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What is IFR?

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- MIT alumnus Jimmy Doolittle
 - <https://www.technologyreview.com/s/508281/flying-blind/>
 - First "blind flight" in 1929
- A system of procedures and technologies to avoid hitting things you can't see
- Instrument Flight Rules (IFR)
 - Flight must be conducted by reference to the flight instruments
- Instrument Meteorological Conditions (IMC)
 - Visual flight cannot be safely conducted
- Goal is to stay safe even though we can't see out the window

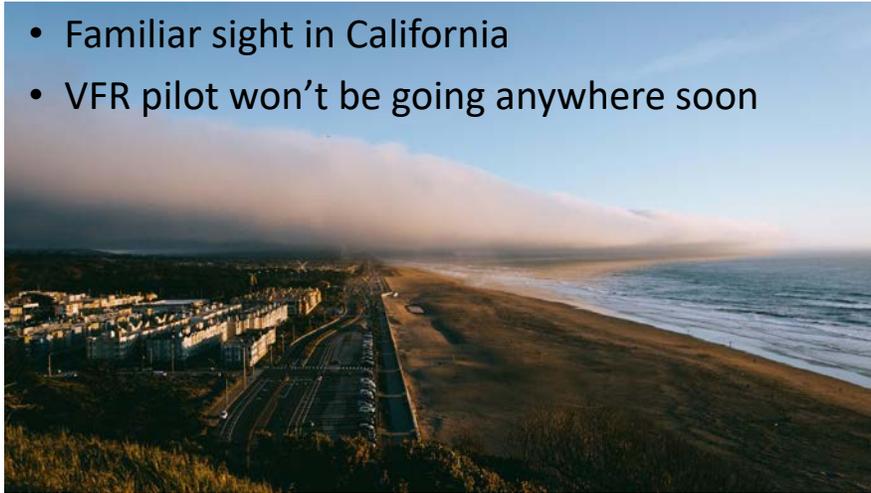
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Why IFR?

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- Familiar sight in California
- VFR pilot won't be going anywhere soon



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Why IFR? (cont'd)

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- Makes you a better, safer VFR pilot.
- Clouds & vis are difficult to forecast beyond the current day (and esp. beyond a few days)
- Don't get trapped because of a thin layer!
 - VFR on top



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Instrument PPL Requirement

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FAR 61.109 requires, in part:

- 3 hours of flight training in a single-engine airplane on the control and maneuvering of an airplane **solely by reference to instruments...**



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Luke Jensen

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Components of the IFR system

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- ATC
 - Responsible for separation of IFR traffic
 - Assigns altitudes, headings, routes, clearances
- Nav aids (e.g, Radio, GPS)
- Radar and transponder
 - Radar alone can't provide accurate altitude, so xpdr broadcasts that

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Components of the IFR system (cont'd)

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- ADS-B
 - Overcomes some limitations of radar
- Departures, Airways, Arrivals
 - All are designed to ensure terrain avoidance
 - Focus on minimums and margins of safety

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Phases of an IFR flight

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1. Pre-flight planning
2. Filing a flight plan
3. Departure
4. Enroute
5. Approach and Landing

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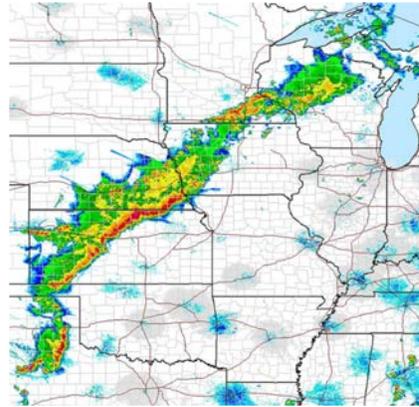
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Pre-flight planning

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- Flight can be made safely with good judgment and planning; wait for front to pass
- Use weather forecasts and in-cockpit data (ADS-B or XM) to stay clear of icing and thunderstorms
- Jets fly right over the top of most of this



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Pre-flight planning (cont'd)

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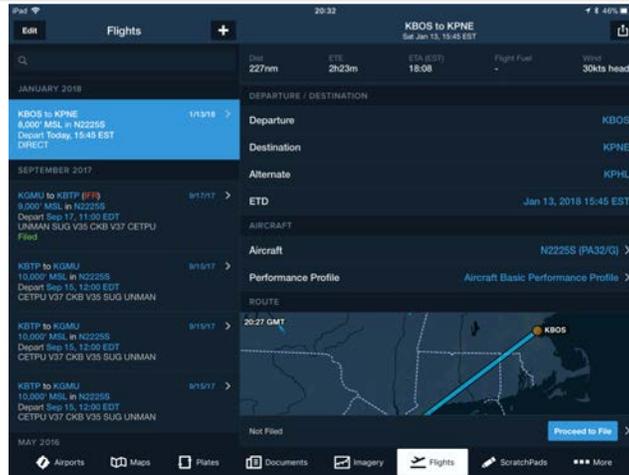
- Will we need an alternate? 1-2-3 rule
 - 1 - During the time **1** hour before to **1** hour after the estimated arrival time
 - 2 - Ceiling less than **2,000** feet
 - 3 - Visibility less than **3** miles
- Note that airlines also may require a takeoff alternate
 - In a jet, you work out almost all problems after you're in the air
- Rule of thumb for GA: don't take off out of an airport you can't get back into!

