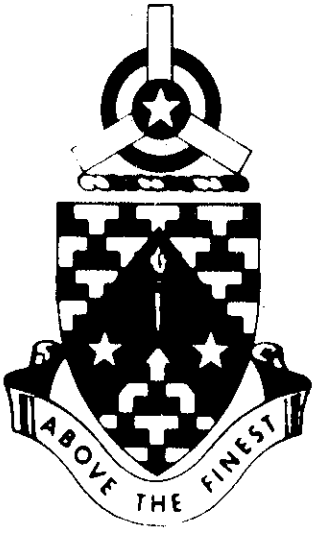
PROGRAMED TEXT

DECELERATIONS AND QUICK STOPS

AM-44



JUNE 1968

UNITED STATES ARMY
PRIMARY HELICOPTER SCHOOL
FORT WOLTERS, TEXAS

PROGRAMED TEXT

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FILE NO: AM-44

PROGRAM TITLE

DECELERATIONS AND QUICK STOPS

POI SCOPE: Explanation of helicopter deceleration, quick stops, and ground taxing.

INSTRUCTOR REFERENCES:

Primary Flight Training Manual (Fort Wolters) Sec III pg 13-14, Sec IV pg 6-8

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TABLE OF CONTENTS

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PREFACE

This program is designed to familiarize you with the proper procedures involved in executing decelerations and quick stop maneuvers. The proper knowledge and application of these procedures will enable you to act promptly and efficiently in an emergency.

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 completion of this programed text, you will be able to:

1. Determine the purpose of the maneuvers.
2. Identify the response obtained from the flight controls.
3. Identify the need of proper pedal and RPM control during abrupt power changes.
4. Realize the potential hazard of an extremely tail low attitude near the ground.

FRAME 1

By now you are aware of the major response you get from the aircraft when any one flight control is moved. Match the number in the left column, indicating the control used, to the aircraft's major response in the right column.

Control Movements	A/C Response
a. Collective down	i 1. A/C moves left
b. Throttle increased	J 2. RPM decreases
c. Cyclic back	f 3. A/C nose turns right
d. Left pedal	h 4. A/C will climb
e. Cyclic right	c 5. A/C will move back
f. Right pedal	b 6. Oil pressure will increase
g. Cyclic forward	a 7. A/C will descend
h. Collective up	d 8. A/C nose turn left
i. Cyclic left	g 9. A/C will move forward
j. Throttle decreased	b 10. RPM increases
	j 11. Oil pressure will decrease
	e 12. A/C will move right

ANSWERS: Increase, decreasing, right, heading

FRAME 7

Your airspeed reaches 30K and it's time to recover. The recovery is started by a SLIGHT UPWARD PRESSURE ON THE COLLECTIVE and simultaneously applying SLIGHT FORWARD CYCLIC until the aircraft begins to accelerate. Maintain this attitude until cruising speed is reached. The nose of the aircraft should not get more than a few degrees below a level attitude; otherwise excessive power may be needed to keep from losing altitude.

As collective is increased, check the tachometer to insure your RPM does not fall and apply necessary left pedal to maintain heading.

The recovery is started by

a. Decrease collective, Forward Cyclic
b. Increase collective, AFT Cyclic
c. Increase collective, Forward Cyclic
d. Decrease collective, AFT Cyclic

ANSWERS:

i	1.	a	7.
j	2.	d	8.
f	3.	g	9.
h	4.	b	10.
c	5.	---	11.
---	6.	e	12.

FRAME 2

You also know that in order to achieve a good coordinated maneuver it normally takes a combination of at least 2 or more of the control movements mentioned in FRAME 1. Let's see if we agree.

If you wanted to enter a normal climb from cruise flight and all you did was increase the collective your RPM would decrease, the nose (heading) of the aircraft would turn right and your airspeed would decrease.

The proper coordinating movements to complete this normal climb successfully woud be to:

increase throttle to correct the RPM
left pedal to aline the nose
forward cyclic to keep the desired airspeed

ANSWERS: Decrease, Left, c

FRAME 8

One other maneuver which is similar to the deceleration is the QUICK STOP.

This also is a coordination maneuver requiring the use of all controls simultaneously. It's purpose is to bring the aircraft to a stationary hover from forward flight at low altitude.

