Pre Solo XC Stage Check Primer

PAUL ROBERTS CFI

CONTENTS

FUEL AND OIL

FUEL AND OIL

- [ ] Minimum fuel for cross country flights:
  - Day VFR Minimum by regulation (FAR 91.151)
    - Sufficient Fuel to Fly to first intended point of landing plus 30 minutes reserve (day) / 45 minutes reserve (night)
    - Most pilots consider a one-hour reserve to be the minimum for a cross-country flight.
  - Don’t forget to change over fuel tanks regularly in a Piper Warrior
  - Order fuel if you require it!

- [ ] Minimum oil for cross country flights:
  - 5.5 - 6.0 Quarts in a Piper Warrior

SECURING THE AIRPLANE AWAY FROM HOME BASE

GROUND OPERATIONS PARKING PROCEDURES

- [ ] Securing aircraft away from home base:
  - Whenever you plan to leave the airplane at a remote airport you should park at a designated spot at the airport.
  - Speak to the local FBO before traveling to notify them of your arrival.
  - Make use of tie downs and chocks if you plan to leave the airplane parked for any period of time.

- [ ] Cockpit covers and proper tie down knots away from home base:
  - When leaving the airplane for an extended period of time you should place and secure the cover over the airplane.

WEATHER

CROSS COUNTRY WEATHER

- [ ] Prognostic Charts (Prog Charts)
  - Prognostic charts: (Prognosticate = to forecast)
  - Shows **IFR** and **Marginal VFR** weather plus **turbulence** and **freezing levels**. (all the different charts grouped together make "**GFA**" - graphical forecast for aviation)
  - Aviationweather.gov Low Level Sig Wx (SFC-FL240)
  - Flight Service / Liedos 1800wxbrief.com
  - FAA Weather Cams https://weathercams.faa.gov
  - Foreflight

CROSS COUNTRY WEATHER

- [ ] **METAR**s - Meteorological Aerodrome Routine Weather Report
  - o Observation at airport (vicinity of the airport)
  - o Published every hour
  - o METAR and SPECI
  - o Look at a number of METARS in an area to give a picture of the current weather effecting the area.

- [ ] **TAFs** Terminal Aerodrome Forecasts (TAF)
  - o Prognostic charts: (Prognosticate = to forecast)

CROSS COUNTRY WEATHER

- [ ] **AIRMET** (Airman's Meteorological Information) i
  In-flight weather bulletin that is issued when there are weather conditions present which may affect the safety of lighter aircraft, though the information they contain is relevant for all aircraft.
  - **AIRMET Sierra** - AIRMET S, is issued for **mountain obscuration** and/or **IFR conditions** with ceilings that are less than 1,000' and/or visibility of under 3 miles over an range of at least 50% of the area covered by the AIRMET
  - **AIRMET Tango** - AIRMET T, is issued for l**ight to moderate turbulence**, sustained surface **winds at 30 knots or higher**, or **low-level windshear**.
  - **AIRMET ZULU** - AIRMET Z, is issued when weather conditions are at **freezing levels** making **light to moderate icing** a possibility.

CROSS COUNTRY WEATHER

- **SIGMETs** Issued when the wx is substantially more severe than those that trigger an AIRMET. Pilots whose flight plans take them into an area with an active SIGMET should **highly consider canceling the flight** since conditions pose a significant threat. Weather in an area under a SIGMET advisory is highly volatile and the rapidly evolving nature of the threat means that modifying the flight plan to simply skirt the adverse conditions is often not as feasible or prudent as it is with an AIRMET.

Two categories of SIGMETs are:

- **Non-Convective SIGMET** (WS) issued for conditions similar to but more severe than those of the three types of AIRMETs. Issued for severe icing, severe to extreme turbulence, dust storms or sandstorms that lower visibility to less than three miles, and for volcanic ash which can incapacitate engines.
- **Convective SIGMET (WST)** issued for the most dangerous of conditions with atmospheric instability. They cover severe **thunderstorms** with surface **winds of greater than 50 knots**, surface **hail ¾ inch** or larger in diameter, tornadoes, and **embedded thunderstorms**, lines of thunderstorms, or thunderstorms with heavy precipitation affecting at least 40% of a region

CROSS COUNTRY WEATHER

- [ ] **Winds and Temperature Aloft Forecast** (FB)

Understanding winds aloft, aids in flight planning by:

- Determining the most favorable altitude based on winds and direction of flight
- Assessing the impact of wind on ground speed and thus fuel requirements for the flight; and to calculate the required heading and
- Predicting turbulence by observing abrupt changes in wind direction and speed at different altitudes
- Identifying areas of possible aircraft icing, by noting air temperature of +2°C to -20°C, and temperature inversions

- [ ] Produced in both a textual and graphical format

CROSS COUNTRY WEATHER

Winds and Temperature Aloft Forecast (FB)

```
DATA BASED ON 131800Z
VALID 140000Z   FOR USE 2000-0300Z. TEMPS NEG ABV 24000

FT  3000    6000    9000   12000   18000   24000  30000  34000  39000
BDL 1233 1623-03 2018-07 2232-13 2148-24 2158-37 226149 236453 256248
ACK 1435 1315-04 1906-05 2113-10 2327-22 2342-36 245048 255453 266649
BOS 1333 1621-03 2012-08 2420-12 2239-24 2351-37 235049 245353 255949
```

Line 1 - DATA BASED ON 131800Z - means that the forecast data is based on forecasts generated the thirteenth day of the month at 1800 UTC.

Line 2 - VALID 140000Z FOR USE 2000-0300Z. TEMPS NEG ABV 24000 - means that the valid time of the forecast is the 14th day of the month at 0000 UTC. The forecast winds and temperature are to be used between 2000 and 0300 UTC. Temperatures are negative above 24,000 feet.

Line 3 - FT 3000 6000 9000 12000 18000 24000 33000 34000 39000 - shows the altitudes analyzed in the report. FT indicates the altitude of the forecast, and each number (i.e., 3000) is an altitude.

Line 4 - ACK 1333 9900 1709+06 2018+00 2130-06 2242-18 2361-30 247242 258848 550252 - shows the location of the forecast and the forecast data. MKC is the station identifier of the forecast. The rest of the data is the winds and temperature aloft forecast for the respective altitudes.

WINDS AND TEMPS ALOFT FORECAST (FB)

```
DATA BASED ON 010000Z
VALID 010600Z FOR USE 0500-0900Z.  TEMPS NEG ABV 24000
FT  3000     6000     9000    12000    18000    24000   30000   34000   39000
MKC 9900  1709+06  2018+00  2130-06  2242-18  2361-30  247242  258848  550252
```

WEATHER BRIEFING

A good weather briefing begins with developing a total awareness of the overall "big picture" prior to obtaining a detailed or standard briefing.

Many pilots start by monitoring weather patterns through commercial television ie. The Weather Channel several days before the flight.

The day or evening before the flight, pilots may wish to obtain an outlook briefing from Flight Service, or electronically from the Leidos Pilot Web Portal which gives free access to weather and aeronautical information, flight plan filing, and automated services, or downloading weather and forecast charts from the Internet.

WEATHER BRIEFING

Obtaining WX from Flight Service Station

- [ ] Telephone 1-800- WX-BRIEF (1-800-992-7433)
  - Prior to contacting Flight Service you should have the general route-of-flight worked out.
  - When you reach Flight Service, you will be answered by a recorded announcement, follow instructions to reach a briefer
  - Give your tail number and aircraft type (ie Piper Warrior)
  - Request either a, Standard, Abbreviated or Outlook briefing;
  - Identify yourself as a student, private, or commercial pilot, and if instrument rated),
  - The type of flight planned (e.g., VFR or IFR),
  - Departure and Destination points , (i.e KBED VFR to KMVY)
  - Time of departure, (**UTC / Zulu** time - calculate before calling!!)
  - Proposed flight altitude(s), (i.e 3,500 feet)
  - Proposed route-of-flight, if other than direct; specify any landing en route,
  - Estimated time en route. (i.e 60 mins - or - one hour 30 minutes etc)

WEATHER BRIEFING
STANDARD BRIEFING

Standard Briefing will include:

- [ ] **Adverse Conditions:** Significant meteorological information that might influence you, the pilot, to alter your proposed route of flight, or even cancel your planned flight entirely (e.g., thunderstorms, icing, turbulence, low ceilings, or visibility)
- [ ] **Synopsis:** A brief statement as to the cause of the weather (e.g., fronts or pressure systems) which are pertinent to your proposed route-of-flight
- [ ] **Current Conditions:** When your proposed time of departure is within two hours, a summary of the current weather, including Pilot Weather Reports (PIREPs) and radar weather information applicable to your planned flight
- [ ] **En Route Forecast:** The briefer will summarize the forecast conditions (unless requested to read the forecasts verbatim) along your proposed route in a logical order (i.e., climb-out, en route, and descent)
- [ ] **Destination Forecast:** The destination forecast for your planned ETA will be provided, including any significant changes expected within one hour of your planned time of arrival
- [ ] **Winds Aloft:** The briefer will summarize forecast winds aloft for the proposed route. Temperature information will be provided on request; and
- [ ] **Notice to Air Missions (NOTAMs)**: “Current” NOTAMs pertinent to your proposed route of flight will be provided.

WEATHER BRIEFING
ABBREVIATED BRIEFING

Abbreviated Briefing:

- [ ] Request and abbreviated briefing when you need the information to supplement other electronically acquired data update a previous briefing, or when you need only one or two specific items.
- [ ] Provide the briefer with appropriate background information, the time you received the previous information, and the specific items needed. You should indicate the source of the information already received so that the briefer can limit the briefing to the information that you have not received, and provide appreciable changes in meteorological conditions or aeronautical information since your previous briefing.
- [ ] The briefer will provide the information in the sequence used in a Standard Briefing.
- [ ] If you request only one or two specific items, the briefer is required to advise you if adverse conditions are present or forecast. Details on these conditions will be provided at your request. Often, and especially when doing local flying, you may want to update the weather at a specific airport.

WEATHER BRIEFINGS
OUTLOOK BRIEFING

Outlook Briefing:

- [ ] You should request an Outlook Briefing whenever your proposed time of departure is **six or more hours in the future**.
- [ ] In this case, the briefer will provide you with available forecast data applicable to your proposed departure time.
- [ ] This type of briefing is provided for planning purposes only.
- [ ] You should obtain a Standard Briefing as close to departure as possible in order to obtain the latest current conditions, forecasts, and NOTAMs.
- [ ] Often, graphical weather depictions obtained online or through an app such as Foreflight can provide excellent trend information and so may be used accordingly.

