TC 1-219

AIRCREW TRAINING MANUAL

GUARDRAIL COMMON SENSOR AIRPLANE

RC-12

HEADQUARTERS
DEPARTMENT OF THE ARMY

Training Circular
No. 1-219

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 3 June 2002

AIRCREW TRAINING MANUAL
GUARDRAIL COMMON SENSOR AIRPLANE
RC-12

TABLE OF CONTENTS

*This publication supersedes TC 1-219, 20 September 1994, and change l, 30 October 2000.

Blank Forms

DA Form 7345-R (GR/CS Takeoff and Landing Data Card)
DA Form 7444-R (RC-12D/H Takeoff and Landing Data Card)

PREFACE

This training circular (TC) consolidates Guardrail and Guardrail Common Sensor aircraft into one aircrew training manual (ATM). It establishes crew member qualification and refresher, mission, and continuation training requirements.

Two fatal training accidents occurred in Guardrail aircraft. After these accidents, the Commanding General of the U.S. Army Intelligence Center and Fort Huachuca, Fort Huachuca, Arizona, directed Guardrail aircrew training be reexamined. A yearlong study team reviewed aircraft certification and applicable Federal Aviation Regulations. The team conducted extensive discussions with the Federal Aviation Administration to gain an understanding of the context of pilot training versus the size of the airframe. Raytheon test pilots explained the operator's manual performance charts and their use.

In addition, the study involved the team's going outside the Army to examine how other Super King Air (C-12) schools conduct their training. The team conducted interviews and examined the training literature of the U.S. Navy, Flight Safety International, Simuflite, and the U.S. Air Force. The flight tasks and the base task list reflect the outcome of this study. The study team carefully evaluated training benefit versus risk during the task development phase; it made the following changes: integrated crew members into training; standardized crew callouts; added behavior outcomes to standards; and allowed flexibility in the description of flight tasks. These changes were made so that pilots are not penalized for using their judgment. Adopted from the civilian section were takeoff and landing data cards that allow aircrews to develop a takeoff plan for an emergency should it occur after V_1.

Flight simulator training is now a mandatory element of aircrew training. High-risk training will be performed in the simulator instead of the airplane. In addition, a maintenance designated instructor pilot has replaced the maintenance test pilot evaluator.

The aircraft operator's manual contains aircraft operating procedures. If differences exist between the maneuver descriptions in the operator's manual and this publication, this publication is considered the governing authority for training and flight evaluation purposes. If a conflict exists between this manual and TC 1-210, TC 1-210 takes precedence.

The proponent for this publication is HQ TRADOC. Send comments and recommendations on DA Form 2028 through the aviation commander to Commander, U.S. Army Aviation Center and Fort Rucker, ATTN: ATZQ-TDS-T, Fort Rucker, AL 36362-5000). Direct e-mail questions to the following address: ATZQTDS@rucker.army.mil. The TRADOC proponent for Guardrail training is Commander, U.S. Army Intelligence Center and Fort Huachuca, ATTN: ATZS-TPM, Fort Huachuca, AZ 85613-6000. Direct e-mail questions to the following address: john.carrithers@hua.army.mil.

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

This publication has been reviewed for operational security considerations.

CHAPTER 1

INTRODUCTION

This ATM describes training requirements for crew members. It will be used with AR 95-1, AR 600-105, TC 1-210, and other applicable publications. The tasks in this ATM enhance training in individual and aircrew proficiency. Training focuses on accomplishing tasks supporting the unit's mission. The mission essential task list (METL) will dictate the scope and level of training to be achieved individually by crew members and collectively by aircrews. Commanders must ensure that aircrews are proficient in mission-essential tasks.

1-1. CREW STATION DESIGNATION

The commander will designate a crew station(s) for each crew member. Crew members will be trained and must maintain proficiency in each crew station they are designated to occupy. Instructor pilots (IPs), standardization pilots (SPs), instrument examiners (IEs), and maintenance test pilots (MPs) must maintain proficiency in both seats. Commanders may designate other aviators in both seats. Aviators designated to fly from both pilots' seats will be evaluated in each seat during annual proficiency and readiness test (APART) evaluations. This does not mean that all tasks must be evaluated in each seat. Commanders will develop a program to meet this requirement.

1-2. SYMBOL USAGE AND WORD DISTINCTIONS

a. Symbol Usage. The diagonal (/) is used to indicate and or or. For example, IP/SP may mean IP and SP or may mean IP or SP. When a difference exits in the task description between series of aircraft, this will be indicated by the use of reverse lettering to indicate the difference; for example: D/H

b. Word Distinctions.

(1) Warnings, cautions, and notes. 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 indicates an operating procedure or condition that is essential to highlight.

(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 nonmandatory, method of accomplishment.

(c) May indicates an acceptable method of accomplishment.

1-3. APPLICABILITY. This manual is designed for operators of RC-12D Improved Guardrail; RC-12H Guardrail Common Sensor Minus; RC-12K; RC-12N; RC-12P; and RC-12Q Guardrail Common Sensor aircraft.

1-4. AIRCRAFT TYPE CERTIFICATE. The Department of Transportation, Federal Aviation Administration (FAA), issued all RC-12 aircraft a Restricted Category Aircraft Type Certificate under Federal Aviation Regulations (FAR) Part 23. The primary mission of all RC-12s is reconnaissance. The mission payloads are integral to the airframe and resulted in certification over 12,500 pounds certified takeoff weight. The RC-12 is considered a large aircraft. In addition, RC-12K/N/P/Q were certified under FAR Part 25 for single-engine operations on takeoff under the provisions of Special Federal Aviation Regulation (SFAR) 41. The Guardrail family of aircraft should not perform maneuvers designed for a light twin.

CHAPTER 2

TRAINING

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

2-1. QUALIFICATION TRAINING

a. Initial Aircraft Qualification. Initial qualification training for all Guardrail Systems will be conducted at the U.S. Army Intelligence Center (USAIC) and Fort Huachuca, Arizona. Aviators assigned to aerial exploitation battalions (AEBs) who have not been previously qualified in an RC-12 must attend the initial qualification course appropriate to their assignment.

(1) RC-12D Systems Qualification Course. Aviators assigned to AEBs with either RC-12D or RC-12H must attend the RC-12D Systems Qualification Course for initial qualification.

(2) Guardrail Common Sensor Pilot Qualification Course. Aviators assigned to Guardrail Common Sensor (GRCS) AEBs with either RC-12K or RC-12N or RC-12P and RC-12Q aircraft must attend the Guardrail Common Sensor Pilot Qualification Course for initial qualification.

b. Assignment Versus Qualification Course. Attending the RC-12D Systems Qualification Course does not meet the qualification requirements for assignment to a GRCS AEB. Conversely, attending the GRCS Pilot Qualification Course does not meet the requirements for assignment to a unit with RC-12D or RC-12H aircraft. Each is a separate qualification course depending on the unit of assignment.

2-2. UNIT TRAINING

a. General. Unit commanders are authorized to conduct refresher training and series qualification at unit level.

b. Deployment Extension. Aviators must RL progress in the timeframe according to TC 1-210. AEBs that are deployed and can not make training resources available because of mission requirements are authorized to extend the progression time from 90 to 180 days. This extension must be documented and approved by the battalion commander.

c. Simulator Training.

(1) Fixed-wing aviators will complete simulator training in a Super King Air simulator within 12 to 18 months after completing the Fixed Wing Multiengine Qualification Course.

(2) Aviators qualified in a C-12/RC-12, but not having served in an operational C-12/RC-12 assignment for 12 months, will receive C-12 simulator refresher training before unit assignment.

(3) Aviators currently serving in RC-12 assignments will receive C-12 simulator training biennially (once every 2 years).

. **(4)** Fixed-wing aviators may apply 6 hours of compatible simulator flight time to their semiannual flying hour requirement.

(5) Aviators attending the fixed wing instructor pilot course which includes time flown in a compatible simulator will receive credit for simulator requirements listed in this paragraph.

(6) Aviators failing to meet the requirements set forth in this chapter will be processed IAW AR 95-1, paragraph 4-10.

d. Training Restrictions.

(1) Low-pressure, high-altitude physiology training must be current before beginning flight training.

(2) A crew member may start the training without a current fixed-wing instrument qualification. However, he will not be progressed to RL2 until he has met the category instrument qualification requirements outlined in AR 95-1.

2-3. CURRENCY REQUIREMENTS

Series aircraft that are similar are grouped below. Separate qualification is required in each aircraft. Currency in any one series aircraft will satisfy the requirement for all aircraft within the series or group in which the aviator is qualified. Separate currency is required for all other aircraft. Aviators are required to receive aircraft series qualification according to this manual. A crew member whose currency has lapsed must complete a proficiency flight evaluation (PFE) given in the aircraft by an IP or SP. The commander will designate the tasks for this evaluation.

a. RC-12D, H.

b. RC-12K, N, P, Q.

2-4. SERIES QUALIFICATION TRAINING. To become qualified in a different series of an RC-12 aircraft an aviator must—

a. Academic Training. Receive sufficient academic instruction to ensure he has a thorough knowledge of the differences between the aircraft in which he qualified and the aircraft in which he is receiving the series training. Table 2-1 shows minimum recommended academic subjects.

Table 2-1. Series qualification academic guide

RC-12K/N/P/Q	RC-12D/H
Base Task	**Base Task**
Aircraft systems differences	Aircraft systems differences
Limitations	Limitations
Performance planning	Performance planning
Operator's manual exam[4]	Operator's manual exam
Mission	**Mission**
Mission switches[1]	Mission switches[1]
GPS[1, 3]	GPS[1, 2]
INS[1,2]	
ASE/ACS differences [1, 3]	
1. May be conducted in the aircraft 2. RC-12K only. 3. RC-12 P/Q mission functions. 4. A combined RC-12P/Q exam satisfies the requirement for both aircraft.	1. May be conducted in the aircraft. 2. RC-12H.

b. Flight Training. As a minimum, an aviator should demonstrate proficiency in the tasks outlined in Tables 2-2 and 2-3 to an IP or SP for a series qualification in the RC-12K, RC-12N, RC-12P, or RC-12Q. For a series qualification between the RC-12D and RC-12H refer to Tables 2-4 and 2-5. There is no minimum hour requirement. This is proficiency-based training.

Table 2-2. Base flight tasks for an RC-12K/N/P/Q series qualification

RC-12 K/N/P/Q Flight Instruction	
Tasks	**Task Titles**
1018	Prepare DA Form 7345-R
1029	Perform preflight inspection
1035	Perform engine start
1040	Perform aircraft taxi
1045	Perform engine runup
1105	Perform normal takeoff and climb
1145	Perform normal landing
1212	Perform EGPWS/TAWS operation (if installed)
1264	Perform GPS approach (if a TSO'd system is installed)
1265	Perform TCAS operations (if installed)
1310	Perform emergency procedure for engine failure during cruise flight
1315	Perform single-engine landing

* If a continual evaluation is conducted by an IP or SP, a separate evaluation is not required.

* These tasks are a minimum and do not prevent commanders from adding to the task list.

Table 2-3. Mission flight tasks for an RC-12K/N/P/Q series qualification

RC-12 K/N/P/Q Flight Instruction	
Tasks	**Task Titles**
2448	Perform Guardrail Common Sensor mission
2476	Operate inertial navigation system[2]
2482	Program ASE/ACS flight plan[1]
2484	Operate the ARC-164 HAVEQUICK II radio using the ASE/ACS[1]
2486	Interpret ASE/ACS threat indications[1]

1. RC-12N/P/Q only.
2. RC-12K only.

* Unit trainers may be used for RL2 training. If a UT is used for training, an IP or SP must conduct a final evaluation to complete qualification.

***** If a continual evaluation is conducted by an IP or SP, a separate evaluation is not required.

* These tasks are a minimum and do not prevent commanders from adding to the list.

Table 2-4. Base flight tasks for an RC-12D or RC-12H series qualification

RC-12D/H Flight Instruction	
Task	**Task Titles**
1022	Prepare DA Form 7444-R
1029	Perform preflight inspection
1035	Perform engine start
1040	Perform aircraft taxi
1045	Perform engine runup
1105	Perform normal takeoff and climb
1145	Perform normal landing
1310	Perform emergency procedure for engine failure during cruise flight
1315	Perform single-engine landing

* If a continual evaluation is conducted by an IP or SP, a separate evaluation is not required.
* These tasks are a minimum and do not prevent commanders from adding to the task list.

Table 2-5. Mission flight tasks for RC-12D or RC-12H series qualification

RC-12D/H Flight Instruction	
Task	**Task Titles**
2432	Perform Improved Guardrail/Guardrail Common Sensor Minus mission
2476	Operate inertial navigation system

***** Unit trainers may be used for RL2 training. If a UT is used for training, an IP or SP must conduct a final evaluation to complete qualification.
* If a continual evaluation is used, a separate evaluation is not required.
* These tasks are a minimum and do not prevent commanders from adding to the task list.

2-5. INDIVIDUAL TRAINING (RL3). Crew members are designated RL3 when they are required to regain proficiency in all base tasks. Crew members will receive training in the crew station(s) in which they are authorized to perform crew duties. Crew members undergoing RL3 training in the aircraft must fly with an SP, IP, or IE, as appropriate. Crew members progress from RL3 by demonstrating proficiency in all base tasks day, night, and instruments to an SP, IP, or IE, as appropriate.

a. Newly Assigned Crew Members. A crew member that has not flown within the previous 180 days must be designated RL3 for refresher training. He should attend a DES-approved C-12 simulator training course prior to beginning training. The crew member must be trained and subsequently demonstrate proficiency in all base tasks to an SP, IP, or IE, as appropriate, for advancement to RL2. If a crew member entering the unit's ATP has flown within the past 180 days, but not the previous 60 days, the commander may still require the crew member to undergo refresher training. The commander will base his decision on a records check and/or a PFE for aircraft currency. The commander will establish a training plan for a crew member that does not demonstrate proficiency in any task(s) during this PFE. A crew member demonstrating a lack of proficiency in base task(s) must, as a minimum, demonstrate proficiency in those tasks to an SP, IP, or IE, as appropriate for advancement to RL2.

(1) During RL3 training crew members do not have minimum hour, iteration, or APART requirements in the aircraft in which the training is conducted. The only requirements they have are those designated by the commander, aircraft currency requirements, and AR 600-105.

(2) A day and night orientation flight according to TC 1-210 must be completed before progressing to RL1.

b. Refresher Training Requirements (RL3). Crew members will receive refresher training in the crew station(s) in which they are authorized to perform crew duties. Commanders will designate the right seat tasks in which the aviator must demonstrate proficiency.

(1) Academic training. The crew member will receive training and demonstrate a working knowledge of the applicable topics in Table 2-6 and complete the operator's manual written examination.

Table 2-6. Refresher academic guide

• Introduction	• Pitot static system
• Powerplant	• Flight controls
• Propeller system	• Landing gear
• Electrical system	• Performance charts
• Fuel system	• Weight and balance
• Pressurization system	• Performance planning
• Environmental system	• Flight planning, to include the DOD FLIP
• Pneumatics system	• Instrument departures, en route navigation, and reporting
• Anti-ice and de-ice systems	• Instrument approaches (including GPS)
• Oxygen system	• Local SOPs and regulations
• Crew coordination	• TAWS, TCAS operations

(2) Flight training. The crew member will receive training and demonstrate proficiency in each base task appropriate to the aircraft in Table 2-12. Table 2-7 is a guide for developing a refresher flight training hour requirement. Actual hours will be based on individual proficiency.

Table 2-7. Refresher flight training guide

Flight Instruction	**Hours**
Local area orientation	1.0
Day and night base task training	12.0
Flight evaluation	2.0
Instrument base task training (aircraft/simulator)	8.0
Instrument evaluation	2.0
Total hours	**25.0**

(3) Night training. The crew member will complete a 1-hour flight (minimum) at night. The training must include all tasks marked with an "X" in the night column of Table 2-12. The aviator must occupy the pilot station. Training in night operations must include locating and operating all aircraft lighting systems.

c. Regressing Crew Members. Crew members failing to demonstrate proficiency in any base tasks during any evaluation will be designated RL3. The commander will establish a crew member training plan for the crew member. The crew member must be trained and subsequently demonstrate proficiency in the base task(s) determined to be below standard to an SP, IP, or IE, as

appropriate, before being reinstated to the appropriate RL status. A crew member regressed to RL3 must meet his existing flying hour and task iteration requirements.

(1) Academic training. After any unsatisfactory evaluation, the commander will establish academic requirements applicable to the base task(s) that were evaluated as unsatisfactory. The crew member will receive training and demonstrate a working knowledge of these topics to an IP.

(2) Flight training. The commander will determine the task(s) to be trained as part of the crew member's training plan. As a minimum, the crew member must receive training and demonstrate proficiency in only the task(s) evaluated as unsatisfactory. The commander may establish additional task(s) for training and evaluation as part of the crew member's training plan.

2-6. MISSION TRAINING (RL2). TC 1-210 outlines mission training requirements and guidelines for developing a mission training program. Mission training develops the crew member's ability to perform specific mission/additional tasks selected by the commander to support the unit's METL. Mission training may be accomplished while performing Guardrail missions. Upon completion of RL3 series or refresher training, the aviator is authorized to perform PI duties while undergoing RL2 training with an UT, IP, SP, or IE. However, final aircraft qualification will not be entered on the DA Form 759 (*Individual Flight Record and Flight Certificate*) until completing mission training. Unit trainers may be used to conduct mission training.

a. ATP Requirements. Proficiency in mission-related tasks is the goal of mission training. During mission training, an aviator does not have minimum hour, task, iteration, or APART requirements in the aircraft in which the training is being conducted. The only requirements he has are those designated by the unit commander and aircraft currency. Mission training guidelines shown in Tables 2-8, 2-9, and 2-10 are the minimum requirements for qualification. The commander may select other mission tasks from Table 2-13 and additional tasks he deems appropriate to the unit's mission to be trained during this phase and add them to the training program.

(1) Academic mission training. The topics in Table 2-8 may be used as a guide to develop an academic mission-training program. The commander should tailor mission academic training to fit the specific needs of the unit's mission and METL.

(2) Flight Training. The crew member 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.

Table 2-8. Mission academic training guide

Guardrail Aviation Mission Planning Station (GRAMPS)$_1$	Mission equipment and mission panel operations
Principles of direction finding	Track geometry
Communication High Accuracy Airborne Location System (CHAALS)	Recall procedures
Electronic intelligence (ELINT)	Threat countermeasures
Communications intelligence (COMINT)	Delco Carousel IV Inertial Navigation System (INS)$_2$
Crew responsibilities	Mission SOP
Communications security (COMSEC)	Integrated processing facility (IPF) functions
Air Ground Equipment (AGE) van	Ground Processing Facility (GRF) and Advanced Quick Look (AQL)$_3$
$_1$RC-12N/P/Q only $_3$RC-12H $_2$RC-12D/H/K	

Table 2-9. Mission flight training guide for the RC-12K/N/P or Q

RC-12K/N/P/Q Mission Flight Instruction	
Task	**Task Titles**
2425	Operate aircraft survivability equipment$_2$
2448	Perform Guardrail Common Sensor mission
2472	Perform data transfer system procedures$_1$
2476	Operate inertial navigation system$_2$
2478	Operate Guardrail Aviation Mission Planning Station$_1$
2482	Program ASE/ACS flight plan$_1$
2484	Operate the ARC-164 HAVEQUICK II radio using the ASE/ACS$_1$
2486	Interpret ASE/ACS threat indications$_1$
1. RC-12N/P/Q only.	2. RC-12K only.

Flight Instruction	**Hours**
Mission tasks	20.0
Evaluation	5.0
Total hours	**25.0**

The above listed hours are recommendations only. However, a minimum number of missions should be conducted from the left and the right seat to ensure proficiency.

Table 2-10. Mission training guide for the RC-12D or RC-12H

RC-12D/H Mission Flight Instruction	
Task	**Task Titles**
2425	Operate aircraft survivability equipment
2432	Perform Improved Guardrail/Common Sensor Minus mission
2476	Operate inertial navigation system
Flight Instruction	**Hours**
Mission tasks	20.0
Evaluation	5.0
Total hours	**25.0**
The above listed hours are recommendations only. However, a minimum number of missions should be conducted from the left and the right seat to ensure proficiency.	

2-7. CONTINUATION TRAINING (RL1). An aviator begins continuation training after completing series or refresher training and mission training. The commander also may place him in this phase of training after a records check or proficiency flight evaluation upon completion of local area orientation. This chapter outlines tasks that each aviator must be able to perform to support the unit's mission. Chapter 4 specifies required performance standards.

a. Semiannual Aircraft Flying-Hour Requirements.

(1) Flight activity category (**FAC) 1**—55 hours.

(2) FAC 2—30 hours.

(3) FAC 3¾ No provision exists to designate fixed-wing crew members as FAC 3.

NOTE 1: UTs, IPs, MPs, SPs, and IEs may credit those hours flown while performing assigned duties toward their semiannual flying hour requirements.

NOTE 2: Aviators may credit up to 6 hours of simulator time toward their semiannual flying hour requirement.

b. Annual Task and Iteration Requirements.

(1) FAC 1 and FAC 2. Crew members must perform at least one task iteration annually in each mode the aviator is required to fly as indicated in Table 2-12 and those mission and additional tasks on his CTL. One iteration of each task that can be trained in the aircraft must be performed in the aircraft. Day iteration tasks performed at night may be counted for day iterations. The crew member will maintain proficiency in each task. The commander may require

additional iterations of specific tasks. Aviators designated MP must, in addition to the required minimum annual tasks, perform at least one iteration of each MTF tasks semi-annually.

(2) FAC 3. No provisions exist to designate fixed-wing crew members as FAC 3.

c. Additional Aircraft. The requirement to perform instrument tasks in additional aircraft will be at the discretion of the commander.

2-8. ANNUAL NBC TRAINING REQUIREMENTS

Annual NBC training is mandatory for all FAC 1 positions and those FAC 2 positions selected by the commander. Aviators must wear full mission oriented protective posture (MOPP) gear (MOPP level 4) during NBC training.

a. Aviators will receive NBC training in the base tasks listed below. The commander may also select mission/additional tasks based on the unit's mission.

Table 2-11. FAC 1 NBC Tasks

Task	Task Titles
1029	Perform preflight inspection.
1035	Perform engine start.
1040	Perform aircraft taxi.
1104	Perform normal takeoff and climb.
1145	Perform normal landing.
1800	Perform after-landing tasks.

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

(1) Aircrews use extra care when performing flight duties or training in aircraft cockpits when wet bulb temperatures are above 75 degrees Fahrenheit.

(2) A qualified and current aviator, without a protective mask and NBC boots, is at one set of the flight controls at all times.

(3) Emergency procedures training is not accomplished in flight while aircrews are wearing MOPP gear.

(4) Close coordination is maintained with the local flight surgeon regarding NBC training.

2-9. ACADEMIC CONTINUATION TRAINING

Units must develop a viable academic training program to reinforce crew member aviation skills and knowledge to attain and sustain technical and tactical proficiency. Academic training may be conducted in any suitable environment; for example, a classroom, hangar, flightline, or field site. Academic training may be oral, written, computer-based instruction (CBI), or distance learning and may be conducted either individually or in groups. Topics listed below should be considered in the development of the unit's academic training program. Instructors should take advantage of commercial and FAA publications and web sites to find relevant topics to share during academic training sessions.

2-10. TRAINING TOPICS

a. Regulations and publications (AR 95-1, DA Pam 738-751; DOD FLIP; TC 1-210; TM 1-1500-328-23; and local SOPs and regulations).

b. Crew coordination/crew resource management.

c. Aviation life support equipment.

d. Aircraft systems, avionics, and mission equipment description and operation.

e. Aircraft operating limitations and restrictions (Operator's Manual).

f. Aircraft emergency procedures and malfunction analysis (Operator's Manual).

g. Aeromedical factors (AR 40-8, FM 3-04.301, and TC 1-204).

h. Aerodynamics (FM 1-203).

i. Performance planning (Operator's Manual).

j. Nuclear, biological, and chemical (NBC) operations.

k. Airspace (Aeronautical Information Manual).

l. Stall and spin awareness training (AC61-67B, Stall and Spin Awareness).

.

m. Takeoff, GO/NO GO decisions (Consider Weather/Aircraft Performance).

2-11. TASK LISTS

a. Base Tasks. Table 2-12 lists the base tasks.

b. Mission Tasks. Table 2-13 lists the mission tasks. The commander will select these tasks based on the unit METL.

c. Additional Tasks. The commander may develop additional tasks to support his METL. Additional tasks are 3,000 series tasks.

d. Maintenance Tasks. Table 2-14 lists the maintenance tasks. These tasks are to be added to the CTL for aviators performing MP duties.

e. MP Academic Training Guide Topics. See Table 2-15**.**

f. Evaluation Guidelines.

(1) APART evaluation tasks are those that are defined as a base task for that mode of flight. An X in the mode of flight column denotes that task as a base task. Tasks in the evaluation (EVAL) column identified with a "S" denotes mandatory tasks for the standardization flight evaluation. Tasks identified with an "I" indicates a mandatory task for the instrument evaluation. The use of the word "or" indicates a task that may be evaluated on either the standardization or instrument flight evaluation. The commander should select additional mission tasks for evaluation that support the unit's METL.

(2) MP evaluation requirements. The MP will be evaluated annually on performance of selected MP tasks during the APART by a maintenance designated SP/IP. Those tasks in Table 2-14 indicated by an X in the Eval column are the minimum tasks to be evaluated during the annual MP evaluation.

Table 2-12. Aviator base task list

Task	Title	D	I	N	NBC	EVAL
1000	Conduct crew mission briefing	X	X	X		S,I
1004	Plan a VFR flight	X				S
1007	Plan an IFR flight		X			I
1015	Verify weight and balance	X				
1018	Prepare DA Form 7345-R K/N/P/Q	X	X			S,I
1022	Prepare DA Form 7444-R D/H	X	X			S,I
1029	Perform preflight inspection	X	X	X	X	S or I
1035	Perform engine start	X	X	X	X	S
1040	Perform aircraft taxi	X		X	X	S
1045	Perform engine runup	X		X		S
1104	Perform normal takeoff and climb	X		X	X	S
1120	Perform steep turns	X				S
1122	Perform climbs and descents	X				S
1125	Perform slow flight (Except the RC-12Q)	X				S
1138	Perform fuel management procedures	X	X	X		S,I
1144	Perform touch and go (Required for IP/SPs only)	X				S
1145	Perform normal landing	X		X	X	S
1177	Perform go-around	X		X		
1182	Perform radio communication	X	X			
1201	Perform instrument takeoff		X			I
1210	Perform holding procedures		X			I
1212	Perform EGPWS/TAWS operations (if installed)	X	X			S or I
1215	Perform precision approach		X			I
1220	Perform nonprecision approach		X			I
1240	Perform missed approach		X			I
1245	Perform unusual attitude recovery	X	X			S or I
1250	Perform autopilot/flight director operations		X			
1254	Perform IFR navigation		X			
1260	Operate weather avoidance system	X	X			S or I
1262	Perform circling approach		X			
1264	Perform GPS approach (if installed - see note 4)		X			I
1265	Perform TCAS operations (if installed)	X	X			S or I
1300	Perform emergency procedures	X	X			S or I
1302	Perform procedures for two-way radio failure	X	X			S or I
1303	Perform approaches to stall	X				S
1310	Perform emergency procedures for engine failure during cruise flight	X	X			S or I
1315	Perform single-engine landing	X				S
1320	Perform single-engine go-around	X				S
1325	Perform emergency procedures for engine failure during takeoff D/H	X				S
1330	Perform emergency procedures for engine failure after V_1 K/N/P/Q	X				S
1335	Perform emergency procedures for engine failure during final approach	X				S

Table 2-12. Aviator base task list ¾ concluded.

Task	Title	D	I	N	NBC	EVAL
1340	Perform emergency landing gear extension	X				
1352	Perform rejected takeoff	X				
1800	Perform after-landing tasks	X	X	X	X	S,I

NOTE 1: When tasks 1004 and 1007 are performed in the primary aircraft, they do not have to be performed in the additional aircraft.

NOTE 2. NBC tasks are for FAC 1 positions and FAC 2 positions designated by the commander. Units should establish a wet bulb globe temperature limit for performing these tasks.

NOTE 3: Task 1215 must be evaluated at least annually while the aircraft is operating under single-engine. It should be evaluated on the standardization or instrument evaluation when possible.

NOTE 4: Units performing GPS approaches will train and evaluate task 1264.

Table 2-13. Aviator mission task list

Task	Title	RC-12D	RC-12H	RC-12K	RC-12N,P,Q
2425	Operate aircraft survivability equipment	X	X	X	
2432	Perform Improved Guardrail/Guardrail Common Sensor Minus mission	X	X		
2440	Perform flat turns	X	X	X	X
2448	Perform Guardrail Common Sensor mission			X	X
2472	Perform data transfer system procedures				X
2476	Operate inertial navigation system	X	X	X	
2478	Operate Guardrail Aviation Mission Planning Station (GRAMPS)				X
2482	Program ASE/ACS flight plan				X
2484	Program the ARC-164 HAVEQUICK II Radio using the ASE/ACS				X
2486	Interpret ASE/ACS threat indications				X

2-12. MAINTENANCE TEST PILOT TRAINING REQUIREMENTS

a. Prerequisites. Commanders are authorized to designate individuals as maintenance test pilots (MPs). Candidates for MP are to be selected from the most qualified/experienced aviators. Instructor pilot (IP) qualification in the type and model aircraft is highly desirable. Fixed-wing MPs are not required to be graduates of the Maintenance Manager Maintenance Test Pilot Course (MM/MTPC) according to AR 95-1. The crew member who performs MP duties will receive training and demonstrate proficiency in all maintenance test flight tasks in Table 2-14.

b. Qualification Requirements. MP qualification training will be conducted at the unit level. The training will be accomplished by a maintenance test pilot qualified SP/IP designated by the commander in writing on DA Form 7120-R (*Commander's Task List*). DA Form 7120-R is prescribed by TC 1-210. The crew member undergoing MP qualification training will receive academic and flight training, and must demonstrate proficiency in all maintenance test pilot tasks listed in Table 2-14 before designation as MP. The commander must designate the MP in writing on the DA Form 7120-R.

Table 2-14. Maintenance test pilot task list

Task	Title	Eval
4910	Perform taxiing check	
4915	Perform engine runup/aircraft systems check	X
4921	Perform before-takeoff checks	
4923	Perform during-takeoff checks	
4925	Perform after-takeoff checks	
4927	Perform during climb checks	
4929	Perform pressurization system checks	
4931	Perform during cruise checks	
4935	Perform speed check at maximum cruise power D/H	X
4936	Perform speed performance check at maximum cruise power K/N/P/Q	X
4937	Perform maximum power-lever position check D/H	X
4938	Perform engine performance check at maximum continuous power K/N/P/Q	
4939	Perform engine acceptance check D/H	X
4940	Perform engine performance check at maximum cruise power K/N/P/Q	
4941	Perform engine ice vanes check	
4942	Perform maximum TGT/N_1 availability check K/N/P/Q	X
4943	Perform trim and rigging check	
4945	Perform autopilot checks	
4947	Perform stall, warning, and characteristics checks	X
4949	Perform flap operation check	X
4951	Perform minimum elevator trim check D/H	X
4953	Perform autoignition checks	X
4955	Perform manual propeller-feathering and unfeathering checks	X
4957	Perform propeller autofeathering system check	X
4961	Perform maximum rate-of-descent check	X
4963	Perform landing gear warning horn operation check	
4967	Perform emergency landing gear extension check	
4969	Perform elevator trim check D/H	
4980	Perform communications and navigation equipment check	
Tasks denoted with an X in the EVAL column will be evaluated during the annual MP flight evaluation. Tasks 4935, 4937, and 4939 may be evaluated orally or at an altitude less than 25,000 feet.		

(1) Flight training. The MP will receive training and demonstrate proficiency in all Table 2-14 tasks.

(2) Academic training. The following topics in Table 2-15 may be used as a guide for developing a mission academic training program for MPs.

Table 2-15. MP academic training guide

• TM 1-1500-328-23	• DA Pam 738-751
• Maintenance Test Flights and Maintenance Operational Checks – Section III	• Chapter 1 - Introduction
• Maintenance Test Flights Manual	• Chapter 2 - Aircraft Logbook Forms and Records
• Maintenance Test Flights Check Sheet	• Chapter 3 - Maintenance Forms and Records
• Crew Coordination	• Aircraft Systems

2-13. ASET Training Requirements. Aircraft survivability equipment trainer (ASET) training will be performed according to TC 1-210 and current guidance. Use of aircraft display systems containing embedded ASET trainers should be maximized. Units will incorporate Mode 4/ identification, friend or foe (IFF) training into unit aviation academic training.

CHAPTER 3

EVALUATIONS

This chapter describes evaluation principles and grading considerations for individual crew members. It also contains guidelines for conducting academic and hands-on performance testing. Evaluations are a primary means of assessing flight standardization and crew member proficiency. Evaluations will be conducted according to AR 95-1, TC 1-210, and this ATM.

3-1. EVALUATION PRINCIPLES

a. The value of any evaluation depends on adherence to fundamental evaluation principles. These principles are described below.

(1) 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 pilots (SPs), instructor pilots (IPs), and instrument examiners (IEs), who assist the commander in administering the aircrew training program (ATP).

(2) The method used to conduct the evaluation must be based on uniform and standard objectives. In addition, it must be consistent with the unit's mission and must strictly adhere to the appropriate SOPs and regulations. The evaluator must refrain from making a personal “area of expertise” a dominant topic during the evaluation.

(3) All participants must completely understand the purpose of the evaluation.

(4) 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.

(5) 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.

b. The evaluation will determine the examinee's ability to perform essential hands-on tasks to prescribed standards. Flight evaluations also will determine the examinee’s ability to exercise crew coordination in completing these tasks.

c. 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 the aircrew coordination basic qualities outlined in chapter 6.

d. In all phases of evaluation, the evaluator is expected to perform as an effective crew member. At some point during the evaluation, circumstances may prevent the evaluator from performing as a crew member. In such cases, a realistic, meaningful, and planned method should be developed to pass this task back to the examinee effectively. In all other situations, the evaluator must perform as outlined in the task description or as directed by the examinee. The examinee must know that he is being supported by a fully functioning crew member.

3-2. GRADING CONSIDERATIONS

a. Academic Evaluation. The examinee must demonstrate a working knowledge and understanding of the appropriate subject areas.

b. Flight Evaluation. Task standards are based on an ideal situation. Grading is based on meeting the minimum standards. The evaluator must consider deviations (for example, 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.

3-3. CREW MEMBER EVALUATION. Evaluations are conducted to determine the crew member's ability to perform the tasks on his commander's task list (CTL) and check understanding of required academic subjects listed in the ATM. When the examinee is an evaluator/trainer or a unit 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 evaluator's qualifications at a new duty station will be conducted in the aircraft.

a. Performance Criteria.

(1) Pilot (PI). The PI must demonstrate an understanding of the tasks on his CTL, including conditions, standards, descriptions, and appropriate considerations. He must perform selected tasks to ATM standards, applying aircrew coordination principles. The PI must also demonstrate a basic understanding of the appropriate academic subjects from the ATM. In addition, he must be familiar with his individual aviator training folder (IATF), and understand the requirements of his CTL.

(2) Pilot in command (PC). The PC must meet the requirements in a(1). In

addition, he must demonstrate sound judgment and maturity in the management of the mission, crew, and assets.

(3) Unit trainer (UT). The UT must meet the PC 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) Maintenance test pilot (MP). The MP must meet the PC requirements in a(2). In addition, he must be able to evaluate the airworthiness of an aircraft and have a thorough understanding of test flight procedures. The commander will select an aviator for performing MP duties based on experience and demonstrated maturity and good judgment. An MP-qualified SP/IP will conduct the training and evaluation.

(5) Instructor pilot (IP). The IP must meet the PC 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. He must be able to develop and implement an individual training plan, and have a thorough understanding of the requirements and administration of the ATP.

(6) Standardization pilot/Instrument examiner (SP/IE). The SP must meet the requirements in a(5). The IE must meet the requirements of a(2). In addition, they must be able to train and evaluate IPs, SPs, and IEs, 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. If the IE is not also an IP or SP, the IE must be evaluated to perform unusual attitude, simulated engine shutdown, or engine failures, according to AR 95-1. IEs who are not FW IPs may only perform simulated engine failures and unusual attitude recoveries in cruise flight (may not be performed while on an IAP, or in the traffic pattern).

NOTE 1: Crew members must be evaluated in all crew positions authorized on his CTL. All tasks are not required to be evaluated in the different crew positions. Evaluators will select some tasks to be evaluated in each crew position appropriate to the duties to that crew station (left or right seat) and individual duty qualification (PI, PC, UT, MP, IP, IE, and SP).

b. Evaluation Criteria.

(1) Proficiency flight evaluations. This evaluation is conducted according to AR 95-1, TC 1-210, and paragraph 3-4. The commander will select the topics and flight tasks to be evaluated for the type of evaluation being conducted.

(2) Annual proficiency and readiness test (APART) contact. The SP/IP will evaluate a minimum of two topics from each subject area in paragraphs 3-4b that apply.

(3) APART instrument. The IE will evaluate a minimum of four topics from the subject areas in paragraphs 3-4b(3) relative to IFR flight and flight planning. If the evaluated crew member is an IP/SP, the IE will evaluate the IP's and SP's ability to instruct instrument related tasks.

(4) APART MP evaluation. A maintenance test pilot qualified IP/SP will evaluate a minimum of two topics from the subject areas in paragraphs 3-4b(9). The IP/SP may choose topics in other subject area if they apply to maintenance test flights or are appropriate for the type evaluation.

c. Flight Simulators. A compatible flight simulator may be used to conduct flight evaluations, except a post mishap, if the following criteria are met:

(1) The flight simulator must be full motion Category (CAT) C or higher.

(2) The flight simulator must be Super King Air similar. Contact Director of Evaluation and Standardization (DES), Fort Rucker, AL, for determination of what is compatible and similar.

3-4. EVALUATION SEQUENCE. The evaluation sequence will consist of four phases. The evaluator will determine the amount of time devoted to each phase.

a. Phase I¾ Introduction. In this phase, the evaluator—

(1) Reviews the examinee's records to verify that the examinee meets all prerequisites for the rating.

(2) Confirms the purpose of the flight evaluation, explains the evaluation procedure, and discusses the evaluation standards and criteria to be used.

b. Phase 2—Academic Oral Evaluation Topics. The evaluator should avoid asking questions that require reciting lists. The evaluator should ask questions that are easily understood, have a definite answer, and are relevant to determining the understanding of a topic.

(1) Regulations and publications (AR 95-1, DA Pam 738-751, DOD FLIP, TC 1-210, Operator's Manual, and local and unit SOPs). Topics in this subject area are—

- ATP, individual aircrew training folder (IATF)/commander's task list (CTL) requirements.
- Crew coordination.
- Performance planning.
- Forms, records, and publications required in the aircraft.

- Risk management.
- Fuel requirements.
- Crew endurance.
- Weight and balance requirements.
- Aviation life support equipment (ALSE).

(2) Aircraft systems, avionics, and mission equipment description and operation (Operator's Manual). Topics in this subject are—

- Landing gear.
- Engines and related systems.
- Propellers.
- Fuel system.
- Servicing and parking.
- Navigation equipment.
- Electrical system.
- Environmental system.
- Ice protection.
- Pneumatic system.
- Pressurization.
- Aircraft survivability equipment (ASE).

(3) Instrument planning and procedures (AR 95-1, AIM, DOD FLIP, Operator's Manual, FM 1-230, FM 1-240). Topics in this subject are—

- Departure procedures.
- Required weather for takeoff, en route, destination, and alternate.
- Notices to airmen (NOTAMs).
- Terminal aerodrome forecasts (TAFs).
- Aviation routine weather reports (METARs).
- DOD FLIP symbology.
- Fuel requirements.
- Weather hazards.
- Army Aviation Flight Information Bulletin.
- Closing flight plans.
- Airspace – Types, dimensions, and requirements to operate in.
- Visual flight rules (VFR) requirements.
- Flight plan preparation.
- Position reports.
- En route weather services.
- Transponder requirements.
- Arrival procedures.

(4) Operating limitations and restrictions (Operator's Manual). Topics in this subject area are—

- Propeller limitations.
- Weather/environmental limitations/restrictions.
- Autopilot limitations.
- Fuel system limitations.
- Landing gear cycling (if applicable).
- Brake de-ice limitations.
- Engine limitations.
- Engine overtemperature and overspeed limitations.
- Generator limits.
- Pitot heat limitations.
- Altitude limitations.
- Crosswind limitations.
- Cracked cabin window/windshield
- Intentional engine out speed.
- Loading limitations.
- Starter limitations.
- Airspeed limits, minimum and maximum.
- Maneuvering limits.
- Icing limitations.
- Oxygen requirements.
- Maximum design sink rate.
- Required equipment listing (REL).

(5) Aircraft emergency procedures and malfunction analysis (Operator's Manual, Chapter 9). Topics in this subject area are—

- Emergency terms and their definitions.
- Engine malfunctions.
- Fires.
- Hydraulic system malfunctions.
- Landing emergencies.
- Duct overtemp caution light illuminated.
- Engine bleed air malfunction.
- Emergency exits and equipment.
- Chip detectors.
- Fuel system malfunctions.
- Electrical system emergencies.
- Flight control malfunctions.

- Loss of pressurization.
- Low oil pressure.

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

- Flight restrictions due to exogenous factors.
- Stress.
- Spatial disorientation.
- Hypoxia.
- Middle ear discomfort.
- Decompression sickness.

(7) Aerodynamics (FM 1-203 and Operator's Manual). Topics in this subject area are—

- Stall and stall characteristics.
- V_{mc} – causes and prevention.
- Torque and P factor.
- Hydroplaning.
- Turning performance.
- Crosswind landings.
- Spins and spin recovery.
- Asymmetrical thrust.
- Elements of the lift equation.
- Slow flight.

