The Role of Aircraft Type Clubs in LOC-I Prevention
Transition Training
LOC-I in IMC

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October 14, 2015

AMERICAN BONANZA SOCIETY

Mastery Flight Training

What is a Type Club?

- Represents and supports owners and operators of a specific *type*, make and model or family of aircraft.
- Usually volunteer-run, with exceptions among the more numerous aircraft types.
- Emphasis is usually on technical support and information sharing, safety and social activities.
- Some type clubs also actively teach pilots, flight instructors and mechanics.

www.eaa.org/typeclubs

- Over 35 member organizations
- Pilot training best practices for type-specific transition and recurrent training

TYPE CLUB COALITION

GA-JSC Request for Input: Best Practices for Teaching Balked Landing/Missed Approach Procedures
October 2, 2012

The General Aviation Joint Steering Committee (GA-JSC) has requested the Type Club Coalition provide industry best practices for teaching Balked Landing (Go-Around) and Missed Approach procedures to support the GA-JSC's work toward reducing accidents in those phases of flight. TCC polled its member organizations and received two responses detailing their recommended procedures:

T-34 Association (www.t-34.com)

The T-34 Association teaches the original U.S. Navy (NATOPS) checklists for the type:

WAVE OFF/GO AROUND

1. Throttle – FULL OPEN
2. Establish positive rate of climb (V_X) – 70 KIAS
3. Gear – AS REQ'D
4. Flaps – UP at 200 FT AGL or above

The NATOPS checklist does not provide a missed approach procedure.

American Bonanza Society (www.bonanza.org)

The American Bonanza Society's Beechcraft Pilot Proficiency Program (BPPP) teaches a "By the Numbers" (BTN) approach to all phases of flight. BTN defines power settings, pitch attitudes and aircraft configurations (flaps and landing gear position) for desired performance in each flight phase. The BTN technique enhances, but does not replace, manufacturer's guidance BPPP teaches these procedures:

BALKED LANDING

From short final with flaps down and airspeed close to touchdown speed:

- Simultaneously add full power (mixture, prop, throttle) and pitch up to +10°.
- Apply right rudder to keep the ball centered.
- With positive climb, raise flaps to approach position (approximately 20° extension in airplanes without an approach flap preselect).
- Raise the gear.
- Maintain positive climb, flaps up.
- Accelerate to V_Y minimum. (V_X with an obstacle)

MISSED APPROACH

From the approach descent configuration, assumes missed approach from DH/DA/MDA:

- Simultaneously, add full power (mixture, prop, throttle) and pitch up to:
  - Bonanza/Debonair +8°.
  - Baron/Travel Air/Duke +12°.
- Resulting airspeed will be slightly greater than V_Y.
- No trim change should be required.
- With positive climb, raise the gear.
- Be in no hurry to raise the flaps (if approach flaps used).
- A small trim change may be required after flap retraction.

Industry Best Practices

From these we can begin to derive some industry best practices for conducting a balked landing or missed approach:

1. There are subtle differences between a balked landing/go-around and a missed approach, notably, the initial airspeed target and the flap position at the beginning of the procedure. Regularly practice and utilize the checklist procedure for each operation as required.
2. Be prepared for a balked landing or missed approach at any time during every landing attempt.
3. For instrument approaches, commit to memory what defines the Missed Approach Point (MAP), the initial missed approach heading, and the altitude to reach before making any turns in the missed approach, before passing the Final Approach Fix (FAF) inbound. Note these items on a kneeboard or other quick-reference location for verification if needed, without having to find the data on the approach chart while flying the approach.
4. Use all heading and altitude reminders available in the aircraft on all instrument approaches.
5. Follow airplane manufacturer's guidance and checklists when available.
6. Use preplanned power settings, pitch attitudes and airspeeds when performing a balked landing or missed approach.
7. When possible, fly instrument approaches at the missed approach/initial climb indicated airspeed. This means there will be little or no change in trim setting with application of power at the beginning of a missed approach in most airplane types. With a constant trim setting, most airplanes will tend to pitch to the proper attitude and airspeed with the application of missed approach power, making it easier to maintain control during this high-workload transition.
8. Consistent with manufacturer's guidance, retract flaps to an intermediate/approach position if flaps are at full extension when beginning the balked landing or missed approach procedure.
9. In a retractable gear airplane, retract the landing gear after achieving a positive rate of climb, unless manufacturer's guidance directs delaying gear retraction.
10. Know beforehand the expected trim change necessary after flaps and/or gear retraction.
11. Be proficient and current in the operation of navigation systems, especially the SUSPEND or similar modes of GPS units, before flying an instrument approach using those systems.
12. Act deliberately and positively, without undue delay, but do not be rushed or abrupt when transitioning from descent to climb in a balked landing or missed approach.
13. As in all other situations, aviate, navigate and communicate, in that order.

