Airspace, Altitudes, and Weather

Oxygen: - Pilots Must Use it Above 12,500' MSL if more than 30 minutes.
Pilots Must Always Use it Above 14,000' MSL.
PAX Must be Provided Oxygen Above 15,000' MSL.

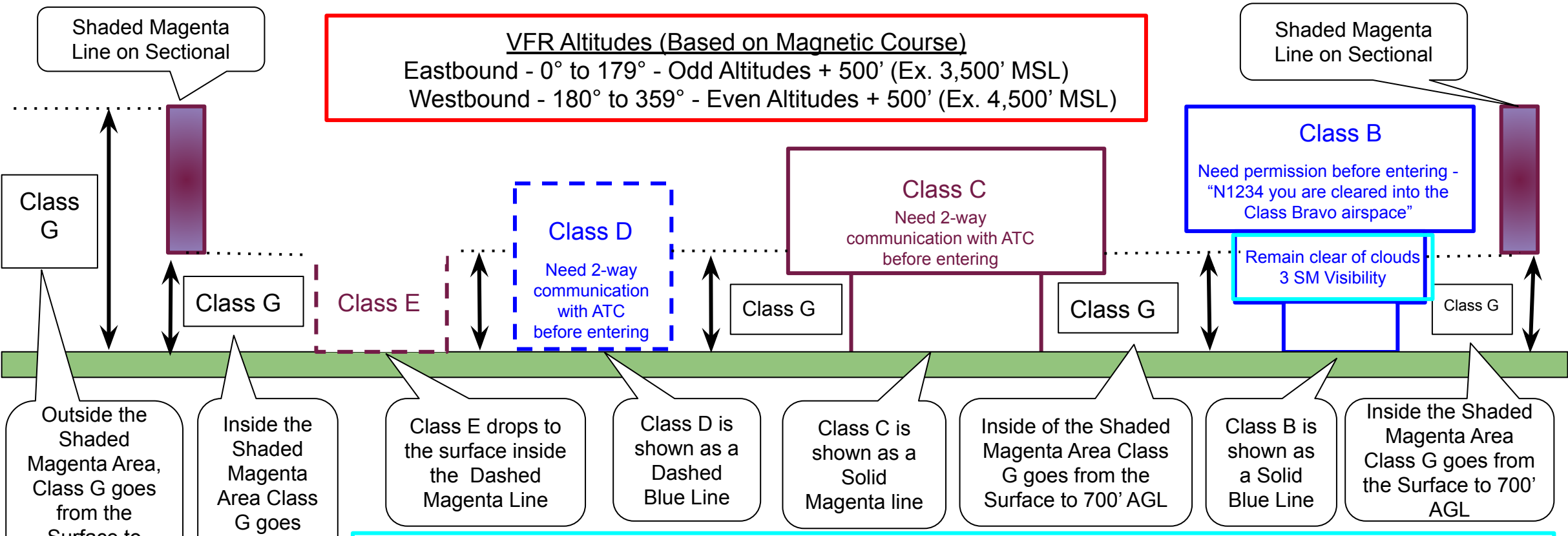
Class A Airspace Begins at 18,000' MSL

Class E Airspace is everything above Class G and outside of Class A, B, C, and D Airspace

Minimum Altitude over cities and towns:
1,000' Above Highest Obstacle
2,000' From Highest Obstacle

Minimum Altitude over other areas:
500' above ground and 500' from people and vehicles

VFR Altitudes (Based on Magnetic Course)
Eastbound - 0° to 179° - Odd Altitudes + 500' (Ex. 3,500' MSL)
Westbound - 180° to 359° - Even Altitudes + 500' (Ex. 4,500' MSL)