WEATHER BRIEFING

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  - Departure and Destination points , (i.e KBED VFR to KMVY)
  - Time of departure, (**UTC / Zulu** time - calculate before calling!!)
  - Proposed flight altitude(s), (i.e 3,500 feet)
  - Proposed route-of-flight, if other than direct; specify any landing en route,
  - Estimated time en route. (i.e 60 mins - or - one hour 30 minutes etc)

WEATHER BRIEFINGS
IN-FLIGHT BRIEFING

In-flight Briefing:

- [ ] In cases when you are already in flight and you need to obtain a standard briefing or update a previous briefing in-flight, you should contact Flight Service (not Flight Watch).
- [ ] Sectional charts can be used to find the FSS frequency needed depending on where you are during your flight.
  - On your sectional charts, you will find RCO (Remove Communication Outlet) frequencies that let you communicate with the FSS
  - Also on your sectional chart, you will find VOR frequencies which can communicate with the FSS.
- [ ] The following frequencies will NEVER be found on a sectional chart:
  - 121.5: Flight emergencies
  - 122.0: Enroute Flight Advisory Service (EFAS)
  - 122.2: Routine communications with a FSS
- [ ] After contact, you should advise the specialist of the type of briefing you require and provide appropriate background information. You will then be provided information as specified in the above paragraphs, depending on the type of briefing requested.

REFUELING WHILE ON CROSS COUNTRY FLIGHTS

REFUELING

If you need fuel at a remote airport during your cross country flight

Fixed Base Operator

- Ensure the airport has fuel available (not all do!!) (Chart Supplement / VFR sectional chart)
- Call the FBO before you go (let them know when you will be there)
- Ensure you know how to taxi to the FBO (have airport diagram available to you)
- ECAC will reimburse fuel up to $.7.00 per gallon* (*subject to change)

View YouTube Video

REFUELING WHILE ON XC FLIGHTS

SkyVector Aeronautical Charts | Airports | Charts | Help | Fuel Prices

LCI Laconia Municipal Airport

Login | Register

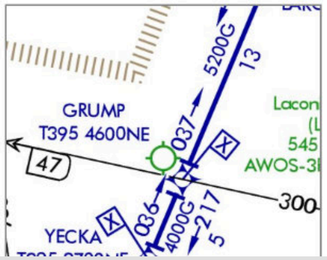
Official FAA Data Effective 2023-02-23 0901Z

Chart Supplement

LACONIA MUNI (LCI)(KL
545 B NOTAM FIL
RWY 08–26: H5890X100
PCN 35 F/D/X/T HI

VFR Chart of KLCI

IFR Chart of KLCI



Location Information for KLCI

Coordinates: N43°34.38' / W71°25.07'
Located 03 miles NE of Laconia, New Hampshire on 502 acres of land. View all Airports in New Hampshire.
Surveyed Elevation is 545 feet MSL.

Operations Data

Airport Use:	Open to the public	A.R.T.C.C.:	BOSTON
Activation Date:	October 1946	F.S.S.:	BANGOR
		NOTAMs Facility:	LCI (NOTAM-D available)
Status:	Operational	Sectional Chart:	NEW YORK
Control Tower:	No	AirspaceAnalysis:	NO OBJECTION
Seg-Circle:	Yes	Attendance:	MAY-OCT/ALL/0700-1900
Beacon:	None		NOV-APR/ALL/0800-1800
Wind Indicator:	Yes, Lighted		
Lighting Schedule:	SEE RMK		

Airport Communications

AWOS-3PT:	133.525 Tel. 603-524-5134
BOSTON APPROACH:	134.75 254.25
BOSTON DEPARTURE:	134.75 254.25
CLEARANCE DELIVERY:	119.85 119.85
CTAF:	123.000
UNICOM:	123.000
AWOS-3 at 1P1 (19.1 NW):	118.45 603-536-1698
ASOS at CON (22.4 S):	132.325 603-224-6558
ASOS at DAW (27.5 SE):	135.275 603-332-7814

Fuel Providers

Sky Bright

US Dollar per US Gallon

Jet A Full Service	$6.00 GAL
JetA+FSII Full Service	$6.10 GAL
100LL Full Service	$6.40 GAL
100LL Self Service	$6.00 GAL

updated 2023-03-14
Update Fuel Prices

Emerson Aviation

CAA Preferred

US Dollar per US Gallon

Jet A Full Service	$7.40 GAL
JetA+FSII Full Service	$7.50 GAL
100LL Full Service	$6.40 GAL
100LL Self Service	$5.95 GAL

updated 2023-02-27
Update Fuel Prices

REFUELING WHILE ON XC FLIGHTS

Sky Bright

Laconia's Premiere Full-Service FBO

Laconia's Premeire FBO offering Phillips 66 aviation fuels, aircraft maintenance, flight instruction, aircraft rentals and aircraft sales

Located at the Laconia Municipal Airport in Gilford, New Hampshire we are within minutes of countless attractions, restaurants, shopping centers, resort hotels, and Lake Winnipesaukee. We continually strive to meet the highest standards in customer service and safety . We will always go the extra mile to make your trip to the Lakes Region an enjoyable and memorable one.

Current Prices

US Dollar per US Gallon

Jet A Full Service	$6.00 GAL
JetA+FSII Full Service	$6.10 GAL
100LL Full Service	$6.40 GAL
100LL Self Service	$6.00 GAL

updated 2023-03-14

Update Fuel Prices

Contact Data

Web Site
www.skybright.com

Contact
Lee Avery

Telephone
603-528-6818
800-639-6012

Fax
603-528-1814

E-Mail
lee@skybright.com
line@skybright.com

UNICOM
122.85

Hours
7:00 - 19:00 Summer,
7:30 - 18:00 Winter

REFUELING

Refueling using self-serve kiosk

- Identify the location of the pump - (use Unicom - or call the FBO before you go.)
- After landing - taxi close to the pump - Shut down the airplane completely and use a tow bar to move the airplane if you are in any doubt about maneuvering near the pump with the engine running.
- Use chocks to secure the airplane
- Connect the ground wire to the airplane - the exhaust is a good place to connect to.
- You will need to swipe a credit / debit card and select the type of fuel and the amount you require. Ensure you select 100LL for Cessnas and Piper Warriors. Always double check if there are two hoses (Jet Fuel and 100LL)
- Start the pump with the lever or switch.
- Reset the counter on the hose to view how much fuel you are pumping
- Pull out the hose
- Pump the fuel you require - note that fuel pumps do not automatically shut off the way car fuel pumps do.
- Turn off the pump and retract the hose when you are finished! Remove the ground wire
- Ensure the area is left clean - as you found it

View YouTube Video

MAINTENANCE ISSUES WHILE ON CROSS COUNTRY FLIGHTS

MAINTENANCE ISSUES WHILE ON XC FLIGHTS

If you experience issues with the airplane while on a cross country flight maintenance issues while away from home base.

- [ ] Confirm what the issue is. Use your checklists and POH in the airplane.
- [ ] Does it pose a flight safety issue and / or does it render the airplane unable to fly (mechanically or legally)?
- [ ] Call and speak to a dispatcher at the ECAC Office. (781) 274-6322
- [ ] If you cannot reach the ECAC office, contact your CFI -or-
- [ ] Contact the CFI who signed off on your XC flight plan and gave you your cross country endorsement.
- [ ] Be prepared to help diagnose the issue with a mechanic (ECAC via telephone or a local qualified mechanic)

ECAC STUDENT PILOT MINIMUMS

(ECAC STUDENT PILOT MINIMUMS)

Wind

- Maximum wind of 17Kts
- Max crosswind of 7Kts Max
- Gusts not to exceed 5Kts

Ceilings and Visibilities

- [ ] Flying in the traffic pattern:
  - 1,600' AGL ceiling and P6SM or greater visibility
- [ ] Local practice area:
  - 3,500' AGL ceiling and P6SM or greater visibility
- [ ] **Cross-country:**
  - 4,000' AGL ceiling and P6SM or greater visibility at origin, along entire route of flight and at destination

PAVE / IMSAFE

IMSAFE

Determining if you are fit and ready for flight **(IMSAFE)**

The **IMSAFE** checklist should be used to determine a pilot's physical and mental readiness for flying.

- **Illness:** Even a minor illness can severely impair performance as a pilot. Fever and other distracting symptoms can impair judgment, memory, alertness, and the ability to make calculations. The safest rule is not to fly while suffering from any illness.
- **Medication:** Pilot performance can be severely impaired by both prescribed and over-the-counter medications.
- **Stress:** Stress is a term to describe the body's nonspecific response to demands placed upon it.
- **Alcohol:** The regulations prohibit pilots from performing crew-member duties within eight hours after drinking any alcoholic beverage ("eight hours bottle to throttle") or while under the influence of alcohol. Alcohol makes the body much more susceptible to disorientation and hypoxia.
- **Fatigue:** Fatigue can be treacherous because it may not be apparent until serious errors are made.
- **Emotion:** Emotionally upsetting events may render a pilot unable to fly an airplane safely. Anger and depression will decrease alertness and lead to the pilot taking self-destructive risks.

CROSS COUNTRY FLIGHT PLANNING

CROSS COUNTRY FLIGHT PLANNING

FAR 91.103, Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include

For any flight, runway lengths at airports of intended use, and the following **takeoff and landing distance information**:

For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing **takeoff and landing distance data is required, the takeoff and landing distance data** contained therein; and ..

…other reliable information appropriate to the aircraft, relating to **aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature**.

CROSS COUNTRY FLIGHT PLANNING

- [ ] Review planned cross country for correct planning to include:
  - Topography
  - Altitude(s) (VFR)
  - Checkpoints
- [ ] Plotting a course, to include:
  - Determining heading, speed, and course
  - Wind correction angle
  - Estimating time, speed, and distance
  - Wind correction angle
  - Power setting selection
  - Planned versus actual flight plan calculations and required corrections
  - Determining if ready for flight / Personal minimums (IMSAFE)
  - Planned use of NAVAIDS (VOR, GPS, Flight Following)
  - If using FOREFLIGHT or other app, check on the use of this

IN FLIGHT EMERGENCIES

IN FLIGHT EMERGENCIES (EN ROUTE)

In flight emergencies (en route)

- [ ] Loss of engine power (**ABCDE**)
  - O Airspeed, Best place to land, Checklist, Declare, Execute Landing /Exit
- [ ] Engine Fire in flight
  - O Emergency Descent
  - O Land ASAP
- [ ] Loss of oil pressure
  - O Know and follow procedure for loss of oil pressure
  - O Land ASAP / Prepare for an off field landing
- [ ] Loss of radio / comms
  - O Squawk 5600 (“56 - radio needs to be fixed”)
  - O Light Gun Signal (have checklist available)
- [ ] Medical Emergencies
  - O Fly the plane
  - O Declare emergency
  - O Land ASAP

OFF AIRPORT LANDINGS / SURVIVAL

IN FLIGHT EMERGENCIES (EN ROUTE)

You land off airfield in a remote area. What survival equipment do you have?

- [ ] Dress for the conditions and the possibility of an off field landing.
- [ ] Utilize the aircraft and its parts and components: (Carry multi tool in flight bag)
  - O Aircraft cabin for shelter (if safe to do so)
  - O Interior fabric for warmth
  - O Fuel for fire (carry lighter in flight bag?)
  - O Distress signal by burning tires
  - O ELT - can it be removed and use as a hand-held device?
  - O Aircraft interior for shelter (after it stops burning)

- [ ] Water survival
  - O Life Preserver Unit(s) (LPU)
  - O Other floatation devices
  - O Parachute use in an emergency

RUNWAY INCURSIONS

RUNWAY INCURSION

Runway Incursion:

Any occurrence at an aerodrome involving **the incorrect presence of an aircraft, vehicle, or person** on the protected area of a **surface designated for the landing and takeoff of aircraft**.

