



AIR SAFETY
FOUNDATION

The American Bonanza Society's Beechcraft Pilot Proficiency Program
(BPPP)

***Guide to Initial Pilot
Checkout: IO-520/550***

Beechcraft Bonanzas and Debonairs Originally Equipped with the
Continental Motors IO-520/IO-550 Engine

Models S35, V35, V35A, V35B, C33A, E33A, E33C, F33A, F33C, 36, A36, G36

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The ABS/BPPP Guide to Initial Pilot Checkout for IO-520 and IO-550 Bonanzas and Debonairs

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Using this Guide

The American Bonanza Society Air Safety Foundation highly encourages pilots receiving initial checkout (transition) training in a Beechcraft Bonanza or Debonair to fly with an authorized instructor knowledgeable about the specific model of airplane to be flown, and current in its operation. Resources include ABS' Beechcraft Pilot Proficiency Program (BPPP), a wholly owned subsidiary of the ABS Air Safety Foundation, and individual Certificated Flight Instructors who have received systems, pilot techniques and instructor standardization training through the ABS Flight Instructor Academy. Information about BPPP live and online training, as well as a list of BPPP-standardized flight instructors, is available at www.bonanza.org.

Although ABS is significantly increasing the number of its standardized instructors, and the BPPP Online+Flight program serves as a thorough, convenient and affordable initial checkout experience, occasionally a pilot new to flying Beech airplanes or transitioning from one model of Beechcraft to another does not have the opportunity to complete BPPP training or fly with a BPPP-trained instructor. For that event the ABS Air Safety Foundation has created this training outline. It is intended for experienced flight instructors who may not have Beech experience, to address the most vital topics and operations during the critical transition in a Bonanza or Debonair. This outline is not intended as a substitute for a thorough checkout by an instructor knowledgeable about the specific make and model and current in flying the type. It cannot address all topics, and completing training described by the outline alone does not meet all the requirements of a Flight Review or an Instrument Proficiency Check, or corresponding requirements governing operations in countries other than the United States. Further, a necessary and thorough avionics checkout is outside the scope of this *Guide* because of the wide variety of avionics installed in individual aircraft. The *Guide to Initial Pilot Checkout* drives the pilot and instructor into the manuals to learn the basic safety and operating characteristics of Beech airplanes, to assist the pilot until such time he/she is able to complete type-specific training with a Beech-knowledgeable flight instructor.

Several supplemental documents referred to in this *Guide* are available for download from the *Guide to Initial Pilot Checkout* web page.

The *Guide to Initial Pilot Checkout* also serves as a training document for instructor pilots in the ABS Flight Instructor Academy.



Pilots completing this syllabus earn 50 points toward the **ABS AVIATOR** program. Earning recognition as an ABS AVIATOR may qualify the pilot for discounts on his/her aircraft insurance—ask your insurance agent or broker. See the ABS AVIATOR description at www.bonanza.org for program details.

Please direct any questions to absmail@bonanza.org or 316-945-1700.

Enjoy your introduction to the Beechcraft Bonanza or Debonair!

Transition Training Checklist

Aircraft systems review

ABS recommends both the pilot and the instructor independently read the entire Pilot's Operating Handbook (POH) and all POH Supplements for optional, installed equipment and STCs before beginning training. Then, review and discuss system design and operation with special emphasis on (but not limited to) the items listed below.

| ITEM | TOPIC | TASK |
|------|---------------------------------------|---|
| 1 | POH Section II, Limitations | <ul style="list-style-type: none"> • Airspeed limitations • Instrument markings • Weight and center of gravity limitations • Approved maneuvers and entry speeds • Minimum fuel required in each main tank for take-off and approved maneuvers • Flight in icing conditions prohibited (unless modified by STC) • Kinds of Operations and Equipment List (KOEL) <p>See the article on using the KOEL on the ABS website <i>Guide to Initial Pilot Checkout</i> page.</p> <ul style="list-style-type: none"> • Any limitations contained in POH Supplements for installed optional or aftermarket equipment. |
| 2 | POH Section III, Emergency Procedures | <ul style="list-style-type: none"> • Emergency airspeeds • All Emergency Procedures checklists |
| 3 | POH Section IV, Normal Procedures | <ul style="list-style-type: none"> • Airspeeds for Safe Operation • All Normal Procedures checklists • Supplemental oxygen endurance calculations (if equipped) |
| 4 | POH Section V, Performance | <ul style="list-style-type: none"> • Compute expected airplane performance for conditions the pilot anticipates to be "normal" and "possible" for his/her operation, to confirm the pilot's ability to use the charts. • Apply correction values for A36 and G36 Bonanzas E-1946, E-2103, and E-2111 and after without altitude compensating fuel pumps (from pages 5-3 and 5-4 of the POH). |

