

# Product Review

## Advanced Scale Models P-61 Black Widow by Les Marriner.

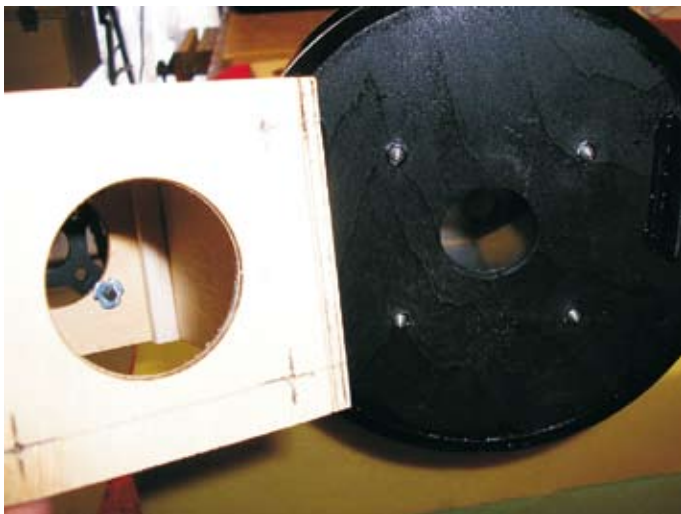


I shall commence this review of the Advanced Scale Models (ASM) P-61 Black Widow by quoting some interesting facts about the full size aircraft, as mentioned in the assembly manual.

*“The heavily-armed Black Widow was the USA’s first aircraft specifically designed as a night fighter. In the nose, it carried radar equipment, which enabled the crew of two or three to locate enemy aircraft in total darkness and fly into the proper position to attack.”*

The XP-61 was flight tested in 1942 and delivery of production aircraft began in late 1943. The P-61 flew its first operational intercept mission as a night fighter in Europe on July 3, 1944 and later was to be used as a night intruder over enemy territory. In the Pacific, a Black Widow claimed its first “kill” on the night of July 6 1944. As P-61’s became available, they replaced interim Douglas P-70s in all USAAF night fighter squadrons.

During WW11, Northrop built approximately 700 P-61s, 41 of these were C variants manufactured in the summer of 1945 offering greater speed and capable of operating at higher altitude. Northrop fabricated 36 more Black Widows in 1946 as F-15A unarmed photo-reconnaissance aircraft.”



### MODEL SNAPSHOT

The ASM Company is quietly going about the business of producing some very unique and accurate to scale, aircraft. The P-61 is my second review model coming from the ASM stable; the first being the 90 to 120 sized Pitts Special. The Pitts still looks as good as it did the day it came out of the box and is a real crowd pleaser at my club. ASM specialises in the production of blow-moulded fuselages, complete with laser cut internal framing and bulkheads, and fully built up flying surfaces. The P-61 has a wingspan of 79.5 inches (2019 mm) with a wing area of 1010 sq inches (65.42 dm sq). The fuselage is 59.5 inches (1511 mm) with a ready to fly weight of 13.75 pounds (6.2 kgs) when fitted with retractable landing gear. Functions include ailerons, elevator, flaps, and throttle, with optional air operated ASM retractable undercarriage.

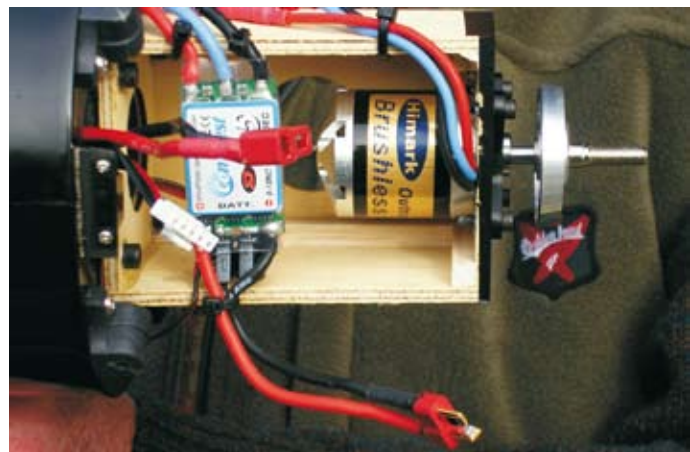
Engine requirements call for 2 X 40 2 strokes or 52 4 strokes IC engines however I always promised myself that if I ever built a twin powered scale model, I would power it with a pair of electrics. I decided on using the Himark 3522 (990 rpv)

