

GENERAL FLYING

Introduction

1. General flying is the art of flying which is conducted taking reference from visual cues flying and it is carried out in Visual Meteorological Conditions (VMC). The exercises practiced in General Flying phase build up understanding of Aircraft & Engine performance, general behavior of the aircraft at different power settings and configuration. It also enhances the general lookout & orientation of the airfield and different training areas. The skills earned through this phase contribute to good Airmanship. For better performance a student should be very conversant with the normal & emergency flying Procedures, Local Flying Orders and Aircraft systems.

Aim

2. The aim of this chapter is to introduce you with the general handling procedure & flying technique of L-410 aircraft, different air exercises as per syllabus.

Objective

3. After reading this chapter a clear idea of basic air exercises which are flown in General Flying phase and basic handling of L 410 aircraft in VFR condition can be obtained.

4. **Airmanship**

- a. Look Out.
- b. Orientation.
- c. Operations normal Check.
- d. Engine handling.
- e. Aircraft handling.
- f. R/T Call.

5. **Domestic-I**

- a. Pre-Flight Medical.
- b. ATC/Met Briefing.
- c. Normal & Emergency Session.
- d. Pre-Flight Briefing.
- e. Operations Room Procedure.
- f. Weather check.
- g. Flight Detail & Submitting flight plan.
- h. Signing Author Book.
- j. Sign F-781
- k. Crew Briefing

6. **Pre-flight Preparation**

- a. Carry Check List, SOP, FOB, Letdown Plate, DASH-1, Map, Jeppesen Manual, White papers and Air Rep to the aircraft.
- b. In case of night flying carry torch light & Red pen.
- c. Carry the Douglas Protector, plotter, marker pen and particular mission profile etc.
- d. Be comfortable with flying boots and coverall.
- e. Always carry your ID card, vomiting bag and a handkerchief with you.

7. **Approach to an Aircraft.** App the aircraft from front or rear quarter and while doing so, check the following:

- a. Check covers removed.
- b. Wings level.
- c. No fuel or oil leakage.
- d. Fire extinguisher available.
- e. No loose article around.
- f. Ground crew available.

Checks and Procedure

8. **External Pre-flight Check:**

- a. Do as per the Check List.
- b. Double check the followings:
 - (1) All intake covers are removed.
 - (3) Tire inflation, alignment and oleo extension.

9. **Internal Checks**

- a. Do as per Check List.
- b. Remember the followings:
 - (1) Use the same seat position.
 - (2) Legs should comfortably reach the rudder pedals. Remember the position and it everyday unless comfortable.

10. **Start up**

- a. Follow the check list.
- b. Know abort start procedure be ready to abort when require.
- c. After Start - As per Check List.

11. **After Start Check**

- a. Carry out the after start check as per Check List.

12. **Taxi Check**

- a. As per Check List.
- b. Set altimeter to QNH & note error.
- c. Check nose wheel straining manual before taxi out.

13. **Instrument Check**

- a. Aircraft turning to the Right/Left, TSI needle to the Right/Left, TSI Ball to Left/Right.
- b. DI increasing/decreasing, passing through heading.
- c. A/H no pitch, no bank.
- d. ASI, VVI, Altimeter zero.
- e. ADF, VOR pointing to the station.
- f. Clock is ready for operations.

Departure Brief

14. All station this is Co-Pilot, going over Departure briefing, we are going for a GF/IF/Route mission, load.....passenger.....AUW.....T/O Power.....V1.....VR.....Any emergency before V1, we will abort take off. At or above V1 continue take off and land back at same airfield. All action according to SOP, FOB, Check List and Dash-1 under captain's command. Any question sir?

15. **Before Line up**

- a. Check any aircraft on base turn to finals position.
- b. Check the position and movement wind socks.
- c. Monitor R/T calls to know the traffic situation in and around the airfield.