Please let us know if you have questions, and how we can provide additional assistance.

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Executive Director, ABS Air Safety Foundation
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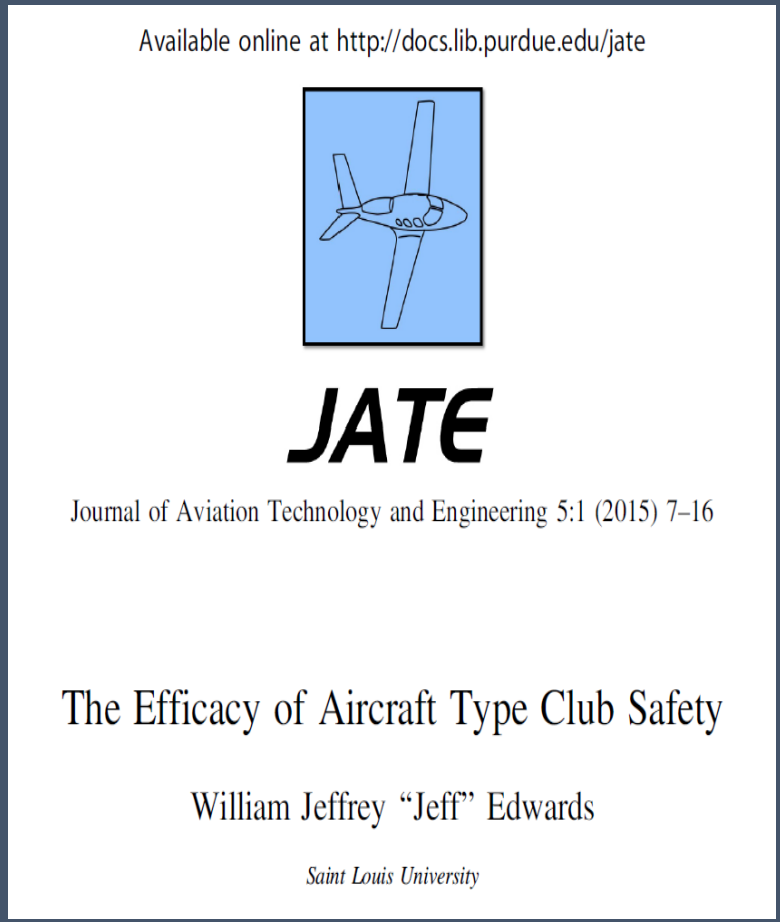
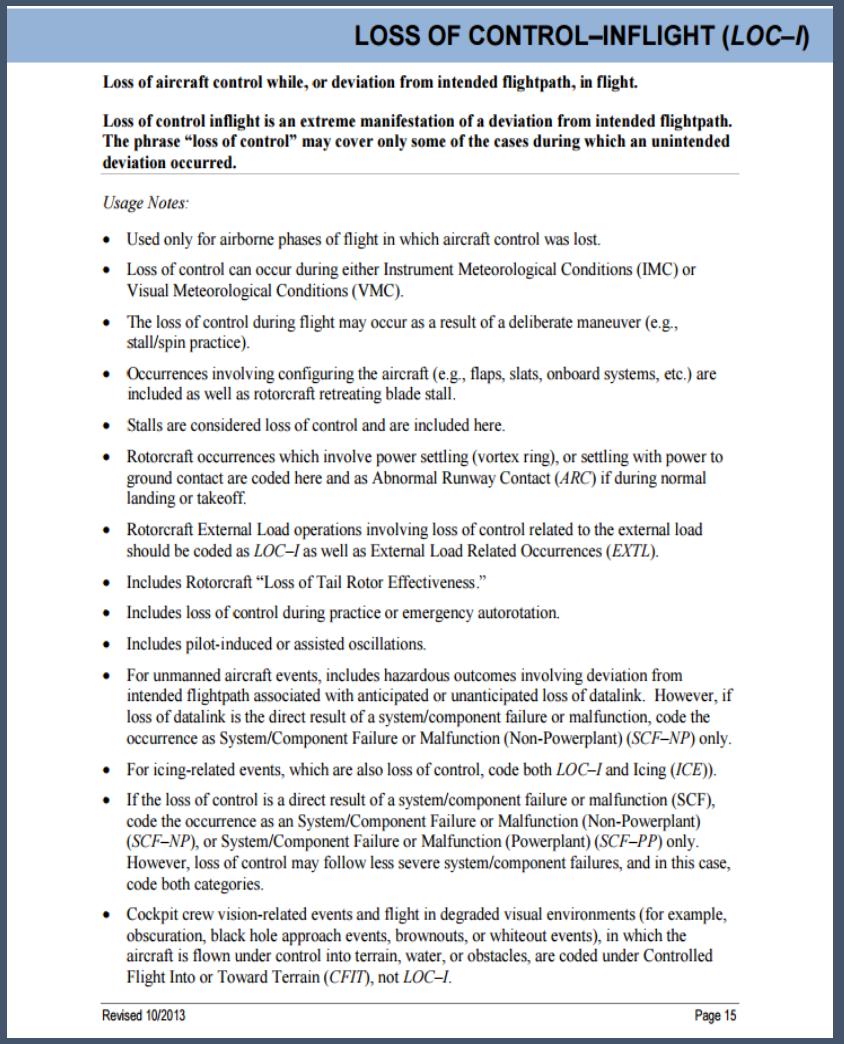
Type Club Membership and Accident Rates

