DRONEZILLA PASS SHEETS™

FAA PART 107 RULES

FAA PART 107 / PASS SHEETS

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FAA PART 107 RULES

WHAT IS THIS?

The legal rules for operating drones under FAA Part 107. This sheet simplifies the core rules you need to fly safely, legally, and with confidence.

MEMORIZE THIS

- 400 ft AGL; structure exception
- VLOS required
- Right-of-way to all aircraft
- Over people: $107.39 / categories
- From / over vehicles: separate rules
- VLOS required unless waived
- Report serious injury, unconsciousness or other-property damage >$500 within 10 days.

TEST TRAP

Part 107 is about safe operations and minimizing risk to people and property. When in doubt, don't fly.

QUICK ANSWER

INCIDENTS: Serious injury, unconsciousness or other-property damage >$500: report within 10 calendar days.

PILOT REQUIREMENTS

1. 16+ YEARS OLD
2. ENGLISH PROFICIENCY — Read, speak, write and understand English; medical exception.
3. INITIAL TEST OR ELIGIBLE PART 61 PATH — Maintain knowledge recency every 24 calendar months.
4. TSA BACKGROUND CHECK — Complete TSA background check.

Also: physically and mentally able to operate safely. Eligible current Part 61 pilots have an alternate training pathway.

FLIGHT RULES

MAX ALTITUDE	400 FT AGL; STRUCTURE EXCEPTION
FLYING OVER PEOPLE	$107.39 EXCEPTIONS / CATEGORIES / WAIVER
VLOS — Visual Line of Sight	REQUIRED UNLESS WAIVED
RIGHT-OF-WAY	YIELD TO ALL AIRCRAFT
MOVING VEHICLE	FROM: sparsely populated; no transport of another person's property for compensation / hire. OVER: category + $107.145 conditions.

REPORTING RULE

REPORT WITHIN 10 CALENDAR DAYS: SERIOUS INJURY / LOSS OF CONSCIOUSNESS; OTHER PROPERTY* REPAIRS >$500, OR TOTAL-LOSS FAIR MARKET VALUE >$500.

Know who qualifies, what is prohibited, and when incident reporting is required.

KEY RULE SUMMARY

MAX ALTITUDE	400 FT + EXCEPTION
VLOS	VLOS / WAIVER
OVER PEOPLE	$107.39 EXCEPTIONS
MOVING VEHICLES	From: 107.25 / Over: 107.145
RIGHT-OF-WAY	YIELD TO AIRCRAFT

Direct participants / protected persons / categories / waiver.

FLIGHT RULE DETAILS

- **MAX ALTITUDE** — 400 ft AGL; near a structure: within 400 ft horizontally, up to 400 ft above its top. AGL = Above Ground Level. 

- **VLOS** — Maintain visual line of sight without aids other than corrective lenses. 
- **OVER PEOPLE** — Direct participants; protected people; eligible Category 1-4 operation; or an applicable waiver. 
- **MOVING VEHICLES** — FROM a vehicle: $107.25. OVER moving vehicles: meet § 107.145 conditions. 
Rural location alone does not permit flight over people.
- **RIGHT-OF-WAY** — Yield to all aircraft and airborne vehicles. 
See and avoid.

FAA PART 107 STYLE QUESTIONS

1. What is the maximum legal altitude for routine Part 107 operations? (A) 300 ft AGL (B) 400 ft AGL (C) 500 ft AGL — **Correct Answer: B** — Why: Routine limit is 400 ft AGL; §107.51 has a structure exception.
2. Which statement is true about visual line of sight (VLOS)? (A) It is optional if the drone has GPS (B) It is required under normal Part 107 operations (C) It only applies at towered airports — **Correct Answer: B** — Why: The remote pilot must maintain visual line of sight during normal operations.
3. A remote pilot wants to fly from a moving car in a populated city area. Is this allowed under Part 107? (A) Yes, anytime (B) Yes, if the drone stays under 400 ft (C) No, unless waived. Standard rule: sparsely populated area; no carriage of another's property for compensation / hire. — **Correct Answer: C** — Why: Sparsely populated area; no transport of another property for compensation / hire.
4. When must a Part 107 pilot report an incident to the FAA? (A) Within 24 hours for any hard landing (B) Within 10 calendar days for serious injury, unconsciousness or other-prosperity damage >$500 (C) Only if another pilot complains — **Correct Answer: B** — Why: Part 107 requires reporting certain incidents within 10 days.