The Himark 3522  
990 rpm per volt  
motor.

outrunners, turning 10 X 5 APC electric props through 35 amp Conquest BL speed controllers. Motor power and battery eliminator circuit (BEC) comes from two Awesome Power 4S 3200 Lipo batteries.

All the blow-moulded parts are factory painted, as are the two fibreglass cowls. The flying surfaces are covered in black film and CA hinges are used throughout. The parts fitment is outstanding and was a pleasure to assemble. The supplied accessories are of high quality and the Assembly Instruction book has over 50 high-resolution digital photos to cover the recommended build sequence.

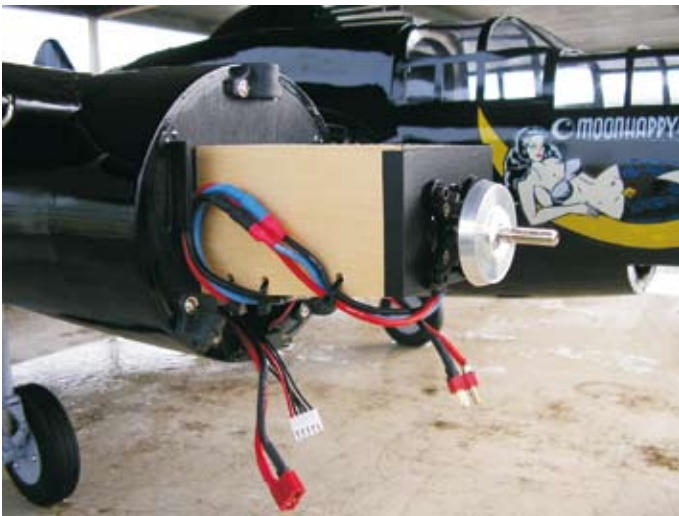
The test flight was carried out on a crisp winter’s morning at my club field at Lilydale Victoria. The twin outrunners proved to be very suitable in providing a safe and realistic power plant for the P-61. The model flies in a scale like fashion and all things being considered, the P-61 is a safe and stable scale model that will turn heads wherever it is campaigned. The sound that comes from the twin electric outrunners and propellers is very pleasing, and quite scale like.



### WING ASSEMBLY

A little re-engineering is required to fit electric power.

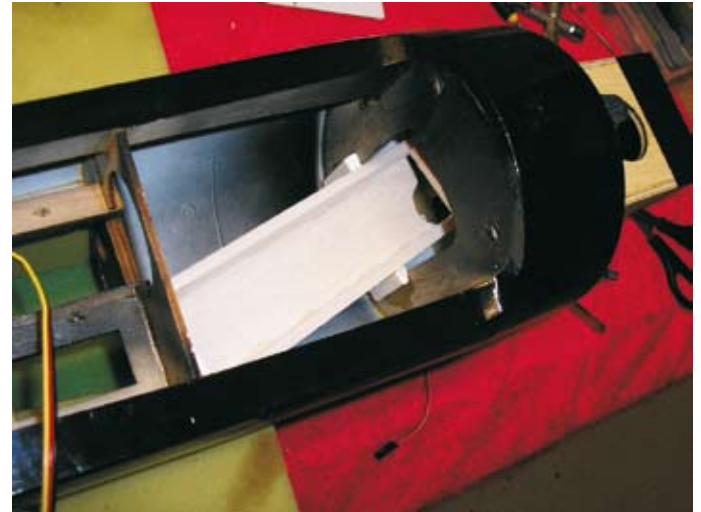
The wing comes as a completed centre section, with the port and starboard outer wing panels containing the flaps and ailerons. The ailerons are centre hinged using CA



The Himark 3522 990 rpm per volt motor.

mounts. I used Hitec HS 425 BB servos for ailerons, rudders and steerable nose wheel, and a HS 225BB for the elevator.

