

Aircraft Systems

Engine

Lycoming O-320-D2A

- 160 HP
- 2700 RPM
- 5.2 L displacement (320 cubic inches)
- air-cooled
- flat-4 (horizontally Opposed)
- direct drive
- naturally aspirated
- carbureted

Propeller

2-blade, fixed-pitch

72-74"

Fuel

25 gallons each side (50 gallons total)

1 gallon unusable each side (48 usable total)

Capacity indicator is at 17 gallons

Aviation grade 100 octane minimum

Engine-driven fuel pump plus electric backup

Oil

8 quart maximum

2 quart minimum

Grade varies with temperature, section 8.19 of POH

Electrical System

60 amp, 14 volt alternator

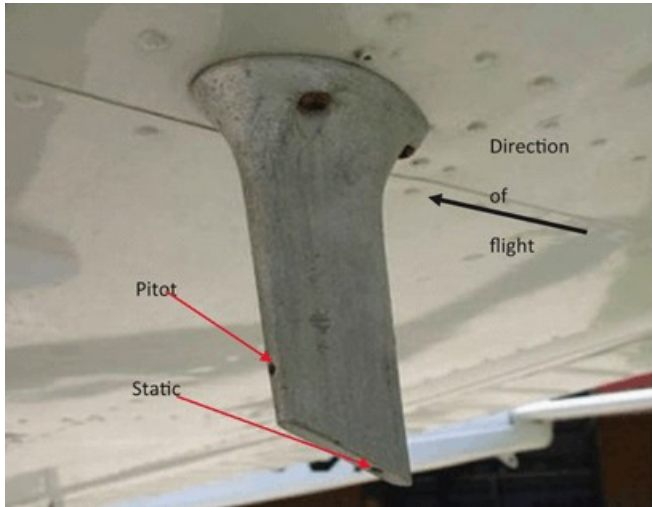
12 volt battery

Pitot Static System

Airspeed indicator: Pitot and Static

Altimeter: Static

Vertical speed indicator: Static (basically an altimeter with a calibrated leak)



In the event static port gets clogged in flight, smash glass on vertical speed indicator

Pitot clogged: Airspeed turns into altimeter

Static clogged: Altimeter freezes, Vertical speed indicator goes to 0

Pitot and static clogged: Airspeed shows 0

Vacuum System

Drives gyro compass

Weight and Balance

Aircraft empty weight: 1502.90 lbs

Aircraft empty moment: 128129.08 lb-in

Front seats arm: 80.5 in

Rear seats arm: 118.1 in

Fuel arm: 95 in

Baggage arm: 142.8 in

Add all weights together (6 lbs per gallon)

Add all moments together (moment = Weight * arm)

Divide moments by weight to get Cg.

Check chart in section 6, PDF page 122.

Night Flying

Part 61.57

Sunset to sunrise: Position/anti-collision lights on

Civil twilight to civil twilight: Can log night time

1 hour after sunset to 1 hour after sunrise: Must be night landing current to carry passengers

Flight Service

1-800-WXBRIEF

Usually 122.2

R means their receive frequency, they will transmit on Morse code frequency

Traffic Pattern

Default is 1000 for piston aircraft, unless otherwise noted.

Left hand pattern unless otherwise noted (RP with runway number on sectional)



Aircraft Maintenance

Part 43 appendix A describes what pilots can and cannot do. Pilots can do preventative maintenance.

Part 91.205 lists required equipment

Part 91.213 lists what must be done with inoperative equipment

ELT

May check in the first 5 minutes past the hour

121.5 MHz is not monitored for ELT transmissions, only 406 MHz. 121.5 MHz has about a 12 nm accuracy, 406 MHz is about 2 nm.

ASOS and AWOS

AWOS are operated by FAA. Many different levels of capabilities.

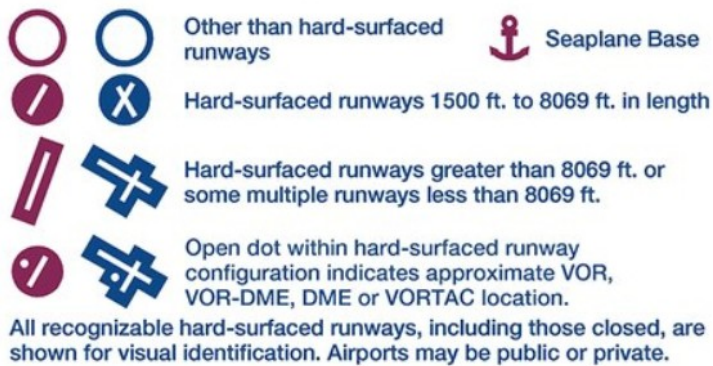
ASOS are operated by National Weather Service and are more advanced.

