outlined in AR 95-1 met, before-landing check completed, and given entry altitude and airspeed.

STANDARDS:

1. Establish entry altitude as directed ±100 feet.
2. Establish entry airspeed as directed ±10 knots indicated airspeed (KIAS).
3. Determine the correct entry point.
4. Make the required verbal call outs at the proper time.
5. Maintain a 60-knot attitude during the turn.
6. Complete the final turn and align the aircraft with the landing area before reaching 200 feet above ground level (AGL).
7. Establish a 60-knot airspeed, +10 / -5 KIAS, before reaching 100 feet AGL.
8. Perform a smooth, progressive deceleration.
9. Apply initial pitch at 10 feet, ±3 feet, AGL.
10. Maintain heading alignment at touchdown ±10 degrees.
11. Perform a smooth, controlled termination.
12. Correctly perform crew coordination actions.

DESCRIPTION:

1. The pilot on the controls (P*) will maintain entry altitude and airspeed as directed until reaching the entry point. The P* will initiate the maneuver by lowering the collective to the full-down position, retard the throttle to engine-idle stop, and adjust the pedals to maintain trim. The P* will smoothly apply the cyclic to attain a 60-knot attitude descending turn. The P* will disregard the airspeed indicator during the turn and adjust the collective as required to maintain rotor revolutions per minute (RPM) within limits. The P* will call out rotor RPM, gas producer, and aircraft in trim. The P* will adjust the angle of bank as necessary to ensure that the turn is completed and the aircraft is aligned with the landing area before descending below 200 feet AGL. Before reaching 100 feet AGL, the P* will ensure that a steady-state autorotation is attained. If it is not attained, the P* will execute a go-around or terminate with power as appropriate. A steady-state autorotation means that—

   a. Rotor RPM is within limits.
   b. The aircraft is at the correct airspeed.
   c. The aircraft is descending at a normal rate.
   d. The aircraft is in a position to terminate in the intended landing area.

2. At approximately 50 feet AGL, the P* will apply aft cyclic to initiate a smooth, progressive deceleration. The P* will maintain aircraft alignment with the touchdown area by properly applying the pedals and the cyclic. The P* will adjust the collective, if required, to prevent excessive rotor RPM. At approximately 10 feet AGL, the P* will apply sufficient collective to control the rate of descent and the ground speed. The amount of collective applied and the rate of application will depend on the rate of descent and the ground speed. Just before touchdown, the P* will adjust the cyclic to attain a level landing attitude and apply the collective as necessary to cushion the landing. After touchdown, the P* will slowly lower the collective to the full-down position while maintaining

ground track alignment with the pedals. When the aircraft comes to a complete stop, the P* will neutralize the pedals and the cyclic.

3. The crewmember not on the controls will assist the P* as directed. The crewmember will monitor the aircraft instruments and advise the P* if any unsafe condition develops.

NIGHT OR NVG CONSIDERATIONS: Attitude control is critical during night autorotations. Reduced visual preferences at night limit the aviator's ability to estimate airspeed, altitude, and alignment with the touchdown area. To compensate for the reduced visual references, the aviator will attain a steady-state autorotation before descending through 200 feet AGL. Selecting ground references that are in the vicinity of the touchdown area and ones that provide high visual contrast or are of a known height will help in judging the approach. If the searchlight or landing light is used, it should be turned on before descending through 100 feet AGL.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 1472

Perform Aerial Observation

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Detect the target using visual search techniques.
2. Identify the target.
3. Locate the target.
4. Report the target as briefed.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) is responsible for clearing the aircraft and obstacle avoidance. The P* will maintain aircraft orientation and perform reconnaissance of assigned sector as duties permit.

   b. The pilot not on the controls (P) will operate the communications (COMM) systems. When scanning the area, the P should concentrate on avenues of approach while periodically scanning adjoining terrain. The P 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 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.

      (1) Detection. Detection requires determination that an object or an activity exists.

      (2) Identification. Major factors in identifying a target are size, shape, and type of armament. Targets are classified as friendly or enemy.

      (3) 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 laser range finder/designator (LRF/D).

      (4) 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.

   b. 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.

      (1) Altitude. Higher altitudes offer greater visibility with less detail. Lower altitudes are usually used because of survivability considerations.

      (2) Airspeed. Selection of the airspeed is determined by the altitude, the terrain, the threat, and meteorological conditions.

      (3) 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 nap of the earth (NOE) altitudes.

(4) 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:

(a) Color. Colors in nature tend to be subdued. Look for colors that stand out against, and contrast with, natural backdrops.

(b) Texture. Smooth surfaces, such as glass windows or canopies, will shine when reflecting light. Rough surfaces will not.

(c) Shadows. Man-made objects cast distinctive shadows characterized by regular shapes and contours, as opposed to the random patterns that occur naturally.

(d) Trails. Trails leading into an area should be observed for cues as to the type and quantity of traffic, and how recently it passed.

(e) Smoke. Smoke should be observed for color, smell, and volume.

(f) 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.

(g) 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.

c. The techniques that provide systematic methods for conducting visual aerial observation are motive and stationary. The technique used will depend on the altitude flown and the terrain encountered.

(1) Motive technique. This technique is used when the aircraft is operating at terrain flight altitudes and at airspeeds of generally 10 KIAS or faster. The entire area on either side of the aircraft is divided into two major sectors: the non-observation sector and the observation work sector. The non-observation 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.

(a) The acquisition sector is the forward 45-degree area of the observation work sector. This is the primary area of search.

(b) 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.

(2) Stationary technique. This technique is used at NOE 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, searching an area approximately 50 meters in depth. The crewmember continues to scan outward from the aircraft, increasing the depth of the search area by overlapping 50-meter intervals until he has covered the entire search area.

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. The P 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.

REFERENCES: Appropriate common references.

TASK 1474

RESPOND TO NIGHT VISION GOGGLE (NVG) FAILURE

CONDITIONS: In an OH-58 helicopter or orally, given a cue of impending or actual NVG failure.

STANDARDS:

1. Identify or describe indications of impending/actual NVG failure.
2. Perform or describe emergency procedures for impending/actual NVG failure.

DESCRIPTION: Impending/actual NVG failure may be indicated by illumination of the low-voltage indicator light. It also may be indicated by one or both tubes flickering, dimming, or shutting down.

1. Crew actions.

   a. The pilot on the controls (P*) will remain focused outside the aircraft. The P* is responsible for clearing the aircraft and obstacle avoidance. If the P*'s NVGs fail or indicate impending failure, the P* will announce "GOGGLE FAILURE" and transfer the controls to the pilot not on the controls (P).

   b. If the P's NVGs fail or indicate impending failure, the P will announce "GOGGLE FAILURE." Switch batteries or troubleshoot the goggles. If the NVGs are not restored to operation, make the appropriate report and modify the mission as briefed.

2. Procedures.

   a. During NVG flight, with a P, the P* will—

      (1) Immediately announce "GOGGLE FAILURE" and, if necessary, begin a climb at a rate that will ensure obstacle avoidance.

      (2) Transfer the flight controls if necessary.

      (3) Attempt to restore the goggles. If NVGs are restored, continue the mission. If not restored, lock the NVGs in the up position and proceed as briefed.

   b. During NVG flight with a P*, the P will—

      (1) Immediately announce "GOGGLE FAILURE" and attempt to restore the goggles.

      (2) If NVGs are restored, continue the mission. If not restored, lock the NVGs in the up position and proceed as briefed.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus:

TM 11-5855-263-10.

TASK 2010

PERFORM MULTI - AIRCRAFT OPERATIONS

CONDITIONS: In an OH-58 helicopter, given a unit standing operating procedures (SOP).

STANDARDS:

1. Brief the flight.
2. Perform formation flight or techniques of movement as briefed.

DESCRIPTION:

1. Crew actions.

2. The pilot on the controls (P*) will focus primarily outside the aircraft, keeping track of other aircraft on the route of flight. The P* will announce any maneuver or movement before execution and inform the pilot not on the controls (P) if visual contact is lost with other aircraft. The P* must keep the P thoroughly informed of observations and actions throughout the formation flight or multi-ship operation. The P* will execute instrument meteorological conditions (IMC) breakup (if necessary) as briefed.

3. The P will provide adequate warning of traffic or obstacles detected in the flight path and identified on the map. The P will assist in maintaining aircraft separation. The P will inform the P* if visual contact is lost with other aircraft, and if threat elements are detected or sighted. The P will perform duties as briefed. The P will notify the P* when attention is focused inside the aircraft. The P should frequently assist the P* by communicating situational awareness perceptions and formation/multi-ship observations. Additionally the P should assist P* by scanning the air route for possible intruders or other hazards and obstacles to the integrity and security of the flight.

4. Procedures. As briefed, maneuver into the flight formation, changing position as required. Maintain horizontal and vertical separation in accordance with unit SOP for the type of formation being flown. If the tactical situation requires, perform techniques of movement as briefed. The techniques of movement, traveling, traveling overwatch and bounding overwatch are described in FM 1-112 and FM 1-114.

NIGHT OR NVG CONSIDERATIONS:

1. Night. During unaided night flight, the crew may use formation and position lights to aid in maintaining the aircraft's position in the formation.

2. Night vision goggles (NVG). 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 crewmember should ensure that the P* maintains attention outside the cockpit. Keep changes in the formation to a minimum. All crewmembers must avoid fixation by using proper scanning techniques.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2012

Perform Tactical Flight Mission Planning

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

STANDARDS:

1. Analyze the mission using the factors of METT-TC (mission, enemy, terrain and weather, troops and support available, time available, civil considerations).
2. Perform a map/photo reconnaissance using the available map media, air mission planning system video map terminal, or photos. Ensure that all known hazards to terrain flight are plotted on the map or into the air mission planning system.
3. Select the appropriate terrain flight modes.
4. Select appropriate primary and alternate routes and enter all of them on a map, route sketch, or into the air mission planning system.
5. Determine the distance ±1 kilometer, ground speed ±5 knots, and estimated time en route (ETE) ±1 minute for each leg of the flight.
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 standing operating procedures (SOP).
9. Conduct a thorough crew mission briefing per the unit SOP and Task 1000.

DESCRIPTION:

1. Crew actions.
   a. The pilot in command (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 pilot (PI) will perform the planning tasks directed by the PC/air mission commander (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, 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, if available. Determine primary and alternate routes terrain flight modes, and movement techniques. Determine time, distance, and fuel requirements using the navigational computer or air mission planning system. Annotate the map, overlay, or air mission planning system with sufficient information to complete the mission. This includes waypoint coordinates that define the routes for entry into the air mission planning system. Consider such items as hazards, checkpoints, observation posts, and friendly and enemy positions. Review contingency procedures.

Note: Evaluate weather impact on the mission. Considerations should include aircraft performance, limitations on visual sensors, and weapons employment.

NIGHT OR NVG CONSIDERATIONS: More detailed flight planning is required when the flight is conducted in reduced visibility, at night, or in the night vision goggles (NVG) flight environment. TC 1-204 contains details on night navigation.

TRAINING AND EVALUATION CONSIDERATIONS: This task specifically considers the tactical flight planning aspects of mission planning. Evaluation of this task will be accomplished academically since actual tactical planning – even for training missions – is normally a collective event with unit members planning separate components of the mission.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references and:

Task 1000

Task 1004

TASK 2025

PERFORM TERRAIN FLIGHT TAKEOFF

CONDITIONS: In an OH-58 helicopter with hover power and before-takeoff checks completed and the aircraft cleared.

STANDARDS:

1. Maintain takeoff heading ±10 degrees.
2. Maintain takeoff flight path until clear of obstacles.
3. Maintain power as required to clear obstacles safely while not exceeding aircraft limitations.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (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 pilot not on the controls (P) will maintain visual reference outside the aircraft, acknowledge that he is ready for takeoff and provide adequate warning of any obstacles or hazards in the flight path.

2. Procedures. Determine the takeoff direction by analyzing the tactical situation, wind, long axis of the takeoff area, and the lowest obstacles. Select reference points to assist in maintaining the takeoff flight path. 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 (nap of the earth [NOE], contour, or low level).

Note 1: Hover out-of-ground effect (OGE) power is required for terrain flight takeoffs.

Note 2: When this maneuver is performed from a confined area, repositioning the aircraft downwind will minimize the power requirements on takeoff.

