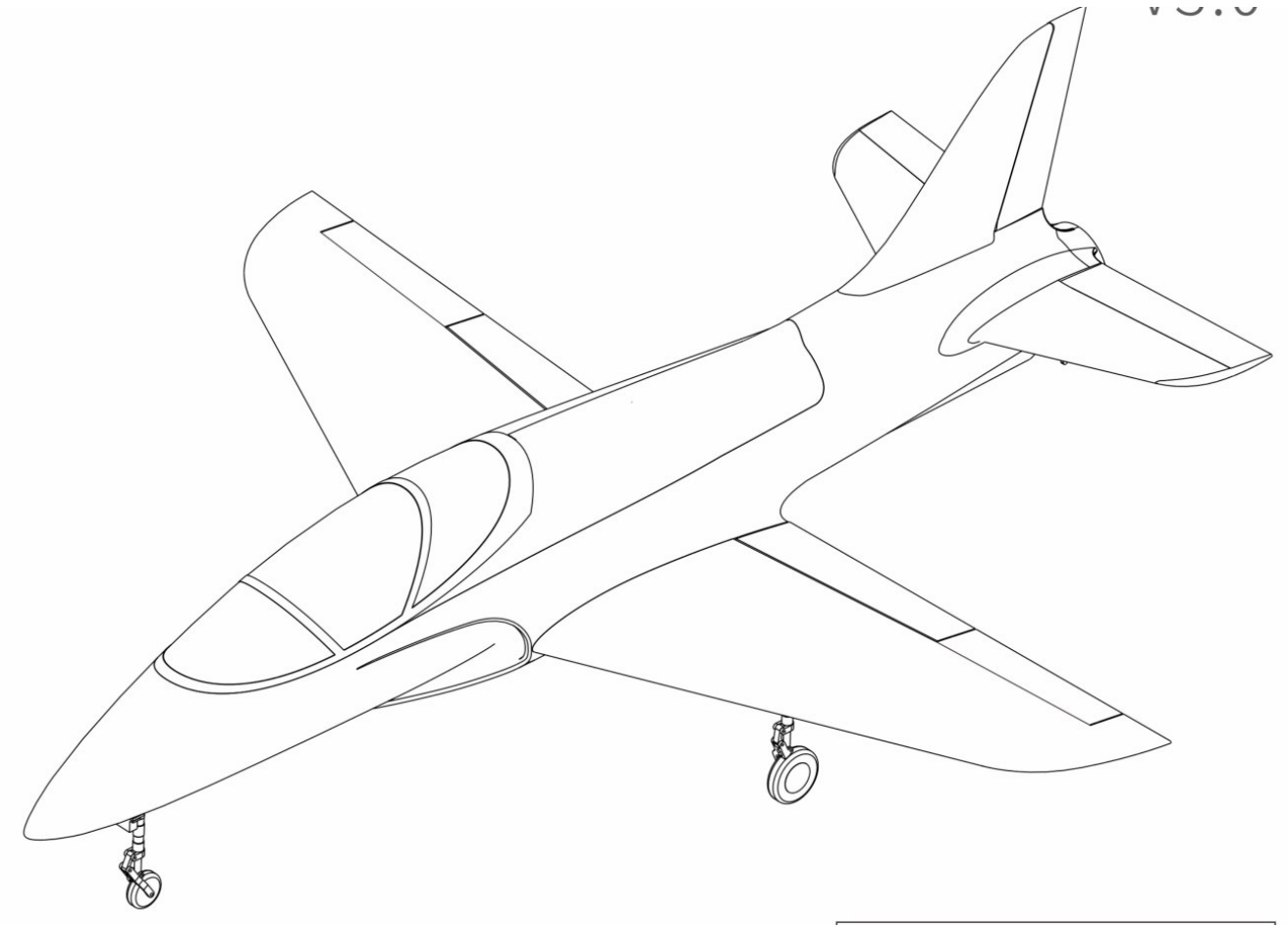
Super Viper Composite 120mm EDF

ASSEMBLY & SETUP MANUAL

PNP aircraft • 12S electric power • A66



Read before assembly or operation

This manual covers final airframe assembly, radio installation, control checks, balance, and preflight preparation for the HSD Super Viper FRP 120mm EDF. Keep it available throughout setup.

