

Briefings

Threats: What are our threats? Pick countermeasures.

- Adverse weather • NOTAMs • Abnormals/maintenance items • Fuel state
- Short runway • Runway condition • Airport construction/closed taxiways
- Obstacles/high terrain • Special use airspace • High MSA • Wind
- Visibility • Cloud decks • Night • High traffic • Delays • Fatigue
- Dehydration • Passenger/schedule pressure • Interruptions

Plan: Amount of detail driven by familiarity and risk.

- Takeoff:** • Runway • Type (speeds, flaps) • Abort pt & proc • Climb speeds, power • Initial heading & altitude • Return • Route (ODP, SID) • Nav setup
- Instrument approach:** • STAR • Apt/proc/rwy/rev • NoPT?, No FAF?, S-I/SS/Cir? • FAF alt, step downs, DH/MDA • Lighting • Missed proc • Nav setup
- VFR landing:** • Runway • Pattern direction, altitude, & entry • Type (speeds, flaps) • Lighting • Go-around • Nav setup

Considerations: Recap extra actions.

Debrief

- What were the flight's objectives? • Review execution of: Planning, Ground ops., Takeoff/departure, En route, Arrival/approach/landing
- What to do better? • Errors/lessons learned • Questions?

Airspeeds & Configurations

Normal Takeoff: flaps up	Maneuvering @ 2450 lb ... 99 KIAS
Rotation 55 KIAS	@ 2100 lb ... 92 KIAS
Takeoff (to 50 ft)..... 75 KIAS	
Short Field Takeoff: flaps 10°	Instrument approach 90 KIAS
Rotation 51 KIAS	Pattern (downwind) 85 KIAS
Takeoff (to 50 ft)..... 57 KIAS	Final (normal)..... 65 KIAS
Soft Field Takeoff: flaps 10°	Final (no flaps) 70 KIAS
Rotation ASAP	Final (short field) 62 KIAS
Takeoff (to 50 ft) 57 or 75 KIAS	Go-around (initial)..... (172R) 55 KIAS
	(172S) 60 KIAS
Initial climb (50–1000 ft) ... 78 KIAS	Engine failure (172R) 65 KIAS
En route climb 86–80 KIAS	(172S) 70 KIAS
	with flaps down (172R) 60 KIAS
	(172S) 65 KIAS

Normal Checklists

Further procedure details are in the *Pilot's Operating Handbook* section 4.

Preflight Cockpit

Preflight Cockpit

Cockpit Area

1. Parking brakeApplied
2. Control wheel lockRemoved
3. Airworthiness and registration certificatesDisplayed
4. Fire extinguisherChecked
5. Pilot's Operating Handbook and GPS Quick ReferenceAvailable

Lower Panel

6. MagnetosOff
7. Master (Alt/Bat).....Off
8. Circuit breakers (main & avionics).....Checked in
9. Beacon, Landing, Taxi, Nav, Strobe LightsTested
10. Pitot HeatTested
11. Electrical switchesOff
12. Avionics MasterOff
13. FlapsExtended Full
14. Alt Static AirOff

Pedestal

15. Fuel Shutoff valveOpen
16. Fuel SelectorBoth

Avionics Stack

17. Avionics cooling fan.....Checked (audible)
18. GPS Self-test & database datesChecked
19. Transponder codeVFR
20. AutopilotEngaged and overpowered

Pilot's Side

21. Annunciator panel switchTested
22. Clock.....[Set]
23. Fuel Qty[Checked]

"Preflight Cockpit check complete"

Preflight Exterior

- 1. Baggage DoorLatched

Empennage

- 2. AntennasSecurely attached and in good condition
- 3. Elevator.....Moves freely and securely attached
- 4. Rudder.....Moves freely and securely attached
- 5. Rudder Gust Lock (if installed)Removed
- 6. Tail Tie-Down.....Disconnected
- 7. Elevator Trim TabSecurely attached

Right Wing Trailing Edge

- 8. FlapSecurely attached and in good condition
- 9. Aileron.....Moves freely and securely attached

