DA-20

Diamond Eclipse
Procedures Guide

Expanded Procedures and Profiles

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Safety Statement

Myth: *Accidents are unforeseen events that result in unavoidable losses.*

Fact: Accidents are common operational errors, which result in costly losses.
Fact: Accidents are caused and therefore can be prevented.

Falcon Aviation Academy has several primary objectives; (1) provide aircraft rental service to qualified pilots, (2) provide the highest level of training with a reasonable cost to our students, (3) provide employment opportunities to our graduates (4) provide a high degree of safety, regulatory compliance and care in our daily operation. Of these, safety and regulatory compliance are of paramount importance.

Safety in our operation is enhanced through;

- Identification of hazards (risk) to our operation.
- Evaluation of safety hazards.
- Elimination of hazards that have the potential to cause injury or damage to our customers, employees, facilities or property.

The operation of an aircraft and the maintenance of an aircraft require everyone involved to continually evaluate risk.

All persons, either employed or doing business with Falcon Aviation Academy, are encouraged to place safety and risk management as their highest priority. The management of Falcon Aviation Academy maintains an open door policy to discuss any safety concern at any time.
Therefore, in order to maintain the highest level of safety all of us must participate in this endeavor.

Note:

Any person acting as PIC must have the Diamond POH in their possession during flight. The PIC must understand all sections of the POH. The POH is not updated by Falcon Aviation Academy. The PIC must be familiar with any revisions made by the manufacturer by reviewing the Diamond website before flight.

Checklist Policy

Checklist usage and standard operating procedures are universally recognized as the basis to safe aviation operations. The NTSB has cited improper use or failure to use a checklist as a leading cause of accidents throughout aviation. Therefore, requires strict adherence to the approved checklist. This ensures a safe environment for you and our customers and will lead to many years of enjoyable flying.

Most checklists are accomplished by flow pattern then verify using checklist. The advantage of this type of checklist is that it allows a backup or redundancy. If an item is missed, it allows a second look to correct the omission. In all cases, a visual verification is made to ensure correct position of a switch.

Abnormal checks are performed by reference to the checklist or manual. These are situations, which do not occur frequently and may require troubleshooting. In addition, time is usually available; therefore rapid completion is not usually required.

Emergency Procedures

Most emergency procedures are critical to maintaining safe flight and returning the aircraft to an airport ASAP. Therefore, emergency procedures require trained flow pattern response, followed by reference to the checklist after completing immediate response items.

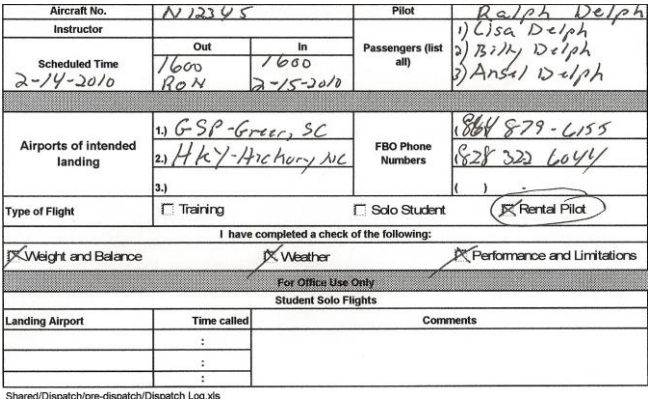
Note

All checklists require training and a complete understanding of the AFM/POH. If in doubt about any item on the checklist, do not depart without additional training

All Pilots must be familiar with the POH purchased at time of checkout. All pilots must remain familiar with the Diamond AFM as posted on the Diamond web site. Falcon Aviation Academy is not responsible for POH updates. Pilots are responsible for any and all revisions published by the manufacturer.

The POH must be assessable to the pilot during flight for reference to Abnormal and Emergency Procedures.

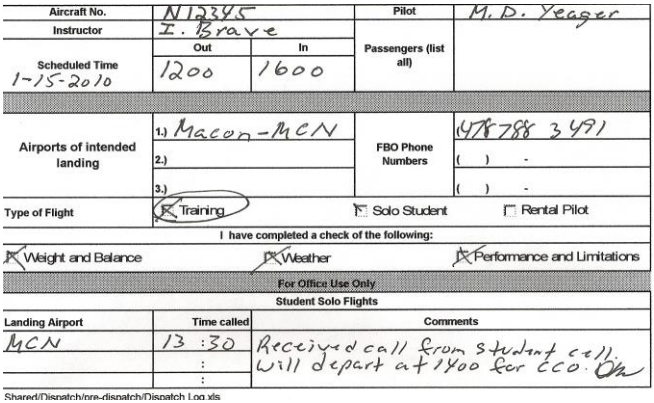
Dispatch of a Rental flight with Overnight stay



Aircraft No.	N12345		Pilot	Ralph Delph
Instructor			Passengers (list all)	1) Lisa Delph 2) Billy Delph 3) Ansel Delph
Scheduled Time 2-14-2010	Out: 1600 RON	In: 1600 2-15-2010		
Airports of intended landing	1.) GSP-Greer, SC 2.) HKY-Hickory NC 3.)		FBO Phone Numbers	(864) 879-6155 (828) 323 6044 ( ) -
Type of Flight	☐ Training	☐ Solo Student	☒ Rental Pilot	
I have completed a check of the following:				
☒ Weight and Balance	☒ Weather	☒ Performance and Limitations		
For Office Use Only				
Student Solo Flights				
Landing Airport	Time called	Comments		
	:			
	:			
	:			

Shared/Dispatch/pre-dispatch/Dispatch Log.xls

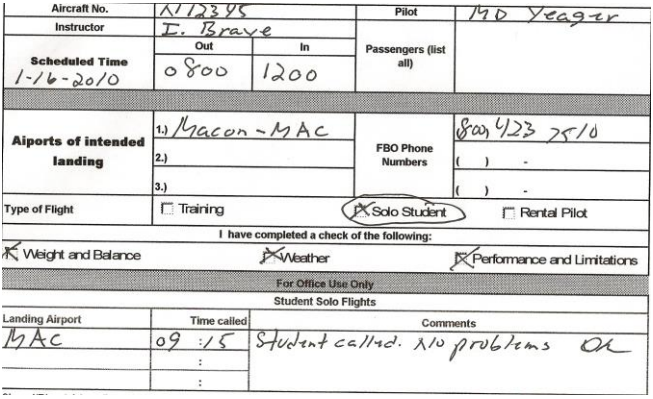
Dispatch of a Training dual Cross Country



Aircraft No.	N12345		Pilot	M. D. Yeager
Instructor	I. Brave		Passengers (list all)	
Scheduled Time 1-15-2010	Out: 1200	In: 1600		
Airports of intended landing	1.) Macon-MCN 2.) 3.)		FBO Phone Numbers	(478788 3491 ( ) - ( ) -
Type of Flight	☒ Training	☐ Solo Student	☐ Rental Pilot	
I have completed a check of the following:				
☒ Weight and Balance	☒ Weather	☒ Performance and Limitations		
For Office Use Only				
Student Solo Flights				
Landing Airport	Time called	Comments		
MCN	13 :30	Received call from student will depart at 1400 for CCO. OK		
	:			
	:			

Shared/Dispatch/pre-dispatch/Dispatch Log.xls

Solo Student Cross country



Aircraft No.	N12345		Pilot	MD Yeager
Instructor	I. Brave		Passengers (list all)	
Scheduled Time 1-16-2010	Out: 0800	In: 1200		
Airports of intended landing	1.) Macon-MAC 2.) 3.)		FBO Phone Numbers	800 423 7510 ( ) - ( ) -
Type of Flight	☐ Training	☒ Solo Student	☐ Rental Pilot	
I have completed a check of the following:				
☒ Weight and Balance	☒ Weather	☒ Performance and Limitations		
For Office Use Only				
Student Solo Flights				
Landing Airport	Time called	Comments		
MAC	09 :15	Student called. No problems OK		
	:			
	:			

Preflight Inspection

Conduct the Dispatch Procedures including Risk analysis

- The Aircraft Inspection will follow a flow pattern. Follow the Preflight Walk around check as listed in the Falcon/Diamond checklist.

