

1. Big picture – what's actually hanging on the wings?

Your DCS C-130J has **four Rolls-Royce AE2100D3 free-turbine turboprops**, each driving a **six-bladed Dowty R391 composite propeller through a reduction gearbox**.

Key points:

- It's basically a **jet engine core** (compressor + combustor + turbine) that:
 - Spins a **gas generator turbine** (NG).
 - That drives a **power turbine** (NP).
 - Power turbine goes through a **reduction gearbox** to the prop.
- **Prop blades are variable-pitch**, controlled by a **Pitch Control Unit (PCU)** under FADEC. In the flight range, FADEC keeps NP \approx 100% and changes the torque/blade angle to make thrust.
- **FADEC** (two per engine, one in control at a time) takes your **Power Lever Angle (PLA)** and:
 - Schedules **fuel flow**.
 - Schedules **blade angle**.
 - Always prioritizes engine health over you.

So in practice, **you aren't directly "opening a throttle" – you're telling FADEC how much shaft power you want**, and it does the rest.

2. Turboprop concepts in C-130J language

2.1 The "four big numbers" on a turboprop

Same concepts as other turboprops, just with Herc labels

- **Torque (TQ)** – "how hard you're twisting the shaft".
 - Primary **power** indication.
 - You set takeoff, climb, and cruise mostly by torque.
- **MGT / ITT** (turbine temperature) – "how hot the guts are".

- Limits protect the turbine hot section. Stay in the green / within published limits.
- **NP** – prop RPM (%).
 - C-130J FADEC holds NP \approx 100% in the flight range and uses pitch to vary thrust.
- **NG** – gas generator speed (%).
 - Tells you how fast the core is spinning; used more for start monitoring and engine health.

2.2 Free turbine vs. “straight shaft.”

The AE2100D3 is a **free-turbine** turboprop:

- Gas generator (NG) and power turbine (NP) are **not directly mechanically linked**. NG can stay high even with low prop load, and vice versa.

Practical takeaway:

- Changes in PLA mostly show up as **torque changes** with NP held at 100% in flight. Engine is “constant RPM, variable torque”.

3. C-130J-specific engine modes & controls

3.1 Engine operating states on the ground

From the manual: the J has three main ground states:

- **LSGI – Low Speed Ground Idle**
 - Lower NG and NP.
 - **Less fuel, less propwash**, good for warm-up and gentle taxi.
 - **No AC generators** – you need APU or another engine in HSGI for AC power.
- **HSGI – High Speed Ground Idle**
 - Default idle.
 - Generators online, ready to fly or reverse range.
- **Hotel mode**

- Engine in **LSGI** with prop **feathered** via auxiliary feather pump.
- Greatly reduces propwash and hazard behind the engine.
- Used for **Engine Running On/offload (ERO)** to protect the ground crew.

In DCS terms:

- Use **LSGI** for warmup / low-power taxi where possible.
- Keep at least one engine in **HSGI** or APU running so you don't brown out the airplane electrically.

3.2 Power levers & ranges

Throttle quadrant notes:

- Four **power levers** with detents:
 - **FLIGHT RANGE** – flight idle through takeoff, climb, cruise.
 - **GROUND RANGE** – ground idle through **beta** and into **max reverse**.
- Mechanical stops:
 - **Stop at flight idle** → prevents you from pulling into ground range in the air.
 - **Stop at ground idle** → prevents accidental reverse selection when you don't mean it.

This lines up with standard turboprop terminology:

- **Flight (alpha) range** – pitch angles for routine flight, thrust forward.
- **Beta range** – between flight idle and reverse; PLA directly controls blade pitch from low/zero thrust down into negative pitch.
- **Reverse** – further aft: high negative pitch for strong braking on rollout.

3.3 FADEC, autofeather, and overspeed protection

From the DCS manual:

FADEC functions include:

- Ground idle prop blade scheduling.