NIGHT OR NVG CONSIDERATIONS:

1. Before the aircraft leaves the ground, determine if the landing or searchlight is required.
2. Treat visual obstacles, such as shadows, the same as physical obstacles.
3. Maintain proper scanning techniques to avoid becoming spatially disoriented.
4. In the absence of obstacles, perform a normal takeoff as described in Task 1018. If sufficient illumination does not exist to view obstacles, an altitude-over-airspeed takeoff should be performed.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2026

PERFORM TERRAIN FLIGHT

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Terrain flight mode.
   a. Nap of the earth (NOE) flight.
      (1) Fly as close to the earth's surface as vegetation, obstacles, and ambient light will permit.
      (2) Maintain airspeed appropriate for the terrain, enemy situation, weather and ambient light.
   b. Contour flight.
      (1) Maintain an altitude that allows safe clearance of obstacles while generally conforming to the contours of the earth.
      (2) Maintain an airspeed appropriate for the terrain, enemy situation, weather and ambient light.
      (3) Maintain the aircraft in trim.
   c. Low-level flight.
      (1) Maintain altitude ±50 feet.
      (2) Maintain airspeed ±10 knots indicated airspeed (KIAS).
      (3) Maintain aircraft in trim.
2. Terrain flight navigation.
   a. During NOE flight—
      (1) Know the en route location within 200 meters.
      (2) Identify all checkpoints.
      (3) Locate the final objective within 100 meters.
   b. During low-level or contour flight—
      (1) Know the en route location within 500 meters.
      (2) Identify all checkpoints.
      (3) Locate the final objective within 100 meters.

DESCRIPTION:

1. Crew actions.
   a. The pilot on the controls (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 pilot not on the controls (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 attention is focused inside the cockpit.

2. Procedures. Terrain flying involves flight 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 mode. 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.

(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.

(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.

Note 1: Out-of-ground effect (OGE) hover power is required for NOE flight.

b. Terrain flight navigation. Terrain flight navigation requires the crew to work as a team. Remain primarily focused outside the aircraft. Acknowledge commands for heading and airspeed changes necessary to navigate the desired course. Announce significant terrain features and other cues to assist in navigation. Announce any verified or perceived hazards to flight and provide instructions and perform actions for obstacle/hazard avoidance. Change aircraft heading and airspeed as appropriate to navigate the desired course. Announce all plotted hazards prior to approaching their location. 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.

(1) During NOE flight, the crew identifies prominent terrain features that are located some distance ahead of the aircraft and which lie along or near the course. Using these points to key on, maneuver the aircraft to take advantage of the terrain and vegetation for concealment. If general navigational techniques do not apply, identify the desired route by designating a series of successive checkpoints. To remain continuously oriented, compare actual terrain features with those on the map.

(2) Contour navigation is less precise than NOE navigation because the contour route is more direct. An effective technique to combine the use of terrain features and rally terms when giving directions. This will allow the P* to focus attention outside the aircraft.

(3) For low-level navigation, verify time and distance to fly specific headings and airspeeds.

Note 2: If the area permits, the crew should navigate at least 20 kilometers during NOE flight training or 40 kilometers during low-level or contour flight training.

Note 3: Each of the methods for stating heading information is appropriate under specific conditions. When a number of terrain features are visible and prominent enough for the P* to recognize them, the most appropriate method is navigation instruction toward the terrain feature in view. Navigation instructions toward a distant, unseen terrain feature are appropriate when few changes are anticipated. 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.

NIGHT OR NVG CONSIDERATIONS:

1. Terrain flight modes. Wires and other hazards are difficult to detect with the night vision goggles (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.
2. Terrain flight navigation. Conducting the flight in reduced visibility or at night (aided or unaided) requires more detailed flight planning and map preparation. TC 1-204 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.

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 (for example, 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: Appropriate common references.

TASK 2030

PERFORM TERRAIN FLIGHT APPROACH

CONDITIONS: In an OH-58 helicopter with the before-landing check completed.

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 with minimum drift.
4. Maintain the appropriate rate of closure.
5. Make a smooth, controlled termination at the intended landing area.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (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 the aircraft to assist in clearing and announce intent to land, abort, or alter the approach. The P* will announce beginning of the approach when intercepting an angle that assures obstacle clearance. The P* will announce if the approach will terminate to a hover or to the ground, intended landing area, and any deviation to the approach.

   b. The pilot not on the controls (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. The P will also announce if his 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 to monitor the aircraft instruments.

2. Procedure. 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.

Note 1: 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. A go-around should be made before descending below obstacles or decelerating below effective transitional lift (ETL) or when visual contact with the approach point is lost on final.

Note 2: If at anytime during the approach the P* loses visual contact or it becomes apparent he will lose visual contact 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.

Note 3: Hover out-of-ground effect (OGE) power is required prior to a terrain flight approach.

Note 4: 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.

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 take off.

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 effective translational lift. 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, lower the collective and allow the aircraft to settle. Apply slight aft cyclic at touch down 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.

Note 1: 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 2: 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.

Note 3: 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.

REFERENCES: Appropriate common references.

TASK 2034

PERFORM MASKING AND UNMASKING

CONDITIONS: In an OH-58 helicopter, and out-of-ground effect (OGE) power available.

STANDARDS:

1. Perform a map reconnaissance.
2. Mask the aircraft from enemy visual and electronic detection.
3. Ensure that exposure time does not exceed 10 seconds when unmasking the aircraft.
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 pilot in command (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 pilot on the controls (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 primary concern will be aircraft control while viewing the assigned sector.

   c. The pilot not on the controls (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 pre-mission 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.

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 for hazards.

   b. Unmasking in flight. Keep aircraft exposure time to a minimum to prevent enemy visual observation or electronic detection. Radar can lock onto a target within 2 to 9 seconds.

   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 see 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 re-masking.

   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. The radar altimeter may be used to assist in maintaining altitude. 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 his viewing perspective between high and low references. Therefore, the P* must rely on the P for assistance if he becomes disoriented. Regardless of the mission the P* must fly the aircraft first and then observe his sector.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references plus aircraft survivability equipment trainer (ASET).

TASK 2036

PERFORM TERRAIN FLIGHT DECELERATION

CONDITIONS: In an OH-58 helicopter.

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

   b. The pilot not on the controls (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.

Note: Out-of-ground effect (OGE) hover power is required for terrain flight decelerations.

NIGHT OR NVG CONSIDERATIONS: Because of the limited field of view (FOV) of the night vision goggles (NVG), avoid making abrupt changes in aircraft attitude. An extreme nose-high attitude limits the forward FOV. 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.

REFERENCES: Appropriate common references.

TASK 2042

PERFORM ACTIONS ON CONTACT

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Use correct actions on contact consistent with the tactical situation.
2. Perform evasive maneuvers (if necessary) appropriate for the type of threat.

DESCRIPTION:

1. Crew actions. The first crewmember to recognize the threat will immediately announce enemy contact (visual or electronic), type (hostile fire), and location of threat.

a. The pilot on the controls (P*) will remain focused outside the aircraft and is responsible for clearing the aircraft and obstacle avoidance. The P* will deploy to cover or position the aircraft to return suppressive fire if necessary/briefed. The P* will announce the direction of flight to evade detection and will direct the pilot not on the controls (P) to remain focused outside the aircraft for clearing.

b. The P will remain oriented on threat location and assist clearing the aircraft and will announce warning to avoid obstacles and when his attention is focused inside the aircraft.

c. The crew will transmit a report as required.

2. Procedures. Actions on contact are a series of combat actions taken on contact with the enemy to develop the situation. Obstacles are treated like enemy contact since they are assumed to be covered by fire. The element making contact initiates these actions and they occur at each level of command, often simultaneously. Units perform these actions whether or not the enemy has detected the presence of the scout. Actions on contact are as follows:

- Deploy and report.
- Develop the situation.
- Choose a course of action.
- Recommend or execute a course of action.

a. Deploy and report. Upon encountering an obstacle or enemy force, the element of the troop making contact deploys to a covered position affording observation and fields of fire. If necessary, the element uses direct fire to suppress the enemy, allowing freedom to maneuver. An immediate contact report is submitted with whatever information is available. This report alerts the commander and allows him to begin necessary actions.

b. Develop the situation. The leader of the element in contact develops the situation to define the threat being faced, using various reconnaissance techniques as appropriate. These techniques range from stealthy dismounted reconnaissance, mounted reconnaissance, and reconnaissance by fire-both direct and indirect. The troop or squadron commander continues the mission with other elements to a designated limit of advance. Doing so helps to develop the situation across the front and provides more maneuver space to execute subsequent action. Once a clearer picture of the situation is developed, detailed spot reports are forwarded.

c. Choose a course of action. Once the leader in contact has gathered enough information to make a decision, the leader selects a course of action. The course of action should adhere to the intent of the commander, be within the capability of the unit, and allow the unit to resume the mission as soon as possible. For enemy contact, courses of action consist of the following:

(1) Hasty attack. A hasty attack is executed if sufficient combat power is available, and it will not detract from mission accomplishment. A hasty attack is executed by at least a troop, which can mass adequate combat power.

(2) Bypass. The enemy may be bypassed if sufficient combat power is not available, or if an attack will jeopardize mission accomplishment. The unit requests permission to bypass unless stated in orders. The commander must keep a minimum force in contact with the bypassed enemy.

(3) Hasty defense. If a hasty attack is not possible or a bypass is not feasible, the leader establishes a hasty defense or screen. The unit will conduct a hasty defense if it can defend against an enemy force. If the enemy contact exceeds the unit's capability to defend, it may elect to establish a screen and maintain contact through observation. The unit concentrates on maintaining contact with the enemy and fixing it in place with indirect or possibly direct fire until additional combat power can be brought to bear from supporting units.

d. Recommend a course of action. Once the leader has selected a course of action, the leader reports it to his commander. The commander approves or disapproves the course of action based upon its impact on the overall mission. The standing operating procedure (SOP) may provide automatic approval of certain actions to avoid unnecessary delay. If the higher commander assumes responsibility to continue developing the situation, the leader in contact supports his actions as ordered.

3. If an evasive maneuver is required to evade enemy fire use the procedures described below for the type weapon encountered.

a. Tanks and small arms. Immediately turn away from the fire toward an area of concealment. If concealment is unavailable, make sharp turns of unequal magnitude and unequal intervals and small changes in altitude to provide the best protection until beyond the effective range of hostile weapons. If the situation permits, employ immediate suppressive fire.

b. Large caliber, antiaircraft fire (radar-controlled). Immediately execute a 90-degree turn. Do not maintain a straight line of flight or the same altitude for more than 10 seconds before initiating a second 90-degree turn (ensure this turn is away from the threat). An immediate descent to nap of the earth (NOE) altitude will reduce the danger.

c. Fighters. When in an area where threat fighters are known or suspected to be operating, fly the helicopter at NOE altitude as much as possible. Upon sighting or sensing a fighter, try to mask the helicopter. If the fighter is alone and executes a dive, turn the helicopter toward the attacker, gain airspeed quickly and descend. This maneuver will cause the fighter pilot to increase his attack angle. Make an approximately 60-degree course change away from the attacker. As soon as the attacker is committed to follow the turn, make an approximately 60-degree course change in the opposite direction. The fighter pilot will then have to break off his attack to recover from the maneuver. Once the fighter breaks off his attack, maneuver the helicopter to take advantage of terrain, vegetation, and shadow for concealment. If the engaging fighters are a multiple element, the P* and P must maintain contact with all the fighters as they maneuver to ensure that countering one fighter attack does not make them an easy target for the second fighter.

d. Helicopters. Use the appropriate terrain flight maneuvers to break contact with or to evade threat helicopters.

e. Heat-seeking missiles. Try to keep helicopter heat sources away from the threat. If a missile is sighted, turn the tail of the helicopter away from the missile and mask the helicopter.

f. Antitank-guided missiles. Some missiles fly relatively slowly and can be avoided by rapidly repositioning the helicopter. If terrain or vegetation is not available for masking, remain oriented on the missile as it approaches. As the missile is about to impact, rapidly change the flight path or altitude to evade it.

g. Artillery. Depart the impact area and determine nuclear, biological, and chemical (NBC) requirements.