16. **Line Up**

- a. Always look at the full length of the R/W for aligning with the Centre line.
- b. Do line up checks as per check list.
- c. Check and call out nose wheel straining pedal after the light comes on.
- d. Obtain clearance from tower, complete the take off checks, check up and ahead clear and release brakes.

17. **Take Off**

- a. Release brake and apply right rudder.
- b. Look at the full length of the R/W.
- c. PNF will call out the speed & PF will have the controls for takeoff.
- d. At Vr PF will rotate the nose wheel gradually to take off attitude and airborne.

18. **After Take off**

- a. Carry out as per check list.
- b. Switch off spoiler, auto bank, auto feather switch after crossing 1000ft.
- c. In case of circuit spoiler, auto bank, auto feather switch will remain on.

19. **Training Area Jurisdiction (Dhaka Area)**a. **Training Area North**

Intercept radial 360° to proceed to Training Area North / proceed to right hand downwind of Hazrat Shahjalal International Airport, cross active and intercept radial 360° at height allotted by Dhaka Tower.

Radial 337°- 029°
DME 25-67Nm
Height Ground- Unlimited

b. **Training Area South**

Intercept radial 185° to proceed to Training Area South.

Radial 165°-210°
DME 10-45Nm
Height Ground-FL60

c. **Training Area East**

Intercept radial 090° to proceed to Training Area East / proceed to right hand downwind of Hazrat Shahjalal International Airport, cross active and intercept radial 090° at height allotted by Dhaka Tower.

Radial 060-110
DME 17-37Nm
Height Ground-FL250

20. **Straight and Level flight Parameters.**

Speed(KIAS)	Power	Attitude
135	42°	+3.5°
150	57°	+2.5°

21. **Increase/Decrease of Speed (By 15 Kts)**a. **Decrease speed (Up to 15 Kts)**b. **Pre-Entry**

- (1) Check heading constant, Heading selector on top.
- (2) Check height constant, eg: 4000ft, 5000ft.
- (3) Check speed constant 150kts.

c. **Entry**

- (1) Reduce power 20% less than the power required for new the speed.
- (2) Apply touch of left Rudder to maintain direct (Cross-check 12 o'clock).

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- (3) Maintain height by gradually raising the nose of aircraft (Cross check VVI).
- (4) As speed approaches 05 Kts short, adjust power to the required setting.
- (5) Trim the aircraft for new speed.

d. Increase speed (Up to 15 Kts)

e. **Pre-Entry**

- (1) Check heading constant, Heading selector on top.
- (2) Check height constant, eg: 4000ft, 5000ft.
- (3) Check speed constant 150kts.

f. **Entry**

- (1) Increase power 20% more than the required power for new speed.
- (2) Apply touch of Right rudder to maintain direction (cross-check 12 O'clock)
- (3) Maintain height by gradually lowering nose of the aircraft (Cross check VVI)
- (4) As the speed approaches 05 Kts short, adjust power to the required setting
- (5) Trim the aircraft for new speed

22. **Increase/ Decrease of Speed (Above 15 Kts)**

a. Increase speed (Above 15 Kts)

b. **Pre-entry**

Same as Increase/decrease of speed (Below 15 Kts).

c. **Entry**

- (1) Open power to 80%.
- (2) Maintain direction by applying required amount of rudder (check 12 O'clock ref and Wings level).
- (3) Maintain height by gradually lowering the nose of the aircraft (Cross check VVI).
- (4) As speed approaches 10 Kts short, adjust power to required setting.
- (6) Trim the aircraft for new speed.

d. Decrease speed (Above 15 KPH)

e. **Pre-entry**

Same as Increase/decrease of speed (Below 15 Kts).

f. **Entry**

- (1) Reduce TCL/Power to 20%
- (2) Apply required amount of rudder to maintain direction (12 O'clock ref and Wings level).

- (3) Gradually raise the nose of the aircraft to maintain the height (Cross check VVI).
- (4) As speed approaches 10 Kts short, adjust power to required setting.
- (5) Trim the aircraft for new speed.

