

# Exercise 4 Effects of Controls 1

Aim : To learn the effects of the aircraft primary controls

1. Lookout - Follow Thru
2. Demo Datum Attitude (Note speed & Alt.)
3. Demo Pitch (Check to neutral to stop)
4. Practice Pitch
5. Demo Roll (Check to neutral to stop)
6. Practice Roll
7. Demo Yaw
8. Practice Yaw (Keep ailerons)
9. Demo Further Effect of Pitch (climb/descent RPM, airspeed), Roll (Yaw) and Yaw (Roll) Spiral Descent
10. Slow to 60kts Feel effectiveness of controls
11. Speed up to 100kts Feel effectiveness of control
12. Do Vy climb (High slipstream) Feel controls.
13. Glide a 65kts (low slipstream) Feel controls

Point out local area Land marks



Instructor Demo



Student Practice



Remember



Mention

# Exercise 4 Effects of Controls 2

Aim: to learn the effects of the secondary controls

1. **Effect of power.** Lookout. Reduce to 2000rpm (trim) and then increase to full power, nose pitches ↑ and yaw ← as the slipstream hits the tail. The yaw will create a roll
2. Roll wings level and reduce power nose pitches down and slight yaw to right
3. ↑ and ↓ power but use elevators to maintain datum Attitude and rudder to keep straight
4. The trimmer is to remove control loading
5. **Effect of trim.** Lookout. Give student control in trim, then put a/c out of trim. **Maintain datum attitude.**  
Applying forward pressure? Wind wheel forward. (SHT)   
Applying backward pressure? Wind wheel back (SHT)
6. **Effect of flap.** Lookout. Flap gives extra lift and drag for a given airspeed.
7. 10° flap nose ↑ speed ↓ Use elevator to lower nose. Trim  
Speed reduced due to extra drag
8. 20° flap nose pitches ↑ more speed ↓ more
9. 30° flap nose ↑ speed ↓
10. Raise flap in stages Airspeed ↑ Nose pitches ↓ each stage
11. Lower & Raise flaps , but use elevator to maintain datum attitude and trim to relieve control forces
12. Lower & Raise flap at once. Big pitch change difficult to control. Which is why we lower & raise flaps in stages
13. Demo carb heat, mixture and cabin heat controls (other systems)

# Exercise 5 Taxying

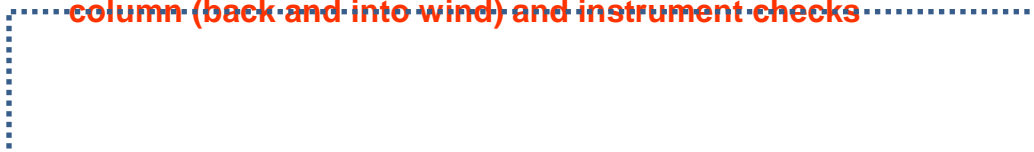
Aim : To learn how to taxi the aircraft correctly and safely

## Part 1 (First Attempt)

1. **Lookout (RT and Route)**
2. Keep feet on rudder pedals, right hand on throttle, left on cc
3. Power to idle, release brakes  
Increase power, start moving  
Power to idle, Test brakes
4. **Student to practice moving off and testing brakes**   
Instructor keeps throttle
4. Turn left and right. Emphasise slow speed
5. **Student to practice turning using rudder, then speed using power**

## Part 2

6. Turning using differential braking
7. Changing surfaces at 45°
8. Hold control column back to protect nose wheel and prop
9. Holding controls in relation to the wind
10. Taxi turns to check instruments. One instrument per turn
11. **Student to practice changing surface, holding control column (back and into wind) and instrument checks**




# Exercise 6 Straight and Level 1

Aim : To fly a constant heading, at a constant height, in balance

**Straight** – flight on a constant heading (wings level, ball in middle)

Intro to Lookout, Attitude & Instruments

1. Lookout, Follow through. Cruise 2300rpm / 90kts. S/L attitude. Straight horizon. Look at wingtips – equidistant above horizon
2. Pick a point straight ahead to use as a reference to fly towards. (Note DI)
3. If wind disturbs aircraft use ailerons to level the wings
4. Practice using ailerons to level wings (disturb if needed)
5.  If wings level but ball not in middle, use rudder  
Tread on the ball.
6. Practice flying straight with wings level and ball in middle
7. Cross controls – Still fly straight but demo of what not to do!

