Remember: FAR Part 91 §91.3 (a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.

Pre-Takeoff

1. Trim – TAKEOFF
2. Flaps – 0° - 10°
3. Mixture – RICH
   (above 3000ft lean for MAX RPM)
4. Lights – ALL ON
5. Record Time

Normal Takeoff

1. Throttle – FULL IN
2. Rotate – 50 KIAS
3. Airspeed – 75 KIAS

Enroute Climb

1. Airspeed – 70 - 85 KIAS
2. Throttle – FULL
3. Mixture

< 3000 ft	RICH
>= 3000 ft	LEAN TO MAX RPM

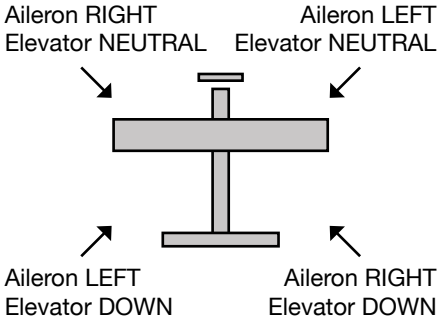
Cruise

1. Power – LESS THAN 75%

Alt	-20°C	ISA	+20°C
3000	2500	2550	2575
3500	2500	2575	2600
5500	2550	2625	2650
7500	2600	2675	2700

2. Elevator Trim – SET
3. Heading Indicator – CALIBRATED
4. Lights – AS NEEDED
5. Time – RECORD
6. Mixture – MAX CYL TEMP minus 50

Crosswind Taxi



Before Descent

1. Altimeter – SET
2. Fuel Selector Valve – BOTH
3. Runway and Taxi Diagram – READY
4. Lights – ALL ON
5. Seat Backs – UPRIGHT
6. Belts, Harnesses – SECURE

Descent

1. Power – AS DESIRED
2. Mixture – SMOOTH (idle = full rich)

Before Landing

1. Autopilot – OFF
2. Fuel Selector Valve – BOTH
3. Mixture – RICH

Normal Landing

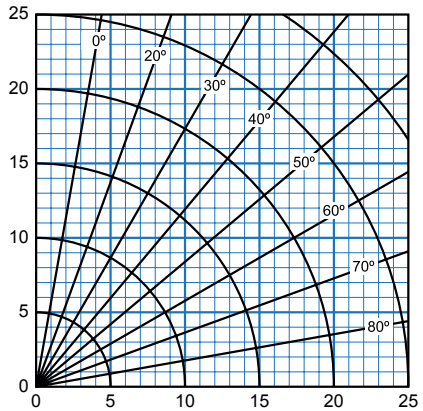
1. Flaps – DOWN 30°
2. Airspeed – 65 KIAS on short final

Flaps Up Landing

1. Airspeed – 70 KIAS on short final

Go Around

1. Power – FULL
2. Flaps – 20°
3. Airspeed – 55 KIAS
4. Flaps – 10° until obstacles cleared
5. Flaps – UP
6. Airspeed – 75 KIAS



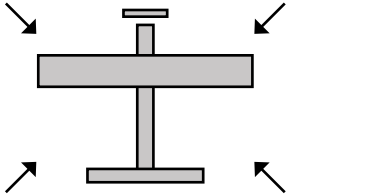
Before Starting Engine

1. Preflight Inspection – COMPLETE
2. IMSAFE
3. Weight & Balance – CHECK
4. Fuel Required – CHECK
5. Weather – CHECK
6. Departure Procedure – PLANNED
7. Route – PLANNED
8. Charts – AVAILABLE
9. Destination Airports – RWY & FREQ
10. Passenger Briefing
    a. No smoking
    b. Seatbelt
    c. Fire extinguisher
    d. Exits – door, windows, baggage
    e. Don't touch the controls including pedals
    f. Distractions during taxi, takeoff & landing
    g. Exchange of controls
    h. Help me look for traffic
    i. Connect your headset
    j. Air Vents
11. Headsets – CONNECTED
12. Seats, Belts, Shoulder Belt – ADJUST
13. Fuel Shutoff Valve – ON (push full in)
14. Fuel Selector Valve – BOTH
15. Avionics Power – OFF
16. Circuit Breakers – CHECK IN
17. STBY BATT Switch – TEST
    (hold for 10 seconds and verify green lamp remains lit)
18. STBY BATT Switch – ARM
19. PFD – WAIT FOR BOOT
20. Engine Indicators – NO RED X
21. BUS E Volts – MINIMUM 24 VOLTS
22. M BUS Volts – MAXIMUM 1.5 VOLTS
23. BATT S Amps – DISCHARGE (negative)
24. STBY BATT Annunciator – VISIBLE
25. Brakes – HOLD

