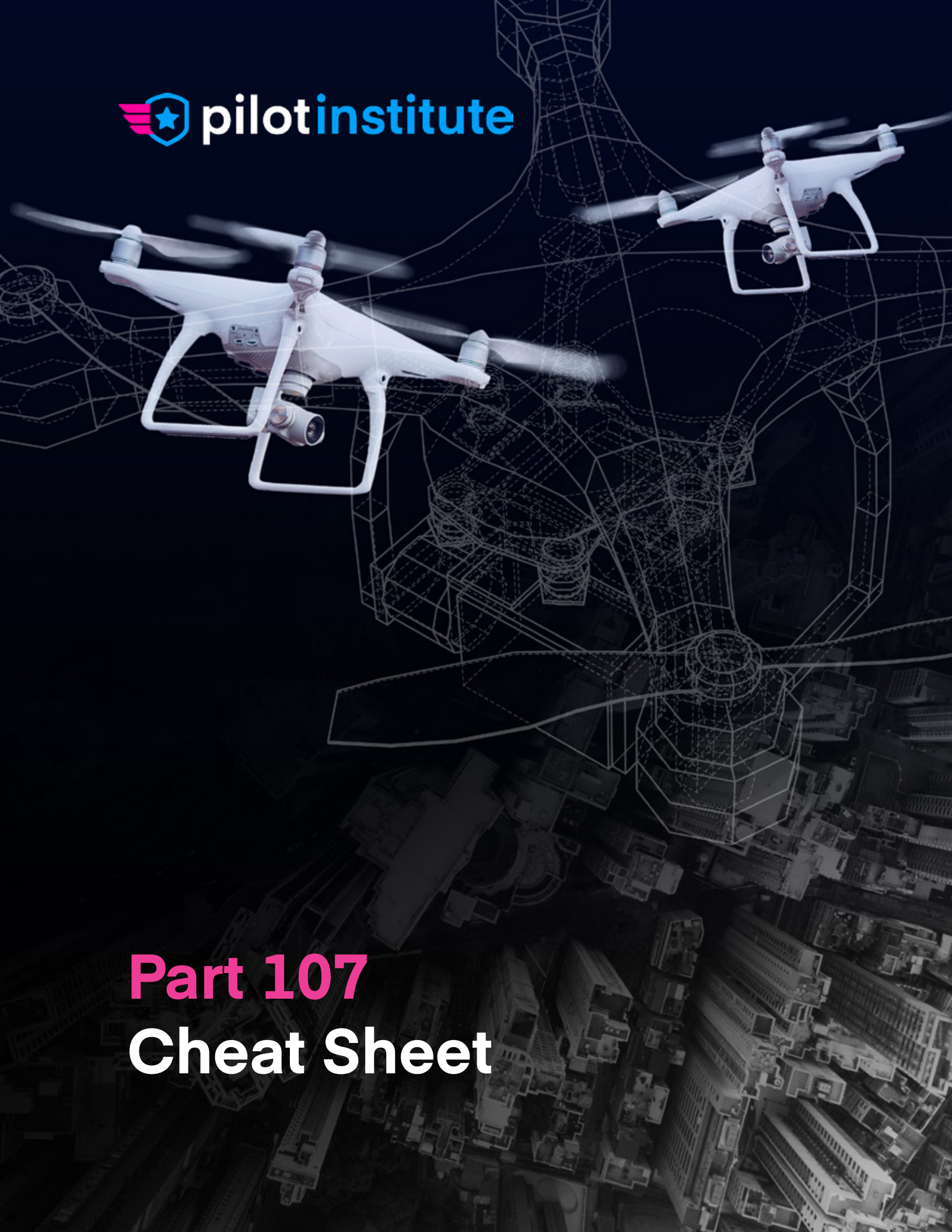

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Part 107
Cheat Sheet

Quick figures

<55	The maximum weight in pounds of a drone that you can fly legally with a Part 107 license
>0.55	The minimum weight in pounds of a drone that needs to be registered with the FAA
13	The minimum age for a person to register a drone
16	The minimum age for an applicant for the Part 107 drone license
100	The maximum groundspeed in mph (or 87 knots) that you are legally allowed to fly your drone
1	The maximum number of drones that any single Remote PIC can fly simultaneously
400	The maximum AGL altitude in feet that you can fly your drone if there are no taller structures within a 400-foot radius
30	The number of minutes before sunrise or after sunset that is considered "civil twilight". You can fly your drone during twilight if you have the appropriate anti-collision lighting.
45-50	The critical bank angle in degrees where a drone experiences a dramatic increase in loading
3	The number of statute miles needed for minimum visibility to fly a drone
500	The minimum distance in feet that you are supposed to fly below a cloud
2000	The minimum horizontal distance in feet that you must fly from a cloud
8	The number of hours that must have passed after consuming alcohol before you can fly a drone. Take note that you have to be physical and mentally fit to fly a drone, even after the 8-hour window has passed.
0.04	The maximum blood alcohol level that will allow you to fly a drone legally
10	The number of days within which you are required to report to the FAA any drone-related accidents
30	The number of days within which you must notify the FAA if a change in your address
90	The number of days of lead-time that the FAA recommends for filing a Part 107 waiver request