REMEMBER

- Fly safe.
- Follow the rules.
- Respect the airspace.
- When in doubt, don't fly.

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01

DRONE WEIGHT + REGISTRATION

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DRONE WEIGHT + REGISTRATION

WHAT IS THIS?

Explains when drone registration is required, where to register and what information you need.

MEMORIZE THIS

- Register every Part 107 aircraft, regardless of weight.
- Recreational exception: 0.55 lb or less at takeoff under 49 USC §44809.
- Indoor-only flight needs no registration.
- $5 per Part 107 drone.
- Registration valid 3 years.

TEST TIP

Include everything attached in takeoff weight. Part 107 has no lightweight exemption.

QUICK ANSWER

Part 107: each aircraft. Recreation: over 0.55 lb.

A. WHEN TO REGISTER

- 0.55 LBS — Eligible recreational use: MORE THAN 0.55 lb at takeoff = register.
- Every Part 107 aircraft, even 0.55 lb or less.

B. WHEN REGISTRATION IS NOT REQUIRED

- 0.55 lb or less at takeoff, including everything attached, and flown exclusively under the eligible recreational exception (§ 44809).
- Indoor-only flight.

C. WHERE TO REGISTER

FAA DRONEZONE

faadronezone-access.faa.gov

$5 per Part 107 drone • Valid 3 years.

D. REQUIREMENTS

- Contact details; carry registration certificate when operating.
- Make, model and required Remote ID serial number.
- FA12345678 — Mark registration number externally.
- Standard Remote ID, broadcast module + VLOS, or FRIA with aircraft and pilot inside + VLOS.

E. FAILURE TO REGISTER WHEN REQUIRED

CIVIL PENALTIES FINES MAY APPLY

CRIMINAL PENALTIES FINES AND/OR IMPRISONMENT MAY APPLY

PRACTICE QUESTIONS (FAA PART 107 STYLE)

1. Above what weight must an eligible recreational drone be registered? (A) 0.25 lb (B) 0.55 lb (C) 1.0 lb — **Correct Answer: B** — Why: The recreational exemption is 0.55 lb or less. Every Part 107 aircraft must be registered.
2. A 0.4 lb drone is used for paid real estate work. Must it be registered? (A) No, under 0.55 lb (B) Yes, Part 107 requires registration (C) Only outdoors at night — **Correct Answer: B** — Why: Part 107 has no lightweight exemption.
3. Which does NOT require registration? (A) 0.49 lb drone flown exclusively under eligible recreational exception (B) 0.60 lb recreational drone (C) 0.40 lb commercial drone — **Correct Answer: A** — Why: Eligible recreation at 0.55 lb or less; include all attachments.
4. One consequence of failing to register when required? (A) Loss of visual line of sight privileges only (B) Civil penalties / fines (C) Automatic permanent license suspension — **Correct Answer: B** — Why: Civil or criminal penalties may apply.

FAA Drone Registration • 14 CFR Parts 48/89

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02

SECTIONAL AERONAUTICAL CHART

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SECTIONAL AERONAUTICAL CHART

WHAT IS THIS?

A sectional chart depicts airports, airspace, terrain, obstructions and navigation aids for VFR flight.

MEMORIZE THIS

- Read boundary color and line style.
- 2400 — Check MSL versus AGL.
- Decode the airport data block.

TEST TIP

Match each symbol to its description. Check current NOTAMs and Chart Supplement.

QUICK ANSWER

Boundary + altitude + symbol + data.

AIRPORT DATA



1. CT = Control Tower frequency.
2. 285 = Airport elevation (feet MSL).
3. ATIS = Automatic Terminal Information Service.
4. L = Lighting available; 72 = Longest runway 7,200 ft.
5. RP = Right traffic runway numbers.
6. 122.95 = UNICOM (common traffic advisory).

FSS = Flight Service Station.
NO SVFR = Fixed-wing special VFR flight is prohibited.
★ = Part-time operation (see frequency notes).

Check current Chart Supplement for airport services, frequencies and details.

121.5 = Emergency frequency.

