CARF-models Ultra Flash Evo

Back in 2010 the Ultra Flash was introduced following in the footsteps of the game changing Classic Flash. For more than eight years the Ultra Flash has ruled as the best sports jet available in the 100-140N turbine class. It is almost impossible to visit a Jet meeting and not see a row of Ultra Flash models lined up ready for action-whatever the weather conditions, it is many pilots go to jet.

Simple to assemble at the field-one piece wing with two bolts, allows super fast assembly. The strength of the Flash series is legendary, the flying qualities are class leading - How do we improve on something so close to perfect? Simplify it further, remove the full ducting, add a single large capacity fuselage fuel tank, factory installed electric undercarriage set-including electric wheel brakes, add a lighter tail pipe tube and the Evolution is complete, with a stunning new colour scheme, (All other options still available-even white and a vinyl set) CARF Models introduce the Ultra Flash Evo.

A good quality epoxy adhesive will be required for the few bonding jobs left. Hysol or ZAP epoxy glues are recommended. Some CA glues are a useful addition too, particularly for tacking parts in place. A selection of drills, Allen keys, large Phillips Screwdriver and spanners will be required.

For any composite drilling, cutting or filing we recommend you wear a suitable face mask and eye protection. Handling epoxy adhesives requires care and you should follow the manufacturer recommendations with any chemical products handled.

You have acquired a kit, which can be assembled into a fully working R/C model, when fitted out with suitable accessories as described in the instruction manual. However, as manufacturers, we are unable to influence the way you build and operate your model and we have no control over the methods you use to install, operate and maintain the radio control system components used. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect application and operation of our products. Unless otherwise prescribed by law, the obligation of the CARF models to pay compensation is excluded, regardless of the legal argument employed. This applies to personal injury, death, damage to buildings, loss of turnover and business, interruption of business or other direct and indirect consequent damages. In all circumstances our total liability is limited to the amount which you actually paid for this model.

BY OPERATING THIS MODEL YOU ASSUME FULL RESPONSIBILITY FOR YOUR ACTIONS.

It is important to understand that CARF-Models.com is unable to monitor whether you follow the instructions contained in this instruction manual regarding the construction, operation and maintenance of the aircraft, nor whether you install and use the chosen radio control system correctly. For this reason CARF-Models are unable to guarantee to any individual or company that the model you have made will function correctly and safely.

You, as the operator must ensure safe operation, though checks before every flight.

Much of the construction follows the same process as the original Ultra Flash, the servo installation is identical, except, the factory does more pre fabrication. The tailplane has been updated to take the more common 20mm wide servos. The wings use the same combined gear cover and aileron/flap servo mounting plate. Builders who have assembled an Ultra Flash before will find the process extremely fast with so many jobs completed by our skilled workers. Assembly should be possible in 10-12 hours. Like all CARF-Models aeroplanes, the airframe has been assembled in the factory with wing and tail fixings completed.

Seven standard size servos with a minimum torque of 10kg are required, plus one standard size servo with metal gears suitable for nose wheel steering. A 9-10 channel radio with suitable programming will make radio set up easy. The Receiver power supply should handle a minimum constant currant of 5A. There are many suitable regulator /switches available. The retracts and brakes require 7.4-8.4v to operate. This can be from a separate 2s Li-Po of small capacity (800-1000mAh). It is also possible to power it from one of the two receiver batteries if you use a redundant system with two Li-Pos, a separate lead is recommended as the retract controller must be disconnected from the battery when stored as there is a small current drain.

Wings

The wings require less work than ever to complete, the servo mounting plates are factory installed on the gear cover plates, ready for you to screw in the servos. The assembled electric landing gear is factory fitted and wired. The omission of the wing tank and electric gear means there are only wire connections.

The wing flaps use a ball link connection onto the flap and a spring steel clevis at the servo. The flap is factory fitted with a pair of horns ready to accept the supplied ball link. A long Allen driver is required to fit the M3 x 16 ball link screw. Access is from inside the moulded hinge cover knuckle. Move the aileron up and flap down to gain access.

Spend some time setting the Flap pushrod length before fully screwing the cover plate down. It is not unusual for the pushrods to be slightly different in length because of the process used constructing the live hinged flaps in the mould.

The flap threaded rod should be approximately 50mm long and a good starting point for the push rod centres would be 75mm. This is centre of ball link to clevis pin. A servo arm length around 16mm gives good flap geometry.

The aileron pushrods need to be approximately 60mm long with 86mm centres. Both figures based on popular servos. The aileron servo arm should be 19-20mm. Ensure the aileron servo neutral has the arm at 90 degrees to the coverplate. Any free play in the clevis thread can be removed using the provided M3 full nuts locked against the clevis thread boss. Alternatively a drop of thin CA will fill the threads and remove the free play.

Tailplane

The tailplane requires very little work. Before screwing the tailplane in position the first time, ensure the tail seats without any force.

Loosely mounting the tail and marking the tailplane seat area on the tailplane top skin with a fine point marker will help you position the elevator servo lead grommet position.

Keep the lead spacing as wide as possible to reduce the chance of the lead coming into contact with the tailpipe.

Servos with a maximum width of 21mm can now be fitted. A servo arm length between 19 and 20mm produces the maximum movement required. Open the servo arm slots to fully clear the servo arms once you have positioned the servos on the brackets.

A small amount of thread lock on the M3 screws fixing the servos is recommended.

