STANDARD FLIGHT TRAINING PROCEDURES

BEECHCRAFT DUCHESS BE-76

INTRODUCTION

The following guide is intended to reduce both student and instructor frustration by standardizing most of the maneuvers you will encounter during your flight training. By no means is this document intended to replace governing directives, manuals and procedures. It merely supplements established FAA guidance and is specific to the aircraft you will train in at AIAA. It should be noted that sometimes it might be necessary to deviate from these standards depending on conditions. These standards are based on procedures derived from the FARs/AIM, FAA handbooks, FAA evaluators and our very own flight instructors. Additionally, your flight instructor will provide more details and techniques for performing the various maneuvers.

Included in this document are the standard training procedures for flight training received in the Beechcraft Duchess BE76 aircraft here at Advanced International Aviation Academy. Maneuvers found in this manual have been reduce to create an efficient and stream-lined training process.

The BE76 has six power settings each pilot should remember.

1. Climb Power-……25”MP, 2500 RPM
2. Normal Cruise-……23”MP, 2300 RPM
3. Slow Cruise-……20”MP, 2300 RPM
4. Pattern / Landing-……18”MP, 2300 RPM
5. Slowing during Clearing Turns-……18”MP, 2300 RPM

*****As always, if the approved Airplane Flight Manual and this Maneuvers Checklist disagree, the procedure in the AFM/POH should be followed in the interest of safety.

Landing Speed Considerations

Note that there are slight differences in the speeds in our procedures and those specified in the Pilot’s Operating Handbook. Our speeds are slightly higher in order to add a margin of safety should an engine fail while in the landing phase. Accordingly, when calculating landing distances, you should account for the extra speed needed to a complete stop.

V-SPEEDS (KIAS)

Vr	Rotation Speed	71
Vx	Best Angle Climb	71
Vxse	Best Angle 1 Engine	85
Vy	Best Rate Climb	85
Vyse	Best Rate 1 Engine	85
Vso	Stall w/ Flaps	60
Vs1	Stall w/o Flaps	70
Vmc	Min Control 1 Engine	65
Va	Maneuvering (3000lb)	116
Va	Maneuvering (Max Gross)	132
Vno	Max Structural Cruise	154
Vne	Never Exceed	194
Vsse	1 Engine Intentional	71
Vlr	Max Gear Retraction	112
Vle/Vlo	Max Gear Speeds	140
Vfe	Flap Extension (20)	120
Vfe	Flap Extension (full)	110
Best Glide	3000lb	82
Best Glide	Max Gross	95
X-Wind	Max Demonstrated	25

Max Ramp Weight	3916
Max TO & Landing Weight	3900
Max Zero Fuel Weight	3500
Max Weight in Baggage	200 lbs

Clearing Turns

Objective: To visually clear the area surrounding the aircraft so as to not pose a collision hazard to any other traffic

Restrictions	Minimum	Optimum	Maximum
Altitude	3000	3000	3000
Speed	110	110	110

Procedure

1. Establish the Pre-Maneuvers Power Setting (18''MP/2300)
2. Visually clear the areas to the right, front, left, and behind the aircraft. Also look for traffic above and below your altitude.
3. Turn 90 to the left.
4. Visually scan the area again.
5. Turn 90 to the right.
6. Scan the area one last time.
7. Announce intentions on Practice Area Advisory Frequency

Slow Flight

Objective: To maneuver the aircraft safely at minimum possible airspeed

Practical Test Standards

Private Multi Add-on:	Bank ±10º, Altitude ±100 feet, Heading ±10, Airspeed +10/-0
Comm. Multi Add-on:	Bank ± 5º, Altitude ±50 feet, Heading ±10, Airspeed +5/-0
ME Instructor:	Bank ± 5º, Altitude ±50 feet, Heading ±10, Airspeed +5/-0

RESTRICTIONS	Minimum
Altitude	3000
Speed	70

Procedure

1. Pre-Landing Checklist
2. Clearing Turns
3. Power 17” Manifold Pressure
4. Below 140 KIAS Gear Down
5. Props Full Forward
6. Below 120 KIAS Flaps 10
7. Below 110 KIAS Flaps 20, Flaps 35
8. Power As Required, Hold 70 KIAS
9. Recovery

a. Power 22”MP
b. Flaps 10
c. Below 112 Gear up
d. Flaps 0
e. Cruise Checklist

Power-Off Stall

Objective: To demonstrate recovery from a stall in the landing configuration

Practical Test Standards

Private Multi Add-on: Heading ±10º, Bank not to exceed 20º ±10º, V_Y before Flaps 0º
Comm. Multi Add-on: Heading ±10º, Bank not to exceed 20º ±5º, V_Y before Flaps 0º
ME Instructor: Heading ±10º, Bank not to exceed 20º ±5º, V_Y before Flaps 0º