- **Autofeather.**
- Auto ignition / relight.
- Prop synchrophasing.
- Prop underspeed / overspeed protection.
- Gas generator overspeed protection.
- Automatic engine start.
- **ATCS (Automatic Thrust Control System).**

Autofeather:

- Requires FADEC + mission computer (MC) permission.
- Outboard engines autofeather freely; inboards need conditions (below ~15,500 ft and the other engines running normally) – otherwise FADEC windmills the prop at 100% NP for hydraulic and electrical power.
- A feather request is sent when levers are at **flight idle or above**, and certain conditions are met (loss of FADEC control, low horsepower with decaying NG, low NG, etc.).

Overspeed protection:

- If **NP > ~104.5%**, overspeed governor increases blade pitch → NP comes back down.
- If **NP > 119%**, FADEC auto-shuts down that engine.
- If **NG > 109%**, FADEC also auto-shuts down to protect the core.

3.4 ATCS and prop sync

From the manual:

- **ATCS switch (guarded):**
 - **ON** – ATCS active; automatically trims thrust between engines.
 - **OFF** – ATCS off.
 - **Warning in the manual:**

With ATCS OFF, in the event of an **outboard engine failure at low speed**, positive aircraft control is **not guaranteed**.

- **Prop Sync switch:**

- **ON** – FADEC synchrophases props to cut the “beat” / drumming.
- **OFF** – no auto sync.

Operationally:

- **Leave ATCS ON** for normal ops and especially for takeoff/landing. It reduces VMCA by balancing thrust, which is a huge safety net.
- Turn **Prop Sync ON** in cruise for comfort; OFF if you’re troubleshooting or in abnormal configurations.

3.5 Prop control panel (manual feather/unfeather)

From the manual:

- Prop control switches (per engine), only work:
 - When the engine is **shut down**, or
 - When it’s running in **LSGI with the power lever at GND IDLE**.
- Positions:
 - **FEATHER** – drives blades toward full feather.
 - **NORMAL** – pump off.
 - **UNFEATHER** – drives blades toward unfeather.
 - If you hold **UNFEATHER** on a shutdown engine, blades can drive all the way to **full reverse** (note in the manual).

In DCS, this gives you realistic manual feather control for training engine-out work.

4. Turboprops by phase of flight (C-130J / DCS focus)

4.1 Engine start

The AE2100D3 has an **automatic start sequenced by FADEC**:

- **Engine control switch positions:** STOP / MOTOR / RUN / START.

- **FADEC will not start** if PLA is below 13° or above 33° – you need the levers in the correct band.

FADEC watches for:

- **No light-off** – no 50°C MGT rise within 12 seconds of fuel/ignition.
- **Stagnated/hung start** – NG fails to reach about 65.5% within 70 seconds.
- **Flameout** during start.

If it sees trouble, it aborts the start automatically.

Pilot-style technique in DCS:

- Check PLA in the correct band (not at cutoff, not too high).
- Hit START; watch NG, MGT, and oil pressure.
- If you see crazy fast MGT rise trending to limits, or NG stagnating, **STOP then MOTOR** to clear and cool (as per manual logic).

4.2 Taxi and ground handling

Use the **ground range**, LSGI / HSGI, and hotel mode smartly:

- **LSGI for light taxi:**
 - Less propwash and braking; easier to keep speed down.
- **HSGI** when you need full systems and power available.
- **Beta range:**
 - Think of it as “propeller brake” – you modulate blade pitch from slightly positive through flat into mild reverse. [Skybrary+1](#)
 - Use gently to control taxi speed instead of riding the brakes.
- **Hotel mode:**
 - For training ERO: one engine LSGI + feather (“hotel”) to keep electrics and hydraulics without blasting the ramp with wash.