Crosswind Taxi

Aileron RIGHT
Elevator NEUTRAL

Aileron LEFT
Elevator NEUTRAL



Aileron LEFT
Elevator DOWN

Aileron RIGHT
Elevator DOWN

Starting Engine

1. Throttle – OPEN 1/4 inch
2. Mixture – IDLE CUTOFF
3. Master Power - ON
4. Beacon – ON
5. Prime (if engine cold)
    a. Fuel Pump – ON
    b. Mixture – RICH
    c. Stabilize Fuel Flow – 5 gph for 3 sec
    d. Mixture – IDLE CUTOFF
    e. Fuel Pump – OFF
6. Brakes - HOLD
7. Propeller Area – CLEAR, SHOUT
8. Start
    a. Ignition Switch – START
    b. Mixture – SMOOTHLY TO RICH
    c. Throttle – 1000 RPM
9. Oil Pressure – CHECK GREEN
10. Battery and Voltage –
    NO RED OR YELLOW
11. Avionics Power Switch – ON
12. Headsets – ON
13. Transponder – 1200 VFR, GND
14. Multifunction Display – INITIALIZED
15. Fuel Totalizer – INITIALIZED
    (Engine > System)
16. Lights – AS REQUIRED
17. Flaps – UP
18. Mixture – LEAN
19. Autopilot Self Check – PASS
20. Parking Brake – OFF
21. Current Time – RECORD

Fire During Start

1. Ignition Switch – CONTINUE CRANKING
   so it sucks the fire into the engine.
2. If engine starts
    a. Power – 1800 RPM
    b. Wait – for a few minutes
    c. Mixture – IDLE CUT OFF
3. If engine fails to start
    a. Throttle – FULL POWER FORWARD
    b. Mixture – IDLE CUT OFF
    c. Craking – CONTINUE
    d. Fuel Shutoff Valve – PULL OUT
    e. Aux Fuel Pump Switch – OFF
    f. Fire Extinguisher – ACTIVATE
    g. Master Switch – OFF
    h. Ignition Switch – OFF
4. EVACUATE & EXTINGUISH fire

Fuel
Left Wing Sump Ports – CLEAN, 100LL
Nose Sump Ports or Drain – CLEAN, 100LL
Right Wing Sump Ports – CLEAN, 100LL

Right Wing Tank
Test Fuel – RETURN TO TANK
Fuel Level – CHECK
Fuel Filler Cap – SECURE

Left Wing Tank
Fuel Level – CHECK
Fuel Filler Cap – SECURE

Tires
Roll forward & back – TIRES INFLATED & UNDAMAGED

Cabin – After
Baggage Compartment – CONTENTS SECURE
Baggage Door – CLOSED AND LOCKED

After Shutdown
Tie Downs – INSTALLED
Avionics Switch – OFF
Master Switch – OFF
Ignition Switch – OFF
Fuel Selector – LEFT
Cowl Flaps – CLOSED
Control Lock – INSTALLED
Pitot Cover – INSTALLED
Passenger Door – LATCHED
Log Book – HOBBS & TACH

Speeds

Rotation	50	KIAS
Vy – Best Rate of Climb		
Sea Level	74	KIAS
10,000	72	KIAS
Vx – Best Angle of Climb		
Sea Level	62	KIAS
10,000	67	KIAS
Va – Maneuvering Speed		
2500 lbs	105	KIAS
2200 lbs	98	KIAS
1900 lbs	90	KIAS
Vglide – Best Glide Speed	68	KIAS
Final Approach Speed		
Flaps 30°	65	KIAS
Flaps Up	70	KIAS
Short Field (flaps 30°)	61	KIAS
Max Flaps Extended Speed		
0° – 10°	110	KIAS
10° – 30°	85	KIAS