**Level** – flight at a constant height, - LAI

8. Lookout. Use elevators to obtain “S/L attitude”. Trim.  
Note the horizon level 4” up windscreen.  
Cross check VSI and altimeter cx Power setting & Trim
9. Demo gust of wind. Nose pitches ↑ horizon goes under nose  
VSI and alt shows we are climbing
10. Demo gust of wind. Nose pitches ↓ horizon goes up screen  
VSI and alt shows we are descending
11. Practice flying level (disturb in pitch, power, trim)
12. Demo how to recover from small gain or loss of height and loss of Heading
13. Practice flying S & L – PAT SA - LAI



Instructor Demo



Student Practice



Remember



Mention

# Exercise 6 Straight and Level 2

Aim : To fly straight and level at different airspeeds

1. Lookout, Follow through. Normal cruise 2300rpm / 90kts  
PAT and LAI

## Straight & Level at a slower airspeed


2. Reduce power to 2000 rpm. Left rudder. As airspeed ↓  
Select ↑ nose attitude progressively to prevent descent. Cross check  
Alt .and VSI. Trim emphasise PAT

3. Note: ↑ nose attitude, ↓ in rpm to 1900 rpm. Speed ↓ 70kts

4. Return to cruise. Trim

## 5. Fly straight and level at a slower airspeed

## Straight & Level at a higher airspeed

6. Increase to full power (don't red line engine). Right rudder  
Select ↓ nose attitude progressively. Use rudder to prevent yaw. Trim.  
Cross check VSI and altimeter for any increase in height  
Check  to confirm straight and level

7. Note: ↓ nose attitude, ↑ in rpm, Airspeed is max for level flight

8. Return to cruise. Trim

## 9. Fly straight and level at a higher airspeed

10. ↑ and ↓ speed maintain S & L and balanced flight

11. Fly at different airspeeds (80kts & 95kts). RPM?

12. Demo slow safe cruise 2000rpm 20° flap. Better view

13. Practice slow safe cruise and return to normal cruise

Intro to FRED A



Instructor Demo



Student Practice



Remember




Mention

# Exercise 7 Climbing

Aim : To climb at a constant speed and in balance

Lookout (especially above). **Vy = 65kts** **Vx = 55kts** **Cruise 80kts**

Entering the climb

1. Power: Full, smoothly, check yaw 
2. Attitude: Pitch nose up to horizon (airspeed 65kts).

**Note:** nose in relation to horizon. ½ way down side window

3. Trim (SHT)

4. Recover to S&L

5. **Practice entering the climb**

Maintaining the Climb LAI

6. Lookout - lower nose

7. Attitude Maintain

8. Instruments

9. ASI Alt Balance 

10. Engine (Check Ts & Ps)

11. Recover to S&L

12. **Practice entering and maintaining the climb**

Recovering to Level Flight

13. Attitude (wait for speed to increase)

14. Power (reduce to 2300rpm Left rudder to balance)

15. Trim (settle & adjust. Confirm on instruments)

16. Settle and Adjust

17. **Entering and maintain climb. Recover to level flight**

**Demo + Pract Cruise climb and Vx Climb + Required Altitude**

18. Cruise climb 80kts Vx climb 54kts Climbing with Flap


# Exercise 8 Descending 1

Aim : To descend at a constant speed and in balance

## Entering Glide Descent (65kts)

1. Lookout (Weave)
2. Follow through
3. Carb Heat to Hot
4. Power Idle
5. Attitude maintain until 65 then pitch to maintain 65k
6. Trim
7. Recover – P.A.T
8. Entering Glide Descent

## In Glide Descent (65kts)

9. Lookout Weave nose
10. Attitude - Instruments
11. ASI, ALT Ball 
12. Engine (Warm – 500ft)
13. Enter and maintain


## Level Off

15. Power - Rudder
16. Attitude
17. Trim
18. Level Off

## Entering Cruise Descent (80kts)

1. Lookout
2. Follow through
3. Carb Heat to Hot
4. Power 1700
5. Attitude
6. Trim
7. Recover – P.A.T
8. Entering Cruise Descent

## In Cruise Descent (80kts)

9. LAI Lookout
10. Attitude (Maintain 80kts)
11. Instruments
12. ASI ALT Balance 
13. Engine (Ts + Ps)
14. Enter and maintain

## Level Off

15. Power
16. Attitude
17. Trim
18. Level Off

Descending 2 over page

# Exercise 8 Descending 2

Aim : To descend at different rates

## Effect of Power on rate of descent

1. **Setup cruise descent at 80kts. Lookout. 1700 rpm.**   
**Attitude for 80kts, Trim.** Note rate of descent is 500 fpm

