



X1000 Sparrow Reference Guide

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1. X1000 Sparrow

This section covers the following information:

- X1000 Sparrow Photos
- General Aircraft Characteristics
- Performance Specifications
- Weight
- Dimensions
- Weather Restrictions and Regulations
- Payload/Cargo Restrictions and Regulations
- Payload/Cargo Center of Gravity
- Storage and Handling
- Propeller Safety

X1000 Sparrow Photos



Figure 1: Sparrow - Side View

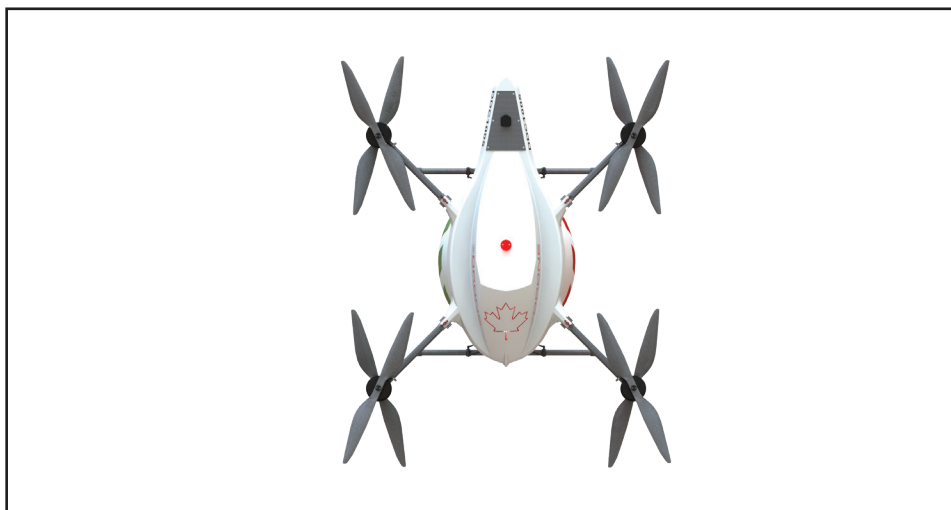


Figure 2: Sparrow - Overhead View

General Aircraft Characteristics

Profile	Rotary Wing Octocopter, VTOL (Vertical Takeoff)
Composition	Structural Airframe, Payload Enclosure, Cover
Materials	Carbon Fiber, Aluminum, Plastics
Colour	White and black, red and green markings
Lights	Red and green position lights, white strobe lights

Performance Specifications

The following table outlines the performance capabilities of the X1000 Sparrow. The RPA must not operate outside the listed specifications.

Maximum Range	10.8 NM (20 km)
Maximum Flight Time	18.9 minutes
Planned Cruising Airspeed	29.16 knots (54 km/h)
Maximum Airspeed	38.87 knots (72 km/h)
Maximum Density Altitude	3000 ft (914 m)

Weight

Empty RPA Weight	13.33 kg (29.39 lbs)
Battery Weight (all 4)	8.49 kg (18.72 lbs)
Maximum Payload Weight	3.17 kg (6.99 lbs)
Maximum Takeoff Weight (MTOW)	25 kg (55.11 lbs)

Dimensions

Overall Airframe Diameter (No propellers)	1204 mm
Overall Airframe Diameter (With propellers)	1762 mm
Height	717 mm