Recommended for intermediate pilots, ages 18+. The aircraft requires a compatible radio system, flight batteries, control-system batteries, and charger.

English revision 1.1. Assembly illustrations show typical installations; colors and hardware may vary by aircraft.

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Terms used in this manual

Left and right are viewed from the pilot's position, looking forward toward the nose. An **aileron** controls roll; an **elevator** controls pitch; the **rudder** controls yaw. **Control travel** is the movement of a control surface, not a transmitter percentage. The **MFC-2085** is the integrated aircraft control unit; it is not a substitute for the receiver or an optional gyro.

Safety & handling

1. Read this manual and the instructions for your radio, MFC control unit, ESC, batteries, and charger before connecting power.

2. Keep hands, tools, loose clothing, and wiring clear of the EDF intake and exhaust. Treat the fan as live whenever flight batteries are connected.

3. Complete radio and servo setup with the main flight batteries disconnected. Keep the throttle at minimum and enable throttle cut before connecting flight power.

4. Use a clear flying site suitable for a large, high-performance EDF aircraft. Keep spectators, animals, vehicles, and obstacles clear of the runway and operating area.

5. Maintain visual contact and comply with the flight-site rules and applicable airspace and altitude restrictions. Do not fly in rain, thunderstorms, fog, or winds beyond your ability.

6. Inspect the composite airframe, wing attachments, hinges, linkages, retracts, and wiring before each flight. Do not fly with loose, cracked, damaged, or binding parts.

7. Use a compatible balance charger and the correct battery settings. Do not use swollen, damaged, or overheated batteries. Charge in an appropriate location and supervise charging.

8. Secure the aircraft for any powered ground test. Keep everyone clear of the intake and exhaust; never attempt to catch the aircraft.

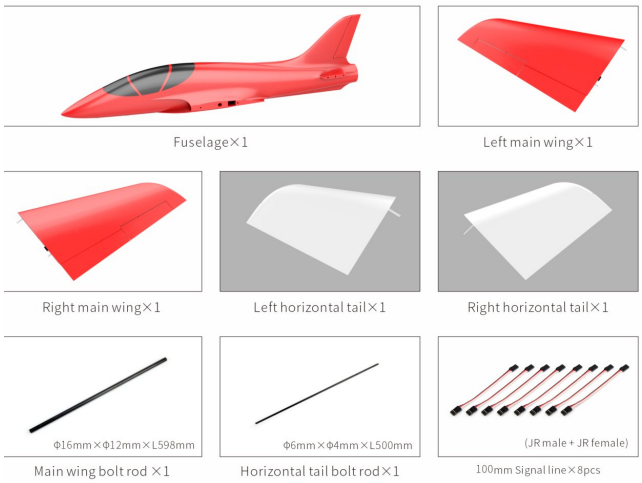
9. After operation, disconnect the main flight batteries before handling the fan or making adjustments. Allow the power system to cool.

10. Clean the painted FRP surfaces with a soft cloth and mild cleaner suitable for the finish. Avoid aggressive solvents and unnecessary soaking.

Package contents & preparation

Unpack the aircraft on a clean, padded surface. Inspect all parts and compare the contents with the package supplied before starting assembly.

Airframe	Fuselage, left and right wings, left and right horizontal stabilizers, vertical tail, nose section, and canopy
Assembly components	Main wing tube, stabilizer tube, supplied fasteners, and signal leads
Installed systems	120mm S-EDF, motor, ESC, MFC-2085, nine digital servos, retracts, electromagnetic brakes, and landing lights
Required separately	16-channel transmitter, compatible receiver, two 6S flight batteries, two 2S control-system batteries, and charging equipment



Important: Use the wing and stabilizer tubes supplied with your aircraft. Confirm that each tube fits its intended mounting sleeve before assembly.