The assembly manual lists the required numbers and sizes of servo extension leads, however I would also recommend that good quality leads be used as a priority. I used the Hitec heavy-duty twisted leads throughout as they guard against excessive voltage drop and the twists help in eliminating radio interference. The wing outer



hinges and the flaps are bottom hinged, also using CA hinges. I decided that I would set up the flaps, but hold back with the fitting of the servos, as I had heard that the P61 didn't really need them for take off or landing, so I saw this as an opportunity shed a little weight where possible.

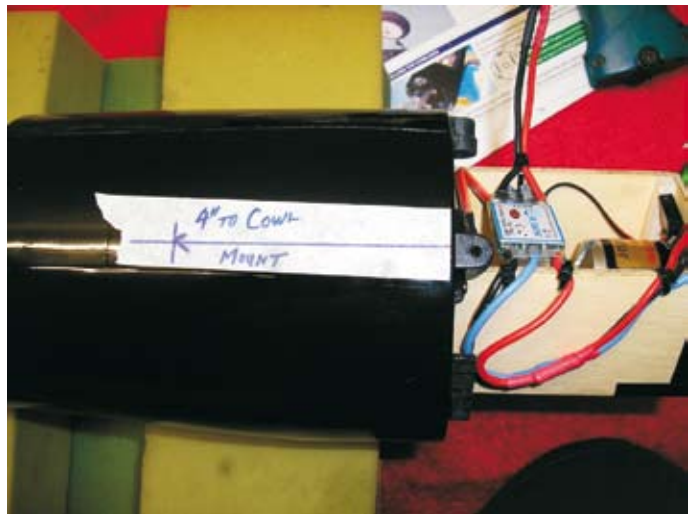
If I saw the need to activate the flaps at a later date, then it was a simple job to install the servos. The aileron servos are a simple installation into the factory prepared

Balsawood battery box to take 4 s 3200 mAh LiPo battery pack.

panels can now be set aside as they take no further part until final assembly.

The centre wing panel is factory complete in it's construction, so all that remains is setting up the Y-leads with their extension leads for the rudders and the throttles. I made up labels from masking tape and named each set at the centres and at each end. The only remaining lead to go

The ASM air retract leg.



in the centre panel is for the elevator. The time I took creating the nametags certainly payed off as the final assembly went without a hitch.

A pencil, ruler and masking tape for cutting accurate holes.

#### OUTER FUSELAGE ASSEMBLIES

The outer fuselages contain the engine nacelles, mains undercarriage legs, and



rudders. I will deal with setting up the port side fuselage, and obviously each task needs to be repeated for the starboard fuselage. The rudder is a simple hinge job, using the supplied point hinges and two-part epoxy glue. The servo is installed into the factory mount and metal pushrods run through outer plastic tubes, to make the connection between the rudder horn and the servo arms. Whilst on the rudder, each rudder servo is linked to the receiver via a Y-lead. As it would be impractical to mechanically link the rudders to the steerable nose leg, I let my computer radio do the mixing by plugging the nose wheel servo lead into the Aux-2 port on my Hitec Supreme 8 channel receiver. I was then

Using the box for a fuselage jig is convenient and in keeping with the clean electric theme, lowers your carbon footprint.



able to set up individual travel adjustments for both rudders and nose wheel and link them with a free mixer.