Surface Incident:

Any unauthorized or unapproved movement within the designated **movement area** (excluding runway incursions)

- or -

An occurrence in that same area associated with the operation of an aircraft that **affects or could affect the safety of flight**.

RUNWAY INCURSIONS

- [ ] **Runway Incursion** Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.
- [ ] **Taxiing**. Write down, Read back and always verify if in doubt. (Verify cross runway instructions if not sure)
- [ ] **Progressive taxi instructions**. If at an unfamiliar airport request in order for the controller will direct you as you go.
- [ ] **Required calls.** Initial Taxi, Clearance to cross runways, Clearance to take off**.**
- [ ] **Required Lights**. Strobes / beacon for day VFR operations
- [ ] **Hot Spots. Designated areas on airport surface designated as a high risk of making incorrect turning or collision with other aircraft**
- [ ] What does "Roger" mean? (R - received)
- [ ] **Hold Short** Hold your position - do not cross runway hold treshold lines
- [ ] **Line up and Wait. Take to the runway - line up on the centerline and wait for the clearance to take off.**
- [ ] **Review of Airport signage index cards**

RUNWAY INCURSION

Approximately three runway incursions occur each day at towered airports within the USA

Pilot Deviations:

- Crossing a runway hold marking without clearance from ATC
- Taking off without clearance
- Landing without clearance

Operational Incidents (OI):

- Clearing an aircraft onto a runway while another aircraft is landing on the same runway
- Issuing a takeoff clearance while the runway is occupied by another aircraft or vehicle

Vehicle (Driver) Deviations:

- Crossing a runway hold marking without ATC clearance

RUNWAY INCURSION TAXIING

- Make taxi route planning an integral part of pre-flight planning.
- **Be current with your knowledge of airport signage**
- **Understand what mandatory hold points are**
- **Make a note of mandatory hold points.**
- Review airport layout(s) as part of pre-flight planning
- Make a note of hot spots.
- Listen to ATIS to understand runway(s) in use. -or-
- Know the traffic patterns for un-towered airports
- **Ensure you have (and use) Airport Diagram(s) during taxiing**

Prior to taxiing

- Know where you are on the airport and what the location is called.
  - You will need to tell ATC so they can issue you a taxi clearance.
- Pickup ATIS / Runway information.
- Be ready to taxi when you call ATC. (They will be looking for you)

RUNWAY INCURSION AIRPORT HOT SPOTS

Hot spots are generally a **complex or confusing** taxiway or taxiway and runway intersection.

Hot spots have a history or potential **risk of collision or runway incursion**, and require heightened attention by pilots and drivers.

Heightened attention by pilots, drivers and controllers is necessary.

Hot Spots depictions are made with with **three shapes** and two meanings.

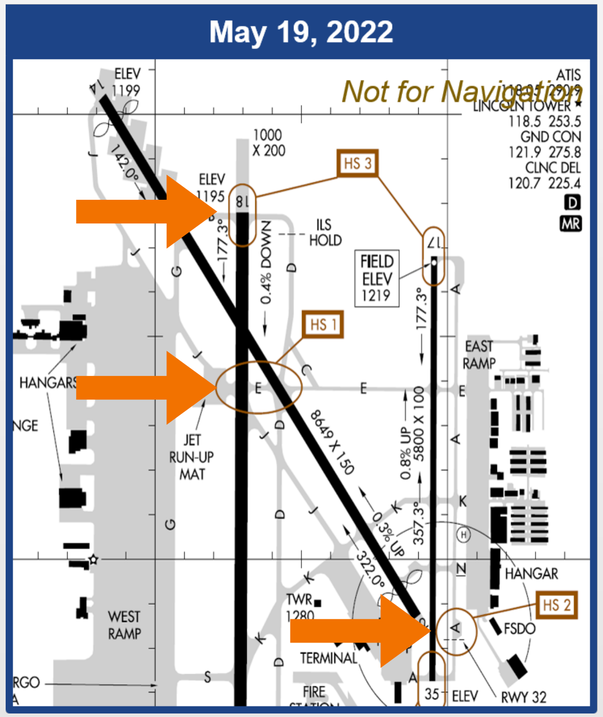
- A circle or ellipse will depict these hot spots, which include issues such as:
- Hold short line infractions
- Approach hold issues
- Complex taxiway configurations
- Movement-non movement boundary area issues
- Tower line of sight problems
- Marking and signage issues.

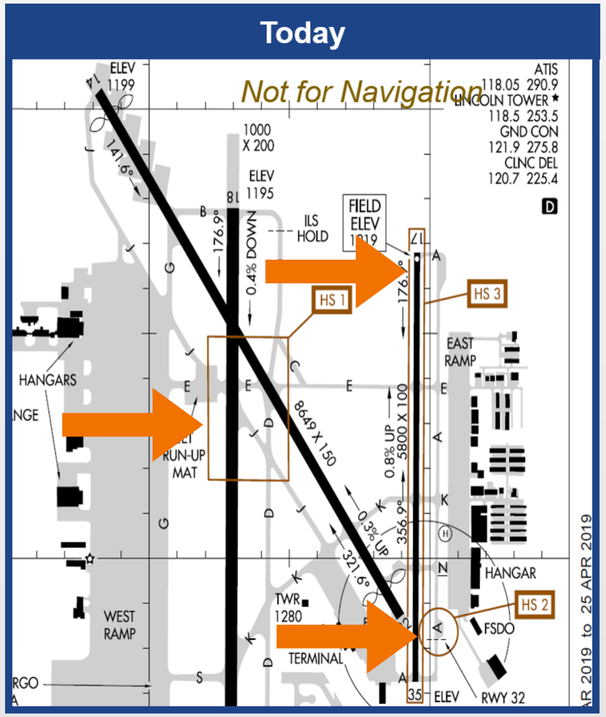
TAXIWAY HOTSPOT DIAGRAMS

The FAA have standardized symbols to **three shapes** with two distinct meanings:

- A circle or ellipse will depict these hot spots, which include issues such as:
  - Hold short line infractions
  - Approach hold issues
  - Complex taxiway configurations
  - Movement-non movement boundary area issues
  - Tower line of sight problems

- A cylinder for wrong surface hot spots.
  - Wrong surface hot spots depict locations where an aircraft has inadvertently attempted to or actually departed or landed on the wrong surface. A cylinder will depict these hot spots.





RUNWAY INCURSION COMMUNICATIONS

TOWERED AIRPORT

- Use standard ATC phraseology at all times to facilitate clear and concise communication
- On initial contact with any controller, state: what you are, who you are, where you are and, what you want.
- **Focus on the ATC clearance** / Don't perform any nonessential tasks while communicating with ATC
- **Write down all clearances from ATC**
- **Read back** taxi instructions **including any runway crossing or hold instructions (mandatory)**
- **Understand the route** and the **clearance** before beginning to taxi
- **If in doubt ask** for clarification.
- When taxiing up to the runway hold short line be ready to communicate with the tower - stating your intentions. **READ BACK ALL HOLD SHORT INSTRUCTIONS**
- If the controller does not explicitly clear you for take of or to line up and wait **DO NOT** cross the runway hold short line.
- **IF IN DOUBT ASK AND CONFIRM!**

RUNWAY INCURSION COMMUNICATIONS

UNTOWERED AIRPORT

Maintain situational awareness

- Be familiar with the local traffic pattern direction and pattern altitude
- Be aware of the routes into and out of the airport and know where you are and other aircraft are operating at all times
- Know that other aircraft may be using an IAP to runways other than the runway in use for VFR operations
- During calm wind conditions, be aware that flight operations may occur at more than one runway at the airport

Departing

- Remember **not all aircraft are radio-equipped**; therefore, before entering or crossing a runway, listen on the CTAF for inbound aircraft information.
- Scan the full length of the runway, including the final approach and departure paths of the runways you intend to enter or cross.

Communication

- **Be alert and communicate** your intentions on the common traffic advisory frequency (CTAF), and **listen for other aircraft** operating on, to, and from the airport.

Be your own controller - clear yourself to enter taxiways and runways the same way a ATC controller would. Check and double check to ensure that you only enter runway areas when it is completely safe to do so

RUNWAY INCURSION COMMUNICATIONS

GENERAL RULES

- Always give 100% attention to taxiing
- Don’t follow other aircraft - their clearance will be different to yours
- Ensure that the clearance you heard is for you - if in doubt ask!
- Don’t ever cross a runway or other mandatory hold boundary unless you are 100% sure you are cleared - don’t assume - clarify!
- Don’t ever cross a runway or other mandatory hold boundary without checking left / right that it is **clear to do so.** (even if you have a clearance)
- Use all available resources to ensure you do not enter protected areas without a clearance
- **Turn on and use all lights when crossing a runway - make yourself visible.**
- Expedite all crossings of runway areas

COLLISION AVOIDANCE

COLLISION AVOIDANCE

Collision Avoidance while flying cross country

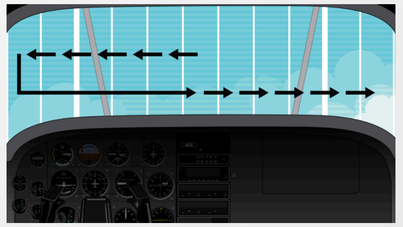
It is the PIC's responsibility to "see and avoid" other aircraft, as laid out in FAR 91.113(b)

- [ ] Proper clearing before any turns or maneuvers
- [ ] Adjusting focus
  - [ ] A proper scan optimizes our vision for collision avoidance. A scan implies a sweep of the eyes, while the correct scan for conflicting traffic is actually a sequence of intense, fixated observations. The eyes need one to two seconds to adjust before they can focus; a continuous sweep blurs the vision.
- [ ] Rights of way rules
- [ ] Pursuit Curves Lead, Lag, Pure (Lag preferred to miss traffic)
- [ ] Right of way rules
- [ ] Flight Following

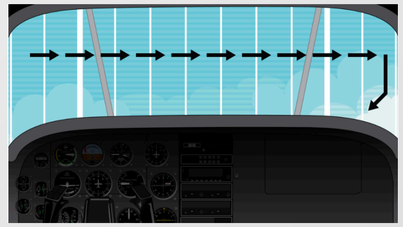
COLLISION AVOIDANCE

It is the PIC's responsibility to "see and avoid" other aircraft, as laid out in FAR 91.113(b)

- [ ] Utilizing **proper clearing techniques** before any turns or maneuvers
- [ ] A proper **scan** optimizes our vision for collision avoidance. A scan implies a sweep of the eyes, while the correct scan for conflicting traffic is actually a sequence of intense, fixated observations. The eyes need one to two seconds to adjust before they can focus; a continuous sweep blurs the vision.