Aborted Takeoff
1. Throttle – IDLE
2. Brakes – APPLY
3. Flaps – RETRACT for improved braking
4. Mixture – IDLE CUTOFF if necessary

Engine Failure After Takeoff
Pitch for Landing speed
1. **Airspeed – 70 KIAS (flaps UP)**
   65 KIAS (flaps DOWN)
2. Flaps – AS REQUIRED

Before Landing
1. Mixture – IDLE CUT OFF
2. Fuel Shutoff Valve – PULL OUT (fuel off)
3. Ignition Switch – OFF
4. Master Switch – OFF
5. Cabin Door – UNLATCH

Run up
1. Radios – SET to TOWER / CTAF
2. Brakes – SET
3. Seat Backs – UPRIGHT
4. Seats & Seat Belts – CHECK SECURE
5. Doors & Windows – CLOSED & LOCKED
6. Flight Controls – FREE & CORRECT
   a. Aileron
   b. Elevator
   c. Rudder
7. Flight Instruments - SET
   a. Horizon – CALIBRATE
   b. Heading & Compass – SAME
   c. Altimeter – SET (PFD, Standby, AP)
   d. PFD – NO RED X
8. Autopilot Check
   a. Autopilot AP Button – ENGAGE
   b. Flight Controls – OVERPOWER AP
   c. AP Disconnect – OPERATIONAL
   d. Autopilot – OFF
9. Fuel Selector Valve – RECHECK BOTH
10. Fuel Quantity - CHECK
11. Elevator Trim – TAKEOFF
12. Engine Check
    a. Mixture – RICH (below 3000ft)
    b. Throttle – 1800 RPM
    c. Magnetos – DROP < 150 RPM on either or 50 RPM difference
    d. Oil Temperature - GREEN
    e. Oil Pressure – GREEN
    f. Vacuum Gauge – GREEN
    g. Ammeter – CHECK (no discharge w/ load)
    h. Annunciators – NO WARNINGS
    i. Throttle IDLE – ENGINE SMOOTH
    j. Throttle – 1000 RPM
13. Throttle Friction Lock – ADJUST
14. Air Conditioner (if installed) – OFF
15. Parking Brake – CHECK RELEASED
16. Squawk Code – SET
17. PFD Settings – DCLTR-1, TOPO, TERRAIN, ZOOM 2 nm, WIND-1
18. MFD Map – DCLTR-1, NEXRAD
19. Flaps – SET FOR TAKEOFF (0° normal, 10° short field)
20. Flight Plan – SET
21. CDI - GPS / VOR1 / VOR2
22. Autopilot (if installed) – OFF
23. Review Takeoff Procedures
24. Review Departure Procedure
25. Lights – AS REQUIRED
26. Current Time - RECORD

Engine Failure During Flight

Pitch for Best Glide

1. **Airspeed – 65 KIAS**
2. **Look for Landing Site**

Fuel / Engine Controls

3. **Shutoff** Valve – PUSH IN (fuel on)
4. **Selector** Valve – BOTH
5. **Mixture** – RICH (if necessary)
6. **Throttle** – CHECK
7. **Master** Switch – ON
8. **Magneto** Switch – BOTH

Restart Engine

9. Aux Fuel Pump Switch – ON
10. Propeller not windmilling
    a. Throttle – IDLE
    b. Ignition Switch – START
    c. Throttle – ADVANCE

If Engine Restarts

- Aux Fuel Pump Switch – OFF
  (If fuel flow goes to 0, turn Aux Fuel Pump back ON)

If Engine Doesn't Restart

11. Mixture – IDLE CUT OFF
12. Fuel Shutoff Valve – PULL OUT (fuel off)
13. Ignition Switch – OFF
14. Master Switch – ON (for avionics)

Perform Landing or Ditching Checklist

Excessive Fuel Vapor

Fuel flow fluctuations of 1 GPH or more, or power surges.