- Doctoral research correlating type club membership to NTSB accident report rates
- Positive correlation between type club membership and reduced accident rates
- Do type clubs make pilots safer? Or do safer pilots join type clubs?



The Challenges of Teaching LOC-I

1. Defining Loss of Control



LOSS OF CONTROL–INFLIGHT (*LOC–I*)

Loss of aircraft control while, or deviation from intended flightpath, in flight.

Loss of control inflight is an extreme manifestation of a deviation from intended flightpath. The phrase "loss of control" may cover only some of the cases during which an unintended deviation occurred.

Usage Notes:

- Used only for airborne phases of flight in which aircraft control was lost.
- Loss of control can occur during either Instrument Meteorological Conditions (IMC) or Visual Meteorological Conditions (VMC).
- The loss of control during flight may occur as a result of a deliberate maneuver (e.g., stall/spin practice).
- Occurrences involving configuring the aircraft (e.g., flaps, slats, onboard systems, etc.) are included as well as rotorcraft retreating blade stall.
- Stalls are considered loss of control and are included here.
- Rotorcraft occurrences which involve power settling (vortex ring), or settling with power to ground contact are coded here and as Abnormal Runway Contact (*ARC*) if during normal landing or takeoff.
- Rotorcraft External Load operations involving loss of control related to the external load should be coded as *LOC–I* as well as External Load Related Occurrences (*EXTL*).
- Includes Rotorcraft "Loss of Tail Rotor Effectiveness."
- Includes loss of control during practice or emergency autorotation.
- Includes pilot-induced or assisted oscillations.
- For unmanned aircraft events, includes hazardous outcomes involving deviation from intended flightpath associated with anticipated or unanticipated loss of datalink. However, if loss of datalink is the direct result of a system/component failure or malfunction, code the occurrence as System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*) only.
- For icing-related events, which are also loss of control, code both *LOC–I* and Icing (*ICE*)).
- If the loss of control is a direct result of a system/component failure or malfunction (SCF), code the occurrence as an System/Component Failure or Malfunction (Non-Powerplant) (*SCF–NP*), or System/Component Failure or Malfunction (Powerplant) (*SCF–PP*) only. However, loss of control may follow less severe system/component failures, and in this case, code both categories.
- Cockpit crew vision-related events and flight in degraded visual environments (for example, obscuration, black hole approach events, brownouts, or whiteout events), in which the aircraft is flown under control into terrain, water, or obstacles, are coded under Controlled Flight Into or Toward Terrain (*CFIT*), not *LOC–I*.

