

ROAMTM

Reconfigurable Open Architecture Multirotor

Aero **Systems West**TM

Your Mission, Our LiftTM

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Kit Handbook Identification:

- Owner: _____
- FAA Registration: _____
- Return If Found: _____
- Phone: _____

Foreword

Thank you for choosing the ROAM kit. As engineers, we take great pride in designing equipment that performs in the field. ROAM was built around three principles: modularity, serviceability, and ease-of-use. Every major component is individually replaceable, every interface is documented, and the platform is designed to be assembled, maintained, and adapted by the operator without specialized tooling or factory support.

This handbook serves as a reference companion to the online resources available at aerosystemswest.com. Because ROAM is a kit product, the most detailed and up-to-date build instructions, video walkthroughs, and programming guidance will always be found on our website. This handbook provides the legal framework, key specifications, quick-reference checklists, and resource links you'll need throughout the life of your ROAM.

For in-depth build instructions, troubleshooting, and expanded technical content, we encourage you to visit our documentation ecosystem online. There, you'll always find the most current resources.

- The ASW Engineering Team - Your Mission, Our Lift™

Important Notice to Builders & Operators

Thank you for choosing an Aero Systems West ROAM kit. Please be aware that by building, assembling, or operating this aircraft, you are agreeing to certain Disclaimers, Terms, and Conditions that apply to its use. Because ROAM is sold as a kit to be assembled by the end user, the operator assumes additional responsibilities for proper construction and airworthiness of the completed aircraft.

These terms outline your responsibilities as both the builder and operator, including compliance with all applicable laws and safe operation of the aircraft. Building or operating the aircraft constitutes acceptance of these terms.

For the complete Disclaimers, Terms, and Conditions, please see the corresponding section of this handbook.

Disclaimers, Terms, & Conditions

Acceptance by Use

By purchasing, assembling, building, programming, or otherwise using any ROAM unmanned aircraft system kit ("UAS Kit") manufactured or supplied by Aero Systems West, Inc. ("ASW"), you ("Customer," "Builder," or "Operator") acknowledge and agree to be bound by these Disclaimers, Terms, and Conditions. If you do not agree, you must not assemble, operate, or permit the operation of the aircraft. Assembly or operation of the aircraft constitutes acceptance of these terms.

1. Kit Product – Builder Responsibility

1.1 Builder as Manufacturer: The ROAM is sold as a kit. The individual or organization that assembles the kit is the manufacturer of the completed aircraft for all legal and regulatory purposes. ASW is the manufacturer of the individual components as shipped, not the assembled aircraft. The builder assumes full responsibility for the structural integrity, electrical correctness, calibration, and airworthiness of the completed aircraft.

1.2 No Guarantee of Airworthiness: ASW provides assembly videos, documentation, and software tools as aids. These resources do not guarantee that any completed build will be airworthy, safe, or suitable for flight. It is the builder's sole responsibility to verify that the aircraft is correctly assembled and calibrated before flight.

1.3 Modifications and 3D-Printed Components: ROAM is designed to support user modification and 3D printing of frame elements. Any modifications, substitutions, or use of 3D-printed components are undertaken entirely at the builder's risk. ASW makes no representations about the structural adequacy, durability, or safety of user-modified or 3D-printed components.

2. Regulatory Compliance & Operator Responsibility

2.1 Sole Responsibility of Operator: Under applicable U.S. law and international aviation principles, the operator of any aircraft (including UAS) is solely responsible for the safe conduct of flight and compliance with all federal, state, and local laws, regulations, and directives. Operators conducting commercial or professional operations should ensure they hold the appropriate FAA certification under 14 CFR Part 107. Operators flying under the recreational exception (49 USC 44809) are responsible for meeting all applicable requirements of that provision.

2.2 No Certification Guarantee: ASW does not represent or warrant that any ROAM system, whether assembled from the kit or modified by the user, is pre-certified, type-certified, or airworthy-certified for any particular use. All certifications, waivers, authorizations, or operational approvals must be obtained by the operator.

2.3 Remote ID Compliance: Because the ROAM is a kit, it does not ship with a factory-installed Standard Remote ID transmitter. Compliance with Remote ID requirements under 14 CFR Part 89 is the sole responsibility of the builder and operator. This may be achieved through installation of a modular Remote ID device, such as the ASW Remote ID module available in the Build Accessory Package, or any other FAA-compliant solution selected by the operator. ASW does not guarantee that the operator's chosen Remote ID solution will meet all applicable requirements.