Install the main wings

1. Disconnect all batteries. Support the fuselage so the landing gear and painted surfaces are not loaded or damaged.

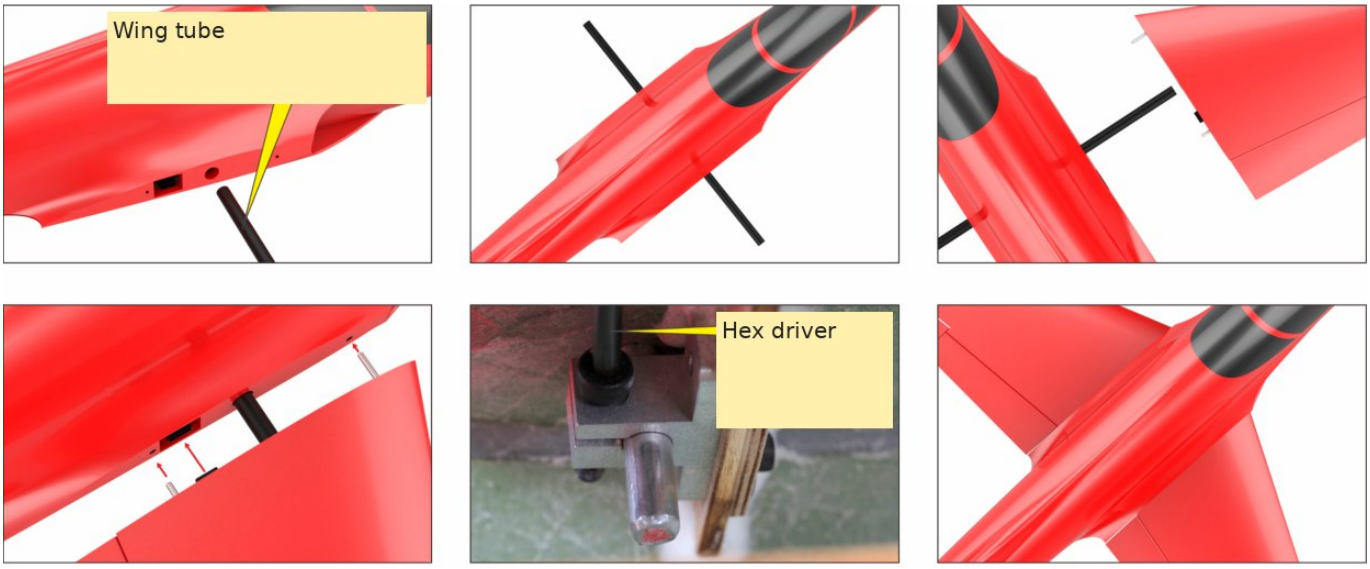
2. Insert the supplied main wing tube through the fuselage mounting sleeve. Center it so the exposed length is equal on both sides.

3. Slide each wing onto the tube while aligning the locating pins and wing-root fittings.

4. Connect the wing electrical interfaces before fully seating the wing. Match the connectors, check orientation, and keep wiring clear of the joint.

5. Seat each wing fully against the fuselage. Install and tighten the supplied retention fasteners using the correctly fitting driver. Do not force a fastener or overtighten a fitting.

6. Confirm both wing roots are fully seated and secure. Check that the wings cannot slide outward and that the ailerons and flaps move freely.



Important: Use the supplied hardware and a correctly fitting driver. Fully seat each component before tightening its retention fasteners.

Install the horizontal stabilizers

1. With all batteries disconnected, insert the supplied stabilizer tube through the rear fuselage sleeve and center it.

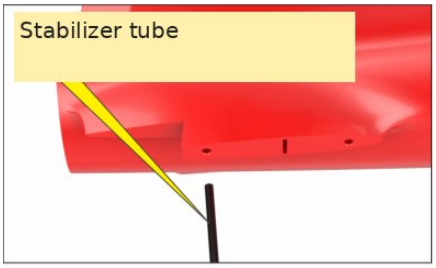
2. Align each stabilizer with its tube and locating pin. Slide it toward the fuselage without forcing the fit.

3. Connect each elevator servo lead to its matching fuselage lead. Check signal, positive, and negative pin orientation; do not rely on connector shape alone.

4. Route the leads clear of the joint and fully seat both stabilizers. Install and tighten the supplied retention hardware.

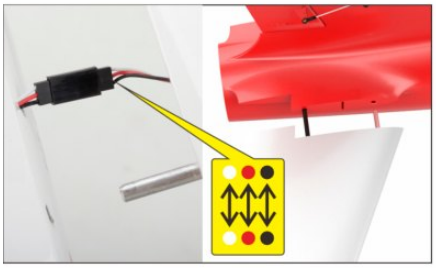
5. Check both stabilizers are secure and aligned. Inspect the elevator hinges and linkages for free movement and adequate clearance.

6. Check the vertical tail, nose section, and canopy attachments as supplied. Secure any components removed for shipping using their matching hardware.