Note: If hit by hostile fire, rapidly assess the situation and determine an appropriate course of action. The most important consideration in an emergency is aircraft control. Therefore, the first step is to assess aircraft controllability. Then check all instruments and warning and caution messages. If a malfunction is indicated, initiate the appropriate emergency procedure. If continued flight is possible, take evasive action. Make a radio call (Mayday or Pan Pan) to report your situation, location, and action. Also request assistance if desired. Continue to be alert for unusual control responses, noises, and vibrations. Monitor all instruments for an indication of a malfunction. Fly the aircraft to the nearest secure location. Then land and inspect the aircraft to determine the extent of damage and whether flight can be continued to a medical or maintenance facility.

NIGHT OR NVG CONSIDERATIONS: Threat elements will be harder to detect. Rapid evasive maneuvers will be more hazardous. Crewmembers must maintain situational awareness. Aircraft control is the primary concern.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references and:

FM 17-95
FM 1-114

TASK 2049

PERFORM GLOBAL POSITIONING SYSTEM (GPS) AIDED NAVIGATION

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards and the following:

1. Operate the installed electronically aided navigational system per the appropriate technical manual (TM) and perform the following—
2. Add/delete/edit/store user defined waypoints.
3. Perform direct-to function.
4. Build a route.
5. Select appropriate route.
6. Route review function.
7. Show page functions.
8. Determine the position of the aircraft along the route of flight within 100 meters.

DESCRIPTION:

1. Crew actions.

   a. The pilot on the controls (P*) will fly the programmed navigation course using system displayed navigation cues or as directed by the pilot not on the controls (P).

   b. The P will announce all navigation destination changes and verify the heading. The P* will acknowledge and verify the new navigation heading.

Note 1: Only the P will perform in-flight time/labor intensive navigation system programming duties (for example, building routes) when available. When flying single pilot, programming of the navigation system should be completed prior to takeoff.

Note 2: The PC will ensure situational awareness is maintained at all times due to increased workload and information management challenges.

   c. As pertinent to the situation, either the P or P* will perform route navigation and position verification.

2. Procedures. Test and programming procedures per the appropriate TM.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 2050

Develop an emergency global positioning system (GPS) recovery procedure

> **WARNING**
>
> **This procedure is designed strictly for recovery under visual meteorological conditions (VMC) for training and for inadvertent instrument metrological conditions (IIMC) use only and will not be used for a planned instrument flight rules (IFR) flight unless approved by USAASA. This emergency recovery procedure is only authorized to be flown when the situation prevents the use of an approved navigational aid.**

Note: This task should be selected for instrument examiners.

CONDITIONS: With a tactical or aeronautical map with current obstruction information. A mission planning system with digital maps and recent chart updating manuals (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 (degrees magnetic), a missed approach course, final approach fix (FAF), missed approach point (MAP), intermediate approach fix (IF), initial approach fix (IAF) and missed approach holding fix (MAHF).
3. Determine obstacle clearance for the Final, MAHF, Missed, Intermediate, Initial segments, and the 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 3 NM 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 visual meteorological conditions (VMC) to validate the procedure.

Note: All altitudes are in Feet MSL, all waypoints are LAT/LONG, all distances are NM and visibility is SM. All obstacles are MSL unless otherwise noted. The flight information handbook (FIH) has the necessary conversion tables.

> **WARNING**
>
> **Ensure coordinates for maps and GPS are the same datum (for example WGS-84) or points on the ground may be off significantly and obstacle clearance will be questionable.**

Note: PPS refers to the GPS precise positioning service. It is Department of Defense (DOD) policy that military aircraft operate with the GPS in the PPS mode.

Note: Complete the enclosed figures for determining approach criteria. The width cannot be adjusted.

DESCRIPTION:

1. **Select The Most Suitable Recover/Landing Area.** Select an area based on METT-TC and obstacles. Ensure proper coordination for airspace de-confliction has been accomplished.

2. **Final Approach Segment:**

   a. Final Approach Segment – The final approach segment begins at the FAF and ends at the MAP.

   b. Determine the MAP (normally associated with the landing area or threshold).

   c. Determine the FAF. The minimum distance is 3 NM from the MAP. The maximum length is 10 NM. The optimum length is 5 NM. The width is 2.4 NM (1.2 NM on either side of centerline).

3. **Determine the Missed Approach Holding Fix (MAHF)**

   a. Determine the MAHF for the landing area.

   b. The minimum distance is 3 NM and the maximum distance is 7.5 NM from the MAP. The optimum distance is 5 NM. The holding pattern leg will not exceed 3 NM. The width is 4 NM (2 NM on either side).

(A) = Highest obstacle within 10 NM centered on the MAHF
MAHF Altitude Calculation

4. **Missed Approach Segment.**

   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.

5. **Intermediate Approach Segment**.

   a. The intermediate segment begins at the IF and ends at the FAF.

   b. Determine the IF. The minimum distance is 3 NM and the maximum distance is 5 NM from the IF to the FAF. The width is 4 NM (2 NM on either side).

6. **Initial Approach Segment.**

   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 3 NM from the IF and the maximum distance is 10 NM. The width is 4 NM (2 NM on either side).

7. **Determine The MSA For The Landing Area.** Use the OROCA or ORTCA elevation from the Enroute Low Altitude (ELA) chart for the area of operations, if available.

a. Select the highest altitude within 30 NM of the MAP.

(1) If an ELA is not available, the minimum sector altitude will be determined by adding 1000 feet to the maximum elevation figures (MEF). When a MEF is not available, apply the 1000 feet rule to the highest elevation within 30 NM of the MAP.

(2) Minimum Sector Altitudes can be established with sectors not less than 90 degrees and with sector obstacle clearance having a 4 NM overlap. Use the figure below for determining MSA.

(A) = Highest obstacle within 30 NM centered on the MAP
MSA Calculation

8. **The Procedures Diagram.** 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.

a. The Plan View. The plan view will include the following.

(1) The highest obstacle altitude (MSL) in BOLD.

(2) The approach course (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.
- "PPS REQUIRED."

b. Minimums section. The minimums section will include the following. The minimum descent altitude, visibility, and the height above landing (HAL). Use Table 4-1 to compute the landing visibility minimum based on HAL.

c. 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).

d. Prior to publication, the diagram will include, as a minimum, all items included in the example diagram.

HAL	250 – 475 ft	476 – 712 ft	713 – 950 ft
Landing Visibility Minimum (SM)	½	¾	1.0

Table 4-1. Landing Visibility Minimums based on Height Above Landing (HAL)

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, for example DGNS, EGI, PLGR. 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.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES:

FAA Handbook 8260.3 (TERPS Manual)
FAA Order 8460.42A (Helicopter GPS Nonprecision Approach Criteria)
FAA Order 7130.3 (Holding)

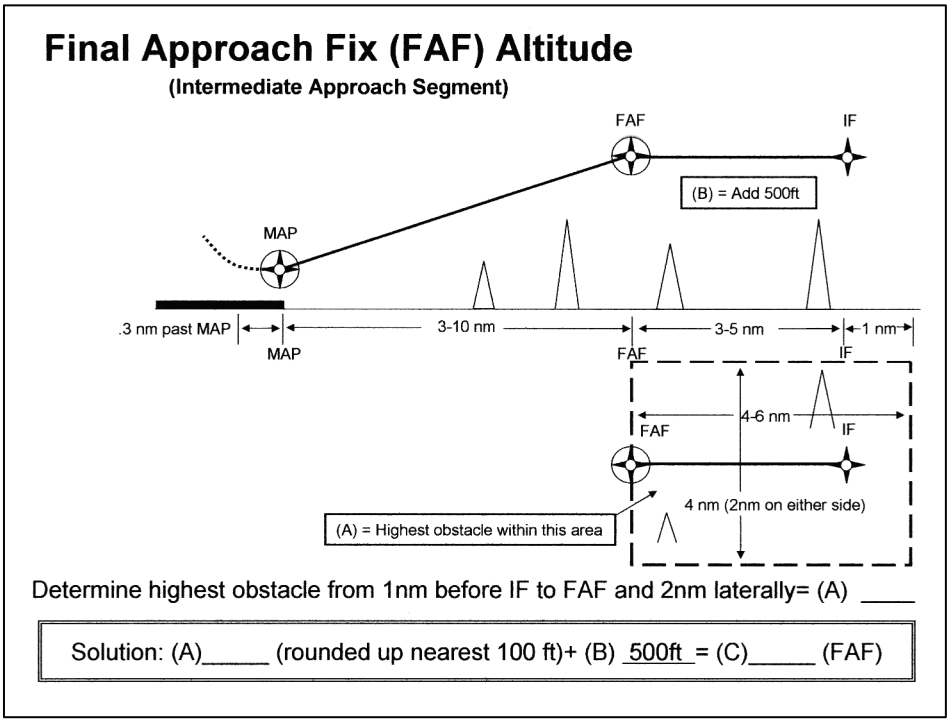


Figure 4-4. Sample of final approach fix (FAF) altitude

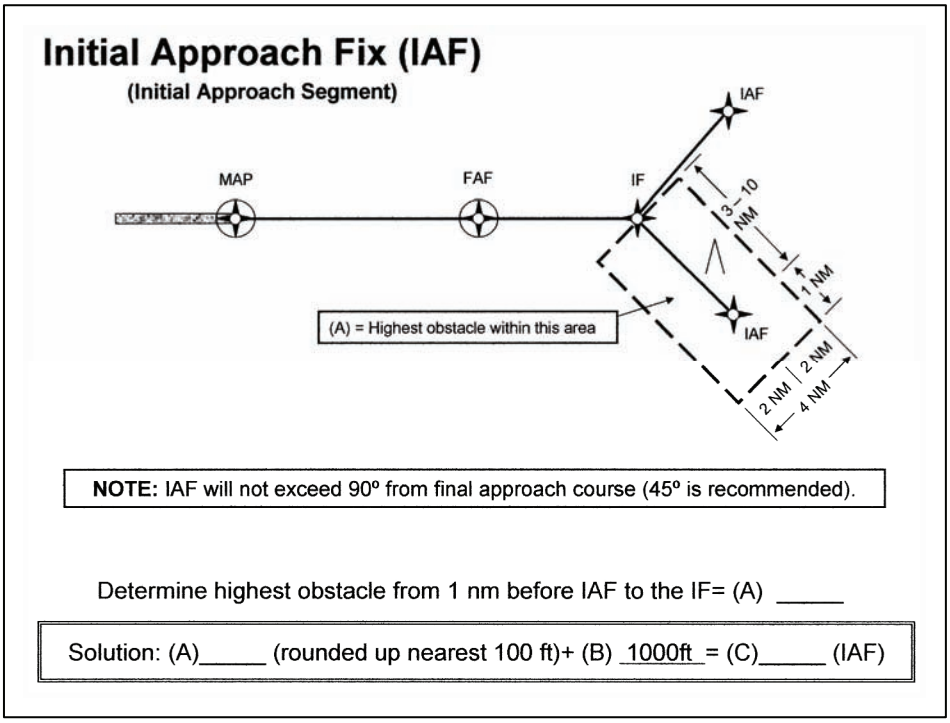


Figure 4-5. Sample of initial approach fix (IAF)