2.4 International Operations: For customers outside the United States, the operator is solely responsible for compliance with applicable local laws and regulations.

3. Limitations of Liability

Disclaimers, Terms, & Conditions - Cont.

3.1 No Liability for Assembly or Operations: ASW disclaims all liability for any loss, injury, damage, or penalty arising from or related to the assembly, construction, calibration, operation, misuse, or modification of the ROAM kit or any aircraft built from it, including but not limited to property damage, bodily injury, regulatory penalties, or loss of data.

3.2 Payloads and Modifications: The operator is solely responsible for the selection, integration, and operation of any payloads, modifications, or third-party components. ASW makes no representation or warranty regarding the design, manufacture, performance, safety, or reliability of any third-party payloads or components.

3.3 Consequential Damages: To the fullest extent permitted by law, ASW shall not be liable for consequential, incidental, indirect, punitive, or special damages, even if ASW has been advised of the possibility of such damages.

4. Assumption of Risk

4.1 Inherent Risks: Building and operating unmanned aircraft systems carries inherent risks, including but not limited to collision, crash, interference, component failure, fire, data loss, and injury. By assembling and/or using the aircraft, the builder and operator voluntarily assume all such risks.

4.2 Insurance: ASW strongly recommends that operators obtain adequate aviation liability and hull insurance coverage before operating any UAS.

5. Product Use & Restrictions

5.1 Intended Use: ROAM kits are designed and sold for professional, commercial, academic, educational, and governmental applications. They are not toys or recreational consumer products, though operators may choose to fly under recreational provisions where applicable.

5.2 Prohibited Uses: The aircraft shall not be used in any unlawful manner, including but not limited to: (a) carriage of hazardous materials, (b) surveillance or operations that violate privacy rights, or (c) applications restricted by applicable laws.

5.3 Export Controls: Export control obligations, if any, are determined by the final configuration of the aircraft. The operator is solely responsible for ensuring compliance with all applicable export control laws and restrictions.

6. Software & Firmware

6.1 Open-Source Software: The ROAM kit utilizes ArduCopter firmware (GPLv3) and recommends Mission Planner (GPLv3) for ground control. These are third-party open-source projects. ASW makes no warranty regarding the performance, reliability, or safety of this software. Software is provided "as is."

6.2 ROAM Programming Utility: The ROAM Programming Utility is proprietary freeware provided by ASW to assist with kit configuration. It is provided "as is" without warranty. The PU's Disclaimers, Terms, and Conditions, accessible within the application's Information tab, apply to its use.

6.3 Parameter Sets: ASW provides pre-tuned parameter sets for the ROAM configuration. These parameters represent a starting point and may require adjustment based on the builder's specific configuration, payload, and- operating conditions. ASW does not guarantee that any parameter set will be optimal or safe for every configuration.

Disclaimers, Terms, & Conditions – Cont.

7. Indemnification

Customer agrees to indemnify, defend, and hold harmless ASW, its officers, employees, contractors, and affiliates from any claims, liabilities, damages, losses, costs, or expenses (including reasonable attorneys' fees) arising out of or related to: (a) Customer's assembly or construction of the ROAM kit, (b) Customer's operation of the UAS, (c) any modification or payload integration, (d) failure to comply with applicable law, or (e) breach of these Terms and Conditions.

8. Governing Law & Dispute Resolution

8.1 Governing Law: These Terms and Conditions shall be governed by and construed under the laws of the State of California, without regard to its conflict-of-law principles.

8.2 Venue: Any disputes shall be resolved exclusively in the state or federal courts located in Santa Clara County, California, unless ASW elects arbitration under applicable rules.

8.3 Severability: If any provision is held invalid, the remainder shall remain in full force and effect.

9. Updates to Terms

ASW reserves the right to modify or update these Disclaimers, Terms, and Conditions at any time. Continued use of the ROAM kit or any aircraft built from it after notice of updates shall constitute acceptance of the revised terms.

Company: Aero Systems West, Inc.

Address: 13025 Murphy Avenue, San Martin, CA 95046

Phone: 408-599-2791

Limited Warranty

1. Coverage - ASW-Branded Components

Aero Systems West, Inc. ("ASW") warrants to the original purchaser ("Customer") that each ASW-branded component included in the ROAM kit, including but not limited to the carrier board, electronic speed controllers (ESCs), frame plates, arms, landing gear, hardware, motors, propellers, and ASW Remote ID module (if purchased), will, for a period of one (1) year from the date of purchase, be free from material defects in workmanship as shipped by ASW.

