

CONSTANT RATE DESCENTS

OBJECTIVE

To teach the instrument student knowledge of the elements relating to attitude instrument flying during rate descents.

COMPLETION STANDARDS

1. Demonstrates descents at a constant rate between specific altitudes in straight or turning flight as directed by the examiner.
2. Enters rate descents from a specified altitude, airspeed, and heading.
3. Establishes the appropriate change of pitch, bank, and power to establish the desired rate of descent.
4. Maintains the desired rate of descent within 100 feet per minute, airspeed within 10 knots, heading within 10°, or if in a turning maneuver, within 5° of the specified bank angle.
5. Performs the level-off within 100 feet (30 meters) of the specified altitude.
6. Uses proper instrument cross-check and interpretation, and applies the appropriate pitch, bank, power, and trim corrections.

DESCRIPTION

With reference to flight instruments only, constant rate and constant airspeed are maintained during a descent by establishing and maintaining the appropriate pitch attitude and power setting. This Maneuver applies directly to executing a Instrument Landing System (ILS).

PROCEDURE

1. Smoothly reduce power as necessary for the descent. A 100 RPM/1" MP decrease in power equals approximately a 100 FPM descent for the same airspeed.
2. Use throttle position, engine sound and control pressures to estimate the initial power setting. Include the RPM/MP gauge in your cross-check when final adjustment is made. During the transition the RPM/MP is primary for power.
3. Avoid fixating on the RPM/MP gauge.
4. Maintain level flight until the airspeed decreases to desired descent airspeed.

5. Establish the approximate descent attitude for the predetermined airspeed and descent rate using the attitude indicator. Primary flight instruments for the transition are: Attitude Indicator (AI)– pitch, Heading Indicator (HI)-bank, and RPM/MP-power.
6. As the VSI stabilizes it becomes primary for pitch. Note the rate of descent and adjust pitch to that desired.
7. Interpret the instruments to determine if minor adjustments are required. Decide how the adjustments are to be made. (Primary for power now is airspeed.)
8. Continue to scan all instruments noting how the supporting instruments aid in your interpretation and subsequent control. Coordinate pitch, power and trim.
9. Repeat steps 6 through 8.
10. Lead level off by 10% of the rate of descent. Pitch to level using the attitude indicator for the transition. Altimeter is now primary for pitch. Simultaneously increase power smoothly to a predetermined setting for the desired speed and trim off the control pressures.

Note: The student will be able to demonstrate constant rate descents using all available instruments or without the use of the attitude and heading indicators.

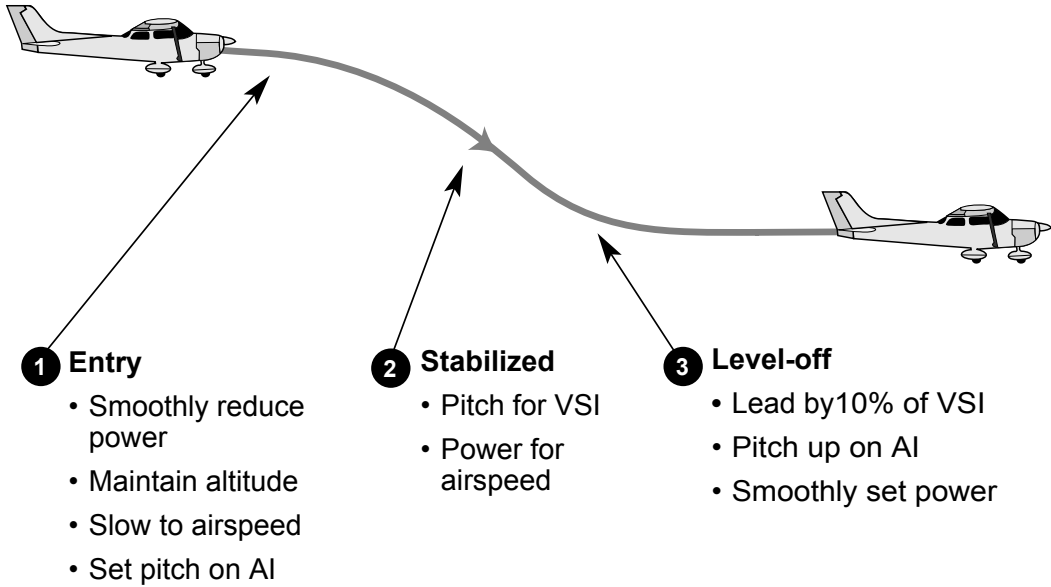
References

Instrument Rating Practical Test Standards FAA-S-8081-4C, pg. 1-8, 1-9.

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Rules of Thumb

- 100 RPM/1" MP = 5 knots
- 100 RPM/1" MP = 100 FPM
- Lead level off by 10% of VSI
- Lead roll out by 1/2 bank angle



A/C	HIGH				NORMAL				LOW			
	FPM	AS	POWER	PITCH	FPM	AS	POWER	PITCH	FPM	AS	POWER	PITCH
C172	1000	90	1300	-7°	500	90	1750	-3°	250	90	2100	-1°

A/C	GLIDE SLOPE			
	FPM	AS	POWER	PITCH
C172	480	90	1750	-3°

	PRIMARY			SUPPORTING		
	PITCH	POWER	BANK	PITCH	POWER	BANK
TRANSITION	AI	RPM/MP	HI	ALT/VSI	AS	TC/AI
STABILIZED	VSI	AS	HI	AI	RPM/MP	TC/AI

Limitations — Heading ±10° • Bank ±5° • Level-off ±100 Feet
 Airspeed ± 10 Knots • Rate of Descent ±100 FPM