Ground danger considerations here (details in section 5), but in short: **FOD, prop arcs, propwash, and reverse thrust abuse.**

4.3 Takeoff

Standard turboprop concepts applied to J:

- **Set takeoff power by torque** (staying within torque/MGT limits in the manual)
- Confirm **NP \approx 100%**, all four engines matched, ATCS ON.
- You're VMCA-limited in an engine-out case. While specific speeds are in AFMANs and squadron pubs, the big idea is:

Below VMCA, you **cannot** maintain directional control with max power on the remaining engines and one dead engine.

Practical DCS technique (no detailed speeds given):

- Roll with symmetrical power.
- If an engine quits on the roll:
 - **Below decision speed** → abort.
 - **After liftoff / above decision** → pitch to a safe **two-engine-out-on-one-side attitude** (shallow climb), **bootful of rudder into the live engines**, aileron into the live side, respect bank limits.
 - Make sure the dead engine is feathered (autofeather or manual).

4.4 Climb and cruise

Once clean and climbing:

- Reduce from TO power to **climb torque** while:
 - Keeping MGT below limits.
 - Keeping NP at 100% (FADEC does that).
- In cruise:
 - Set a **cruise torque** for the desired speed/fuel combo.
 - Use prop sync to keep the cabin quiet (ON).

No piston-style shock cooling worries; main concern is **staying within temp and torque limits** and avoiding abrupt power chops that might destabilize the airplane, especially in icing or close to engine-out margins.

4.5 Descent, approach, and landing

On descent:

- Use **torque reductions + drag** (gear/flaps/props at 100% NP) rather than slamming to idle early.
- Watch MGT (don't get ridiculous, but you're far less temp-limited in descent than climb).

On final:

- Power levers in **flight range**.
- Stabilized approach with matching torque across engines.
- Keep ATCS ON for that extra asymmetric margin.

On touchdown:

- Bring levers back through **flight idle** → **ground idle** → **beta** → **reverse** as needed.
- In the sim, you can realistically modulate reverse:
 - Light reverse for normal runways.
 - More aggressive for short/contaminated – but watch for asymmetry.

5. Turboprop “danger scenarios” in the Herc (and how to avoid them)

Here's the meat of what will actually bite you in the C-130J if you fly it like a fighter.

5.1 Engine failure at low speed – asymmetric thrust & VMCA

What it is:

Engine failure (especially an outboard) near liftoff or on approach → big yaw and roll toward the dead engine because of asymmetric thrust and drag.

What helps you:

- **Autofeather:** removes huge drag from a windmilling prop by feathering it.
- **ATCS:** automatically balances thrust and significantly **reduces VMCA**.

Why it's dangerous:

- Below VMCA, even full rudder isn't enough to hold heading with a dead outboard and max power on the remaining three
- With ATCS OFF, the manual explicitly warns control may **not be guaranteed** after an outboard failure at low speed.

How to avoid/handle:

- **Always depart and land with ATCS ON** unless you have a specific reason not to.
- Treat an engine failure after liftoff like the real thing:
 - **Rudder into live engines**, small bank into the live side.
 - Confirm the dead engine is feathered (auto or manual).
 - Don't yank to max climb – stay smooth and stay well above stall and VMCA.

In DCS, this is very trainable – try deliberate engine-out patterns to get used to how much rudder you actually need.

5.2 Windmilling, high-drag prop vs feathered prop

What it is:

Dead engine, but prop still at coarse (flight) pitch → disc acts like a giant **air brake**.

Real-world behavior:

- After failure, prop at coarse pitch = huge drag.
- Autofeather logic uses FADEC + MC to feather when:
 - FADEC control is lost,
 - Power/NG drops below thresholds with levers at or above flight idle, etc.

If conditions aren't met (e.g., wrong alt/config), FADEC may keep the prop **windmilling at 100% NP** to preserve hydraulics/electrics.

Why it's dangerous:

- A windmilling outboard combined with full power on the other three can give you **massive yaw and roll**, making VMCA issues worse.