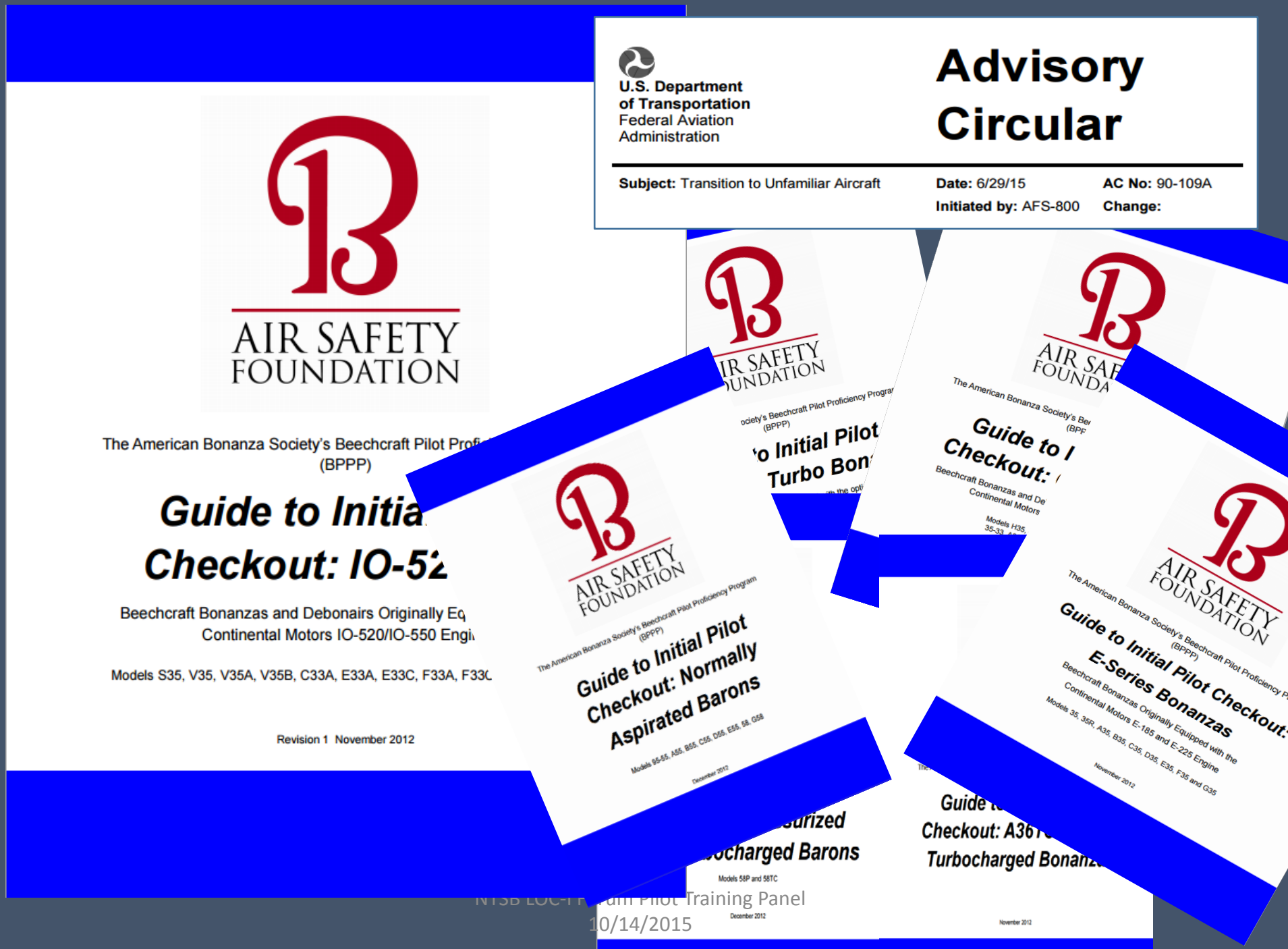
Revised 10/2013 Page 15

The Challenges of Teaching LOC-I

1. Defining Loss of Control
2. Teaching use of Angle of Attack indicators

The Challenges of Teaching LOC-I

1. Defining Loss of Control
2. Teaching use of Angle of Attack indicators
3. Traditionally equipped airplanes


AIR SAFETY FOUNDATION
The American Bonanza Society's Beechcraft Pilot Proficiency Program (BPPP)
Guide to Initial Pilot Checkout: IO-52
Beechcraft Bonanzas and Debonairs Originally Eq
Continental Motors IO-520/IO-550 Engi
Models S35, V35, V35A, V35B, C33A, E33A, E33C, F33A, F33
Revision 1 November 2012
U.S. Department of Transportation
Federal Aviation Administration
Advisory Circular
Subject: Transition to Unfamiliar Aircraft
Date: 6/29/15
AC No: 90-109A
Initiated by: AFS-800
Change:
Guide to Initial Pilot Checkout: Normally Aspirated Barons
Models 95-55, A55, B55, C55, D55, E55, 58, G58
December 2012
Guide to Initial Pilot Checkout: A36 Turbocharged Bonanz
Guide to Initial Pilot Checkout: E-Series Bonanzas
Beechcraft Bonanzas Originally Equipped with the Continental Motors E-185 and E-225 Engine
Models 35, 35R, A35, B35, C35, D35, E35, F35 and G35
November 2012

DOT/FAA/AM-02/19

Office of Aerospace Medicine
Washington, DC 20591

General Aviation Pilot Performance Following Unannounced In-Flight Loss of Vacuum System and Associated Instruments in Simulated Instrument Meteorological Conditions

