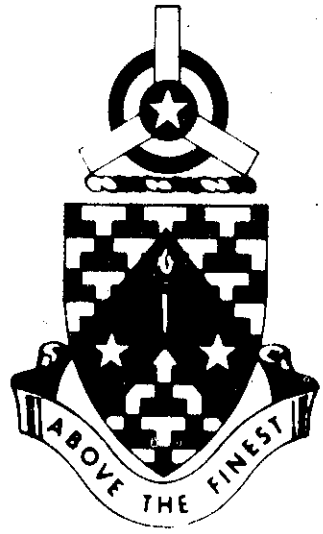
PROGRAMED TEXT

NORMAL TAKEOFF FROM AND APPROACH TO THE GROUND

AM-53



JANUARY 1969

UNITED STATES ARMY
PRIMARY HELICOPTER SCHOOL
FORT WOLTERS, TEXAS

PROGRAMED TEXT

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FILE NO: AM-53

PROGRAM TITLE NORMAL TAKEOFF FROM AND APPROACH TO THE GROUND

POI SCOPE: Explanation of a helicopter takeoff from the ground and a landing to the ground.

INSTRUCTOR REFERENCES:

Primary Helicopter Flight Training Manual
Sec IV, Pg 5-7

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DATE: August 1968

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DATE: January 1969

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DATE: February 1969

TABLE OF CONTENTS

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Normal Takeoff From and Approach to the Ground

PREFACE

This program is designed to acquaint you with the procedures in performing a normal takeoff from the ground and an approach to the ground. This program will only tell you what to do and what to look for. Proficiency in the maneuvers can only be gained in actual practice.

Start with frame 1 and work each frame in succession. Each frame will usually ask you a question. The correct answer is printed on the top of the next frame. If you were incorrect, turn back and restudy the information before continuing on to the next frame. When you have finished the text, complete the self evaluation exercise. Now begin by studying the performance objectives on page iv.

PERFORMANCE OBJECTIVES

Upon the completion of this programed text, you will know and be able to select the correct

1. purpose, preparatory procedures, and technique for the normal takeoff from the ground.

2. Purpose and technique for the approach to the ground.

TAKE-OFF FROM THE GROUND

FRAME 1

The normal take-off from the ground is used to move the helicopter from the ground into translational lift and a normal climb with a minimum amount of power. Quite often it is used when an aircraft is heavily loaded and the most efficient use of available engine power is needed.

The normal take-off from the ground should require ~~c~~ a manifold pressure than a normal take-off.

a. less
b. more
c. the same

TURN TO PAGE 3 FOR FRAME 2

ANSWER: b. used too much forward cyclic. Starting the takeoff too nose low will require excessive power.
b. hold a 3 foot altitude until effective translational lift is attained.

FRAME 4

As you accelerate to translational lift, the helicopter will begin to climb. Adjust attitude and power if necessary to continue the climb in the same manner as a normal takeoff from a hover.

Your goal on this maneuver, under normal wind conditions, is to attain effective translational lift at the same time you reach a 3 foot altitude.

delete

Remember: The purpose of the takeoff is to use a minimum amount of power. You should be able to complete the takeoff using no more than hover power under most wind conditions.

After effective translational lift is obtained

a. some forward cyclic may be required to adjust climb attitude.
b. some rearward cyclic may be required to adjust climb attitude.

The purpose of the normal takeoff from the ground is

a. to aid the aviator who cannot skillfully hover.
b. to aid the aviator whose aircraft is heavily loaded requiring the most efficient use of available engine power.

ANSWER: a. less

FRAME 2

In order to prepare for a normal takeoff from the ground you must

a. execute a clearing turn
b. land 3 feet behind panel
c. collective full down
d. reduce RPM (below green line)
e. clear - behind - overhead - and to each side
f. pick out objects to line up with
g. check engine instruments and you are ready to go.

Which of the above steps are not performed when executing a normal takeoff from a hover?

a. a, e, and g
b. b, c, and d
c. b, c, and f
d. b, d, and g

ANSWER: a. some forward cyclic may be required to adjust climb attitude.
b. to aid the aviator whose aircraft is heavily loaded requiring the most efficient use of available engine power.

APPROACH TO THE GROUND

FRAME 5

The normal approach to the ground is used when it is known or suspected that sufficient power is not available to terminate at a 3 foot hover.

The approach is most commonly used when landing a helicopter under the following conditions.

fully loaded.
under high density altitude conditions.
in loose snow or dust.

An approach to the ground should require *less* manifold pressure than a normal approach to a hover.

a. more.
b. less.

