MODULE 04 // WEATHER COMMANDER

Aviation Weather Briefings & Tactical Decision Making



Dakdan Drone Pilot Academy: eSports Accelerated Curriculum

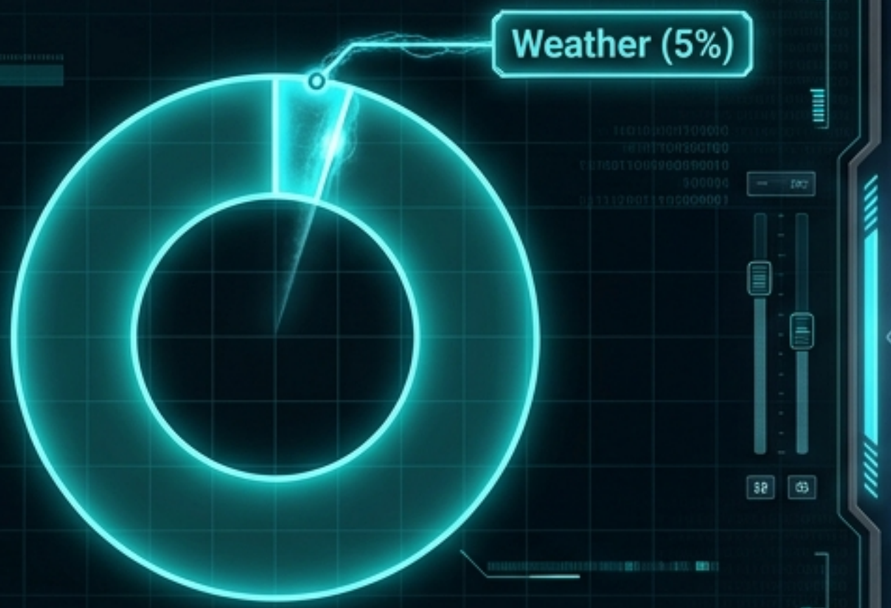
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The 5% Paradox

The Exam

DATA FEED: AGTIVE

MODULE: THEORY



FAA Exam Weight: Weather accounts for just 5% of the Part 107 knowledge test.

DATA FEED: **ACTIVE** | MODULE: **THEORY** | STATUS: **NOMINAL** | STATUS: **NOMINAL**

The Reality

DANGER: HIGH

STATUS: CRITICAL



Operational Reality: Environmental dynamics represent the highest physical risk to your aircraft.

MODULE: **OPS** | STATUS: **CRITICAL** | ENVIRONMENTAL ALERT: **ACTIVE**

⚠ Mission Directive: Do not fly based on exam weights. Fly based on atmospheric reality. ⚠

WARNING: MISSION FAILURE IMMINENT ⚠ ⚠ DO NOT PROCEED ⚠ ⚠ SYSTEM OVERRIDE: MANUAL CONTROL REQU

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DATA FEED:

MODULE: WEATHER

PHASE 1: THE CODE

Reading the Language of the Sky

Before you can assess risk, you must acquire the data. Professional remote PICs do not rely on generic weather apps; they read direct aviation terminal reports.

DATA FEED: METAR STREAM ACTIVE

MODULE: WEATHER INTEL



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Decoding the METAR
(Aviation Routine Weather Report)

KORD 121851Z 21010KT 3SM BR OVC010 15/14 A2983

KORD -> Station Identifier
(Chicago O'Hare)

121851Z -> Date/Time
(12th day, 1851 Zulu/UTC)

21010KT -> Wind
(From 210 degrees at 10 knots)

3SM BR -> Visibility & Weather
(3 Statute Miles, Mist)

OVC010 -> Clouds
(Overcast at 1,000 feet – add two zeros)

15/14 -> Temp/Dewpoint
(15°C / 14°C - tight spread = fog risk)

A2983 -> Altimeter
(29.83 inHg pressure)

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Diagnostic Matrix: METAR vs. TAF

	METAR (Current Observation)	TAF (Terminal Aerodrome Forecast)
Timeframe	Current Observation.	Future Forecast (usually 24-30 hours).
Scope	What is actually happening right now.	What meteorologists predict will happen.
Area	Specific point at the reporting station.	5 Statute Mile radius around the terminal.
Operational Use	Immediate Go/No-Go confirmation.	Mission planning and calculating battery reserve requirements.