How to handle in the sim:

- Let **autofeather** work when appropriate.
 - If you need an actual “no-drag” engine-out demo:
 - Use the **prop control panel FEATHER** option when the manual allows (engine STOP or LSGI/GND IDLE).
 - Respect the aircraft configuration logic; don’t force weird combos you’d never do IRL.
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5.3 Prop overspeed / governor failure

What it is:

Prop tries to spin faster than it was designed to (NP runaway).

Protection:

- FADEC prop control keeps NP at target in flight range.
- If NP > 104.5% → overspeed governor increases blade pitch to bring NP back down.
- If NP > 119% → FADEC **auto-shuts down** the engine.

Why it’s dangerous:

- Before shutdown, you’ve got increased drag and stress on prop/gearbox.
- After shutdown, you’re back to the **engine-out** problem above.

How to handle in DCS:

- If you see NP spiking and torque dropping → treat it as **prop governor trouble**.
 - Expect an auto-shutdown if you let it run away.
 - Fly the airplane: rudder, bank into the live side, level the wings, clean up, then work the checklist.
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5.4 Gas generator overspeed

What it is:

The core (NG) spins beyond limits; FADEC will reduce fuel, and if NG still exceeds ~109%, it **shuts down** the engine.

Pilot impact:

- You'll mainly experience this as an **unexpected engine shutdown**.
 - Again, you're back to asymmetric thrust and engine-out handling.
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5.5 Botched engine starts (hot start / no lightoff / hung start)

What they are:

- **No light-off:** NG rising, but MGT never climbs 50°C within 12 seconds of fuel/ignition.
- **Stagnated/hung:** NG stops climbing and never reaches the starter cutout speed (~65.5%) within 70 seconds.
- **Flameout:** MGT spikes then falls, NG decays.

Why it matters:

- In the real engine, a **hot start** or hung start can cook turbine blades; you'd be doing borescope inspections later.

How to handle:

- FADEC will **auto-abort**, but you:
 - Confirm engine control to **STOP**, then **MOTOR** to clear residual fuel and cool.
 - In DCS, practice monitoring NG, MGT, and being ready to abort rather than "let it ride".
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5.6 Beta / reverse misuse

What it is:

- Going into **reverse** or beta at the wrong time or asymmetrically.

Manual safeguards:

- Mechanical stop at **flight idle** to prevent ground range selection in the air.
- Mechanical stop at **ground idle** to prevent inadvertent reverse.

Real dangers:

- **Reverse while airborne:** can cause massive nose-down pitch and drag (IRL heavily prohibited).
- **Asymmetric reverse** (e.g., one side full reverse, other at idle): severe yaw and risk of runway excursion.
- **Reverse on loose surfaces:** FOD ingestion and damage.

DCS technique:

- Only select **reverse after firm weight on wheels** and at safe rollout speeds.
- Avoid large **asymmetric reverse** inputs; if you practice them, do it on a long runway and be ready with rudder and aileron.

5.7 Ground hazards: propwash, FOD, people in the arc

From the manual: Hotel mode exists specifically to **reduce noise and propwash** behind the aircraft during operations like ERO.

Real-world threats:

- **FODing the engine** on gravel / loose debris, especially in high power, beta, or reverse.
- **Knocking over ground crew or vehicles** with the C-130's propwash.
- People walking into the **prop arc** because they underestimate how quiet/transparent a composite prop looks head-on.

Sim takeaway:

- Use **hotel mode or LSGI** when simulating ramp operations, minimize power near "people".
- Don't slam into high reverse near loose surface environments (if you're simulating unimproved runways).

5.8 Icing

From the manual:

- The six-bladed Dowty props are composite with **heated de-icing boots on the inner leading edge** and nickel reinforcement on the outer sections.

Risk:

- Ice shedding chunks off the blades can cause vibration and structural damage and reduce thrust.
- Engine inlet icing can cause **flameout** or compressor stalls.