RESTRICTIONS	Minimum
Altitude	3000
Speed	

Procedure

1. Pre-Landing Checklist
2. Clearing Turns
3. Power 17” Manifold Pressure
4. Below 140 KIAS Gear Down
5. Prop Full Forward
6. Below 120 KIAS Flaps 10
7. Below 110 KIAS Flaps 20, Flaps 35
8. Establish Descent 85 KIAS (200ft)
9. Reduce Power to Idle and Pitch for Stall (Recovery at First Sign)
10. Recovery

a. Reduce AOA, Apply Full Power, Level Wings
b. Flaps 10, Climb 80 KIAS
c. Positive Rate- Below 112 KIAS Gear Up
d. Climb 85 KIAS
e. Flaps Zero
f. Cruise Checklist

Power-On Stall

Objective: To demonstrate recovery from a stall in the takeoff configuration

Private Multi Add-on: Heading ±10º, Bank not to exceed 20º ±10º, V_Y before Flaps 0º
Comm. Multi Add-on: Heading ±10º, Bank not to exceed 20º ±10º, V_Y before Flaps 0º
ME Instructor: Heading ±10º, Bank not to exceed 20º ±10º, V_Y before Flaps 0º

RESTRICTIONS	Minimum
Altitude	3000
Speed	

Procedure

1. Pre-Landing Checklist
2. Clearing Turns
3. Power 17” Manifold Pressure
4. Below 140 KIAS Gear Down
5. Prop Full Forward
6. Power As Required-Slow to 80 KIAS
7. Reach 80 KIAS, Power 20” Manifold Pressure, Pitch up 20 Degrees (Stall Attitude)
8. Recovery at First Sign

a. Reduce AOA, Apply Full Power, Level Wings
b. Climb 80 KIAS
c. Positive Rate Gear Up
d. Climb 85 KIAS
e. Cruise Check

Short-Field Take Off

Objective: To depart an airport with obstacles on departure demanding a maximum performance takeoff and climbout

Private Multi Add-on: Vx +10/-5 Knots until clear, then Vy +10/-5 Knots
Comm. Multi Add-on: Vx +5/-0 Knots until clear, then Vy ±5 Knots
ME Instructor: Vx +5/-0 Knots until clear, then Vy ±5 Knots

RESTRICTIONS	Optimum
Altitude	3000
Speed	

Procedure

1. Crew Brief Complete
2. Use Maximum Available Runway
3. Hold Brakes, Increase Power to Full, Verify Gauges Green, Brakes Release
4. Rotate 71 KIAS
5. Climb 80 KIAS (Approx 15 Up)
6. Clear of Obstacle, Accelerate to 85 KIAS
7. Out of Unusable Runway-Gear Up
8. 500 AGL, Accelerate 100 KIAS, Set Climb Power
9. If Staying in Traffic Pattern: Turn Crosswind at 700 AGL

If Leaving Traffic Pattern: Passing 1000 AGL-Complete Climb Checklis

Short-Field Landing

Objective: To arrive at an airport and land safely where there is a limited length of runway and/or obstacles on approach

Private Multi Add-on: VREF ±10/-5 Knots (Plus Wind Factor) within 200 ft. of touchdown point, on centerline, no side drift
Comm. Multi Add-on: VREF ± 5 Knots (Plus Wind Factor) within 100 ft. of touchdown point, on centerline, no side drift
ME Instructor: VREF ±5 Knots (Plus Wind Factor) within 100 ft. of touchdown point, on centerline, no side drift

Restrictions	Minimum	Optimum	Maximum
Altitude			
Speed	80	Downwind: 100 KIAS Base: 90 Final: 80	Pattern 120 KIAS

Procedure

1. Approach Brief Complete
2. Pre-Landing Checklist Complete 5 nm prior
3. Downwind – Set Power 18” Manifold Pressure/2300 RPM (Approx 120 KIAS)
4. Abeam Touchdown Point- Gear Down-Flaps 10-Power As Required (Approx 15” MP)
5. Descend 100 KIAS, Power As Required
6. Turn Base-Flaps 20, GUMPS, Power As Required for 90 KIAS
7. Turn Final-Flaps 35, GUMPS, Power As Required for 80 KIAS
8. During flare, reduce throttles to idle