Radio & control-system setup

Use a compatible 16-channel transmitter and full-range receiver. The receiver connection method must match the installed MFC-2085 version and its supported input protocol.

1. Leave the main 12S flight batteries disconnected during initial radio and servo setup.

2. Create an aircraft model memory. Set throttle cut, assign the required switches, and check the transmitter's basic channel order.

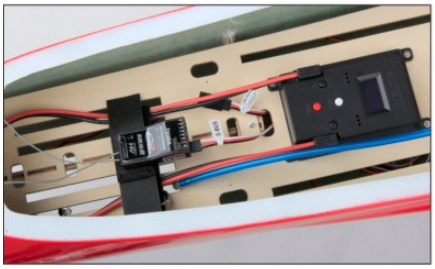
3. Connect the receiver to the MFC using a supported serial connection, or the supported individual PWM inputs. Follow the MFC port labels and its own connection guide.

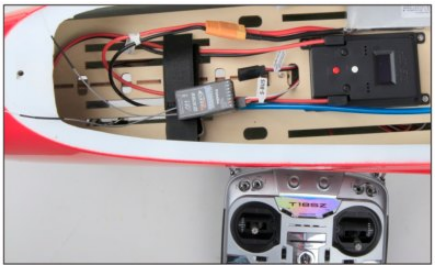
4. Connect the two specified 2S control-system batteries to the designated power inputs, observing polarity and connector requirements.

5. Initialize the MFC following the instructions for the installed unit. Confirm receiver communication and assign each flight and auxiliary function.

6. Verify the channel mapping by operating one control at a time. Check ailerons, elevators, rudder, flaps, steering, retracts, brakes, and lighting individually.

7. Set and test the receiver failsafe with the propulsion system unpowered. Confirm that signal loss cannot command motor power.





Important: Confirm channel mapping against your receiver protocol, transmitter model memory, and MFC configuration. Verify each function individually before connecting flight power.

Battery installation & power-up

Flight batteries	2 × 6S 22.2 V 5000-6000 mAh 70C LiPo; connected in series for 12S / 44.4 V nominal
Control-system batteries	2 × 2S 7.4 V 1800-2200 mAh
Connections	AS150 main power; XT60 control-system connections

Install and secure the batteries

1. Check battery condition, connector polarity, and wiring. Use matched flight packs of the same type, capacity, and similar condition and charge level.

2. Position the batteries on their trays and secure them with the supplied retention system. Keep wiring away from moving parts, sharp edges, and the fan duct. Confirm the canopy closes without pressure on the packs.

3. Use series wiring for the two 6S packs. A parallel connection does not provide the required 12S voltage. Never connect the 12S flight supply to the MFC battery inputs.

Power-up sequence

1. Turn on the transmitter first. Select the correct model, lower throttle fully, and enable throttle cut.

2. Power the receiver and MFC through their designated control-system inputs. Check that the controls respond correctly.

3. Only when ready for a propulsion test or flight, secure the aircraft, clear the intake and exhaust, and connect the main flight batteries according to the installed connector and ESC instructions.

4. Confirm the ESC arms normally with throttle at minimum. If it does not, disconnect flight power and investigate; do not repeatedly advance throttle to force arming.

Shut down

Return throttle to minimum and enable throttle cut. Disconnect main flight power, then turn off the aircraft control system. Turn off the transmitter last. Follow any additional shutdown requirements supplied with the installed equipment.

Aileron setup

Perform these checks with the main flight batteries disconnected. Left and right below refer to the aircraft's own left and right sides.

Right roll command	Right aileron up; left aileron down
Left roll command	Left aileron up; right aileron down
Neutral	Both ailerons aligned with the adjacent wing trailing edge