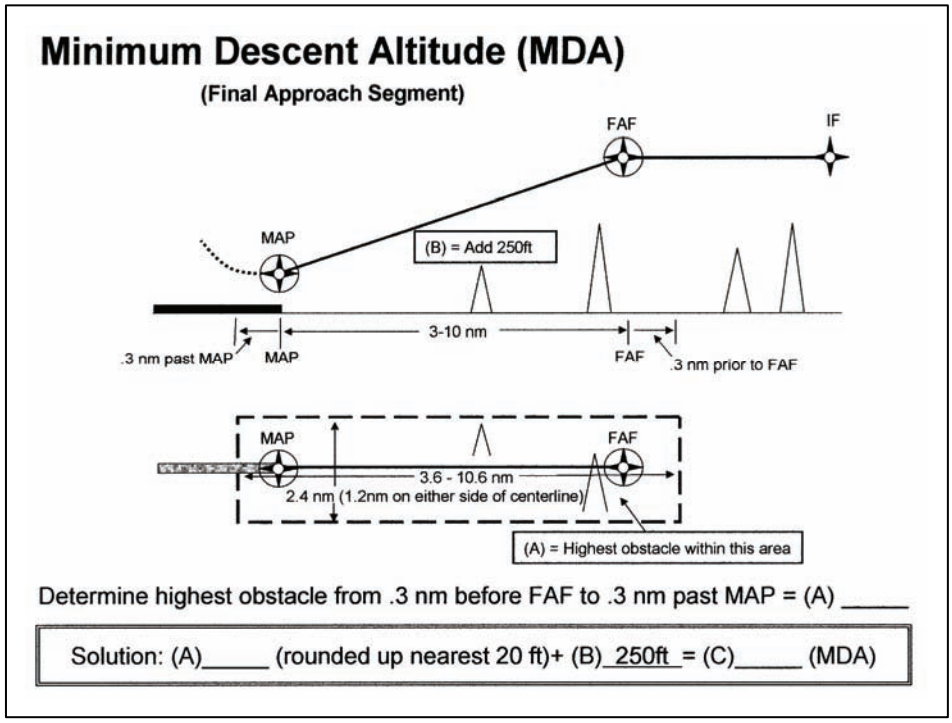


Figure 4-6. Sample of minimum descent altitude (MDA)

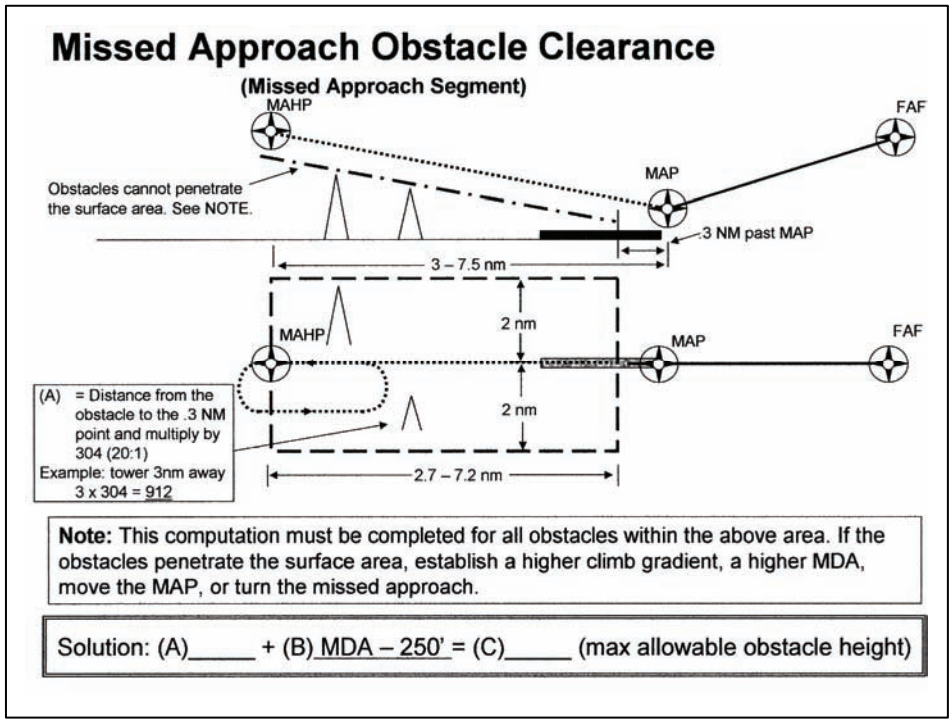


Figure 4-7. Sample of missed approach obstacle clearance

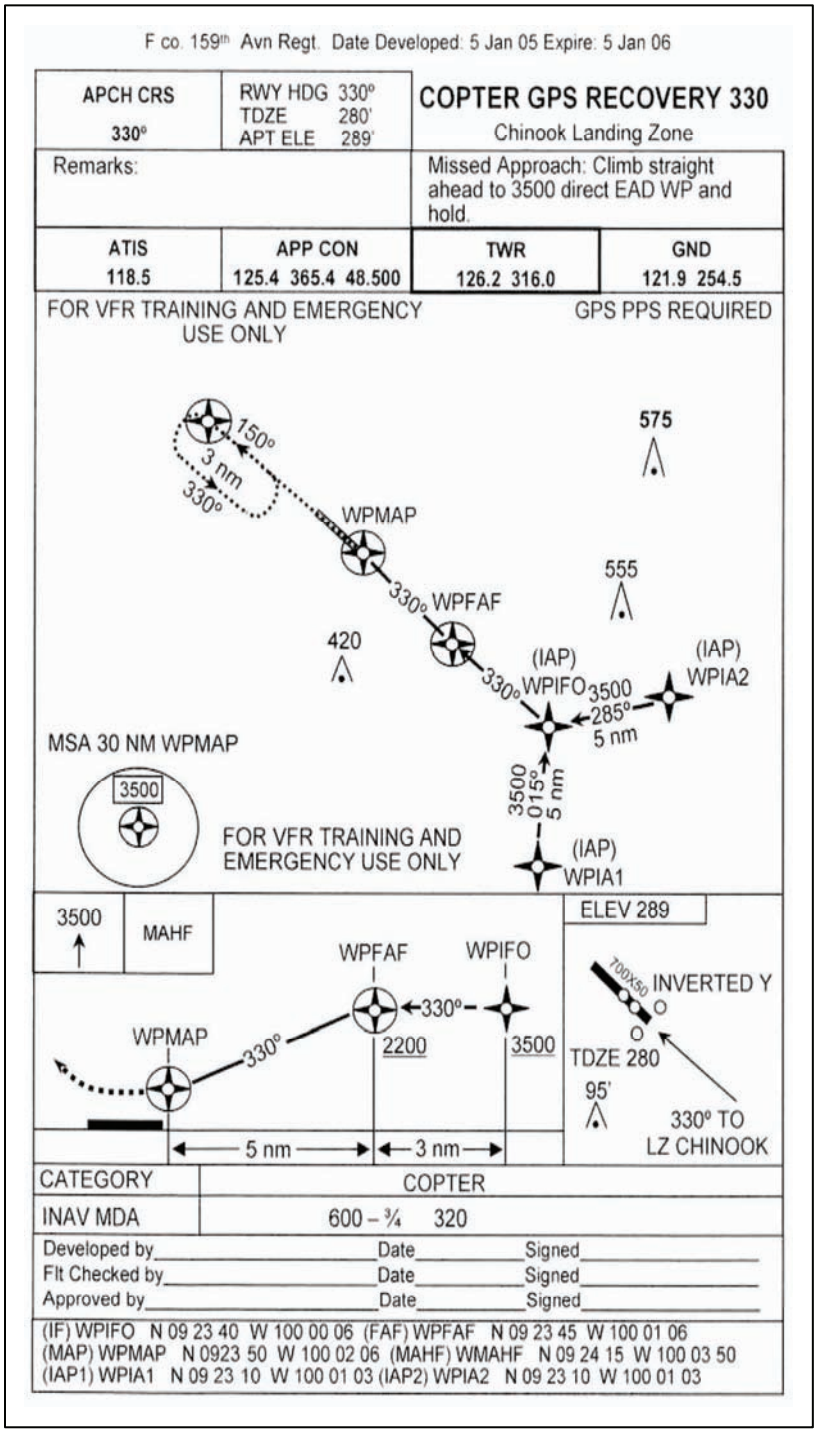


Figure 4-8. Sample of an emergency GPS recovery procedure diagram (page 1)

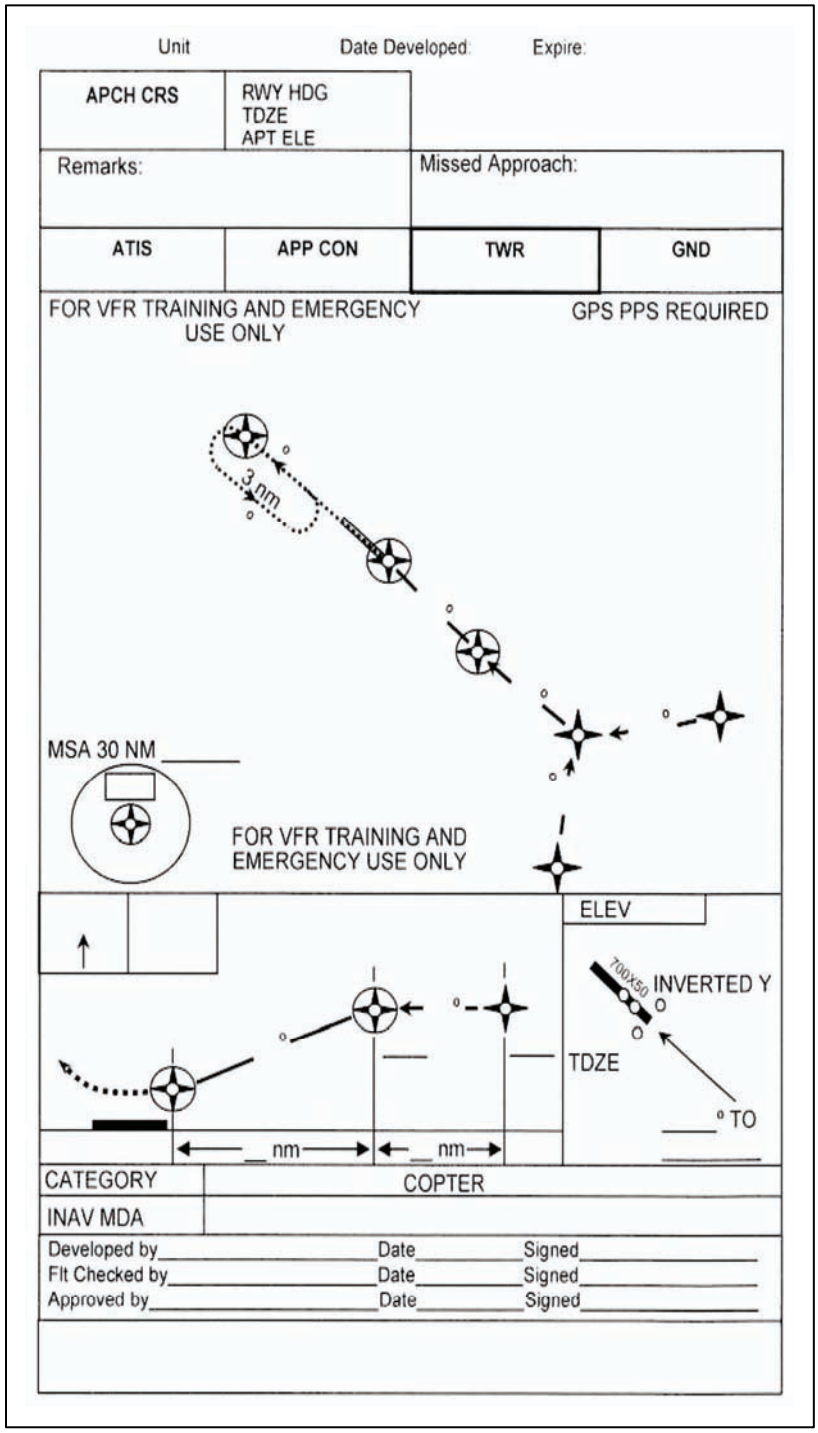


Figure 4-8. Sample of an emergency GPS recovery procedure diagram (page 2)

TASK 2051

PERFORM EMERGENCY GLOBAL POSITIONING SYSTEM (GPS) RECOVERY PROCEDURE

CONDITIONS: In an OH-58 helicopter under instrument meteorological condition (IMC), or simulated IMC.

Note: Use of the GPS as an instrument flight rules (IFR) navigational system is not authorized; however, its use should be considered and planned for as an emergency backup system.

STANDARDS: Appropriate common standards and the following:

1. Maintain airspeed appropriate for the conditions (final approach fix [FAF] to missed approach point [MAP]).
2. Maintain heading ±5 degrees.
3. Comply with descent minimums prescribed for the approach.
4. Execute the correct missed approach procedure.