Right Wing Leading Edge

- 10. Wing Tie-Down.....Disconnected
- 11. Fuel Tank Sump Quick Drain ValvesSampled & checked fuel (5 points)
- 12. Main Wheel TireInflated and in good condition
- 13. Fuel QuantityChecked visually
- 14. Fuel Filler CapVent unobstructed and cap secure

Nose

- 15. Engine Oil Level.....[5–8 qt]
 ⚠ (Avoid used engine oil—possible carcinogen. Wash off with soap.)
- 16. Engine Oil Dipstick/Filler CapSecure
- 17. Fuel Strainer Quick Drain ValveSampled & checked fuel
- 18. Engine Cooling Air InletsClear of obstructions
- 19. Propeller & SpinnerFree of nicks and securely attached
- 20. Air FilterClean
- 21. Nose Wheel Strut.....Inflated
- 22. Nose Wheel TireInflated and in good condition
- 23. Left Static Source Opening.....No blockage

Left Wing Leading Edge

- 24. Fuel QuantityChecked visually
- 25. Fuel Filler CapVent unobstructed and cap secure
- 26. Pitot Tube, Stall Warning, & Fuel Tank VentNo blockage

Preflight Exterior

- 27. Landing & Taxi Lights.....Cover in good condition and clean
- 28. Wing Tie-Down.....Disconnected
- 29. Fuel Tank Sump Quick Drain ValvesSampled & checked fuel (5 points)
- 30. Main Wheel TireInflated and in good condition

Left Wing Trailing Edge

- 31. Aileron.....Moves freely and securely attached
- 32. FlapSecurely attached and in good condition

“Preflight Exterior check complete”

Before Start

Before Start

- 1. Parking brakeApplied
- 2. Tie-downs, chocks, and tow barRemoved
- 3. Seats & seat beltsAdjusted & locked
- 4. Master (Alt/Bat).....On
- 5. BeaconOn
- 6. Avionics MasterOff
- 7. Fuel Shutoff valveOpen
- 8. Fuel SelectorBoth

“Before Start check complete”

After Start

After Start

- 1. Oil PressChecked
 (Shutdown engine if oil pressure not normal within 30 seconds of start.)
- 2. (sunset–sunrise) Nav LightsOn
- 3. Avionics MasterOn
- 4. Flaps.....Up
- 5. MixtureLeaned for ground operations
- 6. Instruments.....[Set]
- 7. GPS startup pages.....Acknowledged

“After Start check complete”

Run-Up

1. Seats, seat backs & seat beltsSecure & upright
2. Cabin doorsClosed & locked
3. Flight controls.....Free & correct
4. Mixture.....Full Rich
5. Checked at 1800 rpm:
 - 5.a. Magneto check.....Complete
(RPM drop less than 150 RPM. Less than 50 RPM difference between magnetos.)
 - 5.b. Oil Temp & PressChecked
 - 5.c. Vac.....Checked
 - 5.d. Alternator check.....Complete
 - 5.e. Annunciator panelClear (none lit)
6. Throttle.....Idle checked
7. Throttle friction lockSet
8. Autopilot.....Disengaged
9. Elevator Trim.....Take-off position
10. Fuel Shutoff Valve.....Open
11. Fuel SelectorBoth
12. Nav.....Set
13. CDI navigation source[GPS/VLOC]
14. Transponder mode & code.....Alt / [Checked]
15. Instruments.....[Set]
16. Fuel Qty[Checked]
17. Flaps.....[Up or 10°]

“Run-up check complete”

Run-Up

Before Takeoff

1. Flaps.....[Up or 10°]
2. Mixture(at or below 3000 density alt.) Full Rich
(above 3000 density alt.) Leaned (for max rpm at full throttle)
3. Landing & Strobe Lights.....On
“Before Takeoff check complete”

Before Takeoff

After Takeoff

1. Flaps.....Up
2. (above 3000 density alt.) MixtureLeaned
3. Landing LightOff
“After Takeoff check complete”

After Takeoff

Cruise

1. Taxi LightOff (Leave on in high traffic areas)
2. Throttle.....[Cruise power]
3. MixtureLeaned
4. Fuel Qty[Checked]

“Cruise check complete”