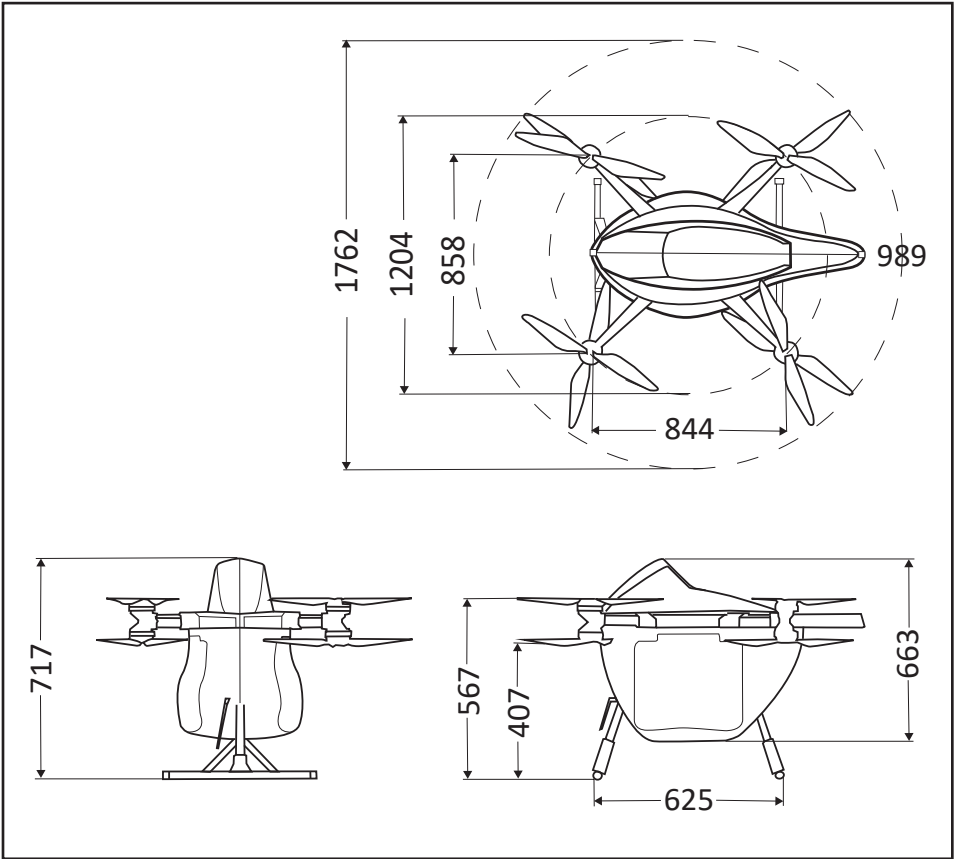


Figure 3: RPA Dimensions (in mm)

Weather Restrictions and Regulations

It is mandatory under DDC regulations to only operate under safe conditions. In no circumstances will the X1000 Sparrow be allowed to operate outside the following restrictions.

Temperature	-10° C to 40° C
Maximum Headwind (Takeoff or Landing)	15 knots (27.78 km/h) Gusting to 20 knots (37.04 km/h)
Maximum Crosswind (Takeoff or Landing)	15 knots (27.78 km/h) Gusting to 20 knots (37.04 km/h)
Prohibited Precipitation	Heavy Precipitation, Thunderstorms, Down-bursts, Lightning, Freezing Rain, Snow, Hail
Other Prohibited Conditions	Flight into known or forecast icing conditions

Payload/Cargo Restrictions and Regulations

All cargo is carried internally in the RPA cargo compartment. The cargo compartment is located on the bottom side of the RPA. All cargo must be correctly packaged and secured to ensure no shifting or rolling during transport. The following diagrams illustrate payload/cargo limitations and prohibited goods:

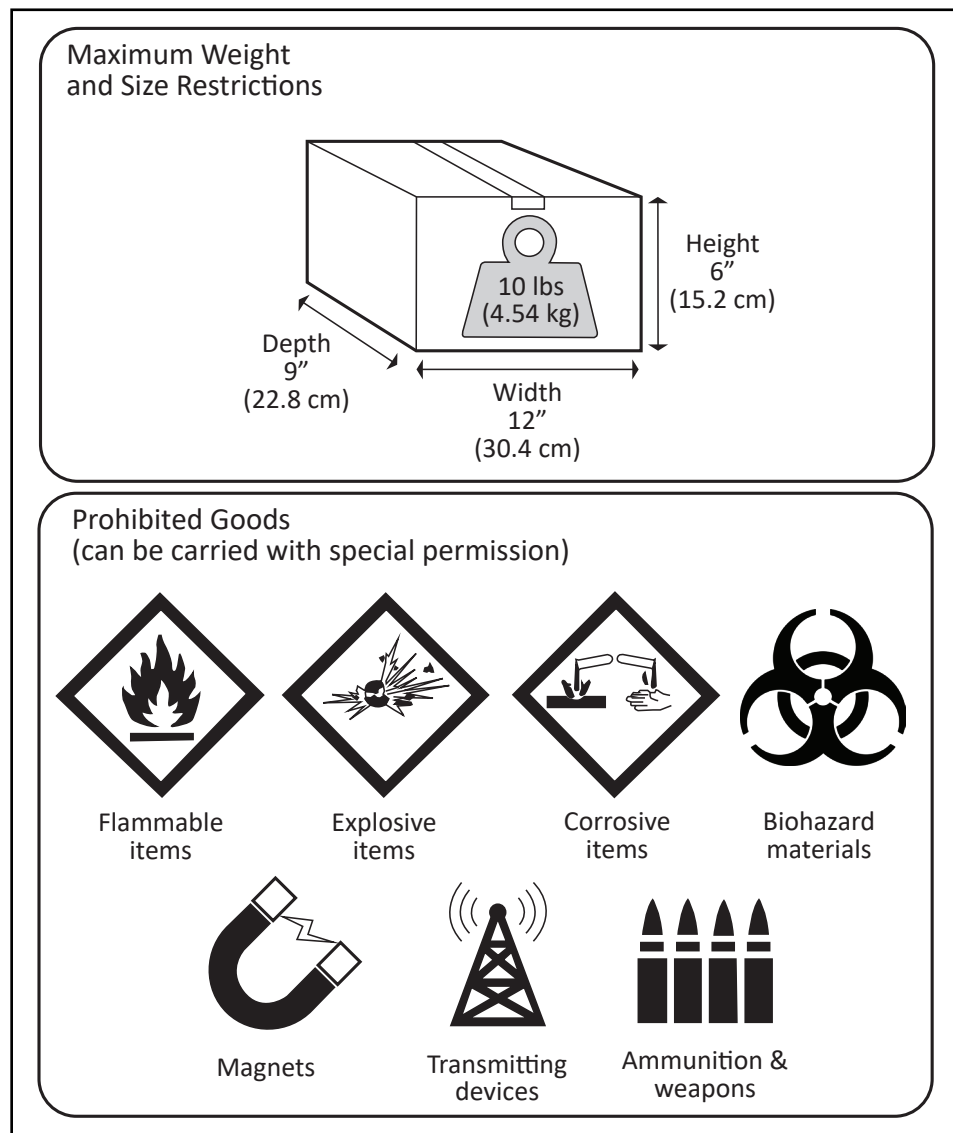


Figure 4: Payload Restrictions and Prohibited Goods



Note: All electronics must be powered off during transportation. All items must be properly secured in place to avoid moving during flight.

Payload/Cargo Center of Gravity

Provided the cargo is properly secured in the cargo compartment and is at or under the maximum weight, the Center of Gravity must remain within acceptable limits.

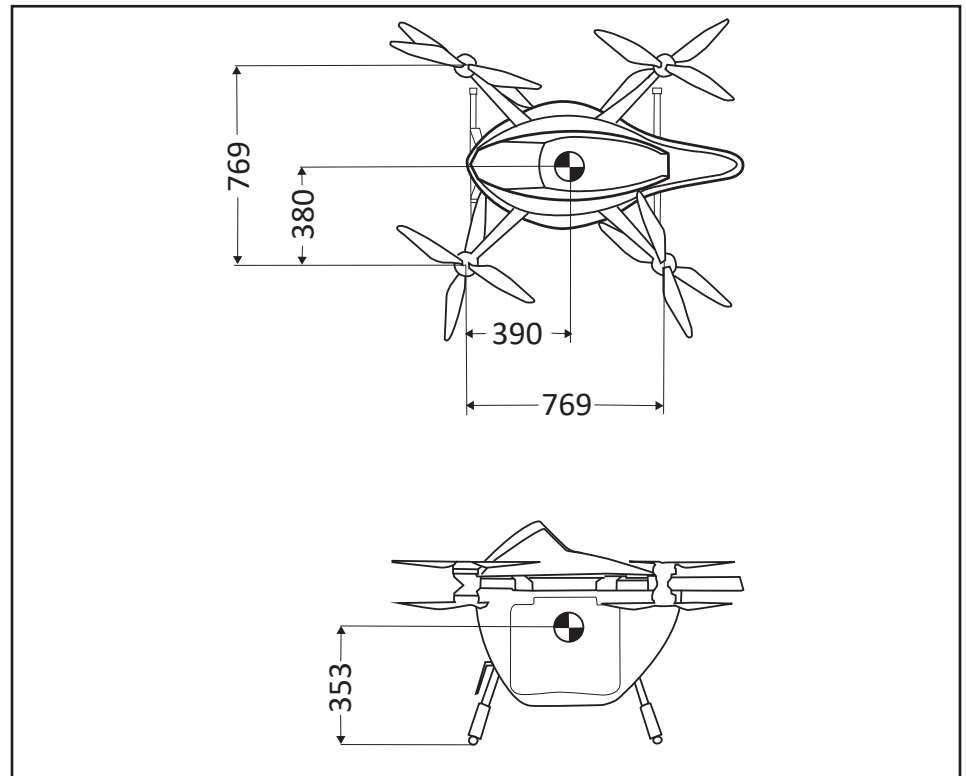


Figure 5: X1000 Sparrow Center of Gravity (in mm)

Storage and Handling

To ensure the Sparrow is always kept and operated at optimal conditions, it must be stored within the following constraints:

Ambient Conditions

Humidity: $65\pm 20\%$ RH and temperature: $23\pm 5^{\circ}\text{C}$.
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Free of liquids and fire hazards.

Clear of all physical and electrical hazards such as falling objects or high voltage sources.

Locked and protected.

Physical Conditions

Spare parts from DDC are grouped and stored together.

RPA is positioned flat and upright. Do not stack items on top of the RPA.

All power supplies are disconnected and turned off. (Store batteries separately in accordance with the Flyte User Guide – Battery Management section)

Handling the RPA

When moving the Sparrow with one person, lift the RPA on the Boom Arm Connectors that are diagonally across from each other. Refer to “Figure 6: Lifting the Sparrow”.