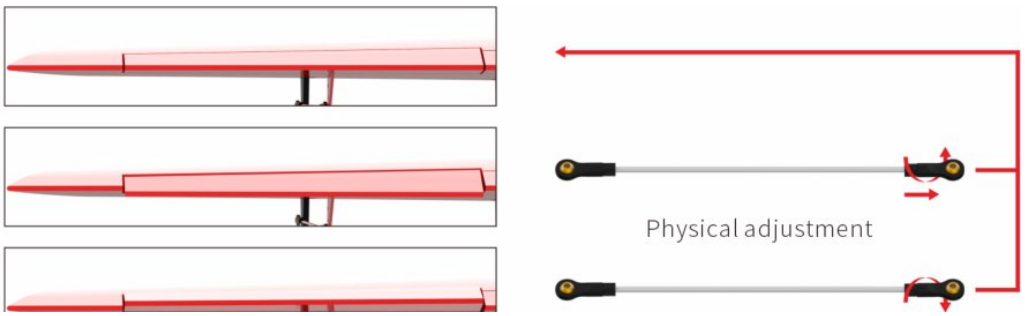
Center and adjust

1. Center transmitter trims and the aileron command. Check servo centering in the MFC before adjusting linkages.

2. Adjust pushrod length to align each aileron with its wing. Use electronic neutral adjustment only as needed; retain adequate travel in both directions.

3. If the response is incorrect, correct the appropriate channel or servo output in the transmitter or MFC. Recheck both ailerons after every change.

4. Move through the full travel range and check for binding, linkage interference, and uneven movement.



Travel reference

Set aileron travel to 25 mm / 0.98 in up and down. Measure actual surface movement at consistent trailing-edge locations. Adjust transmitter or MFC endpoints to achieve the required movement.

Important: Exponential sign conventions differ between radio brands. Configure expo to soften response near stick center, then verify the response on your transmitter; do not copy a signed percentage blindly.

Elevator setup

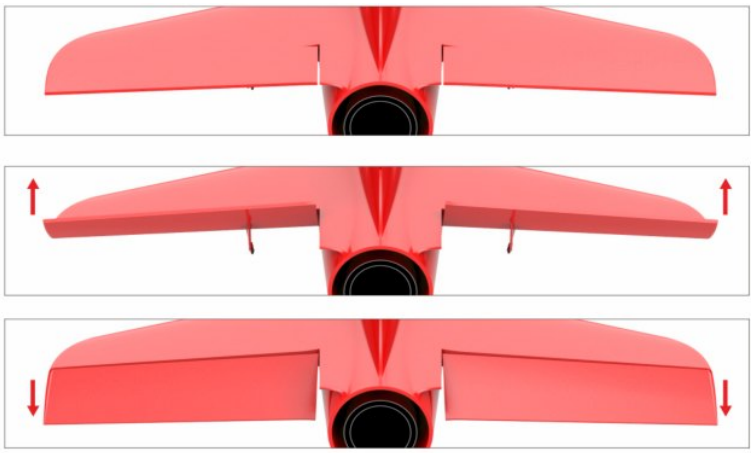
Pitch-up command	Both elevators move up
Pitch-down command	Both elevators move down
Neutral	Both elevators aligned with the horizontal stabilizers

1. Center the elevator command and transmitter trim. Check the two elevator servo neutral positions.

2. Adjust the linkages so both elevators align with the stabilizers and with each other.

3. Check pitch-up and pitch-down commands. If only one elevator moves correctly, correct the individual output rather than reversing the whole channel without checking both sides.

4. Match left and right travel. Check the full range for binding, interference, and servo strain.



Travel reference

Set elevator travel to 25 mm / 0.98 in up and down. Measure at matching trailing-edge locations on both elevators. Adjust endpoints to obtain equal movement without binding.

Important: If an optional gyro is fitted, check its correction direction separately from stick direction. A surface can respond correctly to the transmitter and still have an incorrect gyro correction.

Rudder & nose-wheel steering

Right rudder command	Rudder trailing edge moves right; nose wheel steers right
Left rudder command	Rudder trailing edge moves left; nose wheel steers left
Neutral	Rudder centered; nose wheel aligned for straight tracking

1. Center the rudder command and trim. Adjust the rudder linkage so the surface aligns with the vertical fin.

2. Check rudder direction and full travel. Correct the relevant transmitter or MFC output if needed, then check for binding.

3. Center the nose wheel using its mechanical linkage and the dedicated steering adjustment where supported. Do not offset the rudder simply to straighten the wheel.

4. Check steering clearance with the gear extended. Ensure the wheel and linkage do not interfere with the gear door or retract mechanism.



Travel reference

Set rudder travel to 30 mm / 1.18 in left and right. Adjust nose-wheel steering separately for controllable taxiing without binding; steering travel does not need to equal rudder travel.

