## Preflight

Certificates/Documents . . ARROW
Tach/Hobbs . . . . . Recorded
Control Lock . . . . . Removed
Emergency Equipment . . . . . Check
Magnetos . . . . . Off
Alternate Static . . . . . Closed
Circuit Breakers . . . . . In
Electrical Equipment . . . . . Off
Master Switch . . . . . On
Fuel Quantity . . . . . Set
Flaps . . . . . Full
Avionics Fan . . . . . Audible
Master Switch . . . . . Off

*Exterior Inspection*

Walk Around . . . . . Complete
Fuel Sump . . . . . Both Clear
Dip Fuel . . . . . Record
Engine Oil . . . . . Min. 10 Qts.
Engine Fuel Flush . . . . . No Water

## Before Start

Preflight Inspection . . . . . Complete
Tiedowns/Chocks . . . . . Out
Towbar . . . . . Stowed
Baggage Door . . . . . Secured
Passenger Briefing . . . . . Standard
Seats/Seat Belts . . . Adj. & Secure
Parking Break . . . . . Set
Circuit Breakers . . . . . In
Avionics . . . . . Off
Fuel Selector . . . . . Both
Cowl Flaps . . . . . Open

## Start

Throttle . . . . . Open 1/4"
Propellor . . . . . Full Forward
Mixture . . . . . Full Rich
Carburetor Heat . . . . . Cold
Battery Master . . . . . On
Beacon . . . . . On
Prime . . . . . As Required
Magnetos . . . . . Clear Prop, Start
Oil Pressure . . . . . Green in 30s
Ammeter . . . . . Check, On, Check
Ext. Lights . . . . . On as Required
Avionics . . . . . ON, Set
Flaps . . . . . Retract
Transponder . . . . . ALT
Parking Break . . . . . Off
Breaks . . . . . Test

## After Start

| | |
|---|---|
| Garmin database | Check |
| Garmin self-test | Check |
| ATIS | Copied |
| Transponder | Set |
| COM & NAV | Set |
| Initial altitude | Set |
| Initial heading | Set |
| Clearance | Recieved |

## Taxi

| | |
|---|---|
| Exterior lights | set |
| Brakes | check |
| Heading indicator | $\pm 5^\circ$ |
| Attitude indicator | check |
| Turn coordinator | check |

## Engine Run-Up

| | |
|---|---|
| Seats/Belts | Secure |
| Cabin Doors | Closed |
| Flight Controls | Free & Correct |
| Autopilot | Check, Off |
| Flight Instruments | Check & Set |
| Fuel Quantity | Check |
| Fuel Selector | Both |

*Runup Flow*

| | |
|---|---|
| Mixture | Full Rich |
| Throttle | Approx. 1700 RPM |
| Oil PressureTemp | Green |
| Cylinder Head Temp | Green |
| Ammeter | Check |
| Annunciators | Check |
| Vacuum | Green |
| Magnetos | Check R & L |
| (max drop 150; max $\Delta$ 50) | |
| Carburetor heat | Check |
| Propellor | Cycle 3X |
| Circuit Breakers | In |
| Alternate static | Check |
| Throttle | Idle |
| Mixture | Lean for Taxi |

## V-Speeds

$V_{BG}$ flaps UP/Down ..... 70/65
$V_R$ (flaps 0°/25°) .... 60/50 KIAS
$V_X$ sea/10K ..... 59/63 KIAS
$V_Y$ sea/10K ..... 80/63 KIAS
$V_A$ ..... 89-110 KIAS
$V_{S_0}/V_{S_1}$ ..... 48/53 KIAS

## Before Takeoff

Doors & Windows ..... Secured
Carburetor heat ..... off
Flaps ..... set
Trim ..... set
Cowl Flaps ..... Full Open
Lights ..... As Desired

*Departure briefing*

Takeoff distance ..... briefed
Terrain & obstacles ..... briefed
Takeoff minimums ..... briefed
Departure procedure ..... briefed

*Abnormal operations*

Rejected takeoff ..... briefed
Engine power loss ..... briefed
(below & above ≈ 600' AGL)

## Takeoff

Confirm Runway ..... # Confirmed
Mixture .. Full Rich or Target EGT
Throttle ..... Full Power
Rotate at speed ..... 70 KIAS
Adjust Trim ..... As Required

**IF I LOSE THE ENGINE,**
**I WILL PUSH IMMEDIATELY!**

## Enroute Climb

Airspeed ..... 120-140 KIAS
Power ..... 23"/2450 RPM
Throttle ..... Full Power
Mixture ..... Rich
Cowl Flaps ..... Open as Req.

