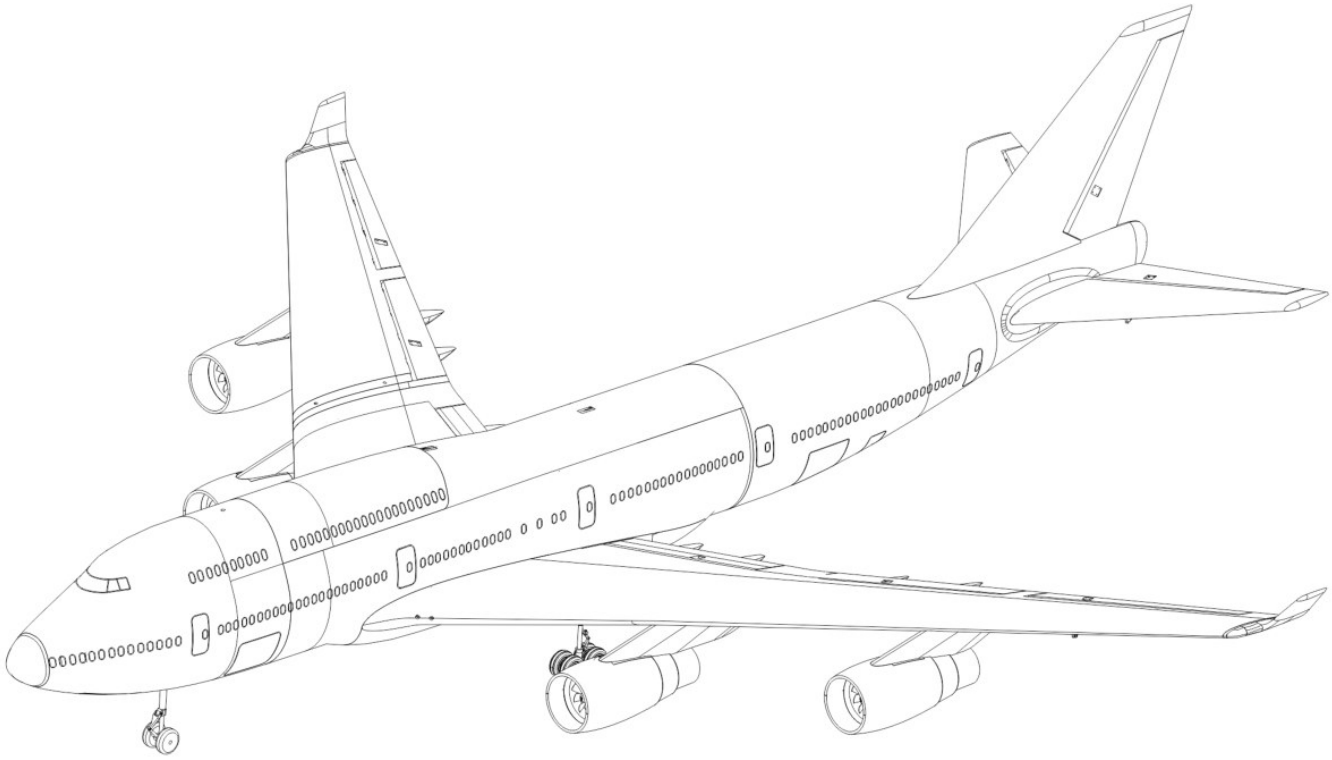
HBY-747 Quad 90mm EDF

ASSEMBLY & PREFLIGHT MANUAL

PNP RC airliner | A51 | Four 90mm 12-blade S-EDF units



Read before assembly or operation

This manual explains airframe assembly, radio installation, control checks, battery installation, balance, and preflight preparation for the HSD HBY-747 PNP airliner. Read it completely before connecting any battery.

Recommended for intermediate pilots, ages 18+. This is a large, high-powered RC aircraft. Seek assistance from an experienced large-model or multi-engine EDF pilot if needed.

One aircraft. Three shipping boxes. Account for the nose, fuselage, and wing boxes before beginning assembly.

Illustrations show typical installations. Colors and installed hardware may vary. Use the supplied components and check the actual aircraft throughout setup.

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Terminology: Left and right refer to the aircraft as viewed from the cockpit looking forward. EDF means electric ducted fan. ESC means electronic speed controller. CG means center of gravity. PNP means Plug-N-Play.

Safety & handling

Keep all four EDF systems safe

1. Keep flight batteries disconnected during assembly, linkage adjustment, radio programming, and control checks. Power the control system separately when required.

2. Treat an EDF as live whenever a flight battery is connected. Keep hands, loose clothing, tools, cables, and debris away from every intake and exhaust. Never look into an intake during a powered test.

3. Use throttle cut or an equivalent motor-inhibit function. Confirm its operation before connecting flight batteries. Do not rely on throttle cut alone while working near the fans; disconnect the batteries.

4. Support and restrain the aircraft securely for powered ground tests. Keep people clear of the aircraft and all four propulsion units. Do not run the fans on a loose or debris-covered surface.

5. Turn on the transmitter first, with throttle fully low and throttle cut active. Follow the power-up sequence in this manual and the installed equipment instructions.

6. After operation, inhibit throttle and disconnect all flight batteries before handling the aircraft. Disconnect control-system batteries, then turn off the transmitter.

7. Never catch or stop a moving aircraft by hand. Wait until it is stationary and all fans have stopped, then disconnect power before lifting it.

Protect the airframe

Use a clean, padded work surface and obtain help when supporting or moving the airliner. Do not lift it by control surfaces, engine nacelles, or the landing gear. Keep foam and painted surfaces away from solvents, excessive heat, and incompatible cleaning products.

Stop if anything is damaged or abnormal. Inspect loose hardware, cracked structures, binding linkages, damaged wiring, and unusual EDF noise or vibration before further operation.

Environment & battery safety

Choose a suitable flying site

Use an approved flying site with sufficient runway length and clear airspace for a 280 cm / 110.2 in wingspan airliner. Keep the aircraft within visual line of sight and clear of people, vehicles, buildings, power lines, and other obstacles. Follow applicable local airspace and model-aircraft rules.

Do not fly in rain, lightning, fog, snow, or strong or gusty wind. Stay within the aircraft operating-temperature range of 0-40 C / 32-104 F. Aircraft performance changes with air density, temperature, wind, and battery condition.

Handle LiPo batteries correctly

1. Use only undamaged batteries of the required cell count, capacity, discharge rating, and connector type. Do not use swollen, punctured, overheated, or damaged packs.

2. Balance-charge each pack with a charger configured for its battery chemistry and cell count. Follow the battery and charger instructions. Never leave charging batteries unattended.

3. Charge away from the aircraft and combustible materials, on a suitable nonflammable surface. Let packs cool before charging or reuse.

4. Check connector polarity before use. Keep exposed contacts insulated. Never short terminals or force mismatched connectors.

5. Secure each battery against movement in every direction. Keep leads clear of moving parts and protect wiring against rubbing or pinching.

