



Fly your next sortie with the EF-16 from Phase 3 Models. This amazing EDF aircraft is fast, fun and shockingly easy to fly. Its comparatively light wing loading, efficient wing and smooth lines make it fast on those full-throttle runs, yet is still a pussycat at low throttle and glide settings. A modern jet model is usually not so easy to fly! The included EF (Electric Fan) system is impressive and will fly your new jet at exciting speeds! We know you'll enjoy flying your next sortie and combating bogies at your local flying field with the Phase 3 Models EF-16.

## ASSEMBLY INSTRUCTIONS

**CAUTION** The Phase 3 Models EF-16 EDF is designed for intermediate pilots. It is not intended for beginners. It is not a trainer!

**Phase 3**

**Includes High-Performance  
Brushless Motor, Ducted Fan Assembly  
and Brushless Electronic Speed Controller!**

Phase 3 Models  
P.O. Box No. 402  
Texaco Road PO  
New Territories, Hong Kong

© 2007, Phase 3 Models - All Rights Reserved  
Version 1 March 2007



### SPECIFICATIONS AND FEATURES

- **Wing Span:** 660mm (26 Inches)
- **Wing Area:** 12.58dm<sup>2</sup> (195 Square Inches)
- **Length:** 914mm (36 Inches)
- **Weight RTF:** 570g (20 Ounces)
- **Wing Loading:** 45g/dm<sup>2</sup> (15 Ounces/Square Foot)
- **Functions:** Stabilators (tailerons) with Elevon Mixing and Throttle
- **Radio Required:** 3-Channel or More w/2 Micro Servos, Micro Rx & Elevon Mixing
- **Battery Required:** 3 Cell 2100mAh Li-Po
- Moulded foam airframe
- Stabilator mixed controls (only requires 2 servos and elevon mixing)
- No ailerons to impede smooth airflow over the wing
- Exceptionally stable flyer, especially for a modern jet design
- High-efficiency ducted fan included
- High-RPM brushless motor included
- 30 amp brushless electronic speed controller included
- Extensive decal sheet included
- High-quality hardware
- Fast and easy assembly - over 50 high-resolution colour photos to guide you

**IMPORTANT** Before beginning assembly, please read and understand the warnings listed on the next page. Failure to read and understand these warnings could lead to bodily harm and/or injury. The Phase 3 Models EF-16 EDF is not intended for those under 14 years of age, unless closely supervised by an adult.

## FOR YOUR SAFETY - PLEASE READ AND UNDERSTAND THESE WARNINGS

### GENERAL WARNINGS

- Do not fly this aircraft if another aircraft is on the same frequency.
- Never fly the aircraft from the street or at night. Always fly in an open area free of obstructions.
- When flying, make sure that any spectators are behind the pilot.
- Always be conscious of the spinning rotor. Be careful not to allow loose clothing or small loose objects to be drawn into the rotor.
- Because this aircraft is operated by radio control, it is important to make sure that fresh and/or fully charged batteries are always used. Never allow the batteries to run low or control of the aircraft may be lost.
- Never attempt to disassemble any of the aircraft's components, especially the electronics.
- Do not allow any of the electrical components to get wet or electrical damage may occur.

- Always complete a successful range check of the radio control equipment prior to each new day of flying, or prior to the first flight of a new or repaired aircraft.
- If the aircraft gets dirty, do not use any solvents to clean it. Solvents will damage the foam and plastic. Use a dry cloth to clean any dirt from the outside of the aircraft.

### RADIO SYSTEM WARNINGS

- Always turn on the transmitter before turning on the aircraft and always turn off the aircraft before turning off the transmitter.
- Always unplug the Li-Po battery when not flying the aircraft.
- Never cut the receiver aerial shorter or control of the aircraft during flight may be lost.
- When flying the aircraft, make sure the transmitter aerial is completely extended.
- Never attempt to disassemble or modify any of the radio control system components.

### LITHIUM POLYMER BATTERY WARNINGS - YOU MUST READ THIS BEFORE CHARGING YOUR BATTERY

- This product may explode or catch fire. Serious injury, loss of property, fire and death can result from misuse of this product.
- All instructions, warnings and cautions must be followed at all times. Failure to do so can lead to serious injury or fire.
- Do NOT use this product before reading and understanding all directions and warnings.
- Do NOT use or charge if the battery is hot.
- Do NOT leave in direct sunlight or in a hot car or storage area.
- Do NOT overcharge. The maximum voltage for each pack must be followed.
- Do NOT get the battery wet or expose it to moisture.
- Do NOT short-circuit the Li-Po battery.
- ONLY discharge and charge the Li-Po battery outdoors or in a firesafe container.
- Do NOT leave the Li-Po battery connected when not in use.
- Do NOT operate or charge unattended.
- Do NOT use the product if you do not understand the warnings and proper use of the product.
- Always let the Li-Po battery cool and "rest" between uses and charging.
- We recommend the use of a firesafe container when charging or storing.
- Do NOT charge inside a car or inside a house.
- Inspect the Li-Po battery before each use for swelling or other malformation. If the cell has ballooned, it MUST be discarded.
- First check the polarity and then connect Li-Po battery to a Li-Po compatible charger.
- In use, do not over-discharge or exceed maximum discharge.
- When handling the Li-Po battery, remember not to poke, bend or damage the cells. The cell's outer casing is soft and can be damaged.
- Remember, the cells must never exceed 160 degrees Fahrenheit (71° C) for any reason.