Stabilize Fuel Flow

1. Fuel Pump Switch – ON
2. Mixture – ADJUST for SMOOTH operation
3. Fuel Selector Valve – SELECT OPPOSITE TANK (if problems continue)
4. Fuel Pump Switch – OFF
   (after fuel flow has stabilized)

Engine Fire in Flight

Put out Fire

1. Mixture – IDLE CUT OFF
2. Fuel Shutoff Valve – PULL OUT (fuel off)
3. Aux Fuel Pump Switch – OFF
4. Master Switch – OFF
5. Cabin Heat and Air – OFF
   (overhead vents ok)
6. Airspeed – 100 KIAS
   (increase speed to starve flames within Vno=129 and Vne=163, watch altitude)

Electrical Fire in Flight

Put out Fire

1. Master Switch – OFF
2. Vent, Cabin Air, Heat – CLOSED
3. Fire Extinguisher – ACTIVATE
4. Avionics Switch – OFF
5. All Switches except ignition – OFF

After Fire is Out

6. Vents / Cabin Air / Windows – OPEN

If necessary, restart electronics slowly

7. Circuit Breakers – CHECK but do not reset
8. Radio Switches – OFF
9. Master Switch – ON
10. Avionics Master Switch – ON
11. Radio / Electrical Switches – ONE AT A TIME, prepared for fire to restart

Cabin Fire

Put out Fire

1. Master Switch – OFF
2. Vents / Cabin Air / Heat – OFF to avoid drafts
3. Fire Extinguisher – ACTIVATE

After Fire is Out

4. Vents / Cabin Air / Windows – OPEN
5. Land safely as soon as possible

Wing Fire

1. Switches: Landing, Taxi, Nav, Strobe, Pitot Heat – OFF
2. Perform SIDESLIP to keep flames away from tank and cabin.
3. Land using flaps only as required

Empennage

Rudder Gust Lock – REMOVE
Tail Tie–Down – DISCONNECT
Rudder – CHECK FOR FREEDOM OF MOVEMENT
Elevator – CHECK FOR FREEDOM OF MOVEMENT
Elevator Trim Tab – CHECK FOR SECURITY
Antennas – SECURE

Right Wing Trailing Edge

Flaps – SECURE, NO DAMAGE
Aileron – FREEDOM OF MOVEMENT, YOKE TURNS TOO, NO DAMAGE
Aileron - CONTROL ROD NOT BOUND
Aileron - HINGES AND BOLTS SECURE

Right Wing

Wing Tip – NO DAMAGE
Wing Leading Edge – NO DAMAGE
Tie Down – DISCONNECT

Nose

Engine Oil Level – 5-8 QTS (8 for long flight)
Air Filter – CLEAN
Engine Cooling Air Inlets – CLEAR
Nose Wheel Strut – 4 FINGERS
Nose Tie Down – DISCONNECT
Spinner – SOLIDLY ATTACHED
Propeller – SOLIDLY, NO NICKS / CRACKS
Static Pressure Source – CLEAR

Left Wing

Wing Leading Edge – NO DAMAGE
Wing Tip – NO DAMAGE
Tie Down – DISCONNECT
Pitot Tube – CLEAR
Fuel Tank Vent – CLEAR
Stall Warning Opening – CHECK

Left Wing Trailing Edge

Flaps – SECURE, NO DAMAGE
Aileron – FREEDOM OF MOVEMENT, YOKE TURNS TOO, NO DAMAGE
Aileron – CONTROL ROD NOT BOUND
Aileron – HINGES AND BOLTS SECURE

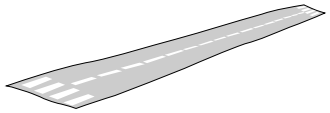
Preflight Checklist

Cabin

Pitot Tube Cover – REMOVE
Hobbs – RECORD TIME
Pilot's Operating Handbook – PRESENT
G1000 Cockpit Reference Guide – PRESENT
Registration & Airworthiness Certificates – CURRENT & PRESENT
Fire Extinguisher – CHARGED
Control Wheel Lock – REMOVE
Fuel Shutoff Valve – ON (push full in)
Static Pressure Alternate Source Valve – OFF
Ignition Switch – OFF
Avionics Power Switch (BUS1 & BUS2)– OFF
Master Switch (ALT & BAT) – ON
Flaps – DOWN
Primary Flight Display – ON
Fuel Quantity Indicators – CHECK LEVEL
Low Fuel L & Low Fuel R Annunciators – NOT VISIBLE
Oil Pressure Annunciator – VISIBLE
Low Vaccuum Annunciator – VISIBLE
Low Volts Annunciator – VISIBLE
Avionics Bus 1 Switch – ON
Forward Avionics Cooling Fan – AUDIBLE
Avionics Bus 1 Switch – OFF
Avionics Bus 2 Switch – ON
Aft Avionics Cooling Fan – AUDIBLE
Avionics Bus 2 Switch – OFF