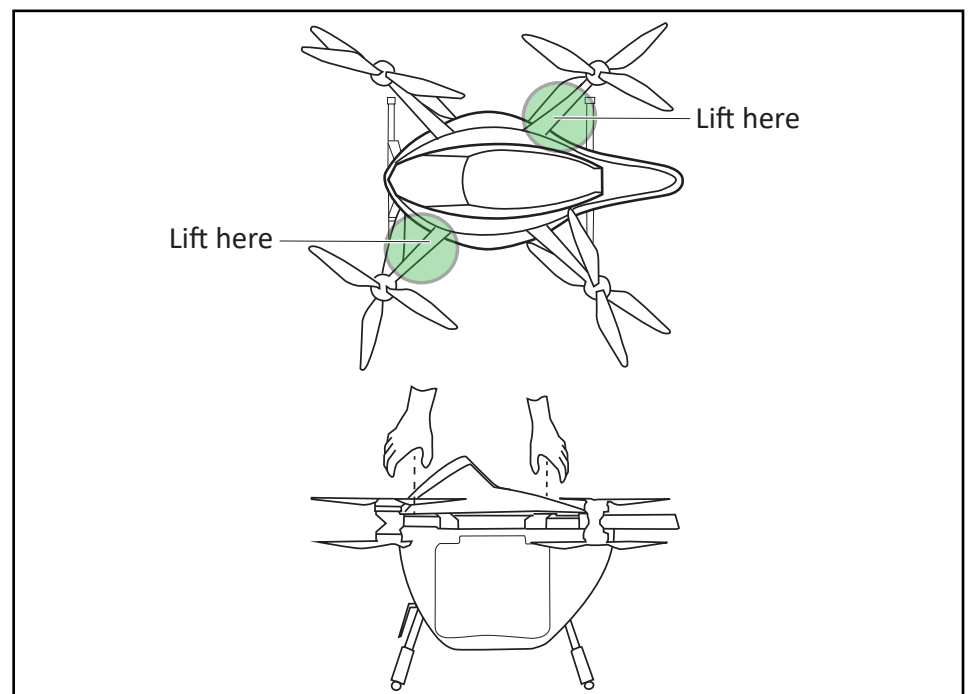


Figure 6: Lifting the Sparrow

If two people are required, lift the RPA by the side boom arms. Refer to “Figure 7: Lifting the Sparrow with Two People”.

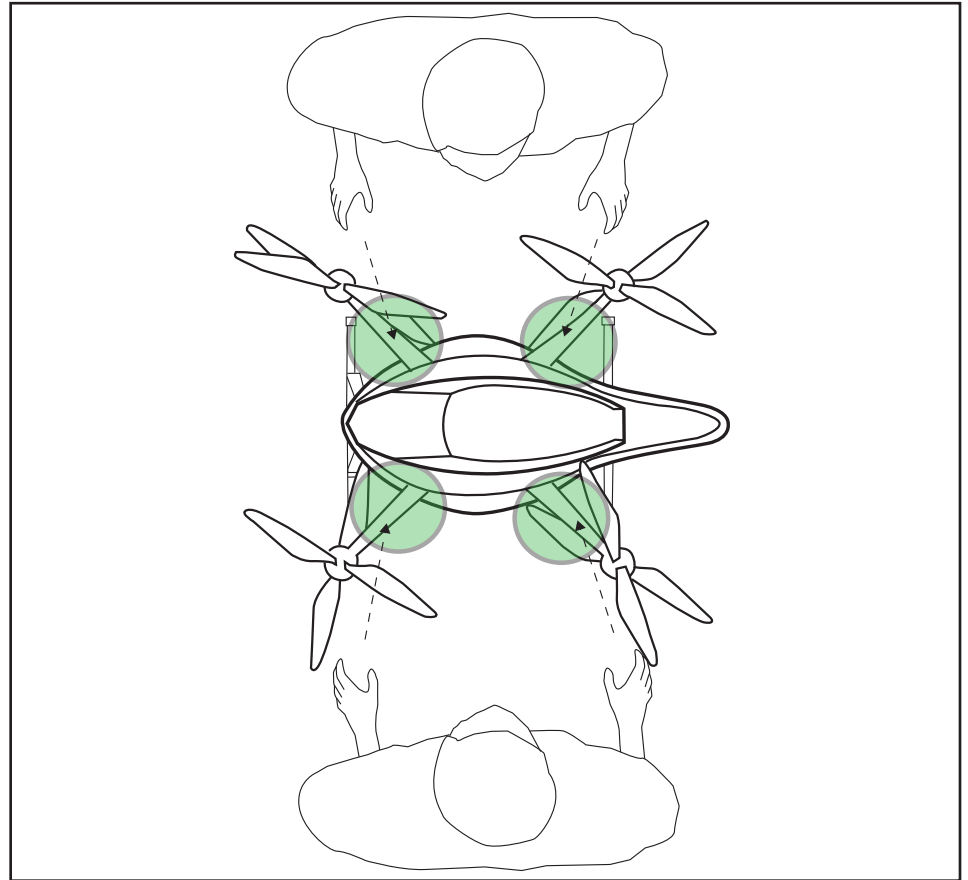


Figure 7: Lifting the Sparrow with Two People

In the event the RPA does not have the boom arms attached, lift and carry the RPA by holding the inner boom arms. Refer to “Figure 8: Lifting the Sparrow Without Boom Arms”.