24	The number of calendar months when the results of the Part 107 knowledge test remain valid
3	The number of years before a UAS registration expires

Airspace Classification

Controlled Airspace – airspace in which air traffic control (ATC) has authority; typically established in areas near airports

Legend	Airspace class	Description
	Class B Airspace	Covers the surface up to 10,000 feet MSL
	Class C Airspace	Covers the surface up to 4,000 feet AGL
	Class D Airspace	Covers the surface up to 2,500 feet AGL
	Class E Airspace with floor at surface	
	Class E Airspace with floor at 700 ft AGL	
	Class E Airspace with floor at 1200 ft or greater AGL	

Class G Airspace

Uncontrolled airspace; needs no ATC authorization to fly a drone

Other codes in sectional charts to remember

Code	Airspace class	Description
P-####	Prohibited areas	Flight is prohibited due to security issues
R-####	Restricted areas	Flight is prohibited when the area is active. Stay away due to dangerous activity
W-####	Warning areas	May fall outside US jurisdiction; Flight is not necessarily prohibited but can be dangerous
MOA	Military operation areas	Flights are allowed but the area may contain an unusually high volume of aerial activity
A-####	Alert areas	Areas that contain an unusually high volume of aerial activity
VR-### or IR-####	Military training route	Routes used by the military for tactical flight training; typically established at altitudes below 10,000 feet

Regulation
(updated in 2021)

Operation over human beings

Sustained flight includes **hovering** above the heads of persons gathered, flying **back and forth**, or **circling** in such a way that the small unmanned aircraft remains above some part of the assembly.

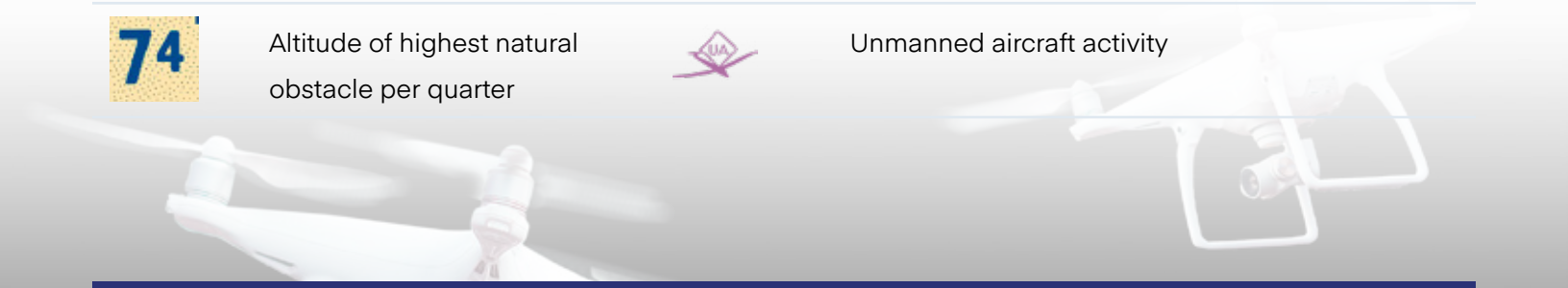
Open Air Assembly refers to **large gathering** of people, typically in public places.