Lights & Pitot Heat

Switches for Beacon, Landing, Taxi, Nav, Strobe, Pitot - ON
Beacon Light – ON
Tail White Light – ON
Right Wing Green – ON
Landing, Taxi Lights - ON AND CLEAN
Left Wing Red – ON
Pitot Tube – WARM
Lights and Pitot Heat - OFF
Master Switch - OFF



Forced Landing

Radio

1. Squwak 7700
2. 121.5 or ATC
3. MAYDAY MAYDAY MAYDAY / Callsign
4. Position / Altitude
5. Problem: "Engine Failure" "Fire" etc.
6. Intended landing site

Prepare

7. Seats and Seat Belts – SECURE
8. Seat Backs – UPRIGHT POSITION
9. Loose or Heavy Objects incl bagagge – SECURE or JETTISON

Site Check (if engine running)

10. Airspeed – 60 KIAS
11. Wing Flaps – 20°
12. Selected Field – FLY OVER, noting terrain and obstructions. Retract flaps when at a safe altitude and airspeed

Approach

13. Wing Flaps – AS REQUIRED (DOWN early if power loss expected)
14. Airspeed Flaps 0° 65 KIAS
    Flaps 10° - FULL 60 KIAS

On Short Final

15. Avionics Switch – OFF
16. Master Switch – OFF
17. Doors – UNLATCH
18. E.L.T. – ACTIVATE IF NECESSARY

After Landing

19. Mixture – IDLE CUT OFF
20. Ignition Switch – OFF
21. E.L.T. – DEACTIVATE IF NECESSARY

Ditching

Radio

1. Squwak 7700
2. 121.5 or ATC
3. MAYDAY MAYDAY MAYDAY / Callsign
4. Position / Altitude
5. Problem: "Engine Failure" "Fire" etc.
6. Intended landing site

Prepare

7. Seats and Seat Belts – SECURE
8. Seat Backs – UPRIGHT POSITION
9. Loose or Heavy Objects incl bagagge – SECURE or JETTISON

Approach

10. Direction
    a. Light Winds – PARALLEL to WAVES
    b. High Winds – INTO WIND
11. Airspeed
    a. Power – 65 KIAS
       300 ft/min DESCENT
    b. Flaps 10° - FULL – 65 KIAS
    c. Flaps Up – 70 KIAS
12. Flaps – 20° to 30°

On Short Final

13. Master Switch – OFF
14. Doors – UNLATCH
15. E.L.T. – ACTIVATE IF NECESSARY

Touchdown

16. Level Attitude at established rate of descent. Wings level.
17. Face – CUSHION

After Landing

18. Mixture – IDLE CUT OFF
19. Evacuate – If needed, open windows to flood cabin and equalize pressure.

LOW VOLTS Annunciator

Alternator Circuit Breaker

1. Master Switch **ALT ONLY** – OFF
2. Alternator Circuit Breaker (ALT FIELD) – CHECK IN
3. Master Switch **ALT & BAT** – ON
4. LOW VOLTS Annunciator – CHECK off
5. M BUS Volts – CHECK 27.5V min
6. M BAT Amps – CHECK charging (+)

If still LOW VOLTS peform Reduce Electrical Load Checklist below

HIGH VOLTS Annunciator or M BAT AMPS > 40

Perform Reduce Electrical Load Checklist below

Reduce Electrical Load

1. Master Switch **ALT ONLY** – OFF
2. Electrical Load – REDUCE IMMEDIATELY
   a. Avionics Bus 1 – OFF
   b. Pitot Heat – OFF
   c. Beacon – OFF
   d. Landing Light – OFF (unless needed for landing)
   e. Taxi Light – OFF
   f. Nav Lights – OFF
   g. Strobe Lights – OFF
   h. Cabin Power 12V – OFF
3. COM1 – SELECT FREQ. & ACTIVATE
4. NAV1 – SELECT FREQ. & ACTIVATE if necessary
5. Avionics Bus 2 – OFF
6. Land as soon as practical. CAUTION: Make sure landing is possible before extending flaps, they are a large load and might deplete the battery.