| ITEM | TOPIC | TASK |
|------|--|---|
| 4 | POH Section V, Performance (continued) | <p>See the article “Performance Corrections for A36s and G36s Without Altitude Compensating Fuel Pumps,” on the <i>Guide to Initial Pilot Checkout</i> page at www.bonanza.org.</p> <ul style="list-style-type: none"> • Associated Conditions and Airspeeds necessary to get computed performance. • Adjustment to performance figures, Associated Conditions or Airspeeds from any POH Supplements for optional or aftermarket equipment. |
| 5 | POH Section VI, Weight And Balance | <ul style="list-style-type: none"> • Seating, baggage and equipment arrangements • Center of gravity (CG) shift rearward with fuel burn • Necessity of computing landing condition CG as well as takeoff condition <ul style="list-style-type: none"> • Discuss limits to flight endurance as needed to remain within CG limits for landing • Compute sample weight and balance for conditions the pilot anticipates to be “normal” and “possible” to confirm his/her ability to use the charts <p>See “How to Make Weight and Balance Calculations” on the <i>Guide to Initial Pilot Checkout</i> page at www.bonanza.org.</p> <ul style="list-style-type: none"> • Adjustment to weight and balance limitations or characteristics from any POH Supplements for optional or aftermarket equipment |
| 6 | <p>POH Section VII, Systems Description:</p> <p>Doors, Windows and Exits</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Procedure to properly secure and check the forward cabin door • Operation of emergency exits • Operation of aft cargo or utility doors • Passenger emergency exist briefing • Airspeed limitation on pilot’s storm window • Procedures following open forward cabin door on takeoff and in flight |

| ITEM | TOPIC | TASK |
|------|---|--|
| 7 | POH Section VII, Systems Description: Seats Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, | <ul style="list-style-type: none"> • Seat adjustment • Seat belt and shoulder harness use for pilots and passengers |
| 8 | POH Section VII, Systems Description: Flight Controls Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources. | <ul style="list-style-type: none"> • Operation of throw-over control yoke, if equipped • Adjustment of rudder pedals • Trim system <ul style="list-style-type: none"> • Operation • Position indication • Takeoff position • Electric pitch trim <ul style="list-style-type: none"> • Operation • Preflight check • Pitch trim runaway emergency procedure • Autopilot <ul style="list-style-type: none"> • Operating modes • Annunciation • Preflight check • Coupled operations • Flight Director operation |
| 9 | POH Section VII, Systems Description: Flaps Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources. | <ul style="list-style-type: none"> • Flap switch operation • Flap position indicating system • Flap limit speeds • S35-V35B, C33A-F33A and F33C, 36-A36 through E-2110 except E-1946 and E-2103: <ul style="list-style-type: none"> • Takeoff with partial flaps extended is not prohibited, but there are no data provided with which to make a performance calculation |

| ITEM | TOPIC | TASK |
|------|--|--|
| 9 | <p>POH Section VII, Systems Description:</p> <p>Flaps (continued)</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • A36 E-1945, E-2103 and E-2111 and after, G36: <ul style="list-style-type: none"> • Takeoff performance charts with zero flaps and with approach flaps • Make comparative takeoff performance calculations: <ul style="list-style-type: none"> • Under the same conditions, calculate ground roll and 50-ft obstacle distances with zero and approach flaps • For a given flap setting, calculate ground roll and 50-ft obstacle distances at various weights, field elevations and ambient air temperatures • Note the liftoff and 50-ft speeds required to get calculated performance at various weights and with and without flaps |
| 10 | <p>POH Section VII, Systems Description:</p> <p>Engine and Propeller</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Cowling latch operation • Cowl flap operation, and when to open cowl flaps • Alternate induction air system operation • Starter <ul style="list-style-type: none"> • Operation, including STARTER ENERGIZED annunciator if equipped • Starter limitations • Manifold pressure gauge • Fuel flow indicator <ul style="list-style-type: none"> • Pressure vs. rate of flow • Direct indicator vs. electrical • Potential hazard of direct indicator fuel flow in the panel • Starting <ul style="list-style-type: none"> • Normal, hot and flooded start procedures • Ammeter/Loadmeter indications after engine start |