	Category 1	Category 2	Category 3
Weight limit	0.55 lbs or less	Less than 55 lbs	
Eligibility Requirements Requirements	No exposed rotating parts than can cause laceration	No exposed rotating parts than can cause laceration	
		No Defect	
		11 foot-pounds of kinetic energy limit	25 foot-pounds of kinetic energy limit
MoC & DoC	None	Required	
Label Requirement	None	Labeled as Category 2	Labeled as Category 3

	Category 1	Category 2	Category 3
Sustained Flights over Open Air Assembly	Yes, if UAS meets Remote ID requirements	Yes, if UAS meets Remote ID requirements	No.
Sustained Flights anywhere else	“Yes”	“Yes”	If inside restricted area and people are notified or outside restricted if under a structure or inside non-moving vechile.
Transitioning over Humans	Yes, including Open Air Assembly*	Yes, including Open Air Assembly*	Yes, but not over Open Air Assembly

In-air hazards and other obstacles

Legend	Definition	Legend	Definition
	Man-made obstacles below 1000 AGL	4977 (1432)	Group obstacles
	Man-made obstacle above 1000 AGL	2049 (1149)	Top number is altitude mean sea level (MSL) and bottom number in parantheses is number above ground level (AGL)
	Lighted obstacles	5000 (1500)UC	Obstacle under construction
U	Ultralight activity		Parachute jumping area
G	Glider operations	H	Hang glider activity
74	Altitude of highest natural obstacle per quarter	UA	Unmanned aircraft activity



Other things to remember

TFR

Temporary Flight Restriction. These are issued by Flight Data Centers (FDC) for extreme but temporary situations such as a major sports event, airshows, the passing of a flock of birds, or disaster relief efforts.

NOTAM

Notice to Airmen. These are notices or advisories that contain information about the establishment, conditions, or changes in any aeronautical facility, service, procedure, or hazards. All users of the national airspace should check for NOTAMs in their area because they indicate the real-time status of features and services within national airspace.

How to read a NOTAM

!IKK 02/098 ZAU OBST WIND TURBINE FARM WITHIN AREA DEFINED AS 2.5NM RADIUS OF 414105N0890743W (9.8NM NE C82) 1424FT (264FT AGL) NOT LGTD 1502051656-1512312359EST

Code	Airspace class	Description
!IKK	Location	Kankakee Flight Service in Illinois
02/098	NOTAM number	NOTAM was released in February and is the 98th NOTAM released by IKK
ZAU	Affected location	Chicago Center
OBST	NOTAM keyword	Obstruction
Various	Detailed description	The NOTAM informs pilots that there is a wind turbine farm at a location of 414105N 890743W with a distance radius of 2.5 nautical miles (2.5NM). Further, the NOTAM also states that the farm is located 9.8 nautical miles north-east of C82 (9.8NM NE C82), which refers to the Compton Bressler Airport.
Various	Remarks	The inclusive altitude of the wind farm is at 1424 feet or 264 feet AGL. The NOTAM also remarks that the wind farm is not lighted (NOT LGTD)
1502051656-1512312359	Beginning and end times	The effectivity of the NOTAM is limited from 1656H of February 5, 2015 (1502051656) to 2359H OF December 31, 2015 (1512312359).