- After the inspection is complete, the Checklist is consulted to verify all tasks are complete.

- Battery cold starting amperes are important. Do not conduct an exterior light check for first flight of the day if temperatures are below 40 degrees.

Cockpit Management

- Ensure all loose items in cockpit are secured
- Never place anything on the glare shield of the Diamond Aircraft
- Brief all passengers on use of seatbelts, shoulder harnesses, and emergency procedures
- Organize material and equipment in a logical, efficient flow pattern

Engine Starting

- Organize cockpit as indicated above.
- Inset the key into Ignition slot
- Review all switches , levers and controls for proper position
- Determine the type of Start to be accomplished. (Cold/Warm/Hot/Flooded) Review from the boxed Items
- Conduct the Before Starting Checklist
- Conduct the Starting Procedures from the boxed (Memory) items.

After Start Procedures

- Accomplish the After Start Flow, then
- Followed by reference to the After Start Checklist.

- Suggested Flow pattern is:

- 1000 RPM
- Primer-OFF
- Oil Pres-Ck
- Gen-On
- Avionics-On
- Volts/Amps-Ck

Read checklist to verify items completed

Cold Weather Operation

- When outside air temperatures are below 35 degrees Fahrenheit, the Cold Start Procedure must be used if the engine is cold. This will require saving battery amps and using engine prime for at least 20 seconds. If the engine does not start after the first attempt, additional prime must be used. The battery will only handle several start attempts.

Caution:

Do not release the starter and then select Start with the propeller in motion. **Start, release, wait.**

For OAT's less than -5º F (-20º C) turn cabin heat on for at least 10 minutes prior to take-off.

Taxi Operations

- Complete pre-taxi checklist prior to aircraft movement
- Set and check communication and navigation equipment before taxi if possible
- *Flight Instruments* means: Directional Gyro and Magnetic Compass Set and Checked
- *Lights* means: Strobes On, Nav lights on if at or after sunset, taxi light On if at or after sunset, unless needed during the day for congested ground awareness.
- State "clear left, front, right"
- Apply sufficient power to move the aircraft forward
- Reduce power to idle and gently test the brakes
- More power is typically required to begin the aircraft movement than is required to sustain a safe taxi speed (brisk walk)
- Adjust power to maintain a safe taxi speed (depending on wind conditions)
- Directional control is accomplished by a combination of rudder and brake control inputs. The nose wheel is NOT controlled by the rudder pedals, however, rudder should be used first along with brakes as needed.
- Apply proper crosswind taxi control inputs
- Observe all local traffic rules, ATC instruction, and airport markings
- Be alert for airport hazards (moving and parked aircraft and vehicles, etc.)

Before Takeoff Check

- Accomplish using the Read and Do method until reaching the boxed items.
- The boxed items are accomplished using the Do and Verify method. This will allow for heads-up attention to the aircraft while running the engine at higher power.
- Accomplish engine run up using flow, then return power to 1000 RPM followed by checklist review
- Hand MUST remain on the throttle during run up to ensure immediate reduction of power if a problem should occur.

Flight Instruments means: In a flow checking:

AS, AI, Alt, TC, DG, VSI

Radios/Navaids means: In a flow setting and checking:

Com/Nav Frequency's, GPS or VOR, Map, Data Base, Course verified, Second Com/Nav set, Transponder Set

- *Departure Plan* means,

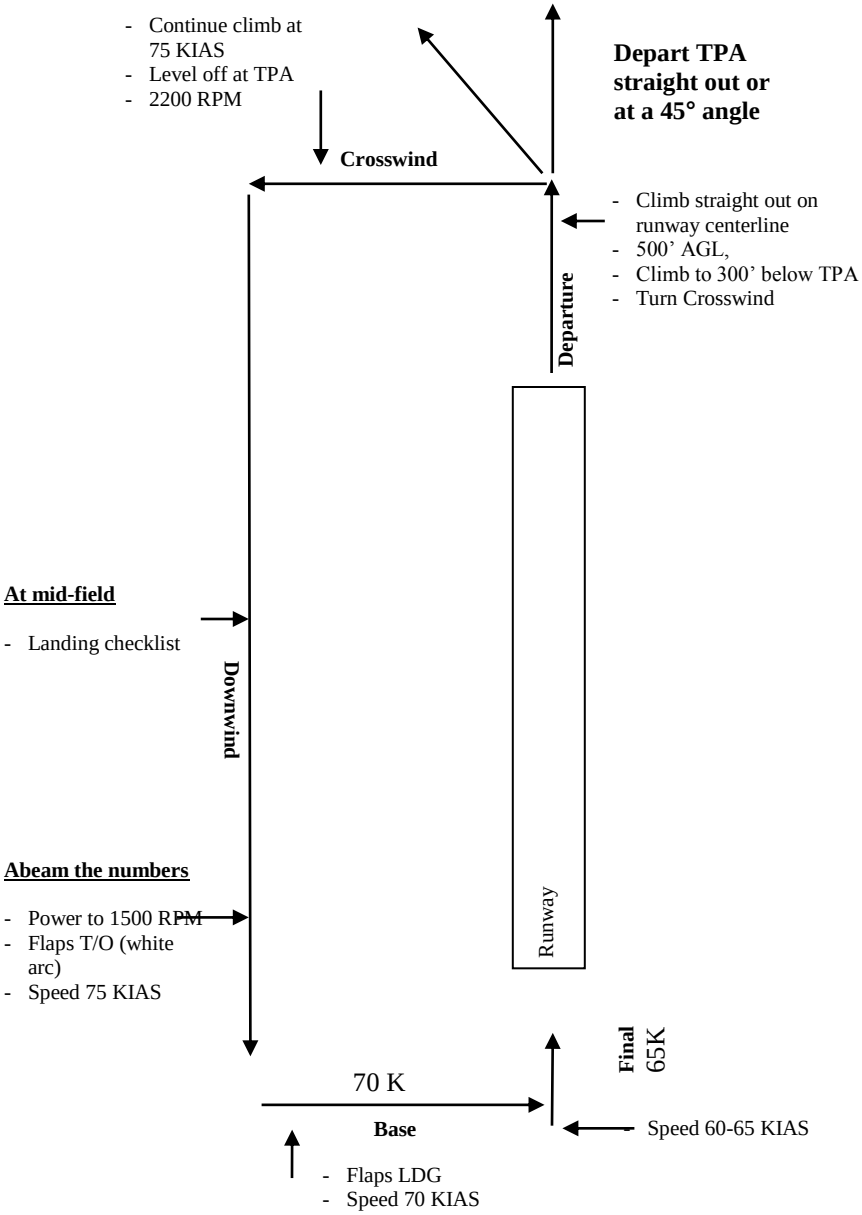
- Briefing stating:

    1. Type of Takeoff
    2. Pattern departure plan or closed traffic
    3. Emergency procedures
    4.

When ready for Takeoff;

Review , then conduct memory *Takeoff* Items

Traffic Pattern Profile



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Normal Takeoff and Climb

DISCUSSION

- Check final, base, & downwind for traffic
- Line up on the runway centerline and align the nose wheel
- Pause briefly to set the heading indicator with runway direction
- Select a reference point straight out for maintaining the runway centerline

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PROCEDURE

1. Gradually apply full power
   - Apply right rudder as necessary to compensate for left turning tendencies
   - Hand MUST remain on the throttle during takeoff
   - Check for minimum RPM (2000)
2. Announce "airspeed alive,"
3. Maintain directional control of the aircraft with rudder inputs during acceleration
   - Aircraft must remain on the centerline during takeoff roll.
4. Rotate at V_R (44 KIAS)
   - Gradually apply back pressure to allow the nose of the aircraft to pitch up
   - Set proper pitch and allow the aircraft to accelerate to V_Y after liftoff
     (65 KIAS, flaps T/O)
   - Allow the aircraft to accelerate while climbing
5. Clear of obstacles or 500', Select Flaps Up
   - Set and maintain a pitch attitude that will allow the aircraft to accelerate to 75 KIAS
6. Choose a reference to maintain the extended runway centerline
   - Maintain straight track over the extended runway centerline
   - The head should remain up at all times and the pilot vigilant for traffic entering or leaving the pattern.
7. Climb to pattern altitude before departing on a 45 to the departure leg.
8. A turn on course should not be made until at least 500' above TPA.
9. Complete checklists when clear of traffic pattern.