## In Descent

2. LAI check
- 3 Reduce power to 1500 rpm, lower nose to maintain 80kts  
Note rate of descent has increased to 700 fpm
4. Increase power to 1900 rpm and maintain 80kts  
Note rate of descent is now 300 fpm
5. Practice descending at a constant speed with varying rates of descent

## Effect of Flap on rate of descent

6. **Setup glide descent (65kts).** Check VFE and lower 10° flap  
Note rate of descent has increased and Lower Nose Att.
7. Lower 20° flap. Note lower nose attitude, higher rate of descent
8. Practice descending with 20° flap at 65kts. Note RoD
9. Demo sideslipping. Note increased RoD
10. Practice sideslipping
11. Demo Emergency Descent



# Exercise 9 Turning

Aim : To change heading at a constant rate and in balance

Demo - Medium 30° turn (to left). Normal cruise (2300rpm 90kts)

1. Lookout. Lift wing + look behind!
2. Watch attitude and look at how horizon cuts dash. Remember!


## Entry

4. Bank 30° 
5. Balance  (Left turn left rudder)
6. Back Pressure (just enough to maintain height)
7. Practice entry into medium turn 30° turn to left

## In turn LAI

8. Lookout – in direction of turn – Maintain attitude
9. Maintain 30° Glance at AI Lookout - Attitude
10. Maintain height. Glance at VSI. Lookout - Attitude
11. Balance. Glance  Don't trim. Speed loss of 5kts
12. Practice entry and maintaining medium 30° turn to left

## Roll Out

13. Roll wings level
14. Relax back pressure
15. Balance  with rudder Lookout
16. Enter, maintain and recover from 30° medium turn to left
17. Demo Medium 30° turn (to right). Note different attitude
18. Enter, maintain and recover from 30° medium turn to right
19. Demo Adverse aileron yaw. Why we use rudder in turns.
20. Turn onto heading. Roll out ½ bank angle b4 (15°) Practice
21. Rate 1 turn Level 15° turn Practice
22. Climbing turn 15° turn. 65kt climb. Hold off bank Practice
23. Descending turn 20° turn. Practice

# Exercise 10a Slow Flight

Aim : To acquaint you with low speed handling characteristics of the Aircraft

S&L at 55kts – flaps up.



1. **Lookout - PAT**

2. Follow me through

3. Carb heat. Power to 1500 rpm.

4. Left rudder. Pitch up progressively to maintain height

5. When 55kts – increase to 1800 rpm. Trim. Check



6. Note symptoms of Approaching stall:

High Nose, low speed, less effective controls, possible stall warner

7. If losing height recover using power + elevators, not just elevators

8. Recover to cruise (2300rpm, right rudder, lower nose)



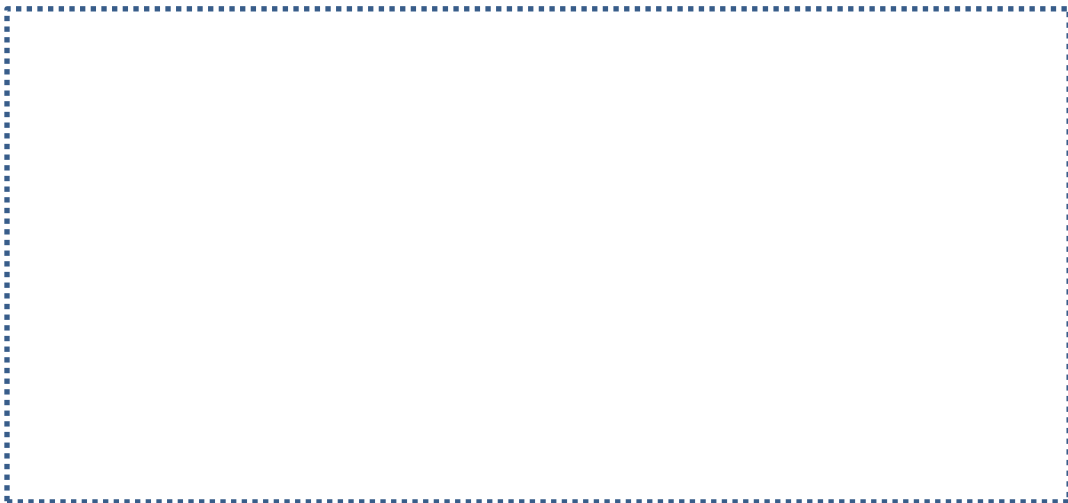
9. **Fly S&L at 55kts** (so you become familiar with a/c app stall)