Cruise

Descent

1. Taxi Light.....On
2. Fuel SelectorBoth
3. Nav & Comm.....Set
4. CDI navigation source[GPS/VLOC]
5. Instruments.....[Set]
6. Fuel Qty[Checked]
7. Seats, seat backs & seat beltsSecure & upright

"Descent check complete"

Descent

(IFR) Approach

1. Landing & Taxi LightsOn
2. Fuel SelectorBoth
3. Mkr SensLO
4. Audio SelectMKR on
5. Approach procedure (in GPS).....Loaded
6. CDI navigation source[GPS/VLOC]
7. Instruments.....[Set]
8. TimerReady

"Approach check complete"

Approach

Before Landing

1. Flaps[10° typical]
2. Mixture.....Full Rich
3. Fuel SelectorBoth
4. Autopilot.....Disengaged

"Before Landing check complete"

Before Landing

After Landing

1. Flaps.....Up
2. Mixture.....Leaned for ground operations
3. Landing & Strobe Lights.....Off

"After Landing check complete"

After Landing

Shutdown

1. Parking brakeApplied
2. Transponder codeVFR
3. (if activated) Flight plan.....Closed
4. Avionics MasterOff
5. Mixture.....Cut-Off
6. Throttle.....Closed
7. MagnetosOff
8. Electrical switchesOff
9. Master (Alt/Bat).....Off
10. Fuel Selector.....Left or Right
11. Control wheel lock.....Installed

"Shutdown check complete"

Shutdown

Securing

1. Dispatch papers (or aircraft log).....Completed
2. Equipment discrepancies.....Logged
3. Panel, Radio, Pedestal, & Glareshield LightsFull dim
4. Map LightFull dim
5. Master (Alt/Bat).....Off
6. Post-flight walk-around.....Completed
7. Pitot cover, chocks, tie-downsInstalled
8. Tow bar.....Stowed
9. Cabin, baggage doors, and windows.....Locked

"Securing check complete"

Securing

Abnormal Procedures

Further procedure details are in the *Pilot's Operating Handbook* section 3.

Static Source Blockage (Erroneous Instrument Reading Suspected)

1. ALT STATIC AIR ValvePULL ON
2. CABIN HT and CABIN AIR KnobsPULL ON
3. VentsCLOSED
4. Airspeed.....Refer to POH Section 5, Figure 5-1 (Sheet 2)
 "Airspeed Calibration, Alternate Static Source" correction chart

Static Source

Landing with Flat Main Tire

1. Approach.....NORMAL
2. Wing Flaps.....30°
3. Touchdown.....GOOD MAIN TIRE FIRST
 (Hold airplane off flat tire as long as possible with aileron control)
4. Directional ControlMAINTAIN
 (Using brake on good wheel as required)

Flat Tire

Landing with Flat Nose Tire

1. Approach.....NORMAL
2. Wing FlapsAS REQUIRED
3. TouchdownON MAINS
 (Hold nose wheel off the ground as long as possible)
4. Elevator (when nose wheel touches down) ...Maintain FULL UP until stop

Ammeter Shows Excessive Rate of Charge (Full Scale)

1. MASTER Switch (ALT Only)OFF

CAUTION

With the alternator side of the master switch off,
compass deviations of as much as 25 degrees may occur.

2. Nonessential Electrical EquipmentOFF
3. Flight.....TERMINATE as soon as practical

Ammeter Full Scale

Low Voltage Annunciator (VOLTS)

NOTE

Illumination of VOLTS on the annunciator panel may occur during low RPM conditions with an electrical load on the system such as during a low RPM taxi. Under these conditions, the annunciator will go out at higher RPM. The master switch need not be recycled since an over-voltage condition has not occurred to deactivate the alternator system.