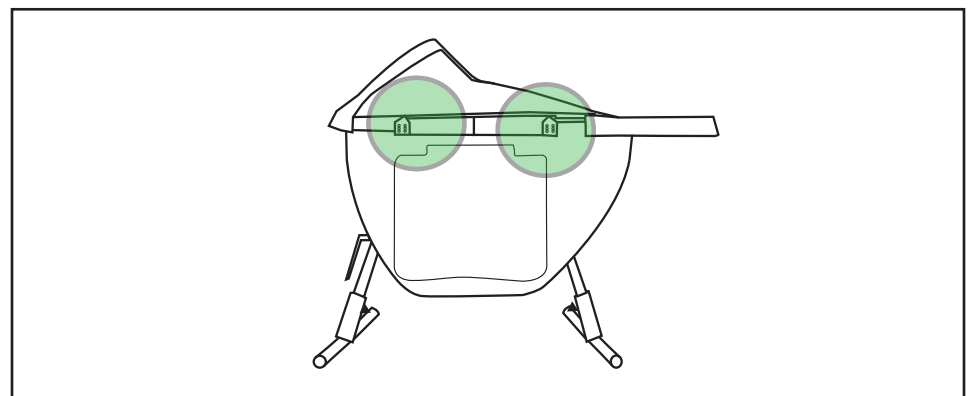


Figure 8: Lifting the Sparrow Without Boom Arms

Propeller Safety

To ensure proper propeller safety:

- The propellers must have no signs of damage or wear. If so, contact DDC for replacement.
- Inspect the propellers very carefully as a damaged propeller may not be easy to identify. Inspect for evidence of the carbon fiber layers peeling, also known as delamination.

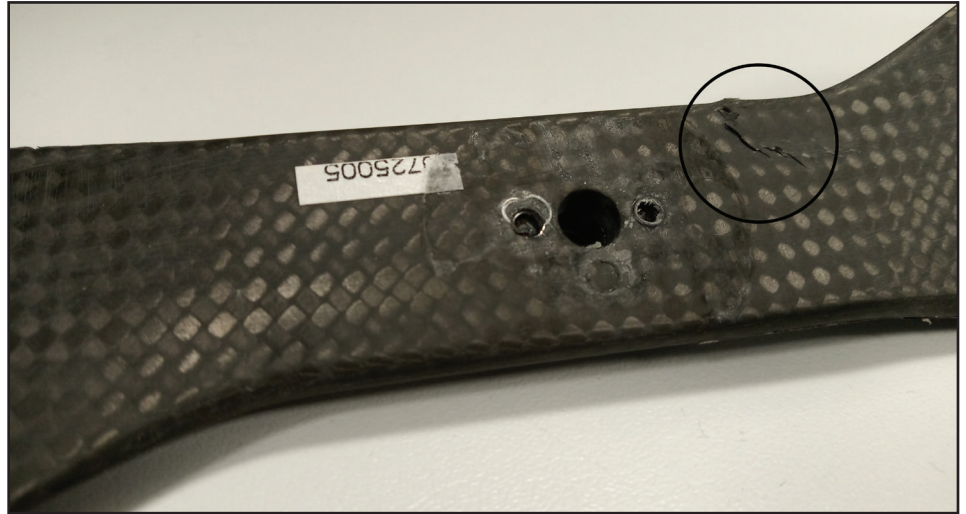


Figure 9: Damaged Propeller (Delamination)

- Never add force onto the propellers or use the propellers in hostile environments (i.e. containing H₂O, SO₂, NO₂, Cl₂, organosilicon and phenol) as this could lead to decomposition of the propellers. Any decomposition will result in a safety hazard.
- Make sure that screws of cover plates and propellers are mounted properly and securely.
- Any impact to the propellers will lead to damage, deformation or cracks. If such an incident occurs, the propeller shall be replaced.
- Keep the propellers from hostile environment containing corrosive gases and maintain strict compliance with storage temperature and humidity requirements, particularly for long term storage.
- Always stay away from the spinning propellers. Special attention should be paid whenever propellers are operating.

- When conducting tasks with the RPA such as loading the payload or changing the batteries, stay clear the radius area of the propellers. Refer to “Figure 10: Radius Area of Propellers”.