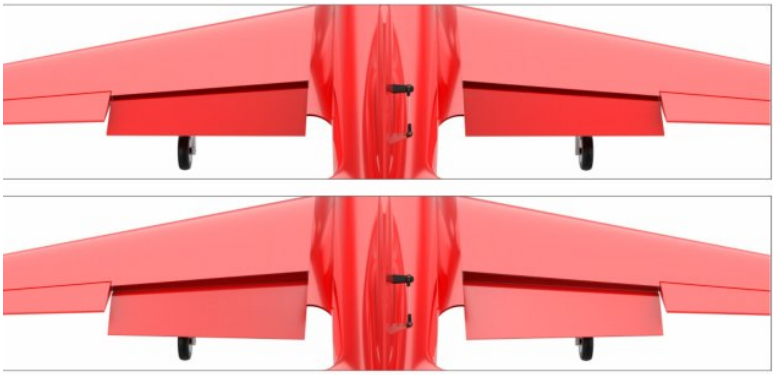
Flap setup

1. Assign a flap switch and set the retracted position. With flaps up, align both flap surfaces with the adjacent wing trailing edges.

2. Deploy each flap stage. Both flaps must move downward together and reach matching positions.

3. If one flap moves upward, correct its individual output direction. Recheck all flap positions after changing a direction or endpoint.

4. Adjust linkage length and individual endpoints to match left and right deployment. Confirm no binding at either endpoint.



Stage 1 reference	25 mm / 0.98 in downward
Stage 2 reference	50 mm / 1.97 in downward

Measure flap deployment at matching trailing-edge locations on both wings. Confirm that both flaps reach the same position at each stage.

Important: If flap-to-elevator compensation is used, verify its direction and operation before flight. Refine the mix through controlled flight testing; do not assume a fixed percentage applies to every installation.

Retracts, brakes & lighting

Retractable landing gear

1. Support the aircraft securely with all wheels clear of the bench and floor. Keep fingers and wires away from the struts and gear doors.

2. Command gear down and verify all three legs extend fully. Inspect the door sequence and check that the gear reaches its proper end position.

3. Command gear up, then down again. All three legs must follow the selected command without binding or interference.

4. If a leg moves in the wrong direction or stops incorrectly, disconnect power. Check output assignment, wiring, and settings against the installed retract and MFC instructions before making changes.





Brakes and lights

1. With gear down and the aircraft supported, check that both main wheels rotate freely with brakes released.

2. Apply the brake command and verify braking at both main wheels. Release the command and confirm both wheels release.

3. Check landing-light operation against the assigned switch or gear sequence. Lighting alone is not proof that a leg is correctly extended.

Important: Do not reverse battery polarity or swap motor connections as a general troubleshooting step. Retract wiring changes must follow the instructions for the installed hardware.

Ground handling

1. Complete radio range and failsafe checks first. Inspect the runway and choose an area clear of people and obstacles.

2. With the nose wheel centered and the rudder neutral, begin a low-speed taxi check using only the power needed to roll.

3. If the aircraft consistently turns to one side, stop and disconnect flight power before adjusting the steering linkage or dedicated steering neutral.

4. If steering is too sensitive, reduce the steering endpoint. If necessary, revise the linkage geometry while maintaining adequate engagement and clearance.

5. Check brake response at low speed. Confirm that the aircraft slows predictably and both brakes release afterward.



After adjustment

Recheck steering direction, straight-ahead alignment, full steering travel, and retract clearance. A change to servo-arm position or pushrod length can affect both travel and centering.

Important: Do not use a high-speed taxi run to compensate for an unresolved setup issue. Stop if the aircraft veers, a wheel binds, or the gear behaves unexpectedly.