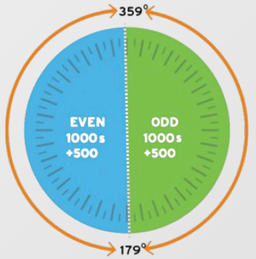
Center-to-Side Scan



Side-to-Side

- [ ] **Adjusting focus**: The eyes tend to relax to an intermediate focal distance. To counteract this tendency, the eyes must periodically refocus on the farthest object within sight—a cloud on the horizon, another aircraft at a distance, or a point on the ground.
- [ ] **Flight Following:** Requesting and receiving flight following provides realtime traffic updates and advisories while flying cross country
- [ ] **Using technology:** Connecting an iPad with Foreflight to your airplane's ADS-B equipment will provide realtime air traffic information

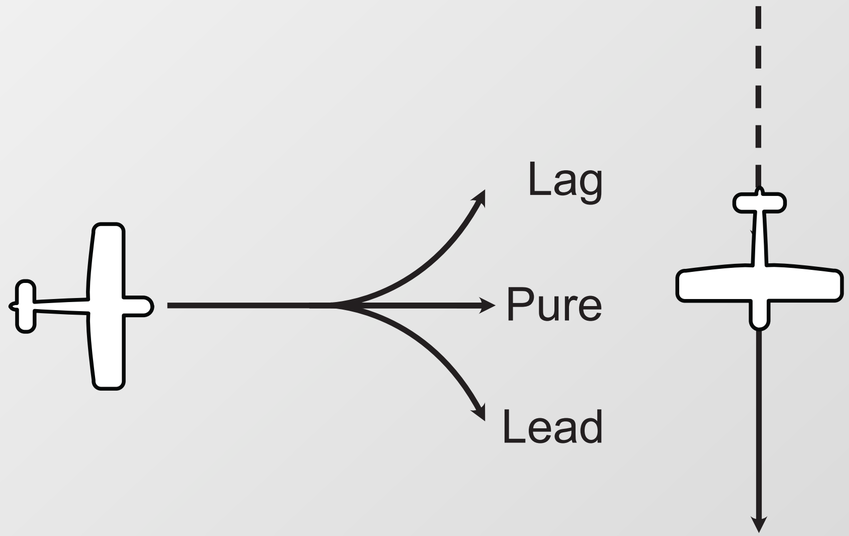
COLLISION AVOIDANCE



- [ ] Fly at expected **VFR altitudes** - be predictable
- [ ] **Right of way rules**: FAR 91.113
  - Aircraft in distress have the right of way over all other aircraft
  - When two airplanes are approaching head-on, both pilots should **turn right** to avoid a collision
  - When two aircraft of different categories are approaching each other, the less maneuverable has the right of way.
  - When approaching another aircraft at the same altitude, the aircraft to the right has the right of way
  - When two aircraft are approaching for landing, **the aircraft that is lower** has the right of way (except this is not to be taken advantage of, i.e. diving lower to make you be that aircraft with the "right of way")
  - An aircraft towing or refueling another aircraft has the right of way over all engine driven aircraft
- [ ] **Use Technology**: If you have a traffic awareness technology such as ADS-B, include it in your scan and practice correlating targets on the screen to what you see out the windscreen. Technology can improve your situational awareness, but it's not a substitute for looking outside: Don't fixate on the screen, and remember not all aircraft will appear on the display.
- [ ] Use aircraft **lights** as required to be seen.

COLLISION AVOIDANCE

- [ ] **Pursuit Curves - Lead, Lag, Pure** (Lag preferred to miss traffic)
- [ ] Pursuit curves describe where you point your aircraft relative to other aircraft.
- [ ] **Lead** pursuit points ahead of the other aircraft current flight path.
- [ ] **Pure** pursuit points at the other aircraft. Like lead pursuit it can reduce distance to the other aircraft but not as quickly.
- [ ] **Lag** pursuit points behind the other aircraft. Lag helps you align flight paths to put you into position behind the other aircraft. Lag pursuit maintains or increases the distance to the other aircraft.



WINDSHEAR AND TURBULANCE AVOIDANCE

WINDSHEAR AND TURBULANCE AVOIDANCE

Wind shear is a change in wind speed and/or direction over a short distance.

It can occur either horizontally or vertically and is most often associated with strong temperature inversions or density gradients. Wind shear can occur at high or low altitude

Wind shear can change a routine approach into an emergency recovery in a matter of seconds. An aircraft is affected by the change in wind direction/velocity because the wind also changes the aircraft motion relative to the ground.

How To Cope with wind shear

- [ ] Don’t takeoff if the airport is reporting low-level wind shear. Wait for the wind to change or fly another day.
- [ ] If you are approaching an airport that is reporting low level wind shear.
  - Understand the magnitude of the change.
  - Be prepared to correct or go around immediately.
- [ ] If you are committed to landing and you encounter low level wind shear.
  - As the aircraft passes through the shear level, airspeed and lift are lost. The aircraft starts to sink and drops below the glide path. You must recognize this and correct with increased pitch and power.
  - Keep your airspeed up (if a wind gust drops you will lose life rapidly)
  - Be prepared to correct or go around immediately.
  - If necessary divert to a nearby airport.
- [ ] For more information see FAA document Wind Shear

NAVIGATION

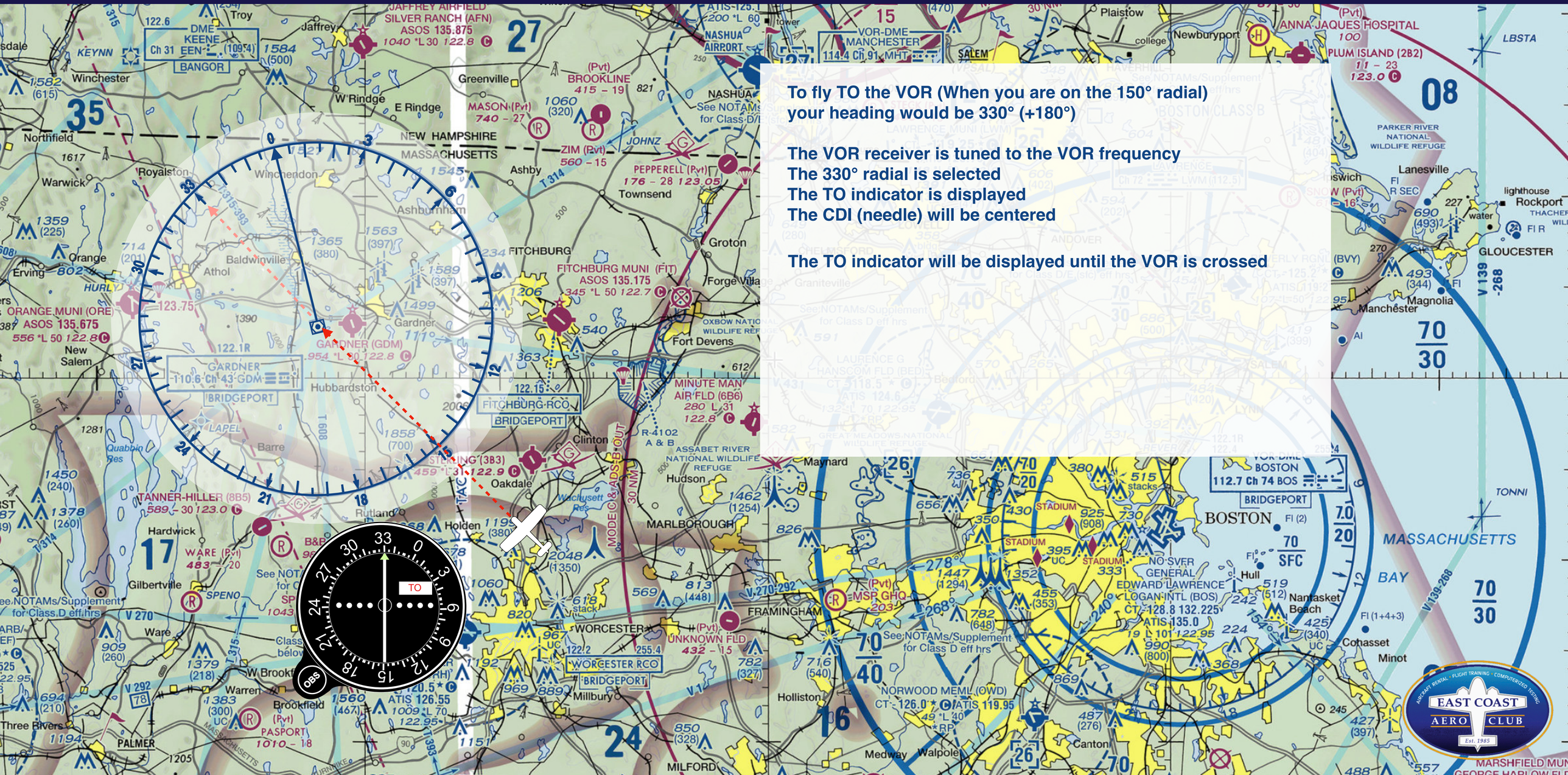
BANGOR
Winchester
W Rindge
E Rindge
Greenville
BROOKLINE
415 – 19
MASON (Pvt)
740 – 27
1060
(320)
NASHUA
See NOTAMs/Supplement
for Class D/E (sfc) eff hrs
STECK (Pvt)
460 – 15
LAWRENCE MU
NEW HAMPSHIRE
MASSACHUSETTS
ZIM (Pvt)
560 – 15
PEPPERELL (Pvt)
176 – 28 123.05
Townsend
Ashby
golf course
Northfield
1617
Warwick
Royalston
Winchendon
Ashburnham
1545
1582
(615)
1359
(225)
Orange
Erving
HURLY
ORANGE MUNI (ORE)
ASOS 135.675
556 *L 50 122.8
123.75
Athol
Baldwinville
1365
(380)
1563
(397)
714
(201)
1589
(397)
1499
1390
Gardner
GARDNER (GDM)
954 *L 30 122.8
111°
122.1R
GARDNER
110.6 Ch 43 GDM
BRIDGEPORT
Hubbardston
New
Salem
FITCHBURG
FITCHBURG MUNI (FIT)
ASOS 135.175
345 *L 50 122.7
1206
540
1363
122.15
FITCHBURG RCO
BRIDGEPORT
Groton
649
(280)
CHELMSFORD
LOWELL
Forge Village
Graniteville
See NOTAMs/Supplement
for Class D eff hrs
OXBOW NATIONAL
WILDLIFE REFUGE
Fort Devens
591
612
LAURENCE G
HANSCOM FLD (BED)
V 431
MINUTE MAN
AIR FLD (6B6)
280 L 31
122.8
R-4102
A & B
Clinton
582
ASSABET RIVER
NATIONAL WILDLIFE
REFUGE
GREAT MEADOWS NATIONAL
WILDLIFE REFUGE
Maynard
Hudson
1462
(1254)
LAPEL
Barre
1281
Quabbin
Res
1450
(240)
1378
1858
(700)
STERLING (3B3)
459 *L 31 122.9
Oakdale
TANNER-HILLER (8B5)
589 – 30 123.0
Rutland
Holden
1199
MARLBOROUGH
Wachusett
Res
656
26
35