AIRSPACE

- Class B Airspace
- Class C Airspace Inside C see FAR 91.215).
- Class D Airspace.
- 40 — Class D ceiling: 4,000 ft MSL. A minus sign excludes the ceiling altitude.
- Class E surface-area boundary (dashed magenta).
- Class E Airspace with floor 700 ft. AGL.
- Class E Airspace with floor 1,200 ft. AGL or greater above surface (as charted).
- 2400 MSL — An explicitly labeled floor is in MSL.
- 4500 MSL — Class E floors vary: commonly 700 or 1,200 ft AGL. Use vignette direction, labels and chart notes. An MSL floor is expressly labeled MSL.

132° V 69 132° — Victor airway: blue centerline; V69 is the identifier. Use published route and altitude information.

SPECIAL AREAS

- Prohibited, restricted and warning areas (blue hatched).
- Military Operations Area (MOA) (magenta hatched).
- Special Airport Traffic Area (See FAR 91.215 for details).
- Air Defense Identification Zone (ADIZ).
- Mode C veil (solid magenta).
- Terminal Radar Service Area (TRSA).
- Military Training Route (MTR).

NAVAIDS

- VOR
- VORTAC
- VOR-DME
- Non-Directional Radio Beacon (NDB)
- NDB-DME
- Other facilities, i.e., FSS Outlet, RCO, etc.

OBSTRUCTIONS

- 1,000 ft. and higher AGL.
- Below 1,000 ft. AGL.
- Group obstruction.
- Obstruction with high-intensity lights may operate part-time.
- 2049' (1149') — Top of obstruction 2,049 ft. MSL (height 1,149 ft. AGL).
- UC — Under construction.

Guy wires may extend outward from structure.

AIRPORT SYMBOLS

- Other than hard-surfaced runways.
- Hard-surfaced runways 1,500 ft. to 8,069 ft. in length.
- Hard-surfaced runways greater than 8,069 ft., or some multiple runways less than 8,069 ft.
- Open dot in a runway symbol = approximate location of a VOR, VOR-DME or VORTAC on the airport.
- R — Private airport (PVT). Use with caution.
- H — Heliport.
- U — Unverified landing area.
- X — Abandoned airport.
- F — Ultralight flight park.

ACTIVITY SYMBOLS

- Isogonic Line (2019 VALUE) (Not current value).
- Ultralight activity.
- Hang glider activity.
- Glider operations.
- Unmanned aircraft activity.
- Parachute jumping area (See Chart Supplement).
- Marine light.
- Missile (HAZ/TZ).
- VFR waypoint (See Chart Supplement for latitude / longitude)

COMMUNICATION BOXES

- OAKDALE OAK 122.1R — Navaid name and frequency. Underline indicates no voice on this frequency.
- 122.1R MIAMI — Remote FSS outlet.
- CHICAGO CHI — Heavy border indicates FSS name. Frequencies, services and hours may be listed in the box.

Verify services, frequencies and availability in the Chart Supplement.

QUICK REFERENCE

MSL	Mean Sea Level
AGL	Above Ground Level
FL	Flight Level (18,000 ft. MSL +)
RP	Right Traffic Pattern
CT	Control Tower
CTAF	Common Traffic Advisory Frequency
FSS	Flight Service Station
ATIS	Automatic Terminal Information Service
CS	Chart Supplement
RCO	Remote Communications Outlet
VFR	Visual Flight Rules

FAA Chart Users' Guide • Study legend — not for navigation

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03

AIRSPACE CLASSIFICATION

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AIRSPACE CLASSIFICATION

MEMORIZE THIS

- Controlled airspace: A, B, C, D, E
- Uncontrolled airspace: G
- Class A: outside standard Part 107
- B / C / D / airport-designated surface E: authorization required
- G: no airspace authorization
- Standard Part 107 minimums, including Class G: 3 SM flight visibility; 500 ft below / 2,000 ft horizontally from clouds

LEGEND

MSL = Mean Sea Level
AGL = Above Ground Level
FL = Flight Level
SVFR = Special VFR
SM = Statute Miles

TEST TRAP

Under Part 107, what weather minimums apply in Class G?

