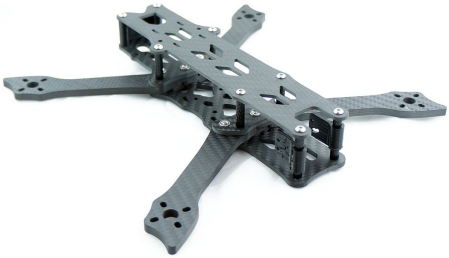
ROTORAMA

Buddy 5" X

Freestyle carbon FPV quadcopter frame
User Manual



Read this manual before building and before the first flight, and keep it for future reference.

www.rotorama.com

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1. Product description

1.1 Intended use

The **Rotorama Buddy 5" X** is a carbon frame for building a freestyle FPV quadcopter with propellers up to 5.4". It is designed to be durable, practical and to fly well – it suits experienced pilots and beginners alike. The X version has symmetrically positioned arms, which helps predictable behaviour in all axes; it is intended above all for fast, dynamic flying and freestyle.

The frame is meant for building your own quadcopter: you choose and purchase the motors, flight controller (FC), electronic speed controllers (ESC), receiver, camera, video transmitter (VTX) and battery yourself. On the Buddy the stack is not mounted at the rear but **between the front and rear arms**, directly on the bottom plate. This makes the frame lower and brings its centre of gravity closer to the propeller plane, while the battery still sits high enough that the propellers will not cut it if it shifts in a crash.



Rotorama Buddy 5" X – top view

1.2 Specifications and package contents

Product designation	Rotorama Buddy 5" X
Max. propeller size	5.4"
Motor spacing	160 × 180 mm
Weight	139 g (including 3D-printed parts)
Arms	15 mm wide, 5 mm thick carbon; each arm fixed individually with three screws
Bottom / top plate	3 mm carbon / 2 mm carbon
Stack space	distance between front and rear arms 55 mm
Height between bottom and top plate	28 mm
Stack mounting	20 × 20 mm (M3), 30.5 × 30.5 mm (M3, slots)
VTX mounting (rear section)	20 × 20 mm M2, 25.5 × 25.5 mm M2, 30.5 × 30.5 mm M3
Camera size	Mini (with the included mount)
Digital video	Caddx Vista, Walksnail Avatar; DJI Air Unit and DJI O3 with a different set of 3D-printed parts

Package contents (set composition)	Qty
Arm X 5"	4×
Bottom plate	1×
Middle plate	1×
Rear plate	1×
Top plate	1×
Hardware	1 set
SMA antenna mount (3D print)	1×
Camera mount – Mini (3D print)	1×

Not included: motors, flight controller (FC) and ESC, receiver, camera, video transmitter, antenna, propellers, battery, battery strap, cables and connectors. 3D-printed kits for DJI O3, DJI FPV (Air Unit) and DJI O4 Pro, the Micro camera mount and the GoPro mount are sold separately as *Rotorama Buddy – Parts*.

※ Since 11 January 2023 the rear and top plates have been revised – holes for Walksnail Avatar were added and the space for the DJI O3 camera was enlarged.

2. Building the quadcopter

2.1 Before you start

- Before building, plan the layout of the electronics and the cable lengths. The stack, VTX, receiver and camera are installed one after another, and some parts will later be covered by the top plate.
- Prepare suitable tools (hex keys or screwdrivers matching the supplied screws, a soldering iron) and work on a clean, non-conductive surface.

2.2 Stack – flight controller (FC) and ESC

The stack is mounted on the bottom plate **between the front and rear arms**. The distance between the arms is 55 mm, so most available stacks will fit. The frame supports mounting-hole patterns of **20 × 20 mm (M3)** and **30.5 × 30.5 mm (M3)**. For larger stacks the frame has **slots** instead of holes – you can shift the stack slightly to one side or the other to gain space, for example for a capacitor or a power lead.



Stack space between the front and rear arms (55 mm)

- Mount the stack on flexible damping grommets if its manufacturer supplies them, and do not tighten the nuts fully – the grommets would lose their damping effect.
- Check that no component or solder pad of the stack touches the carbon plate or the screws.

2.3 Video transmitter (VTX) and receiver

The rear section of the frame is intended for additional electronics, typically the video transmitter. Mounting holes of **20 × 20 mm M2**, **25.5 × 25.5 mm M2** and **30.5 × 30.5 mm M3** are provided; the top plate has holes spaced **20 × 20 mm** and **25.5 × 25.5 mm M2**.

- For digital video, a **Caddx Vista** or **Walksnail Avatar** unit can be mounted in these holes.
- The **DJI Air Unit** (DJI FPV) and **DJI O3** fit into the frame using the corresponding set of 3D-printed parts; a separate set is intended for the **DJI O4 Pro**. The sets are available as *Rotorama Buddy – Parts*.

- The antenna is fixed with a 3D-printed mount; a mount for an **SMA connector** is included with the frame as standard.
- Never power the VTX without an antenna connected – it may be damaged.