In DCS:

- Use prop and engine anti-ice when in icing conditions (visible moisture near or below freezing).
- Avoid “max power + high AoA” with heavy icing where possible – keep it controlled.

6. Very short turboprop cheat sheet for the DCS C-130J

How it works (in one line):

Jet core (NG) spins power turbine (NP) → gearbox → 6-blade prop; FADEC keeps NP at 100% and changes torque and blade pitch to give you thrust.

Key controls:

- **Power levers:** your only “throttle”. Flight range vs ground/beta/reverse.
- **LSGI/HSGL switches:** taxi and warm-up management vs full systems.
- **Prop control panel:** manual feather/unfeather in allowed conditions.
- **ATCS:** leave ON for takeoff/landing – big safety margin for engine-out.
- **Prop Sync:** ON in cruise for comfort.

By phase:

- **Start** – PLA 13–33°, monitor NG/MGT, let FADEC handle start/abort logic.

- **Taxi** – LSGI where possible, gentle beta to control speed; avoid big reverse on the ramp.
- **Takeoff** – ATCS ON, matched torque, NP 100%, treat engine failure like a real asymmetric emergency.
- **Climb/Cruise** – set torque, stay in temp limits, Prop Sync ON.
- **Landing** – stabilize in flight range; after touchdown, go to ground range and then reverse symmetrically.

Biggest “don’t do that” items:

- ATCS OFF + outboard engine failure near liftoff (VMCA trap).
- Asymmetric reverse at high speed.
- Ignoring autofeather / feather on a dead engine (drag monster).
- Sloppy starts – watch MGT and NG; abort if it looks wrong.

What Feathering Actually Is (C-130J-Specific)

A propeller is **feathered** when all blades rotate to a **high-pitch, edge-on** position to the relative wind, producing **minimum aerodynamic drag**. In a turboprop, feathering is essential for:

- Engine-out controllability
- Reducing asymmetric drag
- Preserving climb performance
- Preventing further damage to a failed engine

The C-130J uses a FADEC-controlled Pitch Control Unit (PCU) plus an auxiliary feather pump for both automatic and manual feathering.

Source: DCS C-130J Manual p.72–73

Automatic Feathering (Autofeather)

The C-130J’s FADEC can feather the propeller **automatically** when it detects an engine failure.

Conditions that Allow Autofeather

Autofeather requires **Mission Computer (MC)** permission:

- Always **granted for outboard engines**
- Granted for inboard engines only when:
 - **Aircraft is below 15,500 ft, AND**
 - The **remaining engines are running normally**

If these conditions **aren't met**, FADEC **windmills the prop at 100% NP** to maintain electrical and hydraulic power.

Source: p.74

When Autofeather Triggers

The FADEC requests autofeather if the **power levers are at flight idle or above**, and any of the following occur:

1. **FADEC loses control** of the propeller
2. At high power:
 - **Engine horsepower < 74% of commanded power, AND**
 - **NG is decelerating**
3. At low power:
 - **NG < 69%**

Source: p.74

After Autofeather Occurs

Once feathered:

- FADEC attempts to **maintain NG at flight idle**
- FADEC commands **ignition + relight attempt**
- If NG decays below **56%**, FADEC **cuts fuel** and **shuts the engine down**

Source: p.74

Why Feathering Matters (Aerodynamic Effect)

After an engine failure, the prop is still at a **coarse flight blade angle**, which makes the prop disc act like a **giant flat plate**— MASSIVE DRAG.

Direct text:

“When an engine fails...the propeller is still set to a coarse blade angle which causes the propeller disc to act as a solid object and create a large amount of drag.”