3 SM + 500 ft below / 2,000 ft horizontal



CLASS	FLOOR / CEILING	PART 107 ENTRY	RADIO REQUIRED?	VISIBILITY	CLOUD CLEARANCE	SPECIAL NOTE
CLASS A	18,000 ft MSL to FL600	Outside standard Part 107	N/A	N/A	N/A	Outside standard Part 107
CLASS B	Generally surface to 10,000 ft MSL	Prior ATC authorization	No routine Part 107 radio	3 SM	500 ft below / 2,000 ft horizontal	Major airports / authorization required
CLASS C	Generally 4,000 ft above airport; charted in MSL.	Prior ATC authorization	No routine Part 107 radio	3 SM	500 ft below / 2,000 ft horizontal	Radar + tower airport
CLASS D	Generally 2,500 ft above airport; charted in MSL.	Prior ATC authorization	No routine Part 107 radio	3 SM	500 ft below / 2,000 ft horizontal	Towered airport
CLASS E	Common floors: surface, 700 or 1,200 ft AGL; below 18,000 ft MSL; also above FL600	Airport-designated surface E: ATC authorization. Other E: no § 107.41 authorization	No routine Part 107 radio	3 SM	500 ft below / 2,000 ft horizontal	Controlled; includes surface E and transition areas
CLASS G	Surface to Class E floor	No ATC airspace authorization	No routine Part 107 radio	3 SM	500 ft below / 2,000 ft horizontal	Uncontrolled airspace

Part 107: prior ATC authorization in B, C, D and airport-designated surface E. Radio contact is not a substitute.
Standard minimums: 3 SM flight visibility from the control station; 500 ft below and 2,000 ft horizontally from clouds, including Class G.
Unless waived; other restrictions and authorization conditions still apply.

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RADIO COMMS + AIRPORT OPS

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RADIO COMMS + AIRPORT OPS

WHAT IS THIS?

This sheet teaches the basics of CTAF, UNICOM, and airport communication so students can answer Part 107 questions more confidently.

MEMORIZE THIS

- CTAF = self-announce when no tower operates
- UNICOM = airport advisory service
- Runways = magnetic heading numbers
- A — Taxiways = lettered A, B, C...
- Windsock = wind direction

TEST TRAP

Runway number 22 means about 220° magnetic heading.

QUICK ANSWER

CTAF = self-announce

RADIO BASICS

CTAF — Common Traffic Advisory Frequency

Self-announce when no tower is operating

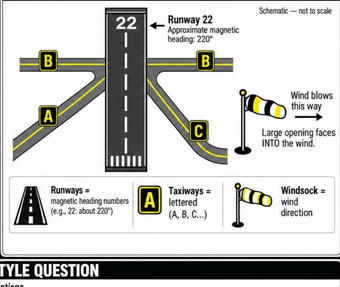
- Aircraft announce position / intentions
- No routine Part 107 radio requirement
- May use a UNICOM frequency
- Listen before you transmit

Includes airports with a closed control tower.

UNICOM — Airport advisory service

- Provides airport information and advisories
- Not air traffic control
- Listen before you transmit

AIRPORT OPS BREAKDOWN



Runways = magnetic heading numbers (e.g., 22: about 220°)
A — Taxiways = lettered (A, B, C...)
Windsock = wind direction

SAMPLE RADIO CALL

Crewed-aircraft example

"Example traffic, Cessna N12345, 2 miles west, 2,000 feet MSL, landing Runway 22, Example."

Airport: Example
Aircraft: Cessna N12345
Position: 2 miles west / Altitude: 2,000 ft MSL
Intentions: landing Runway 22
Airport name repeated: Example

FAA PART 107 STYLE QUESTION

Q — Which frequency is used to self-announce position and intentions at an airport without an operating control tower?

(A) UNICOM (B) CTAF (C) ATIS

Correct Answer: B CTAF

CTAF is used by pilots to self-announce when no control tower is operating so other traffic can hear and avoid conflicts.

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05

LATITUDE + LONGITUDE SHEET

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LATITUDE + LONGITUDE SHEET

WHAT IS THIS?

This sheet shows how to find the latitude and longitude of an airport on a sectional chart. Part 107 exams use chart excerpts to test airport coordinate reading.

