

ASW ROAM™ 3D Printed Parts Guide

ASW ROAM™ is a modular drone platform designed for mission flexibility in educational, training, research, and other industrial sectors. As such, ASW recognizes the potential for custom add-ons and parts to be fabricated by the end user, specifically using additive manufacturing technology (3D printing).

To support this, ASW provides a repository of 3D part files as well as recommendations for creating your own parts. This document is intended to provide the necessary information for integrating these 3D printed parts onto the ROAM™ platform.

Please see your aircraft handbook or contact us at www.aerosystemswest.com/contact for any further questions or inquiries.

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RECOMMENDED PRINT SETTINGS

While 3D printing is economical and accessible, achieving optimal results requires careful attention to configuring print settings properly. ASW recommends following the guidelines in the table below for best results.

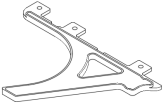
PARAMETER	RECOMMENDATION	NOTES
Filament	PLA, PETG, ABS, ASA Any engineering filament (PA, PPA, and CF variants)	Use recommended filament settings based on your printer and filament type.
Layer Height	0.16 mm	Recommended tradeoff for quality and speed of printing. Use lower values for higher quality prints at the cost of increased print time.
Sparse Infill Type	Gyroid, adaptive cubic	Other infill patterns may be suitable but these are recommended to resist warping and increase strength.
Sparse Infill Percentage	50 - 65%	Balanced infill / wall / shell values to provide the best tradeoff of strength and weight.
Number of Walls	8 - 10	
Number of Top / Bottom Shell Layers	4 - 6	
Supports	Generally not required Tree pattern, 25° threshold	ASW parts are designed to be printed without supports. However, if supports are deemed necessary, use the settings specified.

NOTE	ASW supported parts have been tested utilizing PLA filament, which is one of the most common 3D printing materials. However, a more stable material is recommended for parts intended for sustained outdoor use.
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NOTE	Print settings and overall part quality will vary depending on printer, filament, environmental conditions, etc. For best results, review your printer manufacturer's instructions for baseline settings in addition to ASW's specific recommendations.
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SUPPORTED PART LIBRARY

All 3D files for currently supported ASW 3D printed parts for the ROAM™ platform can be found on the documentation page at www.aerosystemswest.com/docs/roam. These parts are compressed into one single download package for ease of access and version control. The table below contains relevant information for each part to ensure success in integrating these parts to your ROAM™ drone.

IMAGE	FILENAME	NOTES
	2609_ROAM_LG_3DP_REV1.STEP	Landing gear for interfacing with factory arm assembly. Utilize factory hardware to secure the part to the Arm Spine.
	2609_ROAM_PAYLOAD_RAIL_MOUNT_3DP_REV1.STEP	Payload rail mount for interfacing with factory Battery Plate or Lower Frame, or supporting custom payload plates. Recommended hardware: #4 x 3/8" thread-forming screws for plastic (i.e. McMaster-Carr 92295A101). DO NOT USE MACHINE SCREWS.
	2609_ROAM_PAYLOAD_RAIL_COLLET_3DP_REV1.STEP	Payload rail collet for supporting custom payload plates. May also be used as a replacement for FPV Kit collet. Recommended hardware: #4 x 3/8" thread-forming screws for plastic (i.e. McMaster-Carr 92295A101). DO NOT USE MACHINE SCREWS.

CAUTION	When installing 3D printed parts to your ROAM™, ensure the correct hardware is being used. Machine screws are meant to be installed into metal threads, whereas 3D printed parts typically require thread-forming screws intended for plastic. Using machine screws in a plastic part is not advised as it could lead to part damage or affect the airworthiness of the ROAM™ aircraft.
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TERMS & CONDITIONS

Included in this package are the following items:

- ROAM 3D Printed Parts Guide Rev1.0 (pdf)
- 2609_ROAM_LG_3DP_REV1 (STEP)
- 2609_ROAM_PAYLOAD_RAIL_MOUNT_3DP_REV1 (STEP)
- 2609_ROAM_PAYLOAD_RAIL_COLLET_3DP_REV1 (STEP)

This package is made available to customers of the Aero Systems West (ASW) Reconfigurable Open Architecture Multirotor (ROAM) for the sole purpose of fabricating the parts described herein by means of additive manufacturing, and of developing the customer's own custom parts, for installation on or in the customer's ROAM aircraft. The included STEP files are provided as reference geometry for that purpose only.