DESCRIPTION:

1. Crew actions.

   a. The pilot in command (PC) will review the approach with the other crewmember before initiating the procedure. The PC will confirm with the pilot not on the controls (P) the specific approach to be flown, that the correct route and communication frequencies are set/selected, waypoints are properly entered, and attitude indications properly set, as required. The PC may assign the P to perform these duties.

   b. The pilot on the controls (P*) will focus primarily inside the aircraft on the instruments. He will follow the heading/course, altitude, and missed approach directives issued by air traffic control (ATC) and/or the P. The P* will announce any deviation to instructions directed by ATC (if available) or the P and will acknowledge all navigation directives.

   c. The P will call out the approach procedure to the P*. The P will select and announce radio frequencies. He also will monitor radios and ATC information not monitored by the P*. If directed by the PC, the P will complete the approach when visual meteorological conditions (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 his attention is focused inside the cockpit.

2. Procedures.

   a. En route to the FAF. After initially completing the inadvertent IMC recovery procedures (Task 1083), the P should select the pre-programmed route for the emergency GPS approach and the P* should fly to the initial approach fix (IAF).

   b. FAF to missed approach point (MAP). As the aircraft arrives at the IAF, conduct a procedure turn or (for direct entry) continue to the FAF as the next “fly to” waypoint and reduce airspeed to 70 knots indicated airspeed (KIAS) or less (if desired). The P should set the radar altimeter low warning to the height above landing (HAL) as time permits. During the descent to the MAP, the P will monitor outside for visual contact with the landing environment and complete the approach as briefed if VMC is encountered. Consider reducing

the airspeed prior to arrival at the MAP in anticipation of a full stop landing. Forward looking infrared (FLIR) may be used, if equipped, to assist in identifying the landing area.

(1) MDA (preferred method). Once established on the course inbound control the rate of descent to arrive at the decision height (DH) prior to the MAP. Consideration should be given to the weather conditions and if required, a higher rate of descent may be needed to arrive at the MDA prior to the MAP. Arriving at this altitude prior to the MAP allows for a greater chance of encountering VMC.

c. MAP procedure. If VMC conditions are not encountered, perform the missed approach procedure per the plan upon reaching the MAP. Immediately establish a climb utilizing maximum rate of climb airspeed until established at the minimum safe altitude (MSA).

Note 1: This procedure will only be used for training in simulated IMC or during inadvertent IMC when a non-directional beacon (NDB) approach or ground controlled approach (GCA) is not available. IFR use of the global positioning navigation system is not authorized; however, the crew should consider and plan for its use as an emergency backup system.

NIGHT OR NVG CONSIDERATIONS: The P should be in a position to assume control of the aircraft at the MAP and assume control of the aircraft when the landing environment can be determined using NVGs. During night unaided flight, consider using the searchlight to identify the landing environment.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

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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-58 maintenance test pilots (MPs) in accordance with AR 95-1. This chapter contains tasks and procedures to be used by contractor maintenance test pilots in accordance with AR 95-20. .If discrepancies are found between this chapter and TM 1-1520-228-MTF, the maintenance test flight (MTF) takes precedence.

5-1. TASK CONTENTS.

a. **Task number and title.** Each aviation training manual (ATM) task is identified by a number and title that corresponds to the maintenance test pilot tasks listed in chapter 2 (figure 2-4).

b. **Conditions.** The conditions specify the situation in which the task is to be performed. They describe the important aspects of the performance environment. All conditions must be met before task iterations can be credited.

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 MP tasks.

(1) Perform procedures and checks in sequence per TM 1-1520-228-MTF, as required.

(2) Brief the rated crewmember (RCM) or non-crewmember (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 rated crewmember (RCM) or non-crewmember 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 pilot on the controls (P*) indication does not imply pilot in command (PC) or MP duties. When required, P* or MP responsibilities are specified. All tasks in this chapter are to be performed only by qualified maintenance examiners (MEs), MPs, or student maintenance test pilots undergoing qualification training as outlined in AR 95-1. The MP is the PC in all situations, except when undergoing training or evaluation by an ME. For all tasks, MP actions and responsibilities are applicable to MEs. When two MEs are conducting training/evaluation together, or two MPs 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 MP/ME performs or directs the RCM/ Non-crewmember 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.

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) When a non-crewmember is on board, the MP will brief and assign him duties appropriate to his proficiency level.

(2) Except for rated aviator duties, the RCM crew actions described in the task may be accomplished by the non-crewmember at the direction of the MP.

g. **Training and evaluation requirements.** Some of the tasks incorporate more than one check from TM 1-1520-228-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 or academic environment.

(2) Training and evaluations will be conducted only in the listed environments, but 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 MP tasks:

(1) Aircraft logbook and historical records.

(2) TM 1-1500-328-23.

(3) DA Pam 738-751.

(4) TM 55-1520-228-10.

(5) TM 1-1520-228-CL.

(6) TM 1-1520-228-MTF.

(7) TM 55-1520-228-23 series manuals.

(8) TM 55-2840-241-23&P.

(9) TM 11-1520-228-23 series manuals.

(10) TM 55-1500-342-23.

(11) TM 1-6625-742-13&P.

(12) Applicable airworthiness directives or messages from aviation and missile command (AMCOM).

5-2. TASKS

a. **Standards versus descriptions.** MPs and MEs are reminded that task descriptions may contain required elements for successful completion of a given task. When a standard for the task is to "brief the RCM on the conduct of the maneuver" (for example, 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-58 maintenance test pilot critical tasks. Unless noted in conditions, the series designator OH-58 applies to all versions.

TASK 4000

PERFORM PRIOR TO MAINTENANCE TEST FLIGHT CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS:

1. Perform the preflight inspection according to TM 55-1520-228-10/TM 1-1520-228-CL.
2. Determine the suitability of the aircraft for flight and the mission to be performed.
3. Determine the maneuvers, checks, and tasks required during the test flight.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will ensure that a thorough preflight inspection is conducted. The TM 1-1520-228-CL may be used to conduct the preflight inspection, however the inspection will be conducted to the detail level of the TM 1-1520-228-10 (chapter 8). The MP may direct the rated crewmember (RCM) if available, to complete such elements of the aircraft preflight inspection as are appropriate, but verify that all checks have been completed. The MP will ensure that the aircraft logbook forms and records are reviewed and appropriate entries made as per DA Pam 738-751. The MP will determine the checks necessary for the maintenance test flight. The MP will brief the RCM or non-crewmember and any additional support personnel concerning operation on or around the helicopter during ground operations and will ensure that ground communication capability is adequate. The MP will stress any applicable ground or airborne safety considerations or procedures during the briefing. The MP 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 MP.

2. Procedures. Review the aircraft 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 non-crewmember, 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 non-crewmember may be unfamiliar with.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4084

PERFORM BEFORE-STARTING ENGINE CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will identify and perform the checks in this task applicable to the maintenance performed. The MP should direct assistance from the rated crewmember (RCM) or non-crewmember, if available, and will brief him concerning any warnings, cautions, or notes that may impact upon the checks to be performed. The MP will ensure the aircraft area is clear before engine start and that required maintenance test flight (MTF) entries are recorded as appropriate.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Identify the checks to be performed. Brief the RCM or non-crewmember as necessary. Perform the required checks in sequence.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4088

PERFORM STARTING ENGINE CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will coordinate with and brief the rated crewmember (RCM)/non-crewmember and ground support personnel, if available, prior to engine start. The MP will brief all personnel concerning procedures to be followed in the event of emergency. The MP will brief the RCM/non-crewmember concerning any warnings, cautions, or notes that impact upon the checks to be performed, and items required to be recorded during the start sequence. The MP should direct assistance from the RCM/non-crewmember to monitor the flight controls and record the results of checks as appropriate. The MP may direct the RCM/non-crewmember to perform duties as fireguard during the engine start. The MP will ensure the area around the aircraft is clear before engine start.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Coordinate with and brief ground support personnel prior to engine start. Brief the RCM/non-crewmember as necessary. Ensure the fireguard is posted, if available. Clear the aircraft prior to start initiation. Perform the required checks in sequence. After engine start, continue coordination with RCM/non-crewmember and ground support personnel as necessary.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4090

PERFORM ENGINE RUN-UP CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the required checks in sequence. The MP may direct assistance from the rated crewmember (RCM)/non-crewmember, if available, and will brief RCM/non-crewmember concerning any warnings, cautions, or notes that impact upon the checks to be performed. The MP will ensure the results of checks are recorded as appropriate.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Brief the RCM/non-crewmember, if available, and coordinate with ground support personnel as necessary.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4128

PERFORM BEFORE-TAKEOFF CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence according to TM 1-1520-228-MTF. The MP may direct assistance from the rated crewmember (RCM)/non-crewmember if available. The MP will ensure all warnings, cautions, and notes are reviewed and acknowledged and systems checks are recorded as appropriate.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Brief the RCM/non-crewmember if available and coordinate with ground support personnel as necessary. Perform the required checks in sequence.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4132

PERFORM TAKEOFF TO A HOVER CHECKS

CONDITIONS: In an OH-58 helicopter with before takeoff checks completed.

STANDARDS: Appropriate common standards plus the following:

Maintain a 3-foot hover altitude, ±1 foot.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the initial ascent to a hover. The MP will brief the rated crewmember (RCM)/non-crewmember, if available, concerning any warnings, cautions, or notes that may impact upon the checks to be performed. He may direct assistance from the RCM/non-crewmember, if available, to monitor aircraft instruments and maintain obstacle avoidance. The MP will ensure the results of checks are recorded as appropriate.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Confirm that all control and instrument indications are normal. If a RCM or non-crewmember is available, announce the intention to bring the aircraft to a hover. Verify the area around the aircraft still remains clear.

   a. Bring the aircraft to a 3-foot hover and note cyclic, collective, and pedal control response. Note that the apparent center of gravity is normal and that no excessive control displacement is required, (cyclic and pedal positions are normal for the conditions).

   b. Verify that all system instruments are in the normal ranges for conditions, to include power appropriate for conditions and note any N_2 droop.

   c. Before proceeding to the test flight hover area check the parking area for indications of fluid leakage from the aircraft.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4142

PERFORM HOVER POWER CHECK

CONDITIONS: In an OH-58 helicopter and with the takeoff-to-a-hover check complete.

STANDARDS: Appropriate common standards plus the following:

1. Position the aircraft into the wind.
2. Maintain a 2-foot hover altitude, ±1 foot.
3. Record the required readings.
4. Check to ensure that the indicated torque is within 4 percent of the performance planning card (PPC).

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence. The MP may direct assistance from the RCM or non-crewmember as necessary to clear the aircraft and maintain obstacle avoidance. The MP will ensure all warnings, cautions, and notes are reviewed and acknowledged and instrument readings are recorded as appropriate.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Coordinate with and brief the RCM/non-crewmember as appropriate. Confirm the aircraft maneuver area is clear.

   a. Establish a stabilized 2-foot hover into the wind.

   b. Note and record the torque, TOT, and N_1. Confirm that readings are normal for the conditions. 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.

REFERENCES: Appropriate common references.

TASK 4156

PERFORM HOVERING CONTROL RIGGING CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:

1. Hovering turns.
   a. Maintain a 3-foot hover altitude, ±1 foot.
   b. Position the aircraft into the wind.
   c. Turns not to exceed the rate of 90 degrees in 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.
3. Forward hovering flight checks.
   Maintain 5-foot altitude ±1 foot during check.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will determine the systems to be checked and normally perform the hover checks in the maintenance test flight (MTF) sequence. The MP may direct assistance from the rated crewmember (RCM) or non-crewmember, if available, to clear the aircraft and maintain obstacle avoidance.
   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. If the RCM/non-crewmember is available, brief him on the maneuvers to be performed, and direct his assistance in clearing the aircraft and maintaining obstacle avoidance.

