DJI Air 3S - Capture Protocol

Chañaral de Aceituno • Wide-camera capture and reference • 11 November 2026

1 All Protocols

- Use Pro with shutter and ISO set manually for repeatable tests. Auto with EV is an alternative in changing light; recheck shutter against the blur chart.
- Start at 1/1000 s; use faster shutter speeds or slower flight when the blur table requires it.
- Start at ISO 100; raise it as needed for exposure. With shutter and ISO both manual, adjust those controls; EV cannot change fully manual exposure.
- Wide-camera aperture is fixed at f/1.8.
- Histogram ON
- Overexposure warning ON, at the operator's discretion. Protect whale detail; do not darken the whole image just to remove small sun-glints.
- Set the gimbal to nadir, −90°.
- If using a polariser, capture and label a paired comparison with and without it when practical.
- Keep original files and names.

2 High Altitude Survey Protocol

Settings

- Wide camera, 1×, 12 MP, 4:3 (expected 4096 × 3072). Verify saved dimensions.
- Capture JPEGs.
- Photo → Timed Shot → 2 s; 12 MP JPEGs. Verify capture. Optional 50 MP / 5 s test: section 6.
- Use m/s and Normal mode for surveys; examples ≤12 m/s. Respect lower installed limits and conditions.

Protocol

1. **Use the highest chart 2.1 GSD step permitted for the operation within the reported 120 m ceiling; allow for height uncertainty.**
2. **Use the matching height-above-water block on chart 2.2**
3. **Follow that block right to current shutter speed**
4. **Select Normal mode first, align with the intended direction, then engage Cruise Control at a permitted chart speed.**
5. **Start at 4 m/s. Select a speed giving ≤0.5 pixel estimated blur and ≥75% overlap. Overlap values are rounded down; slow further when needed.**
6. **Capture a straight pass including water before and after the whales, subject to the operator's wildlife protocol.**
7. **Use permitted 1 cm/pixel steps in chart 2.1. The 2 cm/pixel row is 56.9 m above water; keep an uncertainty margin above 55 m.**

Chart 2.1
Nominal still GSD in 1 cm/pixel increments

Height above water	Still cm/pixel	Nominal footprint
28.4 m	1	41.0 × 30.7 m
56.9 m	2	81.9 × 61.4 m
85.3 m	3	122.9 × 92.2 m
113.7 m	4	163.8 × 122.9 m
142.2 m	5	204.8 × 153.6 m
170.6 m	6	245.8 × 184.3 m
199.0 m	7	286.7 × 215.0 m

Heights are above water, not ASL: displayed takeoff-relative height + launch-to-water offset, with allowance for uncertainty. Retain the provisional 55 m floor and reported 120 m ceiling; confirm their applicable reference and permissions. Red height cells are reference only outside this range. Heights are rounded to 0.1 m; GSD steps are nominal.

2.2 Motion blur & Overlap field reference

Ground speed	Height	Overlap 2 s	Capture GSD	1/500	1/1000	1/2000	1/4000	1/8000
4 m/s	56.9 m	86%	2 cm	0.40	0.20	0.10	0.05	0.03
8 m/s	56.9 m	73%	2 cm	0.80	0.40	0.20	0.10	0.05
12 m/s	56.9 m	60%	2 cm	1.20	0.60	0.30	0.15	0.07
4 m/s	85.3 m	91%	3 cm	0.27	0.13	0.07	0.03	0.02
8 m/s	85.3 m	82%	3 cm	0.53	0.27	0.13	0.07	0.03
12 m/s	85.3 m	73%	3 cm	0.80	0.40	0.20	0.10	0.05
4 m/s	113.7 m	93%	4 cm	0.20	0.10	0.05	0.03	0.01
8 m/s	113.7 m	86%	4 cm	0.40	0.20	0.10	0.05	0.03
12 m/s	113.7 m	80%	4 cm	0.60	0.30	0.15	0.07	0.04
4 m/s	142.2 m	94%	5 cm	0.16	0.08	0.04	0.02	0.01
8 m/s	142.2 m	89%	5 cm	0.32	0.16	0.08	0.04	0.02
12 m/s	142.2 m	84%	5 cm	0.48	0.24	0.12	0.06	0.03
4 m/s	170.6 m	95%	6 cm	0.13	0.07	0.03	0.02	0.01
8 m/s	170.6 m	91%	6 cm	0.27	0.13	0.07	0.03	0.02
12 m/s	170.6 m	86%	6 cm	0.40	0.20	0.10	0.05	0.03
4 m/s	199.0 m	96%	7 cm	0.11	0.06	0.03	0.01	0.01
8 m/s	199.0 m	92%	7 cm	0.23	0.11	0.06	0.03	0.01
12 m/s	199.0 m	88%	7 cm	0.34	0.17	0.09	0.04	0.02