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Filing a flight plan

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Selected Radial Cross-Check

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- Pilot looks at attitude indicator 80-90% of time
- Quick glances at the other flight instruments
- Eyes always move by way of the attitude indicator

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Safety considerations for GA IFR

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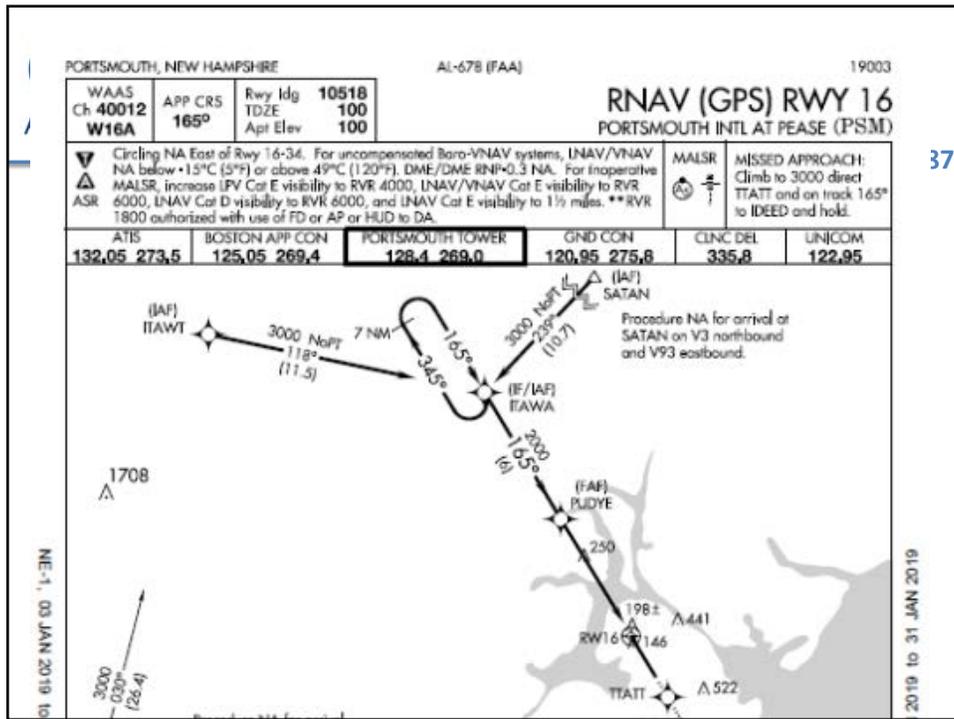
- Weather: ice, t-storms (20 miles) ... embedded thunderstorms
- Personal minimums ... what's legal vs. what's smart
- Two pilot crew, like the airlines
- High quality autopilot can increase safety
 - FAR 135 reflects this
 - no single-pilot IFR without an autopilot and the autopilots on charter planes tend to be pretty awesome
- Currency ... safety pilot and simulated IMC



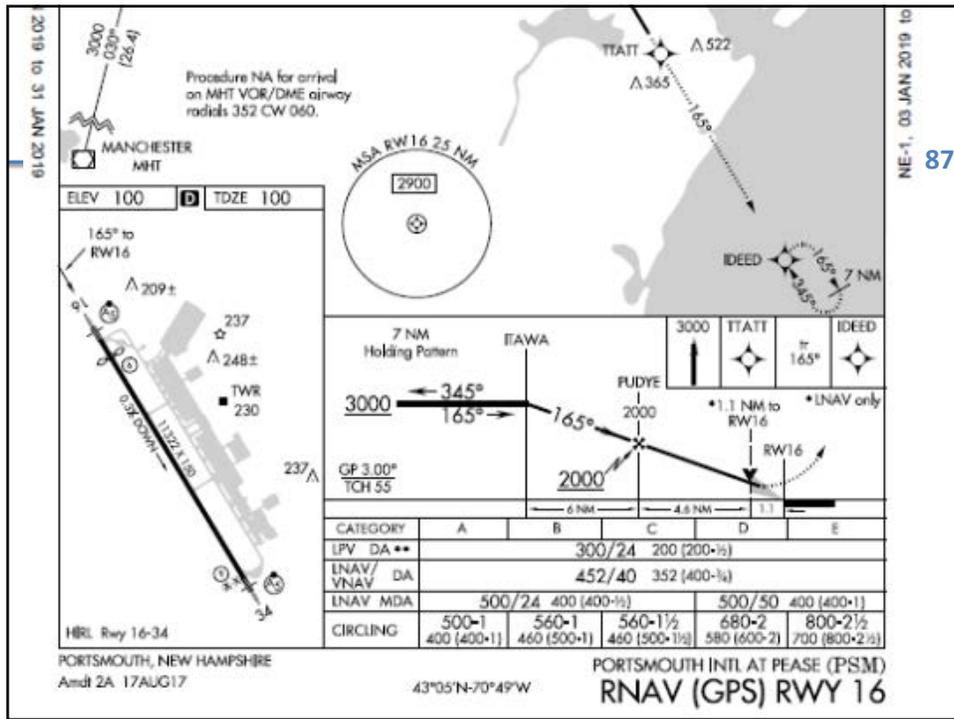
Approach Plate

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How can I get IFR rating?

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- 14 CFR § 61.65
 - Good AOPA article: <http://bit.ly/2D6NreN>
 - 50 hours XC time
 - 40 hours actual/sim
 - 15 hours dual instrument training
 - One long cross-country flight under IFR

14 CFR § 91.109

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- Flight Instruction and Simulated IFR
 - Aircraft must have dual controls (with 1 exception)
- Simulated instrument flight requires safety pilot



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How can I get IFR rating?

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- "Train the way you fight"
 - Train in equipment that you use in real world
 - Train real-world missions that you expect to fly in the future
- Advice from Philip
 - Do a serious cross-country trip, like California and back, and spend more money but get fully comfortable with the real challenges.
 - Fly an approach at least once every flight hour.

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Questions?

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