Center of gravity

CG: 180-185 mm / 7.09-7.28 in

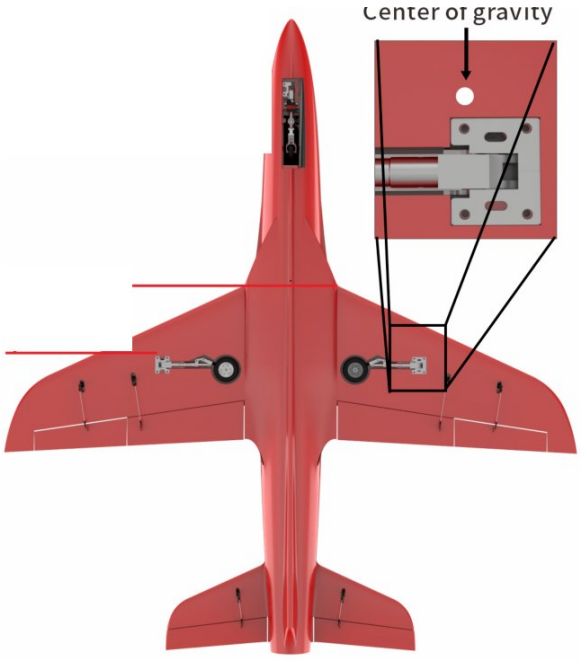
Measure 180-185 mm / 7.09-7.28 in rearward from the main wing leading-edge reference at the wing root. Mark matching balance points on both sides of the aircraft.

1. Assemble the aircraft completely and install the batteries and all equipment in their intended flight positions. Leave main flight power disconnected.

2. Mark corresponding balance points on both sides using the same leading-edge reference. Support the aircraft safely using suitable balancing equipment; get help handling this large model.

3. Check the aircraft balance. If the nose is too heavy, move the batteries rearward within their secure mounting range. If the tail is too heavy, move them forward.

4. Secure the batteries again and recheck balance. Do not compromise battery retention or the required electrical specification to achieve CG.



The illustration identifies the balance reference and is not drawn to scale. Use the stated CG measurement.

Important: Do not fly until the completed aircraft balances within the specified range. Recheck CG after changing batteries, equipment, or their positions.

Current aircraft specifications

Construction / finish	FRP composite; high-gloss paint and waterslide decals
Wingspan / length	1,800 mm / 70.9 in; 2,000 mm / 78.7 in
Flying weight	Approx. 11.5 kg / 25.3 lb including batteries
Wing area / loading	67.7 dm² / 1,049.4 in²; 169.8 g/dm² / 55.6 oz/ft²
EDF / motor	120 mm / 4.72 in, 10-blade S-EDF; 5268-640KV inrunner
ESC	Hobbywing 160A HV, rated 6S-14S; aircraft uses 12S
Flight batteries	2 × 6S 22.2 V 5000-6000 mAh 70C LiPo in series
Control-system batteries	2 × 2S 7.4 V 1800-2200 mAh
Power connectors	AS150 flight power; XT60 control power
Control system / radio	MFC-2085; compatible 16-channel radio system
Servos	9 digital: 2 × 12 g, 5 × 39 g, 2 × 65 g; metal gears, aluminum-case construction
Gear / brakes / lights	All-metal shock-absorbing retracts; electromagnetic brakes; landing lights
CG	180-185 mm / 7.09-7.28 in behind wing-root leading edge
Speed / flight time	Approx. 230 km/h / 143 mph; approx. 3-5 minutes
Pilot / age	Intermediate; ages 18+
Assembly / temperature	Approx. 30 minutes plus setup; 0-40°C / 32-104°F
Package dimensions	140 × 48 × 72 cm / 55.1 × 18.9 × 28.3 in

Preflight & troubleshooting

Before every flight

• Check wing and stabilizer retention, canopy security, hinges, pushrods, and ball links.

• Inspect the EDF inlet and exhaust; remove loose objects and check for damage.

• Check batteries, charge levels, connectors, and retention. Verify CG after any equipment change.

• Select the correct transmitter model. Check control direction, neutral, travel, and flap symmetry.

• Check steering, retracts, doors, brakes, and lights. Confirm gear is down before takeoff.

• Check radio range and failsafe using the radio maker's procedure. Confirm any gyro corrections.

• Set a conservative flight timer and leave enough energy for approach and a possible go-around.

• Confirm runway and airspace are clear before enabling propulsion.

If something does not work

No control response	Leave flight power disconnected. Check control batteries, receiver link, protocol, channel mapping, and MFC initialization.
One surface moves incorrectly	Check the individual output direction and mapping. Recheck both sides and any gyro corrections after changing settings.
EDF does not arm	Lower throttle, enable throttle cut, and check the correct model and ESC instructions. Disconnect power before inspecting connections.
Gear or brakes misbehave	Stop cycling the system. Disconnect power; check for binding, incorrect mapping, loose wiring, or incorrect settings.