## INTRODUCTION

Thank you for purchasing the Phase 3 Models EF-16 EDF. Before completing the assembly of your new model, please carefully read through this assembly manual in its entirety. Doing so will ensure success the first time around. As can be seen, there's not much to it!

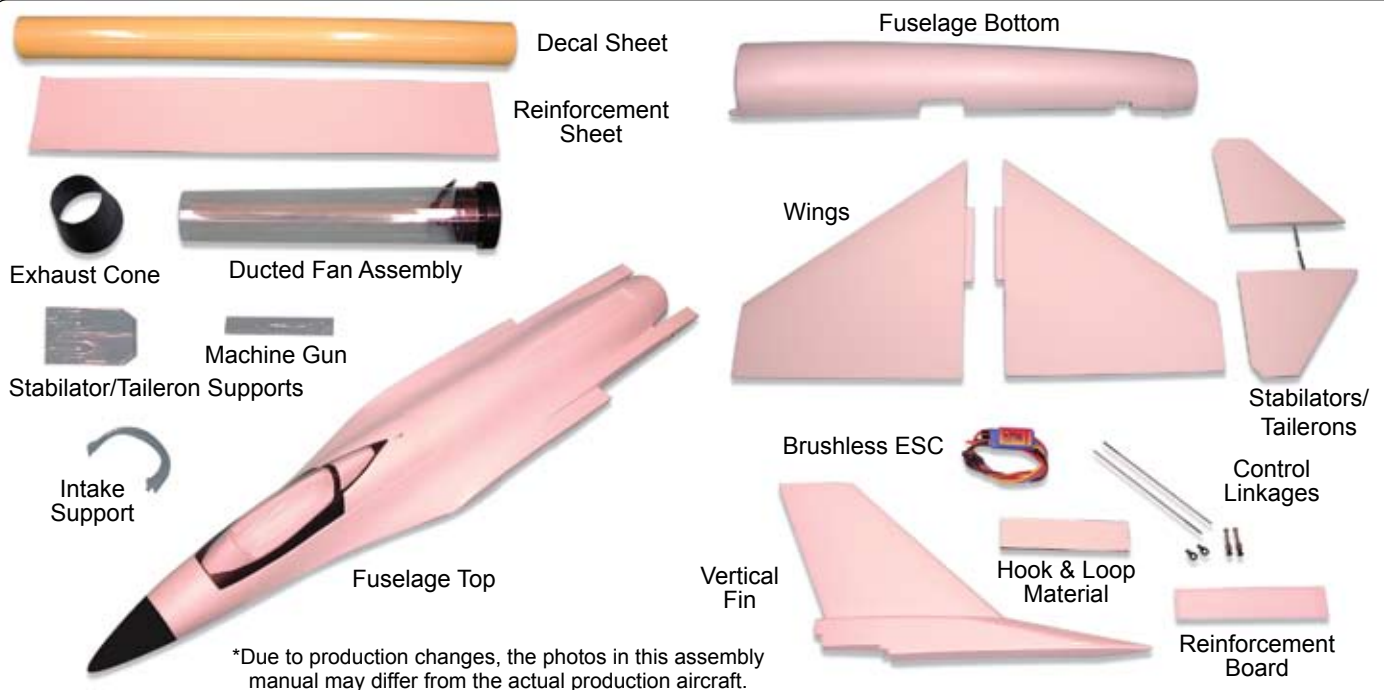
- Identify the parts and familiarise yourself with your new EF-16 EDF
- Install the elevon servos
- Install the ducted fan unit and the fuselage bottom
- Install the wing panels and apply the decals
- Install the stabilators/ailerons, control linkages and fin
- Install the receiver and battery then balance and set control throws



Check out our website for more information on this and other exciting Phase 3 Models products!

**[WWW.PHASE3MODELS.COM](http://WWW.PHASE3MODELS.COM)**

## KIT CONTENTS



## ITEMS RECOMMENDED TO COMPLETE THE EF-16 EDF



## TOOLS NEEDED FOR FINAL ASSEMBLY

This section lists the items needed to help assemble your new aircraft.



Phillips  
Head Screwdrivers



Z-Bend Pliers



Wire Cutters



Scissors



Pencil



Needle Nose Pliers



Straight Edge Ruler



Sanding Block with  
220 Grit Sandpaper



Drill with  
Assorted Drill Bits



Modelling Knife

\*In addition to the tools shown, you will also need basic modeling supplies, such as 5 minute epoxy, paper towels, rubbing alcohol, masking tape, etc. A soldering iron and solder may also be required.