Normal / Crosswind Takeoff

Objective: To depart an airport during normal or crosswind conditions with more than adequate clearance of obstacles on departure

Private Multi Add-on: Vy +10/-5 Knots
Comm. Multi Add-on: Vy ±5 Knots
ME Instructor: Vy ±5 Knots

Restrictions	Minimum	Optimum	Maximum
Altitude			
Speed		Liftoff: 71 Knots Climb 85 Knots	

Procedure

1. Crew Brief Complete
2. Use Maximum Available Runway
3. Hold Brakes, Increase Power 2000 RPMS, Verify Gauges Green, Brakes Release
4. Rotate 71 KIAS
5. Climb 85 KIAS
6. Out of Unusable Runway-Gear Up
7. 500 AGL, Accelerate 100 KIAS, Set Climb Power
8. If Staying in Traffic Pattern: Turn Crosswind at 700 AGL
   If Leaving Traffic Pattern: Passing 1000 AGL-Complete Climb Checklist

Normal / Crosswind Landing

Objective: To arrive at an airport and land safely where there is limited length of runway and/or obstacles on approach

Private Multi Add-on: VREF +10/-5 Knots (Plus Wind Factor)
Comm. Multi Add-on: VREF +10/-5 Knots (Plus Wind Factor)
ME Instructor: VREF +10/-5 Knots (Plus Wind Factor)

Restrictions	Minimum	Optimum	Maximum
Altitude			
Speed	85 KIAS	Downwind: 100 KIAS Base: 90 Final: 85 (short final 76)	Pattern: 120 KIAS

Procedure

1. Approach Brief Complete
2. Pre-Landing Checklist Complete 5 nm prior
3. Downwind – Set Power 18” Manifold Pressure/2300 RPM (Approx 120 KIAS)
4. Abeam Touchdown Point- Gear Down-Flaps 10-Power As Required (Approx 15” MP)
5. Descend 100 KIAS, Power As Required
6. Turn Base-Flaps 20, GUMPS, Power As Required for 90 KIAS
7. Turn Final-Flaps 35, GUMPS, Power As Required for 85 KIAS
8. During flare, reduce throttles to idle

Steep Turns

Objective: To maintain two opposite-direction, level turns while rolling out on entry heading for both turns

Private Multi Add-on: 45º Bank ±5º, Altitude ±100ft.,Heading ±10º, Airspeed ±10 Knots
Comm. Multi Add-on: 50º Bank ±5º, Altitude ±100ft.,Heading ±10º, Airspeed ±10 Knots
ME Instructor: 50º Bank ±5º, Altitude ±100ft.,Heading ±10º, Airspeed ±10 Knots

Restrictions	Minimum	Optimum	Maximum
Altitude	3000		
Speed		125	

Procedure

1. Pre-Landing Checklist
2. Clearing Turns
3. Set power 19”MP-2300RPMS, approximately 125 KIAS
4. Perform two 360º turns, adjust Pitch, Power, and Trim during maneuver
5. Cruise Checklist

Approach & Landing with Inoperative Engine

Objective: To approach an airport and land safely with one engine inoperative. This maneuver should only be attempted with a simulated failure

Private Multi Add-on: Stabilized Approach, Airspeed V_{REF} ±10/-5 Knots
Comm. Multi Add-on: Stabilized Approach, Airspeed V_{REF} ±5 Knots
ME Instructor: Stabilized Approach, Airspeed V_{REF} ±5 Knots

Simulated One Engine Inop: 8.0 Hg / Prop to Feather Detent

Restrictions	Minimum	Optimum	Maximum
Altitude			
Speed	85 KIAS	Downwind: 100 KIAS Base: 90 Final: 85	Pattern: 120 KIAS

Procedure

1. Complete Engine Failure Checklist
2. Approach Brief Complete
3. Pre-Landing Checklist 5nm Prior
4. Power As Required – Maintain 100 KIAS (V_{YSE} or V_{XSE} Minimum)
5. Abeam numbers-Reduce Power As Required-Descend 100 KIAS
6. Base-Below 140 KIAS Gear Down-Power As Req.- 90 KIAS-GUMPS Check
7. Final-Power As Required-Minimum 85 KIAS-Flaps As Required –GUMPS Check
8. During Flare Reduce Throttles to Idle

VMC Demonstration

Objective: To demonstrate the aircraft's behavior during simulated VMC conditions. The instructor will block the rudder in order to induce VMC conditions before the stalling speed.