With Avionics Bus 2 off, the following are inoperative:

- KAP140 Autopilot
- COM2
- NAV 2
- GTX33 Transponder
- GMA 1347 Audio Panel
- GDU 1040 MFD

Red X – PFD Airspeed, Attitude, Altitude, HSI

1. ADC/AHRS Circuit Breaker – CHECK IN (ESS BUS and AVN BUS 1). If open, reset one time. If breaker trips again, do not reset. If LOW VACUUM annunciator comes on, do not use standby attitude indicator
2. Use standby instrument (non-stabilized compass for HSI)

PFD1 COOLING Annunciator or MFD1 COOLING Annunciator

1. Cabin Heat (CABIN HT) – REDUCE
2. Forward Avionics Fan – CHECK (feel for airflow from screen on glareshield)

If forward avionics fan has failed

3. STBY BATT Switch – OFF unless needed for emergency power

If PFD1 cooling or MFD1 cooling annunciator does not go off within 3 minutes or if both PFD1 and MFD1 cooling annunciators come on

4. Land as soon as practical

Visibility & Cloud Clearance Requirements

Airspace			Vis	Distance from Clouds
B			3 sm	clear of clouds
C			3 sm	1,000 above 500 below 2,000 horiz
D			3 sm	1,000 above 500 below 2,000 horiz
E		<10,000 MSL	3 sm	1,000 above 500 below 2,000 horiz
E		≥10,000 MSL	5 sm	1,000 below 1,000 below 1 sm horiz
G	Day	≤1,200 AGL	1 sm	clear of clouds
G	Day	>1,200 AGL & <10,000 MSL	3 sm	1,000 above 500 below 2,000 horiz
G	Day	≥10,000 MSL	5 sm	1,000 below 1,000 below 1 sm horiz
G	Night	≤1,200 AGL	3 sm	1,000 above 500 below 2,000 horiz
G	Night	>1,200 AGL & <10,000 MSL	3 sm	1,000 above 500 below 2,000 horiz
G	Night	>1,200 AGL & ≥10,000 MSL	5 sm	1,000 below 1,000 below 1 sm horiz

Minimum Altitudes

Congested
1,000 feet above obstacle within 2,000 feet

Non-congested
500 feet AGL

Water / sparsely populated
500 feet from person, vessel, vehicle or structure

SVFR Minimum

- ATC clearance
- Clear of clouds
- 1 sm visibility
- If night, pilot and plane IFR certified
- To take off or land – 1 sm ground visibility if measured, otherwise 1 sm in-flight visibility.

Supplemental Oxygen

>12,500 MSL ≤14,000 MSL
Crew for flight segments > 30 min

>14,000 MSL ≤ 15,000 MSL
Crew

> 15,000 MSL
All occupants

Night Operations

Sunset – Sunrise

Required: Nav Lights (position lights)
Beacon (anti-collision)
When safe: Strobes
Suggested: Landing / Taxi Lights

1hr after Sunset – 1 hr before Sunrise
Carry passengers: 3 full stop landings

Short Field Takeoff

- Flaps – 10º
- Mixture – RICH (lean above 3000 for max RPM)
- Use Full Length of Runway

Takeoff

1. Brakes – FULL
2. Throttle – FULL IN
3. Brakes – RELEASE
4. Rotate – 55 KIAS
5. Airspeed – 56 KIAS

After Obstacle

6. Airspeed – 75 KIAS
7. Flaps – UP

Soft Field Takeoff

- Flaps – 10º
- Mixture – RICH (lean above 5000 for max RPM)
- Don't Stop
- Minimal Brakes

Takeoff

1. Yoke – FULL BACK (to keep weight off nose wheel)
2. Add FULL POWER SMOOTHLY
3. Hold nose just off ground (don't stall)
4. Until 75 KIAS – NOSE DOWN (to stay in ground effect)

After positive rate of climb

5. Flaps – UP

Short Field Landing

1. Flaps – DOWN FULL
2. Airspeed – 61 KIAS
3. Power – IDLE after obstacle
4. Touchdown – STEEP ANGLE
5. Brakes – HEAVY BRAKING
6. Flaps – RETRACT