6. Disconnect all packs for transport and storage. Store and dispose of batteries according to the battery supplier instructions and local requirements.

Flight duration is an estimate. Set a conservative timer for initial flights and check battery use after landing. Do not plan to fly until low-voltage cutoff.

Package contents & hardware

One complete aircraft is supplied in three boxes. Inspect all components before assembly and retain the packaging for protection during storage or transport.

Airframe	Nose, center fuselage, rear fuselage, center wing, left and right outer wings, vertical stabilizer, and left and right horizontal stabilizers
Propulsion	Two inboard and two outboard nacelle assemblies with four EDF units, motors, and ESCs
Installed systems	MFC-2085, 12 digital servos, five retractable landing gear assemblies, electromagnetic brakes, and LED lighting
Joining tubes	2 nose tubes: 16 mm OD x 380 mm; 2 fuselage tubes: 16 mm OD x 680 mm; 2 main wing tubes: 16 mm OD x 1380 mm; 2 wing tubes: 10 mm OD x 670 mm; 1 stabilizer tube: 10 mm OD x 270 mm
Hardware	M3 x 14 mm (8); M3 x 35 mm (20); M4 x 35 mm (2); M4 x 50 mm (2); M6 x 95 mm (14); M6 x 125 mm (4); M6 x 130 mm (4)
Signal leads	Eight 100 mm / 3.94 in male-to-male JR leads and one 100 mm / 3.94 in Y-lead
Documentation	Aircraft and MFC-2085 instructions; digital versions may be supplied

Use the supplied tubes and fasteners. Compare each fastener with its illustrated location before installation; do not assume spare hardware belongs in an unmarked hole. Tube dimensions identify supplied parts and are not substitute-material specifications.

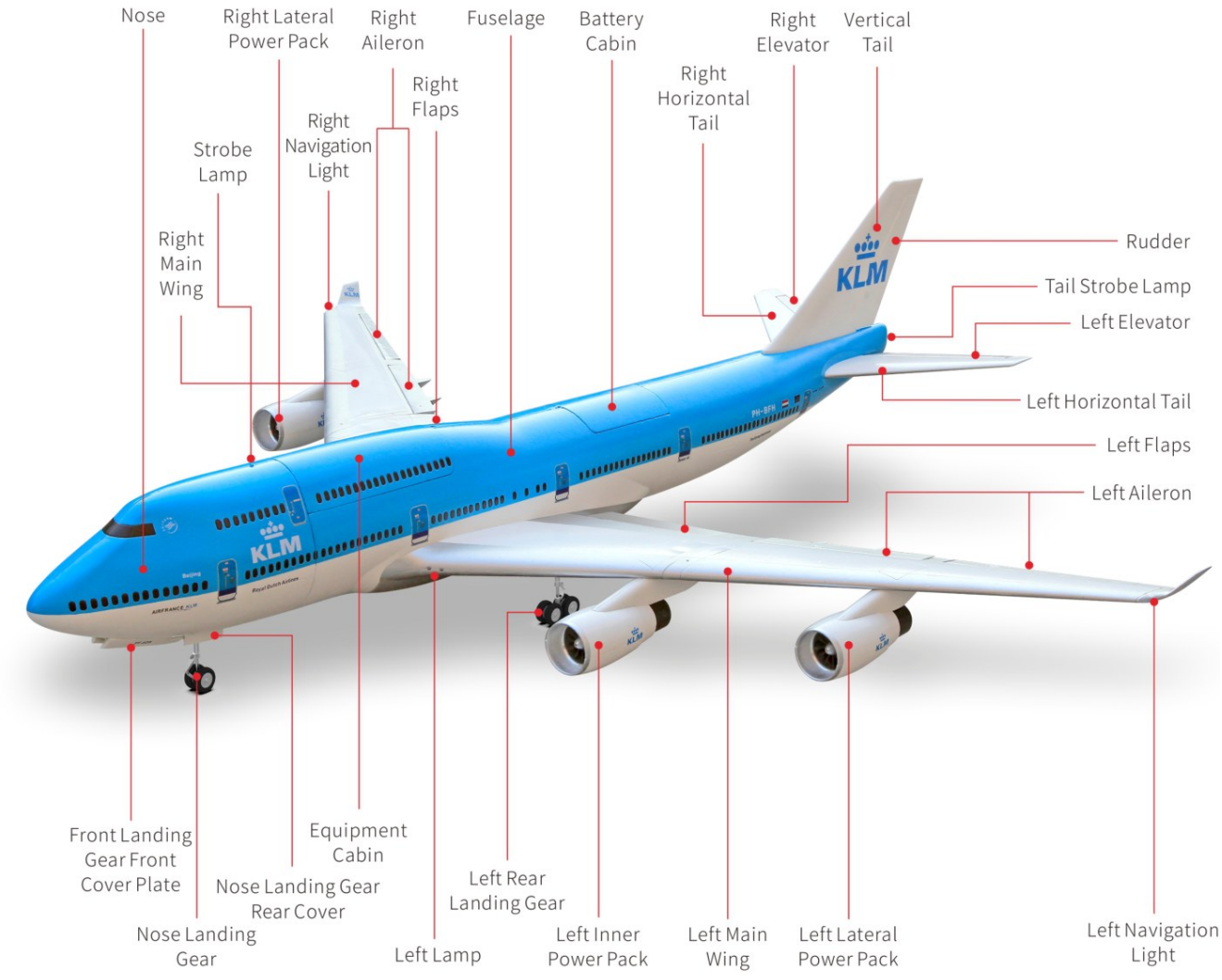
Shipping boxes (cm / in): Nose: 70.5 x 40.5 x 64.3 / 27.8 x 15.9 x 25.3; fuselage: 131 x 62.5 x 40 / 51.6 x 24.6 x 15.7; wings: 119 x 99.3 x 33 / 46.9 x 39.1 x 13.0.

Prepare separately

16-channel transmitter and compatible full-range receiver; four 6S 22.2 V 5000-6000 mAh 70C flight batteries with AS150 connections; two 2S 7.4 V 1800-2200 mAh control-system batteries with XT60 connections; suitable LiPo balance charger, charge leads, and assembly tools. A gyro is optional and sold separately.

Aircraft component reference

Identify the airframe sections, nacelles, landing gear, control surfaces, and equipment compartment before assembly. The reference illustration shows a typical livery.



Flight controls	Ailerons: outer wing trailing edges. Flaps: inboard wing trailing edges. Elevators: horizontal stabilizer trailing edges. Rudder: vertical stabilizer trailing edge.
Propulsion	Two inboard and two outboard EDF nacelles mounted below the wings.
Ground equipment	One nose landing gear assembly and four main landing gear assemblies.

Join the nose & center fuselage

1. Place the nose and center fuselage on a clean, padded surface. Keep all batteries disconnected.

2. Identify the two supplied nose joining tubes: 16 mm outside diameter x 380 mm long. Insert them into the matching nose sockets.