10. Recover to cruise



11. **Slow Flight 10a** (same lesson) continued over page



Instructor Demo



Student Practice



Remember




Mention

# Exercise 10a Slow Flight (cont)

Aim : To acquaint you with low speed handling characteristics of the Aircraft

## Turning

1. Lookout + behind
2. (15° AoB) at 55kts. High nose attitude. Large rudder movement to keep  Note. Small turn radius.
3. Practice (15°) turns at 55kts
4. Medium Turns (30°) at 55kts. Power needed to maintain 55kts

## Climbing & Descending

6. Lookout + above
7. Climb at 55kts. Low rate of climb. Rudder/Elevators firm due to slipstream. Ailerons ineffective (outside slipstream). Trim run out
8. Practice climb at 55kts
9. Descend at 55kts (1300rpm) High RoD. Nose high but descending
10. Practice descending at 55kts
11. Repeat all above with 20° flap at 50kts (better forward visibility)

## Two Speeds for one Power Setting

12. Setup 55kts. Lower nose. Get 65kts

# Exercise 10b Stalling 1

Aim : To recognise the symptoms and prevent but be able to recover in the event of a stall

- 1. HASELL checks
- 2. Demonstrate the symptoms of the approaching stall 
  - i) High nose attitude
  - ii) Low airspeed
  - iii) Less effective controls
  - iv) Possible buffet (mention, as may not be felt)
  - v) Stall Warner
- 3. Recover to cruise
- 4. HELL check. Follow me through
- 5. Demo Stalled Condition. Ignoring stall warner Show Nose drop, High RoD, low airspeed, heavy buffet, stall warner
- 6. HELL check. Demo Stalled Condition. Power off recovery 

Note: Height loss (should be 300 ft approx)
- 7. Repeat 6. Recover to a Glide (scenario of engine failure)
- 8. HELL check Practice Stalled Condition. Power off recovery
- 9. HELL check. Demo Stalled Condition. Standard stall recovery 

Note: Height loss (should be 100ft) approx
- 10 HELL check. Practice Stalled Condition. S.S.R
- 11. Demo SSR at incipient stage (e.g At stall warner)



Instructor Demo



Student Practice



Remember



Mention

# Exercise 10b Stalling 2 (with Power + Flap)

Aim : To learn how to recognise and recover at the 1st sign of an approaching stall, and the stalled condition with Power & Flap

All recoveries will be at 1<sup>st</sup> sign (stall warner, or buffet)

1. **HASELL** check. (3000ft min)
2. Base Leg Configuration

1700 rpm 20° flap. **Imagine a distraction.** Pitch up. **1<sup>st</sup> sign** SSR. When stall warner stops shallow climb Pos RoC retract flaps in stages. Climb Vy

3. **HELL** check, setup in base leg configuration, practice a SSR
4. Base to final turn - HELL check.

1700 rpm 20° flap 20° angle of bank. **Imagine a distraction.** Pitch up. **1<sup>st</sup> sign** SSR. **Only when stall warner/buffet has stopped.** Roll wings level Enter a shallow climb Pos RoC retract flaps in stages. Climb Vy

5. **HELL** check, setup in base to final turn, practice a SSR

6. Final Approach Configuration - **HELL** check

1700 rpm 30° flap **Imagine a distraction.** Pitch up. **1<sup>st</sup> sign** SSR. Retract the drag flap Stall warner/buffet has stopped. Enter a shallow climb POS. RoC retract flaps in stages. Climb Vy