Soft Field Landing

1. Flaps – DOWN FULL
2. Airspeed – 61 KIAS
3. Power – SLIGHT POWER UNTIL TOUCHDOWN
4. Flare – GENTLY BLEED OFF SPEED
5. Touchdown – KEEP FRONT WHEEL UP
6. Brakes – NO / MINIMUM BRAKES

Steep Turns

1. Clear the Area
2. Roll out ±10º of entry heading
- Maintain altitude ±100'
- Maintain airspeed ±10kt
- Maintain bank ±5º

Ground Reference Maneuvers

1. Clear the Area
2. Choose altitude 600-1000' AGL
- Maintain altitude ±100'
- Maintain airspeed ±10kt

Slow Flight

1. Clear the Area
2. Power idle, pitch up, flaps to slow
3. Flaps – FULL
4. Full power, pitch down, flaps to recover
- Always at least >1500' AGL
- Maintain altitude ±100'
- Maintain airspeed +10kt/-0kt
- Maintain bank ±10º

Power Off Stall

1. Clear the Area
2. Configure for landing
3. Perform Stall
4. Pitch down, full power to recover
5. Perform go-around. After positive rate of climb, full power and reduce flaps
- Always at least >1500' AGL
- Straight: Heading ±10º
- Turning: Specified bank <20º ±10º

Power On Stall

1. Clear the Area
2. Configure for takeoff (Slow to ~55 kt)
3. Perform Stall
4. Recover
- Always at least >1500' AGL
- Straight: Heading ±10º
- Turning: Specified bank <20º ±10º

Hypoxia

Symptoms

- Blue fingernails & lips
- Headache
- Decreased reaction time
- Impaired judgement
- Euphoria
- Visual impairment
- Drowsiness
- Lightheadedness or dizziness
- Tingling in fingers & toes
- Numbness

Actions

- Descend
- Supplemental oxygen

Dehydration

Symptoms

- Thirst
- Fatigue
- Headaches
- Cramps
- Dizziness
- Weakness
- Nausea
- Tingling of hands & feet

Actions

- Drink water

Hyperventilation

Symptoms

- Anxiety
- Rapid breathing
- Visual impairment
- Lightheadedness or dizziness
- Tingling sensations
- Hot & cold sensations
- Muscle spasms

Actions

- Slow breathing
- Re-breathe from bag

Carbon Monoxide Poisoning

Symptoms

- Exhaust odor
- Headache
- Blurred vision
- Dizziness
- Drowsiness
- Loss of muscle power

Actions

- Turn off heater
- Open air vents & windows
- Supplemental oxygen

Lost Communications VFR

1. Radio volume
2. Radio frequency
3. Headset connection
4. Handheld radio
5. Alt frequency
   a. Ground
   b. TRACON / ARTCC
   c. Nearby airport
   d. 121.5
6. Squawk 7600
7. Land at untowered if possible
8. Enter pattern and expect light signal
9. Monitor and squawk 7700 and emergency land if necessary
   a. Fuel level
   b. Battery voltage (24V)
   c. Amp meter (discharge = no alternator)

Light Gun Signals

Steady Green	Cleared to Land
Flashing Green	Return for Landing
Steady Red	Give way and Circle
Flashing Red	Unsafe - Do not land
Alt. Red/Green	Extreme Caution

Diversion

1. Slow Down to 100 KIAS or less
2. Circle if necessary
3. Airport info
   a. Elevation
   b. TPA
   c. Runway Length & Layout
   d. Pattern direction
   e. Frequencies
4. Get current location
5. Locate destination airport on charts
6. Plan Route (iPad, GPS, VOR, paper)
   a. Distance
   b. Course / heading
   c. (Cross radials)
7. Calculate time & fuel burn
8. Get the weather (ATIS / AWOS)
9. Plan Approach & Landing
   a. Choose Runway
   b. Pattern Entry
10. Radio Calls
11. Cruise, Descent, Landing checklists

Time & Fuel

Speed 100 kt
Fuel Burn 10 gph

Dist (nm)	**Time** (min)	**Fuel** (gal)
3	2	0.3
5	3	0.5
8	5	0.8
10	6	1.0
13	8	1.3
15	9	1.5
18	11	1.8
20	12	2.0
23	14	2.3
25	15	2.5
28	17	2.8
30	18	3.0
35	21	3.5
40	24	4.0
45	27	4.5
50	30	5.0