MEMORIZE THIS

1. Latitude lines run east-west and measure north/south.
2. Longitude lines run north-south and measure east/west.
3. Read LATITUDE first, then LONGITUDE.
4. Coordinates are written in degrees (°) and minutes (').
5. 1 minute of LATITUDE is about 1 NM.
6. Latitude numbers are on the left / right chart borders.
7. Longitude numbers are on the top/bottom chart borders.

TEST TRAP

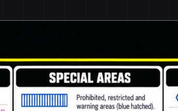
- Use the airport symbol's exact position — not the text label or pictures.
- Estimate between tick marks if the airport falls between whole minutes.
- Do not reverse latitude and longitude.

QUICK ANSWER

33° 28' N / 111° 43' W

HOW TO READ IT

A LATITUDE — Latitude = read from the left or right chart border.



Horizontal lines / north-south measurement

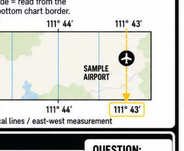
B LONGITUDE — Longitude = read from the top or bottom chart border.

Vertical lines / east-west measurement

STEP-BY-STEP

1. Find the airport symbol on the map.
2. Trace horizontally to the side border to read latitude.
3. Trace vertically to the top or bottom border to read longitude.
4. Estimate the minutes if the airport is between tick marks.

PRACTICE MAP



Schematic — not for navigation

QUESTION: What are the coordinates of Sample Airport?

ANSWER: 33° 28' N / 111° 43' W

Record LATITUDE first, then LONGITUDE.

NEED TO KNOW

COORDINATE FORMAT

Latitude example: **33° 28' N**

Longitude example: **111° 43' W**

KEY TERMS

- Degree (°) = major unit
- Minute (') = subdivision of a degree
- 1° = 60'
- 1 minute latitude is about 1 NM

BORDER READING TIPS

- Latitude values are on the left or right chart borders (horizontal lines).
- Longitude values are on the top or bottom chart borders (vertical lines).
- On actual charts, use the labeled graticule and minute ticks.

FAA PART 107 STYLE QUESTION

You are asked to determine the coordinates of an airport shown on a sectional chart. After locating the airport symbol, which should you record first?

A — Longitude from the top or bottom border
B — Latitude from the left or right border
C — Elevation from the airport data block
D — Magnetic variation from the chart legend

CORRECT ANSWER: B

EXPLANATION: Always record latitude first, then longitude. Latitude is taken from the left or right border. Longitude is taken from the top or bottom border.

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SECTIONAL STUDY MAP

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SECTIONAL STUDY MAP

WHAT IS THIS?

An illustrative practice map for practicing chart patterns. Geography and data are modified; never use it for navigation.

MEMORIZE THIS

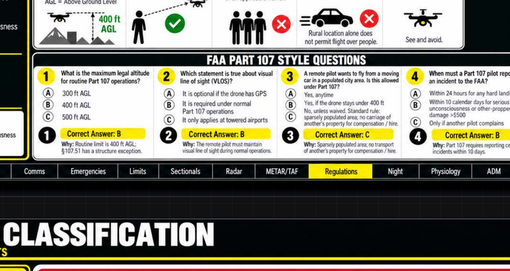
- Study chart patterns—there may be many map questions.
- Read the airport data blocks.
- Check airspace rings first.
- Identify special use airspace.
- Match symbols to the key.

TEST TIP

Identify the airspace, symbol, or airport detail you are looking at. Slow down and decode the chart.

QUICK ANSWER

Symbol + boundary + altitude + data block.



MAP KEY

1. 40 / 12 — Outer C shelf: 4,000 / 1,200 MSL
2. Solid magenta: Class C boundary
3. 40 / SFC — Inner C: 4,000 MSL / surface
4. Dashed blue: Class D boundary
5. 2715 — Terrain dot: 2,715 ft MSL
6. 3561 — Terrain dot: 3,561 ft MSL
7. 2775 — Terrain dot: 2,775 ft MSL
8. MOA boundary: magenta hatching
9. VOR navigation aid symbol
10. 3548 — Terrain dot: 3,548 ft MSL
11. SAN JUAN 117.1 SJN — Navaid name / frequency box
12. 5000 MSL GND — MOA: no automatic permission rule
13. R-2502 5500 MSL GND — Restricted area: permission / status
14. SALINAS CT / ATIS — Airport frequencies / services box
15. Magenta airport: nontowered
16. City / town location (Marina)
17. City / town location (Salinas)
18. Magenta airport: nontowered
19. Airport data: tower / ATIS
20. MONTEREY CT / ATIS — Magenta airport: nontowered
21. PINE MTN 115.5 PXM — Navaid frequency / identifier
22. 23 — Terrain dot: 23 ft MSL
23. Magenta airport: nontowered