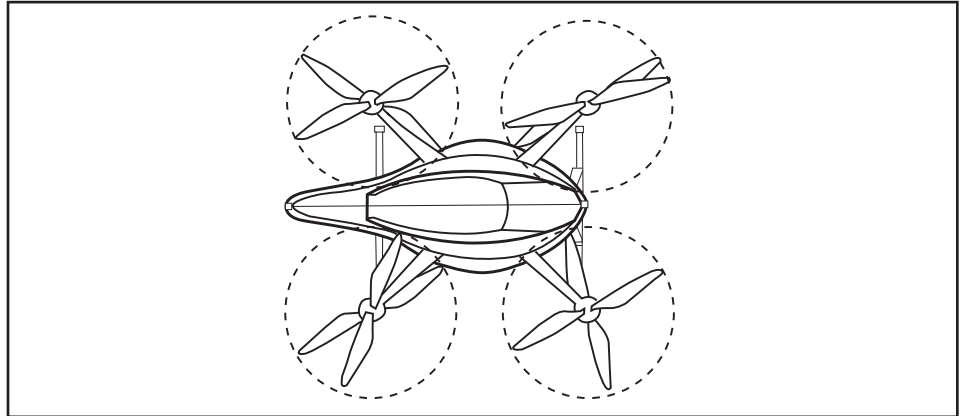


Figure 10: Radius Area of Propellers

2. RPA Maintenance

This section covers the following topics:

- RPA Boom Arm Replacement
- Performing RPA Maintenance

RPA Boom Arm Replacement

Once the RPA's Boom Arms reach their flight hours limit, it is the RPA Handler's responsibility to replace them with a new set.

Getting Started

Before starting this procedure, ensure:

- Flyte has sent you a message indicating the Boom Arms must be replaced.
- You are the RPA Handler.
- You have a set of new replacement boom arms, the Sparrow Arm Tool, and Loctite™ 243 (Supplied by DDC).
- You understand how the boom arms are labeled.

RPA Boom Arm Labeling

The Sparrow boom arms are labelled by colour and letter. The front boom arms are labelled A and B and marked with yellow. The rear boom arms are labelled C and D and marked with blue. Refer to "Figure 11: Boom Arm Labeling".

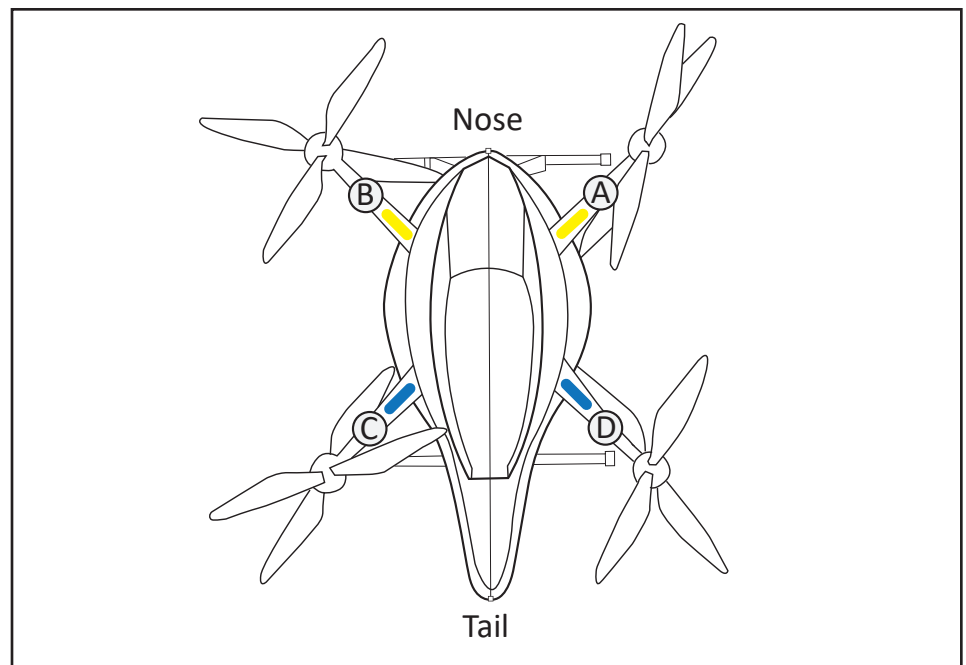


Figure 11: Boom Arm Labeling

Removing the Boom Arms

1. Enter the depot and find the X1000 SPARROW tail number indicated by Flyte.
2. Turn and unlock the landing gear locks. Place your hands on the diagonally-opposite boom arm connects and lift the RPA from its seat container. Refer to “Figure 6: Lifting the Sparrow” on page 12.
3. Move the RPA into a clear space for disassembly.
4. On boom arm “A”, use the Sparrow Arm Tool to unscrew the top and bottom red arm screws. Set aside for later use.