Climb Performance

1.4 gal fuel for taxi & takeoff

Press Alt	Speed (KIAS)	Dist (nm)	Fuel (gal)	Time (min)	Rate (fpm)
0	74	0.0	0.0	0.0	730
500	74	1.0	0.2	0.5	713
1000	73	2.0	0.4	1.0	695
1500	73	3.0	0.6	2.0	675
2000	73	4.0	0.8	3.0	655
2500	73	5.0	1.0	3.5	638
3000	73	6.0	1.2	4.0	620
3500	73	7.0	1.3	5.0	610
4000	73	8.0	1.5	6.0	600
4500	73	9.0	1.7	7.0	575
5000	73	10.0	1.9	8.0	550
5500	73	11.5	2.0	9.0	528
6000	73	13.0	2.2	10.0	505
6500	73	14.5	2.4	11.0	480
7000	73	16.0	2.6	12.0	455
7500	73	17.5	2.8	13.0	433
8000	72	19.0	3.0	14.0	410
8500	72	20.5	3.2	15.5	385
9000	72	22.0	3.4	17.0	360
9500	72	24.5	3.7	18.5	338
10000	72	27.0	3.9	20.0	315
10500	72	29.5	4.2	22.0	290
11000	72	32.0	4.4	24.0	265
11500	72	35.0	4.7	26.0	243
12000	72	38.0	5.0	28.0	220

Pressure Altitude

Indicated Altitude	Altimeter Range 27.75-28.24	28.25-28.74	28.75-29.24	29.25-29.74	29.75-30.24	30.25-30.74	30.75-31.24	31.25-31.74
0	-2000	-1500	-1000	-500	0	500	1000	1500
1000	-1000	-500	0	500	1000	1500	2000	2500
2000	0	500	1000	1500	2000	2500	3000	3500
3000	1000	1500	2000	2500	3000	3500	4000	4500
3500	1500	2000	2500	3000	3500	4000	4500	5000
4500	2500	3000	3500	4000	4500	5000	5500	6000
5500	3500	4000	4500	5000	5500	6000	6500	7000
6500	4500	5000	5500	6000	6500	7000	7500	8000
7500	5500	6000	6500	7000	7500	8000	8500	9000
8500	6500	7000	7500	8000	8500	9000	9500	10000
9500	7500	8000	8500	9000	9500	10000	10500	11000
10500	8500	9000	9500	10000	10500	11000	11500	12000

Cruise Performance

Cruise Power 75% or less
10 gallons per hour

Press Alt	OAT	RPM	KTAS	KIAS	OAT	RPM	KTAS	KIAS	OAT	RPM	KTAS	KIAS
2000	-9	2475	114	109	11	2525	117	112	31	2550	117	112
2500	-10	2475	114	108	10	2550	117	111	30	2575	118	112
3000	-11	2500	115	108	9	2550	118	110	29	2575	118	111
3500	-12	2500	115	107	8	2575	118	110	28	2600	119	110
4000	-13	2500	116	106	7	2575	119	109	27	2600	119	109
4500	-14	2525	116	106	6	2600	119	108	26	2625	120	109
5000	-15	2525	117	105	5	2600	120	108	25	2625	120	108
5500	-16	2550	117	105	4	2625	120	107	24	2650	121	107
6000	-17	2575	118	104	3	2625	121	106	23	2650	121	106
6500	-18	2575	119	103	2	2650	121	105	22	2675	122	106
7000	-19	2600	119	103	1	2650	122	105	21	2675	122	105
7500	-20	2600	120	102	0	2675	123	104	20	2700	123	104
8000	-21	2625	121	101	-1	2675	123	103	19	2700	123	103
8500	-22	2625	121	100	-2	2675	123	102	18	2700	123	102
9000	-23	2650	122	100	-3	2700	123	101	17	2700	123	100
9500	-24	2650	122	99	-4	2700	123	100	16	2700	122	99
10000	-25	2675	123	98	-5	2700	123	98	15	2700	122	98
10500	-26	2675	122	97	-6	2700	122	96	14	2700	121	95
11000	-27	2650	122	95	-7	2675	121	94	13	2675	120	93
11500	-28	2650	121	94	-8	2675	120	92	12	2675	118	91
12000	-29	2650	121	92	-9	2650	119	90	11	2650	117	89