Climb Procedures

- Climb to allow for forward visibility to see and avoid traffic.
- Cruise Climb of 90 kts is recommended to allow for increased visibility and traffic awareness as well as improved engine cooling.
- During dual instructional flights, the mixture should be leaned for improved performance (see AFM 4.4.8)

Short-Field Takeoff and Climb

DISCUSSION

- Check that the runway and final approach are clear
- Position aircraft using all available runway
- Align with the runway centerline

PROCEDURE

1. Hold brakes firmly
   - Avoid creeping
   - Gradually apply full power
     - Apply right rudder as necessary to compensate for left turning tendencies
     - Hand MUST remain on the throttle during takeoff
     - Check for minimum RPM (2000)
     - Check engine gauges green
   - Release brake
   - Maintain directional control of the aircraft with rudder inputs during acceleration
     - Aircraft must remain on the centerline during takeoff roll.
2. Rotate at V_R (52 KIAS)
3. Pitch for 58 KIAS
4. Climb at 58 KIAS until clear of obstacles
5. Clear of obstacles:
   - Pitch for 65 KIAS
6. Trim to relieve control pressures
7. Choose a reference to maintain the extended runway centerline
   a. Maintain straight track over the extended runway centerline
8. Continue with Normal Takeoff Procedures

Soft Field Takeoff

DISCUSSION

- Check that the runway and final approach are clear
- Hold full back elevator pressure beginning at the hold line
- Continue moving as the aircraft is aligned with the runway

PROCEDURE

1. Gradually apply full power
2. Apply right rudder as necessary to compensate for left turning tendencies
3. Hand MUST remain on the throttle during takeoff
4. Check for minimum RPM (2000)
5. Announce "airspeed alive,"
6. Maintain directional control of the aircraft with rudder inputs during acceleration
    - Aircraft must remain on the centerline during takeoff roll.
    - Hold adequate back elevator pressure to allow the aircraft to become airborne as quickly as possibly
        - CAUTION: Avoid a pitch attitude that could result in a tail strike!
7. After the aircraft is airborne, set proper pitch and allow the aircraft to accelerate to V_X after liftoff
8. DO NOT LEVEL OFF to allow the aircraft to accelerate more than V_X
9. For short field takeoff , continue with Short Field Procedure.

Crosswind Takeoff and Climb

NOTE: *During preflight inspection verify that maximum crosswind component of the aircraft and pilot limitations will not be exceeded*

PROCEDURE

1. Gradually apply full power
    - Apply right rudder as necessary to compensate for left turning tendencies
    - Hand MUST remain on the throttle during takeoff
    - Check for minimum RPM (2000)
    - Check engine gauges green
2. Announce "airspeed alive"
3. Maintain directional control of the aircraft with rudder/aileron inputs during acceleration.
    - Light braking may be used for directional control ***ONLY*** if necessary.
4. Establish a positive liftoff by rotating at a slightly higher than normal speed (46 KIAS)
    - Gradually apply back pressure to allow the nose of the aircraft to pitch up. Do not over pitch.
5. Set pitch and allow the aircraft to accelerate to V_Y after liftoff (65 KIAS, flaps T/O)
    .
6. At a safe altitude above the runway:
    - Establish a crab into the wind to correct for drift
    - Maintain crab angle by heading control, coordinate with rudder
7. Choose a reference to maintain the extended runway centerline
    - Maintain straight track over the extended runway centerline

Normal Approach and Landing

Abeam touchdown point

1. Reduce power to 1500 RPM
2. Maintain altitude
3. Flaps T/O below <100k
4. Slow to 75k
5. Descend at 75k

45º from touchdown point

6. After descending approximately 200':
7. Turn base leg (max bank 30º)
8. Flaps LDG <78
    a. **CAUTION:** *Remain in white arc*
9. Slow to 70 KIAS
10. Adjust pitch to continue descent

Final approach (500' AGL)

11. Turn final (max bank 30º)
12. Adjust power to maintain 65 KIAS
13. Maintain a straight track to the runway centerline
14. Use pitch and power adjustments to maintain proper glide path
    b. If the aircraft begins to sink, add power and adjust pitch to maintain airspeed
    c. To increase rate of descent, reduce power and maintain pitch to allow aircraft to slow to approach speed
15. If at any time the glide path or airspeed will cause the aircraft to land beyond the first third of the landing runway a GO AROUND MUST BE INITIATED.

Round-out and Touchdown

16. Begin flare at appropriate altitude
    - **NOTE:** *Be cautious about starting flare too high, which could result in bouncing the airplane or stalling above the runway and damaging the landing gear.*
17. Allow the airplane to descend gradually
18. Simultaneously increase back pressure
    - Increase back pressure at a rate that will allow the airplane to descend and ultimately touchdown with the nose slightly high.
    - **(CAUTION: *Watch for excessive nose high attitude to avoid striking the tail*)**
19. Touchdown main wheels first
    d. **CAUTION:** *DO NOT touch down on the nose wheel first. Dangerous porpoising could result and damage the propeller. A GO AROUND MUST BE INITIATED if this condition were to occur.*

Roll-out

20. Gradually increase back pressure to keep the nose wheel off the runway
    e. Back pressure should be maintained until airspeed decreases sufficiently to allow the nose wheel to touchdown as a result of loss of lift.
21. Maintain directional control on the runway centerline
    f. Use brakes sparingly and only if necessary

NOTE: *For windy conditions add ½ of peak wind value.*

Example:

Reported wind 310° at 15 gusts to 23 kt.
23÷2=11.5
Add 12k to final approach
Normal speed = 65
New Speed 65 + 12 = 77

Crosswind Approach and Landing

Approach

- Establish crab angle that will maintain track on the runway centerline
- Use pitch and power adjustments to maintain proper glide path
    - If the aircraft begins to sink, add power and adjust pitch to maintain airspeed
    - To increase rate of descent, reduce power and maintain pitch to allow aircraft to slow to approach speed
- If at any time the glide path or airspeed will cause the aircraft to land beyond the first third of the landing runway a GO AROUND MUST BE INITIATED.
- When landing is assured, align the nose with the runway using Rudder
- Counteract with drift by banking slightly into the wind
- Begin flare at appropriate altitude, maintaining proper crosswind correction inputs
    - **NOTE:** *Be cautious about starting flare too high which could result in bouncing the airplane or stalling above the runway and damaging the landing gear.*
- Allow the airplane to descend gradually
- Keep the nose aligned with the runway
- Counteract drift by maintaining bank into the wind
- Simultaneously increase back pressure
    - Increase back pressure at a rate that will allow the airplane to descend and ultimately touchdown with the nose slightly high.
    - **(CAUTION:** ***Watch for excessive nose high attitude to avoid striking the tail*****)**
- Touchdown main wheels first
    - As the airplane touches down, the upwind main should touchdown first, followed by the other.
- Gradually increase back pressure to keep the nose wheel off the runway
- As airspeed decreases, increase aileron deflection
- Maintain directional control on the runway centerline
    - Use brakes sparingly and only if necessary

Short Field Approach and Landing

PROCEDURE

1. Extend downwind as needed to allow for proper approach slope
2. Establish a power-on final approach
3. Set landing spot in windshield
4. Adjust power to maintain 60 KIAS
5. Maintain a straight track to the runway centerline
6. Use pitch and power adjustments to maintain proper glide path
7. Landing assured, slow to 55 KIAS
8. Control descent with power
9. Land on spot, retract flaps and simulate max breaking

Roll-out

11. Maintain directional control on the runway centerline
12. Announce "Simulate max Braking"
13. Apply Light to Moderate Braking

note:

1. Practice this procedure in dual instructional flight only unless authorized by a company instructor.
2. Practice in non-gusty conditions.
3. Actual short filed operations not allowed unless approved by company management.
4. A short field is any runway less than the POH charted landing distance multiplied by a factor of 2.
5. Airplane landing distance may be less than the required takeoff distance.