9. **HELL** check, setup in final approach config, practice a SSR

10. Repeat above. But recover at stalled condition if student confident if not this exercise must be covered later

# Exercise 11a Incipient Spins

Aim : To recognise symptoms and prevent entering a spin

1. **HASELL** checks
2. **A/C Stalled Condition with power. 1700 rpm 20° flap. Pitch up**  
**At stall + wing drop. SSR. Prevent further wing drop with rudder**  
**Speed increase (watch VFE) Stall warner/buffet has stopped.**  
**Roll wings level. Pos RoC retract flaps in stages. Climb Vy**
3. **HELL check. Stall with Power & Flap**
3. **HELL check**
4. **Departure Stall (Stall in a climb). Full power. Climb**  
**Imagine a distraction. Pitch up. 1<sup>st</sup> sign SSR.**  
**When stall warner stops shallow climb**  
**Pos RoC retract flaps in stages. Climb Vy**
5. **HELL check. Departure Stall (stall in a climb)**
6. **HELL check**
7. **Stall in a climbing turn. 2000 rpm 15° bank left turn. Pitch up**  
**Hold off bank otherwise will increase**  
**At stall + wing drop. SSR. Prevent further wing drop with rudder**  
**Stall warner/buffet has stopped. Roll wings level. Climb Vy**  
**Pos RoC retract flaps in stages. Climb Vy**
8. **HELL check. Stall in a climbing turn**

Only complete these stalls when student is confident



Instructor Demo



Student Practice



Remember



Mention

# Exercise 11 Spinning

Aim : To be able to recognise and be able to recover from a spin, at the incipient and fully developed stage in a C152

1. HASELL checks (4000ft min)



2. Entry

Power: Reduce to 1500 rpm



Attitude: Pitch up to maintain height

Wait for 55kts

Full right (or left) rudder

Back on control column

Hold until spinning!

3. During

ASI: Low airspeed (if increasing spiral dive)

Turn Coordinator: Check for direction of spin

VSI : High RoD

4. Recovery

Close throttle

Ailerons neutral - Check Spin Direction

Full opposite rudder

Control column forward until spin stops



Centralise rudder

Ease out of dive

Speed <90 Climb VY

# Exercise 15 Step Turns

Aim : To turn the aircraft with 45° and 60° angle of bank

1. Lookout – back window to back window. Lift wing
2. **Demo - 45° turn (to left)**
3. Watch attitude and remember it!
4. **Entry to 45° turn (from 30° Medium Turn)**
5. Bank 30°, Balance  Back Pressure (maintain height) THEN passing 30 degrees
6. Power – Add 200 rpm (sound and feel)
7. Bank – Increase to 45°, Rudder
8. Back Pressure – increase to maintain height
9. Practice entry into 45° turn to left (after entry I take control)
10. **Maintain turn**
11. Lookout . Look in direction of turn. Lean forward
12. Attitude (maintain 45°, Height)
13. Instruments. Glance at AI / ALT, Ball, VSI
14. If nose drops, reduce AoB to 30° pitch up then re-establish
- 15.. Practice entry and maintaining medium 45° turn to left
16. **Roll Out**
17. Roll wings level
18. Relax back pressure
19. Balance  Centralise rudder
15. Power to 2300 RPM Lookout Opposite Direction
16. Enter, maintain, recover from 45° turn to left then right
17. Teach Recovery form Spiral Dive
17. 60° turn if student confident
18. Teach steep gliding turn speed increase 5-10 knots



Instructor Demo



Student Practice



Remember



Mention



# Exercise 19 Instrument Flying

Aim : To teach you to control the aircraft without the horizon

1. Lookout

2. Compare Datum Attitude with Instruments

3. Compare outside picture with instrument indications

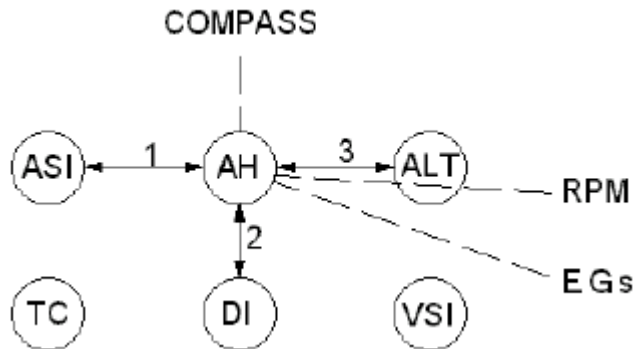
Pitch. **AI not relative in pitch**

Roll. **AI relative in roll**

Yaw. **AI doesn't sense yaw. TC shows turn, not roll. DI changes**

4. Pitch, roll, yaw and compare outside with instruments

5. I will be responsible for lookout



6. Fly S&L on instruments. Primary scan is a T Scan.

Attitude – Heading – Attitude – Height – Attitude - Airspeed

Secondary scan bring in VSI and

7. Rate 1 turn. Primary scan = Attitude - Height - Attitude - Speed

8. Climb & Descending = Attitude – Heading – Attitude – Speed

9. Demo UNOS and ANDS

10. Practice UNOS and ANDS