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PHASE 2: THE PHYSICS

Translating Data to Aircraft Performance

Weather is not just a visual obstruction; it is a physical medium. The density and temperature of the air dictate how hard your motors work and how fast your battery drains.

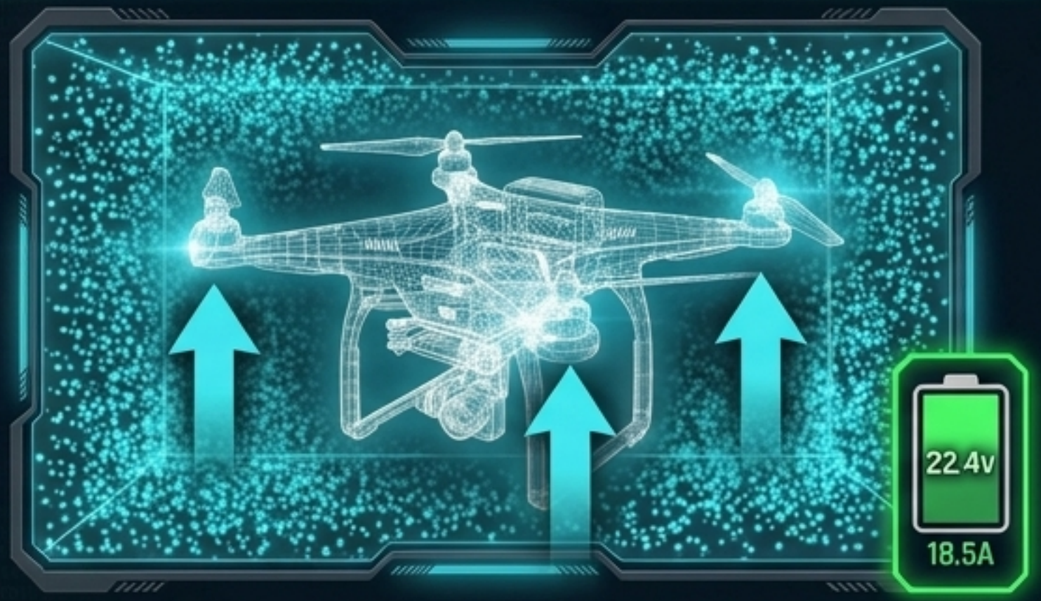


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MODULE: WEATHER

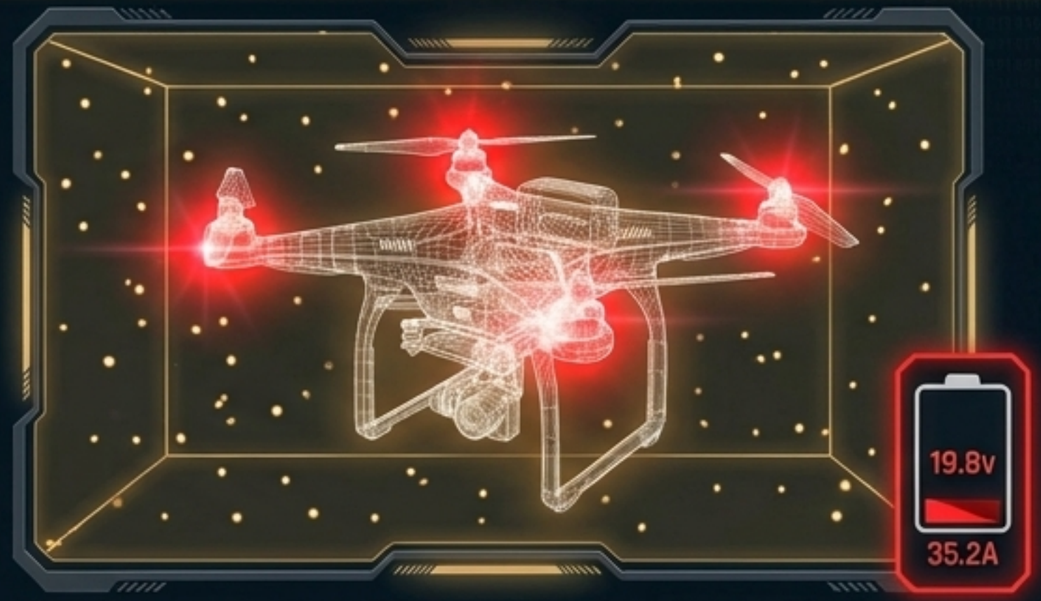
Density Altitude: The Air Density Metric

Low Density Altitude (Heavy Air)



Dense particle concentration. Motors require less RPM to generate lift. High thrust efficiency. Low battery drain.