(8) Night mission operations (TC 1-204). Topics in this subject area are—

- Unaided night flight.
- Visual illusions.
- Distance estimation and depth perception.
- Dark adaptation, night vision protection, and central night blind spot.
- Night vision limitations and techniques.
- Types of vision.
- Use of internal and external light.

(9) MP system operations ¾ systems malfunction analysis and troubleshooting (DA Pam 738-751, Applicable Maintenance Test Flight Manual, and TM 1-1500-328-23.) Topics in this subject area are for MPs only.

- Engine start.
- Instruments.
- Electrical.
- Caution panel.

- Power plant.
- Fuel system.
- Forms and records.
- Propellers.
- Hydraulic (if applicable).
- Engine performance check.
- Flight checks.
- Maintenance test flight requirements.

(10) SP, IP, IE, and UT, evaluator/trainer topics (Instructor Pilot Handbook). Topics in this subject are—

- The learning process.
- Effective communication.
- Teaching methods.
- Types of evaluations.
- Planning instructional activity.
- Flight instructor characteristics and responsibilities.
- Human behavior.
- The teaching process.
- The instructor as a critic.
- Instructional aids.
- Techniques of flight instruction.

c. Phase 3¾ Flight evaluation. If this phase is required, the following procedures apply:

(1) Briefing. The evaluator will explain the flight evaluation procedure and brief the examinee on which tasks he will be evaluated. When evaluating an evaluator/trainer or a unit trainer, the evaluator must advise the examinee that, during role-reversal, he may deliberately perform some tasks outside standards to check the examinee's diagnostic and corrective action skills. The evaluator will conduct or have the examinee conduct a crew briefing that includes, as a minimum, the following items:

- Mission.
- Weather.
- Flight route.
- Performance data.
- Transfer of flight controls.
- Simulated-engine-failure procedures.
- Crew duties, to include emergency duties.

NOTE: Task 1000, operator’s manual, and local directives contain additional crew briefing requirements.

(2) Preflight inspection and engine-start, and runup procedures. The evaluator will evaluate the examinee's use of CL/MTF manual. He also will have the examinee properly identify at least two aircraft components and discuss their functions. For Guardrail mission evaluations, he will demonstrate a working knowledge of the INS and mission switches.

(3) Flight tasks. As a minimum, the evaluator will evaluate those tasks identified in chapter 2 as mandatory for the designated crew station(s) and those mission or additional tasks selected by the commander. A crew member designated as an MP will have those tasks designated by an X in the eval column in table 2-14 evaluated during the APART. An IP, SP, IE, or UT must demonstrate an ability to instruct and evaluate 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.

(4) Engine shutdown and after-landing tasks. The evaluator will evaluate the examinee's use of CL/MTF manual.

d. Phase 4¾ Debriefing. Upon completion of the evaluation, the evaluator will—

(1) Tell the examinee whether he passed or failed the evaluation and discuss any tasks not performed to standards.

(2) Discuss the examinee's strengths and weaknesses.

(3) Offer recommendations for improvement.

(4) Complete the applicable forms.

(5) Ensure that the examinee reviews and initials the applicable forms.

NOTE: A training plan will be developed for the crew member to allow him to regain proficiency in tasks that were evaluated as unsatisfactory.

3-5. ADDITIONAL EVALUATIONS

a. NBC Evaluation. If the commander selects tasks for NBC training, he will establish, in writing, an NBC evaluation program. Units may conduct NBC evaluations as part of the commander's no-notice program, or the APART.

b. Postmishap Flight Evaluation. This evaluation will be conducted after any class A or B accident and any class C accident at the discretion of the commander. The evaluation will be conducted according to paragraphs 3-3a(1) through (5) and paragraph 3-3b(1). See AR 40-501

for medical release requirements before flight. After the evaluation, the IP will debrief the examinee and complete the appropriate IATF entries.

c. Medical Flight Evaluation. This evaluation is conducted according to AR 95-1. The commander, 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 his disability. It should not be based on current proficiency. The flight surgeon may need to be part of the crew to assist in the completion of the evaluation.

(1) After the examinee has completed the medical flight evaluation, the evaluator will prepare a memorandum. He will include in the memorandum—

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

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

(c) A general statement of the examinee's ability to perform with the disability and under what conditions he can perform.

(2) The unit commander will forward the memorandum to Commander, U.S. Army Aviation Center, ATTN: MCXY-AER, Fort Rucker, AL 36362-5333. Commanders will coordinate with the local flight surgeons to obtain board results to ensure actions are completed in a timely manner.

d. No-Notice Evaluation. This evaluation is conducted according to TC 1-210 and the unit's SOP. The commander will select the evaluation method, written, oral, and/or flight in an aircraft or simulator. The evaluation may be conducted for an individual or a crew. After the evaluation, the evaluator will debrief the examinee or crew and complete the appropriate IATF entries.

e. Operator's Manual Examination. This examination will consist of 50 multiple choice questions. Questions from each chapter of the operator's manual should be included in the examination. The aviator must answer 35 of the 50 questions correctly to receive a passing grade.

CHAPTER 4
CREW MEMBER TASKS

This chapter implements portions of STANAG 3114/Air Standard 60/16.

This chapter describes the essential tasks for maintaining crew member skills. It defines the task title, number, conditions, and standards by which performance is measured. A description of crew actions ¾ along with training and evaluation requirements ¾ also is provided. Chapter 6 outlines recommended crew callouts and crew duties. The task description is a training aid to assist crew members to successfully perform the tasks to standard.

4-1. TASK CONTENTS

a. Task Number. Each ATM task is identified by a 10-digit Systems Approach to Training number that corresponds to the tasks listed in the table of contents and chapter 2. All ATM task numbers begin with 011, which is the U.S. Army Aviation Center and School designator. The center three digits are the same as the operator's manual and changes from airframe to airframe. The last four digits of base tasks are assigned 1,000-series numbers, and the last four digits of mission tasks are assigned 2,000-series numbers. As an example, the full task number for Task 1004, Plan a VFR flight, is 011-219-1004. For convenience, only the last four digits are referenced in this training circular.

b. Task Title. The task title identifies a clearly defined and measurable activity. Titles may be the same in several ATMs, but tasks may be written differently for the specific airframe.

c. Conditions. The conditions specify the common wartime or training conditions under which the task will be performed.

(1) A reference to the instructor pilot (IP) in the task conditions includes the standardization instructor pilot (SP).

(2) When a unit trainer UT, IP, or IE is cited in the condition, then that individual will be at one set of the flight controls unless performing the tasks in a flight simulator. An IP, SP, and IE may conduct training/evaluations from a noncrew member station, if authorized by the commander.

(3) Unless otherwise specified in the conditions, all in-flight training and evaluations will be conducted under visual meteorological conditions (VMC). Simulated instrument

meteorological conditions (IMC) denotes flight solely by reference to flight instruments while the aviator is wearing a hood or other similar device that restricts outside visual references. Tasks that are unique to a particular group of RC-12 are indicated in the condition. The abbreviation GR/CS refers to the group that includes the RC-12K/N/P/Q aircraft.

(4) If RL 1 training is being conducted in a compatible flight simulator, an IP or IE is not required to be a crew member to perform emergency procedures tasks. If an evaluation is being conducted in the aircraft, the appropriate evaluator must be a crew member in the aircraft.

(5) Tasks requiring specialized equipment are not mandatory in aircraft that do not have the equipment installed.

(6) If a high cockpit workload exists, essential cockpit procedures may be performed from memory. Crew will prioritize tasks and verify with the CL as time/crew workload permit.

(7) Aviators are expected to maintain operation within aircraft and engine limitations at all times. An operation outside these limits is considered unsatisfactory.

d. Standards. The standards describe the minimum degree of proficiency or standard of performance to which the task must be accomplished. Individual instructor techniques will not be treated as standards nor used as grading elements. Standards are based on ideal conditions. The following standards apply to all tasks.

(1) Tasks.

(a) Perform crew coordination actions and callouts according to chapter 6 and the task description.

(b) Apply the appropriate night and environmental task considerations when performing the task under those conditions.

(2) Taxi operations.

(a) Comply with taxi clearances.

(b) Follow taxi lines with minimum deviation.

(c) Maintain a safe taxi speed.

(d) Correctly use controls as required for wind conditions.

(3) In flight.

(a) Maintain heading $\pm$ 10 degrees.

(b) Maintain altitude ± 100 feet.

(c) Maintain airspeed ± 10 knots indicated airspeed (KIAS).

(d) Maintain rate of climb or descent ± 100 feet per minute (FPM).

(e) Maintain the aircraft in trim ± 1/4 ball width.

(4) Other. Standards other than those listed above will be addressed in that particular task.

e. Description. The description explains one or more recommended techniques for accomplishing the task to meet the standards. This manual cannot address all situations and alternate procedures may be required. Tasks may be accomplished using other techniques as long as the task is done safely and the standards are met. These actions apply in all modes of flight during day; night; IMC; or nuclear, biological, and chemical (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 crew member to ensure safe, efficient, and effective task execution. The designation P* (pilot on the controls) does not refer to PC duties. When required, PC responsibilities are specified. For all tasks, the following responsibilities apply:

(a) Crew members. 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, and distance. Chapter 6 contains examples of crew callouts and guidance on cockpit coordination.

(b) Pilot in command (PC). The PC is responsible for the conduct of the mission, and for operating, securing, and servicing the aircraft he commands. The PC will ensure that a crew briefing is accomplished and that the mission is performed according to air traffic control (ATC) instructions, regulations, and SOP requirements.

(c) Pilot (PI). The PI is responsible for completing tasks as assigned.

(d) Pilot flying (P*). The P* is responsible for aircraft control and the proper execution of immediate action emergency procedures. P* when verbally being described or referenced is called the Pilot Flying. He will announce any deviation, and the reason, from instructions issued by ATC or the P.

(e) Pilot not flying (P). The P is responsible for navigation, in-flight computations, communication, tuning pedestal radios, and assisting the P* as requested. The P, when being verbally described, is referred to as the Pilot Not Flying or Copilot, depending on context.

(f) Trainer/evaluator. When acting as P during training and evaluations, the trainer/evaluator will act as a functioning crew member and perform as required. This is true unless he is training or evaluating pilot response to an incapacitated or unresponsive crew member.

(2) Procedures. This section consists of one or more recommended techniques for accomplishing the task. The procedures are an important element in standardization and training; however, they should not be construed to be the grading standard, rather as a means to meet the standard. There is enough flexibility to allow the P* to use judgment for minor deviations as long as the standards are met; for example, advancing the propellers to high revolutions per minute (RPM) on base to control high airspeed instead of short final is acceptable. For airplanes, the normal crew station for the P* is the left seat. Crew callouts are in **bold** type when integrated in the task description. Chapter 6 contains a consolidated list of callouts.

f. Considerations. This section defines considerations for task accomplishment under various night and environmental conditions. Crew members must consider additional aspects to a task when performing it in different environmental conditions. The inclusion of environmental considerations in a task does not relieve the commander of the requirement to develop an environmental training program according to TC 1-210.

g. Training and Evaluation Requirements. Training and evaluation requirements define whether the task will be trained/evaluated in the aircraft, simulator, or academic environment. Training and evaluations will be conducted only in the authorized environments. 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, however, include hands-on performance of the task. Some task procedures allow multiple ways to achieve the standards. The evaluator will determine which method(s) to examine during the conduct of an evaluation. Chapter 2 lists the modes of flight in which the task must be evaluated. The commander may also select additional mission and/or additional tasks for evaluation.

h. References. The references listed for each task are sources of information about a particular task. Certain references apply to many tasks. Besides the references lists with each task, the following common references apply as indicated.

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

- AR 95-1.
- FM 1-203.
- FM 1-230.

- Operator's Manual/CL.

. **(2) All instrument tasks.**
- AR 95-1.
- FM 1-240.
- DOD FLIP.
- Aeronautical Information Manual (AIM).

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

4-2. TASKS

Standards versus descriptions. Aviators and trainers/evaluators are reminded that task descriptions may contain required elements for successful completion of a given task. For example, when a standard for the task is to "Perform crew coordination actions according to the task description," those crew actions specified in the description are required. Conversely, descriptions are not to be used as a grading standard. The description describes a method to achieve the standard, but has the flexibility to recognize different techniques, and minor variations, and will still allow the aviator to meet the standards. Attention to the use of the words will, should, or may throughout the text of a task description is crucial. The word recommended is used to encourage the use of a procedure, but the procedure is not mandatory.

TASK 1000

Participate in a crew mission briefing.

CONDITIONS: Before flight and given DA Form 5484-R (Mission Schedule/Brief) and a unit-approved crew briefing checklist. DA Form 5484-R is prescribed by AR 95-1.

STANDARDS:

1. The air mission commander (AMC) or PC will actively participate in and acknowledge an understanding of DA Form 5484-R mission briefing.

2. For Guardrail missions, the AMC will conduct or supervise an aircrew mission briefing using mission information from DA Form 5484-R and unit-approved crew briefing checklist for, as a minimum, the mission PCs.

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

4. The crew members receiving the aircrew mission brief will acknowledge verbally a complete understanding of the aircrew mission briefing.

DESCRIPTION:

1. Crew Actions.

a. A designated briefing officer will evaluate and brief key areas of the mission to the PC according to AR 95-1. The PC will acknowledge a complete understanding of the mission brief and initial DA Form 5484-R.

b. The PC has overall responsibility for the crew mission briefing. He may direct the other crew member to perform all or part of the crew briefing.

c. Crew members will direct their attention to the crew member conducting the briefing. They will address any questions to the briefer and acknowledge that they understand the assigned actions, duties, and responsibilities. Lessons learned from previous debriefings should be addressed as applicable during the crew briefing.

2. Procedures. Brief the mission using a unit approved crew mission briefing checklist. Figure 4-1 shows a suggested format for a briefing checklist. Identify mission and flight requirements that will demand effective communication and proper sequencing and timing of actions by the crew members.

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS:

1. **Training.** Training will be conducted academically.

2. **Evaluation.** Evaluation will be conducted academically.

REFERENCES:

Common references
Unit SOP

CREW BRIEFING CHECKLIST

1. Mission overview.

2. Weather. Departure, en route, destination and alternate, if required.

3. Notices to Airmen (NOTAMs).

4. Flight route.

5. Refueling requirements.

6. Mission tracks (Guardrail).

7. Required mission equipment and publications.

8. Crew callouts, duties, and responsibilities – Standard. [1]

9. Analysis of the aircraft.

a. Logbook and preflight deficiencies.

b. Performance planning.

(1) Guardrail Airborne Mission Planning Station (GRAMPS[2]), Takeoff and Landing Data (TOLD).

(2) Mission deviations required based on aircraft performance, weather, or threat.

(3) Single-engine capability.

c. Mission deviations required based on aircraft analysis.

10. Risk assessment considerations.

11. Crew members' questions, comments, and acknowledgment of the mission briefing.

Note 1: Use the word “Standard” when the crew has been trained on crew callouts, duties, and responsibilities according to chapter 6.

Note 2: Guardrail Aviation Mission Planning Station (N/P/Q).

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

TASK 1004

Plan a VFR flight.

CONDITIONS: Before flight and given access to weather information; NOTAMs; flight planning aids; necessary charts, forms, and publications; local flying rules; and weight and balance information.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Complete the Takeoff and Landing Data (TOLD) card using the operator's manual.

2. Verify aircraft performance using the operator's manual.

3. Obtain weather briefing and confirm the weather will be at or above visual flight rules (VFR) minimums.

4. Plan the mission to meet all requirements for VFR flight.

5. Determine appropriate departure, en route, and arrival procedures.

6. Select routes that avoid hazardous weather and best ensure mission completion. If appropriate, select altitudes that conform to VFR cruising altitudes.

7. Complete and file a flight plan according to AR 95-1, DOD FLIP, and local or host country procedures.

8. Compute for the mission:

a. Total flight time ±30 minutes.

b. Ensure the VFR fuel reserve requirement will be met according to AR 95-1.

9. Perform mission risk assessment and mission briefing/briefback according to unit SOP and AR 95-1, and thoroughly brief the other crew member.

DESCRIPTION:

1. Crew Actions.

a. The PC will ensure the required preflight planning items are complete. He 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 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, terrain, or special use airspace. Select the course(s) and altitude(s) that will best facilitate mission accomplishment. Compute total distance and flight time, and calculate the required fuel using the appropriate charts in the operator's manual. Complete the appropriate flight plan and file it with the appropriate agency.

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

TRAINING AND EVALUATION REQUIREMENTS:

1. **Training.** Training will be conducted academically.

2. **Evaluation.** Evaluation will be conducted academically.

REFERENCES:

Common references
Title 14 CFR/Host nation regulations
Unit SOP
Local flying rules

TASK 1007

Plan an IFR flight.

CONDITIONS: Before IFR flight and given access to weather information; NOTAMs; flight planning aids; necessary charts, forms, and publications; and weight and balance information.

NOTE: The use of computer flight planning programs is authorized. The crew should verify the information with applicable charts before using.

STANDARDS:

1. Complete the Takeoff and Landing Data (TOLD) card using the operator's manual.

2. Verify the weight and balance is within limits for the planned load using the appropriate DD Form 365-4.

3. Obtain weather briefing and confirm the weather will be at or above approach minimums at the destination.

4. Plan the mission to meet all requirements for IMC flight. Determine the proper departure, en route, and destination procedures, and if an alternate is required.

5. Select route(s) and altitudes that avoid hazardous weather conditions, conform to IFR cruising altitudes, and do not exceed aircraft or equipment limitations.

6. Determine refueling arrangements, if required.

7. Compute for the mission:

a. Total flight and mission time ± 45 minutes.

b. Ensure IFR fuel and reserve requirements are met according to AR 95-1.

8. Perform mission risk assessment and crew member briefing.

9. Complete and file the flight plan.

DESCRIPTION:

1. Crew Actions.

a. The PC will ensure all premission planning items according to AR 95-1 are completed and that the aircraft is properly equipped to accomplish the assigned mission. He may direct the PI to complete some portions of the IFR flight planning.

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

2. Procedures. Using appropriate military, FAA, or host-country weather facilities, obtain information about the weather. Compare destination forecast and approach minimums, and determine if an alternate airfield is required. Check the NOTAMs and other appropriate sources for any restrictions that may 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. Select the route(s) or course(s) and altitude(s) that will best facilitate mission accomplishment. When possible, select preferred and alternate routing. Select altitude(s) that minimize flight in the icing level and turbulence; are above minimum IFR altitudes; conform to the semicircular rule, when applicable; and do not exceed aircraft or equipment limitations. Compute the total distance and flight time, and calculate the required fuel. Use the appropriate charts, the operator's manual, or a computer flight-planning program, if applicable. If a computer flight-planning program is used, verify aircraft performance data with the operator's manual before using. Complete the appropriate flight plan and file it with the appropriate agency.

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS:

1. **Training.** Training will be conducted academically.

2. **Evaluation.** Evaluation will be conducted academically.

REFERENCES:

Common references
Title 14 CFR/Host nation regulations
Local SOPs and regulations

TASK 1015

Verify aircraft weight and balance.

CONDITIONS: Given crew weights, payload weights, takeoff fuel, aircraft configuration, aircraft weight and balance information, operator's manual, and completed DD Form 365-4 (*Weight and Balance Clearance Form F – Transport/Tactical*), or electronic computer data sheet, according to AR 95-1.

STANDARDS:

1. Verify that center of gravity (CG) and gross weight remain within aircraft limits for the duration of the flight.

2. Identify all mission or flight limitations imposed by weight or CG.

DESCRIPTION:

1. Crew Actions.

a. 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 and loading task/maneuver restrictions/limitations.

b. If there is no completed DD Form 365-4 or electronic computer data sheet 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.

c. All crew members will be briefed on any limitations.

2. Procedures.

a. Identify the correct DD Form 365-4 for the configuration and fuel load.

b. Verify the aircraft CG in relation to CG limits for takeoff and landing.

c. Ensure loading is within zero fuel weight.

d. Verify ramp, takeoff, and landing weights are within the aircraft limits.

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS:

1. **Training.** Training will be conducted academically.

2. **Evaluation.** Evaluation will be conducted academically.

REFERENCES:

Common references
TM 55-1500-342-23
DD Form 365-4

TASK 1018

Prepare a DA Form 7345-R (GR/CS Takeoff and Landing Data Card).

CAUTION

If the takeoff weight cannot be reduced because of mission requirements to meet single-engine performance during takeoff, then selecting a runway that meets Accelerate - Stop is recommended.

CONDITIONS: Given a completed DD Form 365-4; the RC-12K, RC-12N, or RC-12P/Q aircraft operator's manual, airport information, environmental conditions at takeoff, and a blank DA Form 7345-R.

STANDARDS: Appropriate common standards plus these additions and modifications:

1. Correctly compute performance data according to procedures given in the aircraft operator's manual and the description below.

DESCRIPTION:

1. Crew Actions.

a. The PC will compute or direct the other crew member to compute the aircraft performance data according to the instructions provided below.

b. The PC will verify that the aircraft meets the performance requirements for the mission and brief the other crew member.

c. The PC will ensure that aircraft limitations and capabilities are not exceeded.

2. Procedures.

a. DA Form 7345-R is an aid for organizing takeoff and landing planning data. A copy of DA Form 7345-R is located at the back of this document for reproduction purposes. It is also available on the USAPA web site @www.usapa.army.mil. The card provides the crew an easy reference for aircraft performance during takeoff, takeoff emergencies, and landing at the destination. The card will be computed before takeoff and should be updated before landing. It is a primary risk management tool for both the crew and commander to determine the maximum acceptable payloads, minimum runway lengths, and associated risks.

b. The most accurate performance data can be obtained by using existing conditions. If mission or time constraints preclude using these conditions, use the closest pressure altitude (PA) and temperature forecast for the departure time. Instructions for completing the items indicated by bold numbers in Figures 4-2 and 4-3 are given in the aircraft operator's manual. When necessary, they are supplemented by the instructions below. The crew should be aware of variables between precomputed and actual performance.

GR/CS TAKEOFF AND LANDING DATA CARD

For use of this form, see TC 1-219; the proponent agency is TRADOC.

TAKEOFF CONDITIONS		
TEMP C° (1)	PA (2)	
TAKEOFF WEIGHT (3)	RUNWAY AVAIL (4)	
STATIC POWER	(5)	(6)
FLAPS	**0%**	**40%**
Tire Speed Limit	(7)	(13)
V_1	(8)	(14)
V_R	(9)	(15)
V_2	(10)	(16)
Takeoff Distance	(11)	(17)
Accelerate-Stop	(12)	(18)
LANDING DATA		
Vref (19)	LAND DISTANCE (20)	
OPTIONAL (21)		

DA FORM 7345-R, DEC 2001 USAPA V1.00

EDITION OF AUG 94 IS OBSOLETE

Figure 4-2. DA Form 7345-R (Front)

3. Supplemental Instructions.

NOTE: Speeds that are listed as "All Weights" or are published as a single number and do not have a chart that varies the speed with weight are required memory items. The TOLD card eliminates the requirement to list speeds that do not change; for example, V_{enr}, V_{yse}.

a. Front.

(1) Temp C°. Record the temperature in degrees Celsius forecast for the time of departure.

(2) PA. Record the pressure altitude forecast for the time of departure.

(3) Takeoff Weight. Record the takeoff weight obtained from the DD Form 365-4 or the adjusted takeoff weight determined from the reverse side of the TOLD card. If the takeoff weight is adjusted, verify the weight and balance of the adjusted weight.

(4) Runway Avail. Record runway length (including overrun distance if applicable) for the planned departure runway.

(5) Static Power.

- K Record the engine torque in percent, from the Minimum Static Takeoff Power at 1,700 RPM – Flaps Up chart.
- N/P/Q Record the engine torque from the Static Takeoff Power at 1,700 RPM with Ice Vanes Retracted chart.

(6) Static Power.

- K If required, record the engine torque in percent from the Minimum Static Takeoff Power at 1,700 RPM – Flaps Approach chart.
- N/P/Q If required, record the engine torque in percent from the Static Takeoff Power at 1,700 RPM with Ice Vanes extended.

(7) Tire Speed Limit – Flaps 0%.

· N/P/Q Compute the tire speed limit using zero wind component from the Maximum Takeoff Weight – Flaps Up as limited by the Tire Speed chart.

(8) V_1 - Flaps 0%.

· Record the Flaps-Up V_1 for the takeoff gross weight using the Takeoff Speed – Flaps Up chart.

(9) V_R - Flaps 0%.

· Record the Flaps Up V_R for the takeoff weight using the Takeoff Speed – Flaps Up Chart.

(10) V_2 – Flaps 0%.

· Record the Flaps Up V_2 for the takeoff weight using the Takeoff Speed – Flaps Up chart.

(11) Takeoff Distance - Flaps 0%. Do not consider head wind during takeoff computations. However, if takeoff must be made downwind, include the tail wind in takeoff computations. Adjust the distance for takeoff with the ice vanes extended, runway slope or winds.

- N Record the distance required for takeoff using the Takeoff Distance – Flaps Up chart. The distance is from brake release to 50 feet.

- K/P/Q Record the distance required for takeoff using the Takeoff Distance Flaps Up chart. The distance can be computed from brake release to an altitude between 0 to 50 feet.

(12) Accelerate - Stop - Flaps 0%. Record the accelerate – stop distance from the Accelerate – Stop – Flaps Up chart. Adjust the distance for takeoff with the ice vanes extended, runway slope, or winds.

(13) Tire speed limit – Flaps 40%.

- N/P/Q Compute the tire speed limit using zero wind component from the Maximum Takeoff Weight – Flaps Approach as limited by the Tire Speed chart.

(14) V_1 - Flaps 40%.

- Record the Flaps-Approach V_1 for the takeoff gross weight using the Takeoff Speed – Flaps Approach chart.

(15) V_R - Flaps 40%.

- Record the Flaps Approach V_R for the takeoff weight using the Takeoff Speed – Flaps Approach chart.

(16) V_2 – Flaps 40%.

- Record the Flaps Approach V_2 for the takeoff weight using the Takeoff Speed – Flaps Approach chart.

(17) Takeoff Distance - Flaps 40% . Record the runway distance required for takeoff. Do not consider head wind during takeoff computations. However, if takeoff must be made downwind, include the tail wind in takeoff computations. Adjust the distance for takeoff with the ice vanes extended, runway slope, or winds.

- N Record the distance required for takeoff using the Takeoff Distance – Flaps Approach chart. The distance is from brake release to 50 feet.

- K/P/Q Record the distance required for takeoff using the Takeoff Distance – Flaps Approach chart. The distance can be computed from brake release to an altitude between 0 to 50 feet.

(18) Accelerate - Stop - Flaps 40%. Record the accelerate-stop distance from the Accelerate – Stop – Flaps Approach chart. Adjust the distance for takeoff with the ice vanes extended, runway slope, or winds.

(19) V_{ref}. Guardrail Common Sensor Aircraft have a single V_{ref} for all weights. This block may be used for that V_{ref}, for a no flap V_{ref} or left blank.

(20) Land Distance. Record the runway distance required for a landing at the destination. It is not necessary to record the landing distance for returning immediately after takeoff. Since the takeoff distance required will always exceed landing distance required you can assume the runway you departed on is long enough to return and land on in the event of an emergency. This does not imply that the aircraft should be landed above its certified maximum landing weight unless an emergency warrants it.

- K Normal Landing Distance Without Propeller Reversing – Flaps Down.

- N/P/Q Normal Landing Distance – Flaps Down.

(21) Optional. Use this area as desired.

b. Back. Use to determine if takeoff weight needs to be restricted to achieve desired single engine performance if an engine fails during takeoff. If Flaps Up or Flaps 40 percent meets the desired performance, it is not required to compute both. The back of the card should be completed first.

ONE ENGINE INOPERATIVE TAKEOFF CONDITIONS		
FLAPS	0%	40%
Max Takeoff Weight for One Engine Climb at Lift-off	(6)	(12)
Accelerate - Go ((2))	(7)	(13)
Net Takeoff Flight Path First Segment (3) %	(8)	(14)
Net Takeoff Flight Path Second Segment (V_2) (4) %	(9)	(15)
Net Takeoff Flight Path Third Segment (V_{enr}) (5) %	(10)	
Adjusted Takeoff Weight	(11)	(16)
REMARKS		

PAGE 2, DA FORM 7345-R, DEC 2001 USAPA V1.00

Figure 4-3. DA Form 7345-R (Back)

(1) <u>General instructions.</u> Using the planned departure weight, temperature, and pressure altitude, obtain the data from the charts listed below for the planned flap setting. If the single engine climb criteria is met, enter the departure weight on the front side of the takeoff and landing data (TOLD) card and obtain the takeoff data. If a segment(s) does not meet single engine performance criteria, using the worst condition, back plan on that chart to determine the takeoff weight that would satisfy climb performance. Recompute the back side of the TOLD card, using this adjusted takeoff weight to verify the weight reduction meets all performance criteria. Enter the adjusted weight on the front of the TOLD card in takeoff weight block. The commander will determine the minimum criteria for items 1 through 4 as part of risk management. The values given are for information only based on the airplane certification under Title 14 CFR Part 25.

(2) Accelerate - Go. Use this area to enter the maximum distance of accelerate-go allowed by the commander's policy. This segment is one of the most restrictive for planning because the aircraft will be departing ground effect; the gear will be in transient, creating drag and attempting to accelerate to V_2.

(3) Net Takeoff Flight Path – First Segment (%). This segment begins at V_1 and ends when the gear is retracted. It is a high drag segment and a positive rate of climb is highly desirable.

(4) Net Takeoff Flight Path – Second Segment (%). The second segment begins from the point the gear is fully retracted and ends at 500 feet above ground level (AGL) and is flown at V_2. Recommended minimum gradient of climb is 2.4 percent.

(5) Net Takeoff Flight Path - Third Segment (%). The third segment begins after the Acceleration and Flaps retraction segment ends by obtaining V_{enr}. Maintain Takeoff Power until reaching V_{enr} or 5 minutes and then reduce power to Maximum Continuous. The takeoff path ends at 1,500 feet AGL. Recommend a minimum of 1.2 percent climb gradient (Title 14 CFR Part 25.111 (c) (3)(I)).

(6) Max Takeoff Weight to Achieve a Positive Climb at Lift-off – Flaps 0% . Determine if the planned takeoff weight is equal to or less than the charted limit. If the planned departure weight is more than the maximum chart weight for the conditions, continuing the takeoff is not an option unless the takeoff weight is reduced.

(7) Accelerate – Go – Flaps 0%. Determine the total takeoff distance from brake release to clear a 50-foot obstacle if an engine failure occurs at V_1. If the distance from the Accelerate – Go – Flaps Up over a 50-foot obstacle chart is excessive, compare the performance using Approach Flaps or back plan the chart to determine the weight that will result in meeting the required distance. If the distance exceeds runway length plus a clearway (25 percent of the runway length), consider reducing the takeoff weight. Enter the chart in reverse using the total of the runway length plus clearway length and determine the weight for which this acceleration-go distance is possible.

(8) Net Takeoff Flight Path – First Segment – Flaps 0%. Use the Net Takeoff Flight Path – First Segment – Flaps Up - One Engine Inoperative chart to determine the gradient of climb. A positive gradient is desirable.

(9) Net Takeoff Flight Path – Second Segment Flaps 0%. Use the Net Takeoff Flight Path – Second Segment – Flaps Up – One Engine Inoperative chart to determine the gradient of climb.

(10) Net Takeoff Flight Path - Third Segment – One Engine Inoperative – Flaps 0%. Use the Net Takeoff Flight Path – Third Segment – One Engine Inoperative chart to determine the gradient of climb.

(11) Adjusted Takeoff Weight - Flaps 0%. Enter the adjusted takeoff weight, if weight had to be reduced to meet one engine inoperative criteria. Enter this weight on the front of the TOLD card as the takeoff weight.

(12) Max Takeoff Weight to Achieve a Positive Climb at Lift-off – Flaps 40% . Determine if the planned takeoff weight is equal to or less than the charted limit, using the Maximum Takeoff Weight – Flaps Approach To Achieve Positive One Engine Inoperative Climb at Lift-off chart.

(13) Accelerate – Go – Flaps 40%. Determine the distance from the Accelerate – Go Distance Over a 50-Foot Obstacle – Flaps Approach. If the distance exceeds runway length plus a clearway (25 percent of the runway length), consider reducing the takeoff weight. Enter the chart in reverse using the total of the runway length plus clearway length and determine the weight for which this acceleration-go distance is possible.

(14) Net Takeoff Flight Path – First Segment – Flaps 40%. The first segment begins at V_1 and ends when the gear is fully retracted. Use the Net Takeoff Flight Path – First Segment – Flaps Approach - One Engine Inoperative chart to determine the gradient of climb.

(15) Net Takeoff Flight Path – Second Segment – Flaps 40%. Use the Net Takeoff Flight Path – Second Segment – Flaps Approach – One Engine Inoperative chart to determine the gradient of climb.

(16) Adjusted Takeoff Weight – Flaps 40%. Enter the adjusted takeoff weight, if weight had to be reduced to meet one engine inoperative criteria. Enter this weight on the front of the TOLD card as the takeoff weight.

NOTE: The same TOLD may suffice for consecutive takeoffs and landings if the crew verifies that the existing temperature, PA, and weight does not degrade performance.

Table 4-1. Takeoff airspeed terminology

V_1	Takeoff decision speed. If an engine fails at V_1 , the pilot decides whether to stop or continue the takeoff.
V_r	The speed at which the nose tire is departing the ground and the aircraft is rotated to the takeoff attitude.
V_{50}	Two engine speed at 50 feet.
V_2	Takeoff safety speed. Must be attained by 50 feet, single engine, above the runway, and is the speed to be maintained during single climb until 500 feet AGL.
V_{enr}	Single engine en route climb speed is the airspeed that is flown during the third segment from 500 feet AGL to 1,500 feet AGL with gear and flaps up.

c. Takeoff Flight Planning. This section is designed to supplement the explanations of the takeoff charts in the operator's manuals and provide options available for takeoff flight planning. (See figure 4-4, page 4-24, and figure 4-7, page 4-36.) The performance charts in the operator's manuals reflect planning data required for the Aircraft Type Certificate. The pilot is responsible for understanding and using the appropriate charts for takeoff planning. The charts available allow the pilot to determine, if he did lose an engine at the critical point of takeoff (V_1), what his best option would be: continue the takeoff; abort the takeoff and stop; or reduce his planned takeoff weight to increase the aircraft's performance.

d. Takeoff Weight Considerations. The takeoff weight may be limited by the most restrictive of the following:

- Maximum certified takeoff weight (structural).
- Maximum takeoff weight permitted by takeoff field length.
- Maximum takeoff weight to achieve a positive climb at lift-off.
- Accelerate–Go distance over 50-foot obstacle.
- Net takeoff flight path – Second segment.

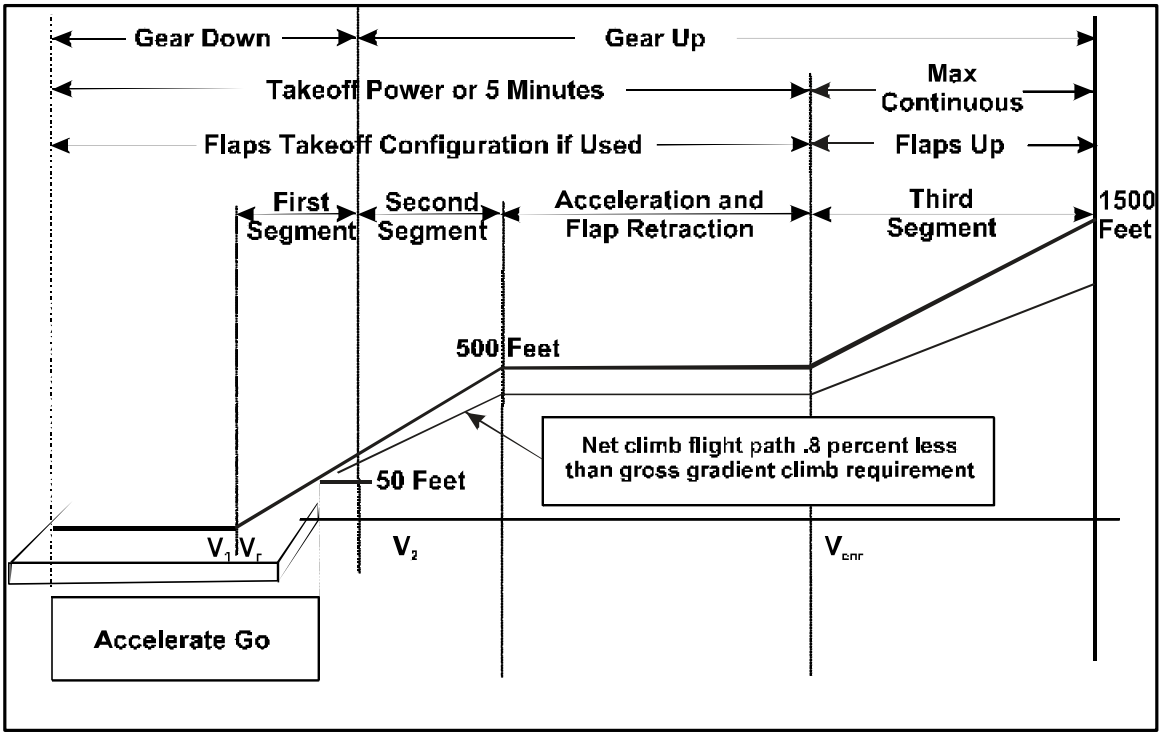


Figure 4-4. RC-12 K/N/P/Q one engine inoperative takeoff

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS. Task will be trained and evaluated academically.

REFERENCES:

TM 55-1510-222-10 K
TM 55-1510-223-10 N
TM 55-1510-224-10 P/Q

TASK 1022

Prepare a DA Form 7444-R (RC-12 D/H Takeoff and Landing Data Card).

CAUTION

If the takeoff weight cannot be reduced because of mission requirements to meet single engine performance during takeoff, then selecting a runway that meets Accelerate-Stop is recommended.

CONDITIONS: Given a completed DD Form 365-4; the RC-12D or RC-12H aircraft operator's manual; unit SOP; environmental conditions at takeoff; and a blank DA Form 7444-R. A copy of DA Form 7444-R is available at the back of this document for reproduction purposes. It is also available on the USAPA web site at www.usapa.army.mil.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly compute performance data according to procedures given in the aircraft operator's manual, the unit SOP, and the description below.

DESCRIPTION:

1. Crew Actions.

a. The PC will compute or direct the other crew member to compute the aircraft performance data according to the instructions provided below.

b. The PC will verify that the aircraft meets the performance requirements for the mission and brief the other crew member.

c. The PC will ensure that aircraft limitations and capabilities are not exceeded.

2. Procedures.

a. DA Form 7444-R is an aid for organizing takeoff and landing planning data. The RC-12 D/H takeoff and landing data (TOLD) card gives the crew an easy reference for takeoff, takeoff emergencies, and landing at the destination. The card is a guide to expected aircraft performance and will be computed before takeoff and should be updated before landing. It is a primary risk management tool for both the crew and commander to determine the maximum acceptable payloads, minimum runway lengths, and associated risks.

b. The most accurate performance data can be obtained by using existing conditions. If mission or time constraints preclude using these conditions, use the closest PA and temperature forecast for takeoff. Instructions for completing the items indicated by bold numbers in Figures 4-5 and 4-6 are given in the aircraft operator's manual. When necessary, they are supplemented by the instructions below. The crew should be aware of variables between computed and actual performance. Items such as braking action or runway surface conditions will affect takeoff and landing distances.

RC-12D/H TAKEOFF AND LANDING DATA CARD

For use of this form, see TC 1-219; the proponent agency is TRADOC.

TAKEOFF CONDITIONS		
STATION (1)	RUNWAY AVAIL (2)	
TEMP C° (3)	PA (4)	
TAKEOFF WEIGHT (5)	TAKEOFF POWER (6)	
FLAPS	**0%**	**40%**
V_1	(7)	(12)
V_2	(8)	(13)
V_{yse}	(9)	
Takeoff Distance	(10)	(14)
Accelerate - Stop	(11)	(15)

LANDING DATA	
Vref (16)	LAND DISTANCE (17)
OPTIONAL (18)	

DA FORM 7444-R, DEC 2001 USAPA V1.00

Figure 4-5. DA FORM 7444-R (FRONT)

3. Supplemental Instructions.

NOTE 1: Speeds that are published as a single number and do not have a chart that varies the speed with weight are required memory items. The TOLD card eliminates the requirement to list speeds that do not change; for example, V_{mc}.

a. Front.

(1) Station. Enter the three letter or International Civil Aviation Organization (ICAO) identifier for the departure airport

(2) Runway Avail. Enter the runway length of the planned departure runway. Update if ATC changes the departure runway.

(3) Temp C°. Record the temperature in degrees Celsius forecast for the time of departure.

(4) PA. Record the pressure altitude forecast for the time of departure.

(5) Takeoff Weight. Record the takeoff weight obtained from the DD Form 365-4 or the adjusted takeoff weight determined from the reverse side of the TOLD card.

(6) Takeoff Power. Record the engine torque in percent from the Minimum Takeoff Power At 2,000 RPM chart. For operation with the ice vanes extended, increase field pressure altitude 1,000 feet before entering the graph.

(7) Flaps up V_1. Record the Flaps Up V_1 for the takeoff gross weight. Figure 4-4 lists other charts V_1 is located on. Different operator's manuals may list V_R on one page, then call it ROTATION SPEED or V_1 on another page; yet when you compare speeds they are identical. They are the same because **V_R equals V_1 and is the rotation speed for the RC-12D/H series aircraft. For standardization, references to V_1 are synonymous with V_R and ROTATION SPEED.**

- D - V_1 is the V_R speed on the Takeoff Distance – Flaps 0% chart.
- H - V_1 is the 'ROTATION SPEED' on the Takeoff Distance – Flaps 0% chart.

