

BIG, BOLD AND BEAUTIFUL

WELL KNOWN PILOT AMONGST THE 3D COMPETITION COMMUNITY, MATHIAS FISHER FROM GERMANY RECENTLY DECIDED TO TURN HIS HAND AND TRANSMITTER TO A SPOT OF SCALE HELI BUILDING AND FLYING STARTING WITH A VERY AMBITIOUS LARGE SCALE VARIO WESTLAND AUGUSTA. HERE'S HOW...





Vario Helicopter is a very popular and famous manufacturer of RC helicopters and especially for scale fuselages from 600

size up to very large ones. They also have officially licensed fuselages by Eurocopter and Bell Helicopter to name just two. They don't make fuselages which are ready to fly where you only have to fit in your existing mechanics. Vario is a brand for real modellers who want to build a scale or semi-scale heli from the beginning until finishing with more or less detail.

The all new Vario Westland Agusta AW139 which has scale of 1:7 is available as a turbine or gasoline version which can easily convert into an electric version as well. It is a modern multi-role helicopter. It has a retractable undercarriage, a five-blade rotor-head and an angled four-blade tail. The model impresses with its detailed GFK fuselage and scale retractable landing gear. The model size is impressive but compact at the same time. In this articles I'm looking at the electric version.

KIT CONTENTS

First here are some of the specifications and contents of the kit. The AW 139 has a length of 1970mm, 450mm width and 560mm height and has a main rotor diameter of 1880mm.

The kit with product number '1390' is supplied unpainted as an 11-piece GFK fuselage including window set, stainless steel tube drive to tail, retractable landing

gear, laser cut wood formers and some various small parts. To make it fly as an electric version you first need the petrol mechanics (139/22) and the additional electric conversion kit (139/100). If you want to build it semi-scale like my one, I have listed the parts in the panel below.

In case you want to build a complete scale version there are a lot of other details available from Vario Helicopter as you can find on their webshop at www.vario-helicopter.biz/gb

Parts required for semi-scale...

- Five-blade rotor-head for 12mm main shaft (705/32)
- Swash-plate driver for 5 blade head (68/52)
- Five-blade set (404/52)
- Push rod set 2.5 x 80mm (70/80-5)
- Four-blade tail rotor
- Four-bladed hub, complete (101/96)
- Four bladed control bridge (101/48)
- 50 degree angle gearbox (1054)
- Tail rotor blades 120mm (34/30)
- Cockpit (139/29)
- Dummy stainless exhausts
- Door hinge set (139/5)

SEMI-SCALE BUILD

I decided to build my AW139 as a semi-scale model without antennas, footboards and all other parts like that because I don't want to have to take too much care of the model during transport and handling at the field. But I do want to fly it with the same number of blades on the main and tail rotor as the original one because in my opinion it looks terrible if you fly a big helicopter like this with only a two-blade head. Also I want to have



The excellent finish of the Vario Agusta fuselage really helps to give the model added realism

some position and landing lights on it.

After ordering all the parts listed they arrived with me only a few days later, in this case Vario offered a very fast delivery. The fuselage is properly packed in a strong cardboard box secured with a lot of bubble wrap which ensures it arrives without any damage. All other additional parts are shrink-wrapped.

I'm only going to cover the build of the Agusta briefly. A detailed step-by-step build articles is planned for my next Vario Helicopter scale model, an Eurocopter EC-135 in scale 1:4.

ELECTRIC CONVERSION

The first step is to build the mechanics and convert it to an electric version. This is one of the easiest things for me because I have built a lot of 3D helicopters over the last few years and it is similar to building scale mechanics. The next in line is the fuselage. I unpacked it and took a closer look for the quality first because this is

As you can see this is one large scale model that takes some serious building and flying



my first fuselage from Vario. I looked intensively at every edge and angle to find blemishes and blotchiness on the surface but it was a search in vain. The quality is very impressive, I had never seen any model quite as good before. This is a very good base for the future paint job because there is not too much to fill and sand which saves you a lot of time.

The first thing you have to do, following the very nice manual, is to cut all the windows and doors with a Dremel tool equipped with a diamond disc and assemble the wooden main parts for the mechanics mount. The second step is to build the front landing gear and install it to a wood frame with a standard servo. There is no expensive special high torque, brushless or high voltage servo needed. A normal digital servo is more than enough for this usage. After you have finished this step you have to cut out the fuselage to fit in the front landing gear. I tested the function of the retract by using a servo tester to make sure it came down and went up without any issues.