Aviation and Weather

METAR

- Meteorological Terminal Aviation Routine Weather Report
- A report on current weather conditions that is delivered on a regular schedule

TAF

- Terminal Aerodrome Forecasts
- A report transmitted by large airports concerning their five-mile radius and is updated four times a day

SIGMET

- Convective Significant Meteorological Information
- A reported that is issued when severe weather conditions (thunderstorms, tornadoes, heavy precipitation) are forecasted

How to Read a METAR

METAR KCLE 220136Z COR 31006KT 10SM SHRA FEW020 BKN024 OVC049 22/21 A2984 RMK A02 RAE04 P0000 T02220206

Code	Airspace class	Description
METAR	Type of report	Can be either METAR (scheduled) or SPECI (unscheduled)
KCLE	Station identified	Cleveland Hopkins Airport
220136Z	Date and time	Issued on the 22nd day of the month at 01:36 Zulu time
31006KT	Wind information	Wind is coming from a direction of 310° and at a speed of 6 knots
10SM	Visibility	Visibility is at 10 statute miles
SHRA	Present weather	Shower (SH) and rain (RA)
FEW020 BKN024 OVC049	Sky conditions	Few clouds up to 2000 feet, broken clouds up to 2400 feet, and overcast conditions at 4900 feet
22/21	Temperature and dew point	The current temperature is at 22 °C with a dew point of 21 °C
A2984	Current sea level pressure	The current pressure at sea level is 29.84 inHg
Everything after RMK	Remarks	The report was issued by an automated station with a precipitation sensor (A02), the rain has ended at 4 minutes past the hour (RAE04), there has been no precipitation within the hour (P0000) and the hourly temperature and dew point is 22.2 °C and 20.6 °C (T02220206).

Other weather terms to remember

Dew point

The temperature at which air moisture starts to condense into dew drops.

Temperature inversion

When the temperature increases with altitude characterized by stratiform clouds, poor visibility, steady precipitation, and smooth air.

Warm front

A boundary between two air masses where a warm mass advances. This typically moves slowly, at 10 to 25 mph.

Stationary front

A boundary between two air masses that is relatively balanced. This produces hazy conditions with overcast clouds and steady precipitation.

Cumulous clouds

Puffy cloud formations brought about by the vertical movement of unstable warm and moist air into cooler regions at high altitudes.

Wind shear

A condition in which a sudden and drastic change in wind speed and/or direction creates very strong updrafts or downdrafts. This is usually a result of frontal systems, thunderstorms, temperature inversions, or upper level winds.

Stable air

Characterized by stratiform clouds, poor visibility, steady precipitation, and smooth air.

Unstable air

Characterized by cumulus clouds, turbulence, showery precipitation, good visibility.

Cold front

A boundary between two air masses where cold and dense air advances. This moves much more rapidly – around 25 to 30 mph. It can also bring heavy rains, lightning, or hail. Severe cold fronts can bring tornadoes.

Stratiform clouds

Thin cloud layers with little or no vertical movement. Typically indicative of fair weather.