NOTE 2: V_{LOF} will always be V_R + 3 knots or V_1 + 3 knots.

(8) Flaps up V_2. Record V_2 with the flaps up. Figure 4-4 lists other charts V_2 is located on.

- D - Flaps up V_2 is listed on the Takeoff Distance – Flaps 0% chart.
- H - Flaps up V_2 is the 50-foot speed on the Takeoff Distance – Flaps 0% chart.

(9) V_{yse}. Record Vyse from the CLIMB SPEED~KNOTS airspeed block listed on the Climb—One Engine Inoperative chart for the departure weight

(10) Takeoff Distance Flaps 0%. Record the runway distance required for takeoff. Do not consider head wind during takeoff computations. However, if takeoff must be made downwind, include the tail wind in takeoff computations. Adjust the distance for takeoff with the ice vanes extended, or runway slope.

(11) Accelerate - Stop Flaps 0%. Record the accelerate-stop distance from the Accelerate – Stop – Flaps 0% chart.

(12) Flaps 40% V_1. Record V_1 with the flaps at the takeoff position for the takeoff gross weight.

- D - V_1 is the V_R speed on the Takeoff Distance – Flaps 40% chart.
- H - V_1 is the 'ROTATION SPEED' on the Takeoff Distance – Flaps 40% chart.

(13) Flaps 40%V_2. Record V_2 with the flaps at the takeoff position for the takeoff gross weight.

- D - Flaps 40% V_2 is listed on the Takeoff Distance – Flaps 40% chart.
- H - Flaps 40 % V_2 is the 50-foot speed on the Takeoff Distance– Flaps 40% chart.

(14) Takeoff Distance Flaps 40%. Record the runway distance required for takeoff. Do not consider head wind during takeoff computations. However, if takeoff must be made downwind, include the tail wind in takeoff computations. Adjust the distance for takeoff with the ice vanes extended, and runway slope.

(15) Accelerate - Stop Flaps 40%. Record the Accelerate – Stop distance from the Accelerate – Stop – Flaps 40% chart.

(16) V_{ref}. Record V_{ref} for landing. Recording the no-flap V_{ref} airspeed is not mandatory. Units have the option of splitting the block (/)and recording the V_{ref} for landing at takeoff gross weight or maximum landing weight on one side. On the other side, record the V_{ref} for the landing weight at destination.

- D - Obtain V_{ref} from the Landing Distance with propeller reversing – Flaps 100% chart.

- H - Obtain V_{ref} from the landing distance without propeller reversing – Flaps 100% chart.

(17) Land Distance. Record the runway distance required for a landing at the destination. For planning purposes, use the 50-foot obstacle height. It is not necessary to record the landing distance for returning immediately after takeoff. Since the takeoff distance required will always exceed landing distance required, you can assume the runway you departed on is long enough to return and land on in case of an emergency.

- D - Obtain the landing distance from the landing distance with propeller reversing – Flaps 100% chart.

- H - Obtain the landing distance from the landing distance without propeller reversing – Flaps 100% chart.

(18) Optional. Use this area as desired.

b. Back. Use to determine if takeoff weight needs to be restricted to achieve desired single engine performance if an engine fails during takeoff. If Flaps Up or Flaps 40% meets the desired performance, it is not required to compute both. Because weight may have to be restricted, it is suggested that this side be completed first.

(1) Accelerate-Go. Use this area to enter the maximum distance of accelerate-go allowed by the commander's policy. This segment is one of the most restrictive for planning because the aircraft will be departing ground effect; the gear will be in transient, creating drag and attempting to accelerate to V_2. As an aid to determining a procedure, the following information is provided:

(a) Balanced field is where Accelerate–Stop and Accelerate–Go are equal.

(b) Clearway. A clearway is an area beyond the runway under the control of the airport authority. Allow 25 percent of the runway length to be added to the total distance using a clearway.

(c) Recognize when operating at heavier weights and or high-density altitudes that, if an engine failed at V_1 or after lift-off, the aircraft is not going to fly and the crew is going to have to stop on the runway or land straight ahead. Consider requiring Accelerate-Stop for these conditions.

(d) Reducing takeoff weight and/or requiring a minimum runway length are the only options available that can be controlled. Some missions may require operating outside these parameters. The commander must then assign a higher risk value to these missions.

ONE ENGINE INOPERATIVE TAKEOFF CONDITIONS		
FLAPS	0%	40%
Positive Climb at Lift-off	(4)	(9)
Accelerate - Go ((1))	(5)	(10)
Single Engine Gradient of Climb (V_2) (2) %	(6)	(11)
Climb One Engine Inoperative (V_{yse}) (3) %	(7)	
Adjusted Takeoff Weight	(8)	(12)
REMARKS (13)		

PAGE 2, DA FORM 7444-R, DEC 2001 USAPA V1.00

Figure 4-6. DA Form 7444-R (Back)

(2) Single Engine Gradient of Climb (V_2)%. Commanders should assign a minimum gradient of climb for the segment that begins at the end of accelerate-go and ends when clear of all obstacles and/or rate of climb allows acceleration to Vyse.

(3) Climb ¾ One Engine Inoperative (V_{yse})%. Commanders should assign a minimum gradient of climb for the segment.

(4) Takeoff Weight to Achieve a Positive Climb at Lift-off – Flaps 0%. Determine if the planned takeoff weight is equal to or less than the charted limit. If the planned departure weight exceeds the charted limit, determine if using flaps will allow a positive climb at lift off or consider reducing departure weight to be within limits.

NOTE 3: If any of the items (5 to 7 or 9 to 11) exceed the required criteria for takeoff, use the worst criteria and back plan on the chart to determine the weight that will result in meeting requirements. Enter this weight in the Adjusted Takeoff Weight block. This will be the new maximum takeoff weight and used for planning on the front of the TOLD card. If Guardrail mission requirements do not allow reducing weight, the risk must briefed at a higher level.

(5) Accelerate – Go – Flaps 0%. Obtain from the Accelerate – Go distance over a 50-ft obstacle – Flaps 0% chart.

(6) Single Engine Gradient of Climb – Flaps 0%. From takeoff climb gradient – one engine – inoperative – Flaps 0% chart obtain the climb gradient for a V_2 climb.

(7) Climb One Engine Inoperative. Record the V_{yse} climb gradient.

(8) Adjusted Takeoff Weight – Flaps 0%. If the takeoff weight of the aircraft is reduced to meet takeoff criteria (Items 4 to 7), update this block before entering it on the front of the TOLD card as the takeoff weight.

(9) Takeoff Weight to Achieve a Positive Climb at Lift-off – Flaps 40%. Determine if the planned takeoff weight is equal to or less than the charted limit.

(10) Accelerate – Go – Flaps 40%. Record the distance from the Accelerate – Go distance over a 50-ft obstacle – Flaps 40% chart.

(11) Single Engine Gradient of Climb – Flaps 40%. From the takeoff climb gradient – one engine – inoperative – flaps 40% chart, determine the climb gradient for a V_2 climb beginning at 50 feet and ending after accelerating to V_{yse} once clear of obstacles and rate of climb allows acceleration.

(12) Adjusted Takeoff Weight – Flaps 40%. Record the planned departure weight. If the takeoff weight of the aircraft is adjusted to meet takeoff criteria (Items 9 to 11), update this block before entering it on the front of the TOLD card as the takeoff weight.

(13) Remarks. Space available for crew member entries.

NOTE 4: The same TOLD may suffice for consecutive takeoffs and landings if the crew verifies that the existing temperature, PA, and weight do not degrade performance.

Table 4-2. Takeoff airspeed terminology

V_1	Takeoff decision speed. For RC-12 D/H aircraft, this is the same as V_r (Rotation Speed). If an engine fails at V_1, the pilot decides whether to stop or continue the takeoff.
V_r	The speed at which the nose tire is departing the ground and the aircraft is rotated to the takeoff attitude. V_r is equal to V_1 for RC-12D/H aircraft.
V_2	Takeoff safety speed. • Engine failure at V_1 takeoff continued. Must be attained by 50 feet, single engine, above the runway and is the speed to be maintained during single climb until clear of obstacles and rate climb allows acceleration to V_{yse} (approximately 400 AGL). V_2 is listed on the Accelerate – Go distance over 50-ft obstacle charts D and is the 'climb' speed in the RC-12H chart. V_2 is the "Climb Speed in Knots" on the Takeoff Climb Gradient – One Engine Inoperative charts. • All engines operating takeoff. V_2 should be obtained by 50 feet as the aircraft accelerates to cruise climb airspeed; for example, 160 KIAS. May be used as an obstacle clearance airspeed in conjunction with the takeoff distance charts to determine if the distance flown versus obstacle height will be sufficient to clear an obstacle. It is the 50-ft H speed listed on takeoff distance charts.
V_{yse}	Best single engine rate of climb speed is the airspeed that delivers the greatest gain in altitude in the shortest possible time with gear and flaps up. V_{yse} for the weight can be obtained from the climb – one engine inoperative chart.
V_{lof}	Lift off speed that occurs 3 knots above V_1.

Table 4-3. Planning chart definitions for a one engine inoperative takeoff

· **Accelerate – Go Distance Over 50-Foot Obstacle**	This chart is used to determine the total distance required from brake release to accelerate to V_1 (takeoff decision speed); experience an engine failure; continue accelerating to lift-off; then climb and accelerate to achieve takeoff safety speed (V_2) at 50 feet.
· **Accelerate-Stop**	Runway length is required if an engine failure occurs at V_1 and the takeoff is aborted. Normal pilot reaction time of 3 seconds is assumed.
· **Takeoff Weight to Achieve A Positive One Engine Inoperative Climb at Lift-Off**	This weight is the maximum at which a positive rate of climb can be achieved with an engine failure at V_1 and allow the vehicle to be able to attain positive rate of climb at lift-off with the landing gear extended. Allows the crew to determine the maximum weight at which Accelerate-GO should be attempted.
· **Takeoff Climb Gradient One Engine Inoperative**	This gradient is used to determine the percent of climb gradient for a one engine inoperative climb using V_2 until clear of obstacles or rate of climb allows acceleration to V_{yse}. Segment begins were Accelerate-Go distance over 50-ft obstacle ends.
• **Climb ¾ One Engine Inoperative**	Used to determine the rate of climb in feet per minute and climb gradient in percent for a one engine inoperative climb using V_{yse} with the gear and flaps up. Segment begins after the V_2 climb clears any obstacle and the rate of climb allows acceleration to V_{yse}.

Table 4-4. Two engine takeoff charts

Minimum Takeoff Power at 2,000 RPM	The minimum torque required to achieve the takeoff performance in the performance section of the operator's manual as a function of ice vanes position, pressure altitude, and ambient temperature. It represents the minimum power at which takeoff performance charts can be realized. Any excess power that may be developed without exceeding engine limitations may be used.
Takeoff Distance	The distance required to achieve a two engine takeoff, ground roll distances for a paved, level, dry surface, and the total distance required to clear an obstacle from 0 to 50 feet.
Climb ¾ Two Engines – Flaps 0 Percent	This chart is not a true V_y but will allow a higher rate of climb than the normal climb schedule listed in the 'Time, Fuel, and Distance to Climb' chart. This chart can be used from sea level to 31,000 feet . The climb speed listed in the Climb-Two Engines – Flaps 0% should not be used routinely when operating in a terminal area because of the high pitch attitude required resulting in an extreme reduction in forward visibility.
Climb ¾ Two Engines – Flaps 40 Percent -	This chart is not a true V_y or V_x; however, it will allow a higher rate of climb than the normal climb schedule listed in the 'Time, Fuel, and Distance to Climb' chart. This chart can be used from sea level to 31,000 feet. The climb speed listed in the Climb—Two Engines – Flaps 40% should not be used routinely when operating in a terminal area because of the high pitch attitude required. This attitude results in an extreme reduction in forward visibility.

c. Takeoff Flight Planning. This section is designed to supplement the explanations of the takeoff charts in the operator's manuals and provide options available for takeoff flight planning. The performance charts in the operator's manuals reflect planning data required for the Aircraft Type Certificate. The pilot is responsible for understanding and using the appropriate

charts for takeoff planning. The charts available allow the pilot to determine, if he did lose an engine at the critical point of takeoff (V_1), what his best option would be: continue the takeoff; plan on landing straight ahead; abort the takeoff and stop; or reduce his planned takeoff weight to increase the aircraft's performance. Based on the TOLD performance, the crew should brief which engine failure during takeoff procedures will apply during the departure brief. As an example:

(1) Prior to V_1 – Engine malfunction before lift-off (abort).

(2) After V_1 but prior to obtaining V_2:

(a) Heavier than positive climb at lift-off weight – Engine malfunction after lift-off (abort).

(b) Accelerate Go distance beyond Accelerate Stop distance - Engine malfunction after lift-off (abort). FAR Part 23 charts in the Operator's Manual do not indicate at what distance continued flight is safe.

(c) Lighter than Positive climb at lift-off weight and Accelerate Go distance equal to Accelerate Stop distance – Engine malfunction after lift-off (flight continued)

Note: If an attempt is made to continue flight prior to obtaining V_2, directional control may be lost if heavier than the positive climb at lift-off weight or the accelerate–go distance is excessive.

(3) After obtaining V_2 and gear is up (second segment) – Engine malfunction after lift-off (flight continued), assuming a positive takeoff climb gradient.

d. Decision Process.

(1) Determine flap setting and takeoff weight for the anticipated departure runway.

(2) Determine— if an engine failed at V_1—would the aircraft climb when rotated using the takeoff weight to achieve a positive climb at lift-off chart(s). If the planned departure weight is more that the maximum chart weight for the conditions, continuing the takeoff is not an option unless the takeoff weight is reduced.

(3) The next step determines the distance required to climb to 50 feet (one engine inoperative) and obtain V_2 using the Accelerate–Go Distance Over 50-ft Obstacle chart. If the distance exceeds the Accelerate-Stop distance, consider reducing the takeoff weight.

(4) The next chart determines the takeoff climb gradient – One engine inoperative from 50 ft using V_2 until clear of obstacles.

(5) Upon accelerating and reaching V_{yse}, retract the flaps and reduce power to maximum continuous. Use the one engine inoperative chart to determine the gradient of climb at V_{yse}.

e. Profiles. Figure 4-7 represents a visualization of airspeed and chart usage. Four hundred feet AGL is a representative altitude for obstruction clearance and the point rate of climb permits acceleration to V_{yse}. The profiles are for illustration and not a requirement to achieve 400 feet before acceleration.

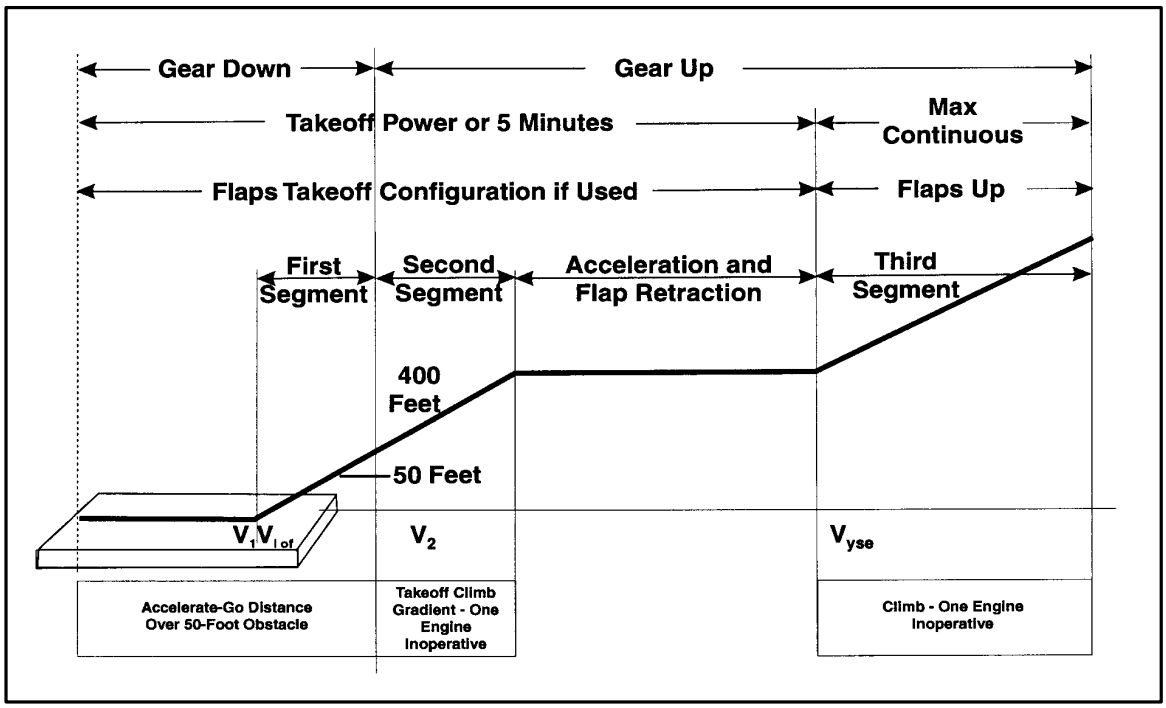


Figure 4-7. RC-12 D/H one engine inoperative takeoff profile

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS. Task will be trained and evaluated academically.

REFERENCES:

TM 55-1510-219-10 D
TM 55-1510-221-10 H

TASK 1029

Perform preflight inspection.

CONDITIONS: In an RC-12 with access to the aircraft operator's manual or checklist.

STANDARDS:

1. Without error, perform the preflight inspections according to the checklist.

2. Correctly enter appropriate information on DA Forms 2408-12 (*Army Aviator's Flight Record*) and 2408-13-1 (*Aircraft Maintenance and Inspection Record*).

3. Determine if inoperable items effect the mission by using the required equipment list (REL).

DESCRIPTION:

1. Crew Actions.

a. The PC is responsible for ensuring that a preflight inspection is conducted using the aircraft checklist. He may direct the PI to complete elements of the aircraft preflight inspection and will verify that all checks have been completed. The PC will report any aircraft discrepancies that may effect the mission and will ensure that the appropriate information is entered on DA Forms 2408-12, 2408-13 (*Aircraft Status Information Record*), and 2408-13-1.

b. The P or P* will complete the assigned elements and report the results to the PC.

2. Procedure.

a. The PC will ensure a proper preflight is conducted and all checks are verified using the checklist. Enter appropriate information on DA Forms 2408-12 and 2408-13-1.

b. Crew member(s) will complete the preflight as directed. The PC will ensure the aircraft meets the required preflight inspection criteria.

NIGHT CONSIDERATIONS: If time permits, accomplish the preflight inspection during daylight hours. During the hours of darkness, use a flashlight with an unfiltered lens to supplement available lighting. Hydraulic leaks, oil leaks, and other defects are difficult to see using a flashlight with a colored lens. TC 1-204 contains details about preflight inspection at night.

COLD WEATHER CONSIDERATIONS: Brakes and tire-to-ground contact should be checked for freeze lockup. Besides the normal preflight exterior inspection, special attention should be given

to all vents; openings; control surfaces; hinge points; and wing, tail, and fuselage surfaces for accumulation of ice or snow. Removal of ice, snow and frost accumulation is required before takeoff. The wing contour may be sufficiently altered by the ice and snow to cause its lift qualities to be seriously impaired and result in the loss of lift and cause adverse stall characteristics. Propeller blades and hubs should be inspected for ice and snow. Unless engine inlet covers have been installed during snow and freezing rain conditions, the propellers should be turned by hand in the direction of normal rotation to verify they are free to rotate before starting the engines. Remove snow, frost, and ice accumulations according to the operator's manual.

DESERT AND HOT WEATHER CONSIDERATIONS: Check that the landing gear struts are free of sand and grit and the aircraft interior is free of an accumulation of sand and dust.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or academically.

REFERENCES:

Common references
FAA-P-8740-24, Tips on Winter Flying
T.O. 1C-12A-1

TASK 1035

Perform engine-start.

CONDITIONS: In an RC-12 airplane or simulator with access to the checklist.

STANDARDS:

Without error, perform procedures and checks according to the checklist.

DESCRIPTION:

1. Crew Actions.

a. Each crew member will complete the required checks or procedures pertaining to his crew duties according to the checklist and the preflight briefing.

b. Both aviators will clear the area around the airplane before each engine start.

2. Procedure.

a. The P* will start the engine(s) according to the checklist and verify system operation. He should be prepared to secure engine(s) immediately if any conditions exist which could be detrimental to the engines or auxiliary equipment.

b. The P should read the checklist, complete all designated P checks, monitor engine instruments and systems during the starting process and assist the P* as required.

NIGHT CONSIDERATIONS: Before starting the engine(s), ensure that all internal and external lights are operational and properly set. Lighting levels must be high enough so the crew can easily see the instruments and the aviator can start the engines without exceeding operating limitations. Beacon lights will be turned on before starting the engines and remain on during engines' operation.

COLD WEATHER CONSIDERATIONS:

1. Before starting engine(s). Check all controls for full travel and freedom of movement.

2. Starting engine(s).

a. Check that the compressor of each engine rotates freely by momentary starter application, if required.

b. When starting engines on ramps covered with ice, the propellers should remain

feathered to prevent the tires from sliding. To prevent exceeding torque limits when advancing the CONDITION levers to HIGH IDLE during the start procedure, place the propeller levers to HIGH RPM and the power levers to BETA before advancing the condition levers to HIGH IDLE D/H.

DESERT AND HOT WEATHER CONSIDERATIONS: Use normal starting procedures. Be aware that higher-than-normal engine temperatures may be expected; and be prepared to abort the start before temperature limitations are exceeded. Blowing sand and debris may make use of ice vanes necessary.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references
FAA-P-8740-24, Tips on Winter Flying
T.O. 1C-12A-1

TASK 1040

Perform aircraft taxi.

CONDITIONS: In an RC-12 airplane or simulator with access to the checklist.

STANDARDS: Appropriate common standards plus these modifications/additions:

1. Correctly perform procedures and checks according to the checklist.

2. Comply with taxi clearances.

3. Properly use power, ground fine or beta, and brakes to maintain a safe taxi speed.

DESCRIPTION:

1. Crew Actions. Each crew member will complete the required checks or procedures pertaining to his crew duties according to the checklist and the preflight briefing. The P, when directed by the P*, will check the flight instruments in turns to verify proper indications. This will allow the P* to keep his attention outside while the aircraft is moving.

2. Procedure. The P*, assisted by the P, will perform the following actions:

a. After verifying completion of all before taxi checks with the checklist, clear the immediate area. Release the parking brakes. Adjust propeller levers to FEATHER DETENT K/N/P/Q, if desired, to obtain the P_y shift to reduce N_1 during ground fine operations. To initiate taxi, increase power until aircraft starts to move, then immediately retard power to IDLE, ground fine or beta, as required, and ensure that both sets of brakes operate properly. Maintain a safe taxi speed compatible with airfield and environmental conditions. Apply controls as required by wind conditions. Regulate taxi speed with a combination of power, ground fine or beta, or brakes, as applicable. Do not drag brakes. Complete required taxi checks and verify with the checklist. While taxiing, follow taxi lines (when applicable) and remain within approved taxi areas. Use taxi guides when operating in areas that are closely restricted.

b. The P should read the checklist and help the P* clear the area. He should complete all designated P checks and assist the P* as required.

NIGHT CONSIDERATIONS: Because of restricted visibility at night, taxi speeds should be reduced to allow for a greater margin of safety. Outside guidance should be requested whenever taxiing in areas where obstacles are difficult to see. Avoid shining the taxi/landing light into other aircraft cockpits or the ground guides eyes.

COLD WEATHER CONSIDERATIONS:

1. Before attempting to taxi, activate the brake deice system. Ensure the bleed air valves are OPEN and the condition levers are in HIGH IDLE. Use an outside observer, if one is available, to confirm that the wheels are turning and not sliding.

2. Whenever possible, avoid taxiing in deep snow, lightweight dry snow, or slush. Under these conditions, more power is required, steering more difficult, and snow and slush will be forced into the brake assemblies. Caution should be exercised to ensure the spray pattern of slush is not ingested into the engine or cooler intakes. Flaps should be retracted during taxi to avoid throwing snow or slush into the flap mechanism. The brake deice system will thaw frozen brake assemblies, but any moisture remaining may refreeze after the system is deactivated. Brakes should be allowed to cool before setting the parking brake. Chocks or sandbags may be use to prevent the aircraft from rolling. Because spotty ice cover is difficult to see, taxi speeds should be slow and more clearance should be allowed in maneuvering the aircraft.

DESERT AND HOT WEATHER CONSIDERATIONS:

NOTE: If ice vanes are used during ground operations, oil temperatures must be monitored closely D/H.

1. Warmup and Ground Operations. Use normal procedures for warmup and ground operations. Higher N_1 speeds may be necessary to maintain oil temperatures within operating limits.

2. Taxiing. When practical, avoid taxiing over sandy terrain to minimize propeller erosion and engine deterioration. Use minimum braking to prevent brake overheating, especially when operating with higher N_1 speeds.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references
FAA-P-8740-24, Tips on Winter Flying
T.O. 1C-12A-1

TASK 1045

Perform engine runup.

CONDITIONS: In an RC-12 airplane or simulator with access to the checklist.

STANDARDS:

1. Without error, perform procedures and checks according to the checklist.

2. Ensure that engines and systems are operating within prescribed tolerances.

DESCRIPTION:

1. Crew Actions. Each crew member will complete the required checks or procedures pertaining to his crew duties according to the checklist and the preflight briefing.

2. Procedure. Considering the wind and his location, the P* will position the aircraft properly for runup and ensure the nose wheel is straight before stopping. The P* (left seat) will complete the engine runup checks, if applicable, and ensure the systems and equipment are operating properly. Use the checklist to verify that all checks are completed. Record appropriate information on applicable aircraft logbook forms. The P should read the checklist, complete all designated P aircraft systems and mission equipment checks, and assist the P* as required. The left seat crew member may task the right seat crew member to complete the engine anti-ice/ice vanes, anti-ice/deice, vacuum and pneumatic and pressurization systems checks. He should ensure that the aircraft does not move during the checks while the P*'s attention is diverted to items inside the cockpit.

NIGHT CONSIDERATIONS: Lighting levels must be high enough so the crew can easily see the instruments and perform engine checks without exceeding engine limitations. The P should assist in clearing the area, both while maneuvering into position and when stopped.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically and in the aircraft or simulator.

REFERENCES:

Common references

TC 1-219

TASK 1104

Perform normal takeoff and climb.

CONDITIONS: In an RC-12 airplane or simulator, day or night.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Without error, complete before-takeoff, lineup, and after-takeoff checks.

2. Maintain runway centerline between the main landing gear during the takeoff roll.

3. Obtain computed static takeoff power before reaching 65 knots.

4. Rotate at V_1 D/H , V_R K/N/P/Q, +5/-0 knots indicated airspeed (KIAS).

5. Perform climb after lift-off at approximately 10 to 12 degrees until reaching 160 KIAS.

NOTE 1: The two engine climb airspeed from SL to 10,000 listed in the Time, Fuel, and Distance Climb chart of the operator's manual (140 KIAS) may be used if required for mission considerations.

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus will be outside the aircraft during the maneuver. While initiating power application, the P* will monitor engine instruments carefully and be prepared to announce an abort if the aircraft performance is not satisfactory.

b. The P will assist the P* by verifying the P*'s flight instruments settings, monitoring engine instruments, adjusting power, making the crew callouts, and reading the checklist. The P will perform those items directed by the P*.

c. As part of the departure brief, the crew will discuss criteria for a rejected takeoff. The crew also will review the TOLD card to determine the course of action if an engine failed at V_1, immediately after liftoff and when the aircraft has obtained V_2.

NOTE 2: Static takeoffs are only required when limited by accelerate-stop distance and runway length.

NOTE 3: The normal flap setting for takeoff is FLAPS UP unless TAKEOFF (40 percent) is required for runway length or tire speed limits N/P/Q.

2. Procedure. The P*, assisted by the P, will perform the following actions:

a. Normal Takeoff D/H.

(1) Lineup. Complete the before-takeoff check and departure briefing. Complete the lineup check using the checklist. Aircrews should start the lineup check when cleared onto the active runway and complete it by the time the aircraft heading is aligned with the runway heading if it can be done safely. Align the aircraft with the runway heading.

(2) Power. Smoothly advance the power levers to within 5 percent of computed power. Transfer the power to the P for the final setting with a **"Set power"** callout. The P will set takeoff power and state, **"Power set."** When runway length permits, the normal takeoff may be modified by starting the takeoff roll before attaining takeoff power. In this case, initially advance power until both propellers are on the primary governors and torque is equal; then continue to advance power transferring the power control to the P with a callout for the final setting.

(3) Takeoff. During takeoff, maintain directional control with nose wheel steering and rudder so that the predetermined track is between the main gear. Keep the wings level with ailerons. Although the P is managing power to 400 feet, the P* will retain a light hold on the power levers until takeoff decision speed (V_1) is attained and be ready to initiate abort procedures if required. The P should ensure that the autofeather advisory lights are illuminated, monitor instruments for proper indications and that the engine limitations are not exceeded. Passing 65 KIAS, the P will callout, **"Normal,"** if all indications are proper. As the elevator starts becoming effectively (about 80 KIAS), the P* should start increasing back pressure on the yoke at a rate that will allow the nose tire to be just departing the ground at the "rotate" callout allowing the aircraft to depart the ground at V_{lof}. The P will call, **"Rotate,"** at V_1; the P* will remove his hand from the top of the power levers and place both hands on the yoke. The P* will slightly increase aft pressure on the elevator and smoothly rotate to the pitch attitude that will result in obtaining a 7-degree deck angle after liftoff. The P will continue to monitor instruments for proper indications and physically guard the power levers.

NOTE 4. If a power change is needed, the P* should direct the P to make the change. This principle is true even in the event of an emergency.

(a) When flight is assured (two positive climb indicators), and receiving the **"Positive rate"** call, the P* will call **"gear UP."** The P will move the landing gear handle to the UP position, turn off the landing/taxi lights, monitor retraction of the gear, and announce **"gear is UP"** or, in the case of a malfunction, **"gear did not retract."** Adjust pitch to 10 to 12 degree deck angle and allow the aircraft to accelerate. When passing Vyse, call for **"flaps UP or check flaps UP."** The P* has the option of retracting his own gear, but must brief the P of this intent prior to the maneuver.

(b) Allow the aircraft to continue to accelerate to 160 KIAS, adjusting forward trim as necessary to relieve the control pressures. When 160 KIAS is obtained, adjust pitch to maintain 160 KIAS until 500 feet AGL. Climb schedule speeds may be used as the mission dictates and takeoff weight allows not to exceed a 15-degree pitch up attitude.

(4) Initial climb. After passing 500 feet AGL, the P* will task the P to **"Set climb power."** Climb power is set by adjusting the torque and propeller RPM according to the operator's manual. The P will transfer the power back to the P* with a **"My power"** callout from the P* (or the P stating "**Your power"**). Complete after-takeoff check. P should monitor the engine instruments, and advise the P* of any abnormal condition.

(5) En route climb. The P* may maintain 160 KIAS until 10,000 AGL before resuming the climb airspeed in the Climb, Fuel, and Distance chart of chapter 7 of the operator's manual.

b. Normal Takeoff K/N/P/Q.

(1) Lineup. Complete the before-takeoff check and departure briefing. Complete the lineup check using the checklist. Aircrews should start the lineup check when cleared onto the active runway and complete it by the time the aircraft heading is aligned with the runway heading if it can be done safely. Align the aircraft with the runway heading.

NOTE 5: The RC-12N/P/Q CA static power charts torque value may not recover to the maximum takeoff power available. The P should monitor and adjust power as required to maintain maximum available takeoff power without exceeding engine limits.

(2) Power. Smoothly advance the power levers to within 5 percent of computed power. Transfer the power to the P for the final setting with a **"Set power"** callout. The P will set static takeoff power and state, **"Power set."** When runway length permits, the normal takeoff may be modified by starting the takeoff roll before attaining takeoff power. In this case, initially advance power until both propellers are on the primary governors and torque is equal; then continue to advance power transferring the power control to the P with a callout for the final setting.

(3) Takeoff. During takeoff, maintain directional control with nose wheel steering and rudder so that the predetermined track is between the main gear. Keep the wings level with ailerons. Although the P is managing power to 500 feet, the P* should retain a light hold on the power levers until takeoff decision speed (V_1) is attained and be ready to initiate abort procedures, if required. The P should ensure that the autofeather advisory lights are illuminated. Monitor instruments for proper indications to ensure that the engine limitations are not exceeded. Passing 65 KIAS, the P will call out, **"Normal,"** if all indications are proper. As the elevator starts becoming effective (about 80 KIAS), the P* should start increasing back pressure on the yoke at rate that will allow the nose tire to be just departing the ground at the **"rotate"** callout. As the P calls, **"V_1,"** the P* will remove his hand from the power levers and place it on the control yoke. The P will call, **"Rotate,"** at V_r. The P* will increase aft pressure on the elevator and smoothly

rotate to the appropriate pitch attitude (RC-12K – 10 degrees, RC-12N/P/Q – 7 degrees). The P will continue to monitor instruments for proper indications and physically guard the power levers.

(a) When flight is assured (two positive climb indicators), and receiving the **"Positive rate"** call, the P* will call **"gear UP."** The P will move the landing gear handle to the UP position, turn off the landing/taxi lights, monitor retraction of the gear, and announce **"gear is UP"** or, in the case of a malfunction, **"gear did not retract."** Adjust pitch to 10 to 12 degree deck angle and allow the aircraft to accelerate. When safely airborne, call for **"flaps UP or check flaps UP."** Safely airborne can be defined as when the P* determines that the aircraft is in a normal climb and has made the commitment to fly by retracting the gear. The P* has the option of retracting his own gear, but must brief the P of this intent prior to the maneuver.

(b) When the gear is raised, the P* will adjust pitch attitude to 10 to 12 degrees and allow the aircraft to accelerate to 160 KIAS in the climb. As the airplane accelerates, adjust forward trim to relieve control pressures.

(4) Climb. After passing 500 feet AGL, the P* will task the P to **"Set climb power."** Climb power is set by adjusting the torque, and propeller RPM according to the operator's manual. The P will transfer the power back to the P* with a **"My power"** callout from the P* (or the P stating, **"Your power"**). Complete after-takeoff check. Throughout the maneuver, the P should monitor the engine instruments, and advise the P* of any abnormal condition. If remaining in closed traffic, the propeller RPM may be adjusted to 1500, if desired.

(5) En route climb. The P* may maintain 160 KIAS until 10,000 AGL before resuming the climb airspeed in the Climb, Fuel, and Distance chart of chapter 7 of the operator's manual. He should, as minimum, maintain 160 KIAS until 1,500 AGL before adjusting to the en route climb speed.

c. Crosswind Takeoff. During crosswind conditions, position the aileron control into the wind at the start of the takeoff roll. In strong crosswinds, consider delaying the point where the P* would normally apply aft pressure for rotation to later in the takeoff roll. This allows the aircraft weight to stays on the wheels longer before transferring it to the wings, thereby minimizing the chance the aircraft will skip and skin a tire before liftoff. As the nose wheel comes off the ground, use the rudder as necessary to prevent turning (crabbing) into the wind. To prevent damage to the landing gear if the airplane were to settle back onto the runway, remain in a slip until well clear of the ground. Then crab into the wind to continue a straight flight path.

NIGHT CONSIDERATIONS: The cockpit lights should be at a low intensity and a serviceable flashlight must be readily accessible. Use taxi/landing light(s) to check that the entire takeoff path is clear before starting the takeoff run. Reduced visual references during the takeoff and the takeoff climb may make it difficult to maintain the desired ground track. Knowing the surface wind direction and velocity will assist in establishing the crab angle required to maintain the desired ground track. Monitor heading and attitude instruments closely and be prepared to convert to instrument flight if the visual horizon is lost or if the P* experiences vertigo.

COLD WEATHER CONSIDERATIONS:

1. Before Takeoff. Activate all anti-icing systems, allowing sufficient time for the equipment to become effective. If the possibility of ice accumulation on flying surfaces exists, do not attempt to take off. Accumulations of slush/snow on the runway greatly increase the takeoff distance and should be considered during planning.

2. Takeoff. Procedures are the same as for a normal takeoff, except for a possible decrease in aircraft performance caused by the use of the anti-icing/de-icing equipment. Additional takeoff distance should be allowed if snow or slush are on the runway. After takeoff, it is recommended that, when flight considerations permit, the landing gear should be left down without braking action long enough for rotational forces and forward speed to remove most of the moisture, snow, and slush. Extra cycling of the landing gear shortly after takeoff can help dislodge moisture on moving parts of the retraction system. Before starting the takeoff roll, check all controls for full travel and freedom of movement. Smoothly apply power to avoid asymmetrical thrust conditions.

3. After Takeoff. If the takeoff was made from a runway covered with snow or slush, refer to the aircraft operator's manual for after-takeoff procedures. Climb at a higher-than-normal air-speed to prevent ice accumulation on unprotected surfaces. Allow ice to accumulate according to the aircraft operator's manual before activating the surface de-icing equipment. Higher-than-normal stall speeds should be expected and, as ice accumulates, the stall warning system may become unreliable. Turns should be wide and shallow.

DESERT AND HOT WEATHER CONSIDERATIONS: Use normal takeoff procedures. Avoid taking off in the wake of another aircraft if the runway surface is sandy or dusty.

MOUNTAIN CONSIDERATIONS:

1. Takeoff Distance/Rate of Climb. Use normal takeoff procedures but remember, because of the higher elevation, your takeoff distance will increase and your rate of climb will decrease.

2. Mountain Wave. Avoid flight at low altitudes over mountainous terrain, particularly near the lee slopes. Mountain waves occur when air is being blown over a mountain range or even the ridge of a sharp bluff area. As the air hits the upward side of the range, it starts to climb, thus creating what is generally a smooth updraft that turns into a turbulent downdraft as the air passes the crest of a ridge. From this point, for many miles downwind, there will be a series of downdrafts and updrafts. All it takes to form a mountain wave is wind blowing across the range at 15 knots or better at an intersection angle of not less than 30 degrees. If the wind velocity near the level of the ridge is in excess of 25 knots and about perpendicular to the ridge, mountain wave conditions are likely over and near the lee slopes. If the wind velocity at the level of the ridge exceeds 50 knots, a strong mountain wave is probable with extreme up and down drafts and severe turbulence. The worst turbulence will be encountered in, and below, the rotor zone, which is usually 8 to 10 miles

downwind from the ridge. This zone is sometimes characterized by the presence of altocumulus lenticular clouds or roll clouds if sufficient moisture is present. Mountain wave turbulence can occur in dry air and with no visible clouds. A mountain wave downdraft may exceed the climb capability of your airplane.

3. Effects of Density Altitude. Aircraft operations at altitudes above sea level and at higher than standard temperatures are commonplace in mountainous areas. Such operations quite often result in a drastic reduction of aircraft performance capabilities because of the changing air density. Density altitude is a measure of air density. It is not to be confused with pressure altitude, true altitude, or absolute altitude. It is not to be used as a height reference, but as a determining criteria in the performance capability of an aircraft. Air density decreases with altitude. As air density decreases, density altitude increases. The further effects of high temperature and high humidity are cumulative, resulting in an increasing high density altitude condition. High-density altitude reduces all aircraft performance perimeters.

4. Night Considerations. Terrain will not be visible unless backlighted by light. If ground lights unexpectedly disappear, then it is highly likely that terrain has appeared between the aircraft and the ground lights. It is critical that crews maintain an altitude or course that guaranties terrain clearance when descending or departing the airport.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted in the aircraft or simulator.

REFERENCES:

Common references
Unit SOP

TASK 1120

Perform steep turns.

CONDITIONS: In an RC-12 airplane or simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain angle of bank within -5 to + 10 degrees.

2. Roll out on the desired heading ±10 degrees.

3. Roll into a coordinated turn of 180 degrees or 360 degrees with a bank of at least 45 degrees.

4. Apply smooth coordinated pitch, bank, and power to maintain altitude and airspeed.

5. Avoid any indication of an approaching stall, abnormal flight attitude, or exceeding any structure or operating limitation during any part of the maneuver.

DESCRIPTION:

1. Crew Actions. The P*'s main focus will be outside the aircraft. The P will monitor flight and engine instruments, keep his area of observation cleared, and perform actions requested by the P*. The P* will call out the direction of turn before starting the turn toward the P so that he can thoroughly clear his area of observation. The P should acknowledge that his area is clear before the turn is started.

2. Procedure. A steep turn is classified as 45- to 60-degree bank angle. The maneuver should be performed using maximum outside visual reference and minimum reference to instruments.

a. Entry. Establish level flight at a designated altitude, 160 KIAS in the clean configuration. Set the heading bug or course bar on the desired rollout heading. Increase power as required to maintain airspeed in the turn. Look over the instrument panel to determine a visual reference for level flight (adjust pitch to maintain altitude if the power application caused the nose to rise). When the altimeter is stationary, begin the turn by banking the aircraft with the aileron, which will result in a smooth and uniform rate of change in the bank angle.

b. Turn. For steep turns, the first 30 degrees of bank is a level turn. As 30 degrees is being passed, adjust back pressure on the yoke to maintain the pitch attitude on the horizon, which will result in maintaining altitude. Continue the bank until the desired bank angle is reached. Use

elevator trim as necessary to neutralize the control pressures. When the desired angle of bank is reached, apply sufficient opposite aileron to hold the desired bank angle (compensates for overbanking tendency). If the bank angle is constant throughout the turn the tendency of the airplane is to be stable. The only corrections should be minor pressure movements with the yoke to correct for minor variances in altitude (pitch) and power (airspeed).

c. Rollout. About 20 to 25 degrees (left turn) or 10 to15 degrees (right turn) before reaching the rollout heading, the P* should begin the rollout to the desired heading using a smooth and uniform reduction of bank at the same rate used during the roll-in. Coordinate pitch attitude, power, and retrim as required during the rollout to maintain altitude and airspeed.