Soft Field Approach and Landing

APPROACH

- Determine landing spot

1. Use the short field approach procedures
2. Over threshold, decrease airspeed to 55kts.
3. Use power on until over landing spot
4. Reduce power to idle and land, nose high
5. Continue holding light up elevator on roll-out

Descent and Arrival

- Plan a descent to arrive at the TPA or other assigned altitude at 5nm from the airport.
- Obtain local winds and weather as necessary before TOD (top of descent) if possible
- Check Fuel remaining
- Check and set communication Radios and Nav Radios as needed
- Adjust the Mixture based on altitude so that you arrive at TPA with a Rich mixture
- After items are completed, use the Descent Checklist to verify items are completed
- "*Flight Instruments*" means; adjustment of the DG and Alt

Go Around / Rejected Landing

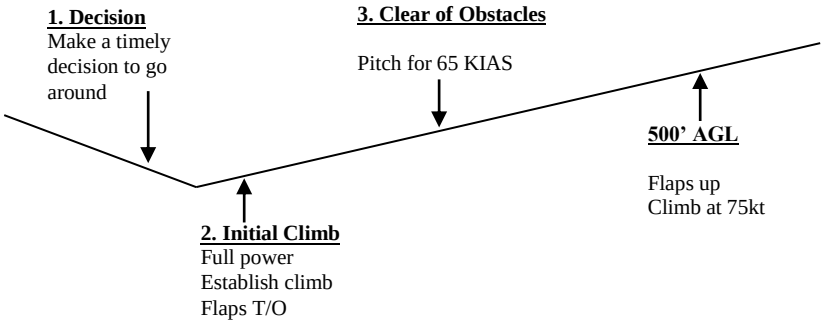
NOTE: *Make a timely decision to discontinue an approach at any time a safe landing is in question. This includes, being too high or low, too fast or slow, or at any time when a landing cannot be made within the first third of the runway.*

1. Gradually apply full power
2. Adjust attitude to stop descent
3. Retract flaps to T/O
4. Begin pitching to establish a slightly positive rate of climb (200 – 300 fpm)
5. Establish pitch attitude to achieve 58 KIAS
6. Clear of obstacles
    - Pitch for 65 KIAS
    - Make appropriate radio announcement
7. 500' AGL
    a. Retract flaps to CRUISE
    b. Pitch for 75 KIAS
8. Maintain a straight track along runway centerline

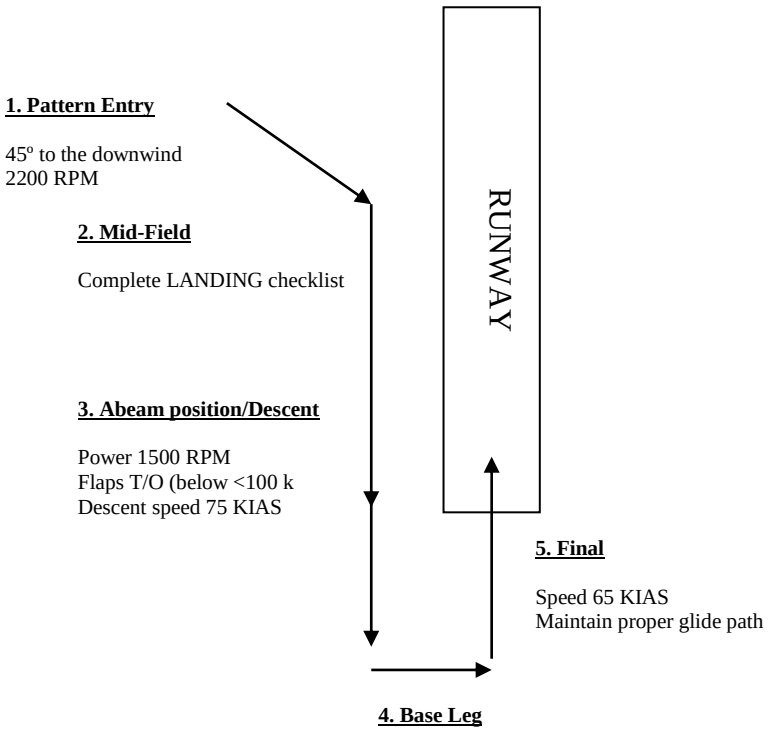
If a go around is executed due to other departing traffic, climb to the right of the departing aircraft (left, if right traffic pattern turns) until well clear and communicate intentions

.

Go Around / Rejected Landing



Approach and Landing Profile



Emergency Approach and Landing

NOTE: *To be practiced with instructor only. IP will adjust throttle up to 1700 RPM every 30 seconds to clear the engine. See Idle Power operations in POH.*

PROCEDURE

1. Convert excess speed to distance or altitude
2. Establish best glide
   - Best glide Flaps CRUISE – 73 KIAS
   - Consider Slowing to 65 KIAS if low altitude
3. Trim for airspeed
4. Determine wind direction and land into the wind if possible
5. Select a landing area within gliding range
6. Develop an approach plan
7. Turn towards to intended landing area
   - If possible position the aircraft directly over the field and execute a spiraling descent at 65-73 KIAS.
   - Attempt to complete the spiral at 1000' AGL abeam the intending point of landing
8. TIME PERMITTING (2000' AGL or higher), complete RESTART IN FLIGHT CHECKLIST
9. Use flow pattern first, verifying with appropriate checklist
10. If engine cannot be restarted, perform EMERGENCY LANDING checklist using flow pattern (do and verify)
11. Squawk 7700
12. Tune radio to 121.5 and announce position and intentions

Notes:

1. Minimum 1,000 AGL to end scenario
2. Maybe practiced to 500 AGL when over actual grass airfield

RESTART IN FLIGHT

PROP WINDMILLING	
Airspeed	73 KIAS
Fuel Shutoff	In, Locked
Mixture	Rich
Ignition Switch	Both
Fuel pump	On
Fuel Primer	On

PROP STOPPED	
Airspeed	73 KIAS
Electrical Equip	Off
Avionics master	Off
Master switch	On
Mixture	Rich
Fuel Shutoff	In, Locked
Fuel pump	On
Fuel Primer	On
Ignition	Start

EMERGENCY LANDING	
Fuel Shutoff Valve	Out
Mixture	Cutoff
Ignition Switch	Off
---	---
Radios	Call
Flaps	As Required
Master Switch	Off, after flaps

Emergency Procedures

Discussion

Before any flight, the PIC must have a complete understanding of the DA 20 aircraft systems, including;
Normal, Abnormal and Emergency operation of all systems.

Once an operational and working knowledge is understood, the PIC should begin directed practice on all Emergency and Abnormal procedures listed in Section 3 of the POH.

The Engine Failure and the Forced Landing Procedures require a briefing from the instructor before flight to ensure the highest level of safety for the training simulation. The company has specific policy on instructions to simulate these events.

Several critical situations can occur which require immediate action :

Those are:

1. an engine Failure immediately after takeoff without runway remaining
2. an engine failure at low altitudes
3. an engine failure in flight at cruise altitude
4. an rough running engine

Each procedure is listed in this manual, the company abbreviated checklist and the POH or AFM.

The aircraft has different glide capabilities with flaps up, takeoff or landing settings. Each configuration must be understood.

Idle Power Operations

Turn fuel pump on for all low throttle operations, including taxiing and all flight operations when engine speed could fall below 1400 RPM (eg. stalls, descents, spins, landings, etc.).