IDENTIFYING THE CORRECT VOR

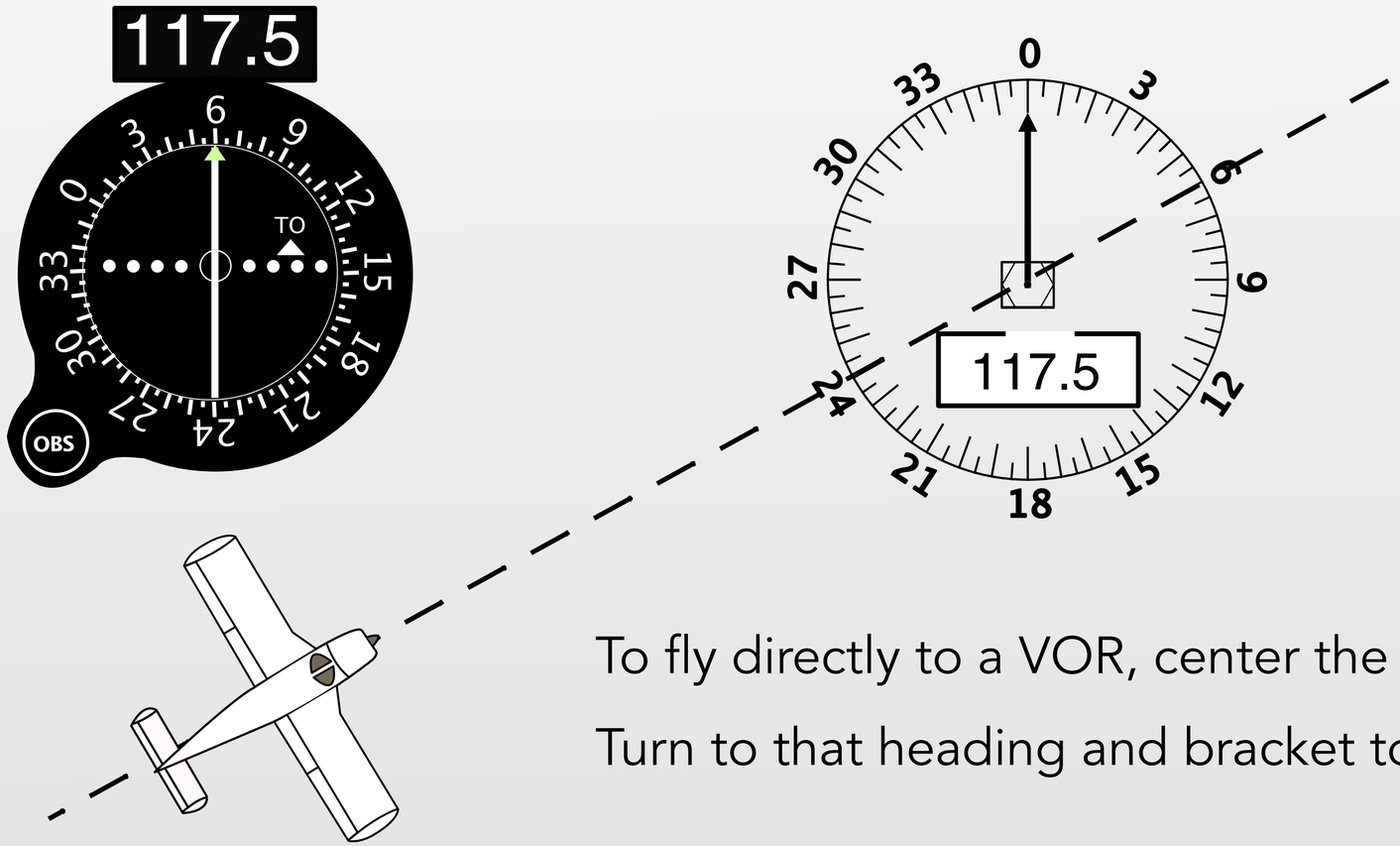
VORs should always be identified.

1. When you're in range of the VOR - tune to the station frequency
2. (Garmin 430) Select OBS (omni bearing selector)
3. Push the V button "push to ID" (Garmin 430) to receive the ID info - Morse Code.
4. Push in the "Nav" button on the audio panel

FLYING TO A VOR ON A RADIAL



DIRECT TO VOR RECEIVER



To fly directly to a VOR, center the needle with a TO indication.

Turn to that heading and bracket to stay on the line

INTERCEPTING RADIALS

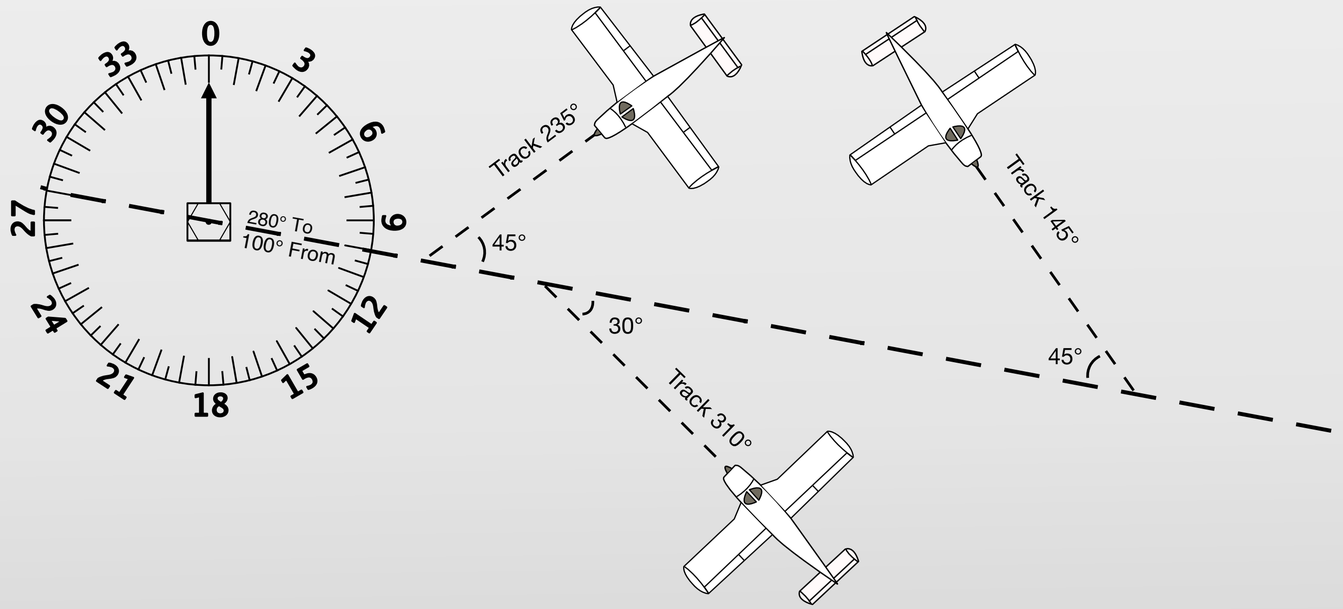
You're trying to **intercept the 280° course** (TO the station) from **south** of that line.

- You choose a 30° intercept. Fly a track of (280°+30°) = 310°

If you're trying to **intercept the 280° course** from the **north** on a 45° intercept, fly a track of (280°- 45°) = **235°**

- If you were going to fly **FROM** on that same line, it's the **100° radial**.
- To intercept at a 45° angle from the north, you 're now on the left side of the line, so fly (100° + 45°) = 145°

Note that the track is not necessarily the heading: you'll have to crab for wind in order to intercept correctly.

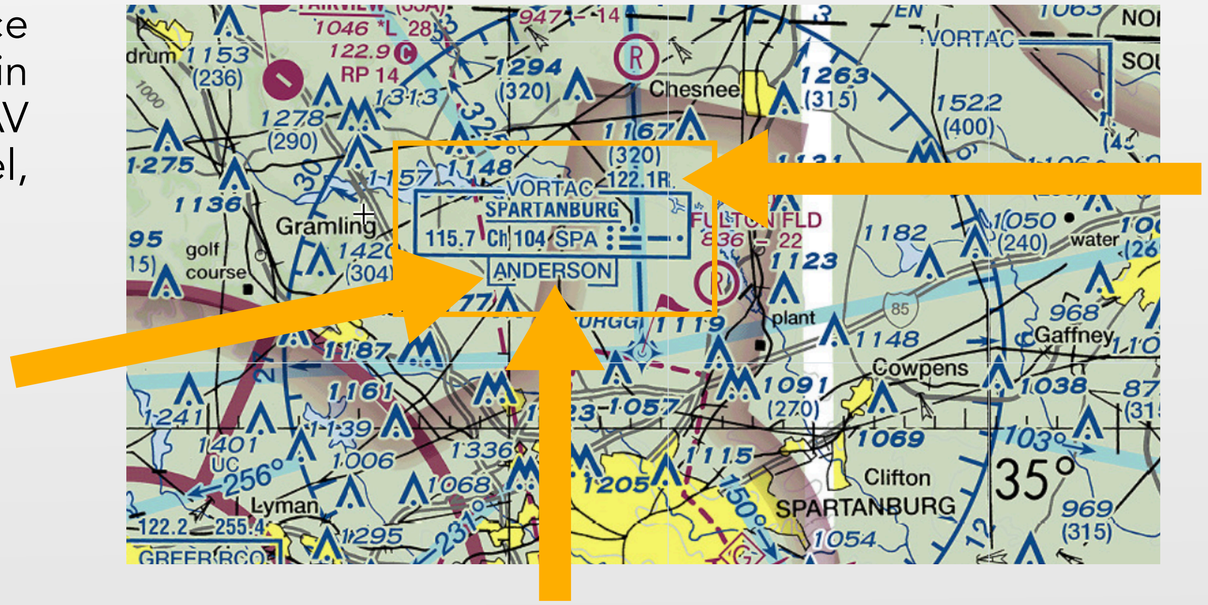


VOR AS A RADIO COMMUNICATIONS RECEIVER

A VOR can receive voice transmissions. Sometimes weather information is given over a VOR frequency, or even communications with FSS can be conducted over VORs in areas where normal where normal comm frequencies are unavailable.

To listen to the voice channel of a VOR, tune in the VOR, push the NAV button on the radio panel, and turn up the volume.

All FSS's monitor 122.2
You can reach Anderson FSS on 122.2



If a FSS can reach you via a VOR, a frequency is noted above the communications box, followed by an R. The "R" means, "Receive only.'

In the case of this VOR, you could talk to Anderson FSS by tuning your communications radio to 122.1, and listening to 115.7 over the VOR radio's voice channel. Yes, you will be talking to them over one machine (the comm radio), and they will be responding and you listening over another (the VOR).