You will probably find this maneuver used quite frequently in Vietnam.

The Quick Stop is used when flying at low altitude and it becomes necessary to stop forward flight and hover.

ANSWERS: Decrease, turn right, decrease
Increase throttle, left pedal, forward cyclic

Another flight maneuver we are going to discuss now is--DECELERATIONS.

FRAME 3

The deceleration exercise is a practice maneuver designed to require maximum coordination of all flight controls.

The procedure for executing this maneuver is to slow the aircraft's airspeed from 50 knots to 30 knots and increase it again to 50 knots without losing altitude.

The knowledge and proper execution of this maneuver will provide a firm foundation for all flight maneuvers.

The purpose of the deceleration exercise is to:

a. change airspeed without changing altitude
b. provide a maximum coordination exercise
c. to provide solid foundation for all maneuvers
d. all the above

ANSWERS: Low level, stop, hover

FRAME 9

Before starting this maneuver be sure to evaluate the wind, both DIRECTION and VELOCITY as the wind will have a bearing on the distance required to stop the helicopter once the deceleration begins. This shouldn't be hard to remember because you need to always be aware of the wind direction and approximate speed.

With wind checked you need only to be sure that you are:

1. Headed into it
2. At a 3 ft. hover
3. At hover RPM (3200 OH-13, 3200 OH-23, 2900 TH-55)

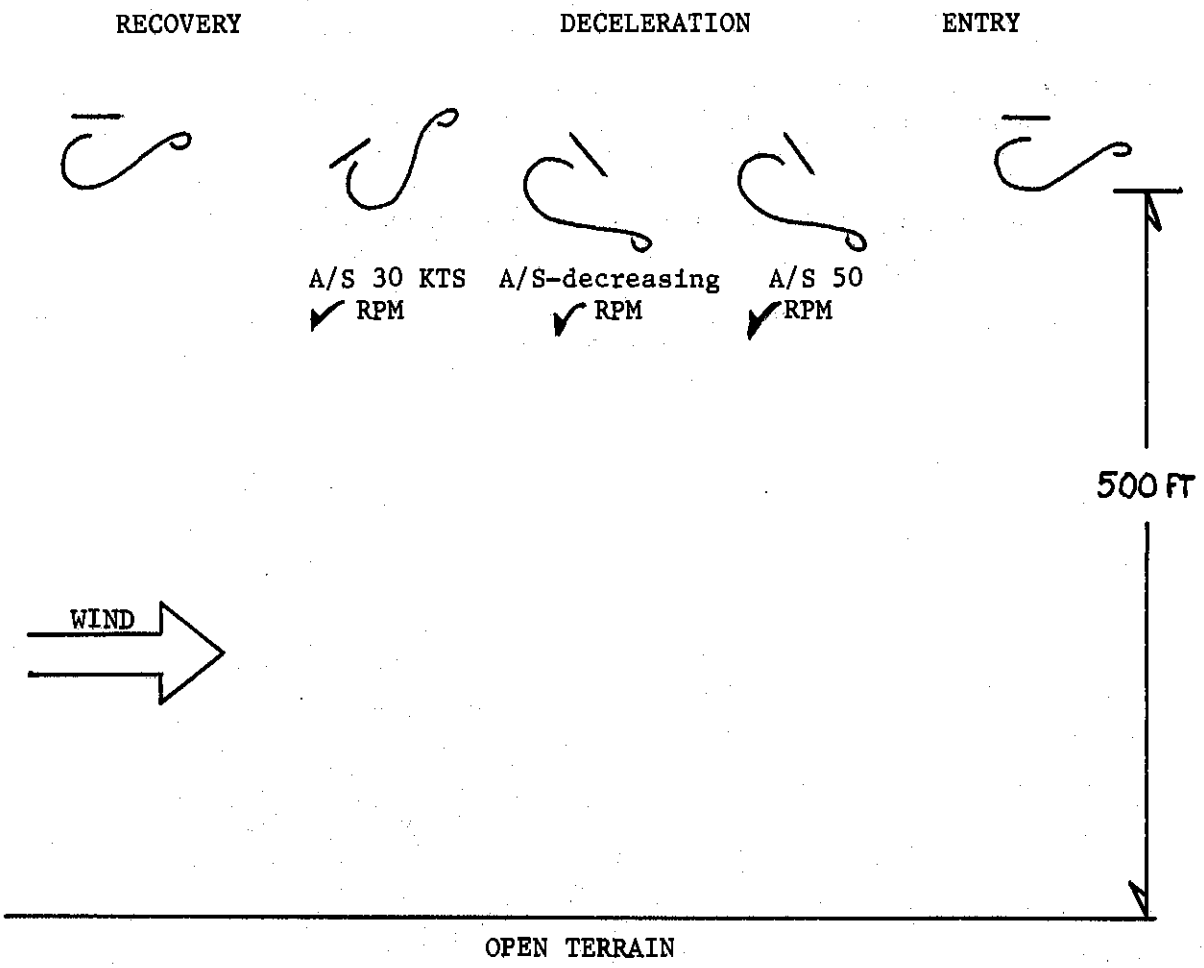
Anytime you are flying you should always be aware of wind speed _____ and direction _____.