ANSWER: b. b, c, and d

FRAME 3

To initiate the takeoff, increase to takeoff RPM and increase collective pitch until the aircraft becomes light on the skids. Hesitate momentarily and adjust cyclic and pedals to prevent any ground movement. Now, continue to apply collective pitch and as the aircraft breaks ground apply slight amount of forward cyclic as necessary to assure forward movement as you slowly gain altitude. The aircraft should gain altitude to 3 feet, then maintain a 3 foot altitude until you reach effective translational lift.

If you require excessive power to complete the takeoff, you probably

a. used too litle forward cyclic.
b. used too much forward cyclic.

If you have reached an altitude of 3 feet, but have not gained effective translational lift

a. continue to climb until effective translational lift is attained.
b. hold a 3 foot altitude until effective translational lift is attained.
c. abort takeoff.

RETURN TO PAGE 2 FOR FRAME 4

ANSWER: b. less

FRAME 6

The same procedures are followed in an approach to the ground as in a normal approach except for the termination. The approach should be terminated to the ground 3 feet behind the panel with no ground run. The skids should be level as ground contact is made.

Remember, the aircraft will tend to stop 4" to 6" above the ground just as it does when landing from a hover, so watch for it.

The angle of descent on a normal approach to the ground is

a. 15°.
b. 20°.
c. 12°.

The helicopter will tend to stop 4" to 6" above the ground due to

a. loss of ground effect.
b. increased ground effect.

You have properly executed an approach to the ground if you

a. terminate 3 feet behind the panel with no forward movement on ground contact.
b. terminate on the panel with no forward movement on ground contact.

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ANSWER: c. 12°
b. increased ground effect.
a. terminate 3 feet behind the panel with no forward movement on ground contact.

NORMAL TAKE-OFF FROM THE GROUND AND APPROACH TO THE GROUND

SELF EVALUATION EXERCISE

1. The purpose of a normal takeoff from the ground is:

a. to move the helicopter from place to place on the ground using skids and power.
b. to move the helicopter from point to point with maximum amount of power and translational lift.
c. to get helicopter airborne using maximum power.
d. to move the helicopter from a position on the ground into translational lift and normal climb with a minimum amount of power.

2. The preparatory procedures for the normal takeoff from the ground are executed as follows:

a. land on panel, collective neutral, increase RPM, line up for takeoff.
b. execute a clearing turn, land 3 feet behind panel, collective down, reduce RPM, clear behind, overhead, and to each side, pick out objects in front of aircraft to line up during takeoff.
c. collective down, reduce RPM, sit down on panel, line up aircraft, clear behind, overhead, and to each side. Pick out an object and take off.
d. execute clearing turn, reduce RPM, pick out objects in front of aircraft and take off.

3. One of the techniques used to accomplish normal takeoff from the ground is:

a. turn throttle to increase to proper RPM, move collective smoothly upward until aircraft is light on skids.
b. increase RPM until 3 feet above ground in a good hover, collective in up position, manifold pressure reads correctly.
c. increase RPM by use of throttle, collective down, hover, and apply pedal for takeoff.
d. move pedals smoothly, increase RPM, collective in neutral, hover at 3 feet above the ground and take off.

4. On takeoff, starting with nose too low would:

a. have no effect.
b. require a reduction in RPM.
c. require extreme pedal adjustment.
d. require excessive power.

5. You should be able to complete the takeoff under most wind conditions, using no more than

   a. necessary power.
   b. hover power.
   c. takeoff power.
   d. climb power.

6. Approach to ground, when it is known or suspected that sufficient power is not available to terminate at a 3 foot hover, is most commonly used when

   a. landing a helicopter fully loaded.
   b. landing at a high density altitude condition.
   c. landing in loose snow or dust.
   d. all of the above.

7. The approach should be terminated to the ground

   a. six feet behind the panel with no ground run.
   b. on the panel with little or no ground run.
   c. three feet behind the panel with no ground run.
   d. on the panel with no ground run.

8. During termination

   a. the skids should be level as ground contact is made.
   b. a constant airspeed should be maintained.
   c. RPM should be reduced to prevent float.
   d. stop at a 3 foot hover then slowly reduce power.

9. During a normal approach to the ground, you should maintain a constant angle of

   a. 15 degrees.
   b. 12 degrees.
   c. 10 degrees.
   d. 8 degrees.

10. As you accelerate to translational lift during normal takeoff from the ground, the helicopter will begin to

    a. hover.
    b. drop.
    c. climb.
    d. none of the above.

ANSWERS TO SELF EVALUATION EXERCISE

1. d
2. b
3. a
4. d
5. b
6. d
7. c
8. a
9. b
10. c

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