High Density Altitude (Thin Air)



Sparse particle concentration (caused by high heat, high elevation, or high humidity). Motors must spin at maximum RPM to maintain hover. Rapid battery voltage sag.

Rule of Thumb: High Density Altitude = Decreased Performance.

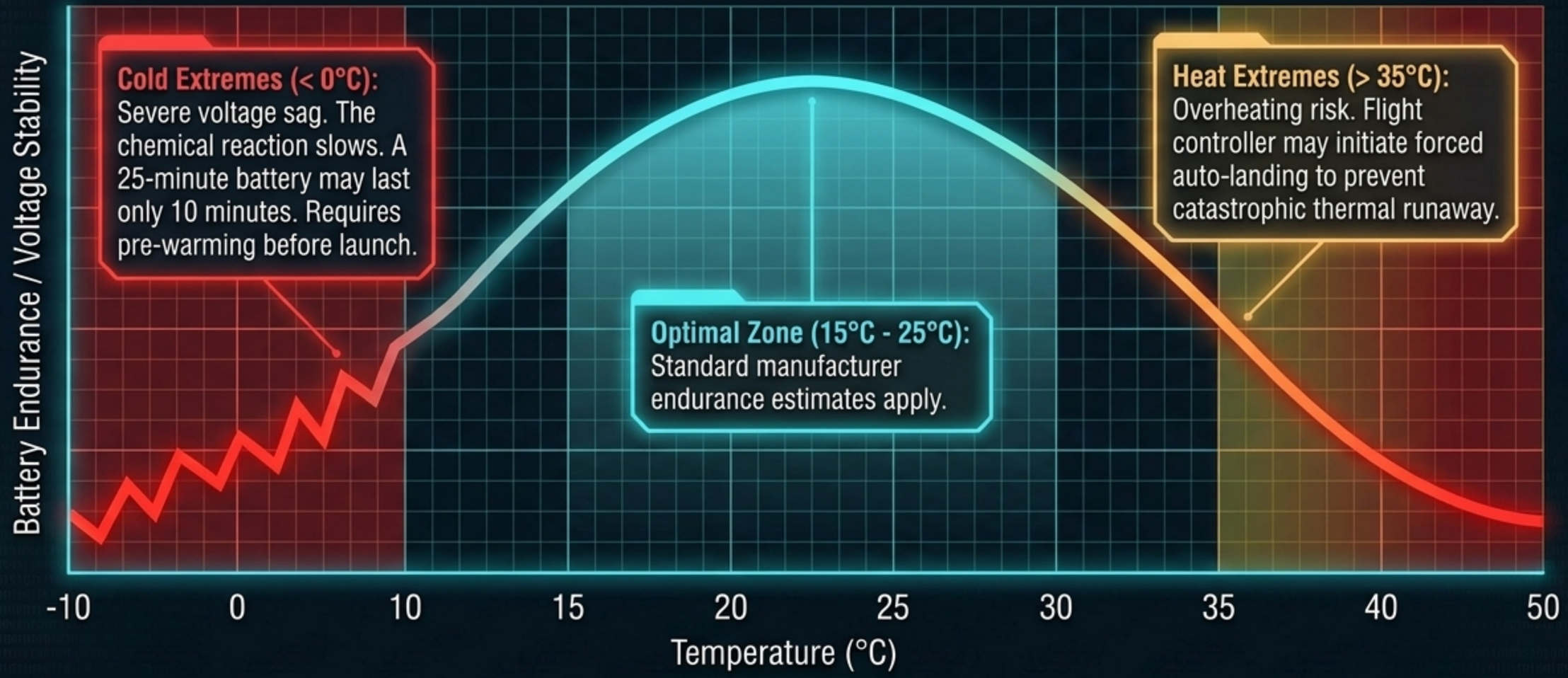
DATA FEED: METAR STREAM ACTIVE

DATA FEED: AIRCRAFT PERFORMANCE ANALYTICS ACTIVE

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The Battery Heat Curve

Lithium-Ion Environmental Stress Parameters



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PHASE 3: THE THREATS

Mapping Invisible Hazards

The atmosphere is a dynamic fluid. As a Remote PIC, your job is to identify unstable air, navigate visibility limits, and avoid convective destruction.