1. Avionics Master Switch.....OFF
2. Alternator Circuit Breaker (ALT FLD)CHECK IN
3. Master Switch.....OFF (both sides)
4. Master SwitchON
5. Low Voltage Annunciator (VOLTS).....CHECK OFF
6. Avionics Master Switch.....ON

If low voltage annunciator (VOLTS) illuminates again:

7. AlternatorOFF
8. Nonessential Radio and Electrical EquipmentOFF
9. Flight.....TERMINATE as soon as practical

Low Voltage

Vacuum System Failure

Vacuum Annunciator Illuminates (L VAC) or (VAC R)

CAUTION

If vacuum is not within normal operating limits,
a failure has occurred in the vacuum system and
partial panel procedures may be required for continued flight.

1. Vacuum Gage.....CHECK

Vacuum Failure

Excessive Fuel Vapor (Fuel Flow Stabilization Procedures)

(If flow fluctuations of 1 GPH or more or power surges occur.)

1. Auxiliary Fuel Pump Switch.....ON
2. MixtureADJUST for smooth operation
3. Fuel Selector Valve.....SELECT OPPOSITE TANK if symptoms continue
4. Auxiliary Fuel Pump Switch.....OFF after fuel flow has stabilized

Excessive Fuel Vapor

Emergency Procedures

Further procedure details are in the *Pilot's Operating Handbook* section 3. Items in **boldface** are immediate action items which should be memorized.

Engine Failure During Takeoff Roll

1. **Throttle****IDLE**
2. **Brakes****APPLY**
3. Wing FlapsRETRACT
4. MixtureIDLE CUTOFF
5. Magnetos Switch.....OFF
6. Master SwitchOFF

Engine Failure Immediately After Takeoff

1. **Airspeed****172R: 65 KIAS (flaps UP) / 60 KIAS (flaps DOWN)**
172S: 70 KIAS (flaps UP) / 65 KIAS (flaps DOWN)
2. MixtureIDLE CUTOFF
3. Fuel Shutoff ValveOFF (Pull Full Out)
4. Magnetos Switch.....OFF
5. Wing FlapsAS REQUIRED
6. Master SwitchOFF
7. Cabin Door.....UNLATCH
8. Land.....STRAIGHT AHEAD

Engine Failure In Flight (Restart Procedures)

1. **Airspeed****172R: 65 KIAS 172S: 68 KIAS**
2. **Fuel Shutoff Valve**.....**ON (push full in)**
3. **Fuel Selector Valve****BOTH**
4. **Auxiliary Fuel Pump Switch****ON**
5. **Mixture****RICH (if restart has not occurred)**
6. Magnetos Switch**BOTH (or START if propeller is stopped)**

NOTE

If the propeller is windmilling, the engine will restart automatically within a few seconds. If the propeller has stopped (possible at low speeds), turn the Magnetos switch to START, advance the throttle slowly from idle and lean the mixture from full rich as required for smooth operation.

7. Auxiliary Fuel Pump SwitchOFF,
Back ON if fuel flow drops to zero

Emergency Landing without Engine Power

1. Pilot and Passenger Seat BacksMOST UPRIGHT POSITION
2. Seats and Seat BeltsSECURE
3. Airspeed.....**172R: 65 KIAS (flaps UP) / 60 KIAS (flaps DOWN)**
172S: 70 KIAS (flaps UP) / 65 KIAS (flaps DOWN)
4. MixtureIDLE CUTOFF
5. Fuel Shutoff ValveOFF (Pull Full Out)
6. Magnetos Switch.....OFF
7. ELTACTIVATE (if rescue needed)
8. Wing Flaps.....AS REQUIRED (30° recommended)
9. Master SwitchOFF (when landing is assured)
10. Doors.....UNLATCH PRIOR TO TOUCHDOWN
11. Touchdown.....SLIGHTLY TAIL LOW
12. Brakes.....APPLY HEAVILY