NOTE 1: The description above is a way to achieve meeting standards. Pilots may change the sequence to suit individual preferences as long as the standards are met.

NOTE 2: An effective means to ensure outside references are used is to cover the attitude portion of the pilot's attitude indicator or electronic attitude director indicator (EADI), as applicable.

NIGHT CONSIDERATIONS: Before starting turns, the area should be cleared using the technique of off-center viewing. Steep banks at low altitudes should be avoided. When using the lights of cities or towns for a horizon reference, the crew should be aware that disorientation or vertigo might occur. If this happens, the P* should discontinue the turn and return to level flight immediately. If no horizon is visible, the P* may have to use instruments as his primary reference.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references

TASK 1122

Perform climbs and descents.

CONDITIONS: In an RC-12 airplane or simulator.

STANDARDS: Appropriate common standards.

DESCRIPTION:

1. Crew Actions. The P*'s main focus will be outside the aircraft. The P will monitor flight and engine instruments, keep his area of observation cleared, and perform actions requested by the P*.

2. Procedure. The P*, assisted by the P, will perform the following actions:

a. Climbs. Establish the climb by applying power, if required, and adjusting the pitch attitude to obtain the airspeed prescribed in the aircraft operator's manual for the desired climb; for example, cruise climb. Monitor instruments to ensure that operating limitations are not exceeded. Trim the aircraft, as required, throughout the maneuver. The P will call out altitudes and airspeeds when requested by the P*.

b. Descents.

(1) En route descents. Establish the descent by adjusting pitch attitude and reducing power to maintain the desired airspeed (normally cruise airspeed) and the desired rate of descent. During the descent, control airspeed by adjusting pitch attitude. The rate of descent will depend on the amount of power reduced. Trim the aircraft as required throughout the maneuver. The P will call out altitudes and airspeeds when requested by the P*. The P will call out, **"1,000 to go,"** when appropriate.

NOTE: A technique for determining top of descent (TOD) or a given point in space to depart an altitude to reach an assigned altitude by another given point may be determined by: (Altitude to Lose) multiplied by 3, plus the altitude restriction point; for example (27,000 feet – 12,000 feet) X 3 plus 30 DME (distance measuring equipment) = 75 DME descent point. A typical ATC clearance, while flying eastbound toward the Dothan (DHN) VORTAC, may be as follows: Army 12345, descend to reach 12,000 feet by 30 miles east of DHN VORTAC.

(2) Slow cruise descents. Reduce power to a setting below that required for level flight at slow cruise. Maintain altitude while decelerating to slow cruise. While approaching slow cruise airspeed, adjust pitch attitude and power to maintain slow cruise airspeed and the desired rate of descent. During the descent, control airspeed by adjusting pitch attitude. The rate of descent will depend on the amount of power that is reduced. Trim the aircraft as required

throughout the maneuver. The P will call out altitudes and airspeeds when requested by the P*. The P will call out, **"1,000 to go,"** when appropriate.

(3) Emergency descents. Establish the descent by reducing the power to idle, increasing propellers to high RPM; place flaps to approach (at or below maximum flap extension speed); extend the gear (at or below maximum gear extension speed); and adjust pitch to maintain at, or below, the operator's manual emergency descent speed. Caution should be exercised not to exceed the published speed if descending in turbulent air or in the vicinity of mountainous terrain. Maintain positive G-forces. To properly clear altitudes below the aircraft, a 25- to 45-degree bank should be established in the initial descent. Call out the direction of the turn before starting turns toward the P so that he can thoroughly clear his area of observation. The P should acknowledge that his area is clear before the turn is started. Maintain this heading change for at least 90 degrees. During the descent, control airspeed by adjusting pitch attitude. Trim the aircraft as required throughout the maneuver. Unless an actual emergency exists, the maneuver should be performed only during daylight hours under VMC. Besides clearing the area, the P will monitor the aircraft instruments and inform the P* if the assigned altitude is about to be exceeded or airspeed is approaching maximum. The P will call out altitudes and airspeeds when requested by the P*. The P will call out, **"1,000 to go,"** when appropriate.

(4) Glides. Establish the glide by reducing the power to idle. Simultaneously adjust pitch attitude to maintain maximum glide airspeed; if unknown, use the flaps up V2. During the descent, control airspeed by adjusting pitch attitude. To recover to level flight, set power as required to maintain the desired airspeed and adjust pitch attitude as required to stop the descent. Retract the landing gear and direct the P, **"Flaps UP**,**"** if recovering from the landing configuration. The maneuver should be practiced with the aircraft in both a cruise and a landing configuration. The P will perform his assigned duties and monitor the aircraft instruments. He will call out altitudes and airspeeds when requested by the P*.

(5) Two-engine inoperative glides (day, VMC, with an IP). This maneuver is performed to gain proficiency in maneuvering the aircraft when both engines have failed. The IP may simulate failing the engines individually or simultaneously. After the P* performs the proper procedures for engine failure, the IP will configure the propellers and power to obtain zero thrust. During the descent, control airspeed with pitch attitude to obtain maximum glide distance or the glide speed recommended in the aircraft operator's manual; if unknown, use flaps up V_2. Practice turns using various angles of bank and with the aircraft in both the clean and the landing configurations.

NIGHT CONSIDERATIONS: Under certain conditions, vertigo can adversely affect the visual sense, and could cause a loss of orientation. Cross-check attitude instruments closely, especially when the horizon is not visible or is obscured by haze or smoke.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane or simulator.

TC 1-219

REFERENCES:

Common references

TASK 1125

Perform slow flight.

CAUTION
Select an altitude that will allow the task to be completed no lower than 4,000 feet AGL.

CONDITIONS: In an RC-12 airplane or simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Stabilize and maintain the airspeed at V_{ref} +/- 5 knots, no lower than $V_{mc.}$

NOTE 1: Flight at minimum controllable airspeed is authorized in the simulator only.

DESCRIPTION:

1. Crew Actions. The P*'s main focus will be outside the aircraft. The P will monitor flight and engine instruments, keep his area of observation cleared, and perform actions requested by the P*.

2. Procedure. This maneuver demonstrates aircraft controllability and handling characteristics while flying at low airspeeds. It provides practice of control techniques and shows the capabilities and limitations of the aircraft in the low-speed regimes. The maneuver should be performed using maximum outside visual references and minimum references to flight instruments. The P*, assisted by the P, will perform the following actions:

NOTE 2: The minimum airspeed is red line (V_{mca}).

a. While maintaining heading and altitude, set propeller speed to high RPM; turn yaw damper off; complete the Before Landing Checklist, and when airspeed permits extend the flaps to 100 percent. Allow the aircraft to decelerate to V_{ref}. It may be necessary to reduce power at lighter weights to obtain V_{ref}. Adjust pitch attitude as necessary to maintain altitude. Maneuver the airplane in straight-and-level flight, in climbs and descents, and in turns not to exceed a standard rate turn (10% of airspeed + 7% = standard rate turn). The P* should maintain coordinated flight while maneuvering through the proper use of the rudder and aileron.

b. The P* should complete the maneuver by returning to 160 KIAS in the clean configuration to a predetermined altitude. Refer to Task 1177 , Perform go-around, for a description of crew duties and callouts. Use power as necessary to accelerate to 160 KIAS. The recovery may be level or climbing.

TC 1-219

NIGHT CONSIDERATIONS: High-aircraft pitch attitudes may obscure part of the horizon and require a faster cross-check of whatever lights or visual horizon is observable.

NOTE 3: Intentional or simulated engine failures below V_{sse} are prohibited.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane or simulator.

REFERENCES:

Title 14 CFR Part 91
FAA-S-8081-12A, Commercial Pilot Practical Test Standards for Airplane

TASK 1138

Perform fuel management procedures.

CONDITIONS: In an RC-12, VMC, simulated IMC or IMC, or simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Verify that the required amount of fuel is on board at the time of takeoff.

2. Correctly perform an in-flight fuel consumption check after level-off or entry into mission profile.

3. Initiate 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. P. As part of the cruise checklist, the P will check and record fuel data as appropriate. He will compute or determine fuel remaining, fuel required to reach destination and alternate with the appropriate fuel reserve. He will announce when he initiates the fuel check and the results of the check.

b. P*. The P* will acknowledge the results of all fuel checks.

NOTE: If the aircraft is equipped with a component that allows fuel calculations (KLN-90B), it should be used.

2. Procedures.

a. Before-Takeoff Fuel Check. The PC will ascertain total fuel on board, and compare with mission fuel requirements determined during premission planning. If fuel is inadequate, have the aircraft refueled or abort/revise the mission.

b. Initial Airborne Fuel Reading. After aircraft has leveled off or entered mission profile and appropriate power settings are obtained from chapter 7 of the operator's manual, the P will note the total fuel quantity and fuel flow.

c. Fuel Consumption Check. After performing initial airborne fuel reading determine the flight time remaining based on fuel remaining versus what is required for loiter time (Guardrail), to reach destination, alternate destination and have a fuel reserve available. He will determine if the remaining fuel is sufficient to complete the flight with the required reserve. If the fuel quantity is inadequate, he will advise the PC and recommend an alternate course of action. The PC will acknowledge the information and initiate the required action.

d. Fuel Quantity and Consumption. The P periodically will monitor the fuel quantity and consumption rate. If fuel quantity/flow indicates a deviation from computed values, he will repeat the fuel consumption check to determine if fuel is adequate to complete the flight.

e. Perform Cross-Feed Operation. During single engine operations, the P* will set appropriate cross-feed controls or call for P action to equalize fuel quantities according to the aircraft operator's manual.

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

TRAINING AND EVALUATION REQUIREMENTS: Task to be trained and evaluated academically, in the aircraft or simulator.

REFERENCES:

Common references
KLN-90B, Operator’s Manual

TASK 1144

Perform touch-and-go landing.

CONDITIONS: In an RC-12 airplane with an IP, given access to the checklist, on a suitable runway (length must exceed accelerate-stop distance by 2,000 feet), with both engines operating, and cleared by ATC.

STANDARDS: Appropriate common standards plus these additions/modifications.

1. Attain landing approach speed (V_{ref} plus one-half the wind gust speed) ±5 KIAS.

2. Maintain centerline between the main landing gear.

DESCRIPTION:

1. Crew Actions. On downwind leg, the IP will inform the P* that the landing will be a touch-and-go unless he later calls out, "**Full stop**." Each crew member will complete the required checks or procedures pertaining to his crew duties according to the checklist and the preflight briefing. The IP will, besides performing IP duties, also perform normal P duties. He will read the checklist, monitor flight and engine instruments, keep his area of observation cleared, and perform actions requested by the P*.

2. Procedure. The P*, assisted by the P (IP), will perform the following actions after the aircraft has landed with both power levers at idle and is on the rollout:

NOTE 1: The touch and go landing will not be performed upon completion of a practice single-engine landing.

a. The IP will advance the condition levers to high idle on landing rollout when power levers are both at idle position. D/H

b. The IP will state, **"Stabilize power."** The P* will push the power levers up to about the 12 o'clock position D/H or 10 o'clock position K/N/P/Q on the throttle quadrant (to bring the props to takeoff RPM and to obtain equal torque on both engines).

c. The IP will set the prop levers to high RPM and adjust flaps and trim, as required, for takeoff (or IAW the current CL).

d. The IP will bring the condition levers back to low idle. D/H

TC 1-219

e. The IP will state, **"Advance power."** The P* will advance power levers to a power setting briefed by the IP and state, **"Set power."**

f. The IP will assume control of the power levers and state, **"Power set"** when takeoff power is reached.

g. The IP will call, **"Rotate"** at V_1. D/H

h. The IP will call , **"V_1"** and **"Rotate"** at V_R. K/N/P/Q

i. From this point, continue the takeoff using the procedures specified for a normal takeoff.

NOTE 2: It is the IP's responsibility to obtain ATC clearance for the touch-and-go landing and to advise ATC if the procedure is later changed to a full stop landing.

NIGHT CONSIDERATIONS: Normal approach and landing techniques are used at night. However, the addition of a slight amount of power is normally used to reduce the rate of descent and to maintain minimum flying speed until touchdown. This is especially important during dark field landings when the ground surface is not visible. When visibility is lowered by haze or smoke, the range of the landing light may be insufficient to see obstructions in time to avoid them. The visual approach slope indicator (VASI), when available, is the most accurate and reliable approach-angle indicator and should be used to maintain a safe glide path. If VASI is not available, the obstruction lights along with the threshold lights should be used to establish a sight picture during the approach. The apparent distance between runway lights can also be used as an aid in establishing the flare-out point.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft.

REFERENCES:

Common references

TASK 1145

Perform normal landing.

CONDITIONS: In an RC-12 airplane or simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Attain landing approach speed (V_{ref} plus one-half wind gust speed) ±5 KIAS.

2. Maintain approach angle at or above the instrument landing system (ILS) glide path, visual approach slope indicator (VASI) or precision approach path indicator (PAPI) when available.

3. Obtain the V_{ref} plus speeds at the designated points in the pattern ±10 knots.

4. Touchdown on the first 3,000 feet of the runway beginning at the threshold or the first third of the runway (on shorter runways) and roll out with desired runway track between the main landing gear.

5. Maximum bank angle in the traffic pattern: 30 degrees + 5 degrees.

6. Maintain positive directional control and crosswind correction during the after landing roll**.**

7. Uses beta, reverse, ground fine, and brakes (as appropriate) in such a manner to bring the airplane to a safe stop or exit the runway at a safe speed.

DESCRIPTION:

1. Crew Actions. Each crew member will complete the required checks or procedures pertaining to his crew duties according to the checklist and the preflight briefing. The P also will read the checklist, monitor flight and engine instruments, keep his area of observation cleared, and perform actions requested by the P*.

2. Procedure. The P*, assisted by the P, will perform the following actions:

a. Discussion. The normal traffic pattern approach should be a stabilized descent and deceleration, excluding deviations required by ATC or environmental considerations. After the initial power reduction, a stabilized descent resulting in a normal 3-degree approach angle can be maintained with minor pitch adjustments. The airspeed can be managed through use of power and flaps to achieve the desired 'V_{ref} + speed' at the appropriate place in the pattern. If the

P* makes a pitch change to correct for the angle, he must understand and correct for the resulting airspeed change. The P* should adjust power, as necessary, to maintain the desired airspeed.

b. Arrival. Complete the descent-arrival check or call for P action before entering the traffic pattern. Maneuver the aircraft into position to enter the downwind leg at midfield at a 45-degree angle (or according to local procedures), at traffic pattern altitude, and at 160 KIAS in the clean configuration. Straight-in or base-leg entry may be used if approved by air traffic control.

c. Downwind. When the airplane is approximately abeam the approach end of the runway (point may vary depending on winds and design), initiate the deceleration to V_{app} (V_{ref} + 30) by lowering flaps to APPROACH and by extending the landing gear (call for P action **"Flaps APPROACH "**). Hold altitude with pitch. As the aircraft decelerates to V_{ref} + 30, complete the Before Landing checklist. Verify all checklist items as the P calls them out. The P will announce, **"Check completed"** when the last item has been verified.

d. Base. Upon reaching V_{ref} + 30, reduce power and allow the aircraft to begin its descent, adjusting to a pitch attitude that will result in about V_{ref} + 20 on base. Trim, as required, and begin the turn to base. After rollout on base, determine the aircraft position in relation to the projected approach angle. Adjust pitch to maintain the required descent angle. Adjust propeller rpm to high and/or flaps, as required, (call for P action) to maintain the airspeed profile, as required. Use power to correct for too slow airspeed. Trim the aircraft as required.

NOTE 1: Flaps should be used as a deceleration tool at the P*'s discretion to obtain the desired airspeed for the approach segment being flown.

NOTE 2: The decision when to place the propeller levers to high RPM is at the P*'s discretion.

NOTE 3: A common mistake is to use the aiming point marking located about 1,000 feet from the landing threshold as a predetermined touchdown point. A stabilized 3-degree descent will allow a descent to the aiming point marking; however, during a normal roundout, the aircraft will touchdown beyond the marking and is acceptable. Do not 'duck under' the approach angle at the last minute to try and touchdown on the marker and destabilize the approach.

e. Final. Turn final so as to complete the turn at, or above, 500 feet AGL. When established on final approach, select flaps (task the P to move the flap switch to the desired setting), as required, to reduce airspeed gradually so as to arrive at about V_{ref} + 10 on mid-final and V_{ref} (plus one-half the wind gust speed) at about 50 feet above the landing area. The landing check may be performed at anytime once the propellers are placed to high RPM.

f. Stabilized landing. From about mid-final to the threshold, the P* should stabilize the approach by setting landing flaps (call for P action). Set landing trim and adjust power, as required, to maintain V_{ref} + 10 until such time it is necessary to reduce power to arrive at V_{ref} (plus one-half the wind gust speed) at about 50 feet above the landing area. As the aircraft nears the runway, coordinate pitch and power, as necessary, to control rate of descent and airspeed for a smooth touch-

down. After touchdown, gently lower the nosewheel to the runway and use brakes, beta, propeller reversing, or ground fine, as necessary, to slow the aircraft. Maintain directional control during the landing roll with rudders/nosewheel steering.

CROSSWIND CONSIDERATIONS: During crosswind conditions, use the crab-into-the-wind method to correct for drift on all legs of the traffic pattern until short final. The crab-into-the-wind is changed to a slip-into-the-wind for roundout and touchdown. The point to begin the slip is at the P*'s discretion. A prolonged slip will result in an increase in the rate of descent. Power will be required to resume a normal descent. During the after-landing roll, use normal rudder or nosewheel steering for directional control and position ailerons, as required, to correct for crosswind effect.

STABILIZED APPROACH: According to the Flight Safety Foundation, a stabilized approach consists of the following:

- The aircraft is on the correct flight path.
- Only small changes in heading and pitch are required to maintain that path.
- The airspeed is not more than V_{ref}+20 KIAS and not less than V_{ref}.
- The aircraft is in the proper landing configuration.
- Sink rate is a maximum of 1,000 FPM; if an approach requires a sink rate greater of 1,000 FPM, a special briefing should be performed.
- Power setting is appropriate for configuration and not below the minimum power for the approach as defined by the aircraft operations manual.
- All briefings and checklists have been performed.
- Specific types of approaches are considered stabilized if they fulfill the following:

    1. ILS approaches must be flown within one dot of the glideslope or localizer.
    2. Visual approaches – wings must be level on final when the aircraft reaches 500-foot height above touchdown (HAT).
    3. Circling approaches – wings must be level on final when the aircraft reaches 300-foot HAT.
    4. Unique approaches such as mountainous terrain, etc., require a special briefing.

The concept as applied to RC-12s is to have all configuration changes (props, flaps, gear) and checklists completed to be stabilized.

NOTE 4: The P* will complete the before-landing check on the downwind leg before turning base for a normal traffic pattern. For an extended downwind, straight in, extended base leg complete the before landing check no later than 2 miles from the threshold. The P* may perform these procedures earlier. If the P* does perform the before-landing procedure early, maintain airspeed at V_{ref} +30 KIAS as minimum until turning base leg.

NOTE 5: When landing on an instrumented runway and the descent angle is at the touchdown markers, the V_{ref} position will be 50 feet above the runway threshold. If landing on an unmarked runway or landing strip, the V_{ref} point will occur before the runway threshold. In no case should the

TC 1-219
P* fixate on touching down on a predetermined point and allow high rates of descent to build. Consideration should be given to ground effect, density altitude, weight, winds, and runway length.

NIGHT CONSIDERATIONS: Normal approach and landing techniques are used at night. However, the addition of a slight amount of power is recommended to reduce the rate of descent and maintain minimum flying speed until touchdown. This is especially essential during dark field landings when the ground surface is not visible. When haze or smoke lowers visibility, the range of the landing light may be insufficient to see obstructions in time to avoid them. The VASI, when available, is the most accurate and reliable means of approach angle indications and should be used to maintain a safe glide path. If VASI is not available, the obstruction lights in conjunction with the threshold lights should be used to establish a sight picture during the approach. The apparent distance between runway lights also can be used as an aid in establishing the flareout point.

COLD WEATHER CONSIDERATIONS: Landings on icy runways should be made only when necessary. Braking and steering are less effective under slick runway conditions, and hydroplaning may occur at high speeds on wet runways. Use of the rudder to maintain directional control until the tires make solid contact with the runway surface may be necessary. Refer to the aircraft operator's manual for any limitations and special procedures. To avoid impairing visibility, reverse power should be used with caution when landing on a runway covered with snow or standing water.

DESERT AND HOT WEATHER CONSIDERATIONS:

1. Use normal landing procedures. Use reverse power and beta/ground fine range with caution to avoid brownout and to preclude blowing excessive amounts of sand and dust into the engines.

2. To prevent brake-disk warping, release the brakes immediately after chocks have been installed.

MOUNTAIN CONSIDERATIONS: If descending in mountainous terrain, be aware of the potential for turbulence associated with mountain waves and reduce speed to turbulence penetration airspeed, if required.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references
FAA-P-8740-24 Tips on Winter Flying
T.O. 1C-12A-1
FAA-S-8081-5C ATP Practical Test Standards for Airplane

TASK 1177

Perform go-around.

CONDITIONS: In an RC-12 airplane or simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Ensure the aircraft is accelerating and/or climbing before moving the gear or flap switches.

2. Apply smooth, coordinated control inputs.

DESCRIPTION:

1. Crew Actions. The P*'s main focus will be outside the aircraft. The P will monitor flight and engine instruments, keep his area of observation cleared, and perform actions requested by the P*. The P will assist the P* with the setting of power and flaps and perform the appropriate crew callouts according to chapter 6.

NOTE 1: This maneuver may be combined with upper air work recovery procedures, a rejected landing, instrument, and circling or missed approach procedures.

NOTE 2: The sequence of power, flaps, gear, and flaps is authorized until such time as all the operator's manuals and checklists can be changed from power, gear, flaps.

2. **Procedure.** The P*, assisted by the P, will perform the following actions when performing a go-around or missed approach:

a. The P* will¾

(1) Initiate the maneuver by advancing the power levers toward maximum allowable power and direct the P to **"Set power."**

(2) Simultaneously increase pitch attitude to about 7 degrees to stop the descent. The Go-Around mode on the flight director may be used as an aid.

(3) If flaps are set beyond APPROACH, direct **"Flaps APPROACH"** after the **"Positive rate"** callout.

(4) Direct the P **"Gear UP"** on the P's **"Positive rate"** callout.

(5) At V_{ref}, direct the P to select **"Flaps UP."**

(6) State **"My power"** when ready to resume full control. The P may transfer it back to the P*, stating **"Your power"** if his workload requires.

(7) Establish a normal climb at cruise climb airspeed.

(8) Call for the go-around checklist when time, altitude, and workload permits.

b. The P will¾

(1) Set maximum allowable power when directed and respond **"Power set."**

(2) State **"Positive rate"** after observing two positive climb indications.

(3) State **"Flaps APPROACH"** when directed by the P* and the flaps switch has been moved to that position. Verify with the flap gage.

(4) Move the gear handle to the UP position, turn the light switches OFF, and respond **"gear up."**

(5) At V_{ref} select **"Flaps UP"** when directed by the P* and flaps switch has been moved to that position.

(6) Read go-around checklist when P* directs.

(7) Advise ATC of the go-around and intentions.

NOTE 3: Accelerating to or above V_{ref} before retracting flaps completely will provide an additional margin of speed over V_{mc} or V_s. If an engine failure at this critical phase, this extra speed will assist in preventing loss of control.

NOTE 4: If a go-around is initiated at high gross weights and/or high density altitudes close to the ground, the aircraft may descend and hit the ground because of "wash out." Leaving the gear down until gaining sufficient altitude and/or airspeed eliminates this risk.

NOTE 5: The P* may elect to retract the landing gear, provided it is briefed prior to the maneuver.

NIGHT CONSIDERATIONS: For traffic avoidance and aircraft identification, the recognition light(s) should be left on until at least traffic pattern altitude. Monitor heading and altitude instruments closely and be prepared to convert to instrument flight if the visual horizon is lost or if affected by vertigo.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references

TASK 1182

Perform radio communications procedures.

CONDITIONS: In an RC-12 airplane or simulator with two-way radio communications established.

STANDARDS:

1. Without error, adjust avionics to the proper frequencies.

2. Establish radio contact with the appropriate ATC facility.

3. When communicating with ATC facilities, use correct radio communications procedures and phraseology according to the DOD FLIP.

4. Acknowledge each radio communication with ATC by using the correct call sign.

5. Acknowledge and comply with ATC instructions to change frequencies.

DESCRIPTION:

1. Crew Actions. Radio communication is primarily the P's responsibility. However, if crew members monitor multiple frequencies simultaneously, they will keep each other informed about any actions/communications they conduct on their respective frequencies.

2. Procedure.

a. The crew will use radio communication procedures and phraseology as appropriate for the area of operations.

b. The P will adjust avionics as required and maintain a continuous listening watch on the assigned frequencies. When required, he will establish communications with the appropriate ATC facility. He will monitor the frequency before transmitting and use the correct radio call sign when acknowledging each communication. He will transmit pilot reports, position reports, and flight plan changes, as required.

c. When advised to change frequencies, the P*/P will acknowledge the transmission before making the change. He will select the new frequency as soon as possible unless instructed to do so at a specific time, fix, or altitude.

NOTE: When the P* performs this task, he will coordinate his actions/communications with the P.
.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. **Evaluation.** Evaluation will be conducted in the aircraft or simulator or orally.

REFERENCES:

Common references

TASK 1200

Perform instrument takeoff.

CONDITIONS: In an RC-12 airplane or simulator, under IMC or simulated IMC.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Select navigational aids for departure procedure.

2. Set navigational instruments and selector switches without error.

3. Select and verify initial level off altitude on the altitude alerter, if installed.

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus will be inside the aircraft except during the start of the takeoff. He will direct the P to engage the flight director/autopilot modes, as he needs them. He will acknowledge all P callouts.

b. The P will assist the P* by performing designated P duties and callouts according to chapter 6. He will make the required radio transmissions, callouts used for a normal takeoff and perform designated actions requested by the P*.

NOTE 1: The procedure describes an instrument takeoff using the flight director. This maneuver can be performed without the assistance of a flight director if desired.

2. Procedure. An instrument takeoff uses the same procedures and callouts as a normal takeoff except it is modified to use flight instruments, the flight director and autopilot to assist the P*. Refer to Task 1104, Perform normal takeoff, for the procedure and callouts. The following are modifications and/or additions used for an instrument takeoff (ITO):

a. Lineup. Recheck heading and attitude indicators/flight director for possible precession errors. Set the heading bug under the lubber line, set the flight director for initial desired pitch attitude (see note 2), task the P to set the altitude preselector (if installed) and desired function on the flight director controller. The P should confirm the flight instrument settings.

NOTE 2: Some flight directors will not allow an initial pitch adjustment while the weight is on the wheels. For these systems, use the heading mode. After liftoff, adjust the pitch attitude to 7 degrees and slave the FD pitch bar to the aircraft pitch attitude using the TCS or CWS switch.

b. Power. Same as a normal takeoff.

c. Takeoff. After the brakes are released, initial directional control should be accomplished predominantly with the aid of outside visual references. As the takeoff progresses, the cross-check should transition from outside references to the heading indicator, airspeed indicator, and attitude indicator. The rate of transition from outside references to inside references is directly proportional to the rate at which the outside references deteriorate. Approaching V_1, the cross-check should be totally committed to the instruments so that erroneous sensory inputs can be ignored. At the **"Rotate"** callout, establish a 7-degree takeoff pitch attitude on the attitude indicator/flight director. Maintain this pitch attitude and wings-level attitude until the aircraft becomes airborne. When both the vertical velocity indicator and altimeter show positive climb indications, the P will make the **"Positive Rate"** callout. The P will then retract the landing gear. After the landing gear is retracted, adjust pitch attitude to obtain 10 to 12 degrees. If the flight director is being used press the CWS or TCS button to keep the "V" bar or pitch bar in synch with the aircraft pitch attitude. Task the P to retract flaps, **("Flaps UP")**, when "safely airborne" K/N/P/Q, or "V_{yse}" D/H (as applicable). Control the bank attitude to maintain the desired heading. Cross-check supporting instruments as required throughout the maneuver. The climb profile is the same as a normal takeoff.

d. Climb. Same as normal takeoff. At single-engine maneuvering altitude (not less than 400 feet AGL), task the P to engage the desired flight director modes and engage the autopilot, if desired.

e. Assist the P*. Throughout the maneuver, the P should assist the P*; he will verify instrument settings; monitor engine instruments; maintain takeoff power; engage the flight director and autopilot modes, requested by the P*; make the appropriate callouts; and advise the P* of any abnormal conditions.

NOTE 3: Precession errors in some attitude indicators may cause the horizon bar to lower slightly during acceleration, causing the pitch attitude to appear higher than actual pitch attitude. To avoid lowering the nose prematurely, cross-check the vertical velocity indicator and altimeter to ensure proper climb performance.

NOTE 4: The P* may elect to retract the landing gear, provided it is briefed prior to the maneuver.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES: Common references

TASK 1210

Perform holding procedures.

CONDITIONS: In an RC-12 airplane, IMC, or simulated IMC or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Execute holding according to FM 1-240, AIM, and DOD FLIP.

2. Correctly tune and identify the appropriate NAVAIDs.

3. Correctly enter holding pattern.

4. Adjust speed so as to cross the fix at or below maximum holding speed.

5. Comply with ATC reporting requirements.

6. Correctly time and track holding pattern legs.

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus (inside/outside the aircraft) will vary depending on whether the aircraft is operating in VMC or IMC. He will announce all frequency changes, instrument settings, and ATC information that the P does not monitor.

b. The P will assist by keeping the area cleared when operating in VMC and tuning the required frequencies when requested by the P*. He will note holding pattern instructions and verify pattern location and entry leg. He will verify all frequency changes requested by the P*, follow the position of the aircraft on the chart, make the required radio transmissions, and be the timekeeper when requested by the P*.

2. Procedure. The P*, assisted by the P, will perform the following procedures:

a. Timed Holding. Slow to holding airspeed within 3 minutes of the fix. Before arrival at the holding fix, analyze holding instructions to determine holding pattern location and proper entry. Upon arrival at the holding fix, turn (if required) to the predetermined outbound heading. Have the P note the time and make the appropriate report to ATC. Check navigation instruments to confirm the aircraft's location in relation to the inbound course. Maintain the outbound heading according to the DOD FLIP or as directed by ATC. After the appropriate time outbound, turn to the inbound heading. Apply normal tracking procedures to maintain inbound course. Have the P verify 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 outbound time when abeam the station. When holding at an intersection, begin the outbound time upon establishing the outbound heading (wings level).

b. DME Holding. Before arrival at the holding fix (normally a radial and DME fix from a VORTAC/TACAN station), determine holding pattern and entry. When within 3 minutes of the holding fix, reduce airspeed as appropriate for holding. Upon arrival at the holding fix, announce the arrival and turn (if required) to the predetermined outbound heading. Have the P note the time, and make the appropriate report to ATC. Check navigation instruments to confirm the aircraft's location in relation to the inbound course. The length of the outbound leg will be attained as specified according to DOD FLIP or as directed by ATC. Begin inbound turn at the appropriate DME point and apply normal tracking procedures to maintain inbound course.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane or simulator.

REFERENCES:

Common references

TASK 1212

Perform Enhanced Ground Proximity Warning System (EGPWS)/Terrain Avoidance Warning System (TAWS) operations.

CONDITIONS: In an RC-12 airplane equipped with EGPWS or TAWS installed, under VMC, IMC, simulated IMC, in a compatible simulator, or in a classroom environment.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly turn on, test, adjust, and operate, the terrain avoidance equipment according to the Aircraft Flight Manual (AFM), Operator's Manual, or Manufacturer's Operating Handbook.

2. Correctly identify terrain avoidance cockpit indications and symbology.

3. Correctly respond to terrain avoidance advisories and warnings, including wind shear warnings, if available (wind shear alerts are only available in some installations, primarily turbo-jet aircraft).

4. Use correct terrain avoidance phraseology.

DESCRIPTION:

1. Crew Actions.

a. Prior to takeoff, the crew will check the system for proper operation. Crews will observe precautions specified in the AFM, Operator's Manual, TAWS Flight Manual Supplement, or the equipment operating handbook.

b. The operation of the terrain avoidance equipment in flight is the P's responsibility. Crew members will adjust the terrain avoidance equipment as required. Normally, the TAWS "pop-up" visual display is the priority display and will override the weather and/or TCAS display when there is a terrain alert. If the installation does not include the terrain display as a pop-up on the display, then crew members will select the terrain display during flight whenever there is a TAWS "Warning" or "Alert." When the particular installation does not include the terrain as a pop-up display and terrain is the overriding concern, as in approaches or departures in mountainous areas or receiving vectors in mountainous areas, the EGPWS display will be operated in the Terrain mode.

c. When IMC, all flight crews will respond to a TAWS Warning to **"PULL UP"** by executing an immediate climb. If the Warning occurs during an instrument final approach, the crew will climb and execute the published or alternate missed approach procedure.

d. When VMC, flight crews are authorized to disregard a terrain avoidance warning if, and only if, they (both crew members) have absolutely identified, beyond any doubt, the terrain that caused the warning and are certain of the capability to clear the terrain. If either crew member has any doubt, then correctly respond to the terrain avoidance warning.

e. Crews are authorized to deviate from their ATC clearance to the extent necessary to comply with a TAWS warning. After a deviation, as soon as workload permits, report to ATC.

f. Upon receiving a terrain avoidance warning during an instrument approach, after completion of the Before Landing check, the missed approach/go-around procedure must be initiated to assure terrain clearance.

g. The Terrain Awareness and Display (TAD) function should be inhibited by selecting the **TERRAIN INHIBIT** switch when—

(1) Operating within 15 NM of takeoff, approach, or landing at an airport not contained in the EGPWS database. (See EGPWS Terrain Database Airport Coverage List, Allied Signal document 060-4267-000.)

(2) The Flight Management System (FMS), or other long-range navigation system providing position information to the TAWS, is in the dead reckoning (DR) mode (if applicable).

(3) Conducting repetitive day closed traffic/traffic pattern operations.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or academically. Task will be evaluated during the crew member's APART.

REFERENCES:

Aircraft flight manual
Operator's manual
Equipment operating handbook (instructions)

TASK 1215

Perform precision approach.

CONDITIONS: In an RC-12 airplane or in a simulator, under IMC, or simulated IMC with access to appropriate DOD FLIP and approach clearance received.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Execute the approach according to AR 95-1, FM 1-240, AIM, and DOD FLIP.

2. Complete before-landing check before final-approach descent.

3. Maintain V_{app} (V_{ref} +20 ±5).

4. For an ILS approach, remain within full-scale deflection of CDI. On final approach, maintain glide-slope indicator within a full-scale deflection.

5. During PAR approaches, maintain headings ±5 degrees and make immediate heading and altitude corrections as issued by ATC.

6. Comply with the DH/PAR minimums prescribed for the approach.

7. Execute correct missed approach procedure immediately upon reaching DH if a landing cannot be accomplished.

DESCRIPTION:

1. Crew Actions.

a. The P*s main focus, inside/outside the aircraft, will vary depending on whether the aircraft is operating in VMC or IMC. When operating in IMC, the P* will remain on instruments until the P advises that the aircraft is in VMC. He will direct the P to engage the flight director and autopilot functions, as he requires when performing a coupled approach. See chapter 6 for crew duties and callouts.

b. The P will obtain weather, winds, current altimeter, active runway, and remarks from ATIS, AWOS, ATC, as appropriate, before commencing the approach and brief the P*. He will assist the P* by tuning the appropriate radio frequencies, selecting the flight director modes, reading the checklist, and making the appropriate callouts according to chapter 6 for a precision approach and missed approach, if applicable.

c. The P* and the P will review the approach procedure to be flown. Standard items to review include type of approach, final approach course, DH, circle maneuver, if necessary, approach lighting available that will assist identifying the runway, missed approach procedure, and clarify any questions on crew actions and intentions with each other. Brief any restrictive notes for that approach. One crew member does not have to read the approach out loud to the other. During refresher or qualification training, the IP/IE may require an oral briefing for training purposes.

d. At the end of the briefing, the approach plate should be positioned in view of the P. The following items should be retained in memory by the P*:

(1) Final inbound course.

(2) Glideslope intercept altitude.

(3) Minimums.

(4) Decision height.

(5) The initial missed approach climb including heading/course and altitude.

e. During the approach, the P* may have the P refer to the approach plate for information as necessary. However, unless unforeseen circumstances develop, the pilot flying should be familiar enough with the procedure not to require reference to the above five items.

NOTE: The P* will engage the desired functions for those aircraft in which the flight director mode controller and autopilot power switches are mounted on the left side.

2. Procedure.

a. Normal. Refer to FM 1-240 for a complete description of approach procedures. An aviator should practice instrument approaches flying manually (unaided), flight director only and coupled with the autopilot.

(1) Airspeed should be about 160 KIAS before configuring for the approach unless ATC requires a different speed. Complete the before-landing check prior to glideslope intercept altitude. Before glideslope intercept, the props should be selected to high RPM. The final approach speed is V_{ref} + 20 KIAS. If the approach is being manually flown, pitch to the glideslope and use power to maintain the airspeed. If the approach is coupled, the autopilot will pitch to the glideslope through the flight director and the P* will control the airspeed with power.

(a) Visual. During the final approach descent, if the P determines the P* can complete the approach to landing visually (Chapter 6), he will report, **"Runway in sight at 12 o'clock, Take over visually."** The P* will respond, **"Runway in sight, visual."** The P* will

continue to descend on glideslope. If the visual callout occurs after the P says **"1,000 to go**,**"** the P* should configure the aircraft using flaps and power to assume a normal approach profile to landing. After the autopilot is disengaged, task the P to verify the landing check so as not to distract the P* at a critical point.

(b) Missed Approach. If the runway environment is not in sight by DH, the P will report, **"DH, Negative contact, missed approach."** The P* will initiate a go-around/missed approach.

b. Single Engine Considerations.

(1) If an engine fails under IMC or simulated IMC, the P* must continue to fly the approach while managing the emergency. The P must assist the P* with the appropriate crew call-outs and actions outlined in Task 1335, Perform emergency procedures for engine failure on final, and chapter 6. By distributing the workload, the standards should not be exceeded.

(2) If a missed approach is executed, comply with Task 1320, Single engine go-around, while complying with the published missed approach procedure or ATC instructions.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane or in a simulator.

REFERENCES:

Common references
FAA–S-8081-5C, Airline Transport Pilot and Aircraft Type Rating
Practical Test Standards for Airplane

TASK 1220

Perform nonprecision approach.

CONDITIONS: In an RC-12 airplane under IMC or simulated IMC or simulator and given access to appropriate DOD FLIP (approach clearance received).

STANDARDS:

1. Execute the approach according to AR 95-1, FM 1-240, AIM, and DOD FLIP.

2. Complete before-landing check before final descent inbound.

3. Maintain V_{app} (V_{ref} +20 ± 5) KIAS final approach descent inbound.

4. Maintain prescribed courses as follows:

a. NDB courses— ±5 degrees.

b. VOR, VOR/DME, RNAV, SDF, and TACAN courses—within one-half scale deflection using the course indicator or ±5 degrees using the radio magnetic indicator (RMI).

c. LOC, LDA courses—remain within full-scale deflection of the CDI.

5. During ASR approaches, make immediate heading and altitude changes issued by ATC and maintain heading ±5 degrees.

6. Comply with descent minimums prescribed for the approach.

7. Establish a rate of descent that will allow arrival at the MDA at or prior to reaching the visual descent point (VDP) if published with the airplane in a position from which a descent from MDA to a landing on the intended runway can be made at a normal rate using normal maneuvering.

8. Execute correct missed approach procedure immediately upon reaching the MAP if a landing cannot be accomplished.

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus (inside/outside the aircraft) will vary depending on whether the aircraft is operating in VMC or IMC. When operating in IMC, the P* will remain on instruments until the P advises that the aircraft is in VMC. He will direct the P to engage the flight director and

autopilot functions when doing a coupled approach H/K/N/P/Q. See chapter 6 for crew duties and callouts.

b. The P will obtain weather, winds, current altimeter, active runway, and remarks from ATIS, AWOS, ATC, as appropriate, before commencing the approach and brief the P*. He will assist the P* by tuning the appropriate radio frequencies, selecting the flight director modes, reading the checklist, and making the appropriate callouts according to chapter 6 for a nonprecision approach and missed approach, if applicable.

c. The P* and the P will review the approach procedure to be flown. Standard items to review include: type of approach, final approach course, minimum decision altitude (MDA), and orientation of the runway to the final approach course. Circle maneuver if necessary; approach lighting available that will assist identifying the runway and missed approach procedure, and clarify any questions on crew actions and intentions with each other. Brief any restrictive notes for that approach. One crew member does not have to read the approach out loud to the other. During refresher or qualification training, the IP/IE may require an oral briefing for training purposes.

d. At the end of the briefing, the approach plate should be positioned in view of the P. The following items should be retained in memory by the P*:

(1) Final inbound course.

(2) FAF altitude and location.

(3) Minimums.

(4) Missed approach point.

(5) The initial missed approach climb including heading/course and altitude.

e. During the approach, the P* may have the P refer to the approach plate for information as necessary. However, unless unforeseen circumstances develop, the pilot flying should be familiar enough with the procedure not to require reference to the above 5 items.

NOTE 1: For the D when the flight director mode controller and autopilot power switches are mounted on the left side, the P* will engage the desired functions.