1. Fuel Pump ON
2. Mixture FULL RICH
3. Throttle IDLE

Rectangular Course

DISCUSSION

- Find practice area where terrain is appropriate for maneuvering with an available emergency landing area
- Select a rectangular are about 1 mile in length

PROCEDURE

1. Set power to 2200 RPM
2. Maneuver is performed 800 AGL
3. Enter the maneuver 45º to the downwind with the first circuit to the left

Downwind

4. Roll wings level, parallel to the boundary
5. Maintain distance (about ½ mile) from boundary
6. At field boundary edge, turn first crosswind leg
7. Start with steep bank
8. Reduce bank angle gradually during the turn

First Crosswind Leg (Crosswind)

9. Roll out, wings level crabbing toward the boundary
10. Manage crab angle to maintain ½ mile distance from boundary
11. At field boundary edge, turn upwind
12. Start with medium bank
13. Reduce bank angle gradually during the turn as ground speed decreases

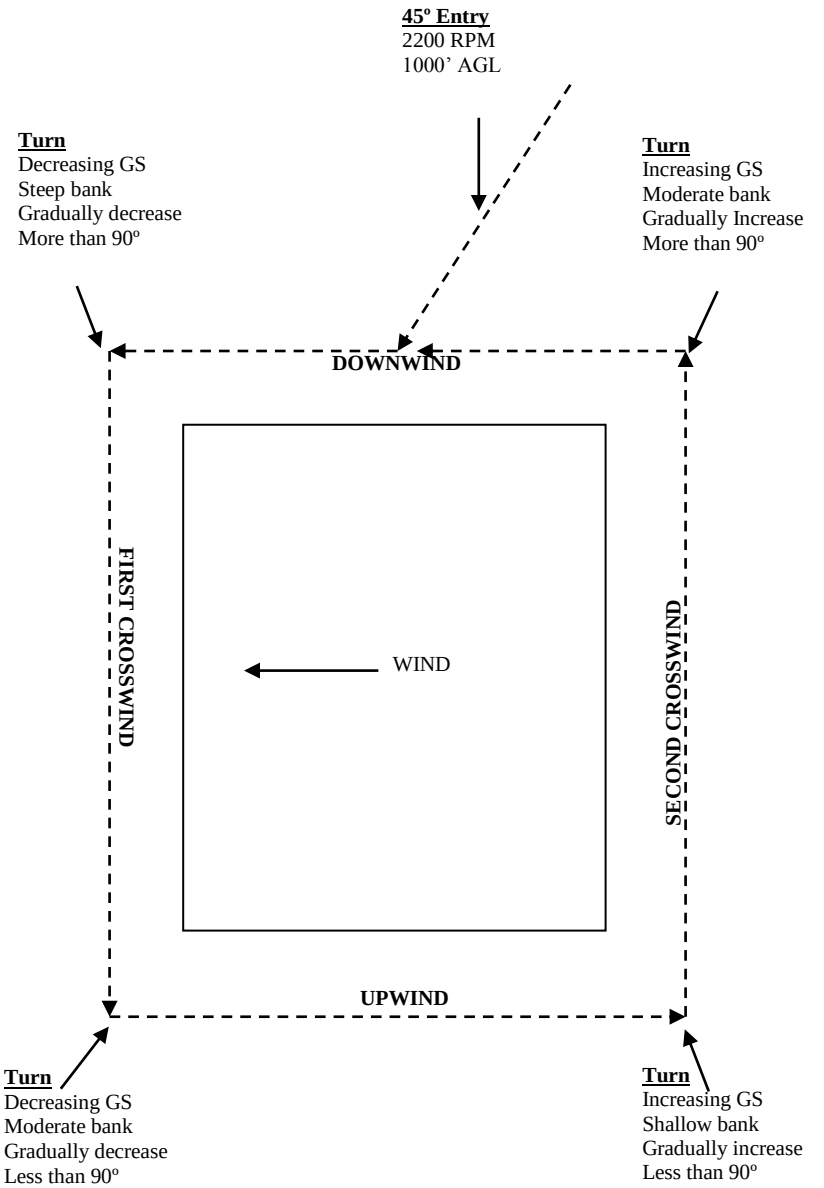
Upwind

14. Roll wings level, parallel to the boundary
15. At field boundary edge, turn second crosswind leg
16. Start with shallow bank
17. Increase bank angle gradually during the turn as ground speed increases

Second Crosswind Leg (Base)

18. Roll out wings level, crabbing away from the boundary
19. Manage crab angle to maintain ½ mile distance from boundary
20. At field boundary edge, turn downwind
21. Start with moderate bank
22. Increase bank angle gradually during the turn as ground speed increases

Rectangular Course Profile

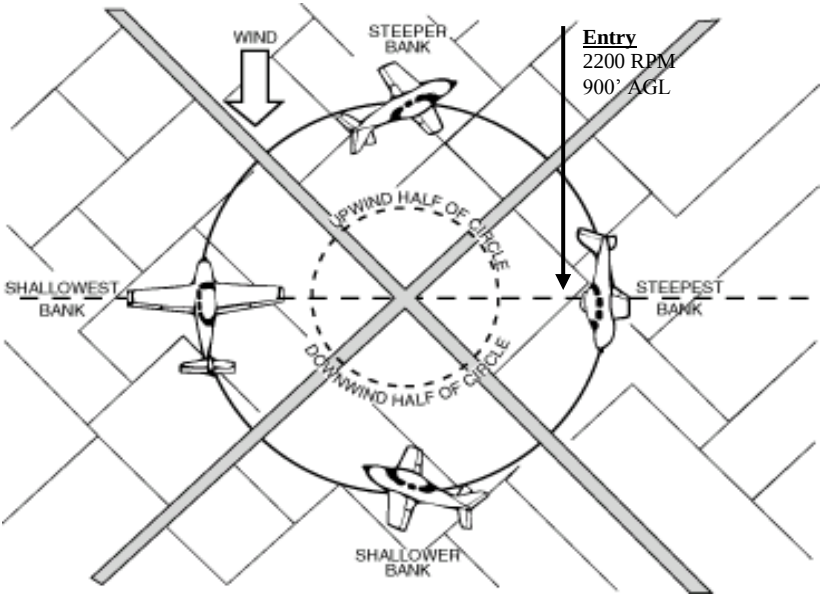


NOTES

- *Complete two circuits*
- *Exit at the point of entry at the same altitude and airspeed*
- *Reverse course as specified*

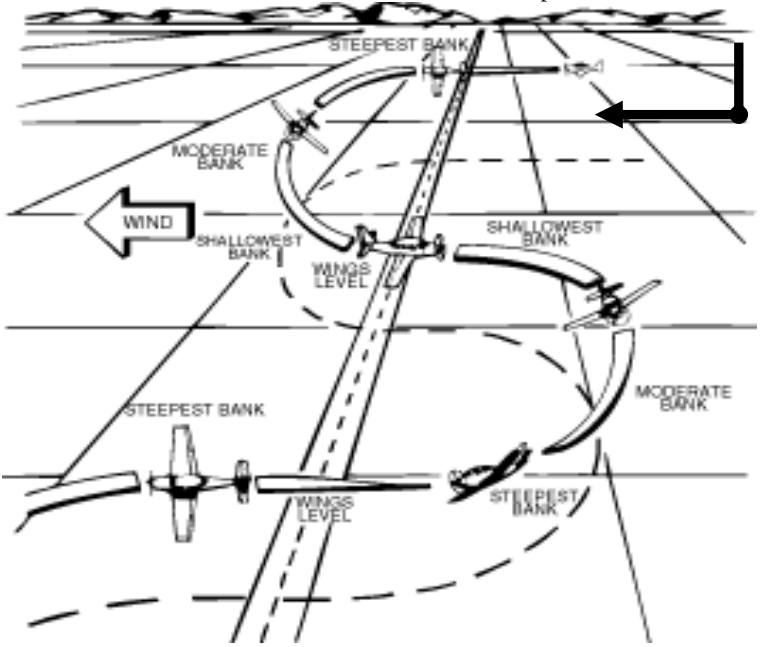
Turns Around a Point

- Find practice area where terrain is appropriate for maneuvering with an available emergency landing area
- Select a reference point
- Set power for V_A (2200 RPM)
- Maintain and fly an altitude between 600 and 1000 AGL (800AGL)
- Clear the area of other aircraft
- Trim the airplane for level, hands-off flight
- Approach reference downwind
- First turn to the left at the highest groundspeed and steepest bank angle (max 45 degrees)
- Bank angle will gradually need to be decreased to the upwind point (slowest groundspeed)
- From the upwind point, bank angle will need to gradually increase to the downwind point (fastest groundspeed)
- Fly 2 circuits and exit at the point of entry at the same altitude and airspeed
- Reverse course as directed