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October 2002

Final Report

U.S. Department of Transportation
Federal Aviation Administration

LOC in IMC: Partial Panel Flight

- 2002 FAA/AOPA study DOT/FAA/AM-02/19

LOC in IMC: Partial Panel Flight

Table 3. Mean recognition time per pilot group.

Pilot Group	Average time to recognize failure (minutes)
Archer A	7.3
Archer B	4.9
Archer C	7.9
Bonanza A	4.6*
Bonanza B	2.6*

Note:

* The only significant difference was between these means. Archer A pilots used standard Archer instrumentation.

Archer B pilots received 30 minutes of partial panel PCATD training prior to their flight.

Archer C pilots had a vacuum annunciator light as a warning when the vacuum system failed.

Bonanza A pilots experienced an AI failure.

Bonanza B pilots experienced both AI and HSI failures.

- 2002 FAA/AOPA study DOT/FAA/AM-02/19
- The average time from failure to recognition ranged from 2.6 minutes with instrument warning flags to **7.3 minutes** without warning besides the instrument air/vacuum gauge

LOC in IMC: Partial Panel Flight

- Recognition
- Diagnosis
- Control

LOC in IMC: Partial Panel Flight

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LOC in IMC: Partial Panel Flight

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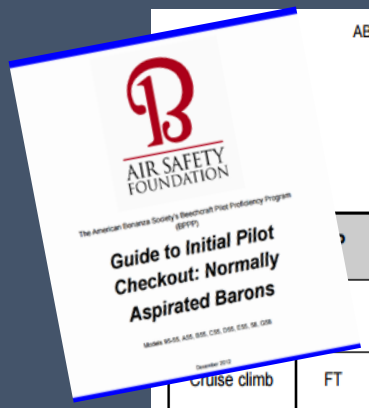
LOC in IMC: Missed Approach