Precautionary Landing with Engine Power

1. Pilot and Passenger Seat BacksMOST UPRIGHT POSITION
2. Seats and Seat BeltsSECURE
3. Airspeed65 KIAS
4. Wing Flaps.....20°
5. Selected FieldFLY OVER, noting terrain and obstructions,
then retract flaps upon reaching a safe altitude and airspeed
6. Avionics Master Switch and Electrical SwitchesOFF
7. ELTACTIVATE (if rescue needed)
8. Wing Flaps30° (on final approach)
9. Airspeed**172R: 60 KIAS 172S: 65 KIAS**
10. Master SwitchOFF
11. Doors.....UNLATCH PRIOR TO TOUCHDOWN
12. Touchdown.....SLIGHTLY TAIL LOW
13. Magnetos Switch.....OFF
14. Brakes.....APPLY HEAVILY
15. MixtureIDLE CUTOFF



Ditching

1. Radio.....TRANSMIT MAYDAY on 121.5 MHz, giving location and intentions and SQUAWK 7700
2. Heavy Objects (in baggage area)SECURE or JETTISON (if possible)
3. Pilot and Passenger Seat BacksMOST UPRIGHT POSITION
4. Seats and Seat BeltsSECURE
5. Wing Flaps20°–30°
6. PowerESTABLISH 300 FT/MIN DESCENT AT 55 KIAS

NOTE

If no power is available, approach at 172R: 65 KIAS 172S: 70 KIAS with flaps up or at 172R: 60 KIAS 172S: 65 KIAS with 10° flaps.

7. Approach.....High Winds, Heavy Seas—INTO THE WIND
Light Winds, Heavy Swells—PARALLEL TO SWELLS
8. ELTACTIVATE
9. Cabin DoorsUNLATCH
10. FaceCUSHION at touchdown with folded coat
11. TouchdownLEVEL ATTITUDE AT ESTABLISHED RATE OF DESCENT
12. Airplane.....EVACUATE through cabin doors. If necessary, open window and flood cabin to equalize pressure so doors can be opened.
13. Life Vests and Raft.....INFLATE WHEN CLEAR OF AIRPLANE

Ditching

Engine Fire During Start

1. **Magnetos Switch...START, continue cranking to get a start which would suck the flames and accumulated fuel into the engine.**

If engine starts:

2. Power 172R: 1700 RPM 172S: 1800 RPM for a few minutes
3. EngineSHUTDOWN and inspect for damage

If engine fails to start:

4. **ThrottleFULL OPEN**
5. **Mixture.....IDLE CUTOFF**
6. **Cranking.....CONTINUE**
7. **Fuel Shutoff ValveOFF (Pull Full Out)**
8. **Auxiliary Fuel Pump Switch.....OFF**
9. Fire ExtinguisherOBTAIN
10. Master SwitchOFF
11. Magnetos Switch.....OFF
12. Parking BrakeRELEASE
13. Airplane.....EVACUATE
14. FireEXTINGUISH using fire extinguisher, wool blanket, or dirt
15. Fire DamageINSPECT, REPAIR or REPLACE

Engine Fire

Engine Fire In Flight

1. **Mixture.....IDLE CUTOFF**
2. **Fuel Shutoff ValvePull Out (OFF)**
3. **Auxiliary Fuel Pump Switch.....OFF**
4. **Master Switch.....OFF**
5. Cabin Heat and Air.....OFF (except overhead vents)
6. Airspeed100 KIAS
(If fire is not extinguished, increase glide speed to find an airspeed—within airspeed limitations—which provides an incombustible mixture).
7. Emergency Landing Without Engine Power checklist.....EXECUTE

Electrical Fire In Flight

- 1. Master Switch.....OFF
- 2. Vents, Cabin Air, HeatCLOSED
- 3. Fire ExtinguisherACTIVATE
- 4. Avionics Master Switch.....OFF
- 5. All Other Switches (except Magnetos switch).....OFF

WARNING

After discharging fire extinguisher and ascertaining that fire has been extinguished, ventilate the cabin.

- 6. Vents/Cabin Air/HeatOPEN when it is ascertained that fire is completely extinguished

If fire has been extinguished and electrical power is necessary for continuance of flight to nearest suitable airport or landing area:

- 7. Master Switch.....ON
- 8. Circuit Breakers.....CHECK for faulty circuit, do not reset
- 9. Radio SwitchesOFF
- 10. Avionics Master Switch.....ON
- 11. Radio/Electrical SwitchesON one at a time until short circuit is found

Cabin Fire In Flight

- 1. Master Switch.....OFF
- 2. Vents/Cabin Air/HeatCLOSED (to avoid drafts)
- 3. Fire ExtinguisherACTIVATE

WARNING

After discharging fire extinguisher and ascertaining that fire has been extinguished, ventilate the cabin.