Source: p.73

Feathering fixes this by rotating the blade's *edge-on*, dramatically reducing drag and improving controllability, especially in:

- **Outboard engine failures** (worst-case for yaw/roll)
 - **Takeoff/landing** when VMCA margins are smallest
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Manual Feathering (Propeller Control Panel)

The C-130J gives you explicit manual feather control using the **Propeller Control Panel**, but **only** under two conditions:

1. **Engine control switch = STOP**, OR
2. Engine is in **LSGI AND**
 - Power lever = **GROUND IDLE**

Source: p.72

Panel Switch Positions

Per p.76 (Propeller Control Panel):

- **FEATHER** — drives blades to full feather
- **NORMAL** — disables auxiliary pump (normal FADEC control)
- **UNFEATHER** — drives blades to unfeather

Important safety note from the manual:

Holding **UNFEATHER** on a shutdown engine can drive the blades **all the way to full reverse**.

Source: p.76

Windmilling vs. Feathered Prop – C-130J Behavior

If FADEC **cannot** feather (permission denied), the prop is deliberately kept **windmilling at 100% NP** for hydraulic and electrical power.

Source: p.74

This is a *designed* behavior:

- Windmilling = **high drag**, but **full system's power**
- Feathered = **low drag**, but **loss of mechanical power generation on that engine**

This is why inboard autofeather requires special conditions — their system's load is more critical.

Engine-Out Handling — Feathering Impact (C-130J-specific)

Upon engine failure:

- Immediate yaw & roll **toward the dead engine**
- FADEC feathers (or windmills if conditions not met)
- Drag reduction after feathering significantly improves:
 - VMCA margins
 - Climb gradients
 - Rudder authority

Source: p.73

Feathering Summary Checklist (Pilot Notes)

AUTOFEATHER WORKS WHEN:

- Outboard engines: **always permitted**
- Inboard engines:
 - **< 15,500 ft**

- **Remaining engines are normal**

AUTOFEATHER TRIGGERS WHEN:

- Power levers \geq flight idle, **AND**
- FADEC detects loss of control **OR**
- NG decaying below thresholds

MANUAL FEATHER WORKS WHEN:

- Engine = **STOP**, OR
- Engine = **LSGI** + **Power lever at GND IDLE**

DANGER ZONES

- Windmilling prop = **giant airbrake**
- Outboard failures at low speed = **worst asymmetry**
- Avoid uncommanded **UNFEATHER** → **FULL REVERSE** on ground shutdown engines

Engine / Prop System

- **AE2100D3** – Rolls-Royce AE2100D3 turboprop engine model used on the C-130J. Identified in the powerplant section as the engine type.
- **FADEC** – *Full Authority Digital Electronic Control*; electronic engine/prop control system. Glossary: "FADEC – Full Authority Digital Electronic Control." (Glossary p. 340)
- **NG** – *Gas Generator* speed (core RPM), shown as percent. Glossary: "NG – Gas Generator." (Glossary p. 341)
- **NP** – *Power Turbine* speed (prop RPM), shown as percent. Glossary: "NP – Power Turbine." (Glossary p. 341)
- **MGT** – *Measured Gas Temperature* (engine temperature used as the primary limit). Glossary: "MGT – Measured Gas Temperature." (Glossary p. 341)
- **ITT** – *Inter-Turbine Temperature*. This is a standard turboprop term; the C-130J manual itself uses **MGT**, not ITT, for turbine temperature indication.

(No specific ITT acronym in the DCS C-130J glossary; this one is general aviation usage, not manual-specific.)

- **PCU** – *Pitch Control Unit*; controls propeller blade angle. Glossary: “PCU – Pitch Control Unit.” (Glossary p. 341)
- **PLA** – *Power Lever Angle*; the commanded lever position FADEC reads to schedule power/prop pitch. Glossary: “PLA – Power Lever Angle.” (Glossary p. 341)
- **TQ** – *Torque*

Ground / Engine Modes

- **LSGI** – *Low Speed Ground Idle*; reduced NG/NP on the ground to cut fuel flow and propwash. Glossary: “LSGI – Low Speed Ground Idle.” (Glossary p. 341)

Engine operating states section explains LSGI behavior and notes generators are not powered in LSGI. (p. 76)