2. Coverage - Third-Party Components (Pass-Through Warranty)

Certain components included in the ROAM kit are manufactured by third parties for whom ASW is a licensed reseller. These include the CubePilot Cube Orange+ autopilot, the Here3+ GNSS module, and the RFD900+US radio pair. For these components, ASW passes through the manufacturer's warranty to the original purchaser. Warranty terms, duration, and coverage for these items are governed solely by the respective manufacturer's warranty policies. ASW will assist the customer in facilitating warranty claims with these manufacturers but makes no independent warranty on these components beyond what the manufacturer provides.

3. Scope and Limitations - Kit Product

Because the ROAM is sold as a kit to be assembled by the end user, this warranty does not extend to the completed aircraft as a system, nor does it warrant the airworthiness, performance, or safety of any aircraft assembled from the kit. ASW warrants only that each component, as delivered, was free from defects at the time of shipment. This warranty does not create any obligation on the part of ASW to inspect, certify, or approve any completed build.

4. Exclusions

This Limited Warranty does not cover:

- Components that have been improperly assembled, installed, wired, modified, or physically damaged by the builder or operator.
- Damage resulting from improper assembly, including but not limited to reversed polarity connections, incorrect motor wiring, overtightened hardware, or physical stress from assembly.
- Components damaged in transport, storage, or during assembly, or subjected to unauthorized repair or modification.
- Damage caused by operation of an improperly built or improperly calibrated aircraft.
- Normal wear and tear, including propeller damage, battery degradation, nd connector wear.
- Third-party components, payloads, software, or modifications not provided by ASW.
- Software provided with or recommended for the product, which is supplied "as is."
- 3D-printed frame components produced by the user, even if based on ASW-provided designs.

5. Claims Procedure

Limited Warranty – Cont.

To make a warranty claim, Customer must notify ASW before the expiration of the warranty period and obtain a Return Material Authorization (RMA) number. Components must be shipped freight prepaid, insured, securely packaged, and marked with the RMA number. A written description of the defect, along with photographs if possible, must accompany the return.

6. Remedies

At its sole discretion, ASW will either replace the defective ASW-branded component or refund the purchase price allocated to that component. For pass-through warranty items, remedies are governed by the respective manufacturer's warranty policy. These remedies are Customer's sole and exclusive remedies under this Limited Warranty.

7. Limitations of Liability

To the maximum extent permitted by law, ASW's total liability under this Limited Warranty shall not exceed the actual purchase price paid for the defective component. In no event shall ASW be liable for any indirect, incidental, consequential, punitive, or special damages, including but not limited to lost profits, property damage, bodily injury, business interruption, or substitute product costs, even if ASW has been advised of the possibility of such damages.

8. Implied Warranties (California Compliance)

To the extent required by applicable law, any implied warranties, including but not limited to the implied warranty of merchantability, are limited in duration to the same one (1) year period as this express Limited Warranty. Some states do not allow limitations on the duration of implied warranties, so this limitation may not apply to you.

9. High-Risk Applications

The product is not designed or intended for use in high-risk applications, including but not limited to manned aviation navigation, nuclear facilities, life-support systems, or weapons systems. ASW disclaims all liability for such uses.

Company: Aero Systems West, Inc.

Address: 13025 Murphy Avenue, San Martin, CA 95046

Phone: 408-599-2791

NDAA Compliance

Frame Kit

The ROAM Frame Kit is designed and sourced by ASW using components selected to comply with U.S. National Defense Authorization Act (NDAA) requirements in effect as of the date of shipment. The contents of the Frame Kit are fixed and do not vary between orders. In its default configuration, the Frame Kit is intended to be compliant with all UAS-relevant portions of the NDAA, including Section 889 and related prohibitions on certain covered telecommunications and video surveillance equipment, and excludes, to the best of ASW's knowledge and based on supplier representations, components known to be restricted under NDAA provisions in effect at the time of shipment.

Build Accessory Package (BAP)

Unlike the Frame Kit, the Build Accessory Package is configurable at the time of purchase. Customers may select from a range of options for motors, hand controllers, batteries, Remote ID modules, and other accessories. Some BAP configurations are fully NDAA compliant; others may include components that do not meet NDAA requirements. The NDAA compliance status of the BAP depends entirely on the specific components selected by the customer at the time of order.

Where a customer requires an NDAA-compliant system, it is the customer's responsibility to select BAP options that meet those requirements. ASW is happy to assist customers in identifying compliant options during the sales process. Any questions regarding the compliance status of specific BAP components should be directed to ASW prior to purchase.

