Colin Chapman Colin Chapman/Tony van Geffen

Spitfire Mk.IX

Colin Chapman realises one of his childhood fantasies by completing and flying this ARTF WWII fighter new from Top Gun R/C Aircraft

Spitfire Magic

As a young lad, I endured several bitter disappointments in attempting to actually see a full size Spitfire perform at an air-show. It seemed that every show that I attended, the performance was cancelled.

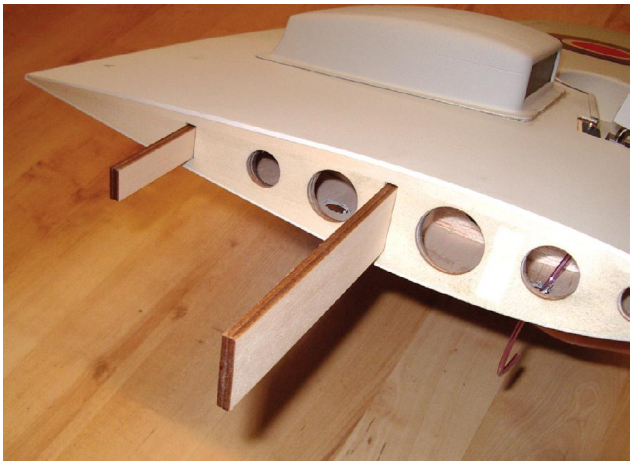
Patience is a virtue and eventually I was rewarded at one of the Model Expo shows at Sywell Airfield in Northamptonshire. I stood enthralled as a Battle of Britain Memorial Flight Spitfire performed a stunning display. The Spitfire made a huge impression and I was totally smitten! It was a display of power, grace and beauty such that nothing else could compare.

Over the years I've been lucky enough to test and set up a whole range of model Spitfires. Once set up properly, I have always managed to get a real buzz out of to displaying the 'Spit' in a proper scale-like manner. Yet despite this ongoing love affair, I've never actually owned a Spitfire of my own – until now!

Model Background

The May 2006 edition of RC Model World, page 40, provided a Cover Story of a pre-production version of the model that is now being reviewed. Within the article there is a little more detail about the history of this Spitfire version. This LF Mk.IX is depicted in the colours of British ace Air Vice Marshal James Edgar 'Johnnie' Johnson to 1:6.2 scale, which equates to a wingspan of 71". The manufacturer has gone to lengths to provide a scale ARTF kit with attention to detail whilst also attempting to bestow benign handling characteristics by ensuring that the wing loading is kept down.

Kit contents



Fitting the 6 mm main and rear braces proved to be accurate and tight

Moulded radiators and oil cooler with plug-in cannon shaped from balsa

Collet relief hole in wheel well, and note the front shape of the radiator moulding

Initial Impressions

Opening the box reveals the most prominent attention-grabbing item – the superb moulded glass fibre fuselage. A lot of panel detail had been incorporated into the moulding, there was a good quality paint job and the fact that it was really light was a bonus! An equally impressive moulded cowling was revealed, complete with exhaust stack detail; that is a fantastic flush-fit on the fuselage.

Other mouldings are included in the kit to add to the realism, comprising the radiators, oil-cooler and aerial mast.

The flying surfaces are all of built up construction, covered with Oracover, which is camouflaged to match the main scheme. The quality of these components was first class and appeared to be accurately constructed.

Equally impressive was the very comprehensive accessories packs. Most notably is the complete set of air-operated retracts included and just about everything else that is required, including a spinner.

Assembly Overview

The instruction manual comprises a series of photographs and notes to give a set-by-step account of assembly. I did however encounter a few problems during construction. Based on my experience I have chosen to run through the main points and highlight any issues encountered.

The manual sets out the assembly sequence in a logical manner, so that was the way in which I proceeded.

Wings