| ITEM | TOPIC | TASK |
|------|--|--|
| 10 | <p>POH Section VII, Systems Description:</p> <p>Engine and Propeller (continued)</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Takeoff and climb power recommendations <ul style="list-style-type: none"> • Mixture control during takeoff • High density altitude takeoffs • Leaning during climb • Automatic leaning in airplanes with an IO-550 engine and an altitude compensating fuel pump • Leaning using the Exhaust Gas Temperature (EGT) indicator or engine monitor <ul style="list-style-type: none"> • Alternative leaning techniques <ul style="list-style-type: none"> • Rich of Peak EGT (ROP) • Lean of Peak EGT (LOP) • Powerplant limitations • Powerplant instrument markings • Engine preheat recommendations • McCauley propeller AD limitations (2007-08-04) <ul style="list-style-type: none"> • McCauley C406 and C409 series props • Avoid 2350 to 2450 RPM above 24" MP • Cockpit placard • Continental Motors recommendation on minimum cruise RPM (CSB09-11) <ul style="list-style-type: none"> • All IO-520 and IO-550 engines • Avoid continuous operation below 2300 RPM in cruise |
| 11 | <p>POH Section VII, Systems Description:</p> <p>Fuel System</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Total fuel quantity • Usable and unusable fuel • Fuel system limitations <ul style="list-style-type: none"> • Minimum fuel quantity in each main tank for takeoff • Use of auxiliary fuel tanks • Maximum continuous slip • Fuel system preflight inspection <ul style="list-style-type: none"> • Fuel strainer locations • Fuel vent locations |

| ITEM | TOPIC | TASK |
|------|---|---|
| 11 | <p>POH Section VII, Systems Description:</p> <p>Fuel System (continued)</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Quantity and routing of return fuel • Fuel tank selection • Use of the auxiliary fuel pump • If equipped with tip tanks: <ul style="list-style-type: none"> • Tip tank capacity • Tip tank fuel quantity indicating systems • Fuel tank selection and/or fuel transfer • Routing of return fuel when tip tanks are in use (if the system installed directly feeds the fuel selector) • Rate and time to transfer fuel from tips to the mains (if the system transfers fuel) • Tip tank fuel strainer and vent locations • System limitations • Fuel management strategy <ul style="list-style-type: none"> • Confirming fuel quantity before start • Tank selection and checks before takeoff • Takeoff tank fuel selection <ul style="list-style-type: none"> • Do NOT switch tanks after engine run-up and before takeoff • When you will burn from each tank in cruise, and for how long <ul style="list-style-type: none"> • Consider a written fuel tank switching plan to complete before takeoff • Timers and other reminders to switch tanks • Confirming fuel state while en route • Tank selection for descent and landing <ul style="list-style-type: none"> • Select a main fuel tank at Top of Descent (TOD) that has sufficient fuel for approach, landing, go-around and climb if necessary without switching tanks again • Do NOT switch tanks in the traffic pattern or after intercepting the approach inbound |

| ITEM | TOPIC | TASK |
|------|--|--|
| 12 | <p>POH Section VII, Systems Description:</p> <p>Landing Gear</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Landing gear switch operation <ul style="list-style-type: none"> • Maximum extension speed • Landing gear position indicators <ul style="list-style-type: none"> • Single light/nose pointer system (as applicable) • Three green light system (as applicable) • Landing gear warning horn and annunciator (as appropriate) • Landing gear squat switch(es) do not always prevent gear retraction on the ground • Throttle position to retract gear (as appropriate) • Confirming gear extension <ul style="list-style-type: none"> • Sound • Aerodynamic effect (attitude change) • Performance effect (power, vertical speed) • Position indicators check • Optional external gear mirrors check • Manual extension procedure <ul style="list-style-type: none"> • Use the checklist • Landing gear motor circuit breaker • Crank until reaching the hard stop • Gear up and gear collapse mishaps account for nearly half of all reported Bonanza accidents <ul style="list-style-type: none"> • Constant attention to landing gear strategy • Landing gear strategy <ul style="list-style-type: none"> • “Gear down to go down”: <ul style="list-style-type: none"> • Gear down at the Final Approach Fix • Use gear extension to begin the final descent from pattern altitude • Do not release the gear switch until extension is complete and you have confirmed gear position • “Down and locked” check on short final • Do not retract flaps, etc. during landing roll, to avoid inadvertent gear retraction |