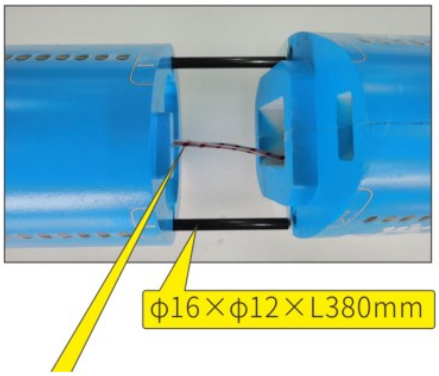
3. Route the nose-section ribbon cable through the joint so that it remains accessible for connection. Keep the cable clear of the joining surfaces and screw holes.

4. Align the center fuselage with the tubes and slide the sections together without forcing them. Confirm that the joint closes evenly.

5. Secure the joint with two M6 x 95 mm screws in the illustrated positions. Tighten evenly without crushing the foam or stripping the mounting inserts.









Check: The nose is fully seated, the joint is secure, and the nose cable is accessible and undamaged.

Install the horizontal stabilizers

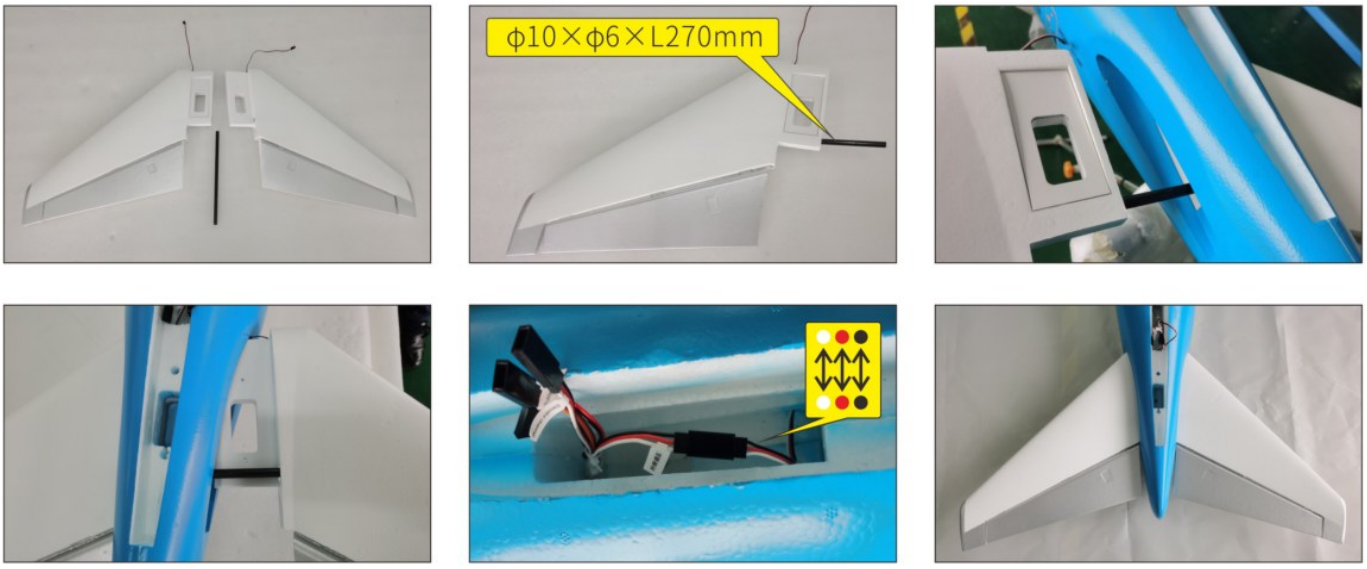
1. Locate the supplied stabilizer joining tube: 10 mm outside diameter x 270 mm long.

2. Insert the tube into one stabilizer, then guide that stabilizer into its matching socket in the rear fuselage. Route its servo lead through the opening at the same time.

3. Slide the opposite stabilizer onto the tube and seat both sides completely. Do not trap servo leads between the mating surfaces.

4. Connect each stabilizer servo lead to its matching fuselage lead. Match the signal, positive, and negative conductors; do not rely on connector color alone.

5. Check that both stabilizers are seated and secured by their supplied retention system. Verify that both elevators move freely.



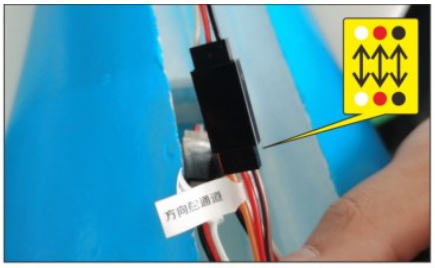
Connector orientation: A reversed servo connector can prevent operation or damage equipment. Confirm pin assignments before applying power.

Install the tail & rear fuselage

Vertical stabilizer

1. Connect the rudder servo lead to its matching rear-fuselage lead. Confirm signal and power polarity, then guide the excess lead into the compartment.

2. Seat the vertical stabilizer in the rear fuselage. Secure it with one M4 x 50 mm screw and one M4 x 35 mm screw at the illustrated front and rear locations.

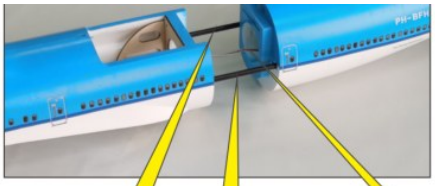



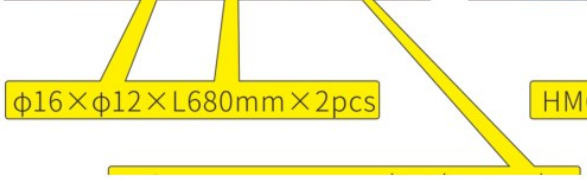

Rear-to-center fuselage joint

1. Fit the two supplied rear fuselage joining tubes: 16 mm outside diameter x 680 mm long.

2. Route the rear-fuselage cable through the joint and keep it accessible. Slide the rear section onto the center fuselage without pinching wiring.

3. Seat the joint evenly and secure it with three M6 x 95 mm screws in the illustrated locations. Check the complete fuselage for alignment.

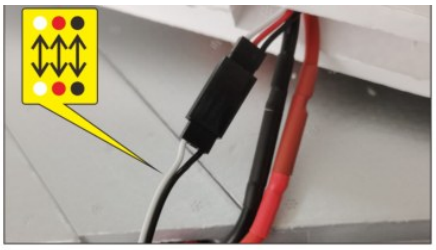
Install the four engine nacelles

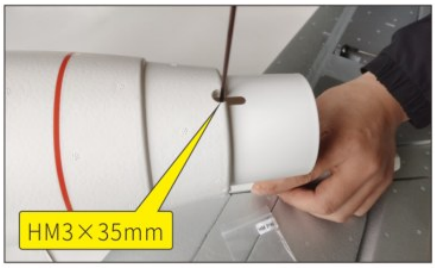
Identify the two inboard and two outboard nacelles before installation. Fit each nacelle to its corresponding wing position; do not interchange units without checking their fit and wiring.

Outboard nacelles

1. Connect the nacelle power lead and throttle signal lead to the matching outer-wing leads. Verify polarity and connector seating.