User Modifications and Substitutions

Because the ROAM is an open-architecture kit, builders may choose to substitute, add, or modify components after purchase. Any such changes are the sole responsibility of the builder and may affect the NDAA compliance status of the system.

Customer Responsibility (Important Notice)

ASW does not guarantee that any drone, whether assembled from the kit as shipped, configured with customer-selected BAP options, or modified by the user after purchase, will comply with current or future NDAA provisions or other applicable laws and regulations. It is the customer's responsibility to determine whether their specific drone configuration complies with all laws, regulations, and contractual requirements applicable to them and their operations. Customers with compliance-sensitive missions (e.g., U.S. Government or defense-related programs) should review their specific requirements with their legal and compliance personnel and verify that their drone configuration is appropriate for those requirements.

ASW does not provide legal advice and cannot guarantee that any drone configuration will meet all current or future legal, regulatory, or contractual requirements applicable to a specific user, program, or procurement.

What's In The Kit

The ROAM system is sold in two parts: the Frame Kit (core structural and electronic components) and the Build Accessory Package, or BAP (motors, propellers, battery, controller, Remote ID, and tools). Together, they provide everything needed to build and fly a complete ROAM drone.

The Frame Kit contents are fixed and do not vary between orders.

The Build Accessory Package is configurable at the time of purchase; customers may select from available options for motors, controllers, batteries, and Remote ID to best match their operational requirements.

Component	Frame Kit	BAP
Genuine CubePilot Cube Orange+ Autopilot	1	-
ASW Carrier Board	1	-
ASW Electronic Speed Controllers (ESCs)	4	-
Genuine Here3+ GNSS Module with Stand	1	-
Genuine RFD900xUS Air Radio + Antennas	1	-
ASW RFD900 Daughterboard	1	-
Genuine RFD900xUS Ground Radio + USB Cable and Antennas	1	-
Carbon Fiber Frame Kit (Multi Piece)	1	-
Payload Rail Mounts (4.25" twin rails)	1	-
Anodized Aluminum Arms	4	-
Complete Hardware Kit	1	-
ROAM Aircraft Handbook (Digital Download)	QR Code in Box	-
ASW Decal	1	-
Hand Controller	-	Configurable
ASW Remote ID Module	-	Configurable
Motors	-	4
Propellers (15x5.5" nylon reinforced) + Mounting Hardware	-	4
6S LiPo Main Flight Battery + Connectors	-	1
Assembly Tool Kit	-	Configurable

BAP contents may vary by customer selection. Your order documentation specifies exactly which components were included. Upon receiving your kit, verify all components against the packing list included in the box. If any components are missing or damaged, contact ASW immediately at info@aerosystemswest.com.

Getting Started

Building your ROAM involves three phases: physical assembly, programming, and first flight. Depending on experience level, a typical build takes approximately two hours from unboxing to flight-ready, with no soldering or specialized tooling required.

All build and programming instructions are maintained online at aerosystemswest.com to ensure you always have the most current version. This handbook does not contain step-by-step build instructions; those live on the website and in the ROAM Programming Utility.

Detailed video instructions for the physical build are available on our website. **Scan the QR code** or visit aerosystemswest.com/docs/roam/ to access the complete build video playlist.



Getting Started - Build Workflow

Phase 1: Physical Build (~1-2 hours)

The build requires no soldering; all connections use plug-in connectors and fasteners included in the hardware kit.

Important: Do not install propellers or connect the battery until directed to do so during the programming and flight phases.

Phase 2: Programming & Calibration (~1 hour)

After completing the physical build, download and install the ROAM Programming Utility (PU) on any Windows computer. The PU provides guided firmware flashing, sensor calibration, and radio configuration through an automated interface. It packages ArduCopter and a pre-tuned ROAM parameter set, eliminating the need for manual parameter entry or tuning.

To download the ROAM Programming Utility
Scan the QR code or visit aerosystemswest.com/docs/roam/ to download directly.