| ITEM | TOPIC | TASK |
|------|--|--|
| 13 | <p>POH Section VII, Systems Description:</p> <p>Brakes</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Brakes operation <ul style="list-style-type: none"> • Presence or lack of brakes on the copilot's side • If there are no brakes on the copilot's side, need to brief on how instructor will command the pilot to increase braking when needed • Parking brake operation <ul style="list-style-type: none"> • Apply brake pressure, then trap pressure by pulling the parking brake valve • Do not leave parking brake set for long periods |
| 14 | <p>POH Section VII, Systems Description:</p> <p>Electrical System</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Normal and standby systems • Monitoring systems and annunciators • Standby generator <ul style="list-style-type: none"> • Test procedure • Emergency operation • What it powers, what it doesn't • Standby alternator <ul style="list-style-type: none"> • Test procedure • Normal and emergency operation • Monitoring and load shedding <p>All except 1984 and later A36/G36 and B36TC Bonanzas do not have an Electrical Fire or Overheat emergency checklist in the POH. See the article "Are You Prepared For an Electrical Fire?" on the ABS website <i>Guide to Initial Pilot Checkout</i> page.</p> |
| 15 | <p>POH Section VII, Systems Description:</p> <p>Environmental System</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Cabin ventilation system operation <ul style="list-style-type: none"> • Using the Firewall Shutoff valve to cool the cabin • Heater operation • Maximum defroster operation • Air conditioning system operation <ul style="list-style-type: none"> • Limitations • Reduce all performance by 5% when air conditioner is operating (as applicable) |

| ITEM | TOPIC | TASK |
|------|---|--|
| 16 | <p>POH Section VII, Systems Description:</p> <p>Pitot/Static System</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Optional emergency static air source operation • Instrument calibration/corrections while using the emergency system |
| 17 | <p>POH Section VII, Systems Description:</p> <p>Instrument Air System</p> <p>Note: Although most information on this topic comes from Section VII or the POH or appropriate POH Supplements, some items reference Section II, Limitations, Section V, Performance, or other sources.</p> | <ul style="list-style-type: none"> • Pressure vs. vacuum system (as appropriate) • Normal “green arc” indication on the cockpit gauge • Factory or aftermarket backup instrument air sources <ul style="list-style-type: none"> • GYRO WARNING and STANDBY AIR annunciator lights • Operation of the backup system • Which instruments are powered by the backup system |
| 18 | <p>POH Section IV, Normal Procedures</p> | <ul style="list-style-type: none"> • Review preflight inspection checklist |

Knowledge Questions

At a minimum, the pilot must be able to answer these questions:

1. What is the total usable fuel?
2. What is the endurance with a one-hour reserve at 75% power (or Full Throttle/2500 RPM) at 8000 feet?
3. What is the maximum and minimum oil capacity in quarts?
4. How much payload can the airplane carry with all fuel tanks full?
5. How much fuel can you carry under the following conditions?
 - Total front seat occupants weight = 400 lbs
 - Total Seats 3/4 occupant weight is 300 lbs
 - Total aft baggage weight is 70 lbs
6. Assuming you load that amount of fuel for takeoff and with that cabin load, after burning 40 gallons of fuel will the center of gravity be within limits?
7. What is the maximum demonstrated crosswind component?
8. What are the indications of a vacuum/instrument air system failure?
9. What is your fuel management strategy for a four-hour flight?
10. When should you extend the landing gear during an instrument approach?
11. When should you extend the landing gear during a visual/VFR traffic pattern approach?
12. How do you verify landing gear extension?
13. When should you retract flaps after landing?
14. When should the cowl flaps be open?
15. How will you lean the mixture for takeoff? Climb? Cruise? Descent? Landing?
16. How many fuel drains are there?
17. What is the procedure for an unlatched forward cabin door on takeoff? In flight?
18. When and how do you use the auxiliary fuel pump?
19. From the moment you taxi onto the runway for departure, what is the sequence of events (airplane configurations, actions, airspeeds, attitudes) for a normal takeoff without obstacles?
20. What is the sequence of events for takeoff with a 50-foot obstacle at the end of a 3000-foot runway?
21. What should be your actions following a loss of engine power in cruise flight?
22. What should you do if the engine loses power immediately after takeoff?
23. What is the Emergency Descent procedure?
24. If the landing gear will not extend, what should you do?