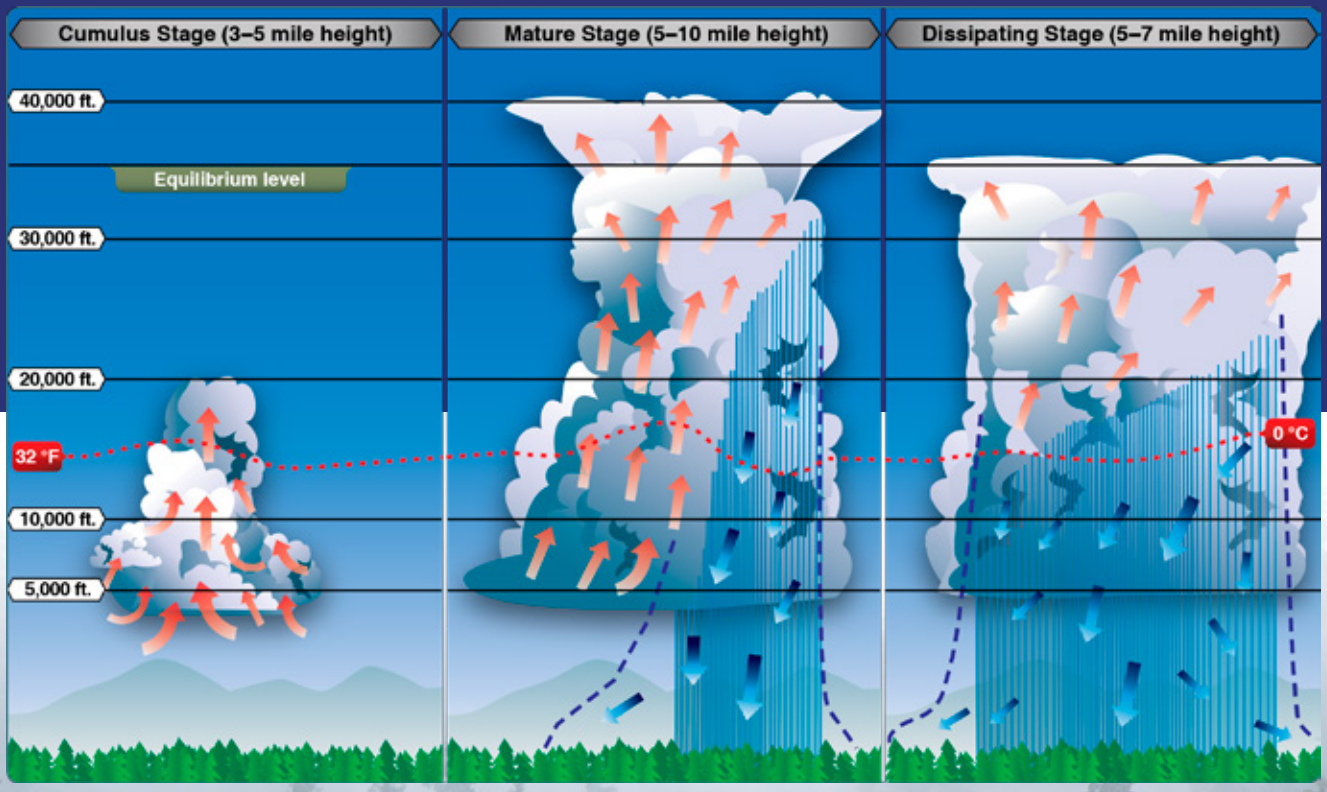
Cumulonimbus clouds

Clouds that continue to grow and may form into thunderstorms. Associate with extremely turbulent winds.

Thunderstorms and Fog

Thunderstorm

Thunderstorms form when the air has sufficient water vapor, an unstable lapse rate, and an initial lifting action to start the process. There are three phases to a thunderstorm, the cumulus stage, the mature stage (characterized by rain falling on the ground), and the dissipating stage.



Fog

Radiation Fog

Occurs when the ground cools rapidly and the surrounding air reaches the dew point. Can lead to ice fog in extremely cold temperatures.

Advection Fog

Occurs when a layer of warm, moist air moves over a cold surface. It can be created when an air mass moves inland from the coast, such as in San Francisco.

Upslope Fog

Occurs when a moist air mass is forced up sloping land, like mountains.

Steam Fog

Occurs when cool, dry air moves over warm water. This can be associated with low-level turbulence and icing.

Physiological conditions that can affect a drone pilot's performance

Hyperventilation — Loss of carbon dioxide to abnormal breathing patterns; can result in lightheadedness and visual impairment

Stress — Being under extreme physical or psychological duress; may lead to increased heart rate and respiration rate and poor decision-making.