- 4. Vents/Cabin Air/HeatOPEN when it is ascertained that fire is extinguished
- 5. FlightLand the airplane as soon as possible to inspect for damage



Wing Fire In Flight

- 1. Landing/Taxi Light SwitchesOFF
- 2. Navigation Light SwitchOFF
- 3. Strobe Light SwitchOFF
- 4. Pitot Heat SwitchOFF

NOTE

Perform a sideslip to keep the flames away from the fuel tank and cabin. Land as soon as possible using flaps only as required for final approach and touchdown.

Inadvertent Icing Encounter

- 1. Pitot Heat SwitchON
- 2. 180 degree turnINITIATE
- 3. Cabin HeatMAXIMUM
- 4. Windshield Defrost.....MAXIMUM
- 5. Cabin Air ControlAS REQUIRED for max defrost
- 6. ThrottleINCREASE
- 7. Air Intake Filter Ice.....MONITOR for SIGNS
- 8. Throttle & Mixture.....MAXIMUM RPM
- 9. Flight.....Land at NEAREST AIRPORT or suitable off airport landing site
- 10. Wing Flaps.....LEAVE RETRACTED
- 11. Windshield on Approach.....SCRAPE if practical
- 12. Approach Speed.....65-75 KIAS
- 13. LandingPerform in LEVEL ATTITUDE

NOTE

Open the throttle to increase engine speed and minimize ice build-up on propeller blades. An unexplained loss in engine speed could be caused by ice blocking the air intake filter, or, in extremely rare instances, ice completely blocking the fuel injection air reference tubes. Plan a landing at the nearest airport. With an extremely rapid ice build-up, select a suitable off airport landing site. With an ice accumulation of 1/4 inch or more on the wing leading edges, be prepared for significantly higher stall speed.

Use of Checklists

Checklists came in to use in aviation after fatal accidents happened to extremely experienced pilots for trivial reasons. One B-17 accident in 1935 killed both the Army's and Boeing's chief test pilots, and was caused by failure to remove a gust lock.

Checklists are here to keep you out of serious trouble. But, for them to work, you must commit to using them consistently on every flight, so that it becomes an instinctive part of your routine (not just when the CFI/DPE is looking).

Checklists are **not** a step-by-step "how to" procedure. Read the aircraft *Pilot's Operating Handbook* to learn procedures.

Research and experience suggest that to set up the cockpit, you should first use a "flow" to set up the cockpit controls. This is a geometric sequence of control and instrument checks that sweeps across the entire cockpit. For exterior inspections, the flow is a route around the aircraft. Suggested flows are on the next page.

After your've completed any procedure or flow, only then use the checklist to check that the important things were done. (Thus, the name: "check" list.) Say the checklist items out loud (even if only you are in the cockpit), and point to or touch the control as you check each item.

You do not need to grab the checklist and read it if that would be distracting. Do the checks from memory, and use the checklist to double-check later.

Timing of briefs and checks:

- Ready for TO—TO brief
- Entering runway—Before Takeoff check
- Roughly 200 ft AGL—After Takeoff check
- After level-off—Cruise check
- Before leaving cruise—Descent check
- (IFR) Getting ATIS and setting up approach—Approach brief and check
- (IFR) Before FAF—Before Landing check
- (VFR) On downwind—Landing brief and Before Landing check
- Clear of runway—After Landing check.

You should memorize the immediate action (boldface) items in the emergency checklists.

This document is designed to be used in a Marv Golden "Flight Crew Checklist Binder - Commercial" PEB1001 or a FlyBoys "Oversized Checklist Book" FB2205.

Print this document on an inkjet printer (*not laser printer*), single sided, in color, with landscape orientation. Fold each page precisely in half and insert into a checklist page sleeve. Discard this page.