Outside the Shaded Magenta Area, Class G goes from the Surface to 1,200' AGL

Inside the Shaded Magenta Area Class G goes from the Surface to 700' AGL

Class E drops to the surface inside the Dashed Magenta Line

Class D is shown as a Dashed Blue Line

Class C is shown as a Solid Magenta line

Inside of the Shaded Magenta Area Class G goes from the Surface to 700' AGL

Class B is shown as a Solid Blue Line

Inside the Shaded Magenta Area Class G goes from the Surface to 700' AGL

Weather in Class C, D, E (below 10,000' MSL): 3 SM Visibility, 500' Below Cloud, 1,000' Above Cloud, 2,000' From Cloud
Weather in Class E, G (above 10,000' MSL): 5 SM Visibility, 1,000' Below Cloud, 1,000' Above Cloud, 1 SM From Cloud
Weather in Class G (above 1,200' AGL): 1 SM Visibility (3 SM Night), 500' Below Cloud, 1,000' Above Cloud, 2,000' From Cloud

Are You Current and Are You Ready to Fly?

Are You Ready to Fly?

- Is your Medical Current?
- Have you completed a Flight Review in the Last 24 Months?
- Have You Reviewed IMSAFE?
  - Illness
  - Medication
  - Stress
  - Alcohol
  - Fatigue
  - Emotion

Are You Ready to Fly the Airplane?

- Have you completed a Weight and Balance check?
- Do you have recent flight experience in the airplane?
- Have you studied the POH, Checklists and reviewed Airspeeds and Traffic Pattern procedures?
- Have you reviewed the airports and airspace you will fly through?

Have You Reviewed the Weather?

Are You Ready to Take Passengers?

- Have you completed 3 Takeoffs and Landings in the past 90 days?
- Have you completed 3 Takeoffs and Full Stop Landings at night in the past 90 days if you are flying at night?

Is the Airplane Ready to Fly?

- Has an Annual Inspection been completed?
- Has the engine been inspected in the last 100 hours? (usually only for airplanes that are rented for hire)
- Has the Pitot-Static system, Transponder VOR been checked as necessary?

Does the Airplane Have Enough Fuel for the Flight?

- For VFR flights you must have enough fuel to get to your destination plus 30 minutes during the day, or plus 45 minutes during the night

Radio Calls at Towered and Non-Towered Airports

What to Say on the Radio:

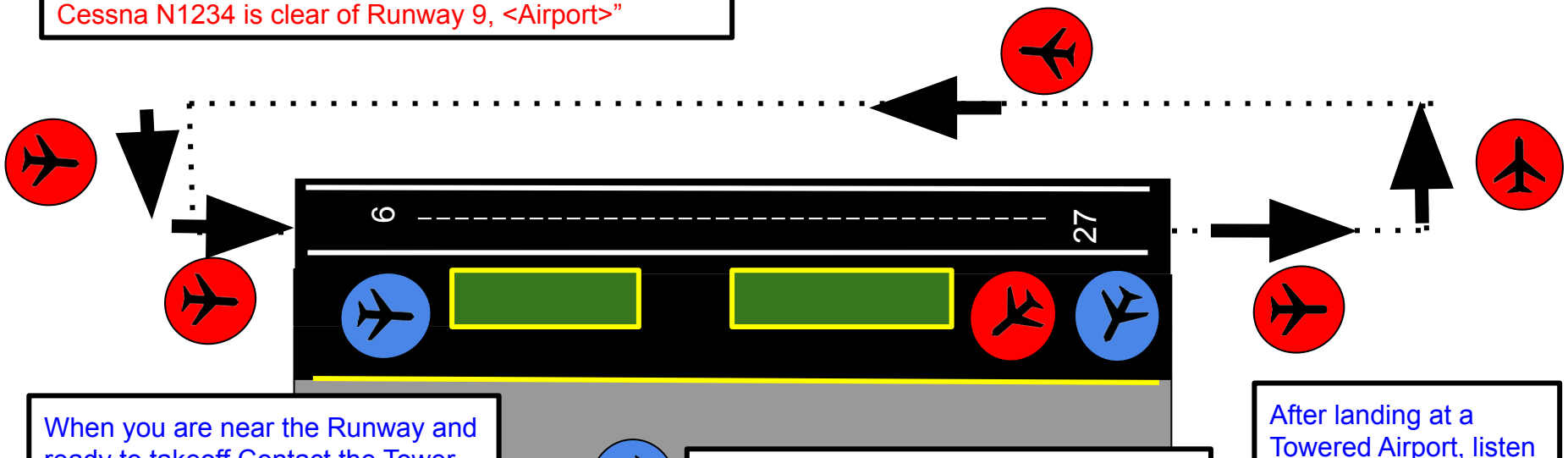
1. Who you are calling
2. Who you are
3. Where you are at
4. What is your request