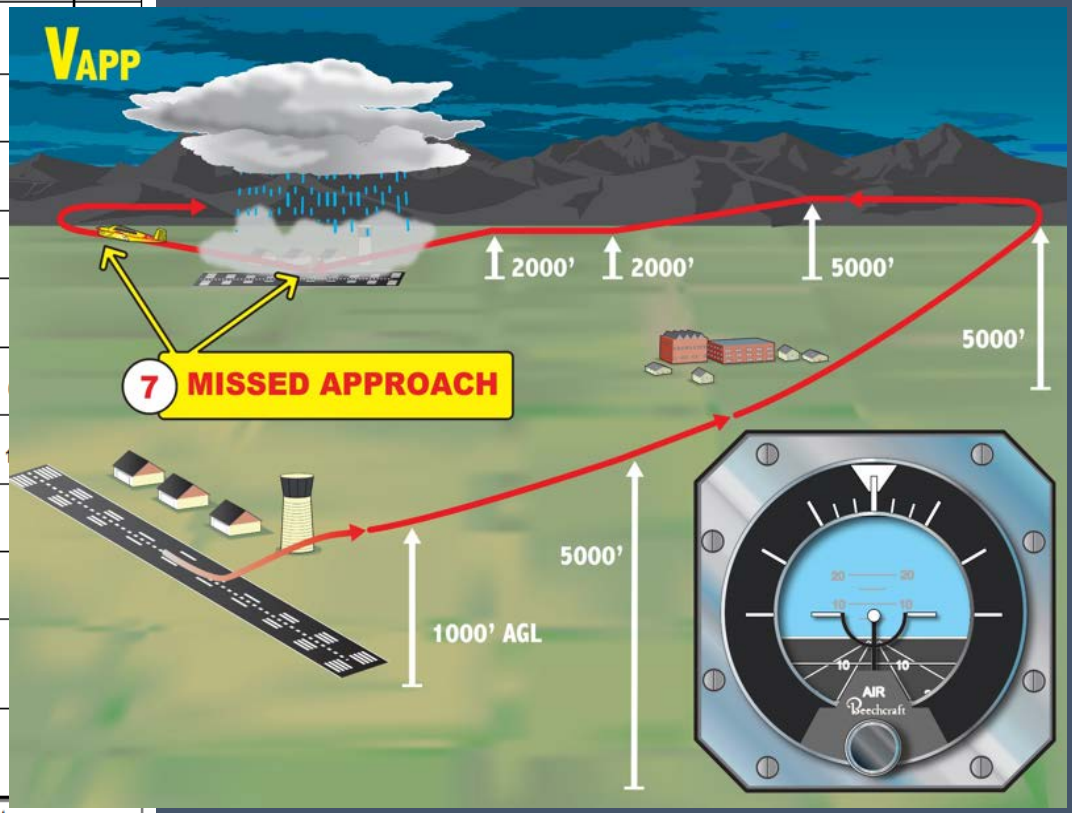
ABS/BPPP Guide to Initial Pilot Checkout: Normally Aspirated Barons

By the Numbers:
Power, Attitude, Configuration (PAC) Chart

Normally Aspirated Barons

		RPM	ATTITUDE	GEAR	FLAPS	KIAS	VSI	TRIM
		MAX	+7°	UP upon positive rate	UP	Per POH		
Cruise climb	FT	2500	+7°	UP	UP	120		
Cruise	As desired	As desired	Level	UP	UP	XXX		
En route descent	As desired	As desired	-2°	UP	UP	Green arc		
Approach (level)	15" 17"	2300 - 2500	+0° +2°	UP	UP APPROACH	120		
Precision descent	15" 17"	2300 - 2500	+0° +2°	DOWN	UP APPROACH	120		
Nonprecision descent	13" 15"	2300 - 2500	+0° +2°	DOWN	UP APPROACH	120		
MDA level	20" 22"	2300 - 2500	+0° +2°	DOWN	UP APPROACH	120		
Missed approach	FT	2500	+7°	UP	UP	120		
Single engine climb (prop windmilling)	FT	MAX	+3°	UP	UP	Vyse (Blue line)		
Single engine climb (prop feathered)	FT	MAX	+7°	UP	UP	Vyse (Blue line)		

Reducing manifold pressure by one inch results in a roughly 100-fpm descent.
A 5-inch reduction in MP results in a 500 fpm descent.



LOC in IMC: Missed Approach

NTSB Identification: CEN11FA302
14 CFR Part 91: General Aviation
Accident occurred Friday, April 22, 2011 in Topeka, KS
Probable Cause Approval Date: 12/05/2012
Aircraft: BEECH 58, registration: N580EA
Injuries: 4 Fatal.

LOC in IMC: Missed Approach

NTSB Identification: CEN11FA302

LOC in IMC: Missed Approach

If you're not on altitude, on course, on speed and in airplane configuration when reaching the Final Approach Fix, do not begin your descent toward the runway. Ask for a hold or a vector while you get prepared. Don't think you can "catch up" while flying the approach.

If you *begin* a missed approach procedure, *fly* the missed approach procedure —even if you subsequently see the runway.

If you miss an approach, climb to the missed approach altitude and enter the hold before trying to set up for, brief and fly a different approach.

If you ask for something (e.g., the GPS 36 approach) and are directed to do something else (the GPS 31 approach), decline the new instructions until everyone's sure that's what you want to do, and you have time to fully prepare.

In IMC, single-engine versus multiengine is less important than familiarity with the airplane being flown, and *much* less important than familiarity with the avionics being used.

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