I2101

Starting Position:

Overhead KNSE
Altitude: 12,000'
Heading: 360°
Speed: 200 KIAS

WORKSHEET

SIMULATOR IN-FLIGHT COCKPIT SETUP

Discuss Items

a. Departures
- Instrument Takeoff

b. Instrument Scan patterns **PFD**
- HUB and SPOKE concept
- Nose and wing cross check instruments
  - Straight and level
  - Constant Angle of Bank Turns
  - Constant Airspeed Climbs & Descents

c. Airspeed Changes
- Accelerations
- Decelerations

d. Steep Turns
- Loss of lift associated with turns noted on the VSI/ALT (elevator correction)
- Loss of energy associated with maintaining altitude noted on the airspeed (power correction)
- Consideration for pitch control with VSI > -1000 fpm during 60° AOB

e. Timed-turns
- One half Standard rate, VIDEO
  - 10% rule for approximate AOB
  - Clock lead point
  - Checkpoints (HDG/TIME)
  - Minimum and maximum AOB during corrections
- Standard rate, VIDEO
  - 20% rule for approximate AOB
  - Clock lead point
  - Checkpoints (HDG/TIME)
  - Minimum and maximum AOB during corrections

f. Enroute Descent
- Enroute Descent Procedures
- Terminal Descent Procedures

SIMULATOR IN-FLIGHT COCKPIT SETUP

BATT/GEN/AUX BATT……..On
Avionics Master ……..On
Probes Anti-Ice……..On
Bleed Air Inflow……..Norm
O2……Normal
Altimeter……..29.92
TCAS……..On
TAD……..On
Gear/Flaps……..Up
Friction Lock……..Adjusted
PCL……Set (for 200 KIAS)
Seat and Rudder Pedals ……...Adjusted
Seat Safety Pin……Removed and Stowed

SIMULATOR GROUND PROCEDURES CHECKLIST

Initial cockpit set up: Adjust seat height and rudder pedals; Batt, Gen, Aux Batt on; Avionics master on; Bleed air inflow Norm; O2 normal; TAD on; TCAS on

BEFORE TAXI

17. UFCP AND MFD'S
    b. UHF…… Copy ATIS and Obtain Clearance
    c. VHF COM…….. Set as Required
    d. VOR……... Set as Required
    e. Transponder…….. SET, STANDBY
    f. FMS…….. Set as Required
    g. Alt, G, Speed, Fuel flags…….. Set as Required
19. ALTIMETERS……____SET AND CHECKED TWICE (BOTH)

Call for TAXI

BEFORE TAKEOFF

3. FLAPS…….. TAKEOFF
4. TRIM……SET for TAKEOFF
11. SEAT SAFETY PIN…….. REMOVED AND STOWED (BOTH)
12. ISS MODE SELECTOR…….. BOTH, **ROGER BOTH**

Call for TAKEOFF

LINEUP CHECKLIST

1. EXTERIOR LIGHTS …….. ON
2. TRANSPONDER ……ALTITUDE
3. PROBES ANTI-ICE SWITCH …….. ON
4. NOSE WHEEL STEERING …….. OFF
5. EICAS DISPLAY …… CHECKED (BOTH)

Flight Manual Date: 01 December 2017

T-6B Basic Instruments
I2100 Block

STUDENT GRADE SHEET DATE _____ INSTRUCTOR _____

MEDIA: UDT VT- _____ BRIEF TIME: _____ NAME: _____ EVENT:_____

#	MANEUVER	MIF	I2101	I2102	12103	I2104	
1	GENERAL KNOWLEDGE / PROCEDURES	3+	X	X	X	X	
2	EMERGENCY PROCEDURES	3+	X	X	X	X	
3	HEADWORK / SITUATIONAL AWARENESS	2+	X	X	X	X	
4	BASIC AIRWORK	3+	X	X	X	X	
5	IN-FLIGHT CHECKS / FUEL MANAGEMENT	2+	X	X	X	X	
7	TASK MANAGEMENT	2+	X	X	X	X	
8	COMMUNICATION	2					
9	MISSION PLANNING / BRIEFING / DEBRIEFING	2					
10	GROUND OPERATIONS	2					
11	TAKEOFF	2					
12	DEPARTURE	2					
40	S-1 PATTERN	3+		X	X	X	
41	STEEP TURNS	3+	X	X	X	X	
42	IFR UNUSUAL ATTITUDES	3+			X	X	
43	TIMED TURNS	3+	X	X	X	X	
47	GCA PATTERN	3+		X	X	X	
48	APPROACH PATTERN	3+			X	X	
50	ENROUTE PROCEDURES	2					
51	ENROUTE DESCENT	2+	X	X	X		
	SPECIAL SYLLABUS REQUIREMENTS	1			X		

SSR:
I2103 Proceed **d**irect to Home Field using any available NAVAID

DISCUSS ITEMS:

I2101: Departures, steep turns, timed turns, enroute descent, and scan patterns.