2. Route the leads inside the mounting area without pinching them. Seat the nacelle and secure it using the supplied M3 x 35 mm screws at the illustrated locations.

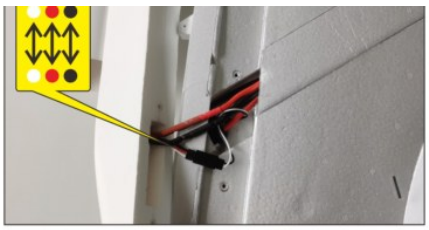



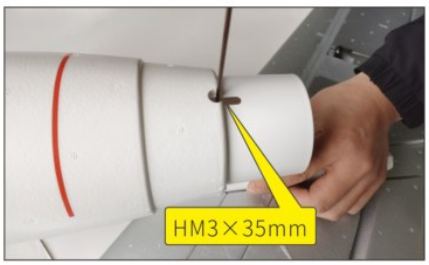



Inboard nacelles

Repeat the connection and mounting process for the inboard nacelles on the center wing. Use the supplied M3 x 35 mm screws. Confirm that all four nacelles are fully seated and that the wiring is clear of the fan ducts and mounting hardware.







Install the center wing

1. Support the fuselage securely and place the center wing, with its inboard nacelles installed, into the matching fuselage mounting area.

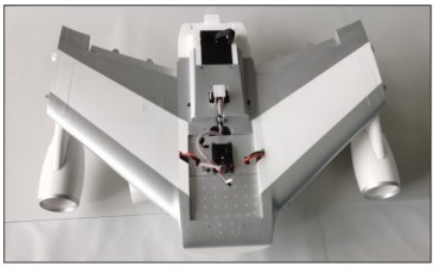
2. Align the mounting holes before inserting screws. Do not use screws to pull a misaligned wing into position.

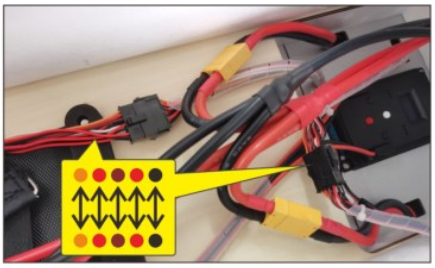
3. Fit four M6 x 130 mm screws at the front locations and two M6 x 95 mm screws at the rear locations shown below. Tighten evenly.

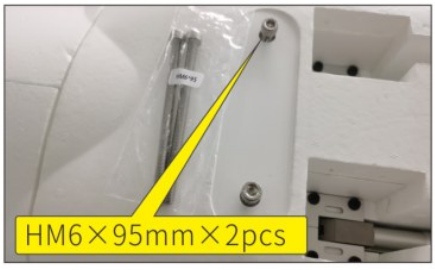
4. Connect the nose and rear-fuselage signal cables at the center-wing equipment area. Confirm the connector orientation and retain the cables so they cannot rub or become pinched.

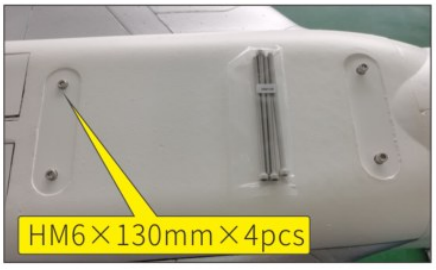
5. Check that the center wing is fully seated and that its nacelles, landing gear, wiring, and mounting points are secure.













Before proceeding: Support the model by suitable structural areas. Do not put the aircraft weight on an unsupported engine nacelle or control surface.

Install the outer wing panels

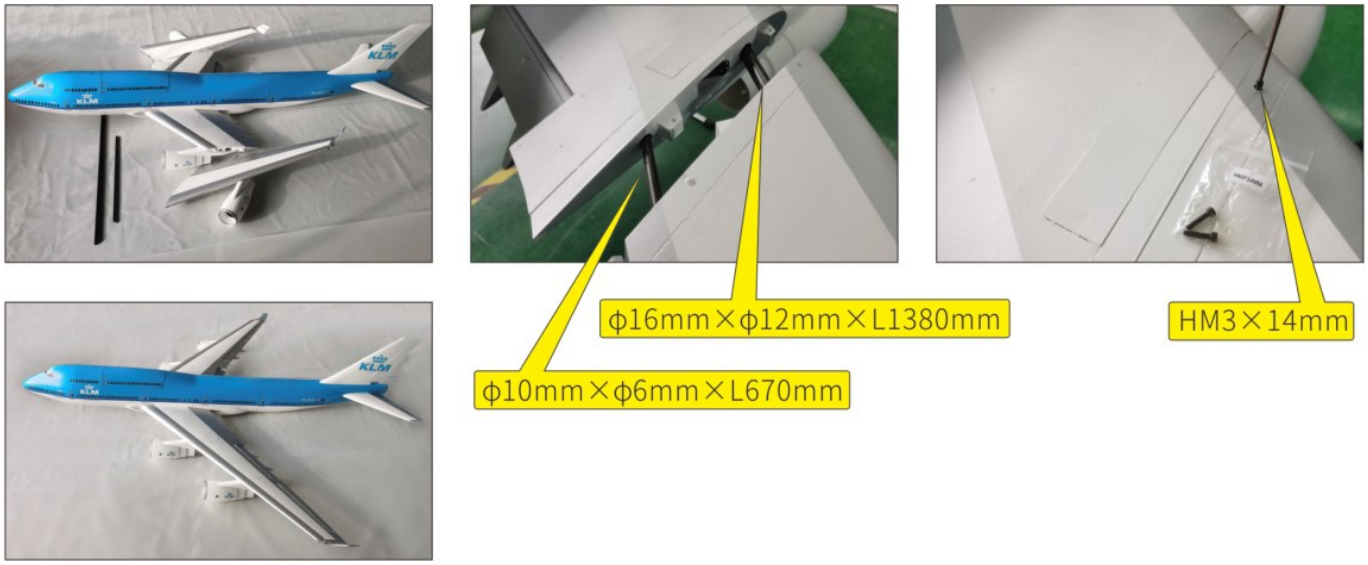
1. Identify the supplied main wing joining tubes: two 16 mm outside diameter x 1380 mm tubes and two 10 mm outside diameter x 670 mm tubes.

2. Insert the tubes into the correct center-wing sockets as illustrated. Keep them clean and free of grit.

3. Align one outer wing with the tubes and slide it inward carefully. Before closing the joint, connect its electrical cable to the matching center-wing cable.

4. Check connector seating and cable clearance. Slide the wing fully home without forcing it or trapping wiring. Repeat on the opposite side.

5. Secure the wing panels with the supplied M3 x 14 mm screws at the illustrated positions. Check that both joints are closed and that the retention hardware is secure.



Final check: Both outer wings are aligned, electrical connections are secure, and ailerons and flaps move without binding.