## Cruise

Power ... 15"-23"/2200-2450 RPM
Mixture ..... Leaned
Trims ..... Adjust
Cowl Flaps ..... Open as Req.

## Descent

Fuel Selector ..... Both
Mixture ..... Rich
Power ..... As Desired
Carb Heat ..... As Req.

## Before Landing

| | |
|---|---|
| Seat & Belts | Secure |
| Fuel Selector | Both |
| Mixture | Rich |
| Propellor | High RPM |
| Cowl Flaps | Closed |
| Carb. Heat | Apply Full Heat |
| Trims | Adjust |
| ATIS, Arrival, & Approach | Briefed |
| Terrain & Taxi | Briefed |
| Specials | Briefed |

## Normal Landing

| | |
|---|---|
| Airspeed | 80 KIAS flaps up |
| Wing Flaps | 0 to 40 |
| Airspeed | 70-80 KIAS flaps down |

## After Landing

| | |
|---|---|
| Cowl Flaps | Open |
| Flaps | Full Retract |
| Carb Heat | Cold |
| Mixture | Lean for Taxi |
| Lights | As Required |

## Shutdown

| | |
|---|---|
| Hobbs & Tach | Record |
| Lights | Off |
| Avionics | Off |
| Throttle | 700 RPM |
| Mixture | Idle Cutoff |
| Magnetos | Off & Pull Key |
| Master Switch | Off |
| Position Plane | Chocks |
| Parking Break | Set |

### Electrical Fire (Smoke in Cabin)

Master switch ..... off
Avionics master ..... off
Electrical switches ..... off

**If no smoke:**

Circuit breakers ..... note tripped
Circuit breakers ..... off
Master switch ..... on

**If no smoke:**

Avionics master ..... on

### Alternator Failure

Verify failure .....
Reduce electrical load as much as possible .....
Alt circuit breakers ..... check
Alt switch ..... off, wait, then on

**If no output:**

Alt switch ..... off
Reduce electrical load and land as soon as practical .....

**Note:** Checklist is a WIP. Missing emergency procedures (like engine failure) as per 14 CFR § 91.503.

Table 1: Rate of climb/descent (ft. per min)

| **ft/NM** | **Ground speed (knots)** | | | | | **Angle** |
|---|---|---|---|---|---|---|
| | 60 | 75 | 90 | 105 | 120 | |
| 210 | 210 | 265 | 320 | 370 | 425 | 2.0° |
| 318 | 318 | 398 | 478 | 557 | 637 | 3.0° |
| 530 | 530 | 665 | 795 | 930 | 1065 | 5.0° |
| 745 | 745 | 935 | 1120 | 1305 | 1490 | 7.0° |

Table 2: Additional runway length required to clear low, close-in obstacle

| | **Climb Angle** | | |
|---|---|---|---|
| | 745'/NM | 530'/NM | 318'/NM |
| **200' obstacle** | 1,224' | 1,720' | 2,867' |
| **150' obstacle** | 816' | 1,147' | 1,911' |
| **100' obstacle** | 408' | 574' | 956' |

**Note:**

- Assumes takeoff performance data is based on clearing a 50' obstacle.
- Subtract obstacle's distance from runway end from required runway length.
- Return back to the departure briefing.

Table 3: Archer flight maneuver entry speeds at 2,150 lbf

| **Maneuver** | **KIAS** |
|---|---|
| Steep Turns | 100 |
| Steep Spiral | 90 |
| Chandelles | 100 |
| Lazy Eights | 100 |
| Eights on Pylons | 100 |

**Note:**

- Design maneuvering speed ($V_A$) at 2,150 lbf gross weight is $\approx$ 102.5 KIAS.
- Wings-level best glide speed ($V_{bg}$) at 2,150 lbf gross weight is $\approx$ 69 KIAS.

Table 4: Speed versus pivotal altitude at 100' MSL elevation

| **Ground speed (knots)** | **Approximate pivotal pltitude (MSL)** |
|---|---|
| 80 | 650' |
| 85 | 750' |
| 90 | 800' |
| 95 | 900' |
| 100 | 1,000' |
| 110 | 1,150' |
| 115 | 1,250' |
| 120 | 1,350' |