The ROAM design and all information contained in this package are proprietary to and remain the sole property of ASW. This package is provided under a limited, non-exclusive, non-transferable license granted to the customer for the sole purpose stated above. That license includes the right to fabricate the parts described herein in quantities reasonably required for the customer's own ROAM aircraft. It does not include the right to fabricate these parts, or any part derived from them, for sale, lease, or distribution to any third party. The customer shall not redistribute, publish, sublicense, or otherwise disclose this package or its contents to any third party without the prior written consent of ASW, and this restriction extends to the STEP files in any converted or derived file format and to any sliced or toolpath file generated from them. No right, title, or interest in ASW's intellectual property is transferred by the provision of this package. Additionally, if the contents of this package, or any derived designs, are to be used in a locale other than the United States or its territories, it is the responsibility of the customer to determine applicable export classification. Use of this package, in part or whole, constitutes agreement with these terms.

As with any engineering product, the ROAM is subject to periodic generational releases as ASW performs continued improvement of the product. It remains the sole responsibility of the customer using this package to ensure they are using the correct version by crosschecking the generation (or purchase date) of their ROAM product with the appropriately dated version of this package as it is made available at <https://aerosystemswest.com/docs/roam/>. Parts fabricated from a superseded version of this package may not fit or function correctly on a later generation aircraft. Except as expressly permitted above, the design information contained in this package may not be used for the reverse engineering, or the fabrication of replacement parts or subcomponents, of the ROAM airframe. Doing so may result in an unairworthy aircraft which voids applicable warranties and may pose safety concerns.

The customer is the manufacturer of any part produced from this package. The strength, dimensional accuracy, durability, and airworthiness of an additively manufactured part depend on the printer, filament, slicer configuration, environmental conditions,

storage, and handling used to produce it, none of which are within ASW's knowledge or control. The recommendations in this guide, including the recommended print settings and recommended installation hardware, are starting points offered for customer convenience and do not constitute a specification, a qualification, or a guarantee of performance. It is the sole responsibility of the customer to inspect each fabricated part prior to installation, to verify its fit and function, to install it using appropriate hardware, and to determine that the aircraft remains airworthy and safe to operate in the customer's intended configuration and operating environment. The customer is further responsible for compliance with all aviation regulations applicable to the operation of the aircraft as configured. Parts fabricated by the customer are not ASW-manufactured parts, are not covered by any ASW product warranty, and are used at the customer's own risk.

Any modification of the geometry provided in this package, including scaling, feature changes, or incorporation into another design, produces a customer design for which the customer is solely responsible. ASW makes no representation as to the suitability or airworthiness of any such modified part, and modified parts shall not be identified, marketed, or otherwise represented as ASW parts or as ASW-approved.

The data contained herein comes with no warranty, express or implied, including without limitation any implied warranty of merchantability or fitness for a particular purpose. It is provided "as is" for customer convenience only. In no event shall ASW be liable for any indirect, incidental, special, or consequential damages arising out of or relating to the use of this package, its contents, or any part fabricated from it. This package and its use are governed by the laws of the State of California. Any dispute arising hereunder shall be subject to the exclusive jurisdiction and venue of the state and federal courts located in Santa Clara County, California.

For any questions on the basic assembly, usage, or flight of the ROAM aircraft, please reference all available materials at <https://aerosystemswest.com/docs/roam/> which include assembly videos, a software programming utility, and a user handbook.

For any other inquiries, please contact ASW at info@aerosystemswest.com.