2. Procedure.

a. Normal. Refer to FM 1-240 for a complete description of approach procedures.

(1) An aviator should practice instrument approaches flying manually (unaided), flight director only and coupled with the autopilot.

(2) When executing a full approach, the P* may complete the Before Landing check and slow to V_{ref} + 20 KIAS at his discretion to aid in controlling ground speed and rate of descent outbound.

(3) The P* should complete the Before Landing checklist, call for props to be set to high RPM and established at V_{ref} + 20 KIAS no later than final approach descent.

(a) Visual. During the final approach descent, if the P determines the P* can complete the approach to landing visually (chapter 6), he will report, **"Runway insight at 12 o'clock, Take over visually**." The P* will respond, **"Visual."** The P* will continue inbound at MDA until he needs to descend to land. He will task the P to set **"Full flaps"** and, when he departs the MDA, call out **"Leaving MDA**." The P* will adjust power and pitch as necessary for a normal descent and landing.

NOTE 1: The landing check may be completed anytime after the autopilot is disconnected, if doing a coupled approach.

(b) Missed approach. If the runway environment is not in sight by the MAP, the P will report, **"Times up" or "Missed approach point**," **"Negative contact, Missed approach**." The P* will initiate a go-around/missed approach.

b. Single Engine Considerations.

(1) If an engine fails under IMC or simulated IMC, the P* must continue to fly the approach while managing the emergency. The P must assist the P* with the appropriate crew call outs and actions outlined in Task 1335, Perform emergency procedures for engine failure final, and chapter 6. By distributing the workload, the standards should not be exceeded.

(2) If a missed approach is executed comply with Task 1320, Single-engine go-around, while complying with the published missed approach procedure or ATC instructions.

NOTE 2: If performing a single-engine circling approach, the decision to complete the before-landing check before the final descent inbound must be tempered with other factors. These include gross weight, weather conditions, and aircraft performance. If the aircraft will not maintain altitude at V_{yse} while circling to land, retract the landing gear and, if required, the flaps. However, once this is done, the entire check must be repeated before the landing.

NOTE 3: If ATC requires that an airspeed be maintained that precludes completing the before-landing check before the final descent inbound, the before-landing check will be completed no later than 2 miles from the runway threshold.

NOTE 4: If a visual descent point (VDP) is not published, an acceptable method or technique for determining VDPs is as follows:

TC 1-219

- **Using Time:** [height above touchdown (HAT) multiplied by 10%] minus [time final approach fix (FAF) to missed approach point (MAP)];
  i.e. , (600 feet X 10%) = 60 sec minus (2 min) = 1 min.
- **Using distance measuring equipment (DME):** (HAT) divided by 300 = DME (VDP from end of runway); i.e., 600 divided by 300 = 2 DME.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references
FAA–S-8081-5C Airline Transport Pilot and Aircraft Type Rating
Practical Test Standards for Airplane

TASK 1240

Perform missed approach.

CONDITIONS: In an RC-12 airplane under IMC or simulated IMC or simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Comply with ATC or published missed approach procedures at missed-approach point.

2. Maintain prescribed course or heading ±5 degrees.

DESCRIPTION:

1. Crew Actions.

a. The P*'s focus will be inside the aircraft. He will apply power to the approximate setting, keeping his main focus on the flight instruments. He will verify the climb-out procedure with the P and acknowledge all P callouts.

b. The P will assist by monitoring engine and flight instruments, setting the final power, and reading the checklist. He will announce when he assumes power control and acknowledge all actions requested by the P*. He will make the required radio transmissions and perform all designated P actions requested by the P*. Refer to chapter 6 crew duties for specific callouts and crew actions.

NOTE 1: Flaps should not be extended beyond approach until a visual descent can be made to the runway.

NOTE 2: If this procedure is conducted while operating single engine the climb airspeed will be V_{yse}, as applicable. The single engine go-around checklist should be used to verify the procedure when time permits.

2. Procedure. A missed approach is a go-around with a published or ATC directed procedure to follow. When a missed approach is necessary, perform the go-around Task 1177 with these additions and modifications:

a. The P* will¾

(1) If performing a coupled approach, disconnect the autopilot using the AP DISC button or by depressing the go-around button on the left power no later than MDA or DH.

TC 1-219

(2) If a turn is involved in the procedure, initiate the turn as published, as instructed by ATC at or above circling minimums.

(3) Reengage the flight director and autopilot (if desired) above 400 feet AGL. Cockpit layout of the mode controllers vary. Task the P to assist in engaging desired functions as appropriate.

b. The P will¾

(1) Direct the P*, **"DH" or "Times up,"** or **"Missed approach point," "Negative contact, Missed approach."**

(2) Engage flight director/autopilot functions as directed by the P.

c. Maneuver the aircraft to follow the missed-approach path shown on the approach plate or the alternate route assigned by ATC. If the approach is terminated while circling for a landing, make a climbing turn toward the runway unless otherwise specified. Remain within the circling obstruction clearance area before turning to intercept the published missed approach course.

d. As soon as practical, the P should inform ATC of the missed approach and state intentions for additional ATC clearance. Do not sacrifice aircraft control for the sake of communicating with ATC. Complete go-around procedure, and verify with the checklist.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane or simulator.

REFERENCES:

Common references

TASK 1245

Perform unusual attitude recovery.

CONDITIONS: In an RC-12 airplane, with IP/IE/SP, simulated IMC, (day only) or in a simulator with an emergency or full-panel configuration.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly analyze aircraft attitude.

2. Without delay, use the correct recovery procedure (sequence).

DESCRIPTION:

1. Crew Actions.

a. The IP, IE, or SP will assume control of the aircraft, clear the area, and establish the unusual attitude. After a positive transfer of the controls, the instructor/evaluator will assume the normal role of the P. In the P role, he will monitor aircraft and engine instruments closely and provide adequate warning for corrective action if operating limitations may be exceeded. He will assist the P* by performing the requested actions.

b. An alternate method is to have the P* fly the aircraft with his eyes closed. The IP, IE, or SP will direct turns and rollouts. When an unusual attitude is reached, he will direct the P* to open his eyes and recover.

c. The P*'s main focus will be inside the aircraft. He will acknowledge transfer of controls, analyze the condition and attitude of the aircraft, and take corrective action.

2. Procedure. Upon detecting an unusual attitude, the P*, assisted by the P, will immediately initiate a recovery to straight-and-level flight by performing the following procedures:

a. Recover from nose-high unusual attitude; airspeed is low and decreasing—

(1) Increase power as necessary up to the maximum power available and increase angle of bank 10 to 15 degrees, not to exceed 45 degrees, in the same direction as the turn.

(2) As the nose of the aircraft falls to the horizon, decrease bank to wings level.

(3) Adjust pitch to reverse the airspeed trend and return to a level flight attitude.

(4) Adjust power to cruise setting.

(5) Cross-check the slip indicator.

(6) Trim the aircraft.

b. Recover from nose-low unusual attitude; airspeed is fast and increasing—

(1) Smoothly reduce power as required.

(2) Level the wings.

(3) Ease the nose up to the horizon.

(4) Adjust power to maintain desired airspeed and altitude.

(5) Cross-check the slip indicator.

(6) Trim the aircraft.

NOTE: In the absence of properly operating attitude instruments, attain straight-and-level flight by centering the turn needle, adjusting pitch to stop the altimeter, and using power to reverse the indications of the airspeed indicator until level flight airspeed is stabilized.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references

TASK 1250

Perform autopilot/flight director operations.

CONDITIONS: In an RC-12 airplane under VMC, IMC, or simulated IMC or in a simulator.

STANDARD: Operate the autopilot/flight director (AP/FD) system according to the appropriate aircraft operator's manual.

DESCRIPTION:

1. Crew Actions. Directing the mode of the AP/FD is primarily the P*'s responsibility. Upon request, the P will engage the AP/FD mode(s) requested by the P* and call out the action. He will monitor the flight instruments and AP/FD annunciator lights and immediately advise the P* of any abnormal indications.

NOTE 1: In those aircraft in which the AP/FD controller(s) are mounted on the left side, the P* will engage the desired function(s).

2. Procedure. The P*, assisted by the P, will perform the following procedures:

a. Perform manual flight responses to the FD commands (climbs, descents, and turns).

b. Perform coupled flight maneuvers (climbs, descents, and turns), using the P to engage the desired flight director function. With the autopilot engaged, fly the desired profile using the appropriate command knob (heading, course, pitch wheel, or turn).

c. Perform coupled navigation and instrument approaches.

NOTE 2: For those systems with an altitude preselector, the P may reset the new altitude without the P* direction when ATC directs an altitude change. The P will announce the new altitude is set and the ALT ARM feature is armed.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane or simulator.

REFERENCES:

Aircraft operator's manual

TASK 1254

Perform IFR navigation.

CONDITIONS: In an RC-12 airplane using the INS, GPS, VOR, TACAN, or NDB under VMC, IMC, or simulated IMC conditions or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly program waypoints in the INS and/or GPS.

2. Correctly tune and identify appropriate NAVAIDs.

3. Correctly determine aircraft position.

4. Correctly intercept and maintain desired course.

5. Correctly identify station passage.

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus (inside/outside the aircraft) will vary depending on whether the aircraft is operating in VMC or IMC. He will announce all frequency changes, instrument settings, and ATC information that the P does not monitor. He will verify the identification of all stations tuned by the P.

b. The P will assist by keeping the area cleared when operating in VMC, checking the avionics equipment, tuning the required frequencies, and performing actions requested by the P*. He will verify all frequency changes requested by the P*, follow the position of the aircraft on the chart, and make the required radio transmissions.

2. Procedure. The P*s, assisted by the P, will perform the following procedures:

a. Equipment Check. Check or have the P check all radio navigational equipment to be used during the mission. Equipment must be operable and within accuracy tolerances, if applicable, as specified in FM 1-240, AIM, the aircraft operator's manual or equipment manufacturer’s manual.

b. Station Identification. The P will obtain correct frequency or for desired navigational station and then tune and identify the station, as applicable. The P* will verify the frequency.

c. Aircraft Position. Determine the position of aircraft with respect to a specified navigational ground station or waypoint according to procedures in FM 1-240 or manufacturer's manual. Have the P verify the position.

d. Course Interception. After identifying the desired station, determine the location of the aircraft in relation to the desired course. Turn 45 degrees toward the course (90 degrees to expedite), and 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 desired heading until navigation instrument shows an off-course condition; then turn 20 degrees toward the course to reintercept. If navigation instruments do not indicate movement toward the course within a reasonable time, increase the intercept angle. When the course is reintercepted, turn 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 procedures in FM 1-240.

g. Station Passage. Identify VOR station passage by observing reversal of the TO-FROM indicator or the RMI needle. Identify NDB station passage by observing reversal of the indicator needle. Identify TACAN station passage by DME mileage reversal.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references
Aircraft operator's manual
Equipment manufacturer's technical manual

TASK 1260

Operate weather avoidance system(s).

CONDITIONS: In an RC-12 airplane, VMC, IMC, or simulated IMC or in a simulator.

STANDARDS:

1. Correctly test and operate the airborne weather radar according to the equipment instruction booklet and the aircraft operator's manual.

2. Correctly test and operate the lightning detection system according to the equipment instruction booklet and the aircraft operator's manual.

3. Correctly perform weather detection, echo interpretation, and hazardous weather avoidance actions.

DESCRIPTION:

1. Crew Actions.

a. The crew will test weather radar and lightning detection systems before takeoff for proper operation. The crew will adhere to object and personnel safety distances specified in the aircraft operator's manual.

b. The operation of weather radar, echo interpretation, and hazardous weather avoidance is the PC's responsibility.

c. The operation of the lightning sensor, interpretation, and hazardous weather avoidance are the PC's responsibility.

2. Procedure.

a. Ground Operation. The P will ground test all weather avoidance system(s) according to the operator's manual for satisfactory performance. The P will advise the P* should any weather avoidance equipment not be fully functional. The crew will evaluate the effect of the reduced capability toward the performance of the mission and brief alternate course(s) of action.

b. Departure Procedure.

(1) Before takeoff, P will operate the weather avoidance equipment to determine any potential hazard conflict with departure and emergency return to the departing airfield. Before takeoff, point the aircraft toward the departure area. Override the receiver transmitter antenna (RTA) ground safety circuitry N/P/Q and tilt the antenna upward. With a maximum of 15-

degree upward tilt, it is possible only to elevate the center of the beam 7,500 feet at 5 miles and 15,000 feet at 10 miles.

(2) The crew will review the ATC departure instructions for conflict with depicted weather display, determine alternatives, and the P will advise ATC of their request. The crew will include, in their departure briefing, any re-distribution of P duties should intense radar operation become necessary. After takeoff and during the climb out, P will adjust the weather avoidance equipment to maintain effective weather depiction and keep the P* advised of changes. The crew will advise ATC of required or desired changes to routing for weather avoidance.

c. En Route Procedure.

(1) The P will adjust the weather avoidance system(s) to maximize "early" detection of weather hazards for planning avoidance maneuvers as required. Crew will use all resources available; for example: center weather advisory (CWA); Flight Watch; air route traffic control center (ARTCC) advisories; hazardous inflight weather service (HIWAS); and pilot weather reports (PIREPs) to supplement weather avoidance displays. Crew will advise ATC of required/desired changes to routing for weather avoidance.

(2) Once established in level flight, adjust weather radar tilt until solid ground returns appear at a range equal to your AGL altitude. To set "zero tilt" (sometimes referred to as normal antenna position (NAP)) for the beam center, raise the tilt 10 degrees from this position, then lower it half the RTA beam width (4 degrees). Zero tilt is a technique for setting the center of the radar beam with the longitudinal axis of the aircraft in level flight. For ideal convective detection, adjust the center of the radar beam between 18,000 and 25,000 feet. (Rule of thumb: Moving the tilt ± 1 degree equates to moving the beam center ± 1,000 feet per 10 nautical miles (NM)).

d. Arrival/Approach Procedure.

(1) The P will adjust the weather avoidance equipment, as required, to maintain the most accurate weather displays. The P will advise the P* if attention will be diverted to intense radar operation. Before entering the approach profile, the crew will evaluate each segment of the designated approach, missed approach, and holding area for displayed weather hazards. The crew will advise ATC of required deviations as they become necessary.

(2) A technique for analyzing the arrival area is setting "low-level park" (also called threat identification position (TIP)). Low-level park is a tilt up of 4 degrees from zero tilt (half the RTA beam width). This places the bottom of the beam at the aircraft's altitude, eliminating ground returns.

3. Supplemental Information.

a. RC-12 aircraft are equipped with a 12-inch diameter receiver transmitter antenna (RTA), emitting an 8-degree beam width (X-Band @ 3.2 cm wavelength/9,400 MHz). RC-12N/P/Q aircraft are configured with an integrated weather radar/lightning sensor controller and dual electronic flight instrument system (EFIS) display indicators. RC-12D/H/K aircraft may have

independent weather radar and storm scope controllers and display indicators. Most RC-12 weather radar features include:

(1) Range – Range selection from 5 to 300-NM full scale (240-NM full scale RC-12D/H). If FP (Flight Plan) mode is available, increased ranges of 500 to 1,000 NM may be selected.

NOTE 1: Weather radar accuracy decreases significantly with the loss of radar energy associated with beam dispersion at increased radar ranges (8-degree beam spans 64,000 feet at an 80 NM range). Beam dispersion formula equals the range in NM (x) 100 (x) radar beam width.

(2) RCT (Rain echo attenuation compensation technique) – When activated, the system is forced into fixed gain and the RCT circuitry compensates for attenuation of the radar signal as it passes through rainfall. The cyan field indicates when further compensation is not possible. Targets detected in the cyan field cannot be calibrated and should be considered dangerous.

(3) STAB (Stabilization system) – The purpose of the stabilization system is to hold the elevation of the antenna beam relative to the earth's surface constant at all azimuths, despite aircraft bank and pitch maneuvers. The system uses the aircraft attitude source as a reference. In the OFF position, the weather radar platform acts independently of the aircraft attitude source reference.

(4) GMP or MAP (Ground mapping) – When activated, the receiver scan sector characteristics are altered to equalize ground-target reflection versus range. The pilot can choose between fixed or variable gain to interpret coastline and mountainous and water region patterns. Weather targets are not calibrated in the ground mapping mode. Do not use this mode for weather detection.

(5) TGT (Target) – Alert feature selectable in all but the 300-NM range. When selected, target alert monitors beyond the selected range (50 NM beyond) and 7.5 degrees on each side of the aircraft heading. Selecting target alert forces the system to preset gain.

(6) FP (Flight Plan) – Navigational feature that forces the RTA to STANDBY. Radar data is cleared and navigation displays ranging from 5 to 1,000 NM may be selected.

(7) TST (Test) – Displays test pattern to verify system operation.

(8) GAIN – Push/pull switch that is used to control the receiver gain. In variable gain, the pilot may adjust receiver gain manually through a rotary control. Fixed gain is recommended for WX mode operations.

(9) TILT – Rotary control used to select the tilt angle of the antenna beam with relation to the horizon. Pilot may select tilt angles from –15 degrees to +15 degrees.

(10) SCT/SECT – Selects either the normal 14 looks/minute 120-degree sector scan, or the faster update 28 looks/minute 60-degree sector scan.

b. RC-12 airborne weather radar systems measure precipitation. To aid in echo interpretation, targets are displayed in various colors. Refer to the aircraft operator's manual for target color intensity indications. Airborne radar is a valuable tool, however, its use is principally as an indicator of storm locations for avoidance purposes while en route. It is not a weather penetration device.

NOTE 2: Weather radar systems operate on two fundamental concepts. "Echo" or "bounce back" theory applies primarily to energy returned from large objects (pure reflectors) such as land mass. In contrast, most weather precipitation types lack the size required to "bounce back" accurate weather returns. Precipitation "reflectivity" is actually based on an energy exchange or "dipole" process. In this process, radar energy "dipoles" or energizes free molecules found in water droplets. Seeking equilibrium, these droplets discharge, emitting energy vectors displayed as weather returns. Because frozen water lacks the free molecules necessary to "dipole," it is not practical to accurately measure the height of a thunderstorm top composed of snow, hail, and cirrus clouds with airborne radar.

c. The majority of RC-12 aircraft are equipped with a passive lightning sensor system. The system measures both visible and high-energy, invisible electromagnetic and electrostatic discharges (lightning) indicating areas of turbulent activity. RC-12 lightning sensor systems provide bearing and intensity information within a 100 NM range at 360 degrees. Refer to aircraft operator's manual for target rate intensity indications. Providing supplementary information to airborne weather radar, the lightning sensor can assist flight crews in the detection and avoidance of hazardous weather systems. It is not a weather penetration device.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Equipment manufacturer's instruction booklet
Aircraft operator's manual
Federal Aviation Administration (FAA) Advisory Circular AC 00-24B, Thunderstorms
Federal Aviation Administration (FAA) Advisory Circular AC 20-68B, Airborne Radar Safety

TASK 1262

Perform circling approach.

CONDITIONS: In an RC-12 airplane, VMC, or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Confirm the direction of traffic and adheres to all restrictions and instructions issued by ATC.

2. Descend at a rate that ensures arrival at minimum decision altitude (MDA) at or before a point from which a normal circle to land maneuver can be accomplished.

3. Avoid descent below the appropriate circling MDA.

4. Maneuver the airplane, after reaching the authorized circling approach altitude, by visual reference to maintain a flight path that permits a normal landing on a runway at least 30 degrees from the final approach course.

5. The angle of bank should not exceed 30 degrees.

6. Maintain the desired altitude –0, +100 feet.

7. Turn in the appropriate direction, when a missed approach is dictated during the circling approach.

DESCRIPTION:

1. Crew Actions. The crew will review the approach plate noting circling MDA and any restrictions on the maneuvering direction. The P*'s main focus will be outside toward the airport. The P should cross monitor airspeed and altitude. Crew duties and callouts that are applicable apply for the segment being flown; for example, normal landing, go-around etc.

2. Procedure.

a. Circling Maneuver. The P* may depart the electronic final approach course when the P reports the runway in sight and is confirmed by the P*. The P* will maneuver the aircraft:

(1) No lower than MDA.

(2) In the appropriate direction, normally a left pattern unless there is a deviation published or issued by ATC. Maneuver the shortest path to the base or downwind, as appropriate, considering existing weather conditions. There are no restrictions from passing over the airport or other runways.

NOTE: Circling maneuvers may be made while VFR or other flying is in progress at the airport. Standard left turns or specific instructions must be considered when circling to land.

(3) To remain in the obstacle protected circling area based on the approach category being flown.

(4) To maintain an identifiable part of the airport so it is continuously in sight.

b. Descent Below MDA to Land. The P* will descend below circling MDA when one of the runway specific cues associated with the landing runway is in view, and the aircraft is in a position to make a normal descent to landing using normal maneuvers. He will announce, **"Leaving MDA."**

c. Missed Approach.

(1) If visual reference is lost while circling to land, from an instrument approach, the missed approach for that particular procedure must be followed (unless an alternate missed approach procedure is specified by ATC). To become established on the prescribed missed approach course, the P* should initiate a go-around and make an initial climbing turn toward the landing runway and continue the turn until established on the missed approach course. This will assure the aircraft will remain within the circling and missed approach obstruction area.

(2) The P will advise ATC of the missed approach and intentions.

NIGHT CONSIDERATIONS: Circling at night is inherently more risky than during the day. If weather permits consider circling at a higher MDA.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references
Title 14 CFR Part 91

TASK 1264

Perform GPS approach.

CONDITIONS: In an RC-12 airplane equipped with an instrument approach-approved GPS system, under IMC, simulated IMC, or in a simulator and given access to appropriate DOD FLIP (approach clearance received).

STANDARDS: Appropriate common standards plus these additions/modifications

1. Execute the approach, according to AR 95-1, FM 1-240, AIM, and DOD FLIP.

2. Complete required check(s) prior to final descent inbound.

3. Maintain V_{app} (V_{ref} +20 ± 5) KIAS final approach descent inbound.

4. Once visual with the landing environment, maintain: V_{app} (V_{ref} +10 ± 5) KIAS).

5. Maintain prescribed course within full-scale deflection (when in the NAV mode), using the course indicator, or ±5 degrees using the radio magnetic indicator (RMI).

6. Comply with descent minimums prescribed for the approach.

7. Execute correct missed approach procedure immediately upon reaching the Missed Approach Waypoint (MAWP) if a landing cannot be accomplished.

DESCRIPTION:

1. Crew Actions.

a. The P* main focus will be inside the aircraft. Operating in VMC, the P will exercise diligence in keeping clear of traffic. When operating in IMC, the P* will remain on instruments until the P advises that the aircraft is in VMC. If required, the P* will direct the P to engage the flight director and autopilot functions when doing a coupled approach.

b. The P will obtain weather, winds, current altimeter, active runway, and remarks from ATIS, automated surface observing system/automated weather observing system (ASOS)/AWOS), or ATC, as appropriate, prior to commencing the approach and brief the P*. The P will assist the P* by tuning the appropriate radio frequencies, selecting the flight director modes if necessary, reading the checklist and making the appropriate callouts for a GPS approach and missed approach, if applicable. If the GPS navigation system does not provide automatic “No receiver autonomous integrity monitoring (RAIM)” warnings prior to the FAF, the P will check RAIM prior to initiating the approach.

c. The P* and the P will brief the approach procedure to be flown and clarify any questions on crew actions and intentions with each other. At a minimum, the briefing will consist of Procedure ID, Inbound course, MDA/DA, MAWP, missed approach procedure, and minimum safe altitude (MSA). During refresher or qualification training the IP/IE may require additional oral briefing for training purposes.

NOTE 1: The IP/IE may require that the approach be flown with or without the use of the flight director and/or the Autopilot.

2. Procedure.

a. Normal. Refer to FM 1-240 for a complete description of approach procedures.

(1) Aviators should practice instrument approaches flying manually, flight director only and coupled with the autopilot.

(2) When executing a full approach the P* may complete the Before Landing check and slow to V_{app} (V_{ref} + 20 KIAS) to aid in controlling ground speed and rate of descent outbound.

(3) The P* should complete the Before Landing checklist, call for props to be set to high rpm, and be established at V_{app} (V_{ref} + 20 KIAS) no later than final approach descent.

b. Visual. During the final approach descent if the P determines the P* can complete the approach to landing visually (Chapter 6) and will report, **"Airport in sight at 12 O'clock, Take over visually**." The P* will respond,**"Visual**." The P* will continue inbound at MDA until in a position to descend and land. The P* will task the P to set **"Full flaps"** or **"Confirm flaps APPROACH**," and when he departs the MDA callout, **"Leaving MDA**." The P* will adjust power and pitch as necessary for a normal descent and landing.

NOTE 2: The landing check may be completed anytime after the autopilot is disconnected, if performing a coupled approach.

NOTE 3: Flaps should not be extended beyond approach until a visual descent can be made to the runway.

NOTE 4: If a Visual Descent Point (VDP) is not published then an acceptable method or technique for determining VDPs is as follows:

- **Using Time:** [Height Above Touchdown (HAT) multiplied by 10%] minus [Time Final Approach Fix (FAF) to Missed Approach Point (MAP)]; i.e. (600 ft X 10%) = 60 sec minus (2 min) = 1 min.
- **Using DME:** (HAT) divided by 300 = DME (VDP from end of Runway); i.e. 600 divided by 300 = 2 DME

NOTE 5: If performing a single-engine circling approach, the decision to complete the required landing checks prior to the final descent inbound must be tempered with other factors. These

include gross weight, weather conditions, and aircraft performance. If the aircraft will not maintain altitude while circling to land, retract the landing gear and, if required, the flaps. However, once this is completed the entire check must be repeated prior to the landing.

TRAINING AND EVALUATION REQUIREMENTS. Task will be trained and evaluated in the aircraft or compatible simulator.

NOTE 6: Units performing GPS approaches will evaluate GPS approach procedures during RL progression and APART evaluations.

REFERENCES:

Common references

TASK 1265

Perform traffic alert and collision avoidance system (TCAS) operations.

CONDITIONS: In an RC-12 airplane under VMC, IMC, simulated IMC, in a compatible simulator, or in a classroom.

STANDARDS:

1. Correctly turn on, test, adjust, and operate the TCAS according to the Operator's Manual, Aircraft Flight Manual (AFM), or Manufacturer's Operating Handbook.

2. Correctly identify TCAS symbology.

3. Correctly respond to TCAS traffic advisories (TAs) and resolution advisories (RAs).

4. Use correct TCAS phraseology.

DESCRIPTION:

1. Crew Actions.

a. Prior to takeoff, the crew will check the system for proper operation. They will observe precautions specified in the Operator's Manual, AFM, or Manufacturer's Operating Handbook.

b. The operation of the TCAS in flight is normally the P's responsibility. Crew members will adjust the TCAS as required. Crew members will monitor the display frequently during flight and note any potentially conflicting traffic.

c. For normal takeoff operations, the TCAS II should be operated in the TA/RA, 5 NM, and "ABOVE" setting.

d. For "closed traffic" (traffic pattern) operations, flight crews are authorized to use the TCAS II in the TA mode.

e. For approach and landing operations, the TCAS II should be in the TA/RA, 5 NM, and "BELOW" setting (unless the flight crew has elected to leave it in TA for closed traffic operations).

f. Recommended TCAS settings: for Climb, 10 NM "ABOVE"; for Cruise, 20 NM "NORMAL"; for Descent/Arrival and terminal area operations, 10 NM "BELOW."

g. When IMC, all flight crews will respond to a TCAS RA. When VMC, flight crews are authorized to disregard an RA if, and only if, they (both crew members) have absolutely

identified, beyond any doubt, the traffic that caused the RA. If either crew member has any doubt, then respond to the RA.

h. Crew members are authorized to deviate from an ATC clearance and will do so in order to correctly respond to an RA. Crew members will use the TCAS as the primary means of collision avoidance.

i. When IFR, and responding to an RA, as soon as workload permits, report to ATC with this report IAW FAA Advisory Circular (AC) 120-55A:

> **"[Call sign] TCAS Climb/Descent."**
>
> For example, if the crew of Sunny 12 experienced the following resolution advisory (RA), "**CLIMB, CLIMB, CLIMB**," they would report to ATC as soon as possible as follows:
>
> "Approach/Center, Sunny 12 TCAS climb."

j. In the event of an engine failure and subsequent engine out operations, the TCAS will be placed in the TA mode of operation IAW Operator's Manual/AFM.

k. During approach operations, after the Before Landing check has been completed, if the crew receives a "CLIMB, CLIMB, CLIMB" RA, they must immediately accomplish the Missed Approach-Go Around procedure in order to attain the required rate of climb.

2. Definitions. Per AC 120-55A and AC 20-131A.

3. TCAS Event Reporting. Paragraph 1h above and AC 120-55A.

4. TCAS Event Phraseology. Per AC 120-55A.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or academically. Task will be evaluated during the crew member's APART.

REFERENCES:

AFM
Operator's manual/AFM
FAA Advisory Circular 20-131A
FAA Advisory Circular 120-55A
FAR 91.221
AIM

TASK 1300

Perform emergency procedures.

CONDITIONS: In an RC-12 airplane, simulator or conference given a specific emergency.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Without error, perform, simulate the performance, or describe the appropriate emergency procedure according to the aircraft operator's manual and Flight Information Handbook (FIH).

CREW ACTIONS: The aviator will be able to state the crew callouts and crew duties according to chapter 6 for the crew station he is authorized to fly in.

DESCRIPTION: The P* and P will be able to perform all underlined immediate action emergency procedures described in the operator's manual. They will also be able to state the actions required in performing those emergency procedures that cannot be practiced or simulated in the aircraft. Aviators will not be downgraded for minor word errors if it doesn't change the intent or context of the emergency action step. The discussion will include procedures outlined in the aircraft operator's manual and the FIH and will include the applicable crew coordination actions.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically, in the airplane or simulator.

REFERENCES:

Common references
Flight Information Handbook

TASK 1302

Perform procedures for two-way radio failure.

CONDITIONS: In an RC-12 airplane, or simulator, or a classroom environment.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Implement correct procedures for two-way radio failure.

DESCRIPTION:

1. Crew Actions. Correcting the loss of two-way radio communication is primarily the P's responsibility while the P* focuses his attention on flying the aircraft.

2. Procedure.

a. The P will advise the P* of the communications problem and attempt to identify and correct the malfunction.

b. If two-way radio communication cannot be established, the crew will perform the following actions:

(1) VFR conditions. If two-way radio failure occurs while operating under VFR or if VMC is encountered after the failure, continue the flight under VFR. Land as soon as practicable.

(2) IFR conditions.

(a) If two-way radio failure occurs while operating in the National Airspace System (NAS), adjust the transponder and continue the flight according to instructions in the flight information handbook (FIH).

(b) If two-way radio failure occurs while operating outside continental United States (OCONUS), comply with International Civil Aviation Organization (ICAO) rules according to instructions in the FIH or applicable host country regulations.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically or in the airplane or in a simulator.

REFERENCES:

Common references
Host nation procedures

TASK 1303

Perform approaches to stall.

WARNING

Because of the increased risk factor while performing stall recognition training, the entry altitude should be no lower than an altitude that will allow recovery to be safely completed at a minimum of 4,000 feet AGL.

CAUTION

Approaching the stall, use rudder instead of aileron as the primary means of keeping the wings level. Be aware of yaw as the aircraft decelerates. If a wing begins to fall as you approach stall, initiate a recovery by using opposite rudder and lowering the nose. Using ailerons in this circumstance may aggravate the condition by increasing the roll rate due to adverse yaw.

CONDITIONS: In an RC-12, with an IP or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly recognize the approach to a stall.

2. Correctly perform recovery procedures.

3. Recover with a minimum loss of altitude.

DESCRIPTION:

1. Purpose. The practice of stall recovery and the development of awareness of imminent stalls are of primary importance in training. The objectives in performing imminent stalls are to familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the habit of taking prompt preventative or corrective action. Because of the high "T" tail design in RC-12 aircraft, waiting for a prestall buffet means the crew have ignored their primary warning device (horn) and are approaching a very critical situation.

2. Crew Actions. The IP will brief stall characteristics and correct recover procedures. The P* will acknowledge the briefing. The P*'s main focus will be outside the aircraft. Perform the crew duties and callouts according to Task 1177, Perform go-around.

NOTE 1: As an aid to recovery practice, do not use nose up trim below 100 KIAS D/H or 110 KIAS K/N/P/C.

3. Procedures. An imminent stall is one in which the airplane is approaching a stall but is not allowed to completely stall. The approach to stall task is primarily for practice in retaining (or regaining) full control of the airplane immediately upon recognizing that a full stall is likely to occur

if timely prevention action is not taken. Since the airplane will not have been stalled completely, the pitch needs to be decreased only to a point where minimum controllable airspeed is attained or until adequate control effectiveness is regained. The object is to reduce the angle of attack but only enough to allow the wing to regain lift.

a. Clean Configuration.

(1) Visually clear the area.

(2) Turn yaw damper off. Set propellers to HIGH RPM.

(3) Set torque to about 20 percent. Maintain heading and altitude. Observe up trim limits.

(4) At the *first* indication of an approaching stall (stall horn, lack of control responsiveness, buffet), simultaneously release the elevator back pressure and perform go-around procedure.

(5) As the aircraft accelerates, ease back on the elevator to break the descent, trim as necessary, and resume your original airspeed and altitude.

b. Approach Flap Configuration.

(1) Visually clear the area.

(2) Turn yaw damper off. Set propellers to HIGH RPM.

(3) Complete the Before Landing checklist.

(4) Set torque to about 20 percent. Maintain heading and altitude. Observe up trim limits.

(5) At the *first* indication of an approaching stall (stall horn, lack of control responsiveness, buffet), simultaneously release the elevator back pressure and perform go-around.

(6) As the aircraft accelerates, ease back on the elevator to break the descent, trim as necessary.

(7) Climb to your initial altitude and complete the go-around checklist.

c. Full Flap Configuration.

(1) Visually clear the area.

(2) Turn yaw damper off. Set propellers to HIGH RPM.

(3) Complete the Before Landing checklist. Set flaps to 100 percent when airspeed permits.

(4) Set torque to about 20 percent. Maintain heading and altitude. Observe up trim limits.

(5) At the *first* indication of an approaching stall (stall horn, lack of control responsiveness, buffet), simultaneously release the elevator back pressure and perform a go-around.

(6) As the aircraft accelerates, ease back on the elevator to break the descent. Trim as necessary.

(7) Climb to your initial altitude and complete the go-around checklist.

NOTE: Recovery from a full-stall condition will be performed in a compatible simulator and demonstrated only during aircraft qualification training at USAAVNC, Ft. Rucker, AL.

TRAINING AND EVALUATION REQUIREMENTS: Task is to be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references
AC 61-67B: Stall and Spin Awareness Training
FAA-S-8081-5C, Airline Transport Pilot and Aircraft Type Rating, Practical Test Standards for Airplane
USAF, C-12 Maneuver Information File, dated May 1999

TASK 1310

Perform emergency procedures for engine failure during cruise flight.

CAUTION

Underlined emergency items in the operator's manual should be committed to memory. This should not be construed to mean the P must verbally call out the underlined items in the procedure while dealing with an emergency. The underlined items are DO items followed by verification with the checklist when time and altitude permits.

CONDITIONS: In an RC-12 airplane, with an IP/IE, VMC, or simulated IMC or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain positive airplane control at all times.

2. Establish a bank up to 5 degrees, if required, to maintain coordinated flight, and properly trim for that condition (ball ½ off center).

3. Set powerplant controls, reduce drag as necessary, and correctly identify and verify the inoperative engine after the failure or simulated failure.

4. Maintain V_{yse} airspeed or above.

5. Follow the checklist and verify the procedures for securing the inoperative engine.

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus will be flying the aircraft. The P* will direct the P to assist him in identifying which engine failed, and if the propeller feathered. The P* may direct the P to feather the failed engine's propeller after mutual verification of the correct propeller lever.

b. The IP will initiate the maneuver by either placing a condition lever to Fuel Cutoff (AR 95-1 restrictions apply) or retarding a power lever to idle. He will monitor the P* to ensure he does not exceed engine limits or get too slow. The IP will set zero thrust at the appropriate time, if applicable. He will complete the required checks or procedures pertaining to the P's crew station. He will also read the checklist and perform all designated P actions and crew callouts according to chapter 6, and those actions requested by the P*.

NOTE 1: Zero thrust is propeller at feather detent and :

RC-12K, N, P & Q – Power lever idle.
RC-12D, H – Torque 8-12 percent.

2. Procedure. The P*, assisted by the P, will perform the following actions:

a. The IP/IE will¾

(1) Initiate simulated engine failure, using the power lever, or perform engine shutdown with the condition lever (above 4,000 feet AGL), as appropriate.

(2) After the P* confirms the propeller feathered, the IP will move the propeller lever out of the FEATHER position and place it at the "detent." He will then set zero thrust, simulating a feathered propeller for a simulated engine failure. If the IP is simulating an engine failure with autofeather he will feather or simulate feathering when the P advances power sufficiently to activate the autofeather micro switches in the pedestal.

b. The P* will¾

(1) Disconnect the autopilot with yoke AP DISC button while advancing power as required to keep airspeed from decaying excessively and to activate the autofeather system.

(2) Advance power at a controllable rate that allows aileron, rudder, and pitch corrections to maintain coordinated flight.

(3) Identify the failed engine and verify with the P, "**Confirm #1 (or #2) Failed**."

(4) Have the P manually feather the propeller after mutual identification and verification by directing the P to **"Identify the #1 or #2 (appropriate) prop lever."** After visually confirming the correct prop lever has been identified, **I agree, Feather the prop or Negative, reidentify the # __prop."**

(5) If the gear and flaps are extended, evaluate whether they need to be retracted.

(6) Call for the engine failure during cruise flight checklist for verification and cleanup.

c. The P will¾

(1) Confirm for the P* that the engine failed and state, " **I confirm #1 (or #2) engine has failed, or negative, the #__(Opposite) has failed"**. In addition state, **"I confirm #1 (or #2) propeller has (has not) feathered."**

(2) Manually feather the failed engine's propeller when the P* directs and state, **"Prop feathered."**

(3) Retract the gear if directed by the P*.

(4) Retract the flaps if directed by the P*.

(5) Read the checklist and perform designated P items.

(6) Notify ATC of the emergency with intentions.

d. Use power as required to cruise at desired airspeed and altitude, if gross weight permits. Use one-engine-inoperative maximum cruise power charts in the operator's manual to obtain this data. If altitude cannot be maintained without going below V_{yse} after setting maximum cruise power, establish a controlled descent to an altitude at which level flight can be maintained (single-engine absolute ceiling). Perform fuel crossfeed/management procedures as required.

e. Complete engine shutdowns and simulated engine failure flight training will be conducted according to AR 95-1.

3. Basic Single Engine Procedures.

a. Know and follow the engine failure procedures on chapter 9 of the operator's manual. However, the basic fundamentals of all procedures are as follows:

(1) Maintain aircraft control and airspeed at all times. **This is Cardinal rule number one.**

(2) Usually, apply maximum available torque to the operating engine. However, if the engine failure occurs at a speed below V_{mca}, or during cruise or in a steep turn, you may elect to use only enough power to maintain a safe speed and altitude. If the failure occurs on final approach, use enough power to maintain the airspeed profile for the distance remaining from the threshold.

(3) Reduce drag to a minimum.

(4) Secure the failed engine and related subsystems.

b. The first three steps should be done promptly and from memory. The checklist should then be consulted to be sure that the inoperative engine is secured properly and that the appropriate switches are placed in the correct position. The airplane should be banked up to 5 degrees into the live engine, with the "slip/skid" ball slightly out of center toward the live engine, to achieve rated performance.

NOTE 2: Identify the dead engine positively before securing it. Use crew coordination and callouts according to chapter 6 for mutual verification that the correct power quadrant levers associated with the failed engine are the ones being moved to secure the engine. Any reduction of power or moving a power lever to idle while the autofeather system is feathering the propeller will disarm the autofeather operation and allow the propeller to windmill.

NOTE 3: If crosswinds are present at the landing airport, IPs should consider failing the downwind engine. This will aid in maximum rudder control on landing.

NIGHT CONSIDERATIONS: The same procedures used for instrument flight should be used at night. Increase cockpit lights or call for P action, as required. Ensure positive identification before switches, condition levers and controls, which are difficult to see at night.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically and in the airplane or simulator.

REFERENCES:

Common references

TASK 1315

Perform single-engine landing.

CONDITIONS: In an RC-12 airplane, with an IP, VMC, or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Attain landing approach speed (V_{ref} plus one-half wind gust speed) ±5 KIAS.

2. Maintain approach angle at or above ILS glide path, VASI, or PAPI when available.

3. Obtain the V_{ref} plus speeds at the designated points in the pattern ± 10 knots.

4. Accomplish a smooth, positively controlled transition from final approach to touchdown.

5. Touchdown on the first 3,000 feet of the runway beginning at the threshold or the first third of the runway (on shorter runways) and roll out with desired runway track between the main landing gear.

6. Maintain positive directional control and crosswind correction during the after landing roll.

7. Uses beta, reverse, ground fine, and brakes (as appropriate) in such a manner to bring the airplane to a safe stop.

DESCRIPTION:

1. Crew Actions. The P*'s main focus will be outside the aircraft. The IP should complete the required checks or procedures pertaining to the P's crew duties. He will also read the checklist and perform all designated P actions, such as monitoring flight and engine instruments, and those actions requested by the P*. Related tasks are 1320 and 1335.