- **HSGI** – *High Speed Ground Idle*; normal ground idle with generators online. Glossary: “HSGI – High Speed Ground Idle.” (Glossary p. 340)

Engine operating states section describes HSGI as default idle with generators powered. (p. 76)

- **Hotel Mode** – Not an acronym, but called out as a named configuration: engine in LSGI with prop feathered via the auxiliary feather pump to reduce noise and propwash (used for ERO). (p. 76)
- **ERO** – *Engine Running Onload/Offload*; ground loading/unloading with engines running. Glossary: “ERO – Engine Running Onload/Offload.” (Glossary p. 340)

Control / Protection Systems

- **ATCS** – *Automatic Thrust Control System*.
Glossary: “ATCS – Automatic Thrust Control System.” (Glossary p. 339)

Detailed description: ATCS limits asymmetric thrust between outboard engines and references VMPR/VMCA3. (pp. 80–81)

- **VMPR** – *Minimum Power Restoration Speed* (name and definition given in text).
Manual: “VMPR is defined as the minimum speed at which full power may be restored to an opposing outboard engine with the aircraft still being controllable.” (p. 80)
- **VMCA3 / VMCA** – The manual uses **VMCA3** in the ATCS section and states “Due to how VMPR is scheduled, VMCA3 will always be greater.” (p. 80)

The manual does **not** expand VMCA/VMCA3 in the glossary; in general turboprop/transport usage, VMCA is the *minimum control speed in the air*, but that long-form phrase is **not** explicitly printed in the ASC/DCS manual.

- **GCAS / GCAS/TAWS** – Mentioned indirectly via systems, but not in your text; included here only if you later reference them. Glossary: “GCAS – Ground Collision Avoidance System.” (Glossary p. 340)

Aircraft / Systems / Displays

- **C-130J** – Lockheed Martin *C-130J Super Hercules* model. The manual is the “DCS: C-130J User Manual”; the type is referenced in front matter and throughout.
- **DCS** – *Digital Combat Simulator*; the sim platform. Glossary: “DCS – Digital Combat Simulator.” (Glossary p. 340)
- **ASC** – *Airplane Simulation Company*; the third-party developer of the C-130J module. Glossary: “ASC – Airplane Simulation Company.” (Glossary p. 339)
- **APU** – *Auxiliary Power Unit*; small jet engine in the left wheel well providing electrical power and bleed air with engines off. Glossary: “APU – Auxiliary Power Unit.” (Glossary p. 339)

Described in systems text: APU location, function, and overspeed limits. (p. 81)

- **HDD** – *Heads Down Display*; the four multi-function LCDs on the main panel. Glossary: “HDD – Heads Down Display.” (Glossary p. 340)

Overview: layout and function of the HDDs. (p. 197)

- **HUD** – *Heads Up Display*; projector displays flight data in the pilot's forward field of view. Glossary: “HUD – Heads Up Display.” (Glossary p. 340)
- **PFD** – *Primary Flight Display*; attitude/airspeed/altitude/navigation on HDD 1/4 when HUD is stowed. Described in the HDD section as “Primary Flight Display (PFD).” (p. 199)
- **AMU** – *Avionics Management Unit*; controls what each HDD shows and manages many avionics functions. Glossary: “AMU – Avionics Management Unit.” (Glossary p. 339)
- **ACAWS** – *Advisory Caution Warning System*; central alerting system. Glossary: “ACAWS – Advisory Caution Warning System.” (Glossary p. 339)

ACAWS behavior (message stack, overflow, color coding) is described in the HDD section. (p. 212)

Speeds / Performance

- **CAS** – *Calibrated Airspeed*. Glossary: “CAS – Calibrated Airspeed.” (Glossary p. 339)
- **VH** – *Maximum Recommended Airspeed*; appears on the V SPEED page tied to “<H” carets on PFD/HUD. (p. 313)