ANSWER: All the above

FRAME 4

Certain conditions must be met prior to beginning the maneuver, these conditions are:

1. Heading--into the wind
2. Altitude--500 ft.
3. Airspeed--50 knots
4. RPM--Cruise (3100 OH-13, 3100 OH-23, 2700 TH-55)
5. Terrain--OPEN



ANSWER: Wind direction and speed

FRAME 10

Start the maneuver in the same manner as a normal take-off. As the aircraft starts to climb continue to accelerate to 40 knots and level off at 25 ft. Once you are all set at:

25 ft. of altitude

40 knots of airspeed

cruise RPM (3200 or 2900)

initiate a quick stop.

How?

With a smooth, positive reduction of collective and simultaneous aft cyclic. This will reduce your airspeed and start a descent.

1. With this sudden reduction of power (and [illegible] pedal applied) the nose of the aircraft will turn (right/left) and the RPM will (increase/decrease).
2. These two reactions will have to be compensated for by applying ____left____ pedal and ___less___ throttle.
3. So! We have to say that a Quick Stop is a simultaneous, coordinated application of what four controls?

   a.
   b.
   c.
   d.

FRAME 5

As is shown in frame 4, the proper technique to perform the deceleration is to begin with a SLIGHT REDUCTION OF COLLECTIVE PITCH, simultaneously applying SLIGHT AFT CYCLIC PRESSURE. This maneuver will slow your airspeed but maintain the altitude. When lowering collective pitch it becomes necessary to: APPLY RIGHT PEDAL, to maintain your heading and DECREASE THROTTLE, to maintain proper RPM.

Let's say that only the collective pitch is reduced, no other flight controls manipulated.

	A/C reactions	Corrective reaction
1. Nose of A/C will	turn left	right pedal
2. RPM will	increase	decrease throttle
3. Altitude will	decrease	left cyclic

ANSWERS: left, increase, right, decreasing, a. Collective, b. cyclic, c. pedal, d. throttle

---

FRAME 11

After the initiation continue to hold a nose high attitude with aft cyclic until the aircraft has decelerated almost to a stop. Maintaining a slight nose high attitude the helicopter will start a descent.

This is to be expected, so what do you think you should do to complete the maneuver?

If you think you should start increasing collective (at the same time increasing throttle to maintain an even RPM) to slow your descent, you're right; at the same time applying left pedal (to maintain your heading) you're still right.

A continuous application of collective, left pedal and throttle is used until the aircraft is level and terminated at a 3 ft. hover again.

1. A nose high attitude should be held until the forward speed has almost dissipated.

2. The use of the collective and throttle is used to control b.

   a. Attitude
   b. Rate of descent
   c. Airspeed
   d. Heading

ANSWERS:	A/C reaction	Correction
1.	Turn left	Right pedal
2.	Decrease	Nothing (this is desired)
3.	Increase	Decrease throttle
4.	Decrease	Aft cyclic

FRAME 6

Now you've successfully started the maneuver just hold what you've got, i.e.

CONTINUE TO HOLD THAT REARWARD CYCLIC

until your airspeed decreases to 30 knots. Of course, your altitude heading and RPM have to be continuously checked throughout the maneuver. Of the three, RPM control seems to give students the most problems.

Remember: When collective is decreased RPM will increase.
This will be corrected by closing the throttle.
A certain amount of right pedal will be
necessary to maintain heading.