Pilot and Instructor Preflight Check and Briefing

| ITEM | TOPIC | TASK |
|------|--|--|
| 1 | Comply with all regulatory, certification and recency of experience requirements applicable to the flight. | <ul style="list-style-type: none"> • FAR 61, 91 requirements for Pilot-in-Command • FAR 91.109 requirements for instructional flight in aircraft with single flight control <p>See the ABS website <i>Guide to Initial Pilot Checkout</i> page for sources of dual control rental if needed.</p> |
| 2 | Comply with any insurance requirements. | <ul style="list-style-type: none"> • Ensure the pilot is authorized to receive instruction in the airplane under the owner's aircraft insurance policy (see "Approved Pilots" in the policy) • Ensure the flight instructor meets the aircraft insurance policy Open Pilot Warranty or is otherwise authorized to provide flight instruction under the owner's insurance policy. • Review and comply with any insurance policy pilot checkout and/or dual instruction requirements before solo and/or carrying passengers. <p>Contact the aircraft owner's insurance agent or broker to answer any questions before flying.</p> |
| 3 | Assess pilot and instructor readiness for flight. | <ul style="list-style-type: none"> • IMSAFE model |
| 4 | Briefing | <ul style="list-style-type: none"> • Review the pilot's completed BPPP Speed Sheet • Review flight syllabus and goals |

Aircraft Preflight Check

| ITEM | TOPIC | TASK |
|------|---|---|
| 1 | Aircraft documents | <ul style="list-style-type: none"> • Required documents (FAR Parts 91) • Required inspections and certifications (FAR Parts 43, 91) • Current GPS database, if IFR GPS is to be used |
| 2 | Compliance with recurring and one-time Airworthiness Directives | <p>Including but not limited to:</p> <ul style="list-style-type: none"> • Uplock rollers last lubed and when next due • Spar web dye penetrant check last performed and when next due • (V-tail) Rear bulkhead inspection last performed and when next due • (Model 33, 36) Rudder spar inspection applicability, last performed and when next due <p>See the following items on the ABS website <i>Guide to Initial Pilot Checkout</i> page:</p> <ul style="list-style-type: none"> • How to conduct an Airworthiness Directives search for your aircraft • Checklist for subscribing to receive Airworthiness Directives (ADs) and Special Airworthiness Information Bulletins (SAIBs) by email • Spar web AD 95-04-03 and MSB 2360 • V-Tail Fact Sheets for the S35 through V35B |
| 3 | Tracking airplane maintenance and inspection status | <ul style="list-style-type: none"> • Discuss creating an aircraft status board or spreadsheet. |
| 4 | Preflight inspection | <ul style="list-style-type: none"> • Conduct preflight inspection of the aircraft using the POH checklist, with special emphasis on: <ul style="list-style-type: none"> • Landing gear manual handcrank stowed and accessible (not blocked by spar cover) • Main landing gear roller bearings free to rotate • Main landing gear uplock and downlock springs and cables • Condition of aft fuselage and empennage • Determining fuel available in each tank. |

Flight Training

General recommendations

These recommendations come from experience as techniques for avoiding the most common causes of Bonanza/Debonair accidents:

- Do not perform touch and goes. There is a high correlation between touch and goes and inadvertent landing gear retraction on the runway. A large number of loss-of control crashes also occur during the high-workload on-runway phase of a touch and go. Make all landings to a full stop and take time to reconfigure for another takeoff and traffic pattern.
- Do not retract flaps during the landing rollout. Reconfigure the airplane only after coming to a stop on the taxiway after clearing the runway.
- Be familiar with the weight and balance of your airplane. As fuel burns the CG moves aft. You should compute two weight and balance problems or each flight—one with fuel and cabin load prior to takeoff, the other with the fuel calculated to be remaining when you arrive at your destination or alternate. You may be under maximum gross weight and within the CG envelope at departure but beyond the aft limit upon reaching your destination. Late-model A36s and G36 Bonanzas may be forward out of limits with full fuel and only the front seats occupied.
- Plan on having a minimum of one hour of fuel on board upon arriving at your destination or alternate. Avoid a planned fuel stop within one hundred miles or one hour of your destination. There is a great temptation to fly over the fuel stop and continue to your destination.
- Always use checklists to verify your actions. Before landing use GUMP:
 - Confirm the *Gas* (fuel) selector is on a main tank that has adequate fuel for approach, landing and, if necessary, missed approach or bailed landing and climb before you begin your descent from cruise flight.
 - Make sure the *Undercarriage* (landing gear) lever is down and indicators confirm gear down.
 - Set the *Mixture* to full rich or as required by field elevation.
 - Put the *Propeller* control the high RPM.
- Undertake a program to insure your currency. Each month select a new area of concentration. Examples include: instrument currency; night operations; short, soft and crosswind takeoffs and landings; GPS operations; slow flight and stall recognition and recovery; etc. See training opportunities recognized by the ABS AVIATOR program for ideas.

A checkout following the checklists in this *Guide* covers only the basic information absolutely necessary for initial transition training. Plan on completing BPPP (Online+Flight or LIVE) as soon as possible to learn much more about your Bonanza or Debonair and how to safely fly it to its maximum potential. See www.bonanza.org for course descriptions and details.



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

IO-520/IO-550

| CONDITION | MP | RPM | ATTITUDE | GEAR | FLAPS | KIAS | VSI | TRIM |
|----------------------|------------|----------------|------------|-----------------------|----------------|-----------|--------------------|---------------|
| Initial climb | FT | MAX | +10° | UP upon positive rate | UP | Per POH | ↑XXX | Per POH |
| Cruise climb | FT | 2500 | +7° | UP | UP | 110-120 | ↑XXX | As req'd |
| Cruise | As desired | As desired | Level | UP | UP | XXX | 0 | 0 to 2 down |
| En route descent | As desired | As desired | -2° | UP | UP | Green arc | As desired | As needed |
| Approach (level) | 15" 17" | 2300 - 2500 | +0° +2° | UP | UP APPROACH | 105-110 | 0 | +3° to +5° |
| Precision descent | 15" 17" | 2300 - 2500 | +0° +2° | DOWN | UP APPROACH | 105-110 | ↓500 - 600 fpm | +0° to -3° |
| Nonprecision descent | 13" 15" | 2300 - 2500 | +0° +2° | DOWN | UP APPROACH | 105-110 | ↓800 - 1000 fpm | +3° to +5° |
| MDA level | 20" 22" | 2300 - 2500 | +0° +2° | DOWN | UP APPROACH | 105-110 | 0 | +3° to +5° |
| Missed approach | FT | 2500 | +7° | UP | UP | 105-110 | ↑XXX | +3° to +5° |

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.

The "By the Numbers" technique has been taught since World War II to provide a simple, consistent way to conduct flight, especially instrument flight, yet it is not widely taught to pilots of personal airplanes like the Bonanza and Debonair. For attitude reference, adjust the airplane bar to the horizon during level cruise flight and do not adjust further. Power settings and airplane configurations will result in the approximate performance tabulated. Adjust these numbers as necessary for your airplane under current conditions.

Flight Training Syllabus

Syllabus items may take several flights to accomplish, and may be presented in any order as conditions require and/or at the discretion of your instructor. Your instructor may incorporate Scenario-Based Training (SBT) techniques but should ensure that, at a minimum, all listed Tasks are covered during your checkout.

There is no set amount of time required to complete the checkout. An inexperienced or non-current pilot, or a pilot not experienced flying high-performance single- or twin-engine piston airplanes, may require longer to complete the training than a current pilot experienced flying similar aircraft. In all cases the instructor should use the Federal Aviation Administration's guidance from the Practical Test Standards, including judgment that the pilot "demonstrates mastery of the aircraft in the tasks performed with the successful outcome of each task performed never seriously in doubt."

