

## 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: <b>flaps up</b>	Maneuvering @ 2300 lb.... <b>97 KIAS</b>
Rotation ..... <b>55 KIAS</b>	@ 1950 lb .... <b>89 KIAS</b>
Takeoff (to 50 ft)..... <b>75 KIAS</b>	
Short Field Takeoff: <b>flaps 10°</b>	Instrument approach ..... <b>90 KIAS</b>
Rotation ..... <b>51 KIAS</b>	Pattern (downwind) ..... <b>85 KIAS</b>
Takeoff (to 50 ft)..... <b>56 KIAS</b>	Final (normal).... <b>flaps 30°: 65 KIAS</b>
<b>(172N 1977-79) ..flaps up, 59 KIAS</b>	<b>flaps 40°: 60 KIAS</b>
Soft Field Takeoff: <b>flaps 10°</b>	Final (no flaps) ..... <b>(172N) 65 KIAS</b>
Rotation ..... <b>ASAP</b>	<b>(172P) 70 KIAS</b>
Takeoff (to 50 ft)..... <b>56 KIAS</b>	Final (short field) ..... <b>60 KIAS</b>
	Go-around (initially)..... <b>55 KIAS</b>
Initial climb (50-1000 ft)... <b>75 KIAS</b>	Engine failure/Best glide .... <b>65 KIAS</b>
En route climb ..... <b>80-77 KIAS</b>	with flaps down ..... <b>60 KIAS</b>

## Normal Checklists

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

Preflight Cockpit

### Preflight Cockpit

#### Cockpit Area

1. Parking brake .....Applied
2. Control wheel lock .....Removed
3. Airworthiness and registration certificates .....Displayed
4. Pilot's Operating Handbook and GPS Quick Reference.....Available

#### Lower Panel

5. Magnetos .....Off
6. Master (Alt/Bat).....Off
7. Circuit breakers (upper & lower rows).....Checked in
8. Nav, Beacon, Strobe, Taxi, Landing Lights .....Tested
9. Pitot Heat .....Tested
10. Electrical switches .....Off
11. Avionics Master .....Off
12. Flaps .....Extended Full
13. Alt Static Air .....Off

#### Pedestal

14. Fuel Selector .....Both

#### Avionics Stack

15. **(172P)** Avionics cooling fan .....Checked (audible)
16. GPS Self-test & database dates.....Checked & Acknowledged
17. Transponder code .....VFR

#### Pilot's Side

18. Fuel Qty .....[Check]
19. Clock.....[Set]

*"Preflight Cockpit check complete"*

**Preflight Exterior**

- 1. Baggage Door .....Latched

**Empennage**

- 2. Antennas .....Securely 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 Tab .....Securely attached

**Right Wing Trailing Edge**

- 8. Flap .....Securely 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 Valve.....Sampled & checked fuel
- 12. Main Wheel Tire .....Inflated and in good condition
- 13. Fuel Quantity .....Checked visually
- 14. Fuel Filler Cap .....Vent unobstructed and cap secure

**Nose**

- 15. Engine Oil Level.....[4–6 qt]  
 ⚠ (Avoid used engine oil—possible carcinogen. Wash off with soap.)
- 16. Engine Oil Dipstick/Filler Cap .....Secure
- 17. Fuel Strainer Drain Valve .....Drained (4 seconds)
- 18. Engine Cooling Air Inlets .....Clear of obstructions
- 19. Propeller & Spinner.....Free of nicks and securely attached
- 20. Landing Light.....Cover in good condition and clean
- 21. Air Filter .....Clean
- 22. Nose Wheel Strut.....Inflated
- 23. Nose Wheel Tire .....Inflated and in good condition
- 24. Left Static Source Opening.....No blockage

**Left Wing Leading Edge**

- 25. Fuel Quantity .....Checked visually
- 26. Fuel Filler Cap .....Vent unobstructed and cap secure