GPS - GARMIN 430

- [ ] **Navigating using GPS (If installed)**
- [ ] **Flight Plan Function (FPL)**
  - [ ] Select FPL and using the GPS knob enter the points in order of your flight plan.
  - [ ] The first leg will be activated and you can begin navigation
- [ ] **GPS “Nearest"function**
  - [ ] From Map page rotate big inner GPS knob all the way to the right. This will take you to the “nearest folder”
  - [ ] Here you will find the pages showing nearest airports and checkpoints etc to you. Select the one you want by pressing the small knob in for the cursor and then select the point you want more information about.
  - [ ] Scroll through the pages
- [ ] **Direct to**: select the button and enter the information you require. You can select by Identifier (ie KBED) or enter other information you may have (e.g airport name)

GPS - GARMIN 430

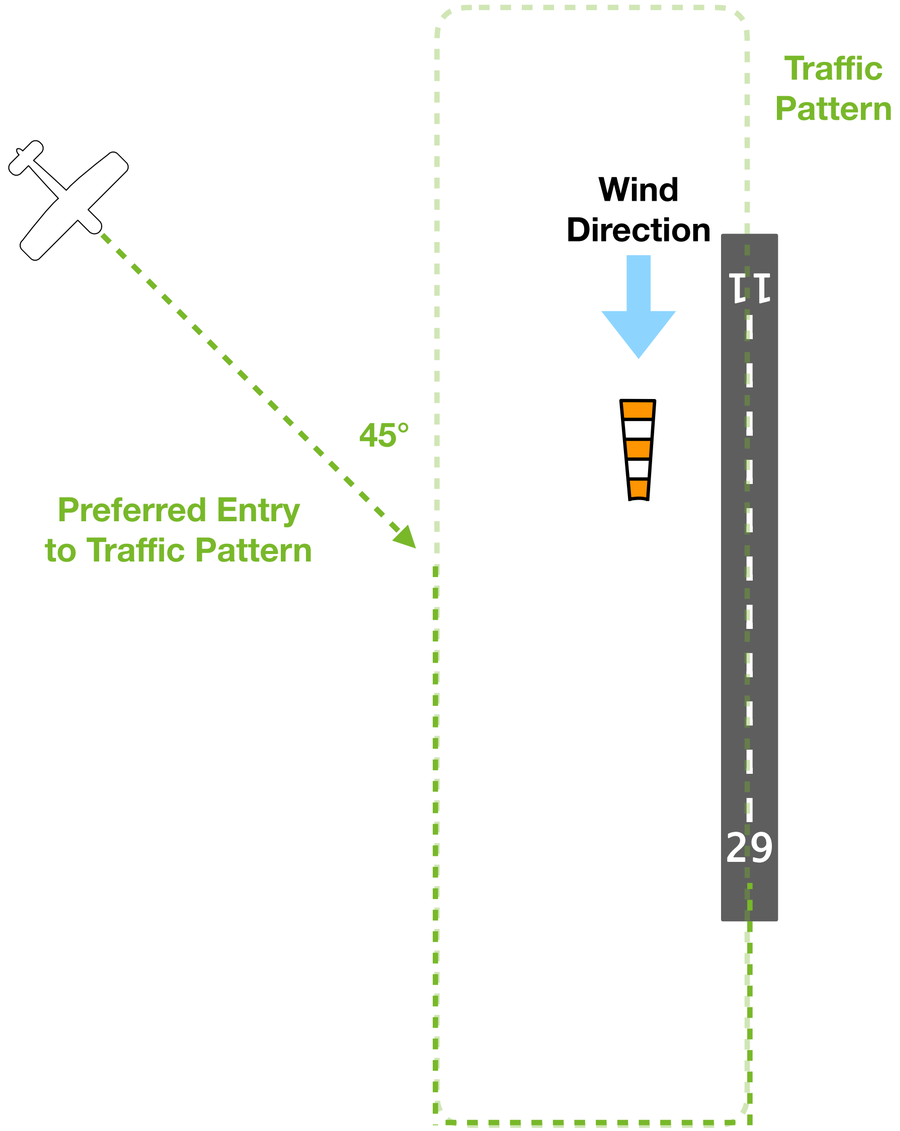
Navigating using GPS (If installed)

- [ ] Flight Plan Function

- [ ] **FPL** allows you to enter your Departure and Destination airports with the chosen checkpoints that make up your flight plan into the GPS for navigation purposes

ENTRY TO THE TRAFFIC PATTERN

- [ ] Entry to traffic pattern downwind on 45° (preferred)
- [ ] Fly proper leg / ground track make 90° turns
- [ ] Traffic awareness and avoidance
  - Monitor Airport Tower Frequency / CTAF
  - Clear left & right before entering pattern or making turns.
  - Self announce at untowered airport
  - Clear to the outside on final before turning final



ABORTED LANDING / GO AROUNDS

REJECTED LANDINGS / GO AROUND

Whenever landing conditions are not satisfactory, a go-around is warranted. There are many factors that can contribute to unsatisfactory landing conditions.

Note: The go-around is not strictly an emergency procedure. It is a normal maneuver that is also used in an emergency situation.

When to execute a go-around

- **Anytime you believe safety is (or could be) compromised** and that there is a risk to the you or other's safety is at risk.
- You've **floated well past your touchdown point** - If you are landing too far down the runway to stop safely. The rule of thumb says that if the aircraft isn't on the ground in the first third of the runway — go around.
- If you are **not stabilized** for the approach by 500' AGL (VFR) i.e the speed or the alignment isn't right, go around (including no landing clearance)
- If there is the **presence of another aircraft, vehicle or person on the runway**.
- Experiencing severe **wind shear**
- **Air traffic control** requests / requires a go-around
- After a hard bounce, go-around **to avoid porpoising**
- You **overshoot your base to final turn**
- You realize you **forgot to complete your checklists** or you're **not configured for landing**.
- **It just doesn't "feel right."**

PERFORMING A GO AROUND

When the decision to go around is made the following steps should be carried out:

Power

The instant a pilot decides to go around, **full or maximum allowable takeoff power must be applied** smoothly and without hesitation and held until flying speed and controllability are restored.

Attitude

Attitude is critical when close to the ground, and when power is added, a deliberate effort on the part of the pilot is required to **prevent the nose from pitching up prematurely**. An attitude is maintained that permits a buildup of airspeed well beyond the stall point before any effort is made to gain altitude or to execute a turn.

Configuration

After establishing the proper climb attitude flaps must be configured to remove high drag. (and secondly landing gear if retractable - in case the airplane inadvertently touches down as the go-around is initiated

Communications

You must notify ATC / CTAF of your intentions to go around. This is the last step. Safety of the airplane is the priority - Once you have completed the previous step you may nofify others of your intention to go aound

PERFORMING A GO AROUND

The 5 C's of a Go-Around

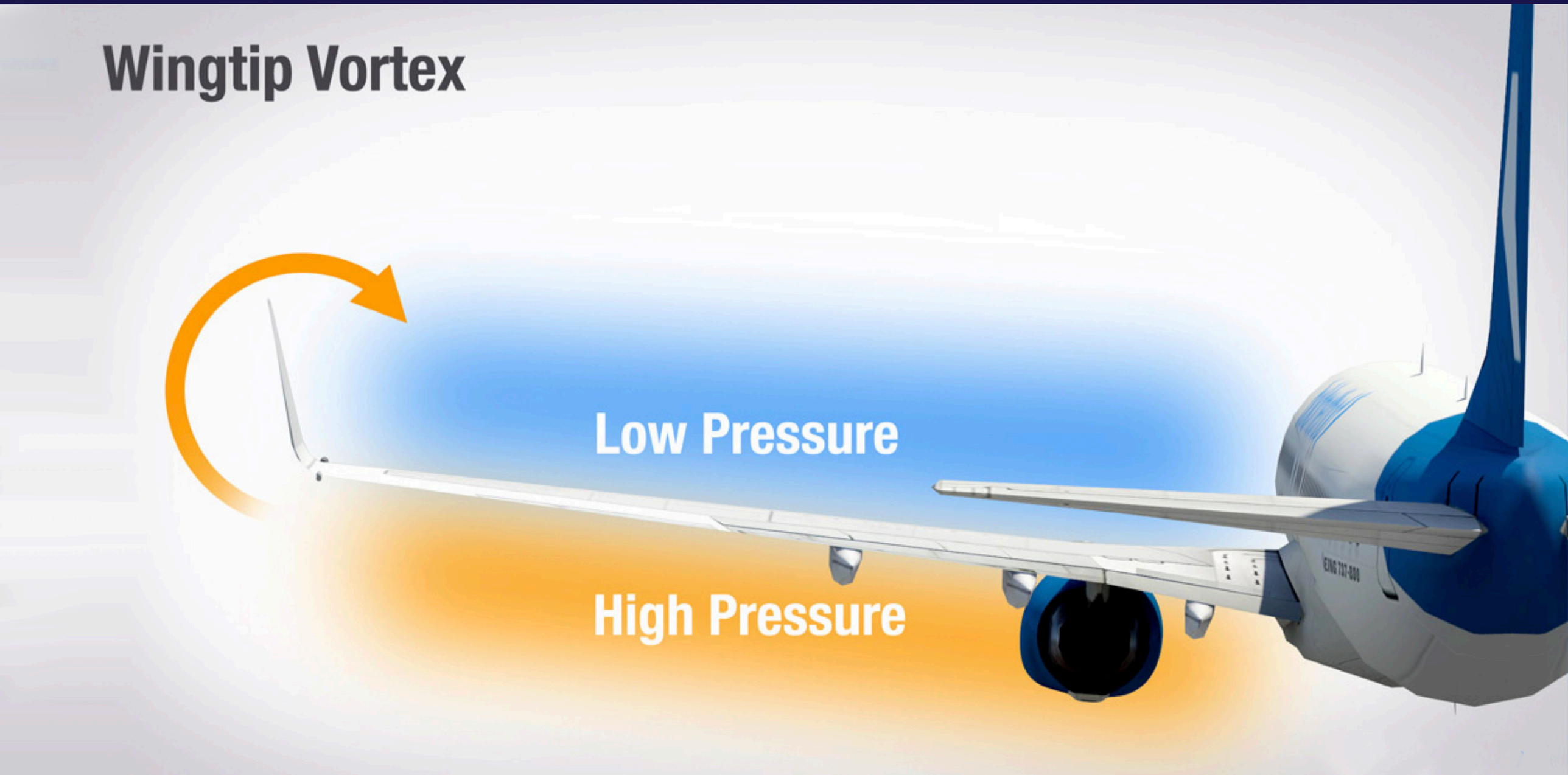
- **Cram** - Full Power
- **Climb** - At Vx or Vy as Appropriate
- **Clean** - Retract Flaps and Landing Gear
- **Cool** - Open Cowl Flaps (if applicable)
- **Call** - Inform ATC of Go-Around Decision

WAKE TURBULENCE AVOIDANCE

WHAT IS WAKE TURBULENCE

- It easy to think that wake turbulence only comes from very large jet aircraft like a fully loaded 747 or large Airbus.
- However, “large” aircraft come in many sizes smaller than a 747 - especially when you are flying a Piper Warrior or a Cessna 172.
- Those larger aircraft still represent an issue to smaller training aircraft.
  As a result, it is important to practice wake turbulence procedures **anytime** you are landing or taking off after a larger aircraft than what you’re flying.