About 8-10 NM from the airport, say on the CTAF frequency: *"<Airport> traffic, Cessna N1234 is 8 NM <direction from airport>, will enter 45 degree downwind (or another pattern entry) for Runway 9, <Airport> Traffic"*

When you are in the pattern at a non-towered airport, it's good practice to announce each leg of the pattern: "<Airport> traffic, Cessna N1234 is Right or Left Traffic Departing/Crosswind/Downwind/Base/Final Runway 9 <Airport>"

Also, Report exiting the Runway: "<Airport> traffic, Cessna N1234 is clear of Runway 9, <Airport>"

Before you enter Class B, C, or D airspace, Contact Tower (or Approach if necessary) and tell them where you are are and the ATIS you have: *"<Airport> Tower, Cessna 1234 is 5 miles <direction from airport>, at <altitude>, with <ATIS letter>"*



When you are near the Runway and ready to takeoff Contact the Tower and Ask for Takeoff Clearance: *"<AIrport> Tower, Cessna 1234 is holding short of Runway 9, Ready for Departure"*

After listening to ATIS, Contact Ground and Ask for Taxi Instructions: *"<Airport> Ground, Cessna 1234 is at <location> Ready for Taxi with <ATIS letter>"*

After landing at a Towered Airport, listen to Tower for instructions to taxi to parking

Airspeed Indicator*
Uses Pitot System, if Pitot Tube is obstructed use Pitot Heat.
Check: Before takeoff Airspeed Indicator should read 0.

Attitude Indicator
About 5 minutes after engine start, place airplane on artificial horizon

Altimeter*
Adjust Altimeter setting regularly throughout the flight by listening to ATC, ATIS, or AWOS/ASOS.
Check: on ground Altimeter should be within 75' of Airport elevation.

*Required for Day and Night VFR flights

Vertical Speed Indicator (VSI)
VSI may lag 9 seconds during flight. If VSI does not read zero before takeoff, note what is indicated.

Turn Coordinator and Slip/Skid Indicator
Shows Roll Direction and Rate and Slip/Skid information. Bottom line shows 3 degrees per second roll rate. *Check: During taxi turns the wings will turn in the direction of the turn, but the ball will move outside of the turn*

Heading Indicator
Adjust Heading Indicator regularly during straight and level unaccelerated flight to match Compass but note Compass Deviation for airplane

Blue - uses Pitot system and Static system
Red - uses Static system
Black - gyroscopic instruments which use vacuum system or electrical system to operate

Airspeed - Types of Airspeed and Airspeeds You Should Know for Your Airplane

Indicated Airspeed (IAS) -
What you see on the Airspeed indicator.
Used during flight or when talking to ATC.

Groundspeed (GS) -
How fast the airplane is travelling over the ground. Use GS = Distance/Time or GPS to find it, or ask ATC.

Knots = Nautical Miles per Hour

Calibrated Airspeed (CAS) -
Indicated Airspeed corrected for installation errors on airplane. See POH Section 5 to find conversion from IAS to Calibrated Airspeed

True Airspeed (TAS) -
How fast you are travelling through the air you are in. Increases as you climb in altitude because of less dense air. Use E6-B computer to find TAS or use the Airspeed Indicator or cockpit displays to find it if able. Use this number for Cross Country planning.