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Atmospheric Stability Diagnostics

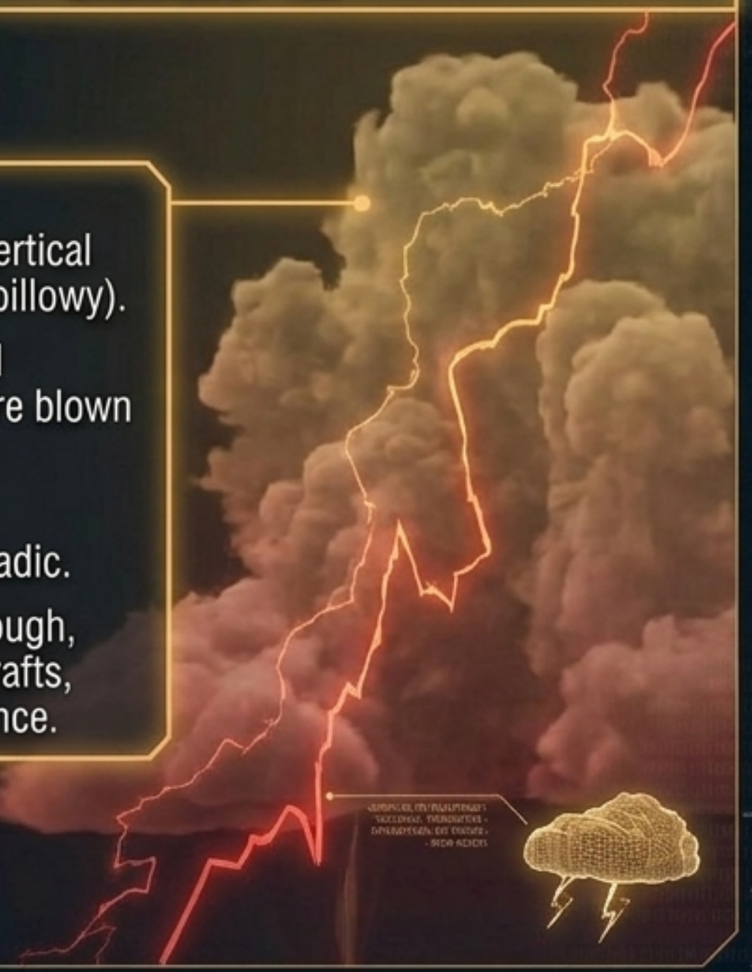
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Stable Air

- Clouds: Stratiform (flat, layered).
- Visibility: Poor (haze, smoke, fog trapped near the surface).
- Precipitation: Continuous and steady.
- Turbulence: Smooth air, low turbulence.

Unstable Air

- Clouds: Cumuliform (vertical development, billowy).
- Visibility: Good (particulates are blown away).
- Precipitation: Showery, sporadic.
- Turbulence: Rough, high vertical drafts, severe turbulence.



DATA FEED: ATMOSPHERIC SENSORS ACTIVE

MODULE: PHYSICS

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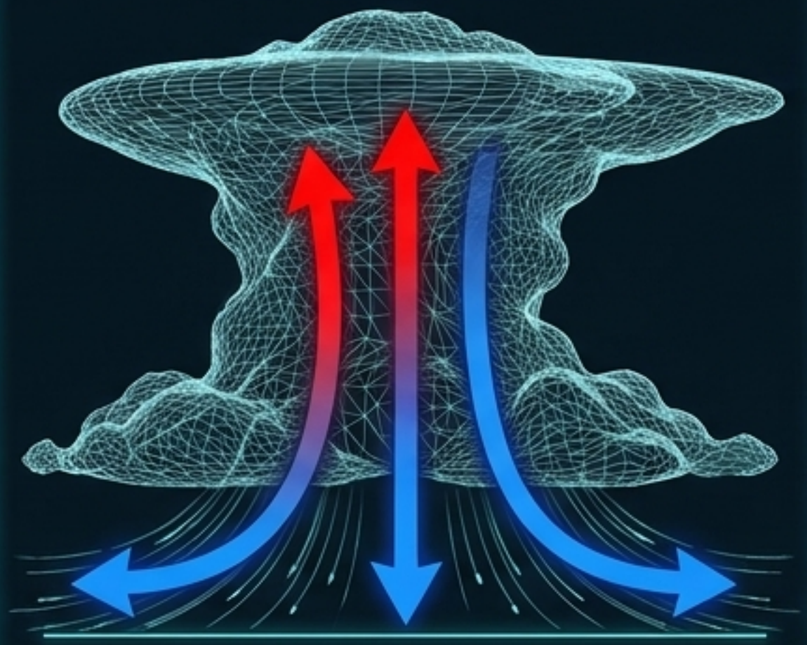
The Convective Lifecycle (Thunderstorms)