VFR Sectional



Airport name, 3 letter location identifier, AWOS/ASOS frequency, field elevation, lighting limitations, length of longest runway in hundreds of feet, UNICOM frequency, right pattern runways.

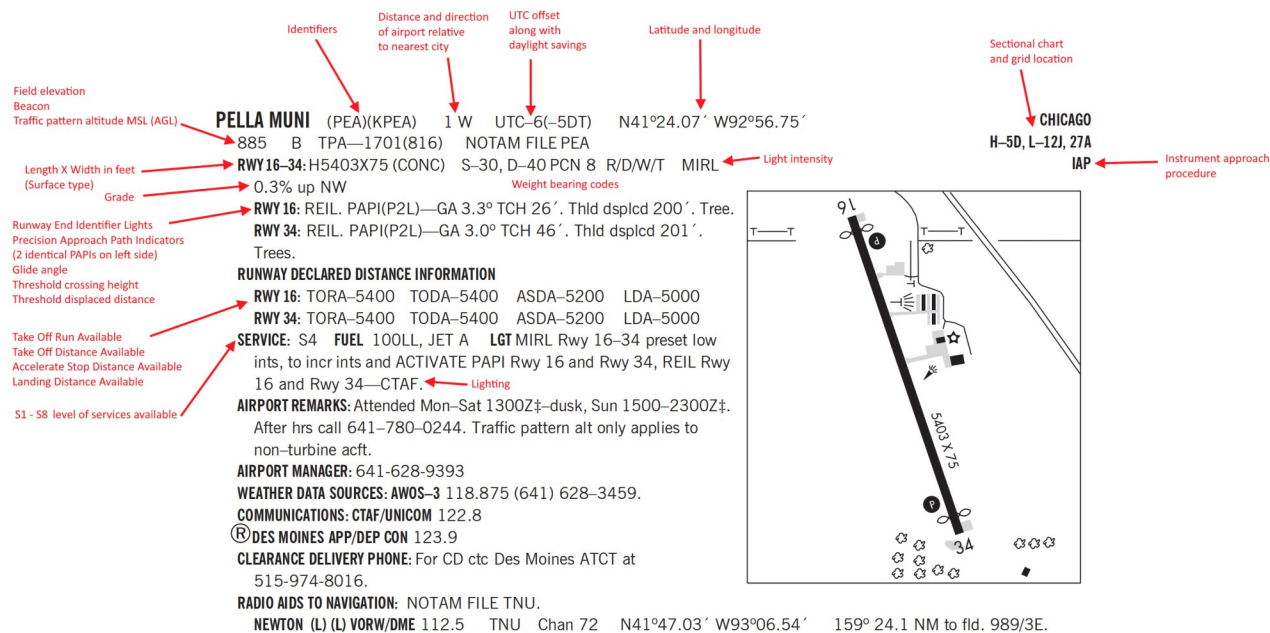
★ indicates part-time tower.



Magenta airports are untowered.

Blue airports are towered.

Chart Supplement



Pressure Altitude

Can set altimeter to 29.92 inHg

18,000 ft, set to 29.92 inHg

Runway Markings

1000 ft markers are 150ft long

Stripes are 120ft long, 80 ft apart

Numbers are 60 ft tall

Altitudes

East → Odd thousands + 500ft

West → Even thousands + 500ft

GPS

Receiver Autonomous Integrity Monitoring (RAIM) – Requires 5 satellites in line-of-sight. Provides error-checking

Wide Area Augmentation System (WAAS) – Relies on ground stations to improve accuracy

Speeds

Max 250 knots below 10,000 MSL

Slips

Nose AGAINST the wind. Fuselage into the wind.

Opposite aileron and rudder inputs.

ADS-B

Automatic Dependent Surveillance-Broadcast

Operates on 978 MHz (UAT) and 1090 MHz

TIS-B

Traffic Information Services-Broadcast

Ground stations that broadcast information about radar contacts that are not ADS-B equipped.