Speeds You Should Know for Your Airplane (see POH for some of these numbers)

V_R (rotation speed) - _____ V_Y (best rate of climb) - _____ V_X (best angle of climb) - _____
V_{GLIDE} (best glide speed) - _____
V_A (design maneuvering speed-do not make abrupt control movements above this speed) - _____
$V_{YCRUISE}$ (best rate of climb during cruise for better engine cooling and increased visibility) - _____
V_{S0} (stall speed in landing configuration) - Shown on Airspeed Indicator as Top of White Arc
V_{S1} (stall speed in other configuration) - Shown on Airspeed Indicator as Top of Green Arc
V_{FE} (maximum speed with Flaps Extended) - Shown on Airspeed Indicator at Bottom of White Arc
V_{NO} (do not exceed except in smooth air) - Shown on Airspeed Indicator at Top of Yellow Arc
V_{NE} (maximum do not exceed speed) - Shown on Airspeed Indicator at Red Line

Types of Altitude

ISA Standards: 15^0C and 29.92” Hg at Sea Level, 2^0C lapse rate temperature decrease for every 1,000’ Altitude gain.

Indicated Altitude -
What you see on the Altimeter. Altitude corrected for non-standard ISA pressure. Regularly update the barometric pressure setting using ATIS/AWOS or ATC.

Pressure Altitude -
Altitude when the Altimeter is set to 29.92” Hg ISA standard pressure.

Absolute Altitude -
The height Above Ground Level (AGL) the airplane is flying above the terrain below. Cloud Bases are shown in AGL in METARs and TAFs.

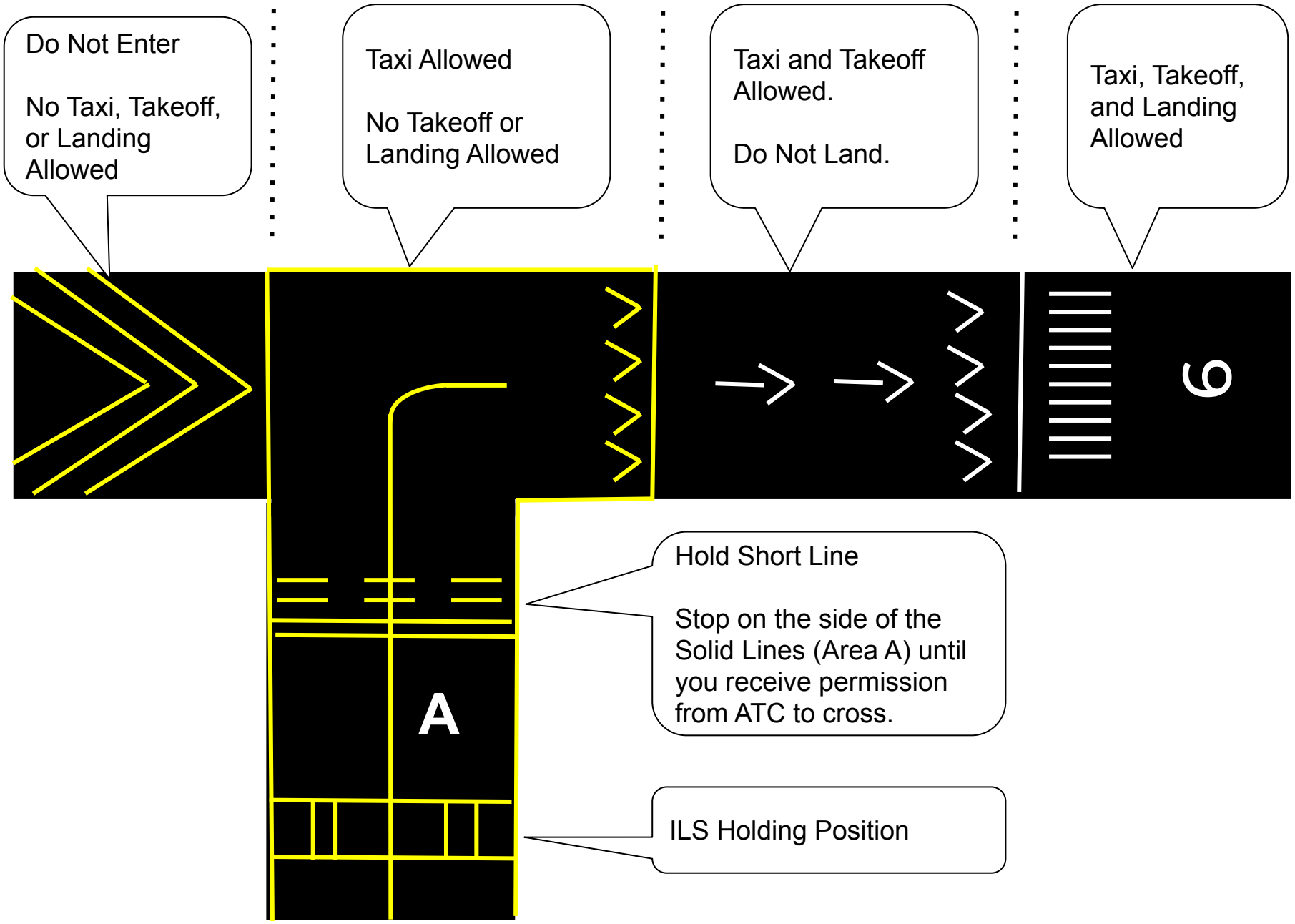
Density Altitude -
It is the environment the airplane is really flying in. High Altitudes, High Temperatures and Humid air reduce the performance of the airplane. METARs, ATIS/AWOS report Density Altitude. Use Density Altitude factors when computing airplane performance.