The PU covers the following steps in order:

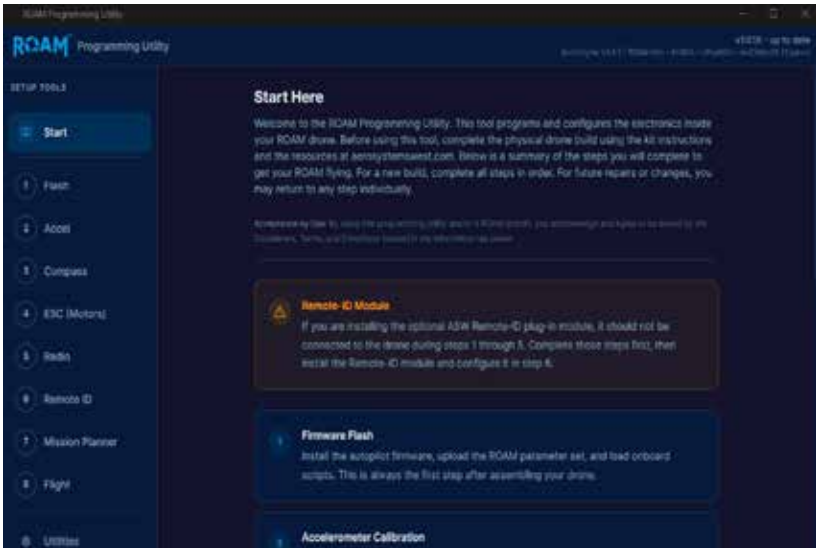
1. Firmware Flash: Install autopilot firmware and upload the ROAM parameter set.
2. Accelerometer Calibration: Teach the autopilot orientation using 6 positions.
3. Compass Calibration: Calibrate the compass by rotating the drone.
4. ESC (Motor) Setup: Assign motors to arms and verify spin direction.
5. RFD Radio Setup: Program ground and air radios for communication.
6. Remote ID Setup: Configure Remote ID module (if applicable).
7. Mission Planner: Install and configure your ground control software and hand controller.

Phase 3: First Flight (~15 minutes)

Once programming is complete, the PU's Flight tab (Step 8) provides a quick-start guide for getting airborne in Loiter mode. Review the preflight checklist in this handbook before your first flight.

ROAM Programming Utility

The ROAM Programming Utility (PU) is a free Windows application that handles all electronic setup and calibration for ROAM drones. It packages the ArduCopter firmware and a pre-tuned ROAM parameter set, and automates the provisioning workflow from firmware flash through first-flight readiness.



The PU is not a flight control application. Once your ROAM is programmed and calibrated, all flight operations are performed through Mission Planner, which the PU also helps you install and configure.

System Requirements:

- Windows 10 or later
- USB port
- Internet connection

To download the ROAM Programming Utility **Scan the QR code** or visit aerosystemswest.com/docs/roam/ to download directly.



For additional detail on each step within the PU, refer to the application's built-in guidance and the online documentation.

Remote ID

FAA Rule 14 CFR Part 89 requires most unmanned aircraft to broadcast Remote ID information during flight. Because the ROAM is sold as a kit, it does not ship with a factory-installed Standard Remote ID transmitter. It is the responsibility of the ROAM builder and operator to determine whether Remote ID requirements apply to their operations and to install and configure an appropriate solution.

ASW Remote ID Module

For maximum convenience, ASW offers a purpose-built Remote ID module that plugs directly into the bottom of the ROAM frame. This module is available as an option in the Build Accessory Package or may be purchased separately. The ASW module uses the same proven hardware as the Remote ID transmitters installed in ASW's HLM product line and has a separate FAA Declaration of Compliance (DOC) on file as a modular device. Declarations of compliance are publicly available at <https://uasdoc.faa.gov/>.

Configuration

The ROAM PU provides a guided interface for setting the required Remote ID Operator ID broadcast field. For most users: enter your Part 107 certificate number or organization name as the Operator ID.

Alternative Remote ID Solutions

Operators may choose to use any FAA-compliant modular Remote ID device. If a non-ASW module is used, it is the operator's responsibility to install, configure, and maintain that device in accordance with the manufacturer's instructions and all applicable regulations. The ROAM Programming Utility's Remote ID tab is designed to work only with the ASW Remote ID module.

ASW Remote ID - LED Indicators

If you are using the ASW Remote ID broadcast module, it includes two LEDs (one red, one green) visible from underneath the drone. These indicate the preflight self-test (PFST) status and ongoing health of the module.

Stage	LED Pattern	Meaning
PFST Stage 1: Initial Boot	Green + Red double blink	Board booted, transmitter healthy, all systems nominal
PFST Stage 2: Autopilot Data	Green + Red second double blink	All data source connections established and healthy
Broadcasting	Green blinks 1Hz + solid Red	Receiving all required data (or data properly set); broadcasting complete information

ArduPilot & Mission Planner

ASW is proud to be an official ArduPilot partner. All ROAM drones run genuine ArduCopter control software. Your ROAM may be controlled by any ground control software supporting the MAVLink control protocol; however, ASW's official recommendation is the Mission Planner Windows application.