Preflight Exterior

- 27. Pitot Tube, Stall Warning, & Fuel Tank Vent .....No blockage
- 28. Wing Tie-Down.....Disconnected
- 29. Fuel Tank Sump Quick Drain Valve.....Sampled & checked fuel
- 30. Main Wheel Tire .....Inflated and in good condition

**Left Wing Trailing Edge**

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

*“Preflight Exterior check complete”*

Before Start

**Before Start**

- 1. Parking brake .....Applied
- 2. Tie-downs, chocks, and tow bar .....Removed
- 3. Seats & seat belts .....Adjusted & locked
- 4. Master (Alt/Bat).....On
- 5. Beacon .....On
- 6. Avionics Master .....Off
- 7. Carburetor Heat .....Off
- 8. Fuel Selector .....Both

*“Before Start check complete”*

After Start

**After Start**

- 1. Oil Press .....Checked  
 (Shutdown engine if oil pressure not normal within 30 seconds of start.)
- 2. (if skyBeacon-equipped or sunset–sunrise) Nav Lights .....On  
 If skyBeacon-equipped, nav lights must be on (day & night) for ADS-B out.
- 3. Avionics Master .....On
- 4. Flaps.....Up
- 5. Mixture .....Leaned for ground operations
- 6. Instruments.....[Set]
- 7. GPS startup pages.....Acknowledged

*“After Start check complete”*

**Run-Up**

1. Seats, seat backs & seat belts .....Secure & upright
2. Cabin doors .....Closed & locked
3. Flight controls.....Free & correct
4. Mixture.....Full Rich
5. Checked at 1700 rpm:
  - 5.a. Magneto check.....Complete  
(RPM drop less than 150 RPM. Less than 50 RPM difference between magnetos.)
  - 5.b. Carburetor Heat.....Checked
  - 5.c. Oil Temp & Press .....Checked
  - 5.d. Suction .....Checked
  - 5.e. Alternator check.....Completed
6. Throttle friction lock .....Set
7. Elevator Trim.....Take-off position
8. Fuel Selector .....Both
9. Nav.....Set
10. CDI navigation source .....[GPS/VLOC]
11. Transponder mode & code .....Alt / [Checked]
12. (if skyBeacon-equipped or sunset–sunrise) Nav Lights .....On
13. Instruments.....[Set]
14. Fuel Qty .....[Checked]
15. 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. Carburetor Heat .....Off
4. Landing & Strobe Lights.....On

*“Before Takeoff check complete”*

**Before Takeoff**

**After Takeoff**

1. Flaps.....Up
2. (above 3000 density alt.) Mixture .....Leaned
3. Landing Light .....Off

*“After Takeoff check complete”*

**After Takeoff**

**Cruise**

**Cruise**

1. Taxi Light .....Off (Leave on in high traffic areas)
2. Throttle.....[Cruise power]
3. Mixture .....Leaned
4. Fuel Qty .....[Checked]

*“Cruise check complete”*

**Descent**

1. Taxi Light.....On
2. Carburetor Heat .....[As required]
3. Fuel Selector .....Both
4. Nav & Comm.....Set
5. CDI navigation source .....[GPS/VLOC]
6. Instruments.....[Set]
7. Fuel Qty .....[Checked]
8. Seats, seat backs & seat belts .....Secure & upright

*“Descent check complete”*

**Descent**

**(IFR) Approach**

1. Landing & Taxi Lights .....On
2. Fuel Selector .....Both
3. Mkr Sens .....LO
4. Audio Select .....MKR on
5. Approach procedure (in GPS).....Loaded
6. CDI navigation source .....[GPS/VLOC]
7. Instruments.....[Set]
8. Timer .....Ready