23. **Climb**

a. **Definition.** Climbing is a balanced flight in which an aircraft gains height with const speed and power setting.

b. **Parameter.**

- (1) Speed - 110-120 Kts.
- (2) Power - 80%.
- (3) Attitude - 10-11°
- (3) RPM - 1900.

c. **Pre entry Check.** Checks that are to be done before entering into a climb are:

- (1) Heading selector on top.
- (2) Ts & Ps - normal.
- (3) Look out - Check up and ahead clear.
- (4) Orientation - Check position.

d. **Entry into Climb - (PATCAR).** Follow PATCAR procedure to enter into a climb:

- P - Power - Increase to 80.
- A - Attitude raise to 10-11° for 110-120 kts KIAS. AH raise 8-10°
- T - Trim the aircraft. All the trimmers.
- C - Check speed 110-120 KIAS, power 80%, RPM 1900, & TSI ball in the center.
- A - Adjust attitude (if required).
- R - Re-trim the aircraft.

e. **Maintenance of Climb**

- (i) Check visually up and ahead clear and if possible take a reference 12 o'clock.
- (ii) Power gradually reduces below 80%, so time to time adjust the power to 80% and RPM 1900 to maintain constant climb. Torque set 80%.
- (iii) Look out especially along the intended track.
- (iv) Visually avoid cloud and when cleared regain track.

f. **Level off from Climb (APTCAR)**

- (1) Give lead of 10% of ROC.
- (2) A -Attitude smoothly lower for 135 KIAS. 3.5 degrees for 130
 P - Adjust power when speed reaches 130 KIAS (05 KIAS lead). Torque 42%, 1700 rpm
 T - Trim the aircraft.
 C -Check speed, attitude, power & TSI ball.
 A - Adjust parameters, which were not correct (if any).
 R -Re-trim the aircraft (if required).

24. **Descend**

a. **Definition.** Descending is a balanced flight in which an aircraft loses height with const speed and power setting.

b. **Parameter**

- (1) Speed - 150Kts
- (2) Power - 30%
- (3) Attitude - -1.0°
- (4) RPM - 1700

c. **Pre-entry check** Following checks are to be done before entering into a descend:

- (1) Heading Sel on top.
- (2) Ts & Ps.
- (3) Look out & orientation.

d. Entry into descend - (APTCAR)

- A - Attitude smoothly lower for desired ROD.
- P - Adjust power and maintain speed 150Kts
- T - Trim the aircraft.
- C - Check speed, attitude, power & TSI ball.
- A - Adjust parameters, which were not correct (if any).
- R - Re-trim the aircraft (if required)

e. **Level Off from Descend**

- (1) Give lead 10% of ROD.
- (2) Maintain the sequence:
 - A - Attitude raise to 3.5° .
 - P - Adjust power to 42° power for cruise speed.
 - T - Trim the aircraft.
 - C - Check speed, attitude, power & TSI ball.
 - A - Adjust (if required).
 - R - Re-trim the aircraft.

25. Medium Level Turn (15°)

a. **Definition.** Balanced state of flight in which an aircraft changes direction with a bank not exceeding 15° .

b. **Parameter**

- (1) Speed: 135 kts
- (2) Power: 42%
- (3) RPM: 1700 rpm.

c. **Pre-Entry**

- (1) Check heading constant, Heading selector on top.
- (2) Check height constant, eg: 4000ft, 5000ft.
- (3) Check speed constant 135 kts

d. **Entry**

- (1) Bank Cross check in A/H, holding same attitude Increase bank to 15°
- (2) Balance Stop sidewise movement of the aircraft, ball in the centre.
- (3) Back Pressure If require to maintain height.