Complete electrical connections

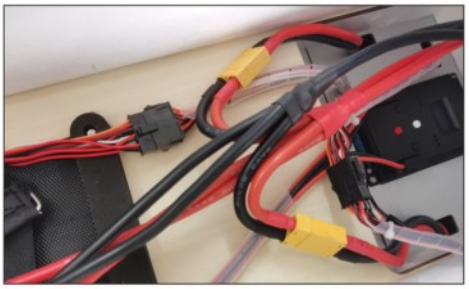
1. Keep the four flight batteries disconnected. Inspect the power harnesses and identify every connector using the aircraft wiring arrangement.

2. Connect the matching internal power-harness plugs in the center wing. An internal harness connection may differ from the AS150 flight-battery connectors; do not force or substitute connectors.

3. Confirm correct polarity and full connector engagement. Retain the harness so that wiring cannot touch moving linkages, retracts, or sharp edges.

4. Connect the receiver interface and control-system leads only after identifying their pin assignments and supported protocol.

5. Inspect all wing and fuselage joints once more. Verify that no cable has been trapped during assembly.





Inspect before applying power

Check the four EDF intakes and exhausts for tools, screws, packing material, and loose leads. Spin no fan by inserting fingers into its duct. Check fan freedom only by the method specified for the installed propulsion unit, with all power disconnected.

Do not connect batteries in series or parallel unless the aircraft wiring diagram explicitly calls for that arrangement. This aircraft uses 6S / 22.2 V flight power; the number of battery packs does not make it a 24S installation.

Radio & MFC-2085 setup

1. Create a new model memory on a compatible 16-channel transmitter. Begin with neutral trims and a clearly assigned throttle-cut switch.

2. Connect the full-range receiver to the MFC-2085 using a supported interface. The illustrated installation uses S.BUS; use PWM only when the installed MFC and receiver support the required connections.

3. With flight batteries disconnected, turn on the transmitter and power the control system using the specified 2S batteries and approved connections.

4. Verify each MFC input assignment against the transmitter channel map. Do not assume that another model memory or receiver uses the same channel order.

5. Check each function separately, including ailerons, elevators, rudder, throttle signal, flaps, retracts, brakes, steering, and lights. Set endpoints so that no servo or linkage binds.

6. Set receiver failsafe to inhibit propulsion. Test failsafe operation with the EDF flight batteries disconnected before conducting a restrained live-power check.

Legacy S.BUS mapping reference

CH1 / CH2	Ailerons / elevators
CH3 / CH4	Throttle / rudder
CH5 / CH6	Landing gear / flaps
CH8	Wheel brakes
Other channels	Assign auxiliary functions to match the installed MFC configuration

This mapping is a setup reference from the illustrated installation, not a substitute for checking the actual MFC input assignments. An optional gyro requires its own installation, direction, and response checks.

Batteries & power-up

Flight batteries	4 x 6S 22.2 V 5000-6000 mAh 70C LiPo; AS150-compatible connections
Control-system batteries	2 x 2S 7.4 V 1800-2200 mAh LiPo; XT60 connections

1. Install batteries in their intended compartments and secure them using the supplied retention provisions. Protect leads from sharp edges, rubbing, and moving components.

2. Confirm wiring and polarity. Keep all flight packs disconnected while completing control checks and CG adjustment.

3. For a powered test, move to a clear, clean area. Support and restrain the model, keep bystanders clear, and activate transmitter throttle cut with throttle fully low.

4. Turn on the transmitter, then connect the control-system batteries according to the MFC instructions. Confirm receiver operation and the selected model memory.

5. Connect the four flight batteries according to the aircraft harness layout. Keep clear of all intakes and exhausts while the ESCs initialize.

6. Verify that throttle cut holds all four motors stopped. Conduct only the brief restrained propulsion checks needed to confirm correct response and normal operation.

7. After testing, inhibit throttle, disconnect all four flight batteries, disconnect the control batteries, and turn off the transmitter last.

Stop immediately if one EDF starts unexpectedly, fails to respond, or produces abnormal noise or vibration. Disconnect power and correct the cause before continuing.

Aileron setup

Perform these checks with the flight batteries disconnected. Left and right refer to the aircraft looking forward from the cockpit.

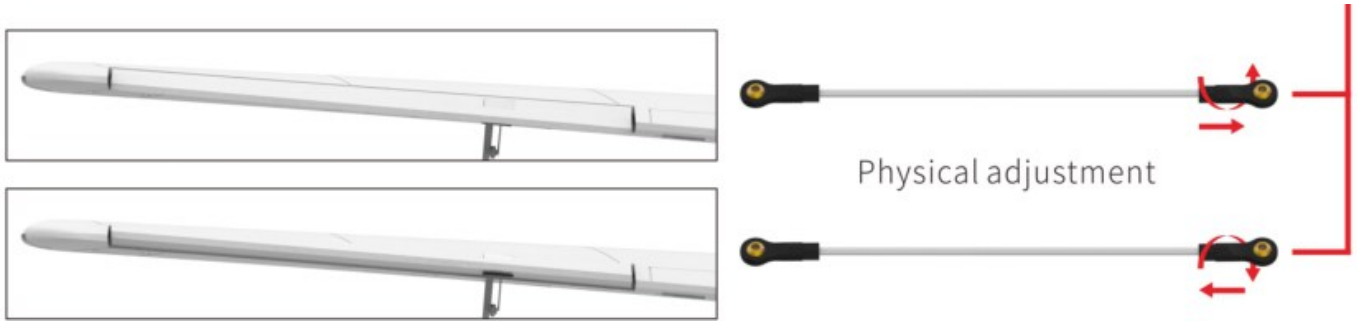
Roll right	Right ailerons move up; left ailerons move down
Roll left	Left ailerons move up; right ailerons move down
Neutral	All ailerons align with their adjacent wing trailing edges

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

2. Adjust linkage length to bring each aileron to neutral. Use electronic neutral adjustment only as needed and retain sufficient travel in both directions.

3. If response is reversed, correct the appropriate transmitter channel or MFC output. Recheck every aileron after a change.

4. Move through the full range and check for binding, unequal movement, or linkage interference.



Control-travel reference

Set aileron travel to **13 mm / 0.51 in up and down**. Measure actual movement at consistent trailing-edge points. Adjust transmitter or MFC endpoints to obtain the specified movement.

Exponential sign conventions vary by radio brand. Configure expo to soften response near stick center and verify its effect; do not copy a signed percentage blindly.