*“Approach check complete”*

**Approach**

**Before Landing**

1. Flaps .....[10° typical]
2. Mixture.....Full Rich
3. Carburetor Heat .....On
4. Fuel Selector .....Both

*“Before Landing check complete”*

**Before Landing**

**After Landing**

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

*“After Landing check complete”*

**After Landing**

**Shutdown**

1. Parking brake .....Applied
2. Transponder code .....VFR
3. (VFR, if activated) Flight plan .....Closed
4. Avionics Master .....Off
5. Mixture.....Cut-Off
6. Throttle.....Closed
7. Magnetos .....Off
8. Electrical switches .....Off
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 Lights.....Full dim
4. Map Light .....Full dim
5. Master (Alt/Bat).....Off
6. Post-flight walk-around.....Completed
7. Pitot cover, chocks, tie-downs .....Installed
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 Valve .....PULL ON
2. CABIN HT and CABIN AIR Knobs .....PULL ON
3. Vents .....CLOSED
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.....FULL
3. Touchdown.....GOOD MAIN TIRE FIRST  
(Hold airplane off flat tire as long as possible with aileron control)
4. Directional Control .....MAINTAIN  
(Using brake on good wheel as required)

Flat Tire

## Landing with Flat Nose Tire

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

## Over Voltage Light On (172N)

1. Avionics Master Switch.....OFF
  2. Master Switch.....OFF (both sides)
  3. Master Switch.....ON
  4. Over Voltage light .....CHECK OFF
  5. Avionics Master Switch.....ON
- If Low Voltage light illuminates again:
6. Flight.....TERMINATE as soon as practical

Over Voltage Light

## Ammeter Shows Discharge (172N)

1. Alternator (ALT side only of MASTER Switch) .....OFF

### CAUTION

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

2. Nonessential Electrical Equipment .....OFF
3. Flight.....TERMINATE as soon as practical

## Ammeter Shows Excessive Rate of Charge (Full Scale) (172P)

1. Alternator (ALT side only of MASTER Switch) .....OFF

### CAUTION

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

2. Alternator Circuit Breaker (ALT FLD) .....PULL
3. Nonessential Electrical Equipment .....OFF
4. Flight.....TERMINATE as soon as practical

Ammeter Discharge / Full Scale Charge

## Low Voltage Light On (172P)

### NOTE

Illumination of Low Voltage light 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 Switch.....ON
5. Low Voltage light.....CHECK OFF
6. Avionics Master Switch.....ON

If Low Voltage light illuminates again:

7. Alternator (ALT side only of MASTER Switch) .....OFF
8. Nonessential Radio and Electrical Equipment .....OFF
9. Flight.....TERMINATE as soon as practical

Low Voltage Light

## 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 Flaps .....RETRACT
4. Mixture .....IDLE CUTOFF
5. Magnetos Switch.....OFF
6. Master Switch .....OFF

### Engine Failure Immediately After Takeoff

1. **Airspeed**.....**65 KIAS (flaps UP) / 60 KIAS (flaps DOWN)**
2. Mixture .....IDLE CUTOFF
3. Fuel Selector Valve.....Push down and rotate to OFF
4. Magnetos Switch.....OFF
5. Wing Flaps .....AS REQUIRED
6. Master Switch .....OFF
7. Cabin Door.....UNLATCH
8. Land.....STRAIGHT AHEAD

### Engine Failure In Flight (Restart Procedures)

1. **Airspeed** .....**65 KIAS**
2. **Carburetor Heat**.....**ON**
3. **Fuel Selector Valve** .....**BOTH**
4. **Mixture** .....**RICH (if restart has not occurred)**
5. 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.

6. **Primer**.....**IN and LOCKED**

## Emergency Landing without Engine Power

1. Pilot and Passenger Seat Backs .....MOST UPRIGHT POSITION
2. Seats and Seat Belts .....SECURE
3. Airspeed.....65 KIAS (flaps UP) / 60 KIAS (flaps DOWN)
4. Mixture .....IDLE CUTOFF
5. Fuel Selector Valve.....Push down and rotate to OFF
6. Magnetos Switch.....OFF
7. ELT .....ACTIVATE (if rescue needed)
8. Wing Flaps .....AS REQUIRED (Full recommended)
9. Master Switch .....OFF (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 Backs .....MOST UPRIGHT POSITION
2. Seats and Seat Belts .....SECURE
3. Airspeed .....65 KIAS
4. Wing Flaps.....20°
5. Selected Field.....FLY OVER, noting terrain and obstructions, then retract flaps upon reaching a safe altitude and airspeed
6. Avionics Master Switch and Electrical Switches .....OFF
7. ELT .....ACTIVATE (if rescue needed)
8. Wing Flaps.....Full (on final approach)
9. Airspeed .....60 KIAS
10. Master Switch .....OFF
11. Doors.....UNLATCH PRIOR TO TOUCHDOWN
12. Touchdown.....SLIGHTLY TAIL LOW
13. Magnetos Switch.....OFF
14. Brakes.....APPLY HEAVILY
15. Mixture .....IDLE 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 Backs .....MOST UPRIGHT POSITION
4. Seats and Seat Belts .....SECURE
5. Wing Flaps .....20°–Full
6. Power .....ESTABLISH 300 FT/MIN DESCENT AT 55 KIAS