- (4) **Scanning**. Scanning technique for medium level turn:

Att -Bank (A/H). While crossing 20° bank 9° hold 42%-44%
 Att -Ball (TSI).
 Att -VVI.
 Att -Alt.
 Att -Speed.
 Att -Look inside the turn is clear.
 Att -DI (include short of roll out).

e. **Corrections**. In case the speed or height is lost for poor maintenance the correction will be as following:

- (1) **Speed**. Speed is corrected by adjusting and readjusting power provided the att is correct. If attitude is not correct attain desired attitude first.
- (2) **Height**. To loose height, lower the nose depending upon the height to be lost, and adjust power to maintain speed. Reverse technique applies for gaining height. Remember to maintain the same bank angle.

26. Medium Level Turn (30°)

a. **Definition**. Balanced state of flight in which an aircraft changes direction with a bank not exceeding 30°.

b. **Parameter**

- (1) Speed: 135 kts
- (2) Power: 42%
- (3) RPM: 1700 rpm.

c. **Pre-Entry**

- (4) Check heading constant, Heading selector on top 4.5.
- (5) Check height constant, eg: 4000ft, 5000ft.
- (6) Check speed constant 150kts

d. **Entry**

- (1) Bank Cross check in A/H, holding same attitude Increase bank to 30°
- (2) Balance Stop sidewise movement of the aircraft, keep ball in the centre.
- (3) Back Pressure Apply if require, to maintain const height.

(4) **Scanning**. Scanning technique for medium level turn:

Att -Bank (A/H).
Att -Ball (TSI).
Att -VVI.
Att -Alt.
Att -Speed.
Att -Look inside the turn is clear.
Att -DI (include short of roll out).

e. Roll out from Turn

- (1) Give lead for roll out, (1/3 of the bank angle).
- (2) Roll out by using opposite aileron and touch of rudder
- (3) Cross check attitude, VVI, altimeter, speed and ball in the center. Re-check DI for correct roll out.
- (4) If required, adjust parameters.

27. Steep Turn (45°)

a. **Definition**. Balanced state of flight in which an aircraft changes direction with a fixed bank angle of more than 45°.

b. **Parameter**

- (1) Speed - 135 kts while xing.
- (2) Power - 60%

c. **Pre-Entry Checks**.

- (1) Carry out HASELO Check.
- (2) Take a ref point, Heading sel - on top.
- (3) Check height const, and speed 135 kts.
- (4) Look out - clear the area same as MLT.

d. **Entry**

(1) Make the entry just like MLT. When bank angle crosses through 30° , gradually apply little back press looking at the horizon. In order to maintain the altitude constant, back press needs to be Increased with the increment of bank angle. Advance power as required to maintain speed 135 kts.

e. **Maintenance of Exercise**

(1) **Bank**. Maintained by aileron and looking at the natural horizon. Occasionally take ref from A/H.

(2) **Balance**. Stop sidewise movement of the aircraft, keep ball in the centre.

(3) **Back Pressure**. Correct attitude & back press ensure constant ht. You can gain or loose height only by varying back press.

(4) **Scanning**. Scanning technique for steep turn:

Att - Bank (A/H).

Att - TSI Ball.

Att - VVI.

Att - Alt.

Att - Speed.

Att - Inside the turn is clear.

Att - DI (Frequent for 45°).

f. **Roll Out From Steep Turn.**

- (1) Give lead (1/2 of Bank angle) 20° .
- (2) Apply opposite aileron and Rudder..
- (3) Check speed & readjust power to 42%.
- (4) As bank reduces to 30 relax back pressure.
- (5) After roll out reduce power the added power.
- (6) Forward trim as require.