FIS-B

Flight Information Services-Broadcast

Ground stations that broadcast meteorological and aeronautical data (NOTAM, PIREP, TAF, etc.).

Always broadcast on UAT.

VOR MON Network

Cutting down VOR network to a smaller number. VORs still provided as backup to GPS.

https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gbng/vormon

Medical Certificates


First class medical is good for 6 months, 12 months if under 40. Needed for airline captain.

Second class medical is good for 12 months. Needed for commercial pilot.

Third class medical is good for 24 months, 60 months if under 40.

BasicMed requirements:

BasicMed Overview




BasicMed lets you fly without a third-class medical if you:

- Have a valid pilot certificate and driver's license.
- Held any FAA medical after July 15, 2006.
- Complete a physical every 4 years and an online course every 2.

Limitations:

- Aircraft $\leq 12,500$ lbs.
- Max 6 passengers (7 total).
- Fly in U.S. only, $< 18,000$ ft, < 250 knots.
- No compensation or hire.

 **pilotinstitute**

Currency

To carry passengers, 3 takeoffs and landings in the last 90 days.

To carry passengers at night, 3 full-stop takeoffs and landings in the last 90 days, from one hour after sunset to one hour before sunrise.

Must complete a flight review every 24 months (at least 1 hour of ground instruction and 1 hour of flight time). See 14 CFR 61.56. 3 WINGS credits of Flight topics and 3 WINGS credits of Knowledge topics can also satisfy flight review.

Flight Service

1-800-WXBRIEF

<https://www.1800wxbrief.com/>

Flight Service RCO are being phased out:

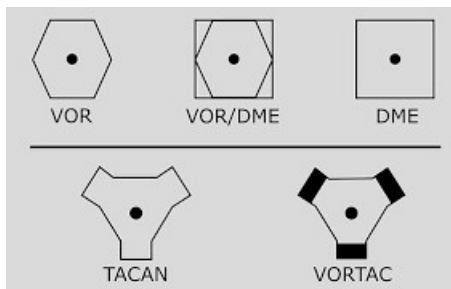
<https://www.federalregister.gov/documents/2025/03/27/2025-05167/notice-of-intent-to-decommission-flight-service-remote-communications-outlets-rcos>

Usually can be reached on 122.2



This means you talk to flight service in 122.1, and listen to their response on 116.2.

VORs



VOR provides magnetic bearing to the station.

DME provides distance.

VORTAC is like VOR/DME, but with military special sauce.

TACAN is military use only.

Airspeed

What Is IAS vs. TAS vs. GS?



Indicated Airspeed (IAS): The speed shown on the airspeed indicator, uncorrected for altitude or air density.

True Airspeed (TAS): The actual speed of the aircraft through the air, corrected for altitude and temperature.

Groundspeed (GS): The aircraft's actual speed relative to the ground, calculated by combining true airspeed (TAS) with wind effects (headwind or tailwind). Groundspeed is not an airspeed as it measures ground reference, not air movement.



Calibrated airspeed is indicated airspeed corrected for installation and instrument errors.