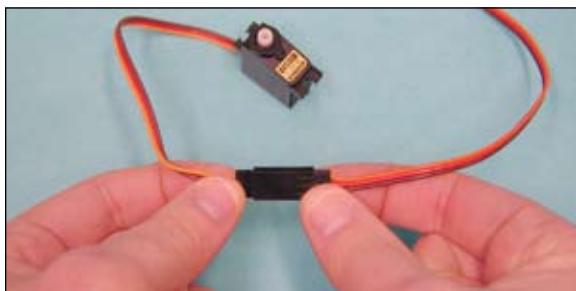
## TIPS FROM THE PROS

- Before installing the ducted fan assembly into the fuselage top, verify that the fan rotor spins in the correct direction. Connect the ESC to the receiver and Li-Po battery, then apply low throttle. When applying throttle, the rotor should spin counter-clockwise when viewed from the front. If the rotor spins in the wrong direction (clockwise), swap two of the three motor wires and check again.
- The ducted fan assembly should only be tack-glued into the fuselage top, using two small dabs of 5 minute epoxy. This will hold the ducted fan assembly firmly in place, yet allow easy removal if required.
- The fuselage bottom should be tack-glued to the fuselage top in 3-4 places along each side. This will hold the fuselage bottom securely in place, yet make it easier to remove it without damage, should service of the ducted fan assembly be necessary.
- Excess epoxy that squeezes out of the glue joints can be cleaned off before it cures, using a paper towel soaked with rubbing alcohol.
- The servos should be installed with the servo horns toward the front of the fuselage.
- When installing the wing panels, use plenty of 5 minute epoxy and coat all of the gluing surfaces thoroughly to ensure a strong bond.
- When installing the larger decals, we suggest drawing temporary guide marks to assist in positioning the decals.
- Decals that go around curved surfaces may need several small slices cut in them to help prevent wrinkling or creasing.
- If any air bubbles form underneath the decals, poke the air bubble with the tip of a pin to release the air, then rub the decals back down.
- Use a sharp pair of scissors to prevent tearing the colored area of the decals while cutting them out.
- When installing the stabilators, make sure that the top of each is towards the top of the fuselage. When installed, notice that the stabilators/taileron are angled down. This is normal and by design.
- For security, make sure all the ball-ends are completely screwed onto the threaded pushrod wires.
- Make sure that both the stabilators/taileron and their control arms are pushed firmly against the fuselage sides. Ensure that it is not possible to move the stabilators/taileron in or out.
- Do not cut the receiver aerial shorter. Allow the excess to hang past the back of the fuselage. Cutting the receiver aerial shorter will reduce the range of your radio control system considerably.

## ASSEMBLING THE EF-16 EDF

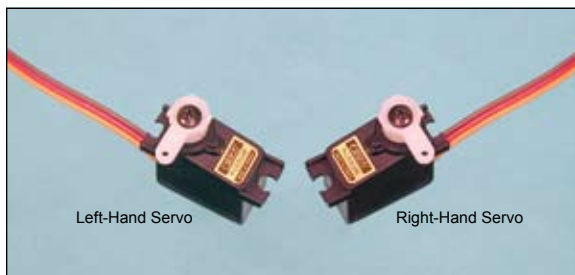
**WARNING** It is very important to avoid the use of solvents or Cyanoacrylate (C/A) glue, which can damage foam. If any of these chemicals comes into contact with the foam parts, the parts will be destroyed. Use only epoxy to assemble the parts.

### STEP 1: INSTALLING THE ELEVON SERVOS



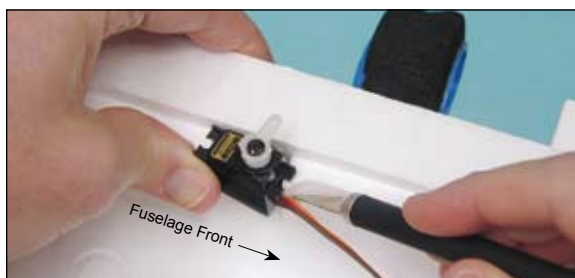
- ❑ Plug one 12" (305mm) servo extension into each of the two servos.

**IMPORTANT** Before centering the servos in the next procedure, make sure to enable the elevon mixing function in the transmitter. For more information, please refer to the radio control system's operating guide.



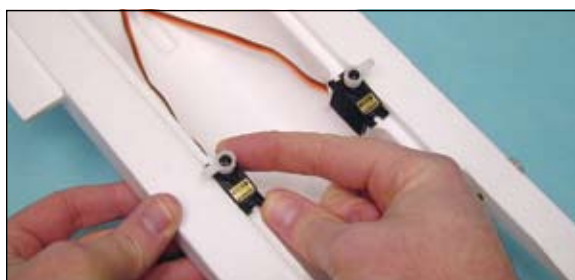
- ❑ Connect the radio control system, then centre the two servos, using the elevator and aileron trim tabs on the transmitter.
- ❑ Install a servo horn onto each servo, making sure that both servo horns are centered.

**IMPORTANT** Position the servo horns so that there is one right-hand servo and one left-hand servo.



- ❑ Position one servo into one servo mounting pocket in the back of the fuselage top, then cut away the foam to clear the servo lead.

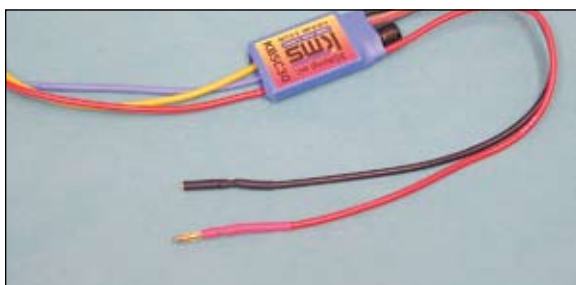
**IMPORTANT** The servo horn should be towards the **front** of the fuselage top.



- ❑ Install each of the two servos into the servo mounting pockets in the fuselage top, using a small dab of 5 minute epoxy to hold them securely in place.