PRACTICE QUESTIONS (FAA PART 107 STYLE)

1. What does the magenta ring around Salinas indicate? (A) Class D airspace (B) Class C airspace (C) MOA (D) Restricted area — **Correct Answer: B** — Why: A solid magenta ring indicates Class C airspace.
2. What does the solid magenta inner ring around the study airport indicate? (A) Radio frequencies (B) Class C surface area (C) Class D airspace (D) Prohibited area — **Correct Answer: A** — Why: Solid magenta outlines Class C. Dashed blue outlines Class D.
3. What do the study labels '40 / 12' and '40 / SFC' mean? (A) Radio frequencies (B) Ceiling / floor in hundreds of feet MSL; SFC means the surface (C) Elevation of the airport (D) Runway lengths — **Correct Answer: B** — Why: 40 / 12 = 4,000 / 1,200 ft MSL. 40 / SFC = 4,000 ft MSL to the surface.
4. If a question asks for airport information like CTAF, ATIS, or runway data, where should you look first? (A) Special use airspace box (B) Victor airway label (C) Airport data block (D) Terrain tint — **Correct Answer: C** — Why: The airport data block contains key airport frequencies and runway information.

REMEMBER

- Outer C shelf: 4,000 / 1,200 MSL
- Inner C: 4,000 MSL / surface
- Class C boundary
- Class D boundary
- Terrain dot: 2,715 ft MSL
- Terrain dot: 3,561 ft MSL
- Terrain dot: 2,775 ft MSL
- MOA boundary: magenta hatching
- VOR navigation aid symbol
- Terrain dot: 3,548 ft MSL
- Navaid name / frequency box
- MOA: no automatic permission rule
- Restricted area: permission / status
- Airport frequencies / services box
- Magenta airport: nontowered
- City / town location (Marina)
- City / town location (Salinas)
- Magenta airport: nontowered
- Airport data: tower / ATIS
- Magenta airport: nontowered
- Navaid frequency / identifier
- Terrain dot: 23 ft MSL
- Magenta airport: nontowered

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07

METAR / TAF SHEET

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METAR / TAF

WHAT IS THIS?

Decode observed and forecast aviation weather: wind, visibility, clouds, temperature, and pressure.

REMEMBER THIS

- CLOUD ORDER: FEW → SCT → BKN → OVC
- VISIBILITY RULE: P6SM = greater than 6 statute miles
- WIND: KT = knots; direction is TRUE
- ZULU TIP: Z = UTC (Zulu time)
- CLOUD HEIGHTS: hundreds of feet AGL; ceiling = lowest BKN/OVC or vertical visibility

METAR VS TAF: METAR = observed; TAF = forecast

TEST TIP

FEW030 = few clouds at 3,000 ft AGL. Multiply the three-digit height by 100.

QUICK ANSWER

METAR = observed | TAF = forecast

METAR REPORT BREAKDOWN

1 Report Type	2 Station Identifier	3 Date & Time	4 Wind	5 Visibility	6 Few Clouds	7 Scattered Clouds	8 Broken Clouds	9 Temperature / Dew Point	10 Altimeter	11 Remarks
METAR — Routine aviation weather report (observed).	KPHX — Phoenix Sky Harbor (airport).	121751Z — 12th at 17:51 UTC (Zulu).	21015G25KT — Direction 210° (true). 15 knots, gusts 25 knots (kt).	10SM — 10 statute miles (automated reports: 10 SM or more).	FEW030 — Few clouds at 3,000 ft AGL.	SCT040 — Scattered clouds at 4,000 ft AGL.	BKN120 — Broken clouds at 12,000 ft AGL.	30/18 — Temperature 30°C / Dew point 18°C.	A2992 — Altimeter 29.92 inHg.	RMK AO2 — Automated station with a precipitation discriminator (letter O, not zero).