28. **Stall.**

a. **Definition**. It is defined as a state of flight, in which an aircraft can no longer maintain level flight. Stalling speed varies with configuration, weight, power and load factor.

b. **Stalling Speed Chart (Clean).**

All Weight(Kg)	Up	Stall Speed(KIAS)	V _R
4500		72	85
5000		76	85
5500		80	85
6000		84	87

6500	88	90
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c. Stall Briefing All station this is co, going over stall briefing. We are going for a clean/dirty stall. Our AUW....., Stalling Speed.....Vr.....During recovery on the first symptom of stall we will lower the attitude and Open power to 80%require power.

d. Stall-Pre-Entry Check (Clean)

- (1) HASELO Check.
- (2) Clear the area.
- (3) Note the height at which exercise is started (min 4000 ft).
- (4) Heading sel on top.
- (5) Check the stalling speed & V_R.
- (6) Carry out stall briefing.
- (7) Rpm 1900.

e. **Entry into Stall (Clean).**

- (1) Put the TCL to idle left rudder, redder trim.
- (2) Wings Level, ball center VVI zero.
- (3) Trim Back-Last trimming speed 110kts

f. **Maintenance of Exercise**

- (1) Trim progressively to maintain height and VVI zero.
- (2) Raise att gradually to maintain height.
- (3) Hold attitude till aircraft stalls.

g. **Symptoms of Stall.**

- (1) Aircraft attitude – high.
- (2) Low speed.
- (3) Controls sluggish.
- (4) Extend Landing Gear It comes on.
- (5) Aircraft judders, critical angle of attack 10-11°.
- (6) Stall warning It and audio signal comes on.

h. Stall Recovery First action are taken to recover the aircraft at initial symptoms of stall.

- (1) Relax back pressure, att lower 0° to -1°
- (2) Open power 80%
- (3) Pull att to 5° when speed approaches V_R
- (4) VVI shows positive ROC, check height lost.
- (5) Speed approaches 110 kts set the aircraft in climb.
- (6) Level off at previous height with 135 kts.

j. **Stalling speed.**

Flaps- 18° - 63 kts 42° - 57 kts

Dirty Stall (Landing Gear Down, Flap 18°)

a. **Pre-Entry Check.**

- (1) HASELO Check.
- (2) Clear the area.
- (3) Check height at which exercise started (min 4000 ft).
- (4) Heading sel on top.
- (5) Check the stalling speed & V_R .
- (6) Carry out stall briefing.
- (7) Rpm 1900.

b. **Entry into Stall.**

- (1) Reduce speed to 135 Kts, wings level and lower gears check 3 green.
- (2) Check speed 128 Kts, lower flaps to 18% check leftt 42°.
- (3) Put TCL to Idle.

c. **Maintenance of Exercise**

- (1) Trim progressively to maintain height and VVI zero-Last trimming speed 110 (18°)/90 (42°).
- (2) Raise att gradually to maintain height.
- (3) Hold attitude till aircraft stalls.

d. **Symptoms of Stall**

- (1) Aircraft attitude – high.
- (2) Low speed.
- (3) Controls sluggish.
- (4) Aircraft judders.
- (5) Stall warning light and audi signal comes on.

e. **Stall Recovery.** First action are taken to recover the aircraft at initial symptoms of stall.

- (1) Relax back pressure, att lower 0° to -1°
- (2) Open power 80%
- (3) Pull att to 5° when speed approaches VR
- (4) VVI shows positive ROC, brakes apply, Gears up, check height loss.
- (5) Speed approaches 110 kts flaps up att 10° and set the aircraft in climb.
- (6) Level off at prev height and settle down with 135kts.

29. **Rejoin.** While leaving training area give call to Dhaka 118.3 tower for leaving the area and ask for rejoining instructions. Maintain height and radial as instructed by Dhaka tower and change to Tejgaon Tower as instructed. After changing to Tejgaon tower freq, request for traffic in the airfield. Before joining the circuit, settle down with parameters and lookout for other traffic and birds. Join downwind or call initial and pass the intention for making low go/full stop landing.)

30. After Landing Procedure & Shut down

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- a. After landing ask for dispersal and carry out 'After Landing Check' as per check list.
- b. Look for Marshaller & taxi to the parking position.
- c. Shutdown as per check list.
- d. Come out of the aircraft and do a thorough post flight inspection. Inspection whole aircraft for bird hit, oil leakage, any other damage or abnormality.