**IMPORTANT** Again, the servos should be installed with the servo horns towards the **front** of the fuselage top.

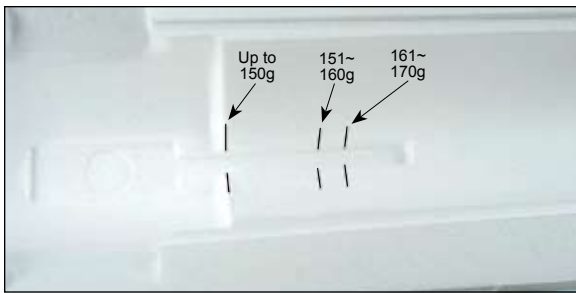
### STEP 2: INSTALLING THE DUCTED FAN ASSEMBLY



- ❑ Install your choice of connectors onto the positive (red) and negative (black) battery leads on the ESC. We suggest using 2mm gold-plated connectors with heat-shrink tubing.

**IMPORTANT** Do not cut the battery leads shorter. They must be left long to be able to reach into the middle of the cockpit.





- ❑ The weight of the Li-Po battery will determine the exact mounting location of the ducted fan assembly. If the Li-Po battery weighs 150 grams or less, the ducted fan assembly should be installed in alignment with the moulded mounting lip in the fuselage top. If the Li-Po battery weighs 151~160 grams, the ducted fan assembly should be mounted 30mm (1-3/16") behind the moulded mounting lip in the fuselage top, and if the Li-Po battery weighs 161~170 grams or more, the ducted fan assembly should be mounted 1-1/2" (40mm) behind the moulded mounting lip in the fuselage top.



- ❑ Cut a shallow notch in each side of the fuselage top just large enough for the servo lead and/or servo plug to clear the sides of the ducted fan assembly once it's installed.

**PRO TIP** Before installing the ducted fan assembly into the fuselage top, verify that the fan rotor spins in the correct direction. Connect the ESC to the receiver and Li-Po battery, then apply low throttle. When applying throttle, the rotor should spin counter-clockwise when viewed from the front. If the rotor spins in the wrong direction (clockwise), swap two of the three motor wires and check again.

**Do not swap the positive and negative battery leads to change the direction that the rotor spins or you will damage both the ESC and the Li-Po battery.**

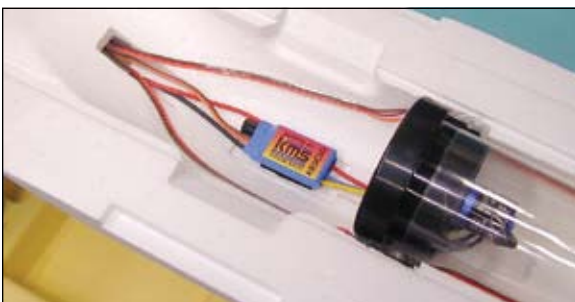


- ❑ Temporarily set the ducted fan assembly into the fuselage top.
- ❑ Apply one piece of hook and loop material to the back of the ESC and one piece into the moulded ESC mounting pocket in the fuselage top.

**PRO TIP** The ducted fan assembly should only be tack-glued into the fuselage top, using two small dabs of 5 minute epoxy. This will hold the ducted fan assembly firmly in place, yet allow easy removal should you ever need to.



- ❑ Test-fit the ducted fan assembly into the fuselage top. When positioned correctly, the motor wires should fit into the moulded channel in the fuselage top and the ducted fan shroud should fit firmly against the radius of the fuselage top. The front of the ducted fan assembly should be in alignment with the moulded mounting lip in the fuselage top (depending on the weight of your Li-Po battery as described in the procedure above).
- ❑ When satisfied with the fit, glue the ducted fan assembly into the fuselage top, using two small dabs of 5 minute epoxy, then fix the ESC in place.



- ❑ Run the servo extension leads through the fuselage top and fit them into the notches that you cut to clear the sides of the ducted fan assembly.
- ❑ Feed the servo extension leads through the moulded hole and into the cockpit, then use two strips of clear tape to secure the servo extension leads to the fuselage top.

**WARNING** Don't allow the servo extension leads to hang loose.



### STEP 3: INSTALLING THE FUSELAGE BOTTOM



- ❑ Using 5 minute epoxy, glue the plastic intake support onto the front of the fuselage bottom, making sure to push the intake support firmly into place.

**IMPORTANT** If necessary, trim the bottom edges of the intake support flush with the base of the fuselage bottom.



- ❑ Test-fit the fuselage bottom onto the fuselage top. When positioned properly, the sides of the fuselage bottom should fit into the moulded grooves in the fuselage top and the back of the fuselage bottom should be even with the back of the fuselage top.



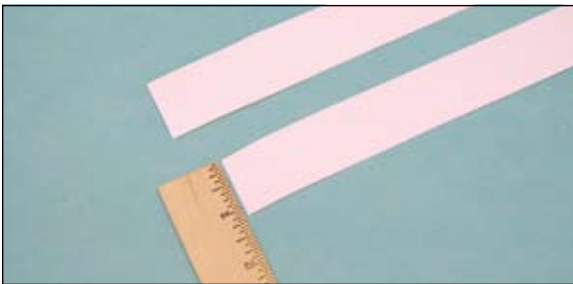
- ❑ Double-check that the servo cutouts in the fuselage bottom do not interfere with the servos. If necessary, enlarge the servo cutouts to allow clearance for the servos.