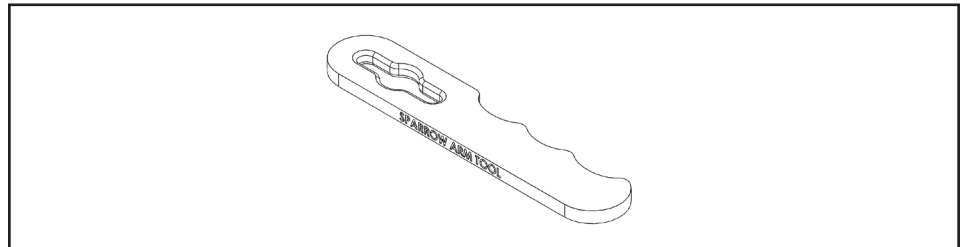


Figure 12: Sparrow Arm Tool

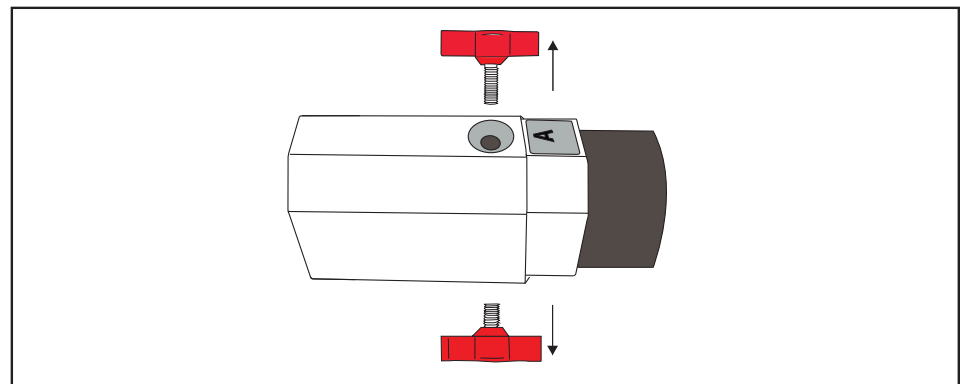


Figure 13: Unscrew Red Arm Screws

5. Carefully remove the boom arm from the RPA by pulling outwards from the RPA placing it into the same container the new boom arms came in.
6. Repeat steps 4–5 for boom arms “B”, “C”, and “D”.

Installing the New Boom Arms

1. Insert the new boom arms into the RPA by matching the letters on the arms with the RPA boom arm connectors (found under the top cowling).

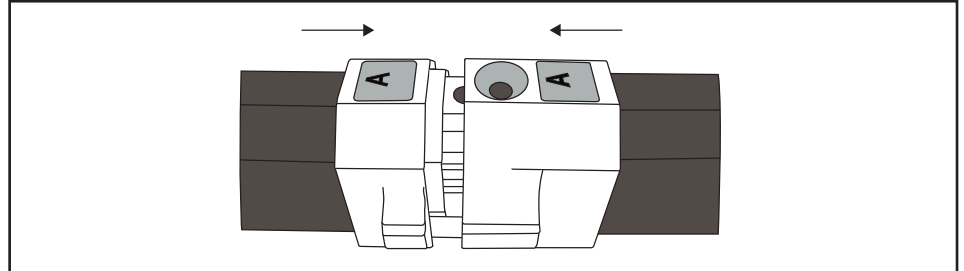


Figure 14: Insert New, Matching Boom Arm

2. Obtain a long red arm screw and gently apply a line of Loctite™ 243 down the threads.

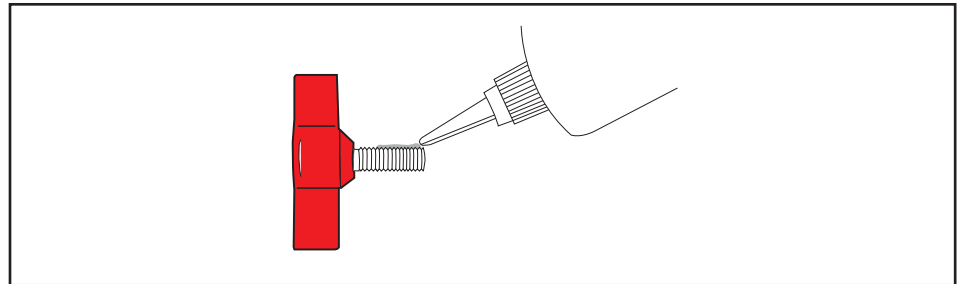


Figure 15: Apply Loctite onto the Long Red Arm Screws



Note: There are four (4) long red arm screws and four (4) short red arm screws. Long red arm screws are screwed in at the top and short red arm screws are screwed in at the bottom.