**NOTE**

If no power is available, approach at 65 KIAS with flaps up or at 60 KIAS with 10° flaps.

7. Approach.....High Winds, Heavy Seas—INTO THE WIND  
Light Winds, Heavy Swells—PARALLEL TO SWELLS
8. ELT .....ACTIVATE
9. Cabin Doors .....UNLATCH
10. Face .....CUSHION at touchdown with folded coat
11. Touchdown .....LEVEL 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.....1700 RPM for a few minutes
3. Engine .....SHUTDOWN and inspect for damage

If engine fails to start:

4. **Throttle .....FULL OPEN**
5. **Mixture.....IDLE CUTOFF**
6. **Cranking.....CONTINUE**
7. **Fuel Selector Valve.....Push down and rotate to OFF**
8. Fire Extinguisher .....OBTAIN
9. Master Switch .....OFF
10. Magnetos Switch.....OFF
11. Parking Brake .....RELEASE
12. Airplane.....EVACUATE
13. Fire .....EXTINGUISH using fire extinguisher, wool blanket, or dirt
14. Fire Damage .....INSPECT, REPAIR or REPLACE

Engine Fire

### Engine Fire In Flight

1. **Mixture.....IDLE CUTOFF**
2. **Fuel Selector Valve.....Push down and rotate to OFF**
3. **Master Switch.....OFF**
4. Cabin Heat and Air.....OFF (except overhead vents)
5. Airspeed .....100 KIAS  
(If fire is not extinguished, increase glide speed to find an airspeed—within airspeed limitations—which provides an incombustible mixture).
6. Emergency Landing Without Engine Power checklist.....EXECUTE

**Electrical Fire In Flight**

- 1. Master Switch.....OFF
- 2. Vents, Cabin Air, Heat .....CLOSED
- 3. Fire Extinguisher .....ACTIVATE
- 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/Heat .....OPEN 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 Switches .....OFF
- 10. Avionics Master Switch.....ON
- 11. Radio/Electrical Switches .....ON one at a time until short circuit is found

**Cabin Fire In Flight**

- 1. Master Switch.....OFF
- 2. Vents/Cabin Air/Heat .....CLOSED (to avoid drafts)
- 3. Fire Extinguisher .....ACTIVATE

**WARNING**

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

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



**Wing Fire In Flight**

- 1. Navigation Light Switch .....OFF
- 2. Strobe Light Switch .....OFF
- 3. Pitot Heat Switch .....OFF

**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 Switch .....ON
- 2. 180 degree turn .....INITIATE
- 3. Cabin Heat .....MAXIMUM
- 4. Windshield Defrost.....MAXIMUM
- 5. Cabin Air Control .....AS REQUIRED for max defrost
- 6. Throttle .....INCREASE
- 7. Carburetor Heat.....AS REQUIRED
- 8. Air Intake Filter Ice.....MONITOR for SIGNS
- 9. Throttle & Mixture.....MAXIMUM RPM
- 10. Flight.....Land at NEAREST AIRPORT or suitable off airport landing site
- 11. Wing Flaps.....LEAVE RETRACTED
- 12. Windshield on Approach.....SCRAPE if practical
- 13. Approach Speed.....65-75 KIAS
- 14. Landing .....Perform 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.