2. Procedure. The P*, assisted by the P, will perform the following actions:

a. Complete the descent-arrival check or call for P action before entering the traffic pattern or starting an instrument approach. Fly a normal traffic pattern or a normal instrument approach and perform the before-landing check at the same point as with both engines operating. Verify all checklist items as the P calls them out. The P will announce, **"Check complete."** when the last item is verified. Plan for a normal approach, allowing for sufficient time on final so minor alignment, speed, and altitude corrections can be accomplished without excessive low-altitude maneuvering. Turn final and complete the turn at or above 500 feet AGL. Maintain a minimum of V_{yse} until landing is assured. Landing assured can be defined as the point on final where the decision to extend flaps beyond APPROACH is based on the ability to remain VMC until touchdown and the need to start reducing airspeed gradually so as to arrive at V_{ref} plus one-

half the wind gust speed at approximately 50 feet above the landing area. (A go-around should not be attempted after flaps are extended beyond approach below 400'.)

b. Reduce airspeed so as to be at V_{ref} plus one-half wind gust speed at about 50 feet above the landing area. Avoid abrupt changes in power and anticipate a yaw and roll as power is reduced. Reduce power at a controllable rate that will allow aileron and rudder to be applied to maintain centerline during round out. Make a normal touchdown. After touchdown, use brakes/ground fine and propeller reversing, if applicable, as necessary to slow the aircraft. Propeller reversing must be limited to a rate consistent with directional control. Perform the after-landing procedure when clear of the runway.

c. Throughout the maneuver, the P should assist the P* by clearing the area and perform all actions requested by the P*. He will complete all designated P duties and read the checklist when the P* calls for it.

NOTE 1: The feathered propeller or simulated feathered propeller will produce less drag than a windmilling propeller. It will cause the aircraft to float during the roundout and rollout farther than during a normal landing. The tendency to float during roundout can be minimized by adjusting the height from which the round out is started.

NOTE 2: Do not intentionally cross the threshold with excessive airspeed thinking it is safer. V_{ref} is the same for single engine as it is for two engines. Excessive airspeed increases the sensitivity of control inputs and may result in overcontrolling. In addition, the inertia will result in increased 'floating' and longer landings.

NIGHT CONSIDERATIONS: Normal approach and landing techniques are used at night. When visibility is lowered by haze/smoke, the range of the landing light(s) may be insufficient to see obstructions in time to avoid them. An ILS glideslope or VASI, when available, is the most accurate and reliable means of approach angle indication and will be used to maintain a safe glide path. If an ILS glideslope or VASI is not available, the obstruction lights and the threshold lights should be used to establish a sight picture during the approach. The apparent distance between runway lights can also be used as an aid in establishing the flareout point.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically and in the airplane or simulator.

REFERENCES: Common references

TASK 1320

Perform single-engine go-around.

WARNING

A single-engine go-around should not be attempted once the flaps are extended beyond approach, and the airplane is below 400 feet AGL. This should not be construed that flaps are limited to approach until short final. It does means the P* has committed himself to landing.

CONDITIONS: In an RC-12 airplane, with an IP, or in a simulator.

STANDARDS:

1. Perform single-engine go-around according to the aircraft operator's manual.

2. Apply smooth and coordinated inputs.

3. Maintain up to 5-degree bank angle into operating engine (ball 1/2 off center).

4. Maintain V_{yse} until safe climb out is established (clear of obstacles).

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus will be flying the aircraft.

b. The IP should assist the P* by completing all designated P checks, duties, and callouts, and read the checklist when the P* calls for it.

2. Procedure.

a. Discussion: An actual single-engine go-around is not a high-probability maneuver, and it potentially can be a high-risk maneuver. Several events have occurred that keep the probability low. The airplane is probably already single engine, which means the crew has declared an emergency, and ATC will give the aircraft priority and crash rescue is standing by. The crew has evaluated and selected the airport at which they wish to land based on runway length, weather, etc. It is important to fly a normal stabilized approach either VFR or IFR to preclude a pilot-induced reason for a single-engine go-around.

(1) Do not initiate the go-around by increasing the pitch first without applying power. If the pitch is raised without power and the gear and flaps are extended, airspeed will start decreasing rapidly. When power is applied with the nose up and in the landing configuration, the control forces will be higher to keep in trim and the descent will take longer to arrest.

(2) During single-engine climb, maintain up to 5 degrees bank and up to one-half ball into the live engine. This is in trim for a single-engine configuration. Failure to do so may degrade controllability and performance to the point; you may actually start descending or lose directional control.

(3) Execute a single-engine go-around when—

(a) At the decision height (DH) or missed approach point (MAP) if runway not in sight.

(b) Not in a position to make a safe landing.

(c) Visual reference with the airport is lost during a circling approach.

b. Maneuver.

(1) The P* will¾

(a) Initiate the maneuver by advancing the power lever toward maximum allowable power and direct the P to **"Set power."** The P will set maximum allowable power and respond, **"Power set."**

(b) Simultaneously increase pitch attitude to about 7 degrees to stopdescent. The Go-Around mode on the flight director may be used as an aid.

(c) At the positive rate callout, call for **"Gear UP."**

(d) Direct the P to bring **"Flaps APPROACH."**

(e) At Vref, direct the P to bring **"Flaps UP."**

(f) Establish a climb at V_{yse}.

(g) Call for the single-engine go-around checklist when time, altitude, and workload permit.

(2) The P will¾

(a) Set maximum allowable power when directed and respond, **"Power set."**

(b) State **"Positive rate"** after observing two positive climb indications.

(c) Move the gear handle switch to the UP position, turn the landing/taxi light switches to the OFF position, when directed, and respond **"Gear UP."**

(d) State **"Flaps APPROACH"** when directed by the P* and the flap switch has been moved to that position. Verify with the flap position indicator.

(e) State **"Flaps UP"** when directed by the P* and the flap switch has been moved to that position. Verify with the flap position indicator.

(f) Read the go-around checklist when the P* directs.

(g) Advise ATC of the go-around/missed approach and intentions, if applicable.

NOTE 1. The P* may elect to retract the landing gear, provided it is briefed prior to the maneuver.

NIGHT CONSIDERATIONS: For traffic avoidance and aircraft identification, the recognition light(s) should be left on until at least traffic pattern altitude, unless their use is restricted by aircraft limitations. Monitor heading and altitude instruments closely and be prepared to convert to instrument flight if the visual horizon is lost or if bothered by vertigo.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically and in the aircraft or simulator.

REFERENCES:

Common references

TASK 1325

Perform emergency procedures for engine failure during takeoff.

WARNING

Simulating an engine failure by retarding a power lever to idle during the takeoff run below, V_{mcg} will result in loss of directional control. See Task 1352, Rejected takeoff.

WARNING

During the departure briefing the PC will review the TOLD card data to determine if an engine failure occurs at V_1 that the aircraft has the performance to continue the takeoff. If it does not, the crew will discuss a rejected takeoff plan.

WARNING

V_1 engine cuts will not be performed in the RC-12D/H aircraft.

CAUTION

Underlined emergency items in the operator's manual shall be committed to memory. This should not be construed to mean the P must verbally call out the underlined items in the procedure while dealing with an emergency.

CONDITIONS: In a RC-12D/H under VMC or simulated IMC, with an IP or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain positive aircraft control.

2. Confirm the failed engine's propeller feathered.

3. Maintain up to a 5-degree bank angle into operating engine (ball 1/2 off center).

4. Obtain and maintain the appropriate airspeed for the segment being flown (V_2 or $V_{yse)}$ + 5, -0 KIAS.

5. Complete and verify the procedure with the checklist above 400 feet AGL.

DESCRIPTION:

1. Crew Actions.

a. The crew will discuss rejected takeoff criteria and crew responsibilities during the departure brief.

b. The crew will review the TOLD card and determine the course of action if an engine fails before and after lift-off.

c. The P*'s main focus will be to fly the aircraft.

d. The IP will initiate the engine failure above V_{sse}. The IP should not simulate an inoperative autofeather until a safe altitude and V_{sse} is reached. He will complete the required procedures pertaining to the P's crew duties. He will also read the checklist and perform all designated P actions and those crew callouts and duties, according to chapter 6, requested by the P*.

2. Procedure. The P*, assisted by the P, will perform a normal takeoff using standard callouts until the single engine is initiated then the crew will perform the actions described below:

a. Discussion. The course of action for an engine failure on takeoff depends on when the failure occurs during the takeoff flight path and the airspeed it occurs at. In addition, temperature, pressure altitude, and weight will effect the aircraft's ability to climb and accelerate. The most critical point to lose an engine is at V_1. This is the decision point for the crew. Do they abort the takeoff and stop or continue the takeoff? One of the criteria to continue the takeoff has been met by the reaching V_1. However that by itself does NOT guarantee the aircraft will safely fly when rotated. TOLD card planning will tell the crew the capabilities based on departure weight, temperature and pressure altitude.

NOTE 1: If an engine fails at or immediately after liftoff, climb to 50 feet may be critical. Positive pilot actions will be required to maintain aircraft control; the distance required to attain 50 feet AGL will be significant.

NOTE 2: Takeoff power is already applied and the P is responsible for maintaining it there.

b. Engine Failure Immediately after Lift-off - Flight Continued.

(1) The P* will¾

(a) Maintain directional control with the rudder and simultaneously establish up to 5-degree bank angle into the operating engine (ball one-half off center) while adjusting pitch to obtain V_2. Make pitch adjustment smoothly to avoid a torque roll.

(b) At the **"Positive rate**,**"** callout, call for **"Gear UP."**

(c) Climb at V_2 for the aircraft configuration.

(d) Identify the failed engine and verify with the P. "**Confirm #1 (or #2) failed."**

(e) "Confirm the propeller did feather" with the P. All RC-12s have an autofeather installed and it should feather the propeller. If an actual engine fails, the autofeather will feather the propeller in less than 10 seconds. Visual identification is easy if one propeller is stationary.

(f) If the aircraft is being flown with an inoperative autofeather, direct the P to manually feather the propeller after mutual identification and verification that the prop did not feather by directing the P to **"Identify the #1 or #2 (as appropriate) prop lever."** The P will place his index finger on the appropriate prop lever. The P* visually confirms the correct lever the correct prop lever has been identified and states, **"I agree, feather the prop or negative, re-identify the #__ prop."**

(g) When sufficient altitude can be obtained that is clear of all obstacles and the rate of climb allows, accelerate to V_{yse}. It may be necessary to climb to single-engine maneuvering altitude (400 feet AGL) and then level the aircraft to accelerate to V_{yse}.

(h) Direct **"Flaps UP"** at V_{yse} (if used).

(i) Transfer power control back from the P by stating **"My power"** or P stating "**Your power"** at 400 feet AGL. Reduce power to maximum continuous.

(j) When time and altitude permit, complete the appropriate engine failure after lift-off checklist.

(k) Land at the nearest suitable airport.

(2) The P will¾

(a) Set and maintain takeoff power from the beginning of the takeoff roll until the P* **"My power"** callout is directed—normally at 400 feet AGL.

(b) Call **"Positive rate"** when two climb indications are observed, raise the gear handle when directed by the P*, and then state **"Gear UP."**

(c) Verify for the P*, **"I confirm #1 (or #2) has failed,"** and **"I confirm #1 (or #2) propeller has/has not feathered."** If an actual engine fails, the autofeather will feather the propeller in under 10 seconds. Visual identification is easy if one propeller is stationary.

(d) Manually feather the failed engine's propeller when the P* directs and state, **"Prop feathered."**

(e) Retract the flaps at V_{yse} (if used) when directed by the P* and state, **"Flaps UP"** when the switch is moved.

(f) Transfer power control to P* by stating **"Your power"** at 400 feet AGL.

(g) Read the checklist when asked by the P*.

(h) Inform ATC of the emergency and intentions.

c. Engine Failure after V_{yse}. Any additional airspeed above V_{yse} at the time of the engine failure will result in increased control effectiveness and fewer controllability problems. In addition, the extra airspeed inertia will allow the aircraft to continue to climb at fairly positive rate while it decelerates. The flying procedure is essentially the same. Takeoff power is already applied, the gear is retracted and airspeed is at or beyond V_{yse}. The critical crew actions remaining are to verify the propeller feathered and maintain directional control with the rudder and simultaneously establish up to 5-degree bank angle into the operating engine (ball one-half off center). Complete the applicable duties remaining.

NOTE 3: To simulate engine failure with an armed autofeather, the IP will retard the affected power lever to IDLE while simultaneously moving the propeller lever to the feather detent position. The IP will advance the power lever to establish zero thrust as soon as practical (8 to 12 percent torque).

NOTE 4: The P* may elect to retract the landing gear, provided it is briefed prior to the maneuver.

TRAINING AND EVALUATION REQUIREMENTS:

1. At V_1 or after lift-off below V_{sse} - Flight continued. Task to be trained and evaluated in a flight simulator.

2. Engine failure airborne after obtaining V_{sse}. Task to be trained and evaluated in a flight simulator or aircraft. For training in the airplane, the V_2 net climb gradient must be at least 2.0 percent.

NIGHT CONSIDERATIONS: The crew should monitor heading and altitude instruments closely and be prepared to convert to instrument flight if the visual horizon is lost or the crew is bothered by vertigo.

REFERENCES:

Common references
Title 14 CFR Part 23

TASK 1330

Perform emergency procedures for engine failure after V_1.

WARNING

During the departure briefing, the PC will review the TOLD card data to determine, if an engine failure occurs at V_1, that the aircraft has the performance to continue the takeoff. If it does not, the crew will discuss a rejected takeoff plan.

CAUTION

Underlined emergency items in the operator's manual should be committed to memory. This should not be construed to mean the P must verbally call out the underlined items in the procedure while dealing with an emergency. The underlined items are DO items followed by verification with the checklist when time and altitude permit.

CONDITIONS: In a RC-12, K, N, P, or Q airplane, with an IP or simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain positive aircraft control.

2. Confirm the failed engine's propeller feathered.

3. Maintain 5-degree bank angle into operating engine (ball ½ off center).

4. Obtain or maintain V_2, +5, -0 KIAS until 500 feet AGL.

5. Accelerate to V_{enr} ± 5 KIAS after 500 feet AGL.

6. Complete and verify the procedure with the checklist after obtaining V_{enr}.

DESCRIPTION:

1. Crew Actions.

a. The crew will discuss takeoff abort criteria and crew responsibilities during the departure brief.

b. The crew will review the TOLD card and determine the course of action in the event of an engine failure after V_1.

c. The IP will initiate the engine failure. He will complete the required checks, procedures, and callouts pertaining to the P's crew duties. He will also read the checklist and those actions requested by the P*.

2. Procedure. The P*, assisted by the P, will perform a normal takeoff using standard callouts until the engine failure is initiated then the crew will perform the actions described below:

NOTE 1: The engine failure after V_1 procedure applies from V_1 to 500 feet AGL. Consult chapter 7 of the operator's manual for performance profiles and data.

a. Discussion. The most critical point to lose an engine is at V_1. This is the decision point for the crew. Do they abort the takeoff and stop or continue the takeoff? One of the criteria to continue the takeoff has been met by the reaching V_1. However, that by itself does NOT guarantee the aircraft will safely fly when rotated. TOLD card planning will tell the crew the capabilities based on departure weight, temperature, and pressure altitude.

b. Engine failure after V_1.

(1) The IP will¾

(a) Initiate the simulated engine failure after making the V_1 callout and the P has transferred both hands to the yoke.

(b) (The simulated engine failure will be with autofeather if still on the runway.) Simultaneously, bring the power lever to idle and the propeller to the feather detent.

(c) Announce **"Engine failure"** when the simulated engine failure is given.

(2) The P* will¾

(a) Maintain centerline with rudder and apply aileron in the opposite direction of drift caused by the engine failure.

(b) When the P calls **"Rotate,"** smoothly raise the nose of the aircraft to the pitch attitude according to chapter 9 of the operator's manual.

(c) Apply aileron and rudder, as necessary, to maintain heading and ground track during lift-off. If this is done correctly, the aircraft will be in trim for single-engine climb (up to 5-degree bank angle into the operating engine and ball one-half off center). Do not pull the airplane off the ground abruptly or a torque roll will result.

(d) At the **"Positive rate,"** callout, call **"Retract the gear."**

(e) Accelerate to and climb at V_2 for the aircraft configuration.

(f) Identify the failed engine and verify with the P. **"Confirm #1 (or #2) failed."**

(g) Confirm with the P, **"Did the propeller feather?"** Have the P manually feathered the propeller after mutual identification and verification that the prop did not feather by directing the P to, **"Identify the #1 or #2 (as appropriate) prop lever."** After visual confirmation, direct "**I agree, feather the prop"** or **"Negative, reidentify the #__ prop."** Then command "F**eather the prop."**

(h) Transfer power control back from the P by stating, **"My power"** or P stating, "**Your power"** at 500 feet AGL.

(i) Level the aircraft with pitch and accelerate to $V_{enr.}$

(j) Upon reaching $V_{enr,}$ direct the P "**Flaps UP,"** if extended. Reduce power to maximum continuous.

(k) Continue climb out at V_{enr}. When time and altitude permit, complete the engine failure after V_1 checklist.

(3) The P will¾

(a) Call **"V_1," "Rotate"** at V_R.

(b) Call **"Positive rate"** when two climb indications are observed, raise the gear handle when directed by the P*, and then state **"Gear UP."**

(c) Verify for the P*, **" I confirm #1 (or #2) has failed"** and **"I confirm #1 (or #2) propeller has/has not feathered."** If an actual engine fails, the autofeather will feather the propeller in under 10 seconds. Visual identification is easy if one propeller is stationary.

(d) Manually feather the failed engines propeller when the P* directs and state **"prop feathered."**

(e) Transfer power control to P* by stating **"Your power"** at 500 feet AGL**.**

(f) Retract the flaps at V_{enr} (if used) when directed by the P* and state, **"Flaps UP"** when the switch is moved.

(g) Read the checklist when asked by the P*.

(h) Inform ATC of the emergency and intentions.

c. The IP may initiate a simulated engine failure after the aircraft is airborne and above V_{sse}. The P* will adjust pitch to achieve V_2 appropriate to the flap setting.

NOTE 2: During single-engine climb, additional power will be available by retracting the ice vanes, if extended.

NOTE 3: Before performing this task, the crew should verify that there will be a positive climb gradient in the first segment.

NOTE 4: The P* may elect to retract the landing gear, provided it is briefed prior to the maneuver.

NIGHT CONSIDERATIONS: Engine Failure After V_1 (prior to lift-off) is a day VFR task only.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane or simulator.

REFERENCES:

Common references
Title 14 CFR Part 25

TASK 1335

Perform emergency procedures for engine failure during final approach.

CAUTION
Underlined emergency items in the operator's manual should be committed to memory. This should not be construed to mean the P* must verbally call out the underlined items in the procedure while dealing with an emergency. The underlined items are DO items followed by verification with the checklist when time and altitude permit.

CONDITIONS: In a RC-12 airplane, with an IP, under VMC or simulated IMC or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Maintain positive aircraft control.

2. Apply sufficient power to maintain the appropriate airspeed for the distance remaining.

3. Maintain approach angle.

4. Complete and verify the procedure with the checklist time permitting.

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus initially will be to maintain heading, runway/course alignment and the approach angle while he applies power.

b. The IP will initiate the engine failure above V_{sse}. He will complete the required checks or procedures pertaining to the P's crew station. On final, he will set zero thrust if the aircraft power settings are such that the actual autofeather system would allow the prop to feather.

2. Procedure. The P*, assisted by the P, will perform the following actions:

a. The P* will continue the approach to landing, maintaining aircraft control and computed approach speed. The distance from the runway to the point where the engine fails will determine the extent of the corrective procedures applied. When an engine fails on final, immediately apply sufficient power to prevent the airspeed from decreasing, simultaneously coordinate pitch, rudder, and aileron to maintain runway alignment and approach angle. Time permitting, if the autofeather did not feather the propeller, direct the P to identify the correct propeller. Once the P* confirms the correct propeller has been identified, command the P to feather

it using callouts according to chapter 6. Once the drag is removed, the aircraft will start accelerating and it will be necessary to reduce power slightly to maintain your approach airspeed. Complete the landing, crossing the threshold in normal descent and airspeed profile. If distance remaining (short final) is minimal, time will not allow verification that the propeller feathered.

(1) The P* will¾

(a) Apply sufficient power to prevent the airspeed from decreasing; simultaneously coordinate pitch, rudder, and aileron to maintain runway alignment/course alignment and approach angle.

(b) Time permitting **v**erify with the P that the engine failed, **"Confirm #1 (or #2) has failed."**

(c) Confirm with the P, **"Did the propeller feather?"** If the answer is negative direct the P to manually feathered the propeller after mutual identification and verification that the prop did not feather by directing the P to, **"Identify the #1 or #2 (as appropriate) prop lever."** After visual confirmation, direct "**I agree, feather the prop"** or **"Negative, reidentify the #__ prop";** then command **"Feather the prop."**

(d) Continue with a normal descent.

(2) The P will¾

(a) Verify for the P*, **"I confirm #1 (or #2) has failed,"** and **"I confirm #1 (or #2) propeller has/has not feathered."**

(b) Manually feather the failed engine's propeller when the P* directs and state, **"Prop feathered."**

(c) Advise ATC of the emergency.

b. If the remaining distance from the runway threshold is too short to permit verifying the propeller feathered, power should be applied immediately and smoothly at a controllable rate to prevent the airspeed from decaying. If power is applied too rapidly, it may result in controllability problems, particularly if the flaps have been extended to full down and/or the propeller is windmilling. As power is being applied, the aircraft will have a tendency to pitch up, roll, and yaw. The P* must coordinate pitch, rudder, and aileron to maintain the approach angle, heading, and runway alignment during the power application. Recheck the gear and complete the landing.

c. The objective in both situations is maintain the aircraft in a normal approach descent while managing the engine failure. The P* must guard against sacrificing airspeed or control because he allows himself to become distracted by procedures instead of flying first. Cardinal rule #1 in all engine failures is maintain airspeed and control at all times. Do not add airspeed thinking it will be safer. On the contrary, the extra inertia may create control problems during the roundout phase of landing.

NOTE 1: A windmilling propeller in a four-bladed propeller system produces extremely high drag and will significantly raise V_{mc}. It is critical that, if time permits, the propeller be feathered or the resulting drag may cause airspeed to decay excessively during a long final.

NOTE 2: During approaches with an armed autofeather, with power below the autofeather arm position, the IP will not simulate autofeathering, until the P* advances the operative engine power lever above the autofeather arm position.

NOTE 3: When conducting this task, the IP should exercise extreme alertness to preclude the P* from inadvertently exceeding maximum allowable/controllable power.

NOTE 4: Maintain, as a minimum, V_{yse} until landing is assured. Landing assured can be defined as the point on final where the decision to extend flaps beyond APPROACH is based on the ability to remain VMC until touchdown, and the need to start reducing airspeed gradually so as to arrive at V_{ref} plus one-half the wind gust at approximately 50 feet above the landing area.

NIGHT CONSIDERATIONS: Use normal approach and landing technique. Do not allow the aircraft to descend below normal glide path. The VASI, when available, is the most accurate and reliable means of approach angle indications and will be used to maintain a safe glide path. If VASI is not available, the obstruction lights and the threshold lights should be used to establish a sight picture during the approach. The apparent distance between runway lights can also be used as an aid in establishing the flare-out point.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically and in the airplane or simulator.

REFERENCES:

Common references

TASK 1340

Perform emergency landing gear extension.

CONDITIONS: In a RC-12 airplane, with an IP, VMC, (Day Only), or simulated IMC or in a simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Extend the landing gear according to the aircraft operator's manual.

2. Complete and verify the procedure with the checklist.

DESCRIPTION:

1. Crew Actions.

a. The P*'s main focus will be inside the aircraft since the extension handle is located on the P*'s side.

b. The P will assist by keeping the area clear, read the checklist, and perform actions requested by the P*.

NOTE 1: When extending the gear manually it is recommended that the pilot in the right seat fly the aircraft or engage the autopilot.

2. Procedure.

a. Determine that normal gear extension has not occurred. Have the P confirm this observation. If applicable, recycle the landing gear using the procedures prescribed in the aircraft operator's manual. If recycling has not caused normal gear extension, perform emergency gear extension according to the aircraft operator's manual.

b. The P, when directed, will assist the P* by reading the checklist. The crew member occupying the right seat will control the aircraft while the crew member in the left seat pumps the gear down.

NOTE 2: This task is mandatory during qualification/refresher training. At other times it will be performed only when deemed appropriate by an IP/SP.

NIGHT CONSIDERATIONS: None.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or compatible simulator.

REFERENCES:

Common references

TASK 1352

Perform rejected takeoff.

WARNING

Initiating a rejected takeoff by reducing a power lever or placing a condition lever to fuel cutoff is prohibited. Velocity minimum control ground (V_{mcg}) limits may be exceeded causing loss of control.

WARNING

During the departure briefing the PC will review the TOLD card data to determine, if an engine failure occurs at V_1 , that the aircraft has the performance to continue the takeoff. If it does not, the crew will discuss a rejected takeoff plan.

CONDITIONS: In a RC-12 airplane, with an IP or simulator.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Review malfunctions that would be a cause for a rejected takeoff before V_1.

2. Determine if sufficient runway remains for a rejected takeoff.

3. Safely stop the airplane on the remaining runway.

4. Maintain centerline between the main landing gear.

DESCRIPTION:

1. Crew Actions. The P*'s main focus will be outside the aircraft. The IP will perform normal P duties and callouts.

2. Procedure.

a. Discussion. The decision to reject or continue the takeoff primarily depends on the runway remaining and the severity of the malfunction. If a condition arises that would make the takeoff unsafe before reaching V_1, reject the takeoff. If it occurs at or above V_1, continue the takeoff. Several common reasons to reject a takeoff:

• Engine malfunction	• Fire light illuminates
• Flat tire	• Oil pressure light (if equipped)
• Chip detector	• Smoke/smell in the cockpit

There may be other reasons that units may deem critical enough for a rejected takeoff. They should address them as a SOP item. The P or PC may state "standard abort criteria" in the departure briefing if all items are included in the SOP.

b. Maneuver.

(1) The IP will¾

(a) Ensure accelerate-stop distance is available.

(b) Perform normal takeoff P duties and callouts.

(c) Announce **"abort, abort."**

(2) The P* will¾

(a) Bring both power levers to idle.

(b) Safely stop the airplane using a braking and beta/ground fine/reverse, as applicable and controllable.

c. IPs should discuss actions for a rejected takeoff if insufficient runway remains.

d. If a malfunction occurs at V_1, the decision to continue the takeoff depends on several factors that should be discussed in the departure briefing.

(1) The performance data on the TOLD card should support continuing the takeoff; for example, you have a positive climb at liftoff and accelerate-go distance is acceptable.

(2) If a fire occurs, the time it takes to continue the takeoff and return for landing could be more hazardous than staying on the ground.

NIGHT CONSIDERATIONS: Aviators should be aware of runway remaining and runway end lights.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft or simulator.

REFERENCES:

Common references

TASK 1800

Perform after-landing tasks.

CONDITIONS: In a RC-12 airplane or simulator, with access to the checklist.

STANDARD: Appropriate common standards plus these additions/modifications:

1. Without error, perform after-landing tasks according to the checklist.

2. Correctly perform crew coordination actions.

DESCRIPTION:

1. Crew Actions. The P* will focus his attention primarily outside the aircraft while it is moving. After exiting the active runway, each crew member will complete the required checks or procedures pertaining to his crew duties according to the checklist and the preflight briefing.

2. Procedure. The P*, assisted by the P, will perform the following procedures:

a. Accomplish after-landing actions, as required, to include engine shutdown and before-leaving aircraft checks. Verify all checks with the checklist.

b. The P should assist the P* by reading the checklist and assisting in clearing the area. He should complete all designated P checks and assist the P* as required.

NIGHT CONSIDERATIONS: Because of the restricted visibility at night, taxi speeds should be reduced to allow for a greater margin of safety. Outside guidance should be requested whenever taxiing in areas where obstacles are difficult to see. Avoid shining the taxi/landing light into other aircraft cockpits or ground guides eyes.

NOTE: The PC will ensure that the aircraft is secured and that the flight plan is closed.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane or simulator.

REFERENCES:

Common references

TASK 2425

Operate aircraft survivability equipment.

CONDITIONS: In a RC-12D, RC-12H, or RC-12K equipped with ASE in a simulated threat environment or in a classroom environment.

STANDARDS:

1. Correctly prepare the equipment for operation.
2. Without error, perform a self-test check, if required.
3. Without delay, identify the threat from the visual display/audio warning.
4. Properly operate the equipment.

DESCRIPTION: The crew will perform/simulate operational and employment procedures/precautions for all ASE installed in the aircraft. Procedures include preflight inspection, turn-on, self-test, and operational checks; mission employment doctrine and operating procedures; partial-failure alternatives; indications and/or signal interpretations; and shutdown procedures.

NOTE: Because of its security classification, this task is not fully described.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically or in the airplane.

REFERENCES:

Aircraft operator's manual
Current threat information
TM 9-1095-206-12&P
TM 11-5841-283-12
TM 11-5841-291-12
TM 11-5865-200-12
TM 11-5865-202-12
TM 11-5865-229-12
TM 11-5865-263-12
TM 11-5895-1199-12
Unit SOP

TASK 2432

Perform Improved Guardrail/Guardrail Common Sensor Minus mission.

CONDITIONS: In a RC-12D/H airplane, under VMC, IMC, or simulated IMC.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly plan the mission profile.

2. Correctly perform the mission profile.

DESCRIPTION:

1. Crew Actions. The crew will identify the required mission equipment and coordinate mission planning so that each crew member is acutely aware of his mission duties. The crew should know and understand the factors requiring the mission to be aborted.

2. Procedures.

a. Preflight. The crew will plan the flight to and from the mission area. As a minimum, it will—

(1) Determine weather conditions en route and in the operational area, evaluating the effects of the weather on the mission.

(2) Review GCI call signs and frequencies.

(3) Review recall procedures, if appropriate.

(4) Confirm the mission equipment configuration.

(5) Obtain appropriate transponder/IFF procedures

b. During Flight. The crew will perform the following actions:

(1) The P will make the appropriate radio calls to ATC, GP*, and GCI.

(2) The P* will fly the mission profile at the appropriate airspeed and altitude.

(3) The P will monitor and update the INS when appropriate.

(4) The P* will monitor aircraft survivability equipment and respond appropriately if a threat occurs.

NOTE: Because of its security classification, this task is not fully described. A full description of the mission is found in the appropriate Army manuals and unit SOP.

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the airplane.

REFERENCES:

Classified references (MI units)
Unit SOP

TASK 2440

Perform flat turns.

CONDITIONS: In a RC-12 airplane, VMC, IMC, day or night.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Recognize the mission event requiring a flat turn.

2. Correctly execute the flat turn.

3. Angle of bank 3 degrees maximum.

4. Maximum of 5 degrees pitch attitude for communications intelligence (COMINT).

5. Airspeed 130 to 140 knots.

DESCRIPTION:

1. Select **ATT 3** for attitude source N/P/Q .

2. Disengage Yaw Damp for initial entry into the maneuver. Yaw Damp is required for flight above 17,000 feet MSL.

3. From straight and level flight at 130 to 140 KIAS, initiate the turn by turning the rudder trim knob in the desired direction of turn (or call for P action). Maintain the wings level with aileron, trimming the control forces to neutral with the aileron trim knob.

4. Once the turn is established (see timing parameters below), have the P turn on the autopilot and press ALT on the flight director. Make minor adjustments to the angle of bank by using the autopilot turn knob and turn rate adjustments with the rudder trim knob. Small rudder trim adjustments to correct rate of turn may be made with the yaw damp engaged. If large corrections are needed, disconnect the autopilot and manually retrim then reengage the autopilot.

5. Timing for flat turns is normally checked every 90 degrees: i.e., for 10-minute flat turn, 2.5 minutes should have elapsed at the first 90-degree point. Adjust trim settings as required to either speed up or slow down the rate of turn. Check timing in the turn by elapsing 16.6 seconds for every 10 degrees of arc or 10 seconds for every 6 degrees of arc.

6. Terminate the turn on the desired heading as dictated by mission requirements.

NOTE 1: If the #1 or #2 NAC LOW caution light illuminates, stop the flat turn and confirm fuel status with the fuel gauges. Continue flight in trim until the NAC LOW light extinguishes.

NOTE 2: Approximate rudder/aileron trim settings for flat turns are “2” for rudder and “4” for aileron.

NOTE 3: Flat turns may induce vertigo or airsickness. Aviators should exercise caution when performing flat turns, and terminate the maneuver should vertigo be encountered.

NIGHT CONSIDERATIONS: Flat turns may enhance night visual illusions.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. **Evaluation.** Evaluation will be conducted in the aircraft.

REFERENCES:

Aircraft operator's manual
Operations Manual for High Accuracy Carousel IV-E
Inertial Navigation System
Unit SOP

TASK 2448

Perform Guardrail Common Sensor mission.

CONDITIONS: In a RC-12K/N/P/Q airplane; VMC, IMC, or simulated IMC.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly plan the mission profile.

2. Correctly perform the mission profile.

DESCRIPTION:

1. Crew Actions. The crew will identify the required mission equipment, receive a mission briefing, review crew and individual duties. The crew should know and understand the recall and abort procedures.

2. Procedure.

a. Preflight. The crew will plan the flight to and from the mission area. As a minimum, they will—

(1) Determine the weather conditions en route and in the operational area, evaluating the effects of the weather on the mission.

(2) Review ground-controlled intercept (GCI) call signs and frequencies.

(3) Review recall procedures, if appropriate.

(4) Confirm mission equipment configuration.

(5) Note Mode 1 and Mode 2 codes, as appropriate.

(6) Review the threat for the mission.

(7) Perform Data Transfer System procedures, as required. (RC-12N/P/Q)

(8) Program the inertial navigation system (INS).

(9) Program the M130, as required.

(10) Program the HAVEQUICK II and/or single channel ground and air radio system (SINCGARS), as required.

b. During Flight. The crew will perform the following actions:

(1) The P will make appropriate radio calls to ATC, IP*, and GCI.

(2) The P* will fly the mission profile at loiter speed and assigned mission altitude.

(3) The P will manage the INS as required for the mission.

(4) The crew will monitor the aircraft survivability equipment and respond appropriately if a threat occurs.

(5) The P* will coordinate with the other aircraft to synchronize the aircraft on mission track.

(6) The P will arm the autopattern steering before reaching the initial point.

(7) The P will compute the fuel burn rate and determine on-station time and return to base time.

NOTE: Because of its security classification, this task is not fully descriptive of the GUARDRAIL COMMON SENSOR mission. A full descriptive of the mission is found in appropriate Army manuals and unit SOPs.

NIGHT CONSIDERATIONS: Normal night considerations.

TRAINING AND EVALUATION REQUIREMENTS:

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

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

REFERENCES:

Classified references (MI units)
Unit SOP

TASK 2472

Perform Data Transfer System procedures.

CONDITIONS: In a RC-12N/P/Q aircraft equipped with the ASE/ACS, an operator's checklist, and a data cartridge.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Properly load the data cartridge into the data cartridge receptacle.

2. Load information from the data cartridge to the ASE/ACS.

3. Store data from the ASE/ACS to the data cartridge.

DESCRIPTION:

1. Crew Actions. A crew member will obtain a data cartridge from flight operations with the COMM, NAV, ASET, and SETUP DATA loaded on the cartridge for the mission to be flown.

2. Loading Procedure. The crew member will perform the following actions:

a. Open the data cartridge receptacle door; insert the data cartridge, and secure the door.

b. With power applied to the aircraft and the ASE/ACS:

(1) Press **UTIL**.

(2) Press **DATA TRANSFER (L1)**.

(3) Box the position to be filled by pressing L1 thru L5 or R4, as appropriate.

(4) Press **LOAD (R1)**.

NOTE 1: The LOAD Legend is boxed and the advisory message **DTS LOADING** is displayed while data is being loaded. If successfully loaded, the identifier of the data will be displayed after the semicolon on the first line at the bezel with the selected identifier. If the data is not successfully loaded, the advisory message **DTS FAIL** will be displayed.

NOTE 2: If an identifier has not been given to that data location, dashes will act as place holders. Only the boxed position will be loaded. The box must be moved, and R1 must be pressed for each position to be filled.

3. Store Procedure.

a. Press **UTI**.

b. Press **DATA TRANSFER (L1)**.

c. Box the position L1 thru L5 to be loaded.

d. Enter a valid identifier in the scratchpad.

e. Press **STORE (R2)**.

NOTE 3: The **STORE** legend will be boxed and the advisory message data transfer system (**DTS) STORING** will be displayed while data is being stored. The **CHECKLIST (R4)** cannot be stored, only loaded. If a valid identifier is scratchpadded, the data will be stored with that identifier at the selected box location.

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS:

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

2. **Evaluation.** Evaluation will be conducted in the aircraft or orally.

REFERENCES:

Aircraft Operator's Manual
ASE/ACS Operator's Manual
ASE/ACS Checklist

TASK 2476

Perform navigation with an inertial navigation system.

CONDITIONS: In a RC-12D/H under VMC, IMC, or simulated IMC.

STANDARDS: Appropriate common standards plus these additions/modifications:

1. Correctly operate the INS according to the aircraft operator's manual.

2. Maintain the desired track.

3. Correctly determine the position of the aircraft along the route of flight.

DESCRIPTION:

1. Crew Actions.

a. Each crew member will complete the required checks or procedures pertaining to his crew duties according to the checklist and the preflight briefing. The P*'s main focus (inside/ outside the aircraft) will vary depending on whether the aircraft is operating in VMC or IMC. He will announce all frequency changes, instrument settings, and any ATC information that the P does not monitor.

b. The P will assist by keeping the area cleared when operating in VMC, checking and tuning equipment upon request, and performing actions requested by the P*. He will verify all frequency changes requested by the P*, follow the position of the aircraft on the chart, make all the required radio transmissions, and maintain the flight log.

2. Procedure. The P*, assisted by the P, will perform the following actions:

a. Secure the required flight publications for the appropriate route structure, and perform INS mission planning.

b. Perform the INS turn-on procedure.

c. Perform the INS programming procedure.

d. Perform the INS system alignment.

e. Select the INS course.

f. Fly a selected INS course.

g. Select an intercept course to a destination.

h. Obtain readouts from the INS.

i. Manually update the INS.

j. Update the INS TACAN.

k. Perform shutdown procedures.

NIGHT CONSIDERATIONS: Normal night considerations.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. **Evaluation.** Evaluation will be conducted in the aircraft.

REFERENCES:

Common references
Operator's Manual High Accuracy Carousel IV-E Inertial Navigation System

TASK 2478

Operate the Guardrail Aviation Mission Planning Station (GRAMPS).

CONDITION: Given an IBM or compatible computer with an 80386 or higher processor with the GRAMPS installed.

STANDARDS:

1. Log on and log off the GRAMPS.

2. Format a Data Transfer System (DTS) cartridge.

3. Retrieve, create, and store MISSION data to the DTS cartridge, hard drive, or floppy disk.

DESCRIPTION:

1. To start GRAMPS from the hard disk, perform the following:

a. At the "C:" prompt, type "CD\GRAMPS." The prompt "C:\GRAMPS" will appear.

b. Type "GRAMPS." The screen will now show the GRAMPS at the "GRAMPS CONTROL" page.

2. To format a new DTS cartridge, perform the following steps:

a. Load a blank DTS cartridge into the DTS receptacle.

b. From the GRAMPS CONTROL page, press "Shift-F1" to access the UTILITY Mode.

c. Press "F1" for "DATA TRANSFER" page.

d. Press "F8" to format the cartridge. A "DTS FORMATTING" advisory message will appear for the duration of the formatting process. Once the formatting is complete, MISSION data is now ready to be created.

3. To create new MISSION data, press one of the following keys to enter one of the ASE/ACS modes:

Shift-F1 -- UTILITY Mode
Shift-F2 -- FLIGHT Mode
Shift-F3 -- ASE(T) Mode
Shift-F4 -- COMMS Mode

From within these pages, data can be entered throughout the GRAMPS in exactly the same manner as with using the ASE/ACS system installed in the aircraft. Because the computer monitor does not come with push-bezel buttons, however, the following computer keys must be used to enter data:

COMPUTER	MFD	COMPUTER	MFD
F1	L1	F6	R1
F2	L2	F7	R2
F3	L3	F8	R3
F4	L4	F9	R4
F5	L5	F10	R5

4. To store new MISSION data, perform the following steps:

a. Press "Shift-F1" to access the Utility Mode.

b. Press "F1" for Data Transfer.

c. Press "F1" through "F5" as required to select COMM, NAV, ASET, C/W HISTORY, or SETUP data.

d. Press "F7" to store the selected data. A "DTS STORING" advisory message will appear for the duration of the storing process.

5. To retrieve MISSION data from the DTS cartridge, perform the following steps:

a. Load the DTS cartridge into the DTS receptacle.

b. Press "Shift-F1" to access the Utility Mode.

c. Press "F1" for Data Transfer.

d. Press "F1" through "F5" as required to select COMM, NAV, ASET, C/W HISTORY, or SETUP data.

e. Press "F6" to load the selected data from the DTS cartridge into the GRAMPS. A "DTS LOADING" advisory message will appear for the duration of the loading process.

6. To retrieve CHECKLIST data from a floppy disk, perform the following steps:

NOTE 1: CHECKLIST data is different from MISSION data in that it cannot be created or modified using GRAMPS display pages. CHECKLIST data also cannot be loaded into GRAMPS from a DTS cartridge and cannot be stored to a floppy disk or the hard disk using the normal GRAMPS environment. CHECKLIST data can only be loaded into GRAMPS from a floppy disk or from the hard disk, and then stored on a DTS cartridge.

a. From the GRAMPS CONTROL page, press “F1” to select “CHECKLIST” as file type.

b. Press desired drive path, then press “F2”; for example, type “B:\” then “F2.”

c. Press “F3” to “Load from Disk.”

Once the CHECKLIST data has been loaded into GRAMPS, it can now be stored to a DTS cartridge for loading into the aircraft. To do this, follow the same steps listed above under storing MISSION data.