**IMPORTANT** The servo cutouts in the fuselage bottom should not interfere with the servo arms in any way.

**PRO TIP** The fuselage bottom should be tack-glued to the fuselage top in 3-4 places along each side. This will hold the fuselage bottom securely in place, yet make it easier to remove it without damage, should service to the ducted fan assembly be required.

- ❑ When satisfied with the fit and alignment, glue the fuselage bottom into place, using 3-4 dabs of 5 minute epoxy on each side.

**PRO TIP** Remove any excess epoxy that squeezes out of the joints, using a paper towel soaked with rubbing alcohol.



- ❑ Cut two 1-1/8" (29mm) wide strips from the reinforcement sheet.

**PRO TIP** To prevent any wrinkles or creases while applying the reinforcement strips in the next procedure, work slowly from the front of the fuselage to the back, while pulling each of the reinforcement strips taut and rubbing them down into place.



- ❑ Working with one reinforcement strip at a time, remove the paper backing from the reinforcement strips and apply each of the two reinforcement strips to the bottom of the fuselage, making sure to line up the inside edge of each reinforcement strip with the centerline of the fuselage.

**PRO TIP** To make it easier to line up the reinforcement strips, draw a temporary centerline mark at both the front and back of the fuselage.



#### STEP 4: INSTALLING THE WING PANELS

**IMPORTANT** When installing the wing panels in the next two procedures, make sure to use plenty of 5 minute epoxy, and coat all of the gluing surfaces thoroughly to ensure a strong bond.



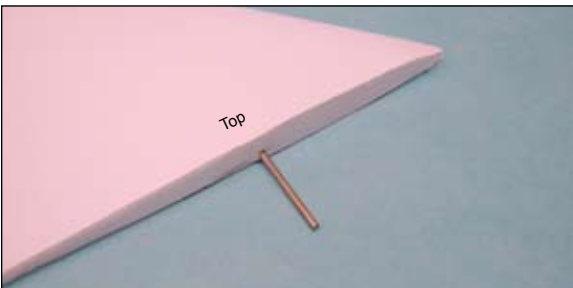
- ❑ Glue one wing panel onto the fuselage, using a generous amount of 5 minute epoxy. The wing panel should be pushed firmly against the mating surfaces of the fuselage and it should be aligned at both the leading edge and the trailing edge. Remove any excess epoxy that squeezes out of the glue joint, using a paper towel and rubbing alcohol and hold the wing panel in place and aligned until the epoxy sets.



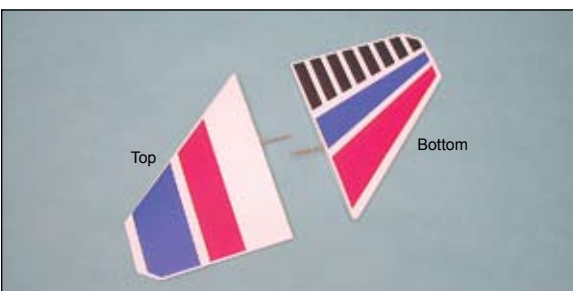
- ❑ Repeat the previous procedure to glue the second wing panel onto the fuselage.

#### STEP 5: APPLYING THE DECALS

- ❑ The decals are large, so work slowly and take care to line up the decals before removing the paper backing and adhering them into place. It's easy to achieve excellent results. Here are some tips that may help:
- For the larger decals, we suggest drawing temporary guide marks to assist in positioning the decals.
- Peel away the backing material from one corner of each decal, then start in that corner and slowly apply each of the decals while rubbing the decal down with your hand to smooth it out. Work slowly, pulling a small amount of the paper backing away at a time and smoothing down the decal, until the entire decal is applied.
- Decals that go around curved surfaces may need several small slices cut in them to help prevent wrinkling or creasing.
- If any air bubbles form underneath the decals, poke the air bubble with the tip of a pin to release the air, then rub the decals back down.
- Use a sharp pair of scissors to prevent tearing the colored area of the decals while you're cutting them out.



- ❑ Verify which is the top side of each stabilator/taileron before applying the decals. Note that the pivot rod installed in each stabilator/taileron is not centred - it is installed towards the bottom.



- ❑ Carefully cut out and apply the decals to the top and bottom of each of the two stabilators/tailerons.

- ➡ The curved portion of the bottom decals will be applied to the underside of the fuselage, after installing the stabilators/tailerons.

**IMPORTANT** The red and blue (only) decals are applied to the **top** of the stabilators/tailerons. Ensure you make one right and one left.





- ❑ Carefully cut out and apply the decals to the right and left sides of the fin.



- ❑ Carefully cut out and apply the decals to both the bottom of the fuselage and to the bottom of the wing panels.

**IMPORTANT** Any wrinkles or creases in the decals applied to the fuselage bottom can be removed by making short cuts in the decal.



- ❑ Carefully cut out and apply the decals to both the top of the fuselage and to the top of the wing panels.

**IMPORTANT** Again, any wrinkles or creases in the decals applied around the canopy can be removed by making short cuts in the decals.



- ❑ Because the canopy frame is prepainted black, cut away the excess portion of the decals that overlap onto the canopy frame. After applying the decals, cut the decals along the front and back of the canopy, and from over the canopy latch, to allow removal and installation of the canopy itself.