Note: Confirm the aircraft maneuver area is sufficient and is clear prior to initiation of each of the following procedures:

a. Hovering turns. Establish a stabilized 3-foot hover into the wind. Note 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 note 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. Reestablish as necessary, a stabilized 3-foot hover into the wind. Smoothly initiate sideward flight to either side. During the maneuver note that no excessive control inputs are required, relative to current wind conditions, and that desired aircraft response is achieved. Neutralize the cyclic, and 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 effective transitional lift (ETL). Check cyclic response and rigging, abnormal vibrations, and/or flight control displacement.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4165

PERFORM PYLON ISOLATION MOUNT CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:

1. Maintain a 3-foot hover altitude, ±1 foot.
2. Induce an extremely low frequency vibration into the aircraft.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform the checks in sequence. The MP may direct assistance from the rated crewmember (RCM) or non-crewmember as necessary to clear the aircraft and maintain obstacle avoidance. The MP will ensure all warnings, cautions, and notes are reviewed and acknowledged.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. If the RCM/non-crewmember is available, brief the RCM/non-crewmember on the maneuvers to be performed, and direct RCM/non-crewmember assistance in clearing the aircraft and maintaining obstacle avoidance. Confirm the aircraft maneuver area is clear.

   a. Establish a stabilized 3-foot hover into the wind.

   b. Initiate the check by displacing the cyclic fore and aft approximately one to two inches at a rate that will induce an extremely low frequency vibration. Once the cyclic is neutralized the oscillations should dampen within five cycles, no abnormal vibrations or engine surges should occur.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4170

PERFORM POWER CYLINDER CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:
Maintain a 10-foot hover altitude, +5 foot, –2 foot.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform P* duties during this check and remain focused outside the aircraft during the maneuver. The MP will brief the rated crewmember (RCM)/non-crewmember, concerning any warnings, cautions, or notes that may impact upon the checks to be performed. The MP will brief the RCM/noncrewmember on the use of the terms "cycle", "off", and "check complete", and the emergency procedures to be performed in the event of a hydraulics system failure. The MP will direct the RCM/noncrewmember to assist in clearing the aircraft and with monitoring the master caution panel.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Land the helicopter to conduct the briefing. Brief the RCM/non-crewmember to identify and hold the HYD SYS switch throughout the check. Brief the RCM/non-crewmember on the commands RCM/non-crewmember should expect to hear and the resultant actions RCM/non-crewmember will perform. Direct the RCM/non-crewmember to confirm during the check that the HYD PRESS caution light does not illuminate. Select HOT MIC on both intercommunication systems (ICS), verify the aircraft maneuver area is clear and that sufficient space is available in the event of hydraulics malfunction.

   a. Establish a stabilized 10-foot hover into the wind.

   b. Check the right servo by smoothly and repeatedly displacing the cyclic at a moderate rate, approximately 6 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.

   c. Return the aircraft to a stabilized 3-foot hover. Adjust ICS switches as necessary.

SINGLE PILOT CONSIDERATIONS: This check will not be performed without an additional crewmember onboard. Either an additional RCM or non-crewmember is required to be on board to assist with HYD SYS switch functions.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4172

PERFORM ENGINE RESPONSE CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:
Do not exceed 50 feet above ground level (AGL).

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will determine which checks to perform and perform the checks in the maintenance test flight (MTF) sequence. The MP will brief the rated crewmember (RCM)/non-crewmember, if available, concerning any warnings, cautions, or notes that may impact upon the checks to be performed. The MP may direct assistance from the RCM or non-crewmember to clear the aircraft and maintain obstacle avoidance.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. If a RCM or non-crewmember is available, brief him on the maneuvers to be performed, and direct RCM/non-crewmember assistance in clearing the aircraft and maintaining obstacle avoidance. Confirm the aircraft maneuver area is clear. Do not exceed a 50-foot hover height during these flight maneuvers. Establish a stabilized 3-foot hover into the wind and perform the following procedure:

   Make a positive increase in the collective pitch. Confirm that the engine responds smoothly and rapidly, that N1 increases in less than 1 second and the N2 recovers to 100 percent within 5 seconds.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4194

PERFORM FLIGHT INSTRUMENTS CHECK

CONDITIONS: In an OH-58 helicopter with all main rotor vibrations minimized.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform pilot on the controls (P*) duties during this check. The MP may direct assistance from the rated crewmember (RCM) or non-crewmember to clear the aircraft and maintain airspace surveillance.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Announce initiation of the check and verify proper indications are displayed and there are no excessive fluctuations of instrument indications. Perform functional checks by using timed turns, climbs, descents, and known power settings verifying the instruments correlate with other supporting instrument indications.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4210

PERFORM TAKEOFF AND CLIMB CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:
Perform check at 60 knots indicated airspeed (KIAS) and 500 feet per minute rate of climb.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will direct assistance from the rated crewmember (RCM) or non-crewmember to clear the aircraft and maintain obstacle avoidance and airspace surveillance. The MP may direct the RCM/non-crewmember to assist in monitoring aircraft instruments and recording fuel consumption data.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. If the RCM/non-crewmember is available, brief RCM/non-crewmember on the maneuvers to be performed, and direct RCM/non-crewmember assistance in clearing the aircraft and maintaining obstacle avoidance and airspace surveillance.

   a. Confirm the aircraft maneuver area is clear. 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 there are no unusual vibrations.

   c. Initiate a fuel consumption check when in straight and level flight

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4232

PERFORM CONTROL RIGGING CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:

1. Maintain airspeed of 100 ±5 knots indicated airspeed (KIAS), into the wind.
2. Maintain torque at 65 percent, ±2 percent.
3. Maintain the aircraft in trim.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform pilot on the controls (P*) duties during this check. The MP will brief the rated crewmember (RCM)/non-crewmember, if available, concerning any warnings, cautions, or notes that may impact upon the checks to be performed. The MP may direct assistance from the RCM or non-crewmember to clear the aircraft and maintain airspace surveillance.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. If the RCM/non-crewmember is available, brief RCM/non-crewmember on the maneuvers to be performed, and direct RCM/non-crewmember assistance in clearing the aircraft and maintaining airspace surveillance.

   a. Select an altitude that will allow for safe recovery.

   b. Establish trimmed flight into the wind at 65 percent torque and 100 KIAS.

   c. Select FORCE TRIM to ON, relax cyclic pressure and note that the cyclic remains in place.

   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 .5 (1/2) inches right pedal forward.

   f. Relax the pressure on the anti-torque pedals and check for pedal creep.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4236

PERFORM AUTOROTATION ROTOR REVOLUTIONS PER MINUTE (RPM) CHECKS

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:

1. Select a suitable autorotation area that will permit a safe descent and emergency touchdown landing.
2. Maintain airspeed of 55 ±5 knots indicated airspeed (KIAS), in trim, into the wind, during autorotation.
3. Establish a climb prior to 500 feet above ground level (AGL) while maintaining airspeed greater than 50 KIAS.
4. Correctly determine proper rotor revolutions per minute for environmental conditions and gross weight.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) will perform pilot on the controls (P*) duties during this check. The MP will brief the rated crewmember (RCM)/non-crewmember, if available, concerning any warnings, cautions, or notes that may impact upon the checks to be performed. The MP may direct assistance from the RCM or non-crewmember to clear the aircraft and maintain airspace surveillance.
   b. The RCM or non-crewmember should assist the MP as directed.
2. Procedures. If the RCM/non-crewmember is available, brief RCM/non-crewmember on the maneuvers to be performed, and direct RCM/non-crewmember assistance in clearing the aircraft and maintaining airspace surveillance.
   a. Confirm that the heater (HTR) and engine (ENG) ANTI-ICE switches are OFF.
   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 rotor revolutions per minute remains within limits.
   e. Retard the throttle to the engine-idle position and confirm free-wheeling clutch disengagement and that N_1 stabilizes.
   f. Confirm the aircraft is in trim and that rotor rpm 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, torque indications are at or near 0 percent and that no warning or cautions lights are illuminated.
   h. Verify and record rotor RPM.

i. Smoothly advance the throttle to full open, adjusting the collective as necessary to maintain rotor rpm within limits. During power application, confirm clutch reengagement.

j. Increase the collective and establish a climb prior to descending below 500 feet AGL.

3. Contact flight following as appropriate.

4. Compare recorded rotor revolutions per minute required for aircraft weight and density altitude. Adjust as required.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4238

PERFORM ENGINE PERFORMANCE CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:

1. Select a suitable area that will permit a safe descent and emergency landing.
2. Establish a climb and maintain 70 ±5 knots indicated airspeed (KIAS), in trim, into the wind.
3. Achieve maximum power available without exceeding aircraft limitations.
4. Correctly analyze engine performance check (EPC) data.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform pilot on the controls (P*) duties during this check. The MP will brief the rated crewmember (RCM)/non-crewmember, if available, concerning any warnings, cautions, or notes that may impact upon the checks to be performed. The MP may direct assistance from the RCM or non-crewmember to clear the aircraft and maintain airspace surveillance.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. If the RCM/non-crewmember is available, brief RCM/non-crewmember on the maneuvers to be performed, and direct RCM/non-crewmember assistance in clearing the aircraft and maintaining airspace surveillance.

   a. Confirm that the heater (HTR) and engine (ENG) ANTI-ICE switches are OFF.

   b. Set altimeter to 29.92.

   c. Turn aircraft into the wind and initiate a climb at 70 KIAS to a pre-determined altitude that has a predicted maximum torque available of less than 100 percent.

   d. At approximately 300 feet prior to reaching the test altitude, slowly increase the collective to achieve the maximum limit of TOT, N_1 or torque with N_2 stabilized at 100 percent when aircraft reaches test altitude.

   e. Upon reaching test altitude record the torque, N_1 and TOT.

   f. Verify the outside air temperature (OAT) at the selected test altitude, reset the altimeter to the current altimeter setting and determine if the required torque was attained.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4244

PERFORM HYDRAULICS-OFF CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards plus the following:

1. Maintain airspeed of 70 ±10 knots indicated airspeed (KIAS).
2. Maintain the aircraft in trim.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) will perform pilot on the controls (P*) duties during this check and remain focused outside the aircraft during the maneuver. The MP will brief the rated crewmember (RCM)/non-crewmember concerning any warnings, cautions, or notes that may impact upon the checks to be performed. The MP may direct assistance from the RCM or non-crewmember in maintaining airspace surveillance, and monitoring aircraft instruments. The MP will brief the RCM/non-crewmember on the use of the terms "hydraulics off", "hydraulics on", and "check complete."

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Brief the RCM or non-crewmember on the maneuvers to be performed, commands he should expect to hear, and the resultant actions he will take. Direct the RCM/ non-crewmember to identify the hydraulic system (HYD SYS) switch before instructing him to select the system to either off or on. Brief RCM/non-crewmember to maintain his hand on the switch until he is told to remove it, and not to move the switch until directed to do so.

   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 70 KIAS noting cruise power.

   b. Direct the RCM/non-crewmember to identify and move the HYD SYS switch to the OFF position using the briefed command.

   c. Confirm the HYD PRESS (pressure) caution light and master caution lights are illuminated. If abnormal forces are not encountered, direct the RCM/non-crewmember to remove his hand from the HYD SYS switch and reset the master caution light.

   d. Do not exceed any aircraft limitations during the following maneuvers. Confirm the aircraft maneuver area is clear and then check controllability by making shallow left and right turns. Establish level flight. Maintain the aircraft in trim during the following collective checks. Raise the collective to 83 percent torque to insure the ability to increase collective is present prior to reduction, lower the collective and verify that torque can be decreased to at least 17 percent. Raise the collective and verify that torque can be increased to at least cruise power torque. Excessive force should not be necessary to achieve either of the torque settings.

   e. Upon completion of the collective checks, reestablish level flight.

   f. Relax pressure on the flight controls. Direct the RCM/non-crewmember to again identify and move the HYD SYS switch to the HYD SYS position using the briefed command.

SINGLE PILOT CONSIDERATIONS: This check will not be performed without an additional crewmember onboard. Either an additional RCM or a non-crewmember is required to be on board to assist with HYD SYS switch functions. Except for rated aviator duties, the RCM crew actions described above may be accomplished by the non-crewmember at the direction of the MP.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4272

PERFORM COMMUNICATIONS CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions. The rated crewmember (RCM) or non-crewmember should assist the maintenance test pilot (MP) as directed.

2. Procedures. If the RCM/non-crewmember is available, brief RCM/non-crewmember on the maneuvers to be performed, and direct RCM/non-crewmember assistance in clearing the aircraft and maintaining airspace surveillance.

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 air traffic control (ATC) facility.

b. Tune and identify a nondirectional (radio) beacon (NDB) station and ensure that the automatic direction finder (ADF) needle points to the station. Fly to the station and verify station passage, if time permits execute an NDB approach.

c. Tune the very high frequency omni-directional range radio beacon (VOR) and verify that the needle points to the station. Adjust the omni-bearing selector (OBS), track to the station and verify station passage. If time permits execute a VOR or instrument landing system (ILS) approach.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4276

PERFORM SPECIAL/DETAILED PROCEDURES

CONDITIONS: In an OH-58 helicopter and equipment installed.