Visible threaded rod between the clevis and ball joint on the elevator pushrods will be approximately 27mm. Ensure the servo arm is at 90 degrees to the cover plate at the neutral position before setting the final pushrod length.

Fuselage

The correct balance is easily achieved on the UF Evo without ballast. Start assembling the fuselage from the back and the final battery positions will find themselves.

Before starting construction, light sanding of the factory installed wood work is recommended. We also coat the wood parts with a thinned epoxy skinning resin like ZAP40. This seals the wood and prevents oil and moisture being absorbed over the life of the model.

The tailpipe opening in the fear fuselage face and mating tailcone opening may require elongating to allow the tailpipe to align correctly.

The rudder servo must be mounted before the tailpipe can be finally installed. The factory installed plywood servo mount should have any excess resin filed away and the four mounting holes cleared before trying to mount the servo.

The servo is mounted with the top of the servo lugs against the mounting plate-so install the grommets and ferrules based on this. A servo arm between 20 and 25mm should be used. A slot is required in the fin skin to clear the rudder servo arm.

Note which side the rudder horns are before making the slot!

A simple method of finding the centre of the servo horn is to install a slightly sharpened nylon arm of 15-16mm length on your chosen servo. Turn the unpowered servo arm so it is in line with the servo case and screw the servo in position to compress the grommets. Power the servo with a tester or your radios throttle channel and slowly move the servo arm so it scratches through the foam inner skin. A torch can help find this line. Add masking tape to protect the paint work and mark the slot before cutting.

After finally mounting the rudder servo a strip of composite/balsa laminated 3mm sheet approximately 50mm wide should be glued across the fuselage to act as a direct heat shield to the servo case bottom.

Tailpipe

Before assembling the tailpipe by screwing the carbon bell mouth to the steel inner pipe, the moulding may require some cleaning up. Use a course file or sandpaper (always wear a

dust mask when filing/sanding composites) to smooth out the top and bottom faces. Grinding to a uniform thickness will aid when fitting the steelpipe.

When you assemble the pipe the use of a flat surface and a bubble level will aid setting the pipe at 90 degrees to the bellmouth.

The steel pipe is pre drilled with four mounting holes, once you have the pipe set correctly, drill through the carbon with an M3 drill and fix with the provided M3 screws, washers and nuts.

Before you insert the tailpipe in the glass fibre tailcone, the mould joint tape should be cleaned up to produce a uniform thickness over the last 15mm. The outer alloy tube is a snug fit in the tailcone as this acts as the rear fixing. Once the pipe installation is complete the fibreglass tailcone can be trimmed slightly to match the outer alloy tube. The tailcone should be screwed to the rear fuselage face with self tapping screws.

The front pipe fixing requires screwing the carbon bell mouth to the half moon doubler glued to the rear of the front former. Before you finally fix the pipe, it is worth completing the turbine positioning. This ensures you can achieve the recommended tailcone to tailpipe gap for your chosen turbine. 20-30mm is the usual range.

On larger JetCat turbines the perfect position is achieved with the motor mounting feet flush with the front of the turbine rails-this requires removing a small amount of the 3mm vertical former-above (looking through the wing opening) the turbine rails. 5-6mm packing under the mount is also normal with the JetCat offset mount used on the 80-90-120-140-160 series.

The new fuselage fuel tank should be cleaned with alcohol before assembling. The tank features a fibreglass baffle plate, so a section of brass tube should be installed in the clunk line equally spaced across this baffle. Tygon tubing should be used for the clunk line (not included) 1/8” 3.2mm i/d is the minimum size suitable for turbines used in the Ultra Flash Evo.

The fuel tank is mounted with the front supported by a composite/wood cross plate approximately 50mm wide-spanning the fuselage. Care should be taken sanding this to size and the fuselage surface roughened before finally bonding in place with epoxy and a small strip of glass cloth. When you position the plate a small amount of movement should be detected-this allows for the fuel tank expansion during filling. The rear of the tank is supported with a Velcro strap. For High G flying a foam support is provided to fit between the tank and wing top skin. Scrap material should be used to stop the tank moving forwards and backwards.

Skilled builders will produce various installations depending on equipment used.

Operation of the three retract units may require the positive-negative swapping by turning over the plug to get all three units working together.

Balance point, gear down 225-235mm back from the wing/fuselage joint line with a little fuel in the fuel tank.

Control Movements

The control surfaces on an Ultra Flash are powerful. Depending on your preferred control feeling, the aileron movements below can be safely reduced by 2mm.

Aileron movement: 12mm up and 14mm down- Expo 30-40%. Elevators: 15mm up and 16mm down - Expo 40-50%, Rudder: 45-50mm each way 30-35% Expo. Measured at the Aileron/Elevator tip joint. Rudder travel at the lowest trailing edge point.

The flap settings for the Ultra Flash Evo are:

Take off 25-28mm (1-1 1/8”). Landing 95-100mm (3 ¾” to 4”) both figures measured at the root, trailing edge of each flap. The landing flap setting creates maximum drag and rapid deceleration with no power, some pilots reduce this figure to 85mm (3 3/8”) and also add a few mm of CROW 3-4mm, though it is not really needed.

The Ultra Flash requires down elevator with flap. Take off flap setting 1.5mm down elevator and Landing 4.5-5mm, measured at the elevator trailing edge tip. Exact figures will be affected by balance position. Slow the flap and elevator compensation in your radio flap system slightly to smooth the transition.

We hope you have years of pleasure from flying your Ultra Flash Evo. Questions on assembly can be answered by contacting your chosen Rep or emailing info@carf-models.com.