7. To retrieve ASET data from a floppy disk, perform the following steps:

NOTE 2: The ASET classified/unclassified database is different from MISSION data in that it cannot be created or modified using the GRAMPS display pages. The ASET database also cannot be loaded into GRAMPS from a DTS cartridge and cannot be stored to a floppy disk or the hard disk using the normal GRAMPS environment. The ASET database can be loaded into GRAMPS from a floppy disk or from the hard disk, and then stored on a DTS cartridge. The ASET database should be loaded before defining ASET MISSION data.

a. From the GRAMPS CONTROL page, press “F1” to select “ASET” as file type.

b. Press desired drive path, then press “F2”; for example, type “A:\” then “F2.”

c. Press “F3” to “Load from Disk.”

Once the ASET data has been loaded into GRAMPS, it can now be stored to a DTS cartridge for loading into the aircraft. To do this, follow the same steps listed above under storing MISSION data.

8. To end a GRAMPS session at any place within GRAMPS, press “ESC.” The “C:\GRAMPS” prompt will then be displayed.

NOTE 3: ASE/ACS MISSION data will be lost when the GRAMPS session is ended. Save all changes before ending the GRAMPS session.

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated academically.

REFERENCES:

GRAMPS User's Manual
ASE/ACS Operator's Manual

TASK 2482

Program ASE/ACS Flight Plan.

CONDITION: In a RC-12N/P/Q airplane equipped with a Delco Carousel IV INS and ASE/ACS.

STANDARDS:

1. Correctly enter required waypoint numbers in the scratchpad.

2. Enter the waypoints into the Routes page.

3. Create a New Flight Plan from the Routes page.

DESCRIPTION:

1. Crew Actions. The PC will designate which crew member will program the ASE/ACS flight plan.

2. Procedure.

a. Access the waypoint page and enter the waypoint numbers in the scratchpad in the order of desired use. Up to nine waypoints can be entered. Example: 11 13 23 25 15 12 34 36 27. The waypoint numbers can be entered by two methods:

(1) Enter the waypoint numbers by using the keyboard or

(2) Box desired WPTs with **PREV (R2)** or **NEXT (R3)** and press **LOAD SCRATCH PAD (L5).**

b. Press **ROUTES (R5).** Select which route to use, First, Second, or Third and press adjacent line number to move waypoint numbers into a route.

c. To activate a route into the active flight plan, select which route to use by pressing the line button (1st, 2d, or 3d route).

d. Press **NEW FPLN (L1)**. The "INS LOADING" message will appear and the new flight plan will transfer to the FPLN page and the aircraft will steer to the first waypoint if NAV CAP is engaged on the autopilot mode controller.

NOTE 1: Once the route has been entered in the route box it may be inverted by pressing the associated L2, L3, or L4 button and pressing **INVERT (L5**).

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft.

REFERENCES:
Aircraft operator's manual
Aircraft checklist
ASE/ACS Source Data Book, dtd 3 Apr 95

TASK 2484

Program the ARC-164 HAVEQUICK II Radio Using the ASE/ACS.

CONDITIONS: In a RC-12N/P/Q airplane equipped with an ARC-164 HAVEQUICK II radio and an ASE/ACS.

STANDARDS: Perform the appropriate steps in sequence without error resulting in successful normal and anti-jam communications.

DESCRIPTION:

1. Crew Actions. The PC will designate the crew member to program the ARC-164.

2. Procedure.

a. Single Channel.

(1) Press the **(D)** mode button on the MFD to access the COMM CONTROL page.

(2) Press **L2/L3** on the MFD to display the ARC-164 preset frequency list.

NOTE 1: The COMM CONTROL page will automatically default to the FM ARC-201(A) preset frequency list. Either the #3-ultra high frequency (UHF) or the #5-UHF radio (buttons **L3** and **L4** on the MFD) must be selected to display the UHF preset frequency list.

(3) To add a frequency to the preset list scratch pad in the preset number, the frequency, a cipher fill (as necessary) and a Net ID (as necessary). Then press **R1** (add) to add it to the preset list.

(4) To tune a preset frequency, scratch pad in the desired preset number and press **L2/L3** to tune the desired UHF radio.

NOTE 2: Text containing the preset number, frequency, cipher fill, and station ID appears under the selected radio after tuning.

(5) The radio is now programmed to communicate in the normal mode.

NOTE 3: To set a manual frequency, scratch pad in the desired frequency, cipher fill, and station ID and press either **L2** to tune the #3 UHF radio or **L3** to tune the #5 UHF radio. The letter M (manual) will precede the frequency, fill, and ID under the selected radio.

b. HAVEQUICK II.

NOTE 4: To use the anti-jam mode, the radio requires five elements of information to be programmed before it can be used: a frequency management table (FMT); Date; Word of Day (WOD); NET number; and Time of Day (TOD).

(1) Frequency Management Table Programming

(a) Press the **(D)** mode button on the MFD to access the COMM CONTROL page.

(b) Press **L2/L3** on the MFD to display the ARC-164 UHF SETUP (R5).

(c) Press **UHF SETUP (R5)**.

(d) Press **NORM/AJ (L1)** to select NORM. This allows L5 WOD/FMT SETUP access.

(e) Press **WOD/FMT (L5)** to access WOD/FMT SETUP page.

(f) Press **FMT/WOD (L1)** to box FMT.

(g) Scratchpad segment 20 frequency and press **SEGMENT 20 ENTRY (R1)**. If a valid frequency was entered, it will appear in the center of the page at "20 = " and the segment number at R1 will decrease to 19. Repeat until all 16 frequencies have been entered.

NOTE 5: It is not necessary to enter decimal points when scratchpadding frequencies.

(2) Word of Day (WOD) Programming

(a) On the WOD/FMT SETUP page press **WOD/FMT (L1)** to select WOD.

(b) Scratchpad the DATE (day of the month) for the WOD to be programmed and press **DATE (L3)**.

(c) Scratchpad WOD 20 and press **SEGMENT 20 ENTRY (R1)**. The WOD will appear in the center of the page at 20 = if valid. The segment number at R1 will decrease by one to 19. Enter the remaining WODs by repeating the procedure until all 6 have been entered.

(d) If an error is made, press **HQII WOD ERASE (L5)** and reprogram using the above procedure.

(3) NET Number Programming

(a) From the WOD/FMT SETUP page, access the UHF SETUP page by pressing **UHF SETUP (R5)**.

(b) Scratchpad in the training NET number. Press **NET (L4)**.

NOTE 5: Training net numbers are: **.3** odd days and ***.4*** even days

(4) Time Of Day (TOD) Programming.

(a) To receive a TOD coordinate with another radio to send a TOD over normal UHF.

(b) When he is ready to send the TOD, press **TOD CONTROL (R4)**.

(c) When he sends the TOD, press **TOD RECEIVE (R4)**.

(d) If another radio is not available, use one of the following two methods to send a TOD to your radio. Press **TOD CONTROL (R4)** then:

(1) To start the time using the internal clock, press **EMER TOD STARTUP (R3)**.

(2) To receive a TOD from the GPS, press **GPS TOD (R5)**.

NOTE: To verify the radio has a valid TOD Press tone **TONE (R3)** on the UHF SETUP page. A single tone—No TOD, Double tone - Valid TOD.

(e) Press **NORM /AJ (L1)** and box AJ.

(f) Conduct a communication check.

(5) Sending a TOD.

(a) To send a TOD, coordinate over normal UHF with the aircraft receiving.

(b) When ready, press **TONE (R3)** to send.

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION REQUIREMENTS: Task will be trained and evaluated in the aircraft.

REFERENCES:

ASE/ACS Operator's Manual
Aircraft Operator's Manual

TASK 2486

Interpret ASE/ACS threat indications.

CAUTION

A null envelope exists because of antenna placement on the aircraft that will cause the continuous wave signal reception to diminish or disappear in certain aircraft attitudes. A sudden loss of tone or indication does not necessarily mean the threat is no longer present. Continue to evade and employ countermeasures until clear.

CONDITIONS: In a RC-12N/P/Q airplane equipped with the ASE/ACS system and with a data transfer cartridge loaded with threat data base.

STANDARDS:

1. Program ASE(T) threat data.

2. Configure ASE(T) suite.

3. Program M-130.

4. Interpret threat indications.

DESCRIPTION:

1. Crew Actions.

a. The PC will ensure the data transfer cartridge is loaded with threat and be responsible for safeguarding it.

b. The P and/or the P* will load and verify the threat, coordinates, engagement parameters, ASE suite and flare/chaff program.

2. Procedure.

a. Program ASE(T) Threat Data.

(1) Load the classified ASET database using the DTS.

(2) Press **ASE + (C)** - Displays ASE page.

(3) Press **ASE SETUP (R5)** - Displays ASE SETUP page.

(4) Press **ASE TRAINING SETUP (R5) –** Displays ASE TRAINING SETUP page. This page allows the operator to enter simulated threat locations and operating parameters. Up to 10 threat lines may be entered.

(5) Scratchpad in threat type and press **THREAT TYPE (L1).** The threat type will be entered in the threat data entry window. Valid threat types are as follows:

2 = SA-2	9 = SA-9	A = AAA
4 = SA-4	10 = SA-10	Z = ZSU
5 = SA-5	11 = SA-11	H = HAWK
6 = SA-6	12 = SA-12	25 = MIG-25
7 = SA-7	13 = SA-13	29 = MIG-29
8 = SA-8	14 = SA-14	IR = MIG-IR

(6) Scratchpad in threat latitude and press **LAT (L2).**

(7) Scratchpad in threat longitude and press **LONG (L3).**

(8) Scratchpad in the range (kilometers) at which the threat will initially engage the aircraft. Press **RANGE (L4).**

(9) Scratchpad in the acquisition to launch time and press **TIME (L5).**

NOTE 1: If the threat in the data entry window is an airborne threat, the legend at L5 is FRONT/REAR. Successive presses of L5 causes the direction of approach of the airborne threat to toggle between FRONT and REAR. Select the desired approach direction of the fighter.

(10) A string of threat data may also be scratchpadded entered into any threat position. For example:

Scratchpad in 1 5 36.30.45 110.20.30 25 20 and press ADD/SEL. An SA-5 threat has been entered into position 1 at N 36.30.45 W 110.20.30. The range at initial engagement is 25 miles, and the acquisition to launch time is 20 seconds.

(11) Single or multiple threat lines may be deleted by pressing R4. If one or more threat numbers are in the scratchpad with spaces between them, pressing R4 causes the listed threats to be deleted. If two threat numbers are in the scratchpad with a dash between them, pressing R4 causes the range of threats listed to be deleted.

ASE/ACS Operator's Manual

b. Configure ASE(T) Suite.

(1) Press **ASE + (C)** - Displays ASE page.

(2) Press **ASE SETUP (R5) –** Displays ASE SETUP page.

(3) Press **ASET (R5)** - Toggles ASET Mode ON/OFF. Toggle ASET ON.

(4) Press **ASE TRAINING SETUP (R5)** – Displays ASE TRAINING SETUP page.

(5) Press **ASET MISSION SUMMARY (R5)** – Displays ASET MISSION SUMMARY page.

(6) Press **ASET SUITE CONFIGURATION (R1)** – Displays ASET SUITE CONFIGURATION page and allows selection of the ASE equipment configuration for the training mission.

(7) PULSE/CW WARN (L1) – Successive presses of L1 cause the APR-39 and APR-44 equipment configuration to toggle from NONE to APR-39(V)1/44(V)3 to APR-39(V)2/44(V)3 to APR-39A(V)2/44(V)3. Toggle as required.

NOTE 2: When the ASE training equipment configuration is an APR-39A(V)2, the legend at L1 will read RADAR WARN.

(8) **DISPENSER (L3)** – Press L3 to read EM NOT CONFIG.

(9) **PULSE JAM (R1)** – Successive presses of R1 toggle the ALQ-136 from NONE to ALQ-136(V)2. Toggle as required.

(10) **CW JAM (R2)** – Successive presses of R2 toggle the ALQ-162 from NONE to ALQ-162(V)2. Toggle as required.

(11) MSL APPR (R3) – Successive presses of R3 toggle the ALQ-156 from NONE to ALQ-156(V)2. Toggle as required.

c. Program the M130 Flare/Chaff.

(1) Press **ASE + (C)** - Displays ASE page.

(2) Press **ASE SETUP (R5)** – Displays ASE SETUP page.

(3) Press **ASET ON/OFF (R1)** to ON.

(4) Enter the CHAFF COUNT in the scratch pad and press **CHAFF COUNT (L1).** Valid CHAFF COUNT data is any whole number from 0-127.

(5) Enter the FLARE COUNT in the scratch pad and press **FLARE COUNT (L2).** Valid FLARE COUNT is any whole number from 0-127.

(6) Enter the Chaff/Flare program as follows:

(a) Enter into the scratchpad, in the order specified on the MFD, the desired numbers for SALVO COUNT, SALVO INTERVAL, BURST COUNT, and BURST INTERVAL. Example: 3 2 2 3. Press **Program Chaff (L3)** or **Program Flare (L4),** as required.

(b) The SALVO COUNT is the number of salvos that will be fired as a result of pressing the chaff firing switch. This can be either a whole number from 1 to 99 or the letter "C" (continuous).

(c) The SALVO INTERVAL is the time interval (measured in whole seconds) between the first cartridge firing in one salvo and the first cartridge firing in the next salvo. Valid SALVO INTERVAL data is any whole number from 1 to 99 or the letter "R" (random).

(d) The BURST COUNT is the number of single expendable loads that will be fired in each salvo. Valid BURST COUNT data is any whole number from 1 to 99.

(e) The BURST INTERVAL is the time interval (measured in tenths of seconds) between each expendable firing in each salvo. Valid BURST INTERVAL data is all tenths of a second from .1 to .9.

NOTE 3: In a valid chaff/flare program, the calculation **(BURST COUNT) X (BURST INTERVAL) ≤ (SALVO INTERVAL)** must be true. If the relationship is not true, the message INVALID CHAFF PROGRAM is displayed and a valid program must be reentered.

(7) Press **ASE "C"** to return to the ASE page.

(8) Press **DISPENSER (L3).** Check M130 mode is safe.

(9) Press **CHAFF (L4)** or **Flare (L5)** to select MANUAL or PRGM. Successive presses of L4/L5 toggles the M-130 chaff/flare mode from MANUAL to PRGM. Set as required.

(10) Press **ASE Setup (R5)**. Pressing **RIPPLE FIRE FLARES (L5)** – Successive presses of L5 toggle the RIPPLE FIRE FLARES mode of the M-130. When L5 is initially pressed, a "RIPPLE ARMED" message is "boxed" and displayed for 7 seconds. During the 7 second time period, if either pilot presses the FLARE FIRE button on either control yoke, flare ripple firing is initiated. If RIPPLE ARMED is displayed and L5 is pressed again, the armed mode is aborted, and the RIPPLE FIRE FLARES text reappears. The RIPPLE FIRE FLARES text also reappears if the 7 second time period elapses before either pilot presses the flare fire button. If flare ripple firing is initiated and L5 is pressed, flare ripple firing is aborted.

d. Threat Equipment and Indications.

(1) AN/APR-39(V)2: This pulse wave radar warning receiver audibly and visually warns pilots that they are being tracked by a threat radar system. Antennas located on the wing pods and one blade antenna on the underside of the fuselage receive pulse wave radar signals. The AN/APR-39 displays azimuth to the threat radar and relative lethality thru the

MFD. The AN/APR-39 will supply missile tracking and missile guidance information for the SA-2/3/4 and tracking information only for the SA-6/8/11, ZSU, and aircraft radars.

(a) Components:

(1) Spiral antennas: (4) (two right/two left) Located on the fore and aft portions of the wing pod. Receive high-band pulse wave radar signals (missile tracking).

(2) Blade antenna: (1) Located on the bottom of the fuselage. Receives low-band pulse wave radar signals (missile guidance).

(3) Processor: (1) Analyzes received signals and matches them to pre-programmed criteria. Then displays information on the MFD.

(4) Receivers: (fore/aft) Send received signals to the processor.

(5) MFD: Power switch, altitude select switch, BIT, and volume control.

(b) Indications:

(1) In flight in a radar-free environment, the screen will display a diamond at each of the four cardinal points and an "H" or "L" in the center of the screen. This is the "no signal" display. A threat display will be announced by a high-pitched tone and a flashing symbol. The symbol will only flash momentarily, then become steady. A steady symbol indicates the radar is in tracking mode. The closer to the center of the screen the symbol is, the greater the interpreted relative lethality. The display will indicate direction of the threat by placing the symbol in a position to show relative bearing from the nose of the aircraft. Lethality interpretation is based on received signal strength compared to lowest known output power of the radar being received.

(2) Range normalization is as follows: symbols just inside the edge of the screen are targets at approximately twice (2x) lethal weapon range. Symbols just outside the outermost ring indicate a target at (1.5x) lethal range. Symbols just outside the innermost ring indicate targets at lethal range. Symbols at the innermost ring indicate targets at (.5x) lethal range. Airborne radar targets are shown when initially detected regardless of range.

(3) Low Band Missile Guidance is as follows: A diamond indicates that the system is receiving low band pulse wave missile guidance signals. When the guidance signal can be correlated with the threat tracking radar, the symbol for that system will appear inside the diamond. If the system cannot correlate the low band guidance signal with received tracking signals, a "U" will appear in the diamond. If the diamond appears in the center of the screen, it indicates that only the low band guidance signal is being received.

(2) AN/APR-44(V)3: The AN/APR-44(V)3 is an airborne system used to detect continuous wave radar signals. Detection is indicated by a message on the MFD coupled with a Master Caution annunciator and a tone heard in the headset. Continuous wave radar is used by SAM (surface-to-air-missile) and AI (aerial intercept) systems to effect semi-active guidance for their associated missiles. The continuous wave signals reflect off the aircraft and are received by the antennas located on the missile. The signal is then used for missile guidance. It gives indications of an SA-5/6/11/17/AI and possibly an SA-10 and 12. If used in conjunction with the AN/APR-39(V)2, SEMA aircraft are warned of virtually every radar Air Defense/Aerial Interdiction threat.

(a) Components:

(1) The MFD consists of a power switch, volume control, and when activated, a message box at the lower left hand corner of the MFD indicating a SAM or AI missile alert.

(2) The receiver has two filters, a low band and high band pass. The receiver responds to a continuous wave signal and converts it to an audio alert and MFD alert. If a SAM threat is detected, it will illuminate "SAM-MISSILE ALERT." If an AI threat is detected, it will illuminate "AI-MISSILE ALERT" on the MFD.

(3) Four antennas are located on poles attached at the forward empennage. Two are for SAM targets and two, for AI targets.

(b) Indications:

The AN/APR-44(V)3 gives no indication of threat radar relative bearing or relative lethality. The pilot must become familiar with the AN/APR-44(V)3 tone to effectively use the system. The only indication will be the Master Caution annunciator and display given on the MFD indicating a SAM or AI Missile Alert.

NIGHT CONSIDERATIONS: N/A

TRAINING AND EVALUATION: Task trained and evaluated in the airplane.

REFERENCES:

ASE/ACS Operator's Manual
Classified references

CHAPTER 5

MAINTENANCE PILOT TASKS

This chapter describes the essential tasks for maintaining maintenance crew member 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, also is provided. Tasks described in this chapter are to be performed by qualified RC-12 maintenance test pilots (MPs) according to AR 95-1 and chapter 2 of this document. This chapter contains tasks and procedures to be used by contractor MPs according to AR 95-2, Volume 1 (DLAM 8210), section 3.4 (publications).

5-1. TASK CONTENTS

a. Task Number. Each ATM task is identified by a 10-digit Systems Approach to Training number that corresponds to the maintenance test pilot tasks listed in chapter 2 (Figure 2-14). For convenience, only the last four digits are referenced in this training circular.

b. Task Title. This identifies a clearly defined and measurable activity. Task titles may be the same in many ATMs, but task content will vary with the airframe.

c. Conditions. The conditions specify the common wartime or training/evaluation conditions under which the Mission Training Plan (MTP) tasks will be performed. The tasks listed that are common to RC-12 are listed as such. When the task condition applies to one group, the condition will add the series designator to the RC-12.

d. 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. The following common standards apply to all MTP tasks.

(1) Before flight, brief the P on the Maintenance Test Flight (MTF) check sheet and the items he needs to record.

(2) Perform procedures and checks in sequence according to the appropriate – MTF manual as required.

(3) Brief the P on the procedures to be completed based on the mission of the flight; for example, limited test flight for a primary governor change. When practical, review the steps for airborne tasks with the P before performing them.

(4) Perform crew coordination actions according to the task description and chapter 6.

(5) Assess and address any malfunctions or discrepancies as they occur and apply appropriate corrective actions or troubleshooting procedures.

(6) Complete the appropriate entries on the Maintenance Test Flight check sheet and in the logbook.

e. 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 actions define the portions of a task to be performed by each crew member to ensure safe, efficient, and effective task execution. The P* indication does not imply PC or MP duties. All tasks in this chapter are to be performed only by maintenance-designated IP/SPs or MPs as outlined in AR 95-1. The MP is the PC in all situations, except when undergoing training or evaluation by a maintenance-designated IP/SP. When two MPs are jointly performing MP tasks, the mission brief will designate the aviator assuming PC responsibilities.

(2) Procedures. This section describes the actions the MP performs or directs to execute the task to standard.

f. Contractor Officer Representative (COR). The COR has the authority and responsibility to determine when a test flight is required and what items need to be checked on the test flight**.**

g. Training and Evaluation Requirements. Some of the tasks incorporate more than one check from the MTF checklist. This section defines the checks in each task that, as a minimum, are required for MP training. Refer to Table 2-14 for a list of tasks that must be evaluated during the annual MP APART. The evaluator may select additional checks for evaluation. Training and evaluation requirements define whether the task will be trained or evaluated in the aircraft, simulator, or academic environment. 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 maintenance-designated IP/SP from evaluating elements of the task academically to determine depth of understanding or troubleshooting 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. Besides the common references listed in chapter 4, the following references apply to all MTP tasks. (These references apply to each of the tasks listed in this chapter and will not be listed for each task):

(1) Aircraft logbook and historical records.

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

(3) DA Pam 738-751.

(4) Operator's manual, checklist, and MTF manual.

(5) Applicable airworthiness directives or messages from U.S. Army Aviation and Missile Command (AMCOM).

(6) Applicable commercial maintenance manuals.

(7) AR 95-1.

5-2. TASK LIST

a. Standards vs. Descriptions. MPs 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 P 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. Maintenance Pilot Tasks. The following numbered tasks are MP tasks for the RC-12:

TASK 4910

Perform taxiing check.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Actions. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks. The MP will determine the checks necessary for the test flight (general/limited), and will brief the P on what checks are necessary. Each crew member will complete the required checks or procedures according to the MTF manual and the preflight briefing.

2. Procedure. Perform the checks according to the appropriate aircraft MTF manual. Other publications and references may be used as necessary. Conduct a briefing to delineate the duties the MP and P may be required to perform pressing safety in ground operations. At least one crew member will focus their attention outside the aircraft at all times during aircraft taxi. Review the task in the MTF manual prior to the individual check to be accomplished to ensure all items required to complete the check will be accomplished. Record the data, as required, for the required checks. The MP may dictate the recording be accomplished by the P. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as appropriate.

REFERENCES:

Common references

TASK 4915

Perform engine runup/aircraft systems check.

CONDITIONS: In an RC-12 aircraft with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Actions. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all required checks have been completed. The MP will determine the checks necessary for the test flight, and he will brief the P on what checks are necessary. The MP will stress ground safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft – MTF. Other publications and references may be used as necessary. Conduct a briefing to delineate the duties the MP and P may be required to perform, stressing safety during ground operations. Crew members will focus their attention outside the aircraft as much as possible to ensure the aircraft does not move during the checks. Review the MTF before the individual check to be accomplished to ensure all items required to complete the check will be accomplished. Record the data, as required, for the required checks. The MP may dictate the recording be accomplished by the P. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

4. Evaluation. Evaluation will be conducted both in the aircraft and academically as appropriate.

REFERENCES:

Common references

TASK 4921

Perform before-takeoff checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The appropriate aircraft – CL may be used; however, the checks will be done to the detail level of chapter 8 of the appropriate aircraft – 10. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will stress ground safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual or aircraft – CL. Conduct a briefing to delineate the duties of the MP and P are required to perform. The briefing will emphasize safety in ground operations. Record data, as required, for the checks to be performed. The MP may dictate the recording be accomplished by the P. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4923

Perform during-takeoff checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are will be performed. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties of the MP and P are required to perform. The briefing will emphasize safety in flight operations. Record data, as required, for the checks to be performed. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4925

Perform after-takeoff checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The maintenance test pilot (MP) will ensure the checks are conducted according to the appropriate aircraft MTF manual. The appropriate aircraft – CL may be used, however the checks will be done to the detail level of chapter 8 of the appropriate aircraft – 10. The MP may direct the pilot not flying (P) to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manaul. Conduct a briefing to delineate the duties of the MP and P are required to perform. The briefing will emphasize safety in flight operations. Record data, as required, for the checks to be performed. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4927

Perform during-climb checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Record data, as required, for the checks to be performed. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4929

Perform pressurization system checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual, Section IV, Special Procedures. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4931

Perform during-cruise checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4935

Perform speed check at maximum cruise power.

CONDITIONS: In an RC-12D/H airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight, and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual, Section IV, Special Procedures. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Obtain the necessary ATC clearances for the altitudes being flown. Review the task in the MTF to ensure all items required for the check are noted for data recording. Since data is being recorded for each engine, differential power may have to be set to reach the conditions specified by the figure referred to in the MTF. Set the power on the engine to be checked according to data from figure 4. Adjust the power on the other engine to reach the airspeed listed in figure 4. After conditions are allowed to stabilize for 1 minute, record the data required to complete the check. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4936

Perform speed performance check at maximum cruise power.

CONDITIONS: In an RC-12K/N/P/Q airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual, Section IV. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Obtain the necessary ATC clearances for the altitudes being flown. Review the task in the MTF to ensure all items required for the check are noted for data recording. Set the torque on the left and right engine from the chart. Task the P to record the required data. If the observed TGT exceeds the chart value, conduct the Engine Performance at Maximum Cruise Power check.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. **Evaluation.** Evaluation may be conducted in the aircraft or orally.

REFERENCES:

Common references

TASK 4937

Perform maximum power-lever position check/Maximum TGT/N_1 availability.

CONDITIONS: In an RC-12D/H airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight, and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual, Section IV, Special Procedures. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Obtain the necessary ATC clearances for the altitudes being flown. Review the task in the MTF to ensure all items required for the check are noted for data recording. Record data, as required, for the checks to be performed. Since this checks requires operations that could exceed aircraft or engine limitations, it is imperative that the crew ensures no limitations are exceeded. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation may be conducted either orally or in the aircraft.

REFERENCES:

Common references

TASK 4938

Perform engine performance check at maximum continuous power.

CONDITIONS: In an RC-12K/N/P/Q airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Check the affected engine according to the appropriate aircraft MTF manual, Section IV. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Obtain the necessary ATC clearances for the altitudes being flown. Review the task in the MTF to ensure all items required for the check are noted for data recording. Set the power on the engine to be checked according to data from figure 4. Adjust the power on the other engine to reach the airspeed listed in figure 4. After conditions are allowed to stabilize for 1 minute, record the data required to complete the check. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed. Task the P to record the required data. If the observed TGT exceeds the chart value, conduct the Engine Performance at Maximum Cruise Power check.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. **Evaluation.** Evaluation may be conducted in the aircraft or orally.

REFERENCES:

Common references

TASK 4939

Perform engine-acceptance check/engine performance at maximum continuous/cruise power.

CONDITIONS: In an RC-12D/H airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual, Section IV, Special Procedures. Conduct a briefing to delineate the duties the MP and P must perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Obtain the necessary ATC clearances for the altitudes being flown. Review the task in the MTF to ensure all items required for the check are noted for data recording. If required, differential power may be required to meet the MTF criteria for the check. Refer to the appropriate aircraft MTF for the conditions to be set for the check. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft - MTF. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. **Evaluation.** Evaluation may be conducted either orally or in the aircraft.

REFERENCES:

Common references

TASK 4940

Perform engine performance check at maximum cruise power.

CONDITIONS: In an RC-12K/N/P/Q airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. If the TGT exceeded the chart value during the Speed Performance at Maximum Cruise Power check, perform Engine Performance at Maximum Cruise Power check on the affected engine according to the appropriate aircraft MTF manual, Section IV. Conduct a briefing to delineate the duties the MP and P must perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Obtain the necessary ATC clearances for the altitudes being flown. Review the task in the MTF manual to ensure all items required for the check are noted for data recording. Set the power on the engine to be checked according to data from figure 4. Adjust the power on the other engine to reach the airspeed listed in figure 4. After conditions are allowed to stabilize for 1 minute, record the data required to complete the check. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed. Task the P to record the required data. If the observed TGT exceeds the chart value, conduct the Engine Performance at Maximum Cruise Power check.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. **Evaluation.** Evaluation may be conducted in the aircraft or orally.

REFERENCES:

Common references

TASK 4941

Perform engine ice vanes check.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P must perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4942

Perform maximum TGT/N_1 availability check.

CONDITIONS: In an RC-12K/N/P/Q airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The MP will determine the checks necessary for the test flight, and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Conduct the check according to the appropriate aircraft MTF manual, Section IV. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety during flight operations. The MP performing the check will keep the other crew member informed of the actions he is taking. The P will assist the MP in monitoring TGT, N_1, and torque to ensure no operating limit is exceeded when the power levers are advanced. Determine if sufficient power lever travel is available to obtain maximum TGT, torque, or N_1 before hitting the forward power lever stop.

TRAINING AND EVALUATION REQUIREMENTS:

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

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

REFERENCES:

Common references

TASK 4943

Perform trim and rigging check.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual, Section IV, Special Procedures. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4945

Perform autopilot checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual, Section IV, Special Procedures. Conduct a briefing to delineate the duties the MP and P must perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4947

Perform stall, warning, and characteristics checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

CAUTION

Extreme caution must be used while performing this check since full stalls are performed. If any unusual flight characteristics are encountered, the maneuver will be terminated. If necessary, the aircraft will be returned to maintenance for further adjustments or maintenance actions.

WARNING

Because of increased risk factor while performing stalls, the entry altitude should be no lower than an altitude that will allow recovery to be safely completed at a minimum of 4,000 feet AGL.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual, Section IV, Special Procedures. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight, and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual, Section IV, Special Procedures. Conduct a briefing to delineate the duties the MP and P must perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. This check calls for various trim speeds for various configurations. The crew will ensure they have enough altitude while performing this check since some conditions may require a descent to set the required trim speed. If the condition calls for power off, the power will be reduced to idle in the configuration being checked. The crew will adjust aircraft controls and trim to reach the trim speed specified in the appropriate MTF manual. Once the conditions are met, the airspeed will be reduced at a rate of 1 knot per second. The crew will note at what indicated airspeed the stall warning horn activates and what indicated airspeed the aircraft encounters a stall. If the check requires a power on condition, the crew will configure the aircraft for the check being performed, set the power in accordance with the MTF manual, and adjust the trim to hold the trim speed. Once this is accomplished, the indicated airspeed will be reduced at a rate of 1 knot per second. Note that the power on stall checks may not call for the recording of a stall speed. The MTF manual may only require a stall warning speed be recorded. Roll characteristics are checked during this task. Should an excessive roll be encountered, the rudder becomes the primary control to level wings

until the pitch angle of the aircraft is reduced to gain airspeed making ailerons more effective in roll control. Record data, as required, for the checks to be performed. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references.

TASK 4949

Perform flap operation check.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P must perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4951

Perform minimum elevator trim check.

CONDITIONS: In an RC-12D/H airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P must perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4953

Perform autoignition checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight, and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Caution must be exercised while performing this task. Engine TGT could be exceeded, and care must be exercised to avoid excessive TGT. If it appears TGT limits will be exceeded, discontinue the task by placing the condition lever for the engine being checked to the fuel cutoff position, manually feather the propeller, and start the engine using a starter assist. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4955

Perform manual propeller feathering and unfeathering checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight, and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. This task specifies airspeeds to be flown during the check. It is important that the specified airspeed is maintained during the feathering or check until the prop is feathered and rotation has stopped. The description of a feathered prop is described in the – MTF for the appropriate aircraft. Record data, as required, for the checks to be performed and set power as dictated by the appropriate MTF manual. The MP may dictate the recording will be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4957

Perform propeller-autofeathering system check.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight, and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety during flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. This task specifies airspeeds to be flown during the check. It is important that the specified airspeed is maintained during the feathering or check until the prop is feathered and rotation has stopped. The description of a feathered prop is described in the – MTF for the appropriate aircraft. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4961

Perform maximum rate-of-descent check.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4963

Perform landing gear warning horn operation check.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12 as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4967

Perform emergency landing gear extension check.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4969

Perform elevator trim check.

CONDITIONS: In an RC-12D/H airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks, but he will verify that all checks have been completed. The exact procedure varies between various models of the RC-12, as well as additional checks to be accomplished. The MP will determine the checks necessary for the test flight (general/limited), and he will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Since this check is detailed with numerous steps to accomplish, the MP or P performing the check will keep the other crew member informed of the actions he is taking. Record data, as required, for the checks to be performed and set power as dictated by the appropriate aircraft MTF manual. The MP may dictate the recording be accomplished by the P. At least one crew member will focus his attention outside the aircraft during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as necessary.

REFERENCES:

Common references

TASK 4980

Perform communication and navigation equipment checks.

CONDITIONS: In an RC-12 airplane with access to the MTF manual.

STANDARDS: Common standards outlined in paragraph 5-1.

1. Without error, perform procedures and checks according to the MTF manual.

2. Correctly perform crew coordination actions.

DESCRIPTION:

1. Crew Action. The MP will ensure the checks are conducted according to the appropriate aircraft MTF manual. The MP may direct the P to perform or assist in the required checks. The exact procedure varies between various models of the RC-12. The MP will determine the checks necessary for the test flight (general/limited), and will brief the P on what checks are necessary. The MP will stress flight safety considerations or procedures during the briefing.

2. Procedures. Perform the checks according to the appropriate aircraft MTF manual. Conduct a briefing to delineate the duties the MP and P are required to perform. The briefing will emphasize safety in flight operations. Record data, as required, for the checks to be performed and set power as dictated by the appropriate MTF manual. The MP may dictate the recording be accomplished during this check to ensure obstacles and other aircraft are avoided. Once tasks and procedures are completed, the MP or P will announce that the task has been completed.

TRAINING AND EVALUATION REQUIREMENTS:

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

2. Evaluation. Evaluation will be conducted both in the aircraft and academically as appropriate.

REFERENCES:

Common references

CHAPTER 6

CREW COORDINATION

This chapter describes the crew coordination elements, basic qualities, and objectives as found in the Army Aircrew Coordination Training Program.

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 could 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 crew members 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 crew members. Communication is positive when the sender directs, announces, requests, or offers information; the receiver acknowledges the information; and the sender confirms the information, based on the receiver's acknowledgment or action.

b. Direct assistance. A crew member will direct assistance when he cannot maintain aircraft control, position, or clearance. He also will direct assistance when he cannot properly operate or troubleshoot aircraft systems without help from the other crew member.

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

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

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

f. Be explicit. Crew members 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." Crew members must also avoid using indefinite modifiers such as, "Do you see that?" or "You are coming in a little slow."

g. Provide aircraft control and obstacle advisories. Although the P* is responsible for aircraft control, the other crew members may need to provide aircraft control information regarding airspeed, altitude, or heading.

h. Coordinate action sequence and timing. Proper sequencing and timing ensure that the actions of one crew member mesh with the actions of the other crew member.

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. Flight team leadership and crew climate are established and maintained. 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 crew members. When crew members disagree on a course of action, they must be effective in resolving the disagreement.

b. Premission planning and rehearsal are accomplished. Premission planning includes all preparatory tasks associated with planning the mission. These tasks include planning for visual flight rules (VFR) or instrument flight rules (IFR) flight. They also include assigning crew member responsibilities and conducting all required briefings and brief-backs. Premission rehearsal involves the crew's collectively visualizing and discussing expected and potentially unexpected events for the entire mission. Through this process, all crew members think through contingencies and actions for difficult segments or unusual events associated with the mission and develop strategies to cope with contingencies.

c. Appropriate decision-making techniques are applied. Decision making is the act of rendering a solution to a problem and defining a plan of action. It must involve risk assessment. The quality of decision making 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 crew members. The crew's ability to apply appropriate decision-making 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 pilot in command (PC) is the key decision maker.

d. Actions are prioritized and workload is equitably distributed. 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.

e. Unexpected events are managed effectively. 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.

f. 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.

g. Mission situational awareness is maintained. This quality considers the extent to which crew members 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.

h. Decisions and actions are communicated and acknowledged. This quality addresses the extent to which crew members are kept informed of decisions made and actions taken by another crew member. Crew members 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.

i. Supporting information and actions are sought from the crew. This quality addresses the extent to which supporting information and actions are sought from the crew by another crew member, usually the PC. Crew members 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.

j. Crew member actions are mutually cross-monitored. 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. Crew members 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.

k. Supporting information and actions are offered by the crew. This quality addresses the extent to which crew members 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.

l. Advocacy and assertion are practiced. This quality concerns the extent to which crew members are proactive in advocating a course of action they consider best, even when others may disagree.

m. Crew-level after-action reviews are conducted. This quality addresses the extent to which crew members review and critique their actions during or after a mission segment, during periods of low workload, or during the mission debriefing.

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 program is 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 intracrew communications using effective patterns and techniques that allow for the flow of essential data between crew members.

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. STANDARDIZED COCKPIT PROCEDURES

a. General. Clearly defining a division of cockpit responsibilities ensures that duties that may distract the pilot flying (P*) are transferred to the pilot not flying (P). Clear division of cockpit responsibilities is of particular importance during the arrival and departure phases of flight. The individual operator’s manual designate RC-12s as two-pilot aircraft. Besides the circled items in the operator’s manual and the checklist that delineates copilot (P) duties, the crew callouts and responsibilities outlined in this chapter should serve to fully integrate the P* and P as a flight crew. The following paragraphs serve as a guide.

b. P* Responsibilities. The P* is responsible for flying the aircraft. If the autopilot is coupled, the P* is responsible for ensuring that the autopilot correctly captures and maintains selected altitudes. Unless required by a safety consideration, the P* shall avoid tasks that distract from the primary responsibility of flying the aircraft by directing the P to accomplish these tasks. As a general rule, if the P can do it, the P should do it, particularly during the departure and arrival phases.

c. P Responsibilities. The P is responsible for cross-monitoring the P*; he will accomplish tasks that may distract the P* from his or her duties. The primary duty of the P is to keep the P* free simply to fly the airplane. Basic P duties include the following:

(1) Radio communications.

(2) Change navigational aid (NAVAID) and communications radio frequencies.

(3) Change transponder codes.

(4) Prepare and review copy clearances, automated terminal information service (ATIS), and other information.

(5) Read and complete checklist items as required.

(6) Set and adjust pages and switches and systems as required.

(7) Operate the frequency modulated system (FMS), or like system, and inertial navigation system (INS) at the direction of the P*.

(8) Change the aircraft configuration at the direction of the P*, such as:

(a) Power and propeller settings.

(b) Flap selection.

(c) Operating the gear handle.

(9) Operate the weather radar.

(10) Change the altitude on the altitude preselector (if installed) and cabin controller.

(11) During IFR operations—

(a) Note takeoff time.

(b) Calculate and monitor times for holding and approaches.

(c) When on approach, watch for the runway environment.

(d) Be prepared to direct and assist the P* with the missed approach procedure, if required.

d. Management of the P*'s Flight Director Panel.

(1) The P may make changes to the altitude controls as required by new altitudes without the direction of the P*.

(2) The P shall not make other changes to the P*'s flight director system without the direction of the P*.

(3) When practicable, the P* should direct the P to make changes to the P* flight director system. When justified by the circumstances, the P* may make minor changes to his or her flight director system. Examples of minor changes include the following:

(a) Arming the approach mode.

(b) Selecting indicated airspeed (IAS) or vertical speed (VS).

(c) Selecting heading (HDG) or navigation (NAV).

(d) Selecting standby (STBY).

(4) Changes to the status of the flight director system that is coupled to the autopilot should be announced and mutually verified. In general, when something is selected, it should be announced to the other pilot. An announcement should also be made when the flight director captures a selected mode.

e. Management of Power Levers. During this phase of flight—from the beginning of takeoff roll until completion of the after takeoff check— the P controls the power levers. If a power change is needed, the P* should direct the P to make the change. This principle is true even in the event of an emergency.

EXAMPLE: (P*) "Set 90 percent of torque."

f. Standardized Calls: See paragraph 6-6.

g. Deviations: Certain circumstances may require deviation from the guidelines published in this chapter. Such deviations, when clearly communicated between the crew, reflect good resource management and coordinated crew actions.

6-6. STERILE COCKPIT. The definition of a sterile cockpit is, only that conversation required for safe aircraft operation is allowed. A sterile cockpit shall exist—

a. From the start of the take-off run through the climb to 10,000 feet, or the en route phase of flight when cruise altitude is less than 10,000 MSL

b. During the descent from 10,000 feet, or the en route phase of flight, into the terminal area for the approach and landing.

6-7. TWO-CHALLENGE RULE. The two-challenge rule allows one crew member to automatically assume the duties of another crew member 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 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.