Nose gear exploded view

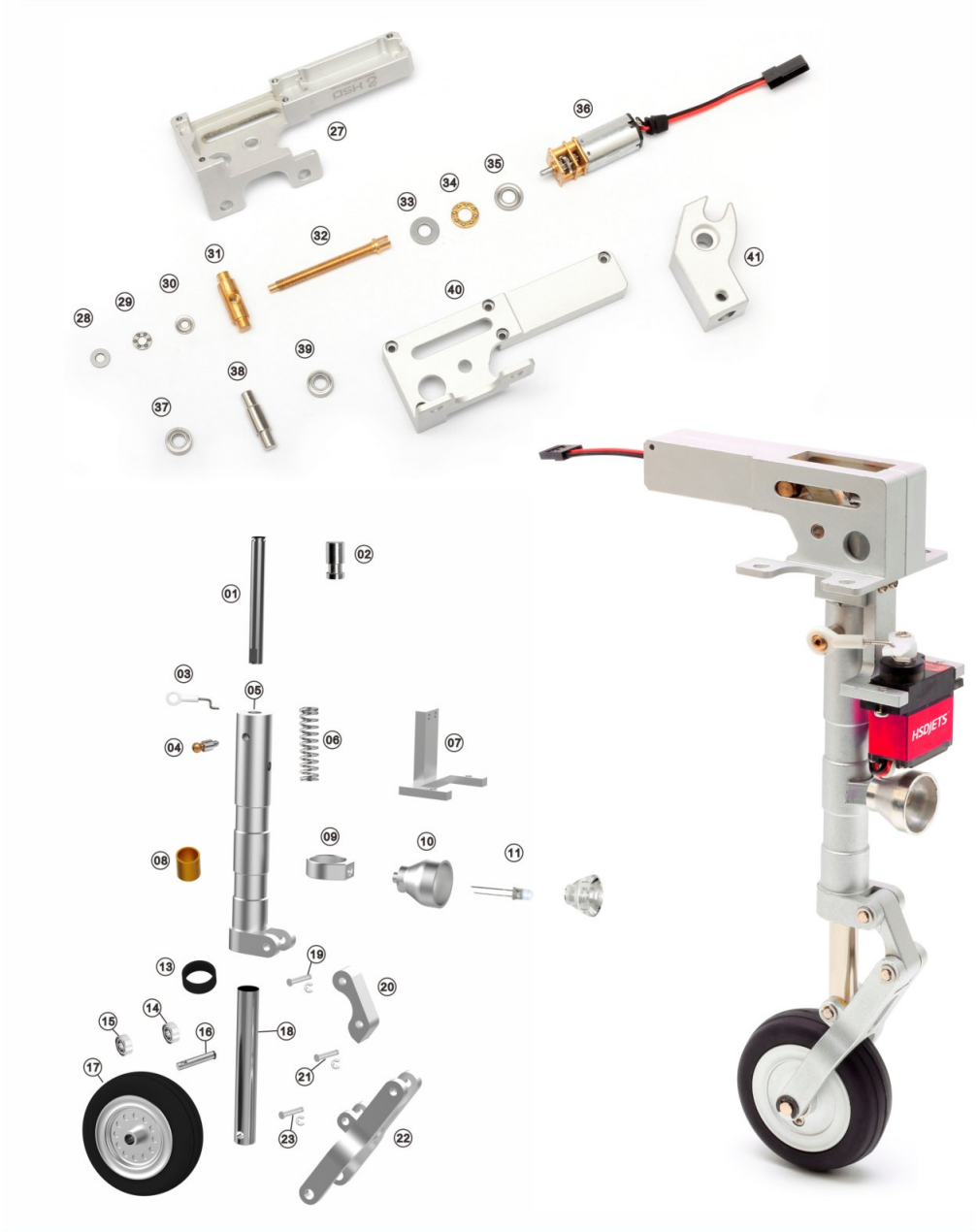
Use this exploded view to identify the nose gear components and their assembly order. Match replacement parts to the gear installed in your aircraft.



Important: Disconnect all batteries before gear service. Keep small parts organized and recheck operation with the aircraft securely supported after reassembly.

Main gear exploded view

Use this exploded view to identify the main gear components and their assembly order. Match replacement parts to the gear installed in your aircraft.



Support

For current aircraft resources and setup assistance, visit **flyhsd.com**. Include the model, installed equipment, a description of the issue, and clear photographs when requesting support.