The ROAM Programming Utility handles the installation of Mission Planner and the configuration of your hand controller (Step 7). For users who wish to install or update Mission Planner manually:

Mission Planner Download:

<https://firmware.ardupilot.org/Tools/MissionPlanner/>

Mission Planner Wiki: <https://ardupilot.org/planner/index.html>

ASW strongly suggests that builders familiarize themselves with Mission Planner, especially the Data and Plan tabs, to maximize the probability of successful flight operations.

Operations & Checklists

Checklists are provided as a supplemental aid only and are not a substitute for training, certification, or regulatory knowledge. Operators are solely responsible for safe operations, airworthiness, and compliance with all applicable laws. All ROAM Programming Utility calibrations must be completed before first flight.

Preflight & Launch Checklist

Run every flight. Items are in order. Complete Part A at the aircraft, then Part B at the GCS.

Part A - Aircraft Inspection

Item	Check	
Weather & Environment	Wind and weather acceptable, adequate visibility	
Airspace	Authorized for flight, NOTAMs and TFRs checked	
Frame, Arms, & Hardware	No cracks or damage, all fasteners tight	
Propellers	CW/CCW matched to arm labels, bolts secured, no visible nicks or cracks	
Motors	Spin freely by hand, no grinding or wobble	
Battery	Charged, strapped securely, connector fully seated	
Antennas & Cables	Antennas upright and secure	
Remote ID (if installed)	Module seated, green LED blinking after power-on	
Payload (if applicable)	Secure, within weight limits, no interference with props	

Part B - Systems & Launch

Item	Check	
GCS, Radio, & Controller	Laptop on, ground radio connected, controller enabled	
Mission Planner	Connected to aircraft, telemetry streaming	
Battery Voltage (HUD)	Full or adequate for planned flight	
GPS (HUD)	3D Fix	
HUD Attitude	Horizon responds correctly when drone is tilted	
Flight Mode	Loiter confirmed	
Launch Area	Safety radius (minimum 15ft) clear of all people, safe to fly	
Arm & Launch	Arm in Mission Planner, throttle up to takeoff	
Payload (if applicable)	Secure, within weight limits, no interference with props	

Operations & Checklists - Cont.

Post-Flight

Run after every flight.

Item	Action	
Disarm	Confirm motors stopped, disarmed in Mission Planner	
Battery	Disconnect, check for heat or puffing	
Propellers	Inspect for damage; replace any damaged props	
Log	Note flight time, any anomalies, battery voltage at landing	

Field Kit Reminder

If flying away from your shop or lab, confirm you have: ROAM with propellers, charged battery, hand controller, ground radio + USB cable, laptop with Mission Planner, and any payload or tools. Install propellers at the field, not before transport. It is also suggested that you "pre-fetch" any maps required to your GCS computer in the event you will not have internet access in the field.

Operations & Checklists - Cont.

Hand Controller Quick Reference

Default ROAM controller layout (common to Logitech F310 and Fort Robotics):

Control	Function
Left Stick - Up/Down	Throttle/Altitude (RC3)
Left Stick - Left/Right	Yaw (RC4)
Right Stick - Up/Down	Pitch (RC2)
Right Stick - Left/Right	Roll (RC1)
A Button (Logitech) / Button 1 (Fort)	AltHold
B Button (Logitech) / Button 2 (Fort)	Loiter
Y Button (Logitech) / Button 3 (Fort)	Auto
X Button (Logitech) / Button 4 (Fort)	RTL (Return to Launch)

Fort Robotics™ Hand Controller ASW Default Mapping



Battery Charging & Care

ROAM drones use high-energy 6-cell (6S) lithium-polymer (LiPo) batteries. Depending on when you made your purchase, your kit may include either a 4000mAh or a 4500mAh battery pack. The ROAM's factory parameter set is configured to fly either option without modification. Please check the labeling on your battery pack(s) to determine the exact capacity and best charge settings for your specific unit.

Higher-capacity 6S battery packs (for example, 8000mAh) are available on the aftermarket for extended flight times. Please see the Specifications section for performance data with different battery capacities.