The kit contains all the required engine mounts and fuel tanks for IC power, however as I was converting the review model to electric, I needed to make up a suitable engine box from 4mm ply, to mount the Himark outrunner and speed controller (Each outrunner requires its own 35 amp brushless controller). The only adaptation was to make up a battery boxes to take the 4S 3200 Lipos. The battery boxes were made up from 5mm balsa, and were located where the fuel tanks would normally go. A generous sized cooling hole was drilled into the bottom of the firewall, which ensures good airflow over the battery and also allows the power lead and charge balancer leads to protrude into the motor compartment.

The motor/engine cowls are fitted to the fuselage nacelles using three self-taper screws as per the manual. The only other modification to the cowl was to cut out the holes to give access for power lead connections to the speed controller and the balance leads for charging. I located this hole underneath the cowl, so it is out of sight when the model is on the ground

A knife will do but I do wonder how I did without a rotary grinder

The finished boom.



and barely noticeable during flight. I also mounted the speed controller arming on/off switch onto the firewall at the rear of the access hole, and this location has proved to be very convenient and out of sight.

Just a word of warning with regards to on/off arming switches; they are not to be seen as a total isolating switch between the Lipo battery and the motors and radio gear. When the battery is connected to the speed controller and the switch is in the off posi-

tion, nothing will run or operate; however it is still drawing a small amount of current. I know of a situation where a fellow modeller inadvertently left the battery plugged in with the switch in the off position, after his last flight of the day. When he got around to charging the Lipo pack some seven days later, the minimal current draw over the course of the week had run the battery down to the point where it was unable to be charged again, which ended up being a costly mistake so be warned.

#### HORIZONTAL STABILIZER / ELEVATOR ASSEMBLY

There is not a lot to do here; and as long as the manual is followed it will all go smoothly. As the elevator servo is flat

mounted within the stabilizer itself, a low profile servo is called for. I used a Hitec HS 225BB as it fitted the space provided and has ample power to do the job on this type of model. You now get to the stage where the sub assemblies need to start coming together. To support the side fuselages, I actually used the bottom section of the box that originally contained the kit as a building jig. This allows the horizontal stabilizer to be bolted onto the side frames,

to ensure that the wing has a slight positive angle of attack from the start. When measuring the review model, I found that I had a negative angle of attack, so I found that the easiest way around this was to pack out the nose-leg mounting plate. By using a 10mm thick piece of aluminium bar-stock that had the same plan dimensions as the supplied mount, the positive angle of attack was achieved. It is a simple job to copy the drill holes and mount the nose-leg.

A simple jig made from masking tape.

Below. A black marker finishes off the edges.



after the 36-inch servo extension lead is installed for the elevator servo. The central wing panel can now be installed, ensuring that the servo extension leads are correctly matched to the servos.

**CENTRAL FUSELAGE**

The central fuselage contains the nose-leg and servo, air tank and valve for retracts (if fitted), and receiver. Once again, the assembly goes together easily as the wing-dowels and bolts are spot-on for accuracy. The hatch that is located on top of the wing, and makes up the central upper fuselage and is held in place with two spring loaded pins. I found that anything that needed gluing onto the plastic fuselage or onto the wing

covering was achieved by using medium CA glue. Installations such as the dummy radiators that require trimming to size and gluing onto the leading edge of the central wing panel, was easily achieved by using a minimal bead of medium CA being put onto the radiator moulding and then being carefully placed into position and held in place for ten seconds. This gives a very sound glue job that is simple to achieve.

I know that a few of you out there will be saying that you cannot glue straight onto the wing covering, however I can assure you that it works well with this covering material. One other tip here - when you trim the radiator moulds to fit the wings leading edge, before gluing in place – run

a black permanent marker pen around the edge of the white plastic moulding. This will finish off the job, and there will be no unsightly white plastic showing between the black plastic and the black covering film.