2.4 Camera and 3D-printed accessories

The camera is fixed with a 3D-printed mount. A mount for a **Mini** size camera is included as standard; a mount for a Micro camera is sold separately. The front of the frame around the camera is reinforced, as it takes the most stress in a crash.

The Buddy has the same spacing of the four front standoffs as the widespread Alien freestyle frame. HD camera mounts designed for the Alien can therefore be used – not only at the front but also at the rear or underneath, so you can place your action camera anywhere. 3D print models for the Buddy frame are available at www.thingiverse.com/thing:5205381.

2.5 Motors and propellers

- The frame accepts propellers up to **5.4"**. With common 2207 size motors the propeller is usually level with the top plate.
- Motor screws must not be so long that they touch the motor windings. After tightening, check that the motor turns freely and smoothly.
- Route the motor wires along the arms and secure them (e.g. with heat-shrink tubing or a cable tie) so that they cannot get into the propeller and are not chafed by the carbon edges.
- Fit the propellers only after the build, setup and motor direction check are complete – always in the correct direction of rotation.

2.6 Battery and power lead

At the rear of the top plate there is an opening through which the power lead with the **XT60** connector can be routed. The top plate can then be removed easily and the lead pulled out, making servicing more convenient. A lead routed through the top plate is also less likely to get caught in the propellers in flight.

- The battery is placed on the top plate. Secure it firmly with a strap (not included) and use an anti-slip pad for better grip.
- Always fit a **fully charged** battery before flight and follow the instructions of the battery and charger manufacturers.

3. Safety, maintenance and operation

3.1 Safety instructions

- **Carbon is electrically conductive.** Make sure the carbon parts cannot chafe cable insulation or touch exposed solder pads – there is a risk of short circuit and battery fire.
- Do not drill, sand or cut carbon parts without protection. Fine dust is produced that irritates the skin and respiratory tract; wear a respirator and do not inhale the dust.
- The edges of carbon parts may be sharp – handle them with care.
- Spinning propellers can cause serious injury. Disconnect the battery or remove the propellers whenever you work on the quadcopter.
- Neither the frame nor the finished quadcopter **is a toy**. Keep them out of the reach of children; small parts and screws present a choking hazard.

3.2 Inspection and maintenance

- After every crash, check the arms and plates. Replace any part with a crack or a chipped or delaminated edge – it may fail in flight.
- Regularly check that all frame screws are tight, especially the three screws of each arm and the motor screws.
- Check that the cables are not chafed by the carbon edges and that the 3D-printed mounts are intact and firmly seated.

3.3 Replacing an arm

Each arm is attached to the frame individually with three screws, so a damaged arm can be replaced without taking the whole quadcopter apart. Replacement arms are sold as *Rotorama Buddy – Parts*, type *Arm X 5*".

① Disconnect the battery and remove the propeller from the motor on the damaged arm.

② Undo the motor screws and remove the motor from the arm. You do not need to unsolder the motor wires if the motor can be set aside next to the frame without straining them.

③ Undo the three screws holding the arm to the frame and remove the arm.

④ Place the new arm in the same position and fasten it with all three screws.

⑤ Reattach the motor and check that it turns freely and smoothly.

⑥ Fit the propeller in the correct direction of rotation and carry out a pre-flight check before flying.

3.4 Operating the finished quadcopter

Regulations (EU) 2019/947 and 2019/945 apply in all EU member states, but national implementing rules differ from country to country – registration portals, minimum pilot age, geographical zones, compulsory insurance, permitted frequency bands and maximum transmit power. The information in this chapter describes the situation in the Czech Republic. If you operate a drone in another country, you must follow the regulations of the country in which you fly.

- A quadcopter built from this frame and separately purchased components has no class label (C0–C4) and is operated as a **privately built UAS** in the open category – in subcategory A1 with a take-off mass below 250 g, otherwise in subcategory A3.
- Operator registration is mandatory if the drone weighs 250 g or more, or is equipped with a camera. Display the registration number on the drone. In the Czech Republic, registration is handled by the Civil Aviation Authority (ÚCL).
- Flying with FPV goggles in the open category is only permitted with an observer who keeps the drone in direct visual line of sight.
- The user is responsible for complying with the frequencies and transmit powers of the receiver and video transmitter used – follow their manufacturers' instructions and the regulations of the country of operation.

4. Information for the EU and Czech Market

4.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorama.cz
Phone	+420 252 252 098
Website	www.rotorama.com

4.2 Disposal

- The frame is not electrical equipment and contains no batteries, so the take-back scheme for electrical equipment does not apply to it.
- Dispose of unwanted or damaged parts according to your municipality's waste system: carbon and plastic (3D-printed) parts in mixed municipal waste, metal hardware in metal collection. Do not burn carbon parts.
- Hand in the electronics installed in the finished quadcopter and the batteries separately at a collection point for electrical equipment and batteries.
- Sort the packaging by material (paper, plastic).
- Outside the Czech Republic, follow the waste regulations of the country in which you use the product.

5. Warranty and rights arising from defective performance

5.1 Rights of the buyer under Czech law

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 4.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.