Elevator setup

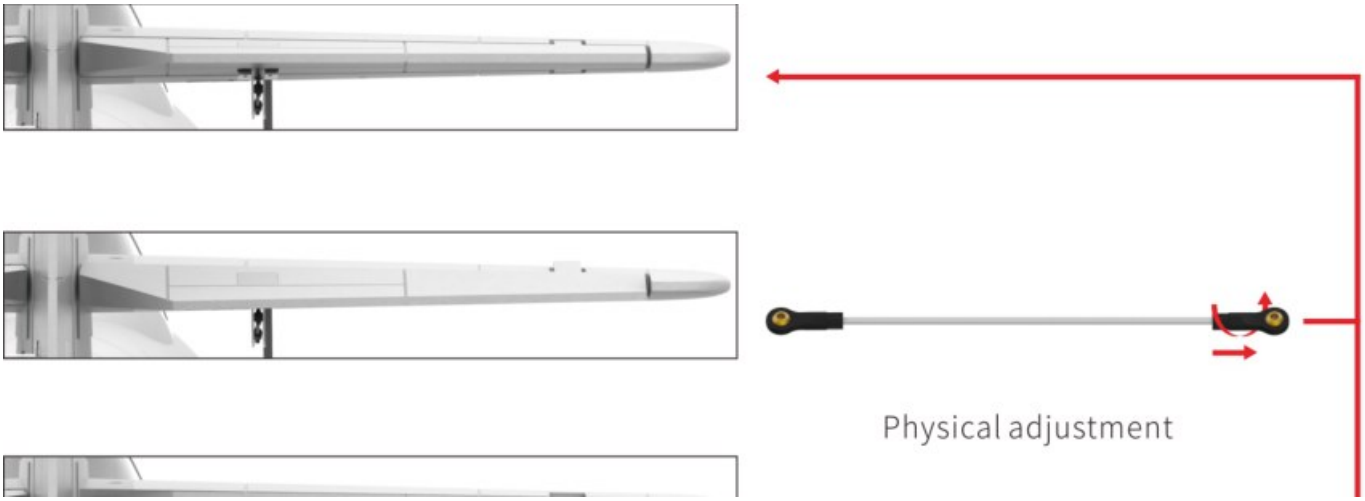
Pitch up	Both elevators move up
Pitch down	Both elevators move down
Neutral	Elevators align with their horizontal stabilizers

1. Center the elevator command and transmitter trim. Check servo neutral positions before changing linkages.

2. Adjust each linkage so both elevators are neutral and aligned with the stabilizers.

3. Check pitch-up and pitch-down commands. If either side moves incorrectly, correct the individual output or channel and repeat the check.

4. Confirm equal movement on both sides and full clearance throughout the travel range.



Control-travel reference

Set elevator travel to **18 mm / 0.71 in up and down**. Measure at matching trailing-edge points on both sides. Use endpoint adjustments to prevent overtravel and binding.

Keep mechanical neutral alignment and electronic centering separate from flight trim. Verify that any optional gyro commands the correct corrective elevator movement before flight.

Rudder & nose-wheel steering

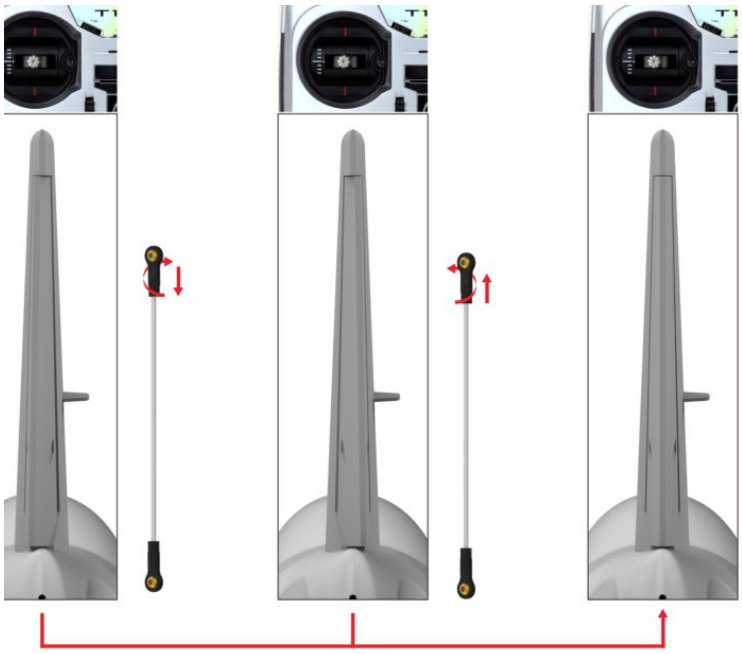
Yaw right	Rudder trailing edge moves right; nose wheel steers right
Yaw left	Rudder trailing edge moves left; nose wheel steers left
Neutral	Rudder is centered; nose wheel points straight ahead

1. Center the rudder command and trim. Adjust the rudder linkage so its trailing edge aligns with the vertical stabilizer.

2. Check rudder direction and correct the individual output or channel if needed.

3. Set rudder travel to 24 mm / 0.94 in left and right, measured at a consistent trailing-edge point.

4. Align nose-wheel steering mechanically, then refine electronic centering and endpoints. Check full steering travel for binding and gear-door interference.



Steering may be configured separately from the flight rudder. Confirm that any steering mix and gyro function work correctly with landing gear extended and retracted. Do not assume an optional gyro is already installed.

Flap setup

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

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

3. If one flap moves in the wrong direction, correct its individual output. Recheck every flap position after a direction or endpoint change.

4. Adjust linkage lengths and individual endpoints to match left and right travel. Confirm no binding or excessive servo loading at any position.



Stage 1 reference	22 mm / 0.87 in downward
Stage 2 reference	44 mm / 1.73 in downward

Measure flap movement at matching trailing-edge locations. If flap-to-elevator compensation is used, verify its direction on the ground and refine the mix through controlled flight testing. Do not assume a fixed mix percentage suits every installation.

Retracts, brakes & lighting

Support the aircraft before cycling the gear

1. With flight batteries disconnected, support the aircraft securely so all five gear assemblies can extend and retract without touching the bench. Keep hands clear of the mechanisms.

2. Check the gear switch assignment and MFC setup. The installed controller may require a deliberate gear-switch cycle after power-up to release its startup interlock; follow the MFC instructions.

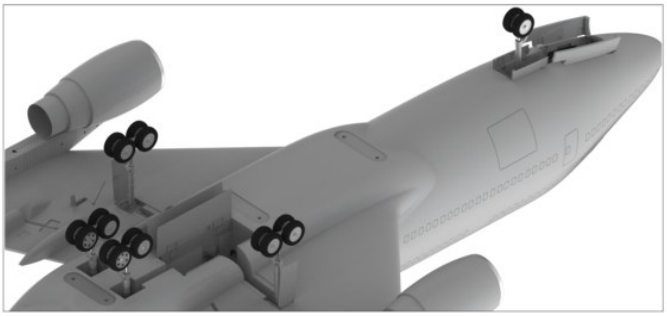
3. Confirm that all five units extend and retract correctly and that every gear door clears the struts and wheels. Check extended gear security before putting weight on it.

4. If a unit operates in the wrong direction or fails to synchronize, stop and check the assigned output, wiring, and MFC settings. Follow the retract instructions for any motor-output change. Never reverse battery polarity.

5. Verify wheel-brake release and application. Confirm that wheels roll freely with the brakes released. Set braking gradually and test at low taxi speed.