S Turns

- Find practice area where terrain is appropriate for maneuvering with an available emergency landing area
- Select a line feature that lies crosswind
- Set power for V_A (2200 RPM)
- Maintain and fly an altitude 800 AGL dual (1,000 AGL solo)
- Clear the area of other aircraft
- Trim the airplane for level, hands-off flight
- Approach the line feature downwind
- Cross the line feature wings level
- Initial turn is to the left at the fastest groundspeed and steepest bank angle (not to exceed 45 degrees)
- Directly crosswind; moderate bank angle and decrease as the airplane turns upwind
- Maintain coordinated flight throughout
- Cross the line feature with wings level
- Upwind turn begins in the opposite direction with a shallow bank angle
- Increase bank angle to moderate at the crosswind position
- Continue to increase bank angle through the turn to downwind
- Cross the line feature with wings level
- Exit the maneuver at the same altitude and airspeed



Slow Flight

NOTE: *Slow Flight may be performed with 0º, 15º, or 45º flap settings*

DISCUSSION

- Find practice area where terrain is appropriate for maneuvering with an available emergency landing area
- Perform the maneuver no lower than 1500 AGL (Use 3500 MSL)

PROCEDURE

1. Clear the area
2. Pre-maneuver check
3. Reduce throttle to 1500 RPM
    a. As airspeed decreases a gradual increase in back elevator pressure will be required to maintain altitude
4. Below 78 KIAS (White Arc)
    - Flaps T/O – watch for ballooning tendency, increase forward elevator as necessary to maintain altitude.
    - Flaps LDG
5. Trim to relieve control pressures
6. Maintain altitude and heading
7. Slow to MCA*
    *Minimum Controllable Airspeed
8. Maintain directional control using outside visual references and inside instrument references
9. Practice gentle climbs, descents, and turns at constant airspeed

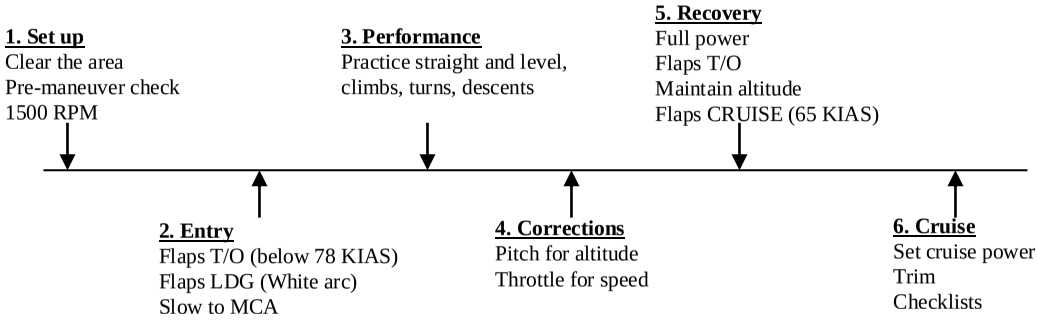
RECOVERY

1. Gradually apply full power
2. Lower nose at a rate that will maintain altitude (0 VSI)
3. Retract flaps to T/O
4. Maintain level altitude (0 VSI)
5. Approaching 65 KIAS, retract flaps to CRUISE
6. Approaching cruise airspeed, trim as necessary
7. Complete CRUISE checklist

PRE-MANEUVER CHECK

Mixture	Fwd
Fuel Shutoff	In and Locked
Fuel pump	On

Slow Flight Profile



Power off Stalls

NOTE: *Stalls should be practiced from both straight flight and turns. Use a maximum of 15º of bank when performing turning stalls. Maintain coordination at all times.*

DISCUSSION

- Find practice area where terrain is appropriate for maneuvering with an available emergency landing area
- Perform the maneuver no lower than 1500' AGL (Use 3500' MSL)

PROCEDURE

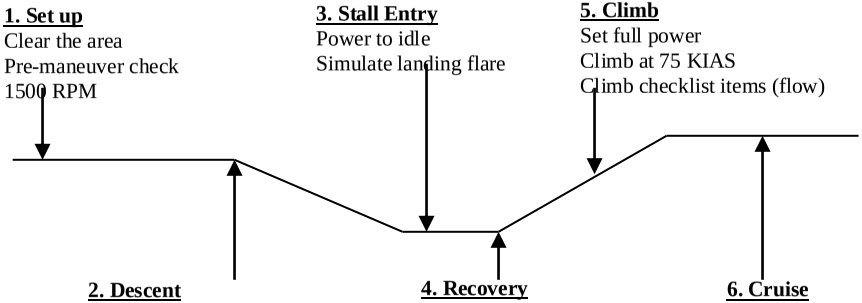
1. Reduce throttle to 1500 RPM
2. Clear the area
3. Pre-maneuver check
4. Below 78 KIAS (White Arc)
   - Flaps T/O
   - Stabilize
   - Flaps LDG at 65 KIAS
5. Stabilize the aircraft in a descent at approach speed (65 KIAS)
6. After descending 200', reduce power to idle (Not less than 1,000 RPM)
7. Simulate landing flare
   - Add 15º bank if performing turning stalls
   - Maintain coordination at all times
8. Recognize and announce symptoms of approaching stall
   - Sight, sound, feel
   - Stall warning horn activates
   - Aerodynamic buffeting

RECOVERY

1. Reduce the Angle of Attack
2. Level the wings using coordinated rudder and aileron
3. Gradually apply full power
4. Stop Descent
5. Retract flaps to T/O
6. Establish a shallow climb (100 – 200 FPM)
7. At positive rate of climb and approaching 65 KIAS
   - Retract flaps to CRUISE
8. Climb at 75 KIAS to initial altitude
9. Complete both CLIMB and CRUISE checklists after leveling off

Note: If engine appears to drop below 1,000 RPM, add throttle to ensure engine will not stop.

Power Off Stall Profile



Power On Stalls

NOTE: *Stalls should be practiced from both straight flight and turns. Use a maximum of 15º of bank when performing turning stalls. Maintain coordination at all times. The power on stall may cause one wing to be more stalled than the other (usually due to uncoordinated flight) causing the wing to drop. Use coordinated rudder and aileron inputs to level the wings.*

DISCUSSION

- Find practice area where terrain is appropriate for maneuvering with an available emergency landing area
- Perform the maneuver no lower than 1500 AGL (Use 3500 MSL)

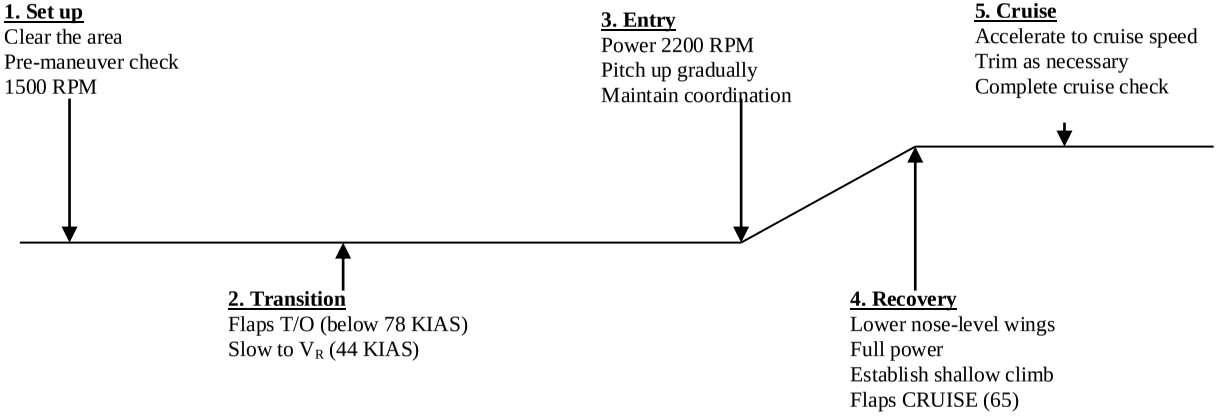
PROCEDURE

1. Clear the area
2. Pre-maneuver check
3. Set power to 1500 RPM
4. Below 78 KIAS (White Arc)
   - Flaps T/O (or flaps up)
5. Slow to V_R (44 KIAS)
6. Add 15º of bank if performing turning stalls
7. Simultaneously pitch up and increase power to 2200 RPM
   - Maintain coordination at all times
   - Recognize and announce symptoms of approaching stall
   - Sight, sound, feel
   - Stall warning horn activates
   - Aerodynamic buffeting