Complete METAR Report: METAR KPHX 121751Z 21015G25KT 10SM FEW030 SCT040 BKN120 30/18 A2992 RMK AO2

TAF REPORT BREAKDOWN

TAF	KPHX	121720Z	1218/1318	21015KT	P6SM	FEW050
1 Report Type	2 Station Identifier	3 Issue Date & Time	4 Valid Period	5 Wind	6 Visibility	7 Clouds
TAF — Terminal Aerodrome Forecast (forecast).	KPHX — Phoenix Sky Harbor (airport).	121720Z — Issued 12th at 17:20 UTC (Zulu).	1218/1318 — Valid 12th at 18:00 UTC to 13th at 18:00 UTC (24 hours).	21015KT — Direction 210° (true) at 15 knots (kt).	P6SM — Visibility greater than 6 statute miles (> 6 SM).	FEW050 — Few clouds 5,000 ft AGL.

Complete TAF Report: TAF KPHX 121720Z 1218/1318 21015KT P6SM FEW050

NEED TO KNOW

WIND & TIME

Direction is TRUE (not magnetic).
KT = knots (wind speed).
G## = gusting winds (## = knots).
Z = Zulu time (UTC).

VISIBILITY & CLOUDS

SM = statute miles (visibility unit).
FEW = few clouds (>0–2/8).
SCT = scattered clouds (3–4/8).
BKN = broken clouds (5–7/8).
OVC = overcast (8/8).
Cloud heights are in hundreds of feet AGL (e.g., 030 = 3,000 ft).
Ceiling = lowest BKN/OVC layer or vertical visibility into obscuration.

CONDITIONS & METRICS

P6SM = visibility greater than 6 SM
A2992 = altimeter 29.92 inHg.

REMARKS / SYSTEMS

RMK = remarks section (extra info).
AO2 = precipitation discriminator.
A01 = no precipitation discriminator.

METAR = OBSERVED AT REPORT TIME.
TAF = FORECAST FOR VALID PERIOD.

METAR DECODER

CODE	MEANING
KPHX	STATION = PHOENIX SKY HARBOR
121751Z	12TH DAY @ 17:51 ZULU (UTC)
21015G25KT	WIND: FROM 210° @ 15KT, GUST 25KT
10SM	VISIBILITY: 10 SM (automated: 10 SM or more)
FEW030	FEW CLOUDS AT 3,000' AGL
SCT040	SCATTERED CLOUDS AT 4,000' AGL
BKN120	BROKEN CLOUDS AT 12,000' AGL
30/18	TEMP/DEW POINT: 30°C / 18°C
A2992	ALTIMETER: 29.92 INHG
RMK	REMARKS — additional, non-standard info follows
A02	AUTOMATED STATION WITH A PRECIPITATION DISCRIMINATOR

TAF DECODER

CODE	MEANING
121720Z	ISSUED 12TH DAY AT 17:20 ZULU
1218/1318	VALID: 12TH @ 1800Z TO 13TH @ 1800Z
21015KT	WIND FROM 210° @ 15 KNOTS
P6SM	VISIBILITY: >6 SM
FEW050	FEW CLOUDS AT 5,000' AGL

Airspace | Weather | Clearance | Comms | Emergencies | Limits | Sectionals | Radar | METAR/TAF | Regulations | Night | Physiology | ADM | Performance | Waivers

08

LIFT, DRAG & WEATHER EFFECTS

FAA PART 107 / PASS SHEETS

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LIFT, DRAG & WEATHER EFFECTS

WHAT IS THIS?

This sheet explains the 4 forces of flight and how weather affects drone performance. It helps you answer FAA Part 107 questions about lift, drag, thrust, weight, and environmental conditions that change aircraft performance.

MEMORIZE THIS

- Lift / rotor thrust = supports weight
- Weight = downward pull of gravity
- Thrust = force produced by propellers
- Drag = resistance from air pushing against motion
- Favorable air density: cool, dry, low altitude, high pressure.

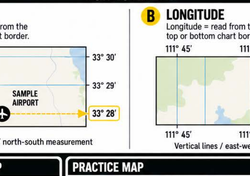
TEST TIP

FAA questions often ask which weather conditions improve or reduce performance.

QUICK ANSWER

Dense air favors performance; cold can limit battery endurance.