Fatigue — Loss of focus and attentiveness due to prolonged performance of cognitive work

Dehydration — The critical loss of water from the body; can lead to headaches, cramps, dizziness, and sleepiness

Heatstroke — Prolongued exposure of the body to extremely high temperatures; may lead to dehydration and ultimately to loss of consciousness

Drugs — Certain drugs may lead to undesirable side-effects, such as drowsiness or other cognitive deficits. Part 107 only requires that drone pilots perform a self-assessment of their physical and mental state before conducting drone flight

Alcohol — Ingesting even small amounts of alcohol can lead to impaired sense and poor judgement. A person who has consumed alcohol within the last 8 hours, has a blood alcohol content above or equal to 0.04%, or is under the influence cannot act as a Remote PIC.

Another way to remember these factors is through the IMSAFE checklist:

- **I** - Illness
- **M** - Medication
- **S** - Stress
- **A** - Alcohol
- **F** - Fatigue
- **E** - Emotions

Any element in the IMSAFE checklist can be sufficient grounds to decide that the flight is a "no go."

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Night Operations

Strobe Light Requirements:
From Sunset to Sunrise, the aircraft must be equipped with a strobe light visible from 3 SM.

Cones detect color and are used for central vision. The highest concentration is in the back of the eye.

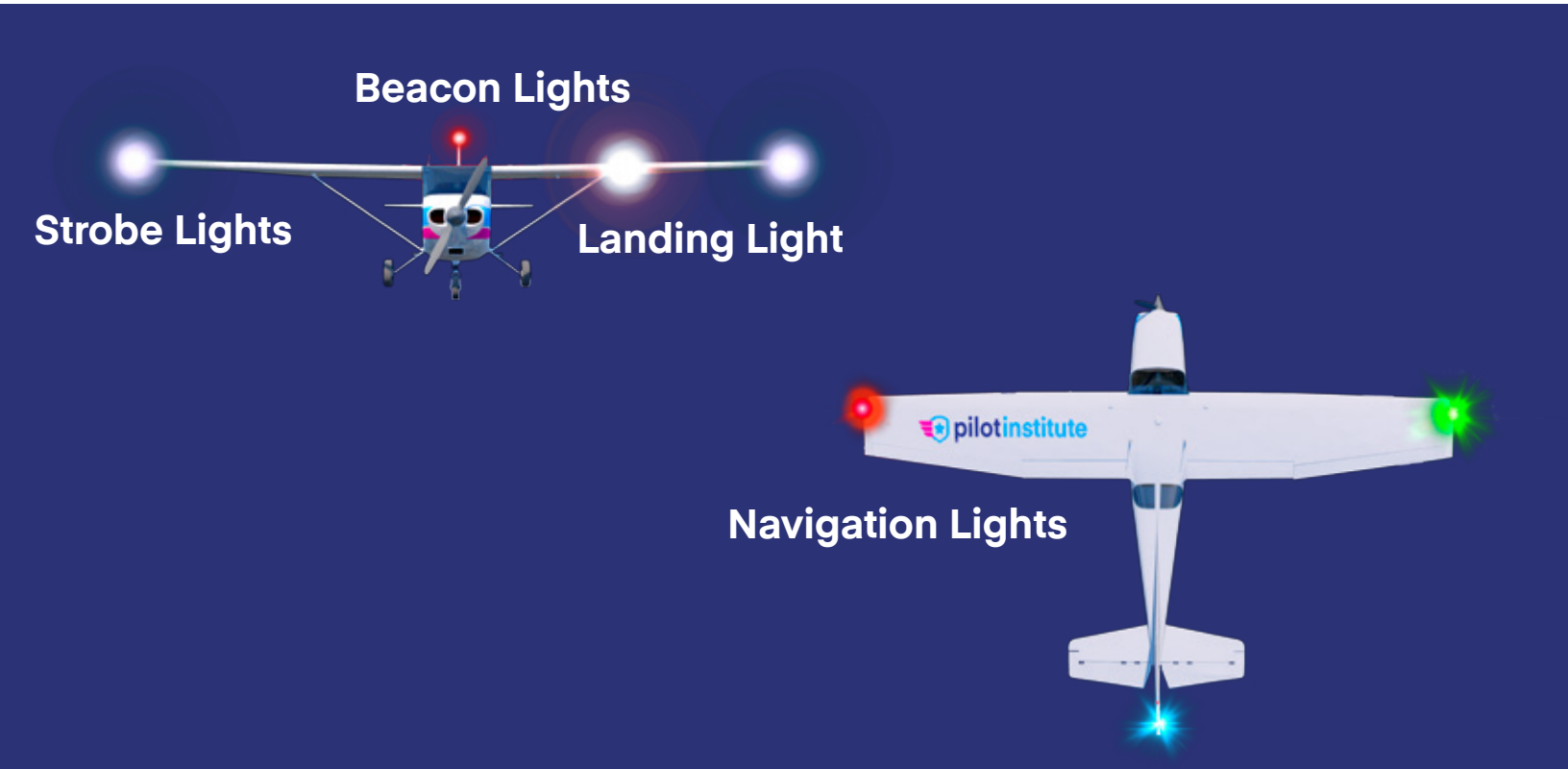
Rods detect movement and are used for peripheral vision. They are 10,000 times more sensitive to light than the cones.