Calculate true airspeed with calculator. <https://e6bx.com/tas/>

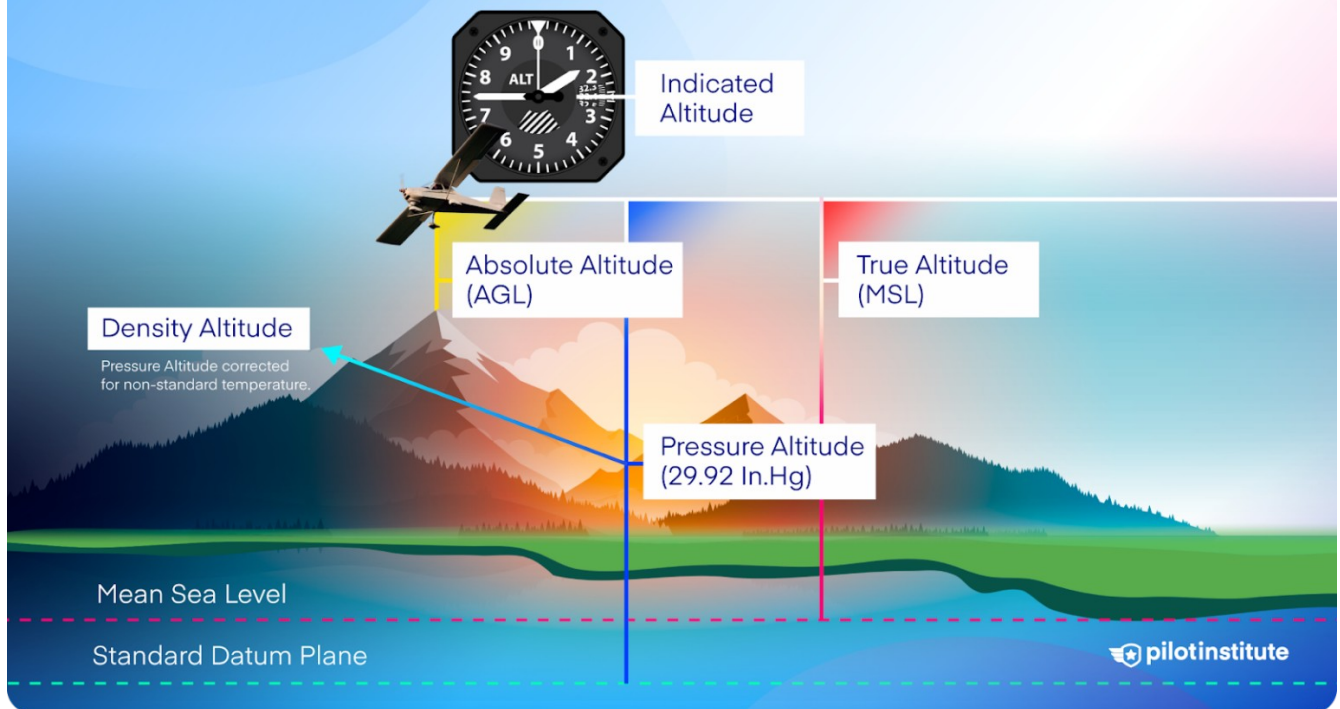
Altitude

Pressure altitude is the height above a Standard Datum Plane (SDP), which is a theoretical level where the air pressure equals 29.92 inches of mercury (Hg).

Density altitude is pressure altitude corrected for non-standard temperature.

True altitude and pressure altitude are the same when standard atmospheric conditions exist.

TYPES OF ALTITUDE



Pressure altitude can be approximated as $(29.92 - \text{Altimeter setting}) * 1000 + \text{Elevation}$