**PRO TIP** Use two pieces of scrap black decal previously cut off, to cover the open area between each side of the back of the canopy and the decal.

## STEP 6: INSTALLING THE STABILATORS



- ❑ Cut out the two plastic stabilator/taileron supports, making sure to cut them out along the inside of the moulded lip.
- ❑ Sand the edges of the supports smooth and straight.



- ❑ Test-fit and glue one stabilator/taileron support to each half of the bottom of the fuselage, using a thin layer of 5 minute epoxy. When positioned properly, the notch on the inside edge of each support should line up with the notch in the inside edge of the fuselage, and the outer edge of each support should be even with the outside edge of the fuselage.





- ❑ Slide the pivot rod of the right-side stabilator/taileron partially into the pivot tube in the fuselage.

**IMPORTANT** Make sure that the top of the stabilator/taileron is towards the top of the fuselage. When installed, notice that it is angled down. This is normal and by design. If the stabilator/taileron is angled up, it's installed onto the wrong side of the fuselage.



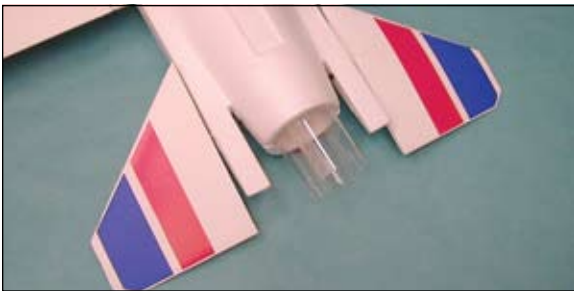
- ❑ Line up the hole in the side of the stabilator/taileron control arm with the end of the pivot rod.
- ❑ Push the stabilator/taileron up against the fuselage side (while holding its control arm in place) to slide the stabilator/taileron pivot rod through the hole in the side of the stabilator/taileron control arm.

**IMPORTANT** The stabilator/taileron control arm should be towards the bottom of the fuselage.



- ❑ While holding the stabilator/taileron tight against the fuselage side, and with its trailing edge centred with the back edge of the fuselage, install and tighten the machine screw in the top of the control arm, to secure it and the stabilator/taileron in place.

**IMPORTANT** The position of the control arm is not important at this time. The correct positioning of both the control arm and the stabilator/taileron will be set when installing the control linkage.

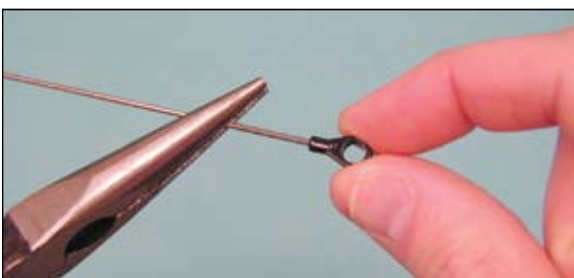


- ❑ Repeat the previous procedures to install the second stabilator/taileron and control arm assembly.

## STEP 7: INSTALLING THE STABILATOR/TAILERON CONTROL LINKAGES



- ❑ Apply one piece of perforated reinforcement board to each side of the fuselage, between the fuselage top and the fuselage bottom. The centre of each piece of reinforcement board should be 25mm (1") behind the back edge of the servo cutout.



- ❑ Thread one ball-end onto the end of each threaded pushrod wire.

**IMPORTANT** For security, make sure to thread the ball-end completely onto the threaded pushrod wire.





- ❑ Snap the ball-end onto the end of one stabilator/aileron control arm.

- ❑ Connect the radio control system and Li-Po battery, then centre both servos using the Sub-Trim or Centre function on the transmitter.



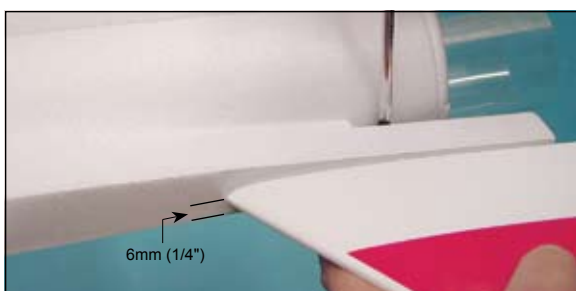
- ❑ Pivot the stabilator/aileron so that its control arm is aligned straight up and down when viewed from the side.
- ❑ With the control arm aligned straight up and down, and the servo horn centred, mark the pushrod wire where it crosses the **outermost hole** in the servo arm.



- ❑ Remove the pushrod wire, then make a Z-Bend in the pushrod wire at the mark you drew, using a pair of Z-Bend pliers.
- ❑ Use a pair of wire cutters to cut off the excess pushrod wire.



- ❑ Install the Z-Bend into the **outermost hole** in the servo arm, then snap the ball-end onto the end of the stabilator/aileron control arm.
- ❑ Verify that when the servo arm is centred, the stabilator/aileron control arm is aligned straight up and down when viewed from the side. If it's not, un-snap the ball-end, thread it in or out enough to achieve the correct alignment, then snap it back onto the control arm.



- ❑ Loosen the machine screw in the top of the stabilator/aileron control arm, then pivot the stabilator/aileron so that the centre of the leading edge is positioned exactly 6mm (1/4") up from the bottom edge of the fuselage. **This is the neutral point of the stabilator/aileron.** When satisfied with the alignment, tighten the machine screw firmly.