6-8. STANDARD CREW TERMINOLOGY

a. Standard Words and Phrases. 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. DOD FLIP contains standard terminology for radio communications. Operator's manuals contain standard terminology for items of equipment. Figure 6-1 is a list of other standard words and phrases that crew members may use.

b. Crew Callouts. Crew callouts are a standard means to effectively communicate actions between the P* and the P in a terminal area during critical phases of flight. By reducing unnecessary cockpit communications, crew callouts increase the situational awareness of both crew members and allow them to focus on flying the aircraft efficiently, staying abreast of traffic and ATC communications. Figure 6-2 contains examples of standardized crew callouts. Crews should not interpret making crew callouts as means to vocalize every action; for example, "Below 197, gear selected down" or during engine start, "Battery charge light on, master caution reset."

c. Standard Brief. The term "Standard Brief" may used during the departure briefing to indicate crew duties and callouts remain the same according to unit requirements.

Abort – To terminate a preplanned maneuver; for example, an aborted takeoff.
Adjusting (Guardrail) – Changing ground speed or track length to sync with the other mission aircraft.
Affirmative – Yes.
Bandit – An identified enemy aircraft.
Bogey – An unidentified aircraft assumed to be enemy.
Braking – Announcement made by the rated crew member (RCM) who intends to apply brake pressure.
Break – Immediate action command to perform a maneuver to deviate from the present ground track; will be followed by "right," "left."
Callout – Command by the P* for a specified procedure to be read from the checklist by another crew member.
Clear – No obstacle present to impede aircraft movement along the intended direction of flight or while taxiing on the ground. Will be followed by direction of movement. *Example: Clear right or left.* Also when preceded by #1 or #2 to indicate that engine area has been visually checked for personnel or other hazards before engine start.
Contact – Traffic in sight or establish communication with….
Correct – Confirms a statement as being accurate or right. Do not use the word "right" to indicate correct.
Correcting – Statement that the P* is taking positive action to correct an out of tolerance flight parameter; for example, drift, altitude, etc.
Drifting – An alert of the unannounced movement of the aircraft on final approach or take-off will be followed by direction. *Example: Drifting Right or Left.*
Egress – Immediate action command to get out of the aircraft.
Execute – Initiate an action.
Expect – Anticipate further instructions or guidance.
Fire light – Announcement of illumination of the master fire warning light.
Go plain/red (Guardrail) – Command to discontinue secure operations.
Go secure/green (Guardrail) – Command to activate secure operations.
Hold – Command to maintain present position.
I have the controls – Used as a command or announcement by the RCM assuming control of the flight controls.
Inside – Primary focus of attention is inside the aircraft.
In sight – Preceded by the word "traffic," "target," "obstacle," or descriptive term. Used to confirm the traffic, target, or obstacle is positively seen or identified.
Maintain – Command to keep or continue the same.
Move forward – Command to taxi the aircraft forward; followed by distance. Also used to announce intended forward or backward movement.
My power – The P* resumes control of the power levers from the P.

Figure 6-l. Examples of standard words and phrases¾ continued

Negative – "No" or "that is not correct."
Normal – Sixty-five-knot check on the takeoff roll indicating the airspeed indicators are alive, autofeather lights are illuminated, and instrument indications are within limits.
Numbers (Guardrail) – An announcement by the base aircraft stating the ground speed, distance to waypoint, and time to waypoint.
Outside – The primary focus is outside the aircraft.
Put me up – Command to place the P*'s radio transmit selector switch to a designated position or to place a frequency in a specific radio.
Report – Command to notify.
Right – Used to indicate a direction only, not to be used in place of "correct."
Rotate – The P callout when the aircraft has obtained V_1 D/H or V_R K/N/P/Q.
Set power – Command by the P* for the P to set takeoff power or maximum available power during a go-around or missed approach.
Stop – Command to go no further; halt present action.
Strobe – Indicates that the AN/APR-39 has detected a radar threat; will be followed by a clock position.
Sync – **(Guardrail)** An announcement that an aircraft is flying the same ground speed, distance to waypoint, and time to waypoint as the base or sync aircraft.
Traffic – Any friendly aircraft that presents a collision hazard; an announcement of traffic will be followed by a clock position, distance, and reference to altitude.
Turn – Command to deviate from the current heading; the command will be followed by the word "right" or "left" and a specific heading.
Up on – Indicates the radio selected; up on will be followed by the position number on the intercommunication system (ICS) panel; for example, "Up on 3."
Verify – Request confirmation of information.
You have the controls – Used as a command or announcement by the RCM relinquishing the flight controls.
Your power – P returning control of the power levers to the P*.
You're up – Announces a specific radio frequency is selected on a selected radio**.** ***You're up on 121.7 on number 1.***

Figure 6-1. Examples of standard words and phrases¾ concluded

6-9. RC-12 CREW COORDINATION CALLOUT. Bold type identifies the crew member who should initiate the call.

a. Takeoff – Applies to a normal takeoff and an instrument takeoff.

TAKEOFF		
ACTION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
POWER LEVERS ADVANCE	**"SET POWER"**	"POWER SET"
65 KNOTS INDICATED (AIRSPEED INDICATORS CHECKED, AND SYSTEMS NORMAL)		**"NORMAL"**
AIRSPEED AT V_1 K/N/P/Q		**"V_1"**
AIRSPEED AT V_R K/N/P/Q OR V_1 D/H		**"ROTATE"**
ABNORMAL OR EMERGENCY CONDITION BEFORE V1 (IDENTIFIED BY P)	"ABORTING"	**"ABORT, ABORT"**
P* ELECTS TO ABORT BEFORE V1	**"ABORTING"** (STATE PROBLEM)	"ROGER"
POSITIVE RATE OF CLIMB (TWO INDICATIONS)	After P "Positive rate" call "GEAR UP"	**"POSITIVE RATE"** "Gear is UP" or "gear did not retract."
FLAPS UP SAFELY AIRBORNE (FLAPS AT TAKEOFF) K/N/P/Q	**"FLAPS UP"**	"FLAPS UP"
FLAPS UP AT V_{YSE} (FLAPS AT TAKEOFF) D/H	**"FLAPS UP"**	"FLAPS UP"

Figure 6-2. Takeoff

b. Climb, Cruise, and Descent. If passing the 1,000-foot prior point and ATC communications is preventing the callout, either crew member may indicate the 1,000-foot prior point by raising the index finger in the view of the other crew member.

CLIMB/CRUISE/DESCENT		
ACTION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
1,000 FEET BEFORE LEVEL OFF	"ROGER"	**"1,000 TO GO"**
DESCENDING THROUGH TRANSITION LEVEL	"30.XX SET LEFT OR RIGHT (AS APPLICABLE)"	**"ALTIMETER 30.XX"**
CLIMBING THROUGH TRANSITION ALTITUDE	"29.92 SET LEFT"	**"29.92" SET RIGHT**

Figure 6-3. Climb, cruise, and descent

c. All Phases of Flight.

ALL PHASES OF FLIGHT		
OBSERVATION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
BANK ANGLE EXCEEDS 30 DEGREES	"CORRECTING"	**"EXCESSIVE BANK ANGLE"**
AIRSPEED DEVIATES +/- 10 KIAS	"INCREASING/DECREASING AIRSPEED"	**"AIRSPEED, __ KNOTS LOW/HIGH"**
ALTITUDE DEVIATES +/- 100 FEET	"INCREASING/DECREASING ALTITUDE"	**"ALTITUDE, __ FEET LOW/HIGH"**
HEADING DEVIATES +/- 10 DEGREES	"CORRECTING LEFT/RIGHT"	**"HEADING, __ DEGREES LEFT/RIGHT"**

Figure 6-4. All phases

d. Instrument Approach. Applies to all instrument approaches except GCA.

INSTRUMENT APPROACH		
ACTION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
INITIAL COURSE/LOCALIZER MOVEMENT	"ROGER"	**"COURSE/LOCALIZER ALIVE"**
COURSE/LOCALIZER CAPTURE	"ROGER"	**"COURSE/LOCALIZER CAPTURED"**
INITIAL GLIDESLOPE MOVEMENT (PRECISION APPROACH)	"ROGER"	**"GLIDESLOPE ALIVE"**
GLIDESLOPE CAPTURE (PRECISION APPROACH)	"ROGER"	**"GLIDESLOPE CAPTURED"**
FAF	"ROGER"	**"TIME"**
1,000 FEET BEFORE DH/MDA	"ROGER"	**"1,000 TO GO"**
500 FEET BEFORE DH/MDA	"ROGER"	**"500 TO GO"**
100 FEET BEFORE DH/MDA	"ROGER"	**"100 TO GO"**

Figure 6-5. All instrument approaches

e. Missed Approach. These callouts apply when—

(1) The aircraft has reached the decision height (DH) or missed approach point (MAP)

at the published minimum decision altitude (MDA), and the appropriate visual reference has not been called in sight.

(2) Wind shear is encountered and is affecting the safe operation of flight.

(3) If—after passing the final approach fix inbound—either the localizer, VHF omnidirectional range (VOR) or global positioning system (GPS) deviation indicator, or glideslope reaches full-scale deflection.

(4) If—upon reaching the DH or MAP—the aircraft is not continuously in a position from which a descent to landing on the intended runway can be made at a normal rate of descent using normal maneuvers, and at a descent rate that will allow touchdown to occur within the touchdown zone of the runway of intended landing.

(5) If— while circling the runway to land—visual contact with the runway environment is lost.

MISSED APPROACH		
ACTION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
STRAIGHT IN APPROACH –REACHING MISSED APPROACH POINT, RUNWAY ENVIRONMENT NOT IN SIGHT	"ROGER, MISSED APPROACH" (FOLLOWED BY MISSED APPROACH ACTIONS)	**"DH" or "TIMES UP" OR "MISSED APPROACH POINT," "NEGATIVE CONTACT, MISSED APPROACH"**
CIRCLING APPROACH – VISUAL CONTACT WITH THE RUNWAY LOST (THE CREW MEMBER MONITORING OUTSIDE WHILE CIRCLING WILL INITIATE THE CALLOUT.)	**"VISUAL CONTACT LOST, EXECUTING MISSED APPROACH"** (FOLLOWED BY MISSED APPROACH ACTIONS) "ROGER, MISSED APPROACH" (FOLLOWED BY MISSED APPROACH ACTIONS)	"ROGER" **"VISUAL CONTACT LOST, EXECUTE MISSED APPROACH"**
GO AROUND SEGMENT AFTER P* INITIATES THE POWER APPLICATION	**"SET POWER"**	"POWER SET"
AFTER VERIFYING TWO POSITIVE CLIMB INDICATIONS	"GEAR UP"	**"POSITIVE RATE"**
FLAPS BEYOND APPROACH	**"FLAPS APPROACH"**	"FLAPS APPROACH"
AIRSPEED REACHES Vref	**"FLAPS UP"**	"FLAPS UP"
WHEN TIME AND ALTITUDE PERMITS	**"MY POWER"**	"YOUR POWER"

Figure 6-6. Missed approach

f. Visual Transition from Instruments.

(1) The P will seek outside references during the approach while cross-monitoring the

P*'s instruments. Should visual reference deteriorate after a sighting call has been made, call "VISUAL CONTACT LOST." If the aircraft has not yet reached the missed approach point, the approach may be continued to DH/MDA.

(2) If your position has passed the missed approach point, the call "MISSED APPROACH," is to be followed by the missed approach actions by the P*.

(3) The key words to indicate to the P* to transition from instruments is when the "CLOCK" position is stated along with a visual cue. The callout indicates to the P* that he can remain in constant visual contact with the runway environment from the callout to landing. The P* must call "VISUAL" before the aircraft continues below DH/MDA. After such call is made, the P assumes primary responsibility for monitoring instrument reference to touchdown, and immediately calling out any deviation from normal operations.

(4) While at MDA on a straight in or circling approaches, the P should callout any deviation in altitude or abnormal approach speeds. If level at MDA, the P will stay level at this altitude until calling "LEAVING MDA."

(5) During a circling maneuver, when the runway is on the P's side, use appropriate callouts to direct the P* when to make turns, with respect to the landing runway, traffic, or any necessary deviations.

INSTRUMENT REFERENCE TO VISUAL		
ACTION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
APPROPRIATE VISUAL REFERENCES IN SIGHT	"ON INSTRUMENTS" (OR OTHER INTENTIONS)	**"APPROACH LIGHTS (OR OTHER FEATURES IDENTIFIABLE WITH RUNWAY ENVIRONMENT) IN SIGHT ; CONTINUE APPROACH (OR OTHER RECOMMENDED ACTION)"**
RUNWAY IN SIGHT	"RUNWAY IN SIGHT, VISUAL"	**"RUNWAY IN SIGHT (CLOCK POSITION), TAKE OVER VISUALLY**"
P* DEPARTS MDA TO LAND	**"LEAVING MDA"**	"ROGER"

Figure 6-7. Visual transition from instruments

g. **Approach Deviations**. The two-challenge rule applies to these callouts.

APPROACH DEVIATIONS		
OBSERVATION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
+/- ONE DOT OF GLIDESLOPE	"CORRECTING (UP/DOWN)"	**"ONE DOT (HIGH/LOW) AND INCREASING/DECREASING"**
+/- ONE DOT OF LOCALIZER/VOR/GPS	"CORRECTING (LEFT/RIGHT)"	**"ONE DOT (LEFT/RIGHT) AND INCREASING/DECREASING"**
+/- 5 DEGREES ON NONDIRECTIONAL RADIO BEACON (NDB) APPROACH	"CORRECTING (LEFT/RIGHT)"	**" 5 DEGREES (LEFT/RIGHT) AND INCREASING/DECREASING"**
+/- 10 KNOTS FROM APPROACH SPEED	"INCREASING/DECREASING AIRSPEED"	**"AIRSPEED, 10 KNOTS LOW/HIGH"**
RATE OF DESCENT EXCEEDS 1,000 FEET PER MINUTE	"REDUCING SINK RATE"	"**SINK RATE (AMOUNT) INCREASING/DECREASING/ HOLDING"**

Figure 6-8. Approach deviations

h. Touch and Go.

TOUCH AND GO		
OBSERVATION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
UPON LANDING WITH ALL THREE GEAR ON THE GROUND.	ADVANCES POWER LEVERS	**"STABILIZE POWER"**
WITH TRIM AND FLAPS RESET TO TAKEOFF POSITION AND ENGINES SPOOLED.	CONTINUES POWER ADVANCE TO PREDETERMINED POWER SETTING	**"ADVANCE POWER"**
ADJUSTS TO TAKEOFF POWER	**"SET POWER"**	"POWER SET" **(**WHEN IS TAKEOFF POWER IS SET)
D/H AIRSPEED AT V_1	REMOVES HANDS FROM POWER LEVERS AND ROTATES	**"ROTATE"**
K/N/P/Q AIRSPEED AT V_1 K/N/P/Q AIRSPEED AT V_R	REMOVES HANDS FROM POWER LEVERS ROTATES	"**V_1**" **"ROTATE"**

Figure 6-9. Touch and go

i. Engine Failures. The callout sequence begins after power has been applied and aircraft is stabilized.

ENGINE FAILURE		
OBSERVATION	**P* CALL/RESPONSE**	**P CALL/RESPONSE**
LOSS OF #1 OR #2 ENGINE BY CONTROL PRESSURES AND/OR INSTRUMENT INDICATIONS	**"CONFIRM #1 OR #2 HAS FAILED"** "**DID THE PROPELLER FEATHER?"**	**"**I CONFIRM #1 /#2 HAS FAILED OR NEGATIVE # __ (OPPPOSITE) HAS FAILED.**"** **"**YES, THE #___ PROP FEATHERED" OR "NO, IT DID NOT FEATHER."
PROPELLER DID NOT FEATHER	**"IDENTIFY THE #1 OR #2 (APPROPRIATE) PROP LEVER"** P* VISUALLY CONFIRMS THE CORRECT PROP LEVER HAS BEEN IDENTIFIED. **"I AGREE, FEATHER THE PROP" OR** **"NEGATIVE, RE-IDENTIFY THE #__ PROP"**	P PLACES INDEX FINGER ON THE APPROPRIATE PROP LEVER."#1 OR #2 PROP LEVER IDENTIFIED" WHEN DIRECTED BY THE P*, MOVE THE PROP TO FEATHER. "PROP FEATHERED."
REACHING THE DESIGNATED AIRSPEED ACCORDING TO THE OPERATOR'S MANUAL FOR ENGINE FAILURES DURING TAKEOFF OR SINGLE ENGINE GO-AROUNDS.	**"FLAPS UP"**	"FLAPS UP"

Figure 6-10. Engine failure

GLOSSARY

ACRONYMS AND ABBREVIATIONS

AC	advisory circular
ACS	aerial common sensor
AEB	aerial exploitation battalion
AFM	aircraft flight manual
AGL	above ground level
AHO	above highest obstacle
AGE	air ground equipment
AIM	aeronautical information manual
AL	Alabama
ALSE	aviation life support equipment
ALT	altitude
AMC	air mission commander
AMCOM	U.S. Army Aviation and Missile Command
AP	autopilot
APART	annual proficiency and readiness test
AP/FD	autopilot/flight director
APO	Army post office
AQL	Advanced Quick Look
AR	Army regulation
ARDF	airborne radio direction finding
ARNG	Army National Guard
ARTCC	air route traffic control center
ASA	Army Security Agency
ASE	aircraft survivability equipment
ASE/ACS	aircraft survivability equipment/avionics control system
ASET	aircraft survivability equipment trainer
ASOS	automated surface observing system
ASR	airport surveillance radar
ATC	air traffic control
ATIS	automated terminal information service
ATM	aircrew training manual
ATP	aircrew training program
attn	attention
avail	available
AVUM	aviation unit maintenance
AWOS	automated weather observing system

C	Celsius
cal	calibrated
CAT	category
CATS	combined arms training strategy
CBI	computer-based instruction
CDB	course deviation bar
CDI	course deviation indicator
CFR	Code of Federal Regulations
CG	center of gravity
CHAALS	communication high accuracy airborne location system
CL	checklist
cm	centimeter
CNGB	Chief, National Guard Bureau
co	company
COMINT	communications intelligence
COMSEC	communications security
CONT	continuous or control
CONUS	continental United States
COR	contractor officer representative
CTL	commander's task list
CWA	center weather advisory
CWS	control wheel steering
BIT	built-in test
D	demonstrated
DA	Department of the Army
DH	decision height
DHN	Dothan
DISC	disconnect
DME	distance measuring equipment
DOD	Department of Defense
DES	Directorate of Evaluation and Standardization
DR	dead reckoning
DTS	data transfer system
EADI	electronic attitude director indicator
ECCM	electronic counter-countermeasures
EFIS	electronic flight instrument system
EGPWS	enhanced ground proximity warning system
EHSI	electronic horizontal situation indicator
ELINT	electronic intelligence

EMER or emerg	emergency
eng	engine
equip	equipment
ESM	electronic warfare support mission
ETA	estimated time of arrival
ETE	estimated time en route
ETP	exportable training package
EVAL	evaluation
EW	electronic warfare
FAA	Federal Aviation Administration
FAC	flight activity category
FAF	final approach fix
FAR	Federal Aviation Regulations
FAT	free air temperature
FC	field circular
FD	flight director
FIH	Flight Information Handbook
FL	flight level
FLIP	flight information publication
flt	flight
FM	field manual or frequency modulated
FMS	flight management system
FMT	frequency management table
FP	flight plan
FPM	feet per minute
FW	fixed-wing
G	gravity (G force)
GCA	ground control approach
GCI	ground-controlled intercept
GMP	ground mapping
GPF	ground processing facility
GPS	global positioning system
gr	grade
GRAMPS	Guardrail Aviation Mission Planning Station
GR/CS	Guardrail/Common Sensor
GROUND FINE	The region of the power lever control that is aft of the idle stop and forward of reversing range where blade pitch angle and gas generator RPM can be changed.
GWT	gross weight

HAT	height above touchdown
HIWAS	hazardous inflight weather advisory service
HDG	heading
HQDA	Headquarters, Department of the Army
hr	hour
I	instrument
IAS	indicated airspeed
IATF	individual aircrew training folder
ICAO	International Civil Aviation Organization
ID	identification
IE	instrument examiner
IFF	identification, friend or foe (radar)
IFR	instrument flight rules
ILS	instrument landing system
IMC	instrument meteorological conditions
incl	included
ind	indicated
INS	inertial navigation system
IP	instructor pilot
IPF	integrated processing facility
ITO	instrument takeoff
KIAS	knots indicated airspeed
lb	pound(s)
LD	lift-drag ratio
LDA	localizer directional aid
LOC	localizer
MAP	missed approach point; mapping (ground)
MAWP	missed approach waypoint
max	maximum
MDA	minimum decision altitude
METAR	aviation routine weather report
METL	mission essential task list
MFD	multi-function display
mhz	megahertz
MI	military intelligence
MIJI	meaconing, intrusion, jamming, and interference
min	minimum

MM/MTPC	maintenance manager/maintenenace test pilot course
mod	modified
MOPP	mission-oriented protective posture
MOS	military occupational specialty
MP	maintenance test pilot
MSL	mean sea level
MTF	maintenance test flight
N	night
NA	not applicable
NAP	normal antenna position
NAS	National Airspace System
NATO	North Atlantic Treaty Organization
nav	navigation
NAVAID	navigational aid
NBC	nuclear, biological, chemical
NDB	nondirectional radio beacon
N1	gas generator RPM
NGR	National Guard Regulation
NM	nautical mile
no	number
NOFORN	no foreign nationals
NOTAM	notice to airmen
NVG	night vision goggles
OCONUS	outside continental United States
ONS	Omega navigation system
OPSEC	operational security
P*	pilot flying
P	pilot not flying
PA	pressure altitude
PAPI	precision approach path indicator
PAR	precision approach radar
PAX	passengers
PC	pilot in command
PFE	proficiency flight evaluation
PI	pilot
PIREP	pilot weather report
POI	program(s) of instruction
PPC	performance planning card
psi	pounds per square inch
PWR	power

QNE	altimeter setting of 29.92 inches of mercury
QNH	local altimeter setting
QRC	quick reaction capability
RA	resolution advisory
RAIM	receiver autonomous integrity monitoring
RC	Reserve components
R/C	rate of climb
REL	required equipment listing
RL	readiness level
RMI	radio magnetic indicator
RNAV	area navigation
RPM	revolutions per minute
RTA	receiver transmitter antenna
RCT	rain echo attenuation compensation technique
RU	reconnaissance utility
S	satisfactory
SAT	Systems Approach to Training
SCT	sector
SDF	Strategic Defense Forces or simplified directional facility
SFAR	Special Federal Aviation Regulation
SIF	selective identification feature
SINCGARS	single channel ground and air radio system
SL	sea level
SOI	signal operation instructions
SOP	standing operating procedure
SP	standardization instructor pilot
SSN	social security number
STAB	stabilization
static power	take off power applied before brake release
STBY	standby
TA	traffic advisory
TACAN	tactical air navigation
TACS	tactical air control system
TAD	terrain awareness and display
TAF	terminal aerodrome forecast
TAMMS-A	The Army Maintenance Management System—Aviation
TAS	true airspeed
TAWS	terrain avoidance warning system
TC	training circular

TCAS	traffic alert and collision avoidance system
TCS	touch control steering
TDA	tables of distribution and allowances
TEC	Training Extension Course
TGT	turbine gas temperature; target
TIP	threat identification position
TM	technical manual
T/O	takeoff
TOD	top of descent; time of day
TOE	table(s) of organization and equipment
TOLD	takeoff and landing data
TRADOC	United States Army Training and Doctrine Command
TST	test
U	unsatisfactory
UHF	ultra high frequency
USAAVNC	United States Army Aviation Center
U.S.	United States (of America)
USAIC	U.S. Army Intelligence Center
USAF	United States Air Force
USAR	United States Army Reserve
UT	unit trainer
VASI	visual approach slope indicator
VDP	visual descent point
VFR	visual flight rules
VHF	very high frequency
VLF	very low frequency
VMC	visual meteorological conditions
VOR	VHF omnidirectional range
VORTAC	VOR and TACAN (colocated)
VS	vertical speed
V-Speeds	
V_1	takeoff decision speed
V_2	takeoff safety speed
V_a	maximum-design maneuvering speed
V_{app}	approach speed (V_{ref} +xx)

$\mathbf{V_b}$	turbulence penetration speed
$\mathbf{V_c}$	design-cruising speed
$\mathbf{V_{enr}}$	single-engine en route climb speed
$\mathbf{V_f}$	design-flap speed
$\mathbf{V_{fe}}$	maximum flap-extended speed
$\mathbf{V_{le}}$	maximum landing-gear extended speed
$\mathbf{V_{lo}}$	maximum landing-gear operating speed
$\mathbf{V_{lof}}$	lift-off speed (rotation speed +3 knots)
$\mathbf{V_{mca}}$	minimum control-speed with critical engine inoperative airborne.
$\mathbf{V_{mcg}}$	minimum control-speed with critical engine inoperative ground.
$\mathbf{V_{mo}}$	maximum operating-limit speed
$\mathbf{V_{ne}}$	never-exceed speed
$\mathbf{V_r}$	rotation speed
$\mathbf{V_{ref}}$	the indicated airspeed the airplane should have on the approach path when the airplane is approximately 50 feet higher than the intended touchdown point in the landing configuration. It is the approach speed shown in the aircraft operator's manual.
$\mathbf{V_{ref}}$**+10 KIAS**	final-approach speed
$\mathbf{V_{ref}}$**+20 KIAS**	base-leg speed or instrument approach speed
$\mathbf{V_{ref}}$**+30 KIAS**	speed after landing gear has been lowered on downwind
$\mathbf{V_s}$	the stalling speed or the minimum steady flight speed at which the airplane is controllable.

V_{so}	the stalling speed or the minimum steady flight speed in the landing configuration.
V_{S1}	the stalling speed or the minimum steady flight speed obtained in a specific configuration.
V_{sse}	the safe twin-engine operative speed selected to provide a reasonable margin against the occurrence of an unintentional stall when making intentional dynamic (abrupt) engine cuts during the climb after takeoff.
V_{yse}	best single-engine, rate-of-climb speed
V_{50}	two-engine airspeed at 50 feet during a normal takeoff
WOD	word of day
wt	weight
wx	weather
XPDR	transponder
Z	Greenwich mean time
ZIP	zip code

REFERENCES

SOURCES USED

These sources are quoted or paraphrased in this publication.

Army Regulations

AR 95-1, Aviation Flight Regulations, 1 September 1997.
AR 385-95. Army Aviation Accident Prevention. 10 December 1999.

Department of the Army Pamphlets

DA Pam 351-4. U.S. Army Formal Schools Catalog. 31 October 1995.
DA Pam 738-751. Functional Users Manual for The Army Maintenance Management System—Aviation (TAMMS-A). 15 March 1999.

Department of Defense Airman's Information Manual

DOD AIM 86-100. Operation and Maintenance Overview General Tri-Service Mode 4 Handbook. May 1987.

This publication is available from Commanding Officer, ATTN: Code 2111, Naval Electronic Systems Engineering Activity, St. Inigoes, MD 20684-0010, or WR-ALC/LYLR-AIMS, ATTN: DOD AIMSPO, Robins AFB, GA 31098-5609.

DOD Training Literature

USAF C-12C/D. Pilot Qualification—Maneuver Information File, dated May 1999.
USN UC-12B/F/M. Replacement Pilot Flight Training Form (5-92).

Federal Aviation Administration Publications

Advisory Circulars

AC00-24B. Thunderstorms.
AC00-54. Pilot Windshear Guide.
AC20-68B. Airborne Radar Safety.
AC20-131A. Airworthiness Approval of Traffic Alert and Collision Avoidance Systems (TCAS II) and Mode S Transponders.
AC60-22. Aeronautical Decision Making.
AC61-21A. Flight Training Handbook.
AC61-67B. Stall and Spin Awareness Training.
AC120-55A. Air Carrier Operational Approval and Use of TCAS II.

Title 14 , United States Code of Federal Regulations (Chapters I and III)

Federal Aviation Regulations:

Part 1: Definitions and Abbreviations.
Part 23: Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes.
Part 25: Airworthiness Standards: Transport Category.
Part 61: Certifications: Pilots and Flight Instructions.
Part 91: General Operating and Flight Rules.
SFAR 41: Turbine Airplanes.

Practical Test Standards:

FAA-S-8081-5C. ATP Practical Test Standards for Airplane (Change 1). Airline Transport Pilot and Aircraft Type Rating for Airplane. 26 October 1998.
FAA-S-8081-12A. Commercial Pilot (Airplane) Practical Test Standards (PTS) (Change 1, 2, and 3), Commercial Pilot Practical Test Standards for Airplane (SEL, MEL, SES, SEL). May 1997.

Operator's Manual

KLN-90B, Bendix/King TSO'd GPS Navigation System, December 1994.

Other

Aircraft Type Certificates Issued by the Federal Aviation Administration to the U.S. Army C-12 and RC-12 (Number A24CE).
FAA-P-8740-24. Tips on Winter Flying.

Field Manuals

FM 1-300. Flight Operations Procedures. 15 July 1998.
FM 3-3. Chemical and Biological Contamination Avoidance. 16 November 1992.
FM 3-100. Chemical Operations Principles and Fundamentals. 8 May 1996.

International Standardization Agreement

STANAG 3114 (Edition Six)/Air Standard 60-16. Aeromedical Training of Flight Personnel 22 October 1986.

Technical Manuals

TM 9-1095-206-12&P. Operator's and Aviation Unit Maintenance and Aviation Intermediate Maintenance Manual (Including Repair Parts and Special Tools Lists) for Disperser, General Purpose Aircraft: M130 PN 9311430, 18 July 1995.
TM 9-1095-206-30& P. Aviation Intermediate Maintenance Manual (Including Repair Parts and Special Tools Lists) for Disperser, General Purpose Aircraft: M130 PN 9311430 (NSN 1095-01-036-6886), 18 July 1995.
TM 11-5841-283-12. Aviation Unit Maintenance Manual for Radar Signal Detecting Set,

AN/APR-39(V). 9 August 1983.
TM 11-5841-291-12. Operator's and Organizational Maintenance Manual (Aviation Unit Maintenance) for Radar Warning Systems, AN/APR-44(V)1 and AN/APR 44(V)3, 14 April 1983.
TM 11-5865-200-12. Operator's and Aviation Unit Maintenance Manual Aviation Unit Maintenance (AVUM) Countermeasures Sets, AN/ALQ-144(V)1 and AN/ALQ-144(V)3. 15 July 1991.
TM 11-5865-202-12. Operator's and Aviation Unit Maintenance Manual for Countermeasures Set, AN/ALQ-136 (V)1, AN/ALQ-136 (V) 5. 1 August 1986.
TM 11-5865-229-12. Operator's and Aviation Unit Maintenance Manual for Countermeasures Set, AN/ALQ-162(V)2. 30 November 1990.
TM 11-5865-263-12. Operator's and Aviation Unit Maintenance (AVUM) Manual for Countermeasures Sets An/ALQ-156 (V) 1, (V)2, (V)3, and (V)1. September 1996.
TM 11-5895-1199-12. Operator's and Organizational Maintenance for Mark-XII IFF System (AN/APX-100; AN/APX-72). 1 July 1984.
TM 55-1500-342-23. Army Aviation Maintenance Engineering Manual for Weight and Balance. 29 August 1986.

DOCUMENTS NEEDED

These documents must be available to the intended users of this publication.

Army Regulations

AR 40-8. Temporary Flying Restrictions Due to Exogenous Factors. 17 August 1976.
AR 40-501. Standards of Medical Fitness, 30 August 1995.
AR 95-1. Flight Regulations. 1 September 1997.
AR 95-2. Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigation Aids. 10 August 1990.
AR 95-10. DOD Notice to Airman (NOTAM) System. 1 January 1997.
AR 600-105. Aviation Service of Rated Army Officers. 15 December 1994.
AR 600-106. Flying Status for Nonrated Army Aviation Personnel. 8 December 1998.

Department of the Army Forms

DA Form 759. Individual Flight Record and Flight Certificate—Army. April 1998.
DA Form 2028. Recommended Changes to Publications and Blank Forms. 1 February 1974.
DA Form 2408-12. Army Aviator's Flight Record. January 1992.
DA Form 2408-13. Aircraft Status Information Record. October 1991.
DA Form 2408-13-1. Aircraft Maintenance and Inspection Record. October 1997.
DA Form 5484-R. Mission Schedule/Brief. February 1996.
DA Form 7120-R. Commander's Task List. August 1995.
DA Form 7345-R GR/CS Takeoff and Landing Data Card. December 2001.
DA Form 7444-R. RC-12 Takeoff and Landing Data Card. December 2001.

DA Forms are available on the Army Electronic Library (AEL) CD-ROM (EM 0001) and the USAPA web site (www.usapa.army.mil).

Department of the Army Pamphlets

DA Pam 738-751. Functional Users Manual for The Army Maintenance Management System—Aviation (TAMMS-A). 15 March 1999.

Department of Defense Flight Information Publications

Flight Information Handbook.

DOD Flight Information Publications are available from Director, U.S. Army Aeromedical Services Agency, ATTN: MOAS-AI, Cameron Station, Alexandria, VA 22304-5050.

Defense Logistics Agency Manual

DLAM 8210, Section 3.4 (Publications).

Department of Defense Forms

DD Form 365-4. Weight and Balance Clearance Form F—Transport/Tactical. August 1996.

DD Forms are available from the Office Secretary of Defense (OSD) web site (www.dior.whs.mil/ICDHOME/DDEFORMS.HTM).

Federal Air Regulations

Aeronautical Information Manual.

FAR Part 91. General Operating and Flight Rules. March 1974.

This publication is available from Director, U.S. Army Aeronautical Services Agency, ATTN: MOAS-AI, Cameron Station, Alexandria, VA 22304-5050.

Field Manuals

FM 1-202. Environmental Flight. 23 February 1983.
FM 1-203. Fundamentals of Flight. 3 October 1988.
FM 1-230. Meteorology for Army Aviators. 30 September 1982.
FM 1-240. Instrument Flying and Navigation for Army Aviators. 15 December 1984.
FM 1-400. Aviator's Handbook. 31 May 1983.
FM 3-04.301. Aeromedical Training for Flight Personnel, 29 September 2000.
FM 21-26. Map Reading and Land Navigation. 7 May 1993.
FM 44-80. Visual Aircraft Recognition. 30 September 1996.

Technical Order

T.O. IC-12A-1.

TRADOC Regulation

TRADOC Regulation 350-370. Systems Approach to Training – Management, Processes, and Products. 9 March 1999.

Training Circulars

TC 1-204. Night Flight Techniques and Procedures. 27 December 1988.

TC 1-210. Aircrew Training Program: Commander's Guide to Individual and Crew Standardization. 3 October 1995.

Technical Manuals

TM 1-1500-204-23-1. Aviation Unit Maintenance (AVUM) and Aviation Intermediate Maintenance (AVIM) Manual for General Aircraft Maintenance (General Maintenance and Practices) Volume I. 31 July 1992.

TM 1-1500-204-23-2. (Pneudraulics Maintenance and Practices), Volume 2. 31 July 1992.

TM 1-1500-204-23-3. (Maintenance Practices for Fuel and Oil Systems), Volume 3. 31 July 1992.

TM 1-1500-204-23-4. (Electrical and Instrument Maintenance Procedures and Practices, Volume 4. 31 July 1992.

TM 1-1500-204-23-5. (Propeller, Rotor, and Powertrain Maintenance Practices), Volume 5. 31 July 1992.

TM 1-1500-204-23-6. (Hardware and Consumable Materials), Volume 6. 31 July 1992.

TM-1-1500-204-23-7. (Nondestructive Testing for Flaw Detection Procedures and Practices), Volume 7. 31July 1992.

TM 1-1500-204-23-8. (Machine and Welding Shop Practices), Volume 8. 31 July 1992.

TM 1-1500-204-23-9. (Tools and Ground Support Equipment), Volume 9. 31 July 1992.

TM 1-1500-204-23-10. (Sheet Metal Shop Practices), Volume 10. 31 July 1992.

TM 1-1500-328-23. Aeronautical Equipment Maintenance Management Policies and Procedures. 30 July 1999.

TM 1-1510-223-10. Operator's Manual for Army Model RC-12N Aircraft . 29 April 1994.

TM 1-1510-223-CL. Operator's and Crewmember's Checklist for Army Model RC-12N Pilot's Checklist. 1 January 2001.

TM 1-1510-223-MTF. Maintenance Test Flight Manual for Army Model RC-12N. 28 February 1995.

TM 1-1510-224-10. Operator's Manual for Army Model RC-12P Aircraft and RC 12Q Aircraft. 31 December 1998.

TM 1-1510-224-CL. Operator's and Crewmember's Checklist for Army Models RC-12P and RC-12Q Aircraft. 31 December 1998.

TM 1-1510-224-MTF. Maintenance Test Flight Manual for Army Model and RC-12P and RC 12-Q 16 May 1997.

TM 11-5841-283-12. Aviation Unit Maintenance Manual for Radar Signal Detecting Set, AN/APR-39(V). 9 August 1983.

TM 11-5841-291-12. Operator's and Organizational Maintenance Manual (Aviation Unit Maintenance) for Radar Warning Systems AN/APR-44(V) 1 and AN/APR-44(V)3. 14 April

1983.
TM 11-5865-200-12. Operator's and Aviation Unit Maintenance Manual for Aviation Unit Maintenance (AVUM) for Countermeasures Sets, AN/ALQ-144A(V)1 and AN/ALQ-144A (V)3. 15 July 1991.
TM 11-5865-202-12. Operator's and Aviation Unit Maintenance Manual for Countermeasures Set, AN/ALQ-136(V)1 and AN/ALQ-136 (V) 5. 1 August 1986.
TM 11-5865-229-12. Operator's and Aviation Unit Maintenance Manual for Countermeasures Set, AN/ALQ-162(V)2. 30 November 1990.
TM 11-5865-263-12. Operator's and Aviation Unit Maintenance (AVUM) for Countermeasures Sets AN/ALQ-156(V)1, (V)2, (V3) (V1). 1 September 1996.
TM 11-5895-1199-12. Operator's and Organizational Maintenance for Mark-XII IFF System (AN/APX-100; AN/APX-72). 1 July 1984.
TM 55-1500-342-23. Army Aviation Maintenance Engineering Manual, Weight and Balance. 29 August 1986.
TM 55-1510-219-10. Operator's Manual for Army Model RC-12D, 30 May 1991.
TM 55-1510-219-CL. Operator's and Crewmember's Checklist for Army Model RC-12D Aircraft. 31 May 1991.
TM 55-1510-221-10. Operator's Manual for Army Model RC-12H Aircraft. 30 December 1988.
TM 55-1510-221-CL. Operator's and Crewmember's for Checklist Army Model RC-12H. 30 December 1988.
TM 55-1510-221-MTF.
TM 55-1510-222-10. Operator's Manual for Army Model RC-12K Aircraft. 30 January 1992.
TM 55-1510-222-CL. Operator's and Crewmember's Checklist for Army Model RC-12K Pilot's Checklist. 30 June 1992.
TM 55-1510-222-MTF. Maintenance Test Flight Manual for Army Model RC-12K. Pilot's Checklist. 30 April 1991.

Miscellaneous Publications.

Operator's Manual for High Accuracy Carousel IV-E Inertial Navigation System. April 1986. This publication is available from Delco Systems Operations, Delco Electronics Corporation, 6767 Hollister Avenue, Goleta, California 93117.

Aircraft Survivability/Avionics Control System (ASE/ACS) for the RC-12 Guardrail Common Sensor Aircraft). September 1996.

ASE/ACS Checklist.
ASE/ACS Operator's Manual.
ASE/ACS Source Data Book. 3 April 1995.

INDEX

This index is organized alphabetically by topics and subtopics. Topics and subtopics are identified by page numbers.

GR/CS TAKEOFF AND LANDING DATA CARD

For use of this form, see TC 1-219; the proponent agency is TRADOC.

TAKEOFF CONDITIONS		
TEMP C°	PA	
TAKEOFF WEIGHT	RUNWAY AVAIL	
STATIC POWER		
FLAPS	**0%**	**40%**
Tire Speed Limit		
V_1		
V_R		
V_2		
Takeoff Distance		
Accelerate-Stop		

LANDING DATA	
Vref	LAND DISTANCE
OPTIONAL	

DA FORM 7345-R, DEC 2001 USAPA V1.00

EDITION OF AUG 94 IS OBSOLETE

ONE ENGINE INOPERATIVE TAKEOFF CONDITIONS		
FLAPS	**0%**	**40%**
Max Takeoff Weight for One Engine Climb at Lift-off		
Accelerate - Go (_____)		
Net Takeoff Flight Path First Segment _____%		
Net Takeoff Flight Path Second Segment (V_2) _____%		
Net Takeoff Flight Path Third Segment (V_{enr}) _____%		
Adjusted Takeoff Weight		
REMARKS		

RC-12D/H TAKEOFF AND LANDING DATA CARD

For use of this form, see TC 1-219; the proponent agency is TRADOC.

TAKEOFF CONDITIONS		
STATION	RUNWAY AVAIL	
TEMP C°	PA	
TAKEOFF WEIGHT	TAKEOFF POWER	
FLAPS	**0%**	**40%**
V_1		
V_2		
V_{yse}		
Takeoff Distance		
Accelerate - Stop		

LANDING DATA	
Vref	LAND DISTANCE
OPTIONAL	

DA FORM 7444-R, DEC 2001 USAPA V1.00

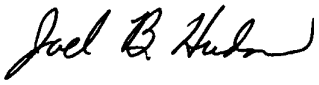
ONE ENGINE INOPERATIVE TAKEOFF CONDITIONS		
FLAPS	**0%**	**40%**
Positive Climb at Lift-off		
Accelerate - Go (_____)		
Single Engine Gradient of Climb (V_2) _____ %		
Climb One Engine Inoperative (V_{yse}) _____ %		
Adjusted Takeoff Weight		
REMARKS		

TC 1-219
3 JUNE 2002

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0212003

DISTRIBUTION:

Active Army, Army National Guard, and US Army Reserve: To be distributed in accordance with the initial distribution number 115257, requirements for TC 1-219.

PIN: 72984