Dark Adaptation takes 30 minutes, after which night vision is maximized. Avoid staring at bright objects at night.

Night illusions

- **Autokinesis: bright object appears to move if you stare at it.**
- **False horizon: clouds or lights appear to be the actual horizon.**
- **Reversible Perspective Illusion: the aircraft may appear to move away when it's actually approaching.**
- **Flicker vertigo: flashing lights can produce nausea, vomiting, and vertigo.**

Aircraft Lights



Decision-making and crew resource management

ADM

Aeronautical Decision Making. The systematic approach used by the aviation industry to determine the best course of action in any situation by assessing the risks involved.

Risk management

One of the core principles of ADM, which involves identification of hazards, assessment of risks, development of countermeasures, implementation of actions, and monitoring of results.

CRM

Crew Resource Management. This pertains to how you manage your crew, keep each member informed of their responsibilities, and integrate them all into the phases of your operation.

The PAVE Checklist is an easy-to-remember list that pilots can run through as a pre-flight exercise.

P Pilot-in-command "Am I ready to fly?

A Aircraft "Is the aircraft safe to fly? Can this aircraft carry the planned load?"

V enVironment "What is the weather forecast for the next couple of hours? Is there a temporary flight restriction? Am I flying in controlled airspace?"

E External pressure "Am I under time pressure to finish this job? Are there spectators that I might be compelled to impress? Can I stick to standard and risk-averse flight procedures?

Drone pilots must avoid the 5 Hazardous Attitudes when flying a drone:

Anti-authority Dislikes being told by authorities what to do and likes to disregard flight rules.

Impulsivity Prone to making decisions without taking the time to deliberate the consequences.

Invulnerability An unfounded belief that they will absolutely not run into accidents.

Machismo A desire to show off fed by attempting risky maneuvers.

Resignation A feeling of helplessness and resignation to let others do what must be done.

Radio communication standards

AWOS

Automated Weather Observing System. This is a suite of automated sensors that are used in aviation for weather forecasting. Depending on the type of AWOS facility, it can generate an automated weather report in the METAR format.

CTAF

Common Traffic Advisory Frequency. This is the common radio frequency used for air-to-air communications, allowing pilots to communicate with each other at un-towered airports. In the US, the CTAF is allocated as either UNICOM or MULTICOM.

UNICOM

Universal Communication. A UNICOM station is an air-to-ground communication facility that broadcasts to pilots in uncontrolled airports, or in airports with no towers. When operational, the UNICOM can also act as a CTAF. Air-ports that use UNICOM broadcast at the 122.8 radio frequency band.

MULTICOM

At airports with no air traffic control, pilots can self-announce advisories using the 122.9 or 122.95 MULTICOM radio frequency band.