Now it's time to glue in the mechanics mount and place the mechanics for a perfect fit. To glue in the mechanics mount follow the recommendations of Vario and take a UHU Plus 300 epoxy resin adhesive. With this glue you have enough time to place the parts in the right position and at the end of the gluing time it provides a very strong bond.

REAR LANDING GEAR

During the time the glue is setting go to the next step of the manual which is assembling the rear landing gear with all the parts and adjusting the pushrods for the servo. All the parts are very scale, precise and strong. For this gear I used the same type of servo as used for the front landing gear. After finishing the assembly of the rear landing gear it's time to mount the gear including the wooden former for it and make the holes by cutting with a diamond disc again for the retract in the fuselage. A final test for the retracts by using the servo tester again to see it works and is placed at the right position. Hopefully all should be going very well and work smoothly as mine did.

By the next day all the glued parts are dried and solid and now you can assemble the upper mechanics support to the fuselage by using the two component glue from UHU again.

During the time the glue is drying again you can assemble the angle gearbox and the whole tail drive system including the tail servo and assemble the tail tube and all other tail parts to the mechanics.

Now all the tail drive parts are in the right position you can place and glue the tail boom to the main fuselage. This is a step where you have to work very precisely to get a good result in all directions without tensions and distortions to make sure you don't have any future vibrations from the tail and a smooth run.

After that you can adjust the tail push rods and assemble. To complete the

Retracts up and in full flight and you'd be hard pressed to tell the model from the real thing



tail the last step is to mount the tail cap. Finally the tail is finished and works very well at the bench.

CANOPY AND FUSELAGE

Next step is to make the cut outs in the canopy and glue the grid to them. After it is done it's time to fit the canopy to the fuselage and mount it by a few screws to remove it easily for adjusting or future maintenance. Last but not least the dummy exhausts have to be placed and installed as well. But before I did that, I had the idea to make it look much more realistic by holding the ends of the exhausts into the flame of a blowtorch to give the ends the typical multi-coloured annealed look. The tail stabiliser also has to be fixed to the fuselage. It stays in position with two GFK tubes in the tail boom and two counter parts at the stabiliser and is secured by a screw. In this way you can remove it very fast and make the helicopter a bit easier to transport.

Now you have to mount the windows to the fuselage and the doors by cutting them first and placing them to the cut outs. Then you have to drill some small holes at the corners and mount with small screws. Also you have to mount the front

doors with the ordered hinge set and magnets to open and close them like it is on the real helicopter to bring a bit of scale feeling to it. The side doors are mounted with six magnets on the door and six counter magnets on the fuselage. They are strong enough to hold the door in the right place during flight but allow them to easily open on the ground. That was very important for me, it is easy and quick because the flight batteries will be placed behind these doors on both sides of the helicopter.

FITTING THE MECHANICS

With these steps the fuselage is fully assembled now and you can go to the next step which is equipping the mechanics with all the RC components to make it ready to fly.

The gear ratio of the mechanics is 21.4:1. There was no long consideration to use a Scorpion motor and speed controller! What else, because I want power and torque in every situation.

With the gear ratio given above I used the powerful HK-5035-500Kv motor combined with the Scorpion Commander V 50V 130A ESC (OPTO) powered by two 6s in series 5000mAh OptiPower Ultra 50C LiPo batteries. They have a very high

Flying a scale model requires just as much focus and concentration as sport or 3D flying





voltage and don't drop under 3.6V during a powerful flight.

Vario use an H4 90° +45 swash-plate that makes it necessary to use four strong servos for this. I wanted to power them directly by a 2s 5000mAh OptiPower LiPo so I chose HV servos which provide very good torque. They don't have to be very fast because it is not necessary for these big scale helicopters. More important is power and torque. The servos are controlled by a Bavarian Demon 3X which is in my opinion the best flybarless (FBL) system for such big and heavy scale machines.

After installing and setting up the flybarless controller by presets for scale helicopter, program the time, endpoints and delay for the retracts on the transmitter and the electronics are then ready for take-off. Only the electronic speed controller (ESC) has to be programmed at last with the PC software but it takes no longer than one minute and the model is finally ready for its maiden flight.

MAIDEN FLIGHT

It was a nice day with very little wind and perfect conditions for a flight like this when I first took the Augusta for its maiden flight. Retracts were down, Bavarian Demon FBL controller and the ESC initialised successfully, I turned the switch on the transmitter and the speed controller started to spool up the motor smoothly. Slowly I increased pitch and the Augusta became very light and left the ground very straight and stable. The rotor-blade tracking, trim and centre of gravity were perfect. I turned the switch and retracts sent up slowly and very 'scale like'. I moved the elevator stick forward and moved into the first scenic flight.