Private Multi Add-on: Heading ±20 feet, Recover to V_{YSE} +10/-5 Knots
Comm. Multi Add-on: Heading ±20 feet, Recover to V_{YSE} ±5 Knots
ME Instructor: Heading ±20 feet, Recover to V_{YSE} ±5 Knots

Restrictions	Minimum	Optimum	Maximum
Altitude	5000		
Speed	70		

Procedure

1. Pre-Landing Checklist
2. Clearing Turns
3. Left Engine-Reduce to Idle
4. Maintain Directional Control
5. Props Full Forward and RT Throttle-Full Forward
6. Establish Zero-Sideslip
7. Maintain V_{YSE} (85 KIAS)
8. Once at V_{YSE}, Set a Pitch Attitude that will enable a 1Knot Decrease per Second
9. Recovery, whichever comes firsta.

Indication of Stall
b. 20 Deg. Heading Change
c. 70 Knots
10. Recovery
a. Reduce Power on RT Engine and Reduce AOA
b. Apply Full Power on RT Engine Establish a Climb at V_{YSE} (85 KIAS)
11. Increase power to LT Engine and Set Cruise Power
12. Cruise Checklist

Drag Demonstration

Objective: To demonstrate the associated drag penalties with different configurations during single-engine operations

Private Multi Add-on:
Comm. Multi Add-on:
ME Instructor:

Restrictions	Minimum	Optimum	Maximum
Altitude	3000		
Speed	85	85	85

Procedure

1. Pre-Landing Checklist
2. Clearing Turns
3. Left Engine-Set Zero Thrust (10” MP)
4. Maintain Directional Control
5. Props Full Forward and RT Throttle-Full Forward
6. Establish Zero-Sideslip
7. Maintain V_{YSE} (85 KIAS)
8. Below 140 KIAS-Gear Down –(Note VSI)
9. Below 120 KIAS-Flaps 10 (Note VSI)
10. Below 110 KIAS-Flaps 20 (Note VSI)
11. Below 110 KIAS-Flaps 35 (Note VSI)
12. Left Engine-Idle (Windmill) (Note VSI)
13. Recover

a. Throttles Full
b. Flaps 10-Climb 80 KIAS
c. Positive Rate-Below 112 Gear Up
d. Climb 85 KIAS
e. Flaps Up
f. Cruise Checklist

Precision Approach, Single Engine

Objective: To safely execute a precision instrument approach procedure with one engine inoperative

Private Multi Add-on: Heading ±10º, Altitude ±100 feet, Airspeed ±10, CDI ¾ Scale
Comm. Multi Add-on: Heading ± 10º,Altitude ±100 feet, Airspeed ±10, CDI ¾ Scale
ME Instructor: Heading ± 10º,Altitude ±100 feet, Airspeed ±10, CDI ¾ Scale

Restrictions	Minimum	Optimum	Maximum
Altitude	3000		
Speed	85	85	85

Procedure

1. Approach Brief Complete
2. Engine Failure Checklist Complete
3. Pre-Landing Checklist Complete
4. Maneuvering-Power as Required to Maintain 100 KIAS (V_{YSE} or V_{XSE} Minimum)
5. 1 Dot Below GS Intercept-Below 140 KIAS Gear Down
6. Power As Required-100 KIAS (If Unable Maintain V_{YSE} or V_{XSE})
7. GUMPS
8. Flaps As Required

a. Maximum 10 Flaps

Non-Precision Approach, Single Engine

Objective: To safely execute a non-precision instrument approach procedure with one engine inoperative

Private Multi Add-on: Heading ±10º, Altitude ±100 feet, Airspeed ±10, CDI ¾ Scale
Comm. Multi Add-on: Heading ± 10º,Altitude ±100 feet, Airspeed ±10, CDI ¾ Scale
ME Instructor: Heading ± 10º,Altitude ±100 feet, Airspeed ±10, CDI ¾ Scale

Restrictions	Minimum	Optimum	Maximum
Altitude			
Speed	85		

Procedure

1. Approach Brief Complete
2. Engine Failure Checklist Complete
3. Pre-Landing Checklist Complete
4. Maneuvering-Power as Required to Maintain 100 KIAS (V_{YSE} or V_{XSE} Minimum)
5. FAF-Below 140 KIAS Gear Down
6. Power As Required-100 KIAS (If Unable Maintain V_{YSE} or V_{XSE})
7. GUMPS
8. Flaps As Required

a. Maximum 10 Flaps

Note: Circling Approaches: Gear Remains up until leaving the MDA on the Circling Maneuver