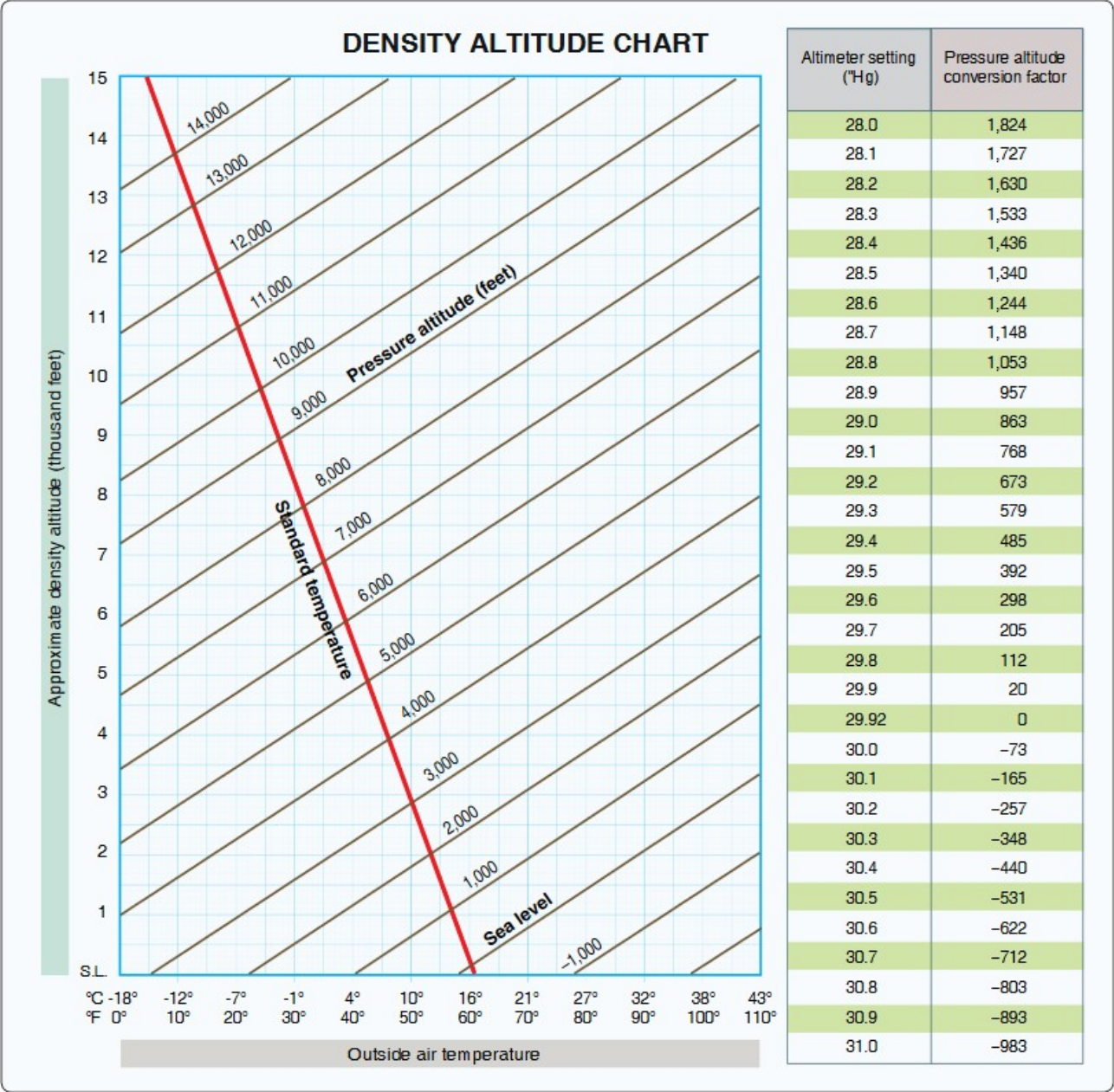
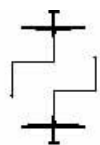
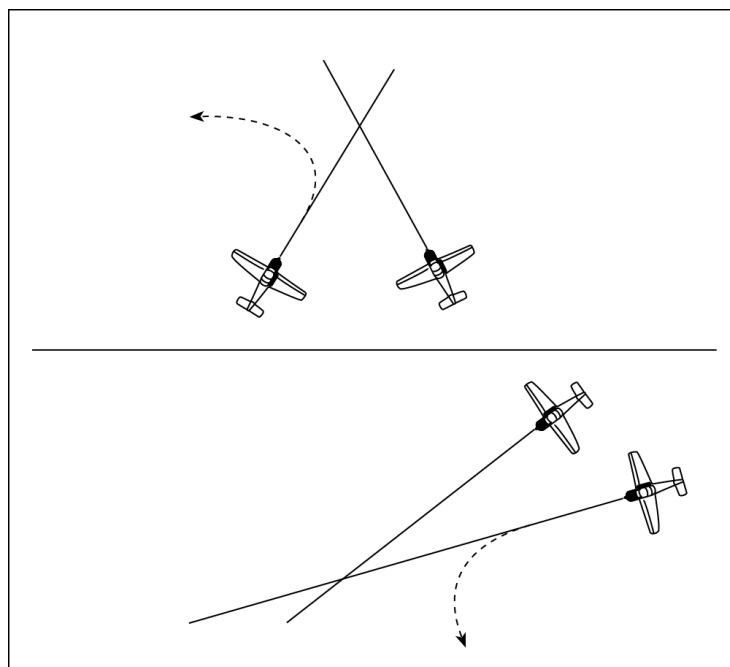


Figure 8. Density Altitude Chart.

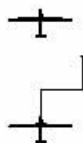
Right of Way

When approaching head on, aircraft pass on the right.

When converging, the aircraft on the left shall give way. Priority given to aircraft with less control (gliders, emergency, etc.)

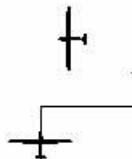


Head-On Alter Course To Right



Right Of Way

Overtaking Alter Course To Right



Converging Aircraft To Right Has Right Of Way - Alter Course To Right