The Augusta was not as precise and stable as I thought it would be and also the tail was too sensitive. I came back and landed the AW139, increased the gain for tail and swash-plate and connected my netbook to change the settings on tail, add some expo there and decrease the direct setting on the swash-plate. Then I started again to a fly with long curves, turns, slow and fast flights and it felt much better than before. I increased the gain on main rotor again and also set up 20% of exponential on my transmitter. The third flight showed me I

had the perfect set-up now. The AW139 is very precise and stable now and follows all inputs from the stick of the transmitter directly like an 800 size trainer helicopter.

FUSELAGE PAINTING

After a perfect maiden and successful set-up flights I went back home and disassembled all parts which was possible to prepare the fuselage for painting. I searched a little bit online for a nice colour scheme and found one I liked straight away. It was a version of the Korean Coast Guard which has the main colour in orange and white. This paint scheme was easy to replicate and the second important thing is, it is very bright and offers good visibility in all weather conditions.

After the paintjob was finished I installed all parts again and as well a red position light on the left side, a green on the right side and a white on the underside. Also the mentioned bright landing lights on each side of the rear landing gear. All the lights are controlled by LCU (Light Control Unit) from Emcotec which is programmable for different flash times and sequences. This unit is powered by a one cell LiPo battery with 1500mAh which is enough for a minimum of six flights.

REAL SCALE FLIGHT

When it was all finished it was time for the first real scale flight. Because of the successful maiden flight and the perfect set-up on the Bavarian Demon there were problems expected. Because of the big flat bottom of the fuselage I transported the Augusta with landing gear up. So the first step is to take the helicopter out of the car but because of the size and the weight it is very complicated to do it all alone. I'm very lucky that my wife is supporting me 100% in this hobby and she travels with me to most events, fun-flies, practice and setup flights and helps me as much as she can. So this is the perfect moment to say thank you for all of your help and support! A lot of what I do in this hobby would not be possible without her.

Now the helicopter nose was in the hand of my wife and the tail lay on the car boot edge which makes sure the retracts are free. I powered on the transmitter, removed the side doors of the helicopter to get access to all electronics

It may take a while to complete the build, but when it flies and looks like this it's all worth-while

The Vario Augusta AW139 is a great looking model from all angles



and batteries and connected the receiver battery for a short time which lets the retracts come down. The second step after the Augusta stands on its own wheels is to mount the five main blades in the right direction on the right position and fold out the four tail blades as well.

Now a short check on all moving parts like linkages and so on to make sure all is perfect, in its place and ready to fly. I connected the the receiver pack now and waited for a successful initialising of the Bavarian Demon. Now I could power on the light control unit with the one cell LiPo.

The next important step to make the helicopter ready to fly is to connect the flight packs to the ESC and wait until the controller initialises as well. I closed all the Augusta's doors and got in position for flying. Now the time had come to flip the throttle hold switch on the Tx. The speed controller spooled up the motor and rotor very smoothly and softly. After around 15 seconds the head speed has reached and stabilised at 920rpm and it was time to increase the pitch. The Augusta took off in a very scale like way. I flipped the next switch, the retracts went slowly up and landing lights turned off.

Time to fly and enjoy the great flight silhouette of this beautiful and awesome flying helicopter which has a very smooth and nice sound as well but is still so powerful in every situation. After a couple minutes of flight I came back, flipped the switch which turns on the landing lights and let the landing gear come down very slowly. A last slow hovering flight to the landing point and I brought back the AW139 to the ground.

THE VERDICT...

I have never felt so happy with a scale helicopter before. For all scale helicopter enthusiasts I only can recommend this great Augusta AW139 or some other models from Vario Helicopter. It is a great German manufacturer and the best in quality on the market for sure. So have fun and enjoy your flights with Vario Helicopter. 

Mathias Fischer

Tech Spec...



VARIO WESTLAND AGUSTA AW 139

- 11-piece GFK fuselage
- Window set
- Stainless Steel tube drive to tail
- Retractable landing gear
- Laser cut wood formers
- Various small parts

Scale: 1:7
 Length: 1970mm
 Width: 450mm
 Height: 560mm
 Rotor: 1880mm
 Motor: Electric or Benzine
 Weight: Approx 11,6kg
 RRP: £ 1,116.64

Manufacturer: Vario Helicopter
 Tel: +44 (0)1942 273888
 Web: www.vario-helicopter.biz