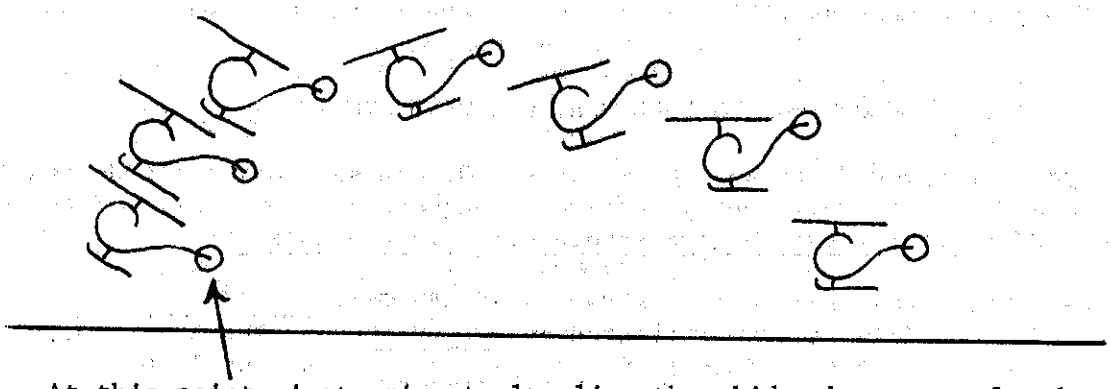
KEEP A CLOSE EYE ON RPM!

Turn to Frame 7 page 2

ANSWERS: 1. Nose High
2. b. rate of descent

FRAME 12

There is one potentially hazardous condition to be aware of when executing a quick stop and that is an extremely "tail low" altitude of the aircraft at a very low altitude.



At this point, just prior to leveling the skids, be aware of and avoid excessive tail low altitude too close to the ground.

The first flight control surface that could be damaged while doing a Quick Stop is the tail rotor.

Go on to self-evaluation exercise page 13

ANSWER: Tail rotor

SELF-EVALUATION EXERCISE
DECELERATIONS AND QUICK STOPS - AM-44

1. Decelerations are maneuvers used

   a. continously.
   b. only when needed.
   c. as coordination exercises.
   d. in emergencies.

2. When performing Decelerations and Quick Stops the minimum controls used simultaneously are the

   a. collective and cyclic.
   b. collective and cyclic and throttle.
   c. collective and cyclic and pedal.
   d. collective and cyclic and pedal and throttle.

3. List the conditions that must be met prior to beginning a deceleration.

   HEADING into wind
   ALTITUDE 25 ft.
   AIRSPEED 50 KNOTS
   RPM 2900 (list RPM for type A/C you fly)
   TERRAIN flat smooth

4. Sudden decrease in collective pitch will call for the use of right _____ pedal to maintain aircraft heading.

5. Which causes students the most problems when doing decelerations?

   a. Heading
   b. Altitude
   c. Airspeed
   d. RPM

6. A downward pressure on the collective will cause the RPM and nose of the aircraft to

   a. increase, turn right.
   b. increase, turn left.
   c. decrease, turn right.
   d. decrease, turn left.

7. If you were hovering in a formation in an LZ (landing zone) in VN and the aircraft in front of you suddenly stopped this would probably cause you to have to perform a quick stop maneuver.

8. The Quick Stop is maneuver performed at a low altitude.

9. Two things you should always be aware of prior to performing any maneuver are

   a. wind direction and velocity.
   b. aircraft heading and altitude.
   c. aircraft heading and airspeed.
   d. aircraft altitude and airspeed.

10. The one potentially hazardous condition which you must be aware of while performing a Quick Stop is the tail low altitude

AM-44
ANSWERS TO SELF-EVALUATION EXERCISE

1. c

2. d

3. Into wind
   500 ft.
   50 Knots
   Cruise (3100 for OH-13 & 23, 2900 for TH-55)

4. Right

5. d

6. b

7. Quick stop

8. Low

9. a

10. Tail low attitude

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ANSWERS TO SELF-EVALUATION EXERCISES

power setup

c

d

Line wind
500 ft.
50 Knots
Cruise (3100 for OH-13 & 23, 2900 for TH-55)

Night

d

c

Quick stop