6. Check the LED lighting functions and confirm that lights and gear state agree with your programmed settings.





Note: the super integrated control box has a built-in program to avoid false retraction and retraction. When the landing gear retraction and retraction function is used for the first time after each power on, it is necessary to toggle the gear pull switch on the

Do not force a stalled retract. Disconnect control power and inspect for mechanical obstruction, trapped leads, or incorrect setup before cycling it again.

Ground handling

1. Complete control, gear, braking, and CG checks before taxi testing. Choose a clear, smooth surface with enough space to stop safely.

2. Start with low power and a conservative steering rate. Verify that all four EDFs respond smoothly and that the model tracks straight.

3. If the aircraft consistently veers, stop, disconnect flight power, and correct the nose-wheel alignment or steering neutral. Inspect the main wheels and brakes for drag.

4. If steering is too sensitive, reduce electronic travel. If a linkage attachment point is changed, recheck travel, clearance, and mechanical advantage before moving again.

5. Test braking progressively at low speed. Confirm the model stops predictably without unwanted turning.

6. Stop if the model swerves suddenly, a wheel binds, braking is uneven, or any propulsion system behaves abnormally. Correct the cause before flight.



Do not use a high-speed taxi run as a substitute for a planned takeoff. Avoid excessive steering input as speed increases. Keep sufficient room for a controlled stop.

Center of gravity

CG: 470-475 mm / 18.50-18.70 in

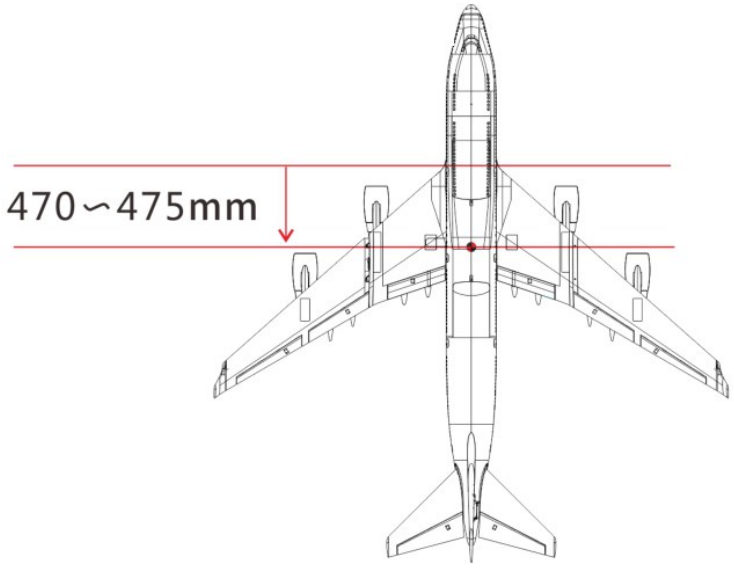
Measure rearward from the main-wing leading-edge reference shown in the original diagram below. Mark corresponding balance points on both sides. Do not use the illustration as a scale ruler.

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

2. With adequate assistance and suitable balance supports, support the model at the marked CG points. Protect the airframe and keep it from rolling or slipping.

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

4. Secure the batteries and repeat the balance check. Keep the required battery specification and secure retention; do not compromise power requirements simply to achieve balance.