STANDARDS: Appropriate common standards plus the following:

Perform special/detailed procedures according to TM 1-1520-228-MTF as part of general maintenance test flights.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) may perform these checks or direct the rated crewmember (RCM)/non-crewmember to perform them, as appropriate. If the MP performs the checks, the MP will direct the RCM (pilot on the controls [P*]) to remain focused outside during the procedures, maintain airspace surveillance and/or obstacle avoidance as appropriate.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Brief the RCM/non-crewmember on the checks to be performed. Check any equipment installed on the aircraft for which special detailed procedures are contained in section IV of the maintenance test flight (MTF). Use additional reference publications as required. If these checks are performed during an MP or maintenance examiner (ME) evaluation, the evaluated crewmember should demonstrate knowledge of the system, published operational checks, and knowledge of published charts, graphs, and work sheets.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4280

PERFORM BEFORE-LANDING CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
   a. The maintenance test pilot (MP) may perform these checks or direct the rated crewmember (RCM)/non-crewmember to perform them, as appropriate.
   b. The RCM or non-crewmember should assist the MP as directed.
2. Procedures. Announce initiation of the before landing checks. Perform the before landing checks in sequence.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4282

PERFORM AFTER-LANDING CHECK

CONDITIONS: In an OH-58 helicopter.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.
    a. The maintenance test pilot (MP) may perform these checks or direct the rated crewmember (RCM)/non-crewmember to perform them, as appropriate.
    b. The RCM or non-crewmember should assist the MP as directed.
2. Procedures. Announce initiation of the after-landing checks. Perform the after-landing checks in sequence.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

TASK 4284

PERFORM ENGINE SHUTDOWN CHECK

CONDITIONS: In an OH-58 helicopter with the after-landing check performed.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew actions.

   a. The maintenance test pilot (MP) may perform these checks or direct the rated crewmember (RCM)/non-crewmember to perform them, as appropriate. The aircrew will monitor the area for safety hazards, (vehicles, equipment and personnel), and maintain the flight controls neutral, and collective full down.

   b. The RCM or non-crewmember should assist the MP as directed.

2. Procedures. Announce initiation of the engine shutdown checks. Perform the engine shutdown checks in sequence. Direct assistance from the RCM/non-crewmember as necessary.

TRAINING AND EVALUATION REQUIREMENTS:

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

REFERENCES: Appropriate common references.

Chapter 6
Crew Coordination

This chapter describes the background of crew coordination development. It also describes the crew coordination elements, basic qualities, and objectives, as found in the Army Aircrew Coordination Enhancement Training Program.

> ***Note:*** Digitization of the crew compartments has expanded and redefined the lines of responsibility for each crewmember. The ability for either crewmember to perform most aircraft/system functions from his crew station breaks down the standard delineation of duties and has added capabilities in training and in combat. This could mean that during an unforeseen event, one crewmember may attempt to resolve the situation rather than seeking assistance from the other crewmember. It is essential for the pilot in command (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. CREW COORDINATION BACKGROUND. An analysis of U.S. Army aviation accidents revealed that a significant percentage of these accidents resulted from one or more crew coordination errors committed before or during the mission flight. 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 accidents are avoided, these same errors can result in degraded mission performance. A systematic analysis of these error patterns identified specific areas where crew-level training could reduce the occurrence of such errors and break the error chains leading to accidents and poor mission performance.

6-2. CREW COORDINATION ELEMENTS. Broadly defined, aircrew coordination is the interaction between crewmembers necessary for the safe, efficient, and effective performance of tasks. The essential elements of crew coordination are described below.

a. **Communicate positively.** Good cockpit teamwork requires positive communication among crewmembers. Communication is positive when the sender directs, announces, requests, or offers information; the receiver acknowledges the information; the sender confirms the information, based on the receiver's acknowledgment or action.

b. **Direct assistance.** A crewmember will direct assistance when he cannot maintain aircraft control, position, or clearance. A crewmember will also direct assistance when unable to properly operate or troubleshoot aircraft systems without help from the other crewmembers.

c. **Announce actions.** To ensure effective and well-coordinated actions in the aircraft, all crewmembers must be aware of the expected movements and unexpected individual actions. Each crewmember will announce any actions that affect the actions of the other crewmembers.

d. **Offer assistance.** A crewmember will provide assistance or information that has been requested. A crewmember also will offer assistance when he sees that another crewmember needs help.

e. **Acknowledge actions.** Communications in the aircraft must include supportive feedback to ensure that crewmembers correctly understand announcements or directives.

f. **Be explicit.** Crewmembers should use clear terms and phrases and positively acknowledge 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."

g. **Provide aircraft control and obstacle advisories.** Although the pilot on the controls (P*) is responsible for aircraft control, the other crewmembers may need to provide aircraft control information regarding airspeed, altitude, or obstacle avoidance.

h. **Coordinate action sequence and timing.** Proper sequencing and timing ensure that the actions of one crewmember mesh with the actions of the other crewmembers.

6-3. CREW COORDINATION BASIC QUALITIES. The crew coordination elements are further broken down into a set of 13 basic qualities. Each basic quality is defined in terms of observable behaviors. The paragraphs below summarize these basic qualities.

a. **Establish and maintain flight team leadership and crew climate.** This quality addresses the relationships among the crew and the overall climate of the flight deck. Aircrews are teams with a designated leader and clear lines of authority and responsibility. The PC sets the tone for the crew and maintains the working environment. Effective leaders use their authority but do not operate without the participation of other crewmembers. When crewmembers disagree on a course of action, they must be effective in resolving the disagreement. Specific goals include the following:

(1) The PC actively establishes an open climate where crewmembers freely talk and ask questions.

(2) Crewmembers value each other for their expertise and judgment. They do not allow differences in rank and experience to influence their willingness to speak up.

(3) Alternative viewpoints are a normal and occasional part of crew interaction. Crewmembers handle disagreements in a professional manner, avoiding personal attacks or defensive posturing.

(4) The PC actively monitors the attitudes of crewmembers and offers feedback when necessary. Each crewmember displays the proper concern for balancing safety with mission accomplishment.

b. **Accomplish pre-mission planning and rehearsal.** Pre-mission planning includes all preparatory tasks associated with planning the mission. These tasks include planning for visual flight rules (VFR), instrument flight rules (IFR), and terrain flight. They also include assigning crewmember responsibilities and conducting all required briefings and brief-backs. Pre-mission rehearsal involves the crew's collectively visualizing and discussing expected and potential unexpected events for the entire mission. Through this process, all crewmembers think through contingencies and actions for difficult segments or unusual events associated with the mission and develop strategies to cop with contingencies. Specific goals include the following:

(1) The PC ensures that all actions, duties, and mission responsibilities are partitioned and clearly assigned to specific crewmembers. Each crewmember actively participates 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.

(2) The crew identifies alternate courses of action in anticipation of potential changes in mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC) and is fully prepared to implement contingency plans as necessary. Crewmembers mentally rehearse the entire mission by visualizing and discussing potential problems, contingencies, and responsibilities.

(3) The PC ensures that crewmembers take advantage of periods of low workload to rehearse upcoming flight segments. Crewmembers continuously review remaining flight segments to identify required adjustments. Their planning is consistently ahead of critical lead times.

c. **Apply appropriate decisionmaking techniques.** Decisionmaking is the act of rendering a solution to a problem and defining a plan of action. It must involve risk assessment. The quality of decisionmaking and problem solving throughout the planning and execution phases of the mission depends on the information available, time constraints, and level of involvement and information exchange among crewmembers. The crew's ability to apply appropriate decisionmaking techniques based on these criteria has a major impact on the choice and quality of their resultant actions. Although the entire crew should be involved in the decision-making and problem-solving process, the PC is the key decision maker. Specific goals include the following:

(1) Under high-time stress, crewmembers rely on a pattern-recognition decision process to produce timely responses. They minimize deliberation consistent with the available decision time. Crewmembers focus on the most critical factors influencing their choice of responses. They efficiently prioritize their specific information needs within the available decision time.

(2) Under moderate- to low-time stress, crewmembers rely on an analytical decision process to produce high-quality decisions. They encourage deliberation when time permits. To arrive at the most unbiased decision possible, crewmembers consider all important factors influencing their choice of action. They consistently seek all available information relative to the factors being considered.

d. **Prioritize actions and equitably distribute workload.** This quality addresses the effectiveness of time and workload management. It assesses the extent to which the crew, as a team, avoids distractions from essential activities, distributes and manages workload, and avoids individual task overload. Specific goals include the following:

(1) 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 more critical tasks. Crewmembers consistently avoid nonessential distractions so that these distractions do not impact on task performance.

(2) The PC actively manages the distribution of mission tasks to prevent the overloading of any crewmember, especially during critical phases of flight. Crewmembers watch for workload buildup on others and react quickly to adjust the distribution of task responsibilities.

e. **Effectively manage unexpected events.** This quality addresses the crew's performance under unusual circumstances that may involve high levels of stress. Both the technical and managerial aspects of coping with the situation are important. Specific goals include the following:

(1) Crew actions reflect extensive rehearsal of emergency procedures in prior training and pre-mission planning and rehearsal. Crewmembers coordinate their actions and exchange information with minimal verbal direction from the PC. They respond to the unexpected event in a composed, professional manner.

(2) Each crewmember appropriately or voluntarily adjusts individual workload and task priorities with minimal verbal direction from the PC. The PC ensures that each crewmember is used effectively when responding to the emergency and that the workload is efficiently distributed.

f. **Ensure that statements and directives are clear, timely, relevant, complete, and verified.** This quality refers to the completeness, timeliness, and quality of information transfer. It includes the crew's use of standard terminology and feedback techniques to verify information transfer. Emphasis is on the quality of instructions and statements associated with navigation, obstacle clearance, and instrument readouts. Specific goals include the following:

(1) Crewmembers consistently make the required callouts. Their statements and directives are always timely.

(2) Crewmembers use standard terminology in all communications. Their statements and directives are clear and concise.

(3) Crewmembers actively seek feedback when they do not receive acknowledgment from another crewmember. They always acknowledge understanding of intent and request clarification when necessary.

g. **Maintain mission situational awareness.** This quality considers the extent to which crewmembers keep each other informed about the status of the aircraft and the mission. Information reporting helps the aircrew maintain a high level of situational awareness. The information reported includes aircraft position and orientation, equipment and personnel status, environmental and battlefield conditions, and changes to mission objectives. Awareness of the situation by the entire crew is essential to safe flight and effective crew performance. Specific goals include the following:

(1) Crewmembers routinely update each other and highlight and acknowledge changes. They take personal responsibility for scanning the entire flight environment, considering their assigned workload and areas of scanning.

(2) Crewmembers actively discuss conditions and situations that can compromise situational awareness. These include, but are not limited to, stress, boredom, fatigue, and anger.

h. **Communicate and acknowledge decisions and actions.** This quality addresses the extent to which crewmembers are kept informed of decisions made and actions taken by another crewmember. Crewmembers should respond verbally or by appropriately adjusting their behaviors, actions, or control inputs to clearly indicate that they understand when a decision has been made and what it is. Failure to do so may confuse crews and lead to uncoordinated operations. Specific goals include the following:

(1) Crewmembers announce decisions and actions, stating their rationale and intentions as time permits. The P verbally coordinates the transfer of or inputs to controls before action.

(2) Crewmembers always acknowledge announced decisions or actions and provide feedback on how these decisions or actions will affect other crew tasks. If necessary, they promptly request clarification of decisions or actions.

i. **Seek supporting information and actions from the crew.** This quality addresses the extent to which supporting information and actions are sought from the crew by another crewmember, usually the PC. Crewmembers should feel free to raise questions during the flight regarding plans, revisions to plans, actions to be taken, and the status of key mission information. Specific goals include the following.

(1) The PC encourages crewmembers to raise issues or offer information about safety or the mission. Crewmembers anticipate impending decisions and actions and offer information as appropriate.