**IMPORTANT** Make sure that both the stabilator/aileron and the control arm are pushed firmly against the fuselage side. It should not be possible to move the stabilator/aileron in or out.

- ❑ Repeat the previous procedures to install the second stabilator/aileron linkage assembly and set the neutral point.



- ❑ Carefully cut out and apply the remaining portion of the bottom stabilator/aileron decal onto the bottom of the fuselage.



## STEP 8: INSTALLING THE VERTICAL FIN



- ❑ Test-fit and glue the fin to the top of the fuselage, using a generous amount of 5 minute epoxy.

**IMPORTANT** Before the epoxy cures, double-check that the vertical fin is aligned straight up and down when viewed from the front.

## STEP 9: FINAL ASSEMBLY



- ❑ Test-fit and glue the exhaust cone onto the back of the fuselage, using a thin layer of 5 minute epoxy.



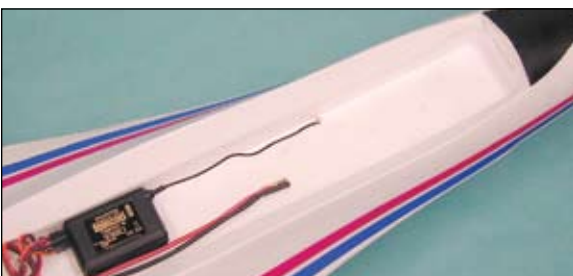
- ❑ Apply one piece of perforated reinforcement board to the front and to the back of the intake cutout in each side of the fuselage.



- ❑ Remove the canopy by first pulling the canopy latch forward, then by pulling the back of the canopy up and off the fuselage.



- ❑ Plug the servo and ESC leads into their correct slots in the receiver, then mount the receiver to the cockpit floor, near the back of the cockpit, using a small piece of hook and loop material.



- ❑ Drill a 2mm (5/64") diameter hole down through the cockpit floor (up against the side of the cockpit), 102mm (4") behind the front of the cockpit.
- ❑ Uncoil the receiver aerial and feed it out through the hole.





- ❑ Secure the receiver aerial along the underside of the fuselage, next to the fuselage bottom. Use pieces of clear tape to hold the aerial securely in place.

**IMPORTANT** The receiver aerial must be prevented from accidentally being sucked into the rotor.



- ❑ Secure the receiver aerial along the entire length of the underside of the fuselage, using several pieces of clear tape. Allow the extra receiver aerial to hang past the back of the fuselage.

**WARNING** Do not cut the receiver aerial shorter. Allow the excess to hang past the back of the fuselage. If you cut the receiver aerial shorter, the radio control system range will be greatly reduced.



- ❑ Mount the Li-Po battery to the cockpit floor, near the front of the cockpit, using the remaining piece of hook and loop material.

**IMPORTANT** You may need to move the Li-Po battery either forward or backward, depending on how the aircraft balances. The position shown is a good starting point. Balancing will be done in the next section.



- ❑ Carefully drill a 6mm (1/4") diameter hole through the front of the canopy (drill through the clear plastic and through the foam), to allow air to enter and cool the Li-Po battery. Warm air will exit through the moulded hole in the back of the cockpit and into the air-intake duct.

**IMPORTANT** Make sure that the servo extension leads and ESC leads are not completely blocking the moulded hole in the back of the cockpit.



- ❑ Cut out the plastic Gatling gun, making sure to cut it out along the inside of the moulded lip.
- ❑ Sand the edges of the Gatling gun smooth and straight.



- ❑ Glue the Gatling gun onto the left side of the fuselage. When positioned properly, the front of the Gatling gun should be even with the vertical canopy frame and the bottom of the Gatling gun should be just above the red portion of the red and blue decal.



## BALANCING, CONTROL THROWS AND ESC SETUP

### STEP 1: BALANCING

**IMPORTANT** It is critical that the aircraft is balanced correctly. Incorrectly balancing the aircraft can cause it to lose control and crash! **Balance the aircraft right-side up.**

#### BALANCE POINT (C/G):

- 160mm to 190mm (6-1/4" to 7-1/2") in front of the trailing edge of each wing panel, measured at the wing panel glue joints.

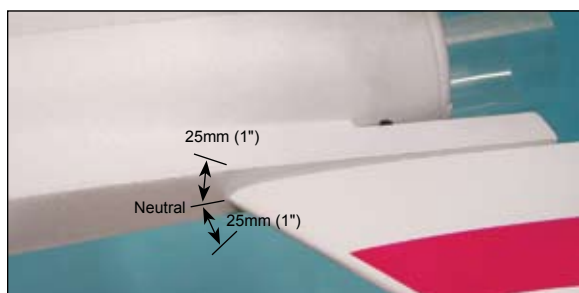


- ❑ The EF-16 EDF must be correctly balanced before flying. The aircraft should sit level or slightly nose down when supporting it on a balancer or with your finger tips at the balance point. Move the Li-Po battery forward or backward to balance the aircraft. Once satisfied that the aircraft balances correctly, mark the mounting location of the Li-Po battery so that it can be reinstalled in the same location each time after it is removed for charging.

- Balancing the aircraft further back in the C/G range will make it more tail heavy and increase elevator control response and general manoeuvrability. Balancing it further forward in the C/G range will make the aircraft more stable and smoother to fly.