Planning estimates: 2 s interval, short image dimension along track; overlap rounded down. Require ≥75% overlap and ≤0.5 px blur. Yellow overlap cells fail the overlap target; green blur alone is insufficient. Red height cells fall outside 55–120 m. Blur = speed × exposure time / GSD; whale motion and vibration add blur. Check actual timestamps.

3 Video

- Wide camera
- MP4 container
- H.265
- Normal colour, H.265 (10-bit); no D-Log M or HLG. Confirm that the receiving software can decode the original clips.
- Capture UHD 4K (3840 × 2160), 60 fps, 1×; baseline 3 cm/pixel at 80.0 m above water where permitted. Record video separately from timed photos.

Protocol

1. **Use the 3 cm/pixel video row (80.0 m) where permitted, with a margin below the applicable ceiling.**
2. **Use the matching height-above-water block on chart 3.2**
3. **Follow that block right to current shutter speed**
4. **Select Cine mode, align with the intended direction, then engage Cruise Control for the pass.**
5. **Start with a hover or slow pass. Use chart 3.2 only as a provisional blur estimate until video crop is checked.**
6. **Use Cine mode when suitable for slow manual tracking.**
7. **Hover or SLOWLY track with whales.**
8. **The 2 cm/pixel video row (53.3 m) is reference only: below the retained 55 m floor.**

Chart 3.1 — Nominal video GSD in 1 cm/pixel increments

Height above water	Video cm/pixel
26.7 m	1
53.3 m	2
80.0 m	3
106.6 m	4
133.3 m	5
159.9 m	6
186.6 m	7

3.2 Provisional video motion-blur reference

Nominal full-width 4K/60 geometry: verify crop against a still from the same position. Rows use exact 2 and 3 cm/pixel GSD. Speeds of 1, 2 and 2.8 m/s are slow-tracking examples, not Cine limits; use the lower of the example, installed mode limit and conditions. Cells show translation blur, not overlap.

Ground speed Mode · height	Video GSD cm/pixel	1/500 s	1/1000 s	1/2000 s	1/4000 s	1/8000 s
1 m/s UHD 4K · 53.3 m	2.000	0.10	0.05	0.03	0.01	0.01
2 m/s UHD 4K · 53.3 m	2.000	0.20	0.10	0.05	0.03	0.01
2.8 m/s UHD 4K · 53.3 m	2.000	0.28	0.14	0.07	0.03	0.02
1 m/s UHD 4K · 80.0 m	3.000	0.07	0.03	0.02	0.01	0.00
2 m/s UHD 4K · 80.0 m	3.000	0.13	0.07	0.03	0.02	0.01
2.8 m/s UHD 4K · 80.0 m	3.000	0.19	0.09	0.05	0.02	0.01

4 Files and supporting information

Retain the original JPEGs and video clips, unchanged filenames, flight logs and SRT files when available. Link each test to a short capture log with the following information:

- Location, date, species and individual IDs where known; permissions and required credit.
- Actual height above water, launch height and any launch-to-water offset. A boat launch makes takeoff-relative altitude different from height above the water.
- Camera, mode, zoom, resolution, frame rate or still interval, exposure settings and polariser status
- Weather, lighting, glare, sea state and any operational changes or observed disturbance.

Keep each mode and height test identifiable. Check a short sequence before surveying: 12 MP JPEGs (expected 4096 × 3072), actual spacing, sharpness and complete storage. If the cadence or dimensions differ, recalculate the table values.

5 DJI Air 3S camera reference

Two cameras: this protocol uses only the 24 mm-equivalent wide camera at 1×. The 70 mm medium tele camera at 3× needs different geometry. Baseline: 12 MP/2 s; optional 50 MP/5 s detail test. Published specifications checked 11 November 2026.