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

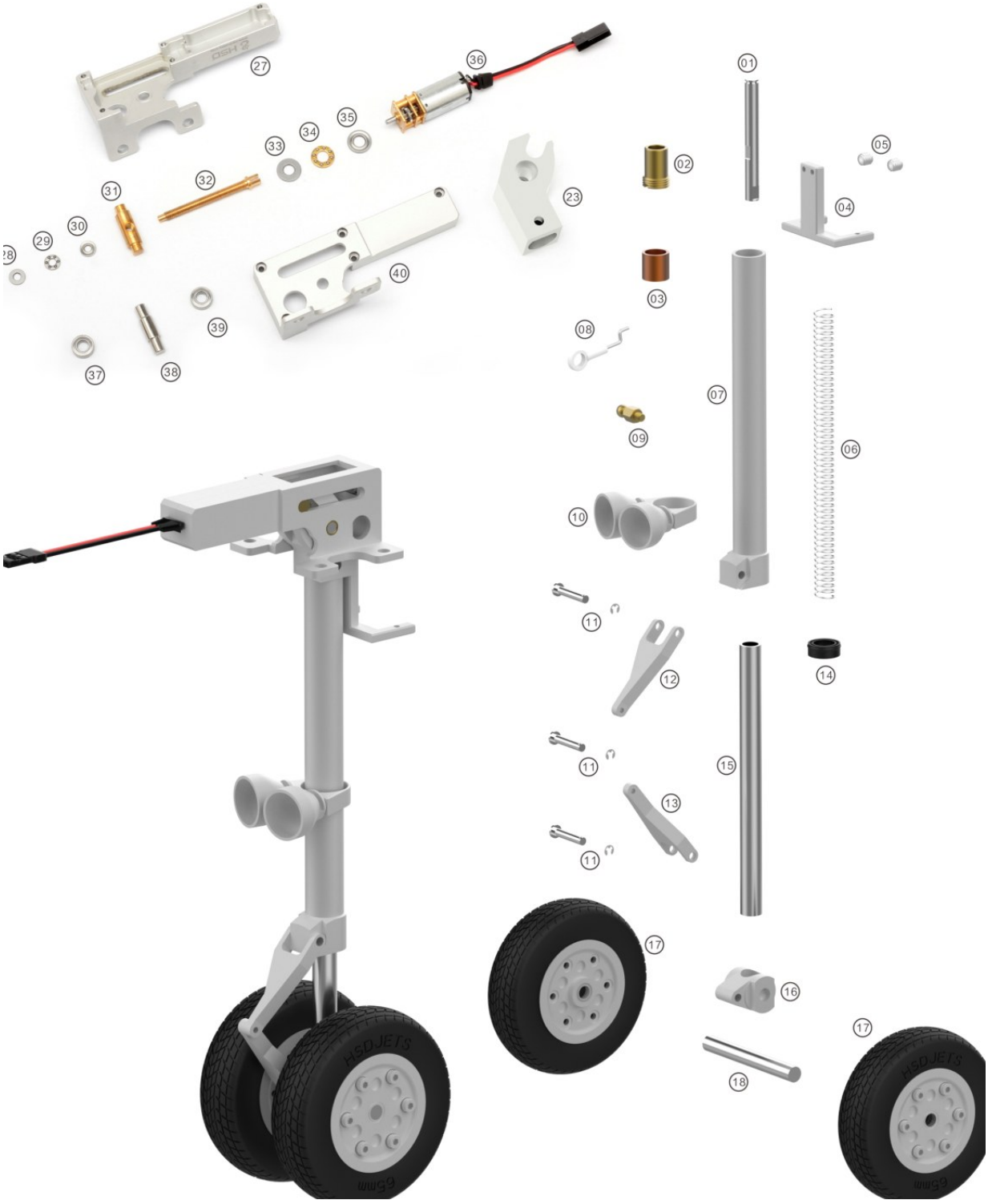
Aircraft specifications

Aircraft / model	HSD HBY-747 PNP / A51
Construction / finish	AeroCore 35 Sport EPO with ABS components; matte paint and waterslide decals
Wingspan	2800 mm / 280 cm / 110.2 in
Length	3000 mm / 300 cm / 118.1 in
Flying weight	Approximately 17 kg / 37.5 lb with batteries
Wing area / loading	101.8 dm2 / 1577.9 in2; 167 g/dm2 / 54.7 oz/ft2
Propulsion	4 x 90mm 12-blade S-EDF; 4 x D3560-KV1550 motors
ESCs / main connector	4 x Hobbywing 100A / AS150
Flight batteries	4 x 6S 22.2 V 5000-6000 mAh 70C LiPo
Control-system batteries	2 x 2S 7.4 V 1800-2200 mAh LiPo; XT60
Control / radio	MFC-2085; 16-channel transmitter and compatible receiver
Servos	12 digital servos: 3 x 12 g and 9 x 35 g
Landing gear / brakes	Five all-metal shock-absorbing electric retracts; electromagnetic brakes
Lights / gyro	Scale LED lighting; optional gyro sold separately
CG	470-475 mm / 18.50-18.70 in; see measurement diagram
Speed / duration	Approximately 160 km/h / 99 mph; 5-8 minutes
Experience / age	Intermediate / 18+
Assembly / temperature	Approximately 30 minutes plus setup; 0-40 C / 32-104 F

Weight, speed, and flight time vary with batteries, equipment, throttle use, and flying conditions. Radio equipment, batteries, gyro, and charging equipment are sold separately.

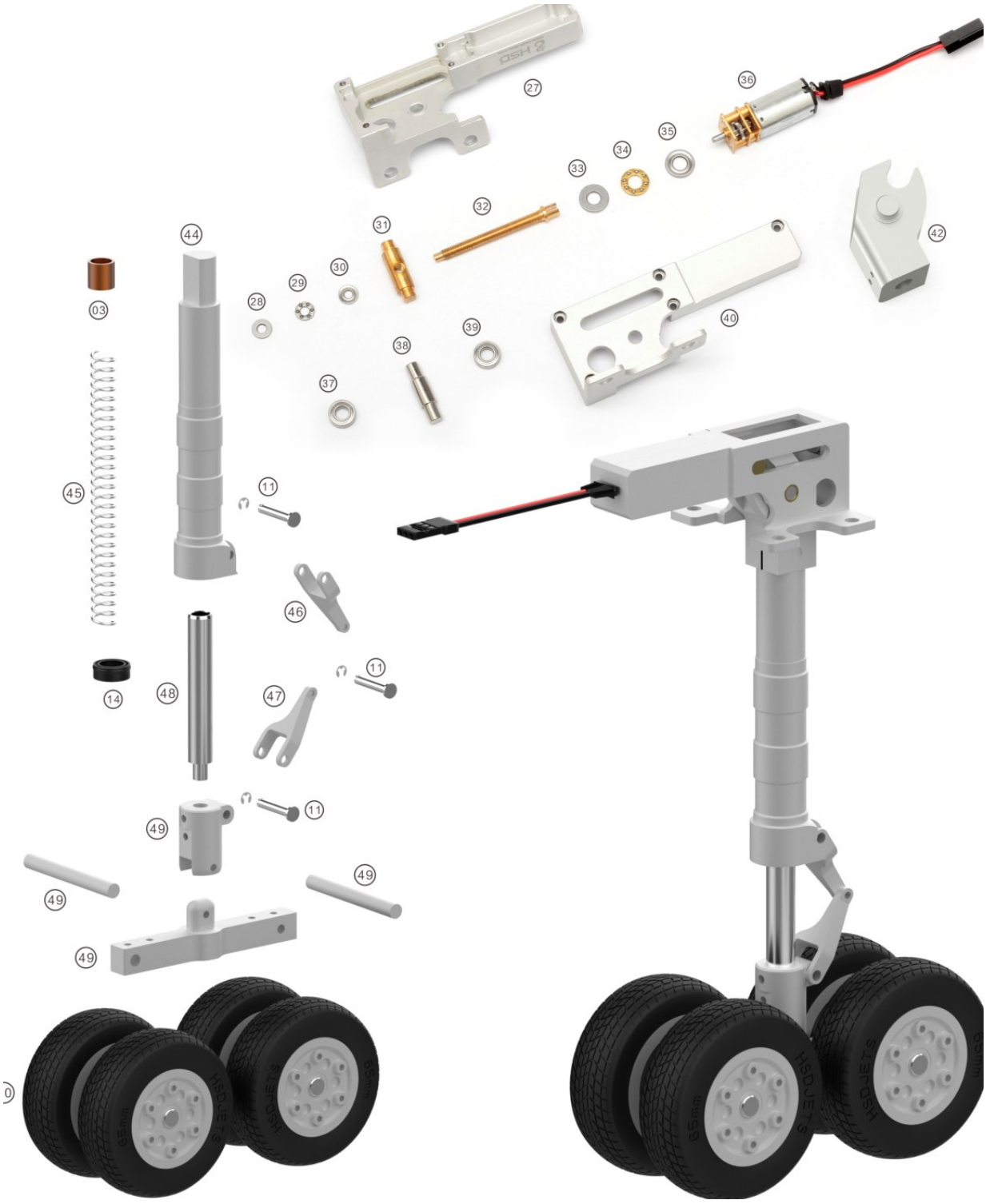
Nose landing gear reference

Exploded component reference. Disconnect all batteries before inspection or service. Retain the order and orientation of spacers, bearings, and mounting hardware. This illustration is not a disassembly procedure.



Main landing gear reference

Exploded component reference for the main landing gear. Disconnect all batteries before inspection or service. Do not alter the retract mechanism or brake wiring without the applicable component instructions.



Preflight & troubleshooting

Before every flight

- Airframe joints, nacelles, joining tubes, fasteners, and linkages secure.
- All six batteries charged, undamaged, retained, and correctly connected.
- CG within 470-475 mm / 18.50-18.70 in at the specified reference.
- Correct transmitter model selected; range and failsafe checks completed.
- Ailerons, elevators, rudder, and flaps move in the correct directions with full clearance.
- Optional gyro response verified, if fitted.
- All five landing gear assemblies, doors, brakes, and lights operate correctly.
- Four EDF systems respond correctly with no abnormal sound or vibration.
- Runway, weather, flying area, timer, and landing plan suitable for the flight.

If a check fails

No control response	Check transmitter model, receiver link, control batteries, interface protocol, and MFC channel assignments.
One EDF does not respond	Disconnect flight power. Check that unit's battery connection, ESC supply, throttle signal, and ESC setup.
Reversed or unequal surface	Correct channel/output direction, neutral alignment, linkage length, and endpoints; repeat all related checks.
Gear or brake fault	Support the aircraft and disconnect power. Inspect for obstruction, wiring errors, drag, and incorrect MFC settings.

Do not fly with an unresolved fault. Contact HSD support through flyhsd.com if you need assistance. After landing, inhibit throttle, disconnect flight batteries, disconnect control-system batteries, then turn off the transmitter.