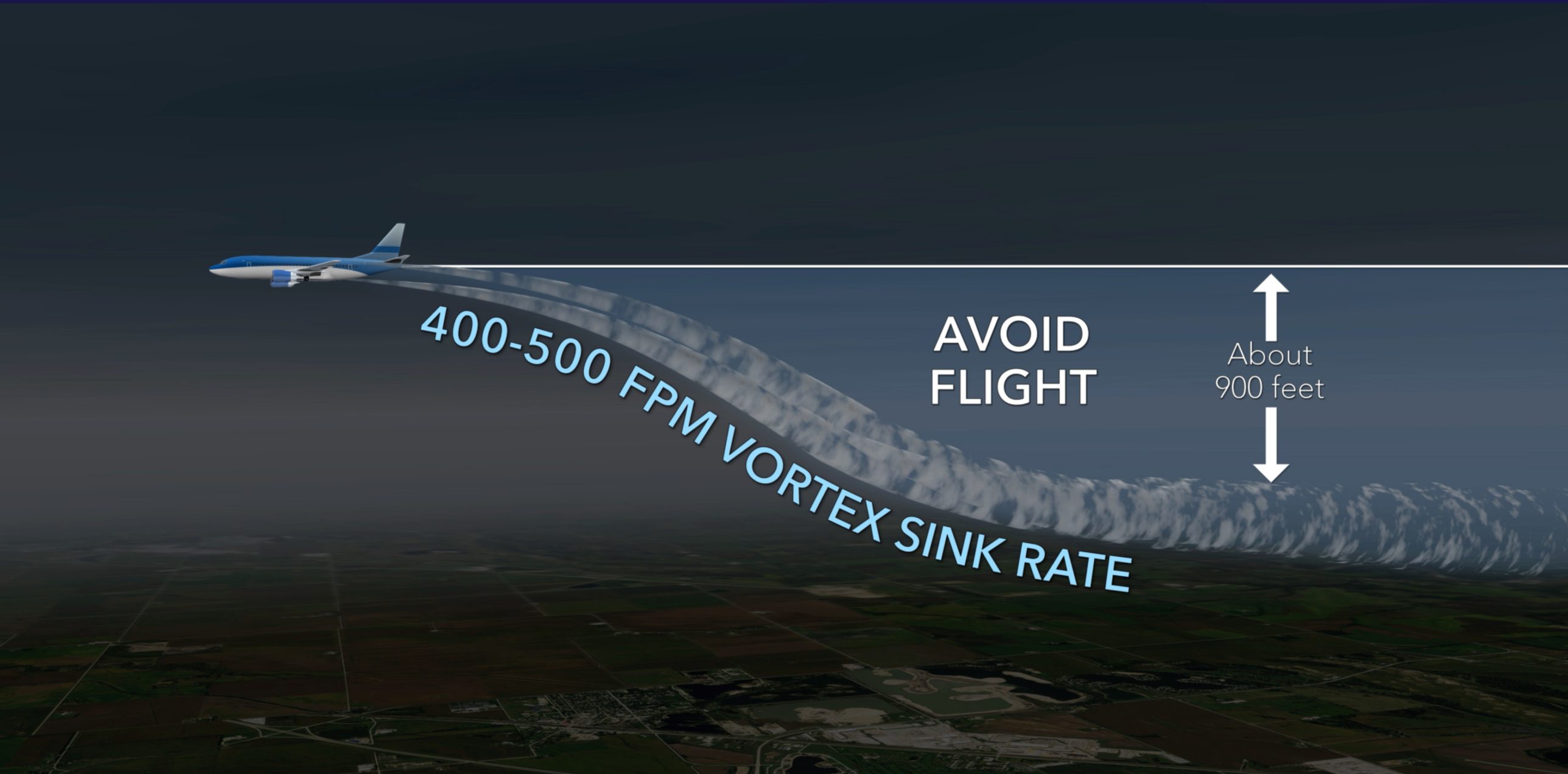
WING TIP VORTICES



WAKE TURBULENCE AVOIDANCE PROCEDURES

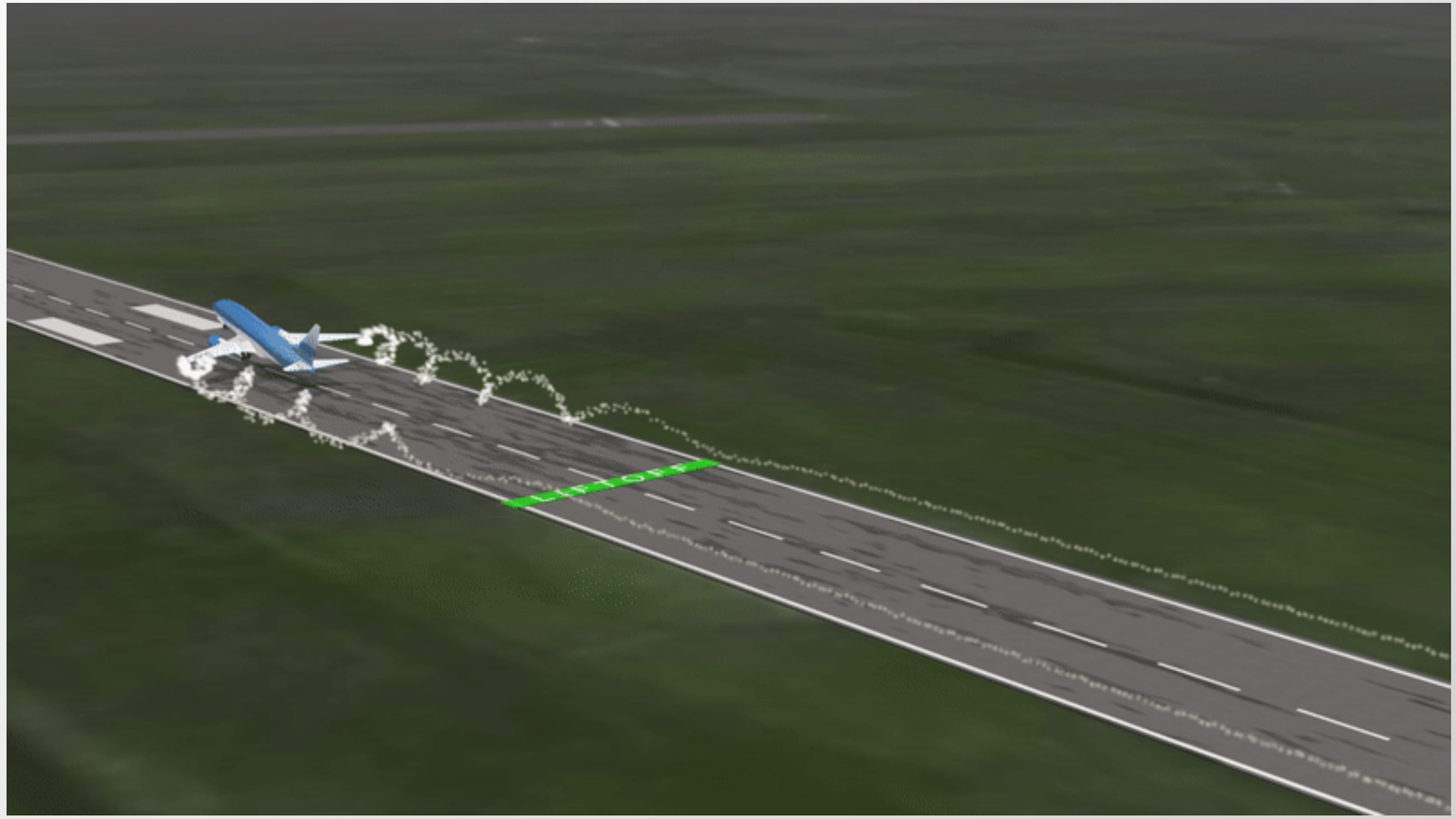
While en route or flying near a large airplane in the terminal environment, avoid flying under the flight path as the wake vortices will sink below the flight path at a rate of **400-500 FPM**

WINGTIP VORTEX

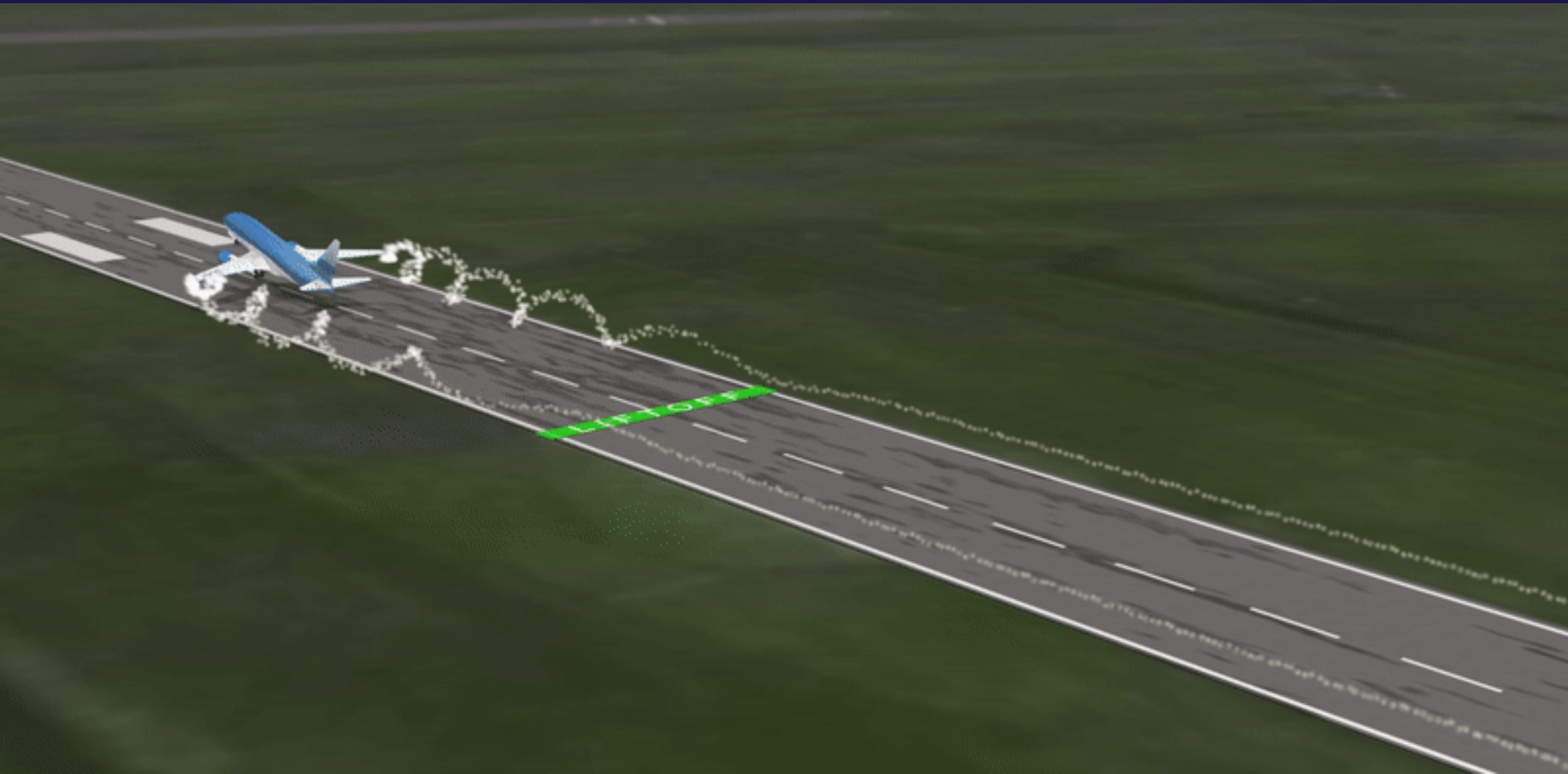


WAKE TURBULENCE AVOIDANCE PROCEDURES

Taking off behind a large airplane – **rotate prior** to the point at which the preceding aircraft rotated and **make a turn into the wind if possible**