(2) Crewmembers always request assistance from others before they become overloaded with tasks or before they must divert their attention from a critical task.

j. **Mutually cross-monitor crewmember actions.** This quality addresses the extent to which a crew uses cross-monitoring as a mechanism for breaking error chains that lead to accidents or degraded mission performance. Crewmembers must be 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. Specific goals include the following:

(1) Crewmembers acknowledge that crew error is a common occurrence and the active involvement of the entire crew is required to detect and break the error chains that lead to accidents. They constantly watch for crew errors affecting flight safety or mission performance. They monitor their own performance as well as that of others. When they note an error, they quickly and professionally inform and assist the crewmember committing the error.

(2) The crew thoroughly discusses the two-challenge rule before executing the mission. When required, they effectively implement the two-challenge rule with minimal compromise to flight safety.

Note: The two-challenge rule allows one crewmember to automatically assume the duties of another crewmember who fails to respond to two consecutive challenges. For example, the P* becomes fixated, confused, task overloaded, or otherwise allows the aircraft to enter an unsafe position or attitude. The pilot not on the controls (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.

k. **Supporting information and actions are offered by the crew.** This quality addresses the extent to which crewmembers anticipate and offer supporting information and actions to the decision maker—usually the PC—when apparently a decision must be made or an action taken. Specific goals include the following:

(1) Crewmembers anticipate the need to provide information or warnings to the PC or P* during critical phases of the flight. They provide the required information and warnings in a timely manner.

(2) Crewmembers anticipate the need to assist the PC or P* during critical phases of flight. They provide the required assistance when needed.

l. **Practice advocacy and assertion.** This quality concerns the extent to which crewmembers are proactive in advocating a course of action they consider best, even when others may disagree. Specific goals include the following:

(1) While maintaining a professional atmosphere, crewmembers state the rationale for their recommended plans and courses of action when time permits. They request feedback to make sure others have correctly understood their statements or rationale. Time permitting, other crewmembers practice good listening habits; they wait for the rationale before commenting on the recommended plans or courses of action.

(2) The PC actively promotes objectivity in the cockpit by encouraging other crewmembers to speak up despite their rank or experience. Junior crewmembers do not hesitate to speak up when they disagree with senior members; they understand that more experienced aviators can sometimes commit errors or lose situational awareness. Every member of the crew displays a sense of responsibility for adhering to flight regulations, operating procedures, and safety standards.

m. **Conduct crew-level after-action reviews.** This quality addresses the extent to which crewmembers review and critique their actions during or after a mission segment, during periods of low workload, or during the mission debriefing. Specific goals include the following:

(1) The crew critiques major decisions and actions. They identify options and factors that should have been discussed and outline ways to improve crew performance in future missions.

(2) The critique of crew decisions and actions is professional. "Finger pointing" is avoided; the emphasis is on education and improvement of crew performance.

6-4. CREW COORDINATION OBJECTIVES. The crew coordination elements and basic qualities are measured to determine if the objectives of the crew coordination program have been met. The objectives of the program have been defined by five crew coordination objectives. The five objectives are as follows:

a. **Establish and maintain team relationships.** Establish a positive working relationship that allows the crew to communicate openly and freely and to operate in a concerted manner.

b. **Mission planning and rehearsal.** Explore, in concert, all aspects of the assigned mission and analyze each segment for potential difficulties and possible reactions in terms of the commander's intent.

c. **Establish and maintain workloads.** Manage and execute the mission workload in an effective and efficient manner with the redistribution of task responsibilities as the mission situation changes.

d. **Exchange mission information.** Establish intra-crew communications using effective patterns and techniques that allow for the flow of essential data between crewmembers.

e. **Cross-monitor performance.** Cross-monitor each other's actions and decisions to reduce the likelihood of errors impacting mission performance and safety.

6-5. STANDARD CREW TERMINOLOGY. To enhance communication and crew 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. Department of Defense (DOD) flight information publication (FLIP) contains standard terminology for radio communications. Operator's manuals contain standard terminology for items of equipment. Table 6-1 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.
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.
Cease fire	command to stop firing but continue to track.
Clear	no obstacle 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	establish communication with... (followed by the name of the element).
Controls	refers to aircraft flight controls.
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.
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 antijam communications.
Go plain/red	directive to discontinue secure operations.
Go secure/green	directive to activate secure communications.
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.
Maintain	command to continue or keep the same.

Table 6-1. Examples of standard words and phrases

Standard word or phrase	***Meaning of standard word or phrase***
Mask/unmask	to conceal aircraft by using available terrain features and to position the aircraft above terrain features.
Mickey	a Have Quick time-synchronized signal.
Monitor	command to maintain constant watch or observation.
Move aft	command to hover aft, followed by distance in feet.
Move forward	command to hover forward, followed by distance in feet.
Negative	incorrect or permission not granted.
Negative contact	unable to establish communication with. . . (followed by name of element).
No joy	target, traffic, or obstruction not positively seen or identified.
Now	indicates that an immediate action is required.
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.
Release	command for the planned or expected release of an external load.
Report	command to notify.
Roger	message received and understood.
Say again	repeat your transmission.
Slide	intentional horizontal movement of an aircraft perpendicular to it's heading; will be followed by the word "right" or "left."
Slow down	command to reduce ground speed.
Speed up	command to increase ground speed.
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	target, traffic, or obstruction positively seen or identified; will be followed by a repeat of the word “target,” "traffic," or "observation" and the clock position.
Target	an alert that a ground threat has been spotted.
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 rated 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 degrees"), or instructions to follow a well-defined contour ("Follow the draw at 2 o'clock").

Table 6-1. Examples of standard words and phrases

Standard word or phrase	***Meaning of standard word or phrase***
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").
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.

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Glossary

AC	active component
ADF	automatic direction finder
AGL	above ground level
AHO	above highest obstacle
alt	altitude
AFSO	Air Force Safety Officer
AMC	air mission commander
AMCOM	Aviation and Missile Command
ANCD	automated net control device
AO	aerial observer
APART	annual proficiency and readiness test
AR	Army regulation
ASE	aircraft survivability equipment
ASET	Aircraft Survivability Equipment Trainer
ASET II	Aircraft Survivability Equipment Trainer II
ASR	airport surveillance radar
ATC	air traffic control
ATIS	automated terminal information service
ATM	aircrew training manual
ATP	aircrew training program
AWR	airworthiness release
BDA	battle damage assessment
BINGO	a pre-briefed fuel state that allows the aircraft to return to the base of intended landing or an alternate, if required, using preplanned recovery parameters and arriving with normal recovery fuel [AFI 11-2T-6].
CBI	computer based instruction
CBRN	chemical, biological, radiological, nuclear
CDI	course deviation indicator
CG	center of gravity
CHUM	chart updating manuals
CL	checklist
comm	communication
CTL	commander's task list
DA	Department of the Army
DD	Department of Defense

DES	Directorate of Evaluation and Standardization (Fort Rucker, Alabama)
DLAM	Defense Logistics Agency manual
DOD	Department of Defense
ECM	electronic countermeasures
ECCM	electronic counter-countermeasures
ENG	engine
EPC	engine performance check
ETA	estimated time of arrival
ETE	estimated time en route
ETL	effective transitional lift
ETP	exportable training packets
FAA	Federal Aviation Administration
FAC	flight activity category
FAT	free air temperature
FIH	flight information handbook
FLIP	flight information publication
FM	field manual; frequency modulation
FOV	field of view
GWT	gross weight
HQ	headquarters
HTR	heater
HYD	hydraulic
IAS	indicated airspeed
IATF	individual aircrew training folder
ICS	intercommunication system
IE	instrument flight examiner
IFF	identification, friend or foe (radar)
IFRF	instrument flight rules flight
IFR	instrument flight rules
IGE	in-ground effect
ILS	instrument landing system
IMC	instrument meteorological conditions
IP	instructor pilot
JOKER	a pre-briefed fuel state needed to terminate an event and transition to the next phase of flight [AFI 11-2T-6].
KIAS	knots indicated airspeed

lbs	pounds
LOC	location
LRF/D	laser range finder/designator
MDA	minimum decision altitude
MAP	missed approach point
max	maximum
Mayday	The distress signal MAYDAY is used to indicate that a station is threatened by grave and imminent danger and requests immediate assistance [Federal Communication Commission].
ME	maintenance examiner
METL	mission essential task list
METT-TC	mission, enemy, terrain and weather, troops and support available, time available, civil considerations
MIJI	meaconing, interference, jamming, and intrusion
MMS	mast-mounted sight
MOS	military occupational specialty
MP	maintenance test pilot
MSL	mean sea level
MTF	maintenance test flight
MUSKEG	thick deposit of partially decayed vegetable matter of wet boreal regions
NAV	navigation
NAVAID	navigational aid
N	night
N_1	gas producer (speed)
N_2	power turbine (speed)
NDB	non-directional (radio) beacon
NGR	National Guard regulation
NM	nautical mile
NOE	nap-of-the-earth
NOTAM	notice to airmen
NVG	night vision goggle
OAT	outside air temperature
OBS	omni-bearing selector
OGE	out-of-ground effect
PA	pressure altitude
PAM	pamphlet

Pan Pan	The urgency signal PAN PAN is used when the safety of the ship or person is in jeopardy [Federal Communication Commission].
P	pilot not on the controls
P*	pilot on the controls
PC	pilot in command
PFE	proficiency flight evaluation
PI	pilot
POI	program of instruction
PPC	performance planning card
RBHI	radio bearing and heading indicator
R/C	rate of climb
RCM	rated crewmember
RL	readiness level
RPM	revolutions per minute
S	satisfactory (for grade slip purposes); standardization
SALUTE	size, activity, location, unit, time, and equipment
SIF	selective identification feature [JP 1-02]
SOI	signal operation instructions
SOP	standing operating procedure
SP	standardization instructor pilot
STANAG	standardization agreement
TAC	tactical
TAS	true airspeed
TB	technical bulletin
TC	training circular
TM	technical manual
TQ	torque
TOT	turbine outlet temperature / time on target
TRADOC	U.S. Army Training and Doctrine Command
UHF	ultra high frequency
USAAVNC	United States Army Aviation Center
U.S.	United States
UT	unit trainer
VFR	visual flight rules
VHF	very high frequency
VOR	very high frequency omni-directional range radio beacon
VMC	visual meteorological conditions

Vne	never exceed speed
XPDR	transponder

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STANAG 3114 (Edition Seven). *Aeromedical Training of Flight Personnel*. 22 May 2003.

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Aeronautical Information Manual: *Official Guide to Basic Flight Information and ATC Procedures*.

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Title 14 of the U.S. Code of Federal Regulations

OTHER

Applicable Airworthiness Directives/Messages from Program Executive Officer Aviation (PEO-AV)

Aircraft logbook and historical reports.

DOCUMENTS NEEDED

These documents must be available to the intended users of this publication.

DEPARTMENT OF THE ARMY FORMS

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DA Form 2408-12. *Army Aviator's Flight Record*.

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OH-58A/C PERFORMANCE PLANNING CARD

For use of this form, see TC 1-228; the proponent agency is TRADOC.

HOVER DATA

AIRCRAFT GWT			FUEL	
lbs			/	lbs
PA CUR	PA MAX	FAT CUR	FAT MAX	LOAD AVAIL lbs

MAX TORQUE AVAIL (CURR. / MAX).	%	%
CONT. TORQUE AVAIL (CURR. / MAX).	%	%
HOVER IGE TORQUE (CURR. / MAX.)	%	%
HOVER OGE TORQUE (CURR. / MAX.)	%	%
MAX ALLOWABLE GWT IGE (CURR. / MAX.)		
MAX ALLOWABLE GWT OGE (CURR. / MAX.)		

SAFE PEDAL MARGIN YES NO

CRUISE DATA

ALT	FAT (° C)	VNE IAS	
IAS	TAS	FUEL	TORQUE

MAX R/C / ENDURANCE IAS	MAX RANGE IAS

FUEL MANAGEMENT

START (TIME / lbs) /	STOP (TIME / lbs) /	RESERVE (TIME)
FUEL FLOW PPH	BURNOUT (TIME)	BINGO lbs

ARRIVAL DATA

PA MAX	FAT MAX

MAX TORQUE AVAIL	(MAX)	
CONT TORQUE AVAIL	(MAX)	
MAX ALLOWABLE GWT IGE	(MAX)	
MAX ALLOWABLE GWT OGE	(MAX)	

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TC 1-228
13 June 2006

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

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Secretary of the Army

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