Charging Guidelines:

- Always use a smart charger designed for lithium-polymer (LiPo) batteries.
- Balance-charge every time. This helps maintain pack health.
- Charge at no more than 1C (1 × pack capacity in amps). For a 4500mAh pack, this means 4.5A max.
- Confirm the correct cell count (6S) and battery chemistry (LiPo) before starting the charge.
- Never leave batteries charging unattended.

Storage and Long-Term Care:

- If a charged battery is not used within one week, return it to storage voltage (~3.75 V per cell, approximately 22.5 V for a 6S pack).
- Packs stored for more than 3 - 6 months should be cycled (one discharge/charge) to maintain performance.
- Store batteries in a cool, dry place away from flammable materials, using a fire-resistant container when possible.
- Do not store batteries in a fully discharged or fully charged state.

Handling and Safety:

- Inspect batteries before and after use. Do not use any pack that is punctured, puffed, or damaged.
- Do not use packs that have fallen below 3.0 V per cell, exceeded 4.2 V per cell, been shorted, or no longer hold a normal charge.
- Avoid dropping or crushing the packs. Prevent any contact between the battery terminals and conductive materials.
- Allow batteries to cool after flight before charging.
- Transport batteries in a manner that prevents puncture or crushing.
- Note: Battery chargers are not included with the Frame Kit or the Build Accessory Package and must be purchased separately. Contact ASW for charger recommendations compatible with 6S LiPo packs.

Emergency Procedures

ROAM drones running ArduCopter include several built-in failsafes that respond automatically to conditions such as low battery, loss of communication link, or loss of GPS. These failsafes are pre-configured in the ROAM parameter set uploaded by the Programming Utility. ASW recommends consulting with us before changing any failsafe settings.

Failsafes are not a substitute for operator-defined emergency procedures. Every operation is unique, and it is the operator's responsibility to establish, brief, and rehearse mission-appropriate emergency procedures before flight. At a minimum, operators should have clear plans for:

- **Low battery:** Recognize warnings, assess whether landing in place is safe, know when to intervene manually.
- **Loss of power or motor failure:** Communicate immediately, attempt to regain control, execute safest possible landing.
- **Loss of GPS:** Transition to AltHold mode (A button), select a safe landing point.
- **Manned aircraft incursion:** Immediately descend and/or divert, land if airspace cannot be cleared.
- **Loss of communication link:** Understand the pre-configured failsafe behavior (default: RTL after timeout).

In any emergency: Positively identify the event, communicate clearly with your crew, maintain awareness of the aircraft's position relative to people and property, and take decisive action.

Maintenance

The Preflight & Launch Checklist is your primary maintenance tool. Running it before every flight covers the most common airframe, propulsion, and avionics checks. The items below address periodic maintenance that goes beyond preflight, plus guidance for post-incident inspection.

Periodic Maintenance

Item	Interval	Action
Motor Bearings	Every 200 flight hours	Spin each motor by hand. Replace bearings if any roughness, grinding, or play is felt.
Wiring & Connectors	Every 50 flight hours	Inspect all cables for chafing, abrasion, or loose connectors. Reseat any suspect connections.
Battery Storage Charge	After 1 week idle	If not flying within one week, return pack to storage voltage (~3.75 V/cell, ~22.5 V for 6S).
Battery Cycle	Every 3 - 6 months of storage	Cycle once to maintain cell health. Return to storage voltage if not flying immediately.

After a Hard Landing or Crash

After any crash or hard landing, perform a full inspection before the next flight:

- Check all carbon fiber plates and arms for cracks, chips, or delamination.
- Check all circuit boards (ESC's, Carrier, Radio Interface) for bending, cracks, missing components, or delamination
- Check for missing or loose fasteners
- Check all motor mounts and motor bells for bends, cracks, or looseness.
- Replace any propeller involved in a ground strike; do not fly damaged propellers.
- Inspect the GPS mast, antennas, and any mounted payload for damage or shift.
- Power on and connect in Mission Planner. Check HUD attitude, GPS lock, and compass health before re-flying.
- If the Cube Orange+ was subjected to a significant impact, recalibrate the accelerometer (PU Step 2) and compass (PU Step 3).
-

Propeller Note: 15x5.5" carbon fiber propellers are available from ASW as a durability upgrade. Standard nylon reinforced propellers should be replaced at any sign of nicks, cracks, or warping.