Upon completion of the syllabus the instructor shall log all ground and flight instruction time in the pilot's log book in accordance with Federal Air Regulations. The instructor may reference the use of the ABS/BPPP Guide to Initial Pilot Checkout as a reference for such training, but doing so does not imply ABS, ABS Air Safety Foundation or BPPP endorsement of the instruction received.

The instructor may endorse the pilot for a Flight Review and/or an Instrument Proficiency check entirely at the instructor's discretion. Whether or not the instructor provides such endorsements, he/she should recommend additional study, practice, and/or dual flight instruction for the pilot to improve his/her skills, and suggest a regimen of recurrent training that should include participation in BPPP online or live training to learn more about the Beechcraft Bonanza or Debonair.

Flight Training Syllabus

| ITEM | TASK | AMPLIFICATION |
|------|---------------------------|---|
| 1 | Preflight inspection | <ul style="list-style-type: none"> • Orderly habit pattern • Special emphasis items • Checklist use |
| 2 | Startup and taxi | <ul style="list-style-type: none"> • Cockpit flows and checklists • Develop an orderly cockpit for single-pilot operations • Do not program avionics (GPS) while taxiing |
| 3 | Takeoff and initial climb | <ul style="list-style-type: none"> • Flows and checklist use • Technique and speeds per the POH performance charts <ul style="list-style-type: none"> • Normal takeoff • Crosswind takeoff • Short-field takeoff • Soft-field takeoff • Engine management including mixture control • Use of the Power, Attitude and Configuration (PAC) recommendations • Forward cabin door unlatched: <ul style="list-style-type: none"> • Do not attempt to close the door in flight • The airplane flies nearly the same with the door open • Land and then secure the door • Pilot distraction is the biggest hazard |
| 4 | Cruise climb | <ul style="list-style-type: none"> • Flows and checklist use • Engine and mixture management • Step climb • Oxygen use (as applicable) |

| ITEM | TASK | AMPLIFICATION |
|------|--|---|
| 5 | Level-off and cruise | <ul style="list-style-type: none"> • Flows and checklist use • Engine and mixture management • Fuel management |
| 6 | Normal maneuvering | <ul style="list-style-type: none"> • Standard rate turns • Normal (30° bank) turns |
| 7 | Steep turns | <ul style="list-style-type: none"> • Begin below weight-adjusted V_A <ul style="list-style-type: none"> • Reduce published V_A by 2 knots for every 100 pounds below maximum weight |
| 8 | Slow flight | <ul style="list-style-type: none"> • Mixture: Full Rich • Cowl flaps: Open • Monitor cylinder head temperature (CHT) and oil temperature. Exit slow flight if either becomes excessive. |
| 9 | Spiral tendency demonstration and recovery | <ul style="list-style-type: none"> • Enter at 90 to 100 knots • Allow the airplane to roll to 50° to 60° bank (do not exceed 60°) • Recover at V_A or 60° bank, whichever is reached first <ul style="list-style-type: none"> • Wings level • Gear down as needed • Power idle until in a climb attitude • Normal climb attitude • In recovery, forward pressure will be needed on the controls to prevent excessive pitch up and potential overstress <p>See the article “Demonstrating the Spiral Tendency and Recovery” on the ABS website Guide to Initial Pilot Checkout page.</p> |
| 10 | Stall recognition and recovery | <ul style="list-style-type: none"> • Mixture: Full Rich or as required by altitude • Keep ailerons neutral and ball centered prior to stall and during recovery (instructor may need to block movement of the controls) |

| ITEM | TASK | AMPLIFICATION |
|------|--|---|
| 10 | Stall recognition and recovery (continued) | <ul style="list-style-type: none"> • Do not practice stalls with fuel in optional tip tanks <ul style="list-style-type: none"> • The weight of fuel may introduce or amplify roll, making recovery difficult • Approach to landing stalls <ul style="list-style-type: none"> • Power idle • Gear down • Full flaps • Descend ~500 fpm • Trim off pressures • Increase Angle of Attack until the wing stalls • Recover • Takeoff and departure stalls <ul style="list-style-type: none"> • Power: 20" MP to full throttle • Gear up • Flaps up • Trim set for takeoff • Climb steeply • Increase Angle of Attack until the wing stalls • Recover • Accelerated stalls (Approach and/or Takeoff) <ul style="list-style-type: none"> • Bank no more than 30° • Stall occurs at a higher indicated airspeed ("accelerated") • Balked landing (Trimmed) stalls <ul style="list-style-type: none"> • Takeoff stalls with pitch trim set to the typical landing position <ul style="list-style-type: none"> • 6 to 9 units up • 19 to 21 units up in turbonormalized Bonanzas/Debonairs |