3. On boom arm “A”, hand screw (but do not tighten) the long red arm screw through the top cowling and into the top of the boom arm connector joints.

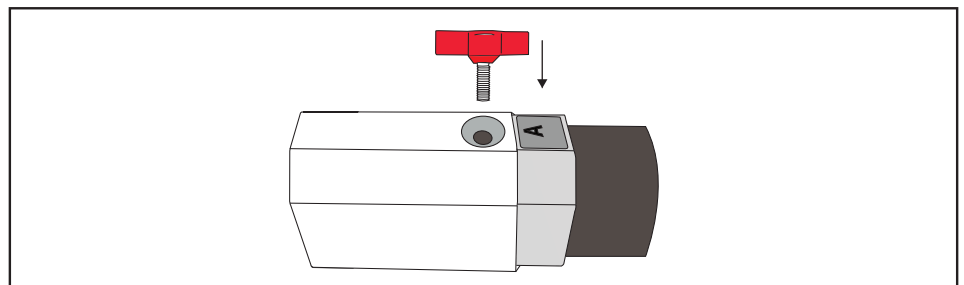


Figure 16: Screw Long Red Arm Screw into Top Boom Arm Connector

4. Obtain a short red arm screw and gently apply a line of Loctite™ 243 down the threads.

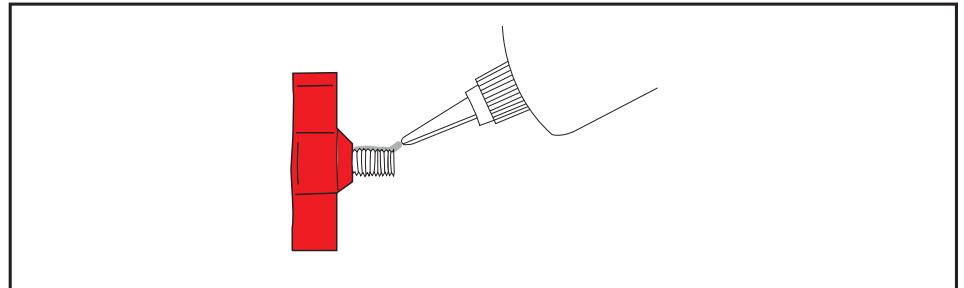


Figure 18: Apply Loctite onto Short Red Arm Screw

5. On the same arm (A), hand screw (but do not tighten) the short red arm screw into the bottom of the boom arm connector joints.

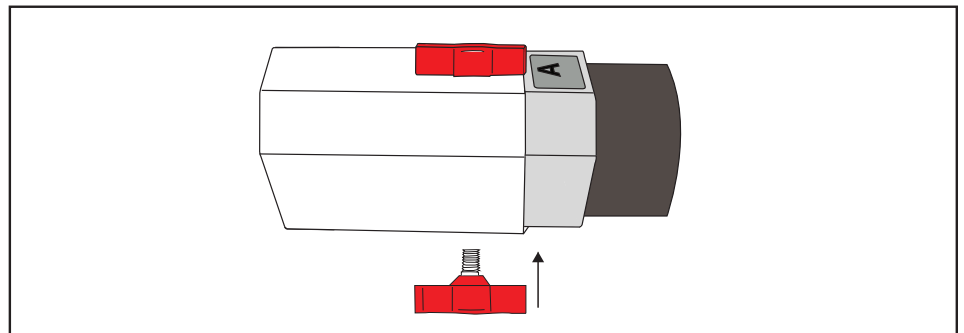


Figure 17: Screw Short Red Arm Screw into Bottom Boom Arm Connector

6. Tighten both red arm screws with the pre-set torque wrench (set at 2.5NM) until it clicks, indicating that the desired torque level has been reached.
7. Repeat steps 2–6 for boom arms “B”, “C”, and “D”
8. Return the re-assembled RPA back into its seat in the depot.
9. Place the old boom arms into the same container the new boom arms came in.
10. Secure the container and ship back to DDC.

Performing RPA Maintenance

The RPA Handler will be responsible for simple maintenance of the RPA.

Part Replacement Schedule

Once the RPA Boom Arms reach a specific flight time, they must be replaced. Flyte will indicate when it is time to replace the Boom Arms. Refer to “RPA Boom Arm Replacement” on page 18 for the detailed procedure.

Maintaining the RPA

For regular maintenance:

- Clean the RPA body regularly using a microfiber cloth and isopropyl alcohol.
- Gently wipe down the propellers after every use.
- Check the RPA for chips or cracks after every use.
- Contact DDC immediately if you notice any damages.



Be Advised: Do not use any random household cleaning agent on the RPA.

Use compressed air to blow out dust from cracks or tight areas.

If you notice any damage to the RPA, immediately contact DDC for support. Be vigilant, the RPA must never be flown if there are any concerns left unchecked.