1. Cumulus Stage



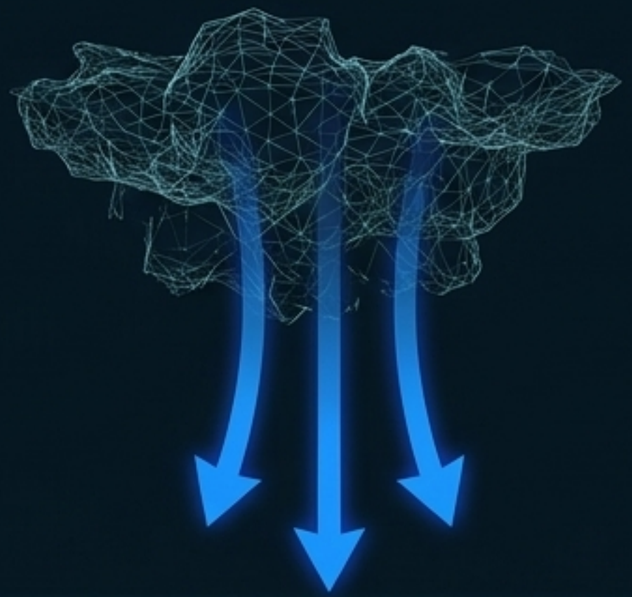
Fueled by continuous vertical updrafts.

2. Mature Stage



The most dangerous phase. Marked by the start of precipitation. Extreme turbulence, wind shear, and microbursts (severe localized downdrafts).

3. Dissipating Stage



Dominated entirely by downdrafts as the storm collapses.

Operational Command: Never fly near a thunderstorm in the mature stage.

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The Safe Zone Geometry: Visibility & Cloud Clearance

Minimum Flight Visibility:

You must have at least 3 Statute Miles (SM) of visibility from your control station.



Cloud Clearance Limits:

- Stay at least 500 feet BELOW the base of any cloud.
- Stay at least 2,000 feet HORIZONTALLY away from any cloud.

Why? To maintain VLOS and provide a buffer for manned aircraft descending through the cloud deck.

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PHASE 4: THE CALL

Synthesizing the Go/No-Go Decision

Data is useless without action. The ultimate responsibility of the Remote PIC is evaluating the variables and making the final operational call.



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The Mission Risk Assessment Engine

	GO	MODIFY	NO-GO
Wind/Turbulence	Calm.	Approaching aircraft limits.	Exceeds manufacturer limits.
Visibility/Clouds	>5 SM / Clear.	3-5 SM / Approaching 500/2000 limits.	<3 SM / Inside cloud clearance limits.
Density Altitude & Temp	Optimal (15-25°C).	Cold/Hot (adjust battery expectations).	Extreme heat (thermal runaway risk).
Convection	Stable air.	Distant cumulus buildup.	Mature thunderstorm nearby.

The Absolute Rule: A single **RED** indicator in any category overrides all **GREEN** indicators. The mission is grounded.

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GROUND CONTROL STATION

LEARN → GAME → APPLY → COMPETE

INITIALIZE GAME 04: WEATHER COMMANDER

Mission Profile:
Decode METAR/TAF, calculate density altitude impacts, and execute Go/No-Go decisions.

Scoring Parameters:
- Accuracy: 70%
- Rationale: 20%
- Time: 10%

Mastery Gate:
80% Minimum Required.

Warning: Any answer that knowingly creates an unsafe operation results in an automatic zero, regardless of speed.

Log into the League Hub.
Briefing Concluded.

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