THE 4 FORCES OF FLIGHT



NEED TO KNOW

A PERFORMANCE BASICS

At the same settings/configuration:

- Dense air = greater lift/thrust capability
- Thin air = reduced lift/thrust capability
- Weather changes aircraft performance

B BEST CONDITIONS

- Cool air
- Dry air
- Sea level / low density altitude
- High pressure

WEATHER EFFECTS ON FLIGHT

- **DENSITY ALTITUDE** — Hot, humid, high = less dense air = less lift
- **HUMIDITY** — More moisture = less dense air = less lift
- **WIND** — Gusts can destabilize; headwinds increase energy needed to return
- **TEMPERATURE** — Heat reduces air density; cold can reduce battery capacity and endurance
- **BAROMETRIC PRESSURE** — Higher pressure = denser air = greater lift/thrust capability (all else equal).

FAA PART 107 STYLE QUESTIONS

1. Which force opposes the drone's motion through the air? (A) Lift (B) Drag (C) Weight — **Correct Answer: B** — Why: Drag is the air resistance that pushes against motion.
2. Which conditions produce the best drone performance? (A) Hot, humid, high-elevation air (B) Cool, dry, sea-level air with high pressure (C) Warm air with low pressure. — **Correct Answer: B** — Why: Cool, dry, dense air improves lift and aircraft performance.
3. What is the effect of high humidity on drone performance? (A) More lift because the air is heavier (B) Less lift because moist air is less dense (C) No effect on lift. — **Correct Answer: B** — Why: Humid air is less dense, which reduces lift.
4. What is a common effect of cold weather on drone operations? (A) Batteries last longer (B) More drag in calm air (C) Reduced battery performance — **Correct Answer: C** — Why: Cold can reduce usable battery capacity, voltage and endurance.

Airspace | Weather | Clearance | Comms | Emergencies | Limits | Sectionals | Radar | METAR/TAF | Regulations | Night | Physiology | ADM | Performance | Waivers

09

EMERGENCIES + FLIGHT LIMITS

FAA PART 107 / PASS SHEETS

START HERE

EMERGENCIES + FLIGHT LIMITS

WHAT IS THIS?

Handle emergencies safely and recognize key Part 107 limits.

MEMORIZE THIS

- Lost link: configured failsafe.
- Do not launch an unsafe aircraft.
- 400 ft AGL; structure exception.
- < 55 lb including payload.
- 100 mph / 87 knots maximum.

TEST TIP

GPS loss and lost link are different. Follow aircraft-specific procedures.

QUICK ANSWER

Regain control or land safely. Deviate only as necessary.

EMERGENCY SCENARIOS

PROBLEM	ACTION
LOST SIGNAL	Follow configured failsafe; regain control if safe.
GPS SIGNAL LOST	Follow aircraft-specific GPS-loss procedure.
FLYAWAY	Land if possible; report if § 107.9 applies.
LOW BATTERY	Land as soon as safely possible.
PREFLIGHT SYSTEM FAIL	Do not launch until assessed, resolved, and safe.
SUDDEN WIND/WEATHER	Land as soon as safely possible; maintain VLOS.

REPORTING: § 107.9 qualifying accident — within 10 calendar days. § 107.21 emergency deviation — written report if FAA requests.

PART 107 FLIGHT LIMITS

RULE	LIMIT
ALTITUDE	400 ft AGL; within 400 ft of a structure up to 400 ft above the top, subject to airspace limits.
TAKEOFF WEIGHT	Less than 55 lb including everything attached.
GROUNDSPEED	100 mph (87 knots).
NIGHT OPERATIONS	Anti-collision lighting visible 3 SM with sufficient flash rate to avoid collision.
VLOS	Required unless waived.
VISIBILITY	Minimum 3 SM from control station.
CLOUDS	500 ft below and 2,000 ft horizontal.
VEHICLE OPERATIONS	From a vehicle: § 107.25; over vehicles: § 107.145.
EMERGENCY RULE	Deviate only as necessary for an in-flight emergency requiring immediate action.
RIGHT-OF-WAY	Yield to all aircraft, airships, and launch/reentry vehicles.

PRACTICE QUESTIONS (FAA PART 107 STYLE)

1. You lose connection to the controller. Best immediate action? (A) Wait for GPS and fin