| ITEM | TASK | AMPLIFICATION |
|------|--|---|
| 11 | Simulated engine failure/ power off glide | <ul style="list-style-type: none"> • Demonstrate only at altitude in VMC after clearing for traffic, including below • Do not descend below 1000 feet AGL during the demonstration • Reduce engine temperatures gradually prior to initiating demonstration • Ensure gear is up, flaps are up and cowl flaps are closed • Pull the propeller control fully out to ensure maximum glide performance • Maximum Glide speed <ul style="list-style-type: none"> • Reduce published speed by 2 knots for every 100 pounds below maximum weight • For minimum descent rate the speed is approximately 25% <ul style="list-style-type: none"> • Landing Without Power speed from the Emergency Speeds table in the POH • Remains aloft longer, but not able to glide as far <p>See the article “Demonstrating the Power-Off Glide” on the ABS website <i>Guide to Initial Pilot Checkout</i> page.</p> |
| 12 | Manual landing gear extension | <ul style="list-style-type: none"> • Checklist use • Slow to 100-110 knots • Continually check for traffic during demonstration • Pilot should move the seat aft and recline the seat back. The front passenger should move the seat forward for better access to the manual gear hand crank. • Extend the gear without using the autopilot (simulating a total electrical failure) • Discuss using the autopilot during gear extension <p>See the article “Manual Landing Gear Extension Technique” on the ABS website <i>Guide to Initial Pilot Checkout</i> page.</p> |

| ITEM | TASK | AMPLIFICATION |
|------|-----------------------------|--|
| 13 | Instrument procedures | <ul style="list-style-type: none"> • VFR only pilots <ul style="list-style-type: none"> • PACs demonstration <ul style="list-style-type: none"> • Approach level • 500 fpm descent • 800 fpm descent • Missed approach • Basic attitude flight • Recovery from unusual flight attitudes • Level, 180° escape turn • Use of autopilot for escaping IMC • IFR pilots wishing to exercise instrument rating privileges <ul style="list-style-type: none"> • PACs demonstration <ul style="list-style-type: none"> • Approach level • Precision approach descent • Non-precision approach descent • MDA level off/Circling • Missed approach • Flows and checklist use • Approach set-up and briefing • Instrument Proficiency Check items as required by Part 91 and IFR Practice Test Standards Rating Task Table (p. 1-vii) |
| 14 | Visual approach and landing | <ul style="list-style-type: none"> • Flows and checklist use • Normal landing • Crosswind landing • Short-field landing • Soft-field landing • No-flap landing • Rejected landing (“go-around”) • Do not perform touch and goes • Do not reconfigure the airplane during the landing roll. Clear the runway and come to a stop on the taxiway before retracting flaps, etc. |

| ITEM | TASK | AMPLIFICATION |
|------|------------------------|---|
| 15 | Taxi and shutdown | <ul style="list-style-type: none"> • Flows and checklist use |
| 16 | Post-flight inspection | <ul style="list-style-type: none"> • Exterior walk-around to detect and issues that should be addressed before the next flight |
| 17 | Debriefing | <ul style="list-style-type: none"> • Review of all tasks and maneuvers • Any questions from the pilot • Suggestions for additional study, practice and/or dual flight instruction • Suggestions for a regimen of regular recurrent training, including participation in BPPP online or live instruction • Discussion of personal minimums, especially in the pilot's first 100 hours in the specific aircraft • Logbook entries • Endorsements at the discretion of the instructor |

ABS welcomes pilot and instructor comments on the Guide to Initial Pilot Checkout, as well as suggestions for additional and improvement. Please post your reviews and comments on the ABS Hangar Flying bulletin board Flight Instruction forum, or send them to asf@bonanza.org.

I hope this *Guide* has made you a better pilot and instructor.



Thomas P. Turner
 Executive Director
 ABS Air Safety Foundation