I2102: IMC emergencies, GCA pattern, and S-1 pattern.

I2103: Approach maneuver and IFR unusual attitudes.

I2104: IMC emergencies, avionics failures and BFI.

DEPART _____ ARRIVE _____ SIDE # _____ SIM TIME _____


PFD
PFD
240
220
200
180
160
AOA
2.5
300
20
20
10
10
10
10
20
20
RA
10000
8000
6000
4000
7000
270
29.92 IN
TAS: 209
12
270
GS: 331
PFD
SOURCE:
VOR
"0"
RESET
115.50
20.0 nm
1.0
VOR
115.50
20.0nm
CRS
270
FMS
CRP
20.0nm
270

MANEUVER	NOSE CROSSCHECK	WING CROSSCHECK	PERFORMANCE/ PROGRESS INSTRUMENT	ADDITIONAL INSTRUMENTS
STRAIGHT AND LEVEL	ALTIMETER, VSI	HSI	AIRSPEED	SIDESLIP, TORQUE
CONSTANT ANGLE OF BANK TURNS	ALTIMETER, VSI	AOB	HSI AIRSPEED	SIDESLIP, TORQUE
CONSTANT AIRSPEED CLIMBS & DESCENTS	AIRSPEED	HSI	ALTIMETER	SIDESLIP, TORQUE
CONSTANT RATE TURNS	ALTIMETER, VSI	TURN NEEDLE AOB	HSI CLOCK AIRSPEED	SIDESLIP, TORQUE
CONSTANT RATE CLIMBS & DESCENTS	AIRSPEED	HSI	ALTIMETER VSI CLOCK	SIDESLIP, TORQUE
CLIMBING OR DESCENDING TURN AT CONSTANT ANGLE OF BANK & AISPEED	AIRSPEED	AOB	HSI AIRSPEED	SIDESLIP, TORQUE

Figure 2-1 Crosscheck/Performance Instruments

205. SPATIAL DISORIENTATION

Spatial disorientation can be defined simply as a body sensation which tells the aviator that his aircraft is in a particular attitude, when the aircraft is actually in an entirely different position relative to the horizon. This false sensation is derived from a number of sources: the inner ear and vestibular stimulation are the most common.

Spatial disorientation usually does not occur when a pilot has visual reference to the horizon, or at least, the pilot pays little attention to his body feelings, since his sight simply overcomes them. Disorientation occurs when there is no reference to the horizon; however, this does not necessarily limit vertigo to flying in the clouds. It can occur when the aircraft is flying in visual meteorological conditions (VMC), on a day when there are large buildups, when flying above a layer of clouds, when flying in and out of a broken layer, or when launching at night with no clear horizon. Vertigo or the disorientation sensation is, and always will be, a factor in aviation, but is dangerous only when the pilot believes and flies his senses instead of the reliable instruments.

The spatial disorientation training in the T-6B will demonstrate and emphasize three specific facts:

1. A pilot's attitude sensations are generally unreliable.

2. The pilot cannot recover to straight and level flight using these sensations.

3. Instruments are the only way to recognize and recover from unusual attitudes in Instrument Meteorological Conditions (IMC).

2-4 FUNDAMENTAL INAV CONCEPTS

4. Overshooting the assigned heading due to slow or improper scan.

5. Ballooning during rollout. This error is often caused by fixating on the HSI, thereby missing the needed nose and attitude adjustments on the ADI.

503. STEEP TURNS

General

Maintain smooth, coordinated flight in turns to specific headings at steeper than normal bank angles.

Description

These turns will normally be practiced at 45 and 60 degrees of bank and 150 KIAS, but other airspeeds and angles of bank are permissible.

Procedure

Enter a steep turn in the same manner as a normal turn. Anticipate the addition of power to maintain a constant airspeed. The pitch required during steep turns is notably higher than those associated with the smaller angles of bank. Use a constant angle of bank during steep turns, and attempt to correct altitude deviations by adjusting the pitch attitude. During 60° angles of bank with a loss of altitude and a VSI rate in excess of 1000 FPM, a momentary decrease in bank angle may be needed correct the pitch attitude.

For turns conducted at 150 KIAS the approximate pitch and power settings in Figure 5-4 will aid in establishing the new power and attitude. Anticipate adding power approaching 30° AOB. To roll out on the desired heading, use the one-third rule (15° for a 45° AOB turn and 20° for a 60° AOB turn).

Common Errors

1. Loss of altitude control.

2. Unable to maintain desired angle of bank.

3. Slow to set or inability to set desired power setting.

504. RATE TURNS

General

A timed turn (maintaining a specific rate of turn in degrees per second) to an assigned heading maintaining altitude and airspeed.