Specification	Main wide
Sensor	1-inch CMOS
Still resolution	12 MP: expected 4096 × 3072; 50 MP: 8192 × 6144
Field of view	84°
Equivalent focal length	24 mm
Aperture	f/1.8
Timed shooting	12 MP: 2/3/5/7/10/15/20/30/60 s; 50 MP: 5/7/10/15/20/30/60 s

Video — H.265

Camera and resolution	Protocol frame rate (fps)
Wide (UHD 4K) 3840 × 2160	**60**

Nominal still and provisional UHD 4K geometry

Camera baseline	Assumed diagonal	Image dimensions	Horizontal factor
Wide — still	84°	4096 × 3072*	1.44065
Wide — UHD 4K	79.1°*	3840 × 2160	1.44065

Nominal calculation: width/height factor = 2 × tan(84°/2) × 4/5 = 1.44065; still vertical factor = 1.08048. GSD = 100 × height × 1.44065 / 4096 cm/pixel. *12 MP dimensions are the working half-width/half-height assumption from the published maximum; verify an original file. Video assumes full-width 16:9, not a verified mode-specific FOV. Nadir view and flat water are assumed.

6 Interval capture and automation checks

Baseline: manual passes with 12 MP Timed Shot JPEGs. This Air 3S adaptation has not been demonstrated on the team's aircraft.

Resolve the actual setup

- Susannah mentions Air 3/3S aircraft in the email thread. Confirm DJI Air 3S on the actual aircraft before using this document; Coni's Mavic Air 2 is a different model.
- Record the actual controller, phone if used, operating system, app and firmware. Confirm the exact combination supports the chosen capture workflow.
- Record the installed DJI Fly version and aircraft/controller firmware versions.
- If using automation, identify the mission planner and verify its support for this exact aircraft and controller. Manual capture remains the baseline.

The email reports a 120 m maximum and fieldwork from 22 November to 9 December 2026. Confirm the applicable permit conditions and height reference with the operator. This document uses that reported ceiling; it does not independently establish Chilean flight permissions.

Optional high-resolution interval test

The 50 MP wide-camera mode supports timed capture from 5 s. At the same height its nominal GSD is half the 12 MP value, while the footprint is unchanged; this does not prove twice the resolved detail. At 5 s, use 40% of a 2 s speed to retain the same overlap. Example: 4 m/s becomes 1.6 m/s. Recompute blur with the smaller GSD and inspect real files. Do not apply the 2 s overlap column unchanged.

DJI Air 3S supports native Waypoint Flight in DJI Fly. Validate lens, nadir, speed, height reference, camera action and continuous interval capture on a non-wildlife test. Do not reuse Mavic 3 Pro KMZ file-replacement steps. DJI does not document KML route import for this model.

Validation gate

1. Confirm 12 MP, 4:3, JPEG, 1×, nadir, actual interval, water-relative height estimate, shutter speed and storage before a pass.
2. Review obstacles, operating conditions, failsafes and return-to-home behaviour with the operator.
3. Compare intended and actual behaviour in an authorized non-wildlife test; inspect the files before documenting controller-specific operational steps.

The operator's assessment of permissions, wildlife response, local aviation requirements and conditions governs whether and how a flight proceeds. No nominal altitude in this document is a clearance or an instruction to approach wildlife.

Sources and adaptation record

DJI Air 3S specifications - https://www.dji.com/air-3s/specs

DJI Air 3S - User Manual (v1.0, April 2026) - https://dl.djicdn.com/downloads/DJI_Air_3S/UM/20260423/DJI_Air_3S_um_en1.pdf

Email basis: Re: Collaborations from Chañaral de Aceituno!, Ted / Coni / Susannah, 11 November 2026.

Email thread — https://mail.google.com/mail/u/?authuser=greg%40worldwidedronesolutions.com#all/1a1cc3a2bf085fc7

Short edition. The matching long edition adds exposure explanations and the recovered histogram illustrations.

Source document — https://docs.google.com/document/d/1d_GG5qFBupaAsk0CAXQpnT9TDWR-IHPLI9mfOhjHfcc/edit

11 November 2026: corrected short/long charts to 1 cm/pixel increments; recalculated heights, footprints, overlap and blur; flagged rows outside 55–120 m; clarified manual exposure and slow video speeds. Geometry and installed controls still require a preflight check.

Open checks: saved 12 MP dimensions, actual capture cadence, video crop, controller/app versions and the operator's height reference. Quadcopter notebook destination remains unresolved; this adaptation record is saved with the protocol.