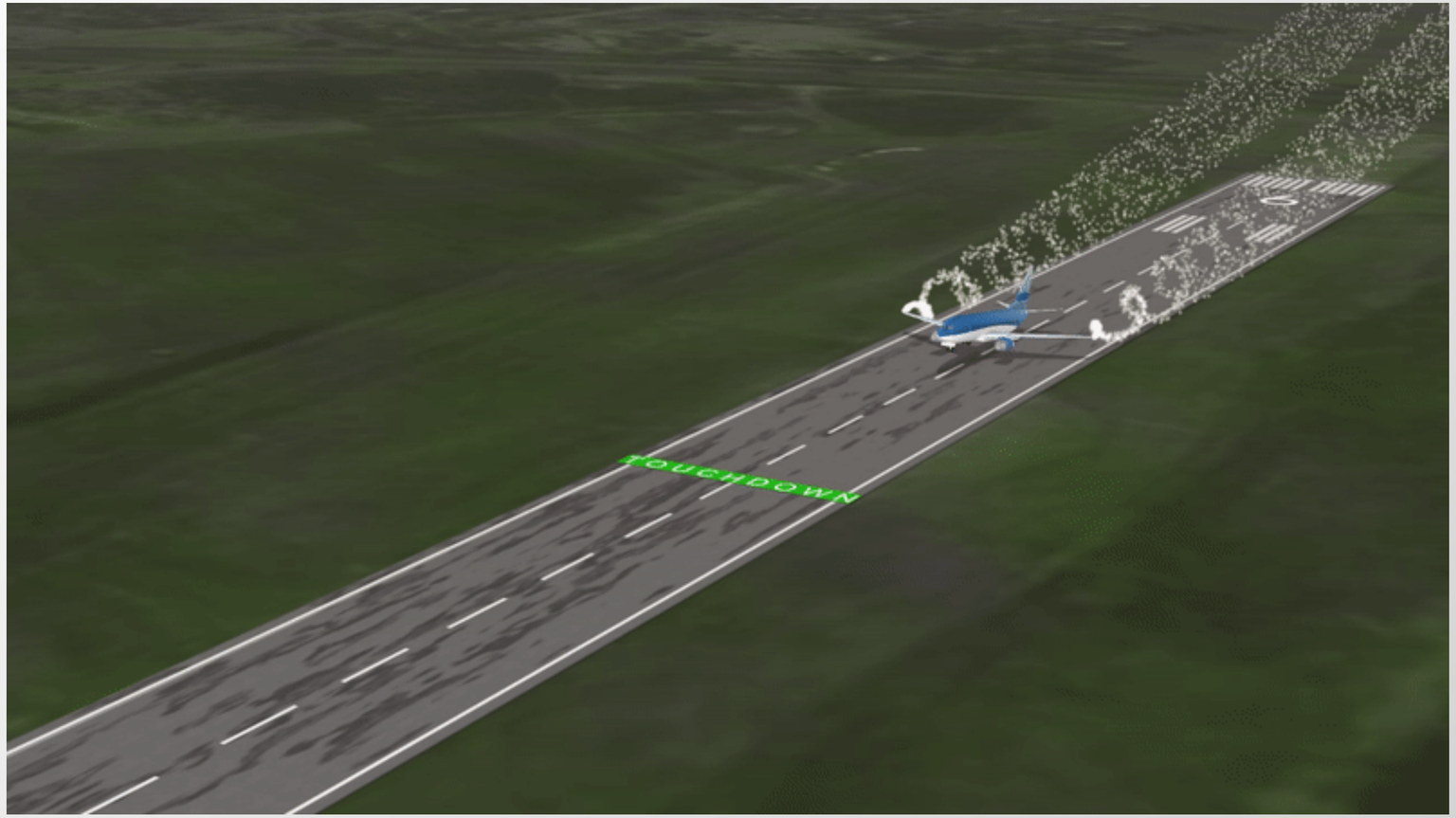


AVOIDING WAKE TURBULENCE - TAKING OFF



WAKE TURBULENCE AVOIDANCE PROCEDURES

Landing behind a larger airplane – approach the runway above the preceding airplane's path and touch down **aft of the point** where the other airplane's wheels contacted the runway:

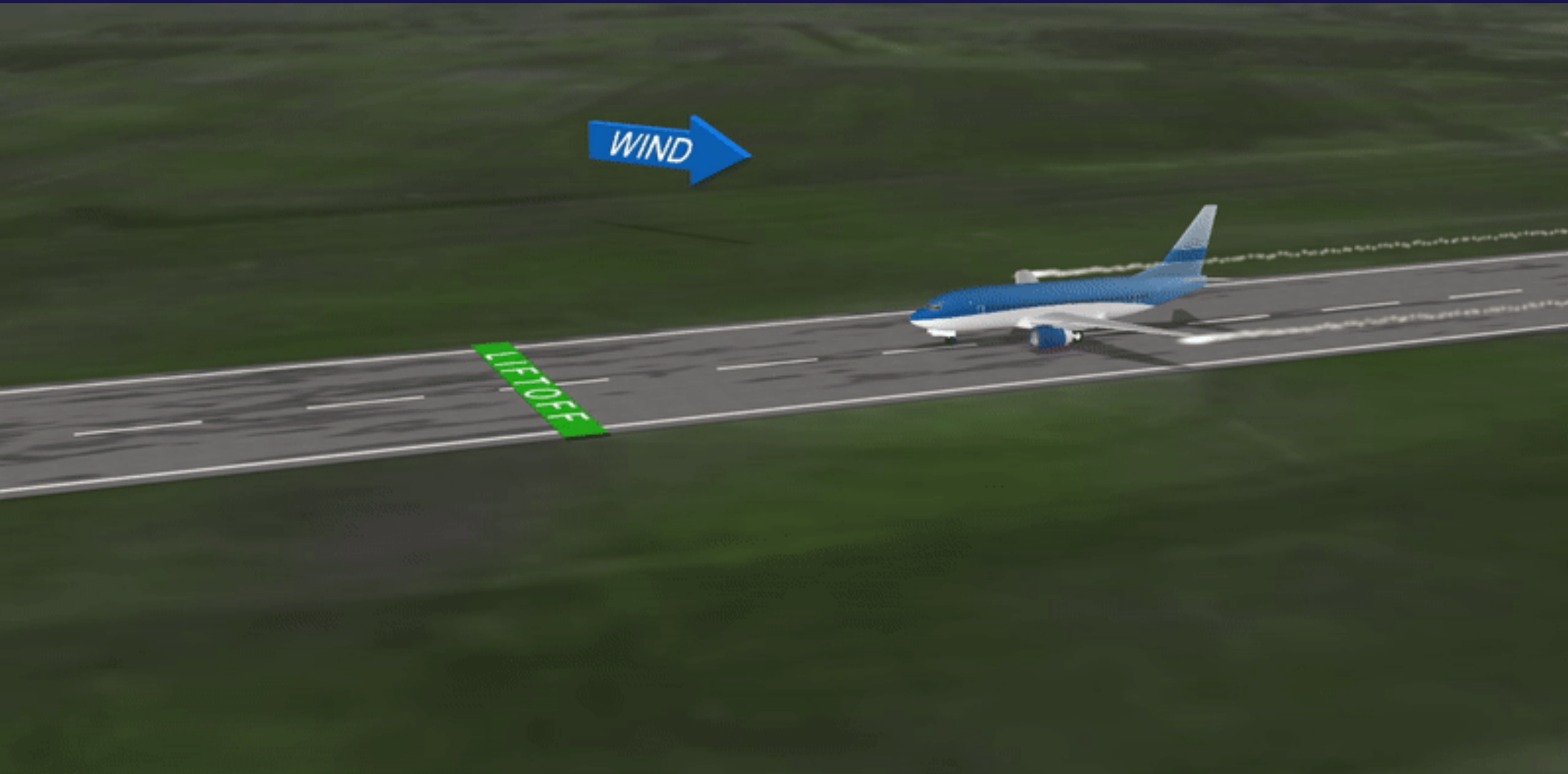


AVOIDING WAKE TURBULENCE - LANDING

WAKE TURBULENCE AVOIDANCE PROCEDURES

Landing behind a departing airplane – touch down **before the point** where the other airplane **lifted off**:

AVOIDING WAKE TURBULENCE - LANDING



SQUAWK CODES

Squawk codes are entered into the aircraft transponder.

They allow ATC to identify your aircraft on radar.
Squawk codes also allow pilots to transmit descreet codes to allow ATC to identify aircraft in distress / lost communications / military intercept etc.

1200 VFR
7500 Hijack *(75-Man with a knife)*
7600 Lost Communications *(76-Radio needs to be fixed)*
7700 Emergency - *(77 Falling from heaven)*
7777 Military Intercept

Mayday Mayday Mayday - Used for life threatening situations
Pan pan - Pan pan - Pan pan - Used in non life threatening situations

LOST PROCEDURES

LOST PROCEDURES

DONT PANIC & REMEMBER THE 6 C's

CONFIRM - recall your prior steps and actions, try to determine where you went off course!

- Verify your heading
- En-route check points.
- Check the elapsed time since departure
- Your airspeed to work out how far you have travelled

CHECK FREQUENCIES - ensure you're talking to "someone"

- Check your last frequncy or other known frequencies
- Check nav (VOR) frequencies)
- Re-tune and verify as necessary

CLIMB - If able begin a climb to a higher altitude

- Gives better visibility
- Better Use of Nav Aids
- Better Radio Range
- Best glide range

CIRCLE - Stay where you are rather than becoming "more lost"

- Do turns around a point
- Try to spot your last checkpoint
- Attempt to workout your position as you circle

COMMUNICATE - Try to contact any nearby facilities - use the frequencies on your charts

CONFESS - Inform ATC that you are uncertain of your position. Let them help you! That's why they are there after all!

YOU CAN DECLARE AN EMERGENCY ON 121.5 AND SQUAWK 7700 IF THE SITUATION IS THREATENING - I.E LOW FUEL etc