TEMP °C ALTITUDE	IAS (KTS)	TAS (KTS)	AOB ½ SRT	AOB SRT
13	120	122	10	19
	150	152	11	22
	180	183	13	25
1000	200	203	14	27
5	120	129	10	20
	150	162	12	23
	180	194	13	26
5000	200	215	14	29
-5	120	140	11	21
	150	174	12	24
	180	209	14	28
10000	200	233	15	30
-15	120	151	11	22
	150	189	13	26
	180	227	15	30
15000	200	252	16	32
-25	120	164	12	23
	150	205	14	28
	180	246	16	32
20000	200	274	17	34
-35	120	179	12	25
	150	224	15	29
	180	269	17	34
25000	200	298	18	37
-45	120	196	13	27
	150	245	16	32
	180	294	18	36
35000	200	327	20	40

Figure 5-1 Standard Rate Turn Chart

Procedure

For practice, timed turns will be started at 150 KIAS on a cardinal heading. The turn will be initiated three seconds prior to the clock indicating 00 or 30 seconds. This lead will compensate for time needed to establish the desired angle of bank.

1. **Half SRT**

   a. For the timed ½ SRT, roll into a turn on the attitude indicator using the 10 percent rule to establish the approximate bank. Once the attitude is set on the attitude indicator, crosscheck the turn needle for an exact one needle width deflection and

adjust AOB as required. Crosscheck altimeter and VSI for nose attitude.

b. When the HSI is 30º past the cardinal heading (next numbered heading), check for 20 seconds of elapsed time on the clock. The next checkpoint is 60º of turn and 40 seconds of elapsed time (and so forth). During the scan it is recommended that you check the clock after reaching a 30 degree checkpoint on the HSI. The instruments are arranged on the panel in groups. With the attitude indicator, altimeter, airspeed and VSI grouped together and the HSI nearby, scanning these instruments does not require you to shift your point of vision very far to check for errors and make corrections. If the clock is checked only once every 30 degrees of heading change rather than four or five times, you will be able to devote more time to maintaining altitude, airspeed and bank angle.

c. When checking the HSI and clock, if the turn is less than ½ SRT (behind the clock), increase the AOB and check the turn needle for a greater deflection in order to catch up with the clock. If the turn is more than ½ SRT (ahead of the clock), decrease the AOB and check the turn needle for less deflection in order to allow the clock to catch up with the heading. When back on time and heading, the AOB must be readjusted to maintain ½ SRT. To roll out on the desired heading, use the one–third rule.

d. For ½ SRTs, ***never use more than 20º of bank to increase rate of turn or less than 10º of bank to slow the rate of turn***. If corrections outside these limits are used it usually results in overcorrection of the rate. Have patience, catch up slowly and deliberately.

2. **Standard Rate Turns (SRT)**

a. Timed SRTs are accomplished in much the same manner as timed ½ SRTs. Roll into the turn on the attitude indicator, using the 20% rule and crosscheck the turn needle for two needle width deflection, but do not exceed 30º AOB. Since the aircraft is turning twice as fast (3º per second), it will be necessary to check the clock after every 30º of heading change for ten seconds of elapsed time. The scan pattern, corrections for desired rate of turn and the procedure for leading the rollout on the desired heading are the same as the ½ SRT.

b. A more vigilant crosscheck of the nose attitude, altimeter and VSI during power and attitude adjustments is necessary due to the resultant decrease in vertical lift (more notable at steeper AOBs).

c. For the SRT ***never use more than 30º of bank to increase the rate of turn or less than 15º of bank to slow the rate of turn.***

NOTE

The "expect" altitudes/speeds are published so that pilots may have the information for planning purposes. These altitudes/speeds should not be used in the event of lost communications unless ATC has specifically advised the pilot to expect these altitudes/speeds as part of a further clearance.

Pilots navigating on a STAR/RNAV STAR shall maintain last assigned altitude until receiving authorization to descend so as to comply with all published/issued restrictions. This authorization will contain the phrase ***"descend via."***

NOTE

1. A "descend via" clearance authorizes pilots to navigate vertically and laterally, in accordance with the depicted procedure, to meet published restrictions. Vertical navigation is at pilot discretion; however, adherence to published altitude crossing restrictions and speeds is mandatory unless otherwise cleared. (Minimum Enroute Altitudes [MEAs] are not considered restrictions; however, pilots are expected to remain above MEAs.)

2. Pilots cleared for vertical navigation using the phrase "descend via" shall inform ATC upon initial contact with a new frequency.

Pilots of IFR aircraft destined to locations for which STARs have been published may be issued a clearance containing a STAR whenever ATC deems it appropriate.

Use of STARs requires pilot possession of at least the approved chart. As with any ATC clearance or portion thereof, it is the responsibility of each pilot to accept or refuse an issued STAR. Pilots should notify ATC if they do not wish to use a STAR by placing "NO STAR" in the remarks section of the flight plan or by the less desirable method of verbally stating the same to ATC.