To find Pressure Altitude
Pressure Altitude = [(29.92 - current altimeter setting) * 1000] + Current elevation

To find True Altitude use E6-B computer to convert Pressure Altitude to True Altitude.

True Altitude - Pressure Altitude that is corrected for non-standard ISA pressure and non-standard ISA temperature. The Altimeter assumes standard ISA standard temperature lapse rate. When the air is warmer than ISA standard, you are higher than the altimeter indicates. When the air is colder than ISA standard, you are lower than indicated. *“Hot to Cold, look out below!”*
True Altitude is shown on VFR Sectional Charts.

Runway Markings



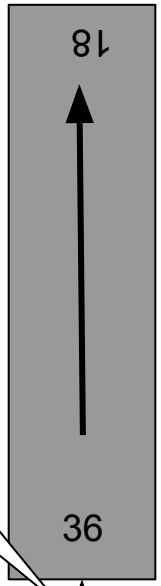
The Basics of Flying in the Traffic Pattern

Note: make sure to factor in the wind direction and speed in each leg of the traffic pattern

On **Crosswind** continue to climb to Traffic Pattern Altitude (1,000' AGL).

Climb out at V_Y and fly the Runway Heading to at least 300' below Traffic Pattern Altitude.
Use Right Rudder to counteract P-factor.

On **Downwind** reduce power and maintain Traffic Pattern Altitude. Fly parallel to the runway about ½ mile or 1 mile from the runway.



Reduce throttle when crossing the Threshold and begin Flare when around 10 feet above the runway

During **Departure** use Rudders to stay on Centerline and use Ailerons to counteract Crosswind.