### STEP 2: CONTROL THROWS

- The stabilators/taileron function as both ailerons (to control roll) and elevators (to control pitch), and require the use of an onboard electronic elevon mixer or a transmitter that features elevon mixing to work properly.
- ❑ Looking from the back of the aircraft, push the aileron control stick completely to the left. The trailing edge of the left stabilator/taileron should move UP and the trailing edge of the right stabilator/taileron should move DOWN. Next, pull the elevator control stick completely back. The trailing edge of both stabilators/taileron should move UP. If they don't move as described, use the aileron and/or elevator servo reversing function of the transmitter to change the direction that the stabilators/taileron move.



- ❑ Remember that the neutral point of the stabilators/taileron is 6mm (1/4") up from the bottom of the fuselage. With both the transmitter aileron/elevator stick(s) plus trim tabs centred, the centre of the leading edge of both stabilators should be 1/4" (6mm) up from the bottom of the fuselage.

**Elevator: 1" (25mm) Up and Down**

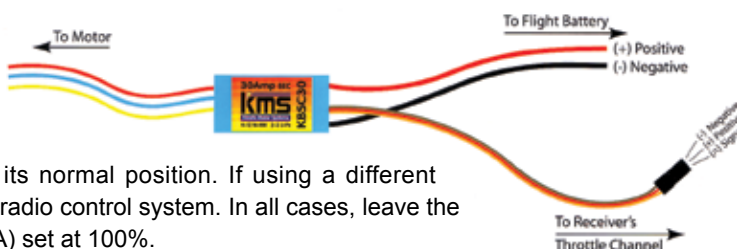
**Aileron: 1" (25mm) Up and Down**

**When measuring the control throws, measure from the neutral point.**

**THE CONTROL THROWS ARE MEASURED FROM THE LEADING EDGE OF THE STABILATORS/TAILERONS.**

### STEP 3: SETTING UP THE ESC

- ❑ The EF-16 EDF is supplied with an electronic speed controller (ESC) that is very simple to set up. It is connected as shown in the diagram at right.
- ❑ If using a Futaba transmitter, reverse the throttle channel. If using a JR transmitter, leave the throttle channel in its normal position. If using a different transmitter, refer to the user's guide provided with the radio control system. In all cases, leave the throttle ATV (Adjustable Travel Volume)/End Points (EPA) set at 100%.
- ❑ With the throttle control stick at its LOW position, switch on the transmitter. Connect a fully-charged Li-Po battery. There is no separate switch, so connecting the Li-Po battery will turn on the airborne radio components and begin the motor arming process. Next, slowly move the throttle control stick to its HIGH position, then return it to the LOW position. You will hear an audible 'beep' to confirm that the ESC is armed, and increasing the throttle now will cause the rotor to spin.



### STEP 3: SETTING UP THE ESC (CONTINUED)

- ❑ Once the battery voltage level falls below the safe cut-off point (approximately 9 volts), power to the motor will be shut off, leaving sufficient power for the radio during landing.

## FLYING THE EF-16 EDF

- ❑ With the transmitter turned on and the Li-Po battery installed, extend the transmitter aerial completely.



- ❑ Double-check that the throttle control stick is in the OFF/CLOSED position, then grip the bottom of the aircraft at the balance point location.

- ❑ While holding the transmitter in your other hand, push the throttle control stick forward to check that the motor powers up. Now, pull the throttle control stick completely back.
- ❑ If there is any wind, turn to face it. While holding the throttle control stick completely forward (the rotor will spin very fast), hold the aircraft just above shoulder level and firmly launch the aircraft straight ahead and level. Allow the aircraft to fly straight and continue to hold the throttle control stick completely forward so that the aircraft gains sufficient speed and climbs.
- ❑ The EF-16 EDF is a high-performance jet that yields its best performance when flown smoothly and fast. The aircraft is perfect for high-speed low passes down the runway and large, open aerobatics.
- ❑ After landing, unplug and remove the Li-Po battery from the aircraft and allow it to cool completely before recharging it for the next flight.

## FIXING MINOR CRASH DAMAGE

While you're flying the aircraft, there comes a time when you might crash. If the crash isn't too bad, most damage can be repaired quickly and easily. If the damage is beyond repair, spare parts are available for purchase. If a foam part is going to break during a crash it will usually break cleanly. To repair a clean break, follow the procedures below:

- ❑ Glue the broken parts together, using a thin layer of 5 minute epoxy or white glue, following the directions on the glue bottle. Hold the parts together and in alignment until the glue fully cures.
- ❑ Apply a strip of clear tape over the seams to strengthen the joint even more.

**WARNING** It is very important not to use solvents or Cyanoacrylate (C/A) glue, which can damage foam. If any of these chemicals comes into contact with the foam parts, the parts will be destroyed. Use only epoxy or white glue to repair damaged foam parts.

## OUR GUARANTEE

Phase 3 Models guarantees this kit to be free from defects in both material and workmanship, at the date of purchase. This does not cover any component parts damaged by use, misuse or modification. **In no case shall Phase 3 Model's liability exceed the original cost of the purchased kit.**

In that Phase 3 Models has no control over the final assembly or material used for final assembly, no liability shall be assumed for any damage resulting from the use by the user of the final user-assembled product. By the act of using the final user-assembled product, the user accepts all resulting liability.



Phase 3 Models  
P.O. Box No. 402  
Texaco Road PO  
New Territories, Hong Kong