ROAM Specifications

Feature	Details
Configuration	Quadcopter
Frame Material (From Factory)	Carbon fiber and aluminum
Autopilot	CubePilot Cube Orange+
Flight Software	ArduCopter
GPS	Cubepilot Here3+ GNSS
Telemetry Radio	RFD900xUS (900 MHz)
ESCs	Qty 4; droneCAN
Propellers	15x5.5" reinforced nylon
Standard Battery*	6S LiPo, 4000mAh or 4500mAh
Max Operating Payload**	1.5 - 2.0 kg
Max Flight Time (w/ included battery)***	~25 minutes (no payload)
Max Forward Flight Range***	~24 km (no payload, w/ included battery)
Service Ceiling	3,600 m MSL
Max Takeoff Weight (MTOW)**	3.7 - 4.2 kg
Max Wind Limitation	Payload Dependent; Unladen: 5-10 m/s typical
Payload Mounting	4.25" twin rail mounting
Remote ID	Optional modular (ASW module or third-party)

Performance

Payload (g)	Endurance (min)	Range (km)	AUW (kg)
0	25.2	23.9	2.2
250	21.1	20.0	2.5
500	18.1	17.1	2.7
750	15.7	14.9	3.0
1000	13.8	13.0	3.2
1250	12.2	11.5	3.5
1500	10.8	10.2	3.7
1750**	9.6	9.1	4.0
2000**	8.5	8.1	4.2

ROAM Specifications

Performance - 8000mAh Battery (Example Upgrade)*

Payload (g)	Endurance (min)	Range (km)	AUW (kg)
0	38.6	36.6	2.4
250	32.9	31.2	2.7
500	28.6	27.1	2.9
750	25.1	23.7	3.2
1000	22.1	21.0	3.4
1250	19.7	18.7	3.7
1500**	17.6	16.7	3.9
1750**	15.7	14.9	4.2
2000**	14.1	13.4	4.4

**Battery Note: ROAM kits ship standard with either a 4000mAh or 4500mAh 6S LiPo pack depending on when you made your purchase. The ROAM's factory parameter set is configured to fly either option without modification. Please check the labeling on your battery pack to determine the exact capacity for your unit. The performance data above reflects the 4500mAh pack included with most kits. The 8000mAh data is provided only as an example of the performance improvements achievable with a higher-capacity pack.*

***While the ROAM is capable of payloads in excess of 2.0kg (AUW >4.2kg), it has been found that configurations exceeding 1.5kg of payload (AUW >3.7kg) may require the application of tuning (parameters) specially adjusted for such conditions and differing from those pre-packaged in the Programming Utility. If your mission is expected to operate under such conditions, please contact ASW for guidance.*

****All performance values are nominal and based on standard test conditions. Actual results may vary depending on build quality, payload configuration, environmental factors, and operational practices. Maximum payload and MTOW values represent the upper limit of the tested flight envelope and should not be considered standard operating parameters.*

Resources

Aero Systems West

ASW General Documentation: aerosystemswest.com/docs/

ROAM Documentation & Downloads:

Scan the QR code or
visit aerosystemswest.com/docs/room/



ArduPilot

ArduPilot Main Wiki: <https://ardupilot.org/ardupilot/index.html>

ArduCopter Wiki: <https://ardupilot.org/copter/>

ArduPilot Community Forum: <https://discuss.ardupilot.org/>

Mission Planner

Mission Planner Wiki: <https://ardupilot.org/planner/index.html>

Mission Planner Download: <https://firmware.ardupilot.org/Tools/MissionPlanner/>

CubePilot

CubePilot Hardware Overview: <https://cubepilot.org>

CubePilot User Manuals: <https://docs.cubepilot.org/user-guides>

FAA Resources

FAA DroneZone (Registration): <https://faadronezone.faa.gov/>

FAA UAS Declarations of Compliance: <https://uasdoc.faa.gov/>

14 CFR Part 107 - Small Unmanned Aircraft Systems

14 CFR Part 89 - Remote Identification of Unmanned Aircraft

49 USC 44809 - Exception for Limited Recreational Operations

Admin - Version Control

Change Log:

Revision	Date Issued	Changes Made	Pages
1.0	3/26/26	Initial Publication	ALL
1.1	3/30/31	FAA Remote ID Info	16
1.2	3/31/31	Text	12, 23, 26

References:

Contact - ASW General Support

For all inquiries—including technical support, maintenance questions, warranty claims, replacement parts, and sales—please contact Aero Systems West (ASW) directly. Our team is available to assist with product registration, mission integration, troubleshooting, and service coordination.

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For warranty-related matters, please retain a copy of your proof of purchase and aircraft serial number when contacting ASW.



ASW - Official Website

For general support and additional information related to our aircraft, additional products and more.

<https://aerosystemswest.com/>