**UNDERCARRIAGE ASSEMBLY**

The P-61 comes with fixed landing gear as standard. ASM also offer air-retracts and scale, sprung undercarriage, as an optional extra. The fixed gear is a very strong system that uses 13/64<sup>th</sup> spring steel legs with a built in coil. This results in a straightforward installation that will perform well and give a trouble free operational life.

As with all tri-cycle setups, it is very important to ensure that the wing's leading edge is 1mm to 2mm higher than the trailing edge. This will give a positive angle of attack when the model is accelerated, resulting in a smooth transition for take-off. If the angle is negative and the leading edge is lower than the trailing edge, take-offs become very difficult and are nearly impossible to achieve as the downward forces on the wing will be forcing the front of the aircraft down, and the only way to get it off the ground is to use excessive amounts of up elevator and the use of full flaps. This could cause the model to rear-up aggressively and present the pilot with a steeply climbing aircraft that could have serious consequences. (a stall followed by a crash) It is far safer



This is the gun turret. I added the small squares of wood to give more gluing area and this helped ling them all up.

Plywood could be used to do the same job, however I was after some nose weight to help counteract the difference in the weight of the outrunner electric motors, compared to the weight of a IC 2 or 4 stroke 40 size engines. The extra thickness of the 10mm plate was a bonus as it acted as a longer bearing support for the leg and mounting bolt. If the ASM air retracts are purchased, the same amount of packing will also be required to achieve this required positive angle of attack.

In regards to choice of undercarriage my advise to the prospective P-61 owner would depend on what powerplants you



Steerable fixed nose-leg.

choose. If you are considering to use the electric set up that I chose then use the standard fixed gear and close in the wheel wells with the supplied doors.

This simple and lightest option with minimal drag. If you opt for the retracts I feel the model needs a bit more oomph to overcome the extra weight and drag created by the large holes waiting to swallow up the wheels. A pair of Hi Mark 50mm 670rvp outrunners would be the go along with a 50-60 amp esc. These motors are

### The climbout.

very flexible so the prop and battery selection will proved the level of performance and duration your budget allows. IC power in the region of a 40 to 46 size, the model will have ample power to deal with the added weight and drag during take-off.

### FLIGHT TESTING

I am not going to bore you all with the do's and don't of model set-ups. I will simply point out the set-up on my model that has resulted in a very pleasing model to fly, that is safe to operate and a set-up that has turned my first experience with twin electric power, into a rewarding one. The initial climb out on the first flight revealed the model was a bit under powered but once it gained some altitude and speed it soon was apparent the model handles very well.

The assembly manual gives the recommended throws for all flying surfaces and these measurements are ideal. The most interesting recommendation calls for the ailerons to have 22 mm up and 8 mm down deflections. This is to compensate for what is known as adverse yaw, which is caused by the downward going aileron causing more drag that the upward aileron, hence the need to reduce the movement for the downward aileron. I achieved this by



programming 40% positive differential into my computerised radio.

The Centre of Gravity is quoted as 89 mm (3 1/2") behind the leading edge of the wing, measured at the central fuselage. On a wing that has a 15" cord, this is a very forward and conservative measurement, however the model flies very well with this set-up, and it obviously takes into account that the C of G will move slightly rearward on models fitted with retractable undercarriage, as all three wheels retract rearwards.

### SUMMARY

The ASM P-61 Black Widow is a delightful looking aircraft that assembles easily owing to the accuracy of manufacturing, and ASM's ability to incorporate I high degree of scale detail into a relatively light airframe. It is a real head turner in both static and flying views. The 80" wingspan ensures good visibility and easy orientation in flight.

If you have any question relating to the ASM P-61, please feel welcome to drop me a note at my email address of [marriner@alphalink.com.au](mailto:marriner@alphalink.com.au) Regards, Les Marriner. The Advanced Scale Models P-61 Black Widow is distributed to hobby shops by Model Engines Australia tel 038793 5555 [www.mod-](http://www.mod-)