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 reduced to create an efficient and streamlined 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)

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Vr</td>
<td>Rotation Speed</td>
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<tr>
<td>Vx</td>
<td>Best Angle Climb</td>
<td>71</td>
</tr>
<tr>
<td>Vxse</td>
<td>Best Angle 1 Engine</td>
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<tr>
<td>Vy</td>
<td>Best Rate Climb</td>
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<tr>
<td>Vyse</td>
<td>Best Rate 1 Engine</td>
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<tr>
<td>Vso</td>
<td>Stall w/ Flaps</td>
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<tr>
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<tr>
<td>Vmc</td>
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<tr>
<td>Va</td>
<td>Maneuvering (3000lb)</td>
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<tr>
<td>Va</td>
<td>Maneuvering (Max Gross)</td>
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<tr>
<td>Vno</td>
<td>Max Structural Cruise</td>
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<td>Vne</td>
<td>Never Exceed</td>
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<tr>
<td>Vsse</td>
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<tr>
<td>Vlr</td>
<td>Max Gear Retraction</td>
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<td>Vle/Vlo</td>
<td>Max Gear Speeds</td>
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<tr>
<td>Vfe</td>
<td>Flap Extension (20)</td>
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<tr>
<td>Vfe</td>
<td>Flap Extension (full)</td>
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<tr>
<td>X-Wind</td>
<td>Max Demonstrated</td>
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</table>

- **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

<table>
<thead>
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<th>Restrictions</th>
<th>Minimum</th>
<th>Optimum</th>
<th>Maximum</th>
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<tr>
<td>Speed</td>
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</tbody>
</table>

**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

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<thead>
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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

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<th>RESTRICTIONS</th>
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<td>Altitude</td>
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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 ±10°, Bank not to exceed 20° ±10°, VY before Flaps 0°

**Comm. Multi Add-on:** Heading ±10°, Bank not to exceed 20° ±10°, VY before Flaps 0°

**ME Instructor:** Heading ±10°, Bank not to exceed 20° ±10°, VY before Flaps 0°

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<tr>
<td>Altitude</td>
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</table>

**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

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<td>Speed</td>
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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: $V_{REF} \pm 10/-5$ Knots (Plus Wind Factor) within 200 ft. of touchdown point, on centerline, no side drift

Comm. Multi Add-on: $V_{REF} \pm 5$ Knots (Plus Wind Factor) within 100 ft. of touchdown point, on centerline, no side drift

ME Instructor: $V_{REF} \pm 5$ Knots (Plus Wind Factor) within 100 ft. of touchdown point, on centerline, no side drift

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<td>Base: 90</td>
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<td></td>
<td></td>
<td>Final: 80</td>
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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:* $V_y +10/-5$ Knots  
*Comm. Multi Add-on:* $V_y \pm 5$ Knots  
*ME Instructor:* $V_y \pm 5$ Knots

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<th>Maximum</th>
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<tr>
<td>Altitude</td>
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</tbody>
</table>
| 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:** $V_{REF} +10/-5$ Knots (Plus Wind Factor)

**Comm. Multi Add-on:** $V_{REF} +10/-5$ Knots (Plus Wind Factor)

**ME Instructor:** $V_{REF} +10/-5$ Knots (Plus Wind Factor)

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<td>(short final 76)</td>
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<tr>
<td></td>
<td></td>
<td>Pattern: 120 KIAS</td>
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**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: 45° Bank ±5°, Altitude ±100ft., Heading ±10°, Airspeed ±10 Knots
Comm. Multi Add-on: 50° Bank ±5°, Altitude ±100ft., Heading ±10°, Airspeed ±10 Knots
ME Instructor: 50° Bank ±5°, Altitude ±100ft., Heading ±10°, Airspeed ±10 Knots

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<tr>
<td>Speed</td>
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Procedure

1. Pre-Landing Checklist
2. Clearing Turns
3. Set power 190MP-2300RPMS, approximately 125 KIAS
4. Perform two 360° 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 $V_{REF} \pm 10/-5$ Knots

**Comm. Multi Add-on:** Stabilized Approach, Airspeed $V_{REF} \pm 5$ Knots

**ME Instructor:** Stabilized Approach, Airspeed $V_{REF} \pm 5$ Knots

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

<table>
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<td></td>
<td></td>
<td>Final: 85</td>
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**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 VySE ±10/-5 Knots  
**Comm. Multi Add-on:** Heading ±20 feet, Recover to VySE ±5 Knots  
**ME Instructor:** Heading ±20 feet, Recover to VySE ±5 Knots

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</table>

**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 VySE (85 KIAS)  
8. Once at VySE, 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 VySE (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:**

<table>
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<td>Speed</td>
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**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

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

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<tr>
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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