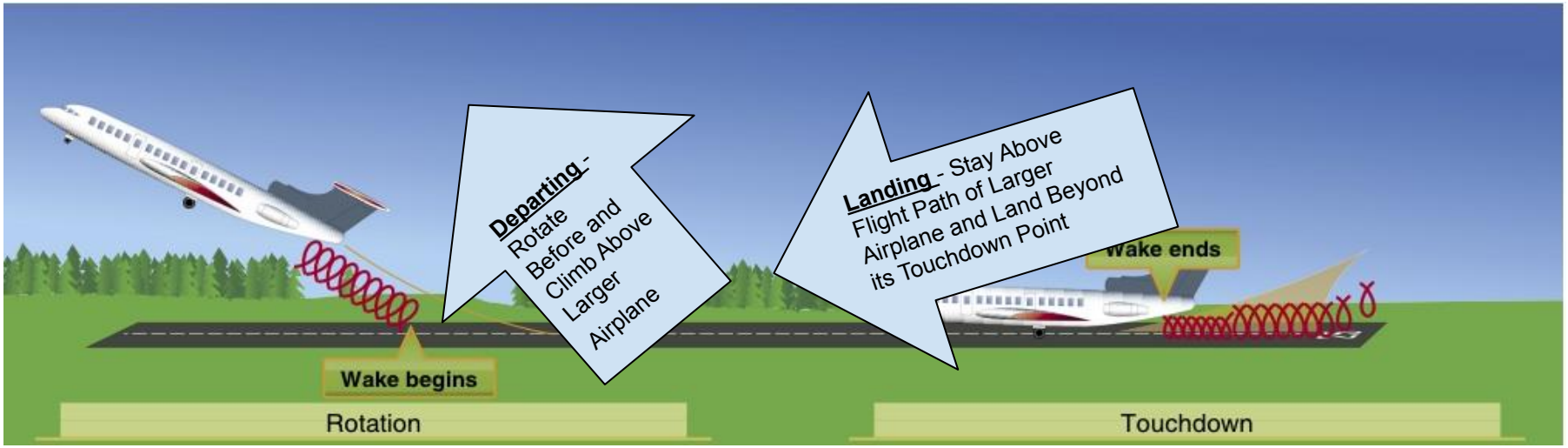
When Abeam the touchdown point, reduce power, extend the first notch of flaps and fly a reduced airspeed. Turn Base when 45 degrees from touchdown point.

On **Base** extend 2nd notch of Flaps and reduce Airspeed further

On **Final** extend 3rd notch of Flaps, maintain Final Approach Speed (1.3*V_{SO}), use Ailerons to counteract Crosswinds, and use Rudder to longitudinally line airplane up with Centerline.

Wake Vortices, Calculate Cloud Base and Calculate top of Descent

Wake Vortices:



Cloud Base - to calculate the approximate cloud base Above Ground Level (AGL)
Using Fahrenheit:

Cloud Base AGL = [(Temperature in Fahrenheit - Dew Point in Fahrenheit) ÷ 4.4] × 1000

Using Celsius:

Cloud Base AGL = [(Temperature in Celsius - Dew Point in Celsius) ÷ 2.5] × 1000

Top of Descent - the distance (NM) at which you begin your normal descent rate to arrive at your desired altitude such as the Traffic Pattern Altitude or Runway.

Top of Descent = [(Current Altitude - Desired Altitude) × 3] ÷ 1000

When Taxiing - Climb into the wind with elevator and ailerons when wind is coming from ahead. Dive away from the wind with elevator and ailerons if it is coming from behind

How to Read a METAR

KORD 151200Z 14013G19KT 4SM RA BKN024 OVC030 10/04 A3002

KORD – Station identifier where the METAR was recorded

151200Z – Date and time of record

First two digits are day of the month it was recorded and the last four digits are the time it was recorded. These times are Zulu.

14013G19KT – Wind Direction and Speed

First three digits are magnetic heading of direction wind is coming from. Next two digits (13) is speed of wind in Knots. And G denotes speed of Wind Gusts in Knots.

4SM – Visibility in statute miles

RA – Weather

Codes include: RA = Rain, BR = Mist, TS = Thunderstorm, FG = Fog, SN = Snow, HZ = Haze

+/- = Heavy or light intensity, VC = Vicinity

BKN024 OVC030 – Cloud Coverage and heights listed in hundreds of feet Above Ground Level (AGL) (ex. Broken Cloud Cover at 2,400 feet AGL).

Can also say “CLR” if sky conditions are clear.

Types of Cloud Coverage: Few = Few, SCT = Scattered, BKN = Broken, OVC = Overcast

10/04 – Temperature and Dewpoint

First two digits is the temperature in degrees C, last two digits is the Dew Point in degrees C. If the numbers are within 3 degrees C, beware of possible Fog. An “M” before the number denotes minus.

A3002 – Altimeter reading in inches Hg