804. ENROUTE DESCENT

Description

In the enroute structure, the FAA expects the pilot to ***descend at an optimum rate consistent with the operating characteristics of the aircraft to 1000 feet above the assigned altitude, and then attempt to descend at a rate of 500-1500 fpm until the assigned altitude is reached.*** Advise ATC it is necessary to level off at an intermediate altitude, except when leveling off at 10,000 feet MSL to reduce speed to comply with the FAA speed restriction of 250 KIAS or when 2,500 feet above airport elevation (prior to entering a Class C or Class D surface area) to reduce speed to comply with the speed restriction of 200 KIAS.

Procedure

1. Report leaving the current altitude for the new assigned altitude.

2. Establish and maintain a descent at 200-250 KIAS and approximately 4000 FPM (fine tune power and nose attitude as required).

3. Commence the Descent Checklist.

4. Approximately 1000 feet prior to level-off, adjust pitch to slow rate of descent to between 500-1500 FPM.

5. Level off at assigned altitude and transition to desired Cruise Speed (adjust power as required).

NOTE

To comply with charted NATOPS enroute descent profile, lower the nose 10° nose down, approaching 220 KIAS set power to 10%. Fine tune power and nose to maintain approximately 220 KIAS and approximately 4000 FPM.

If the situation or ATC requires a greater rate of descent, power and/or speed brake may be adjusted as required until within 1000 feet of level off. Descent rates will increase significantly (to 8000-11,000 fpm) with idle power and speed brake extended. For NATOPS maximum range descent and other profiles, refer to NATOPS appendix A.

Common Errors

1. Not completing the Descent Checklist.

2. Loss of heading control due to lack of rudder input with changes to power/airspeed.

3. Not reducing rate of descent to between 500-1500 FPM during the last 1000’ of descent.

805. TERMINAL DESCENT

General

Transition the aircraft from an intermediate altitude to the approach phase of flight.

Description:

A terminal descent is a procedure used to descend to a lower altitude when in contact with the destination controller and in the terminal phase of flight. During descents in this possibly congested area, maintaining a constant speed makes you “predictable” and aids the controller in

Procedure

1. Report leaving the current altitude for the new assigned altitude.

2. Establish and maintain a descent at 200-250 KIAS and approximately 4000 FPM (fine tune power and nose attitude as required).

3. Commence the Descent Checklist.

4. Approximately 1000 feet prior to level-off, adjust pitch to slow rate of descent to between 500-1500 FPM.

5. Level off at assigned altitude and transition to desired Cruise Speed (adjust power as required).

NOTE

To comply with charted NATOPS enroute descent profile, lower the nose 10° nose down, approaching 220 KIAS set power to 10%. Fine tune power and nose to maintain approximately 220 KIAS and approximately 4000 FPM.

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Common Errors

1. Not completing the Descent Checklist.

2. Loss of heading control due to lack of rudder input with changes to power/airspeed.

3. Not reducing rate of descent to between 500-1500 FPM during the last 1000’ of descent.

805. TERMINAL DESCENT

General

Transition the aircraft from an intermediate altitude to the approach phase of flight.

Description:

A terminal descent is a procedure used to descend to a lower altitude when in contact with the destination controller and in the terminal phase of flight. During descents in this possibly congested area, maintaining a constant speed makes you “predictable” and aids the controller in

providing adequate spacing between aircraft.

Procedure

1. Report leaving the assigned altitude.

2. Adjust power and speed brake as required to control desired rate of descent.

3. Lower the nose as required to ***maintain current speed***.

4. Trim (commence descent checklist if not previously completed).

5. Approximately 1000' prior to level off, (retract speedbrake if used) adjust power as required to establish a rate of descent between 500-1500 FPM.

6. Level off at the assigned altitude, resetting power to maintain airspeed.

NOTE

Prior to commencing an approach, the most common terminal descent is conducted at 200 KIAS. Power set at 20% and nose 5° down will provide approximately 2000 fpm, which is an adequate rate of descent for most situations.

806. INSTRUMENT APPROACH BRIEF

Description

Upon being cleared for an approach, or having been advised (by the controller or ATIS) to expect a specific approach, the student will brief the instructor on the particulars for the approach. The brief should include all of the following that apply:

1. **Approach name**: Approach title, page number.

2. **Weather minimums**: For the applicable portion of the approach.

3. **NAVAID setup**: NAVAIDS required for the approach.

4. **IAF**: Name and/or radial/DME.

5. **Course(s)**: Initial and Final Approach Course and arc description (as applicable).

6. **Segment altitudes**: All applicable altitudes depicted on the approach.

7. **MDA/DA**: For the applicable portion of the approach.