RECOVERY

1. Reduce the Angle of Attack (AOA)
2. Release enough back pressure to break the stall
3. Level wings
4. Apply full power
5. Establish a shallow climb (100 – 200 FPM)
6. At positive rate of climb and approaching 65 KIAS
7. Retract flaps to CRUISE
8. Climb at 75 KIAS to initial altitude
   - **NOTE:** *This stall may not cause any loss of altitude. In this case, lower the nose and establish a pitch attitude for a stabilized shallow climb (100 – 200 fpm) and level off at a determined altitude.*
9. Complete both CLIMB and CRUISE checklists after leveling off

Power On Stall Profile



Steep Turns

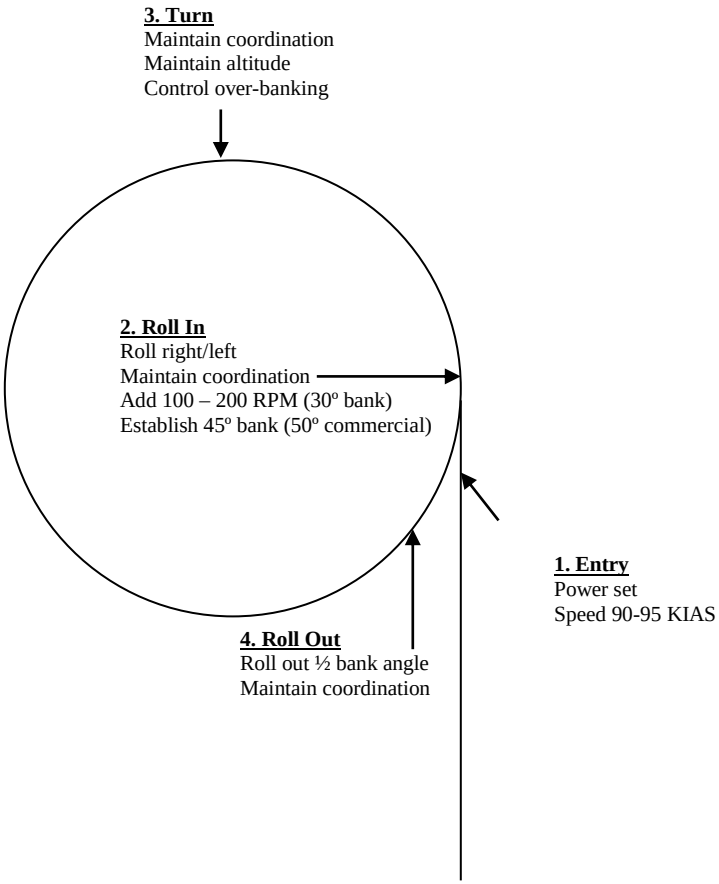
DISCUSSION

- Find practice area where terrain is appropriate for maneuvering with an available emergency landing area
- Perform maneuver no lower than 1500' AGL (Use 3500' MSL)

PROCEDURE

1. Set power to 2200 RPM
   - Starting speed 90-95 KIAS
2. Clear the area
3. Select a heading or reference point for rollout
4. From straight and level coordinate aileron and rudder to roll into a 45º bank (50º for commercial)
5. Add a small amount of power (100 – 200 RPM) as you roll through 30º of bank
6. Maintain altitude and airspeed
   - Reference the horizon to assist with maintaining altitude and bank angle
   - Maintain bank angle with aileron, coordinate with rudder
   - Apply opposite aileron to counter over-banking tendency
7. Anticipate rollout by half the angle of bank (20 - 25 degrees)
8. Roll out using coordinated aileron and rudder pressures to straight and level flight
9. Repeat in the other direction
10. Exit at the point of entry at the same altitude and airspeed at which the maneuver was started
11. Adjust power to 90-95 KIAS

Steep Turn Profile



Steep Spiral

NOTE: *The Steep Spiral requires a minimum of three full turns. It will be important to choose a ground reference point to properly account for the number of turns as well as meet the PTS performance objectives.*

DISCUSSION

- Position airplane over a specified point on or near a landing runway at 4000' AGL
- Enter maneuver downwind

PROCEDURE

1. Clear the area
2. Pre Maneuver Check
3. Reduce power to idle
4. Trim to 73 KIAS
5. Enter a 45° - 50° bank
6. Maintain a constant radius around the selected point by varying bank according to groundspeed
   - Increasing GS = increasing bank
   - Decreasing GS = decreasing bank
7. Clear the engine every 30 seconds by increasing the throttle to 1700 RPM and then return to idle

Idle Power Operations

Turn fuel pump on for all low throttle operations, including taxiing and all flight operations when engine speed could fall below 1400 RPM (eg. stalls, descents, spins, landings, etc.).

1. Fuel Pump ON
2. Mixture FULL RICH
3. Throttle IDLE

Chandelle

DISCUSSION

Pre-maneuver

- Practice Area & Emergency Field at 3500' MSL
- Pre-maneuver check
- Set 2200 RPM
- Slow to 90 kts
- Clear the area of other aircraft
- Choose a 90º reference point

PROCEDURE

0° to 90° Point

1. Roll into a coordinated, level 30° banked turn
2. Begin pitching up gradually to reach maximum pitch up at the 90° point
3. Simultaneously add full throttle
4. Maintain coordinated 30° bank

90° to 180° Point

5. Gradually roll out bank to reach wings level at the 180° point
6. Maintain max pitch up by continuously applying additional back pressure as necessary
7. Time roll out to reach MCA at the 180° point

180° Point

8. Note altitude
9. Gradually lower nose to maintain altitude (+/- 50')
10. Return to cruise flight

NOTES:

- If airspeed **decreases rapidly** after 90° position stay in bank longer to finish turn quicker
- If airspeed **decreases slowly** after 90° position start roll out sooner to lengthen turn time.
- **Pitch must remain constant** throughout the second half of the turn.

Lazy Eights

DISCUSSION

Pre-maneuver

- Practice Area & Emergency Field at 3500' MSL
- Pre-maneuver check
- Set power to 2200 RPM
- Slow to 90 kts
- Clear the area of other aircraft
- Choose a 90° ground reference

PROCEDURE

0° - 45° Point

1. Gradually begin to pitch up
2. Simultaneously begin banking the aircraft slowly
3. Maximum pitch up should be achieved at the 45° point (about 10°)
4. Time the roll to achieve approximately 15° bank

45° - 90° Point

5. Hold back pressure and allow the nose to gradually fall forward
6. Continue to increase bank slowly to 30°
7. Level pitch should be attained at the 90° point
8. Time the roll to achieve 30° bank at 90° point

90° - 135° Point

9. Gradually release some back pressure and allow the nose to continue to fall through the horizon
10. Simultaneously begin to roll out bank
11. Max pitch down should be at the 135° point
12. Time the roll to achieve approximately 15° bank

135° - 180° Point

13. Apply gradual back pressure to raise the nose to the horizon by the 180° point
14. Continue to roll out bank to reach wings level
15. After wings level for 1 or 2 seconds, repeat in opposite direction

NOTES:

- Start and finish at the same altitude
- If the nose is falling too fast and the speed is building too fast keep the bank in longer (roll out very slowly at the end.)
- If the nose is falling too slowly and speed is not building fast enough, lengthen the roll out time to lengthen the time in the turn.

Eights on Pylons

DISCUSSION

- Determine a suitable landing area in the event of an emergency
- Determine Pivotal Altitude (approximately 885' AGL)
- Find two pylons approximately ½ - 1 mile apart

PROCEDURE

1. Pre-maneuver check
2. Set power to 2200 RPM
3. Clear the area
4. Slow to 90 KIAS
5. Enter the pattern crosswind
6. Position the aircraft at a distance from the pylon that will allow a 30° to 40° bank throughout the maneuver
7. Abeam the first pylon place the wingtip on the pylon
8. Keep the reference point on the pylon by changing altitude ONLY
   - Keep the aircraft coordinated
   - DO NOT CHEAT WITH RUDDER!!
   - As GS increases, Pivotal Altitude increases
   - AS GS decreases, Pivotal altitude decreases
9. Wings level for 3 – 5 seconds
10. Roll on to the opposite pylon and repeat

NOTES:

- Figure a pivotal Altitude {$TAS^2/11.3$ = Approximate Pivotal Altitude}
- Abeam the pylon begin your turn into the wind
- As g/s slows, pivotal altitude will be lower
- As g/s increases, pivotal altitude will be higher
- The first part of your turn will be steeper because of a high Ground Speed
- IF THE REFERENCE LINE MOVES FWD OF THE PYLON, **PULL UP**
- IF THE REFERENCE LINE MOVES AFT OF THE PYLON, **GO DOWN**

180° Power Off Accuracy Approach

NOTE: *During this maneuver do not use speeds slower than those published in the aircraft POH. Attempting to stretch the glide with a slower speed could result in a stall with no option for a go around.*

DISCUSSION

- Set up abeam a point of intended landing at 1000' AGL
- Decide where you want to land
- Complete LANDING checklist mid-field

PROCEDURE

1. Close throttle
2. Below 78 KIAS, flaps T/O (or up depending on wind)
3. Establish best glide
4. Trim
5. Develop an approach plan
6. Lose about 100' – 200' on downwind
7. Turn base at not more than ½ mile from the intended landing area
8. Turn final not more than ½ mile out at about 500' AGL
9. Use flaps as required
10. Touchdown as slow as possible in a full stall attitude on the point of intended landing
11. Hold yoke fully back to keep nose-wheel off the ground as long as possible

After Landing

- Clear the runway only following yellow lead off lines
- Ensure engine will continue to idle. Adjust throttle as necessary to maintain 1,000 RPM
- Make appropriate radio calls
- Use after landing flow pattern, confirm with checklist (traffic permitting)

Parking and Securing

- Throttle to 1000 RPM
- Use shutdown flow pattern, confirm with checklist
- Secure aircraft by tying down securely and installing gust lock, Stall Warning plug, and pitot mast cover if available.
- Leave the aircraft clean

Cross Country Flight Planning

- Plot Course (Departure to destination)
    1. Airspace
    2. Terrain
    3. Maximum elevation figures (MEF)
    4. Type of airport
    5. Navigation aids
    6. Radar services
    7. Weather reporting capabilities
    8. Checkpoints
- Weather
    1. METAR
    2. TAF
    3. 12/24 hour prognostic charts
    4. SIGMET, AIRMET, Convective SIGMET
    5. Weather depiction chart
    6. Weather briefing (1-800-WX-BRIEF)
    7. NOTAM
    8. Go/No Go Decision
- Aircraft performance (POH
    1. Climb chart
    2. Cruise Chart
    3. TAS
    4. Takeoff and landing distances
    5. Weight and balance
- Flight Log
    1. True course
    2. Wind correction angle
    3. True heading
    4. Magnetic variation
    5. Magnetic heading
    6. Compass deviation
    7. Groundspeed
    8. Times
    9. Fuel
    10. Airport info
    11. Frequencies
- Flight Plan
    1. FSS- VFR plan
    2. Notams
    3. TFR
    4. Go or No Go

Diversion

NOTE: *Reasons to divert – low fuel, poor weather, airport closed, fatigue, illness, change of route*

1. Confirm present position using a sectional
2. Select an appropriate alternate airport and estimate a heading
3. Note time and turn to new heading
4. Insert new destination in GPS*
5. Adjust current heading for course
6. Use pilotage to confirm course if necessary
7. Compute new groundspeed, arrival time, and fuel consumption to the alternate

* Use VOR as a nav-aid if asp not

Lost Procedures

- Keep heading constant if you believe you may be lost
-
- Reconfirm all available data:
- Heading Indicator to magnetic compass
- Use GPS: Use NRST on GPS
- Use VOR
- IF LOST
- Continue to fly original heading and watch for identifiable landmark
- If possible and desirable fly to a VOR or GPS selected airport
- If you encounter marginal weather, turn 180 degrees
- Call ATC approach on 119.8 or other available frequency
- If necessary use emergency frequency 121.5

Radio Communications

- Select and use of appropriate radio frequencies and thoroughly understand the use of the audio panel
- Recommended procedures and phraseology for voice communications
    1. Whom you are calling
    2. Your call sign
    3. Position and altitude
    4. State intentions

Example:" XYZ Unicom, diamond six seven eight charlie sierra, ten miles south of the field, three thousand, five hundred, requesting airport advisory. "

Example: " diamond 12345 entering downwind runway 32 Newnan "

Instrument Procedures

In additional to the normal VFR procedures outlined in the manual:

(for a simulated IFR flight for training purposes:)

Pre-taxi:

- Set up Navaids for the departure procedures expected
- check DG/Magnetic Compass/ AI during taxi
- Check Altimeter against reported pressure to no more than 75 ft

Before Takeoff;

- Obtain clearance
- Re-set Navaids
- Set and check Com Radios
- Brief the IFR departure

Takeoff:

- Align aircraft on runway
- Set DG to runway heading, and check Magnetic compass

Descent:

- Accomplish the tasks necessary before TOD
- See Approach Preparation flow below
- compute VDP (HAT/300)

Arrival:

  - Briefing
- Vectoring within 5nm or on procedure turn or Initial Segment : 90 kt
- Final approach: 90 kt with T/O Flaps

Landing:

- At VDP or DA: **Immediately:**
  - Power to Idle if at 90kt
  - slow to White Arc
  - flaps to LDG
  - Remain on glide path
  - Adjust power to land in touchdown zone

Preflight

Step 1: Route Overview

- Charts/Maps/flight Log
- POH
- Distance
- Est. TAS
- ETE
- Planned Altitude
- Minimum Altitudes
- Diversion airports
- Weather stations

Step 2: Weather analysis (AWS, DUAT (s)) AOPA, or FSS

Decision Factors

- VFR Escape
- Engine Failure Break out options
- Icing
- Convective Sigments

Analysis using data found in Instrument PTS

Step 3: Planning Log

(Found in share files; Docs, Forms, Flight Planning)

- Using Data from Step 2;
- Complete log with TOC, CRZ, TOD, Arrival factors, Alt if req., RSV

Step 4: Final Decision

- File FAA plan
- NOTAMS
- TFR
- Go or No-go

Flight Phase Decision Markers

For the Instrument Pilot

Preflight Markers

- Planning Steps Complete as necessary
- Planned IFR Dept Procedures
- Taxi Plan
- ATC clearance plan (if necessary)
- Charts folded and available
- Paper
- Pen
- Review of planned approaches

Before Start Markers

- Charts Open and folded
- Flight log/paper available
- Cockpit Flow
- Checklist Completed

After Start Markers

- Flow
- Checklist

Before Taxi Markers

- Winds/Wx
- Navs- loaded and set
- CRS-Set
- F.I. Set
- Checklist-Completed
- Clear-lt,rt,frt

Before Takeoff Markers

- Flow down to Runup Boxed items
- Runup
- Flow “to the line”
- Completed checklist “to the line”

- Final Review of departure and clearance
- Complete check “below the line”

Takeoff Markers

- DG and Rwy check
- Power Set-Check Min 2000 RPM

Climb Markers

- DP if req
- Joining course
- Cockpit Flow
- Checklist-at safe alt

Cruise Markers

- Establish Planned Perf
- FI and Systems Set
- Cockpit Flow
- Checklist
- Low Work load Planning

Arrival Markers

Instrument Approach Procedures

Prior to TOD

- Determine type of approach
- Obtain charted procedure
- Winds/Wx
- weather minimums required
- Arrival plan
- Approach setup: CRS, Freq, Nav Data
- Follow chart and brief:

Heading View

- Approach name
- Primary navaid frequency
- Approach course
- Runway and elevation
- Lights
- Missed approach

Plan view

- Feed in
- Navaids
- Terrain

Profile view

- Procedure
- Altitudes
- Minimums
- DA/MDA

- VDP if non-precision
- Missed approach point

Airport View

- Lights
- Final approach path
- Runway Exit Plan

Complete D/A check

- Use flow pattern
- Reference checklist
- Heads up during descent

Approach Markers

- Verbal DA/MDA
- Nav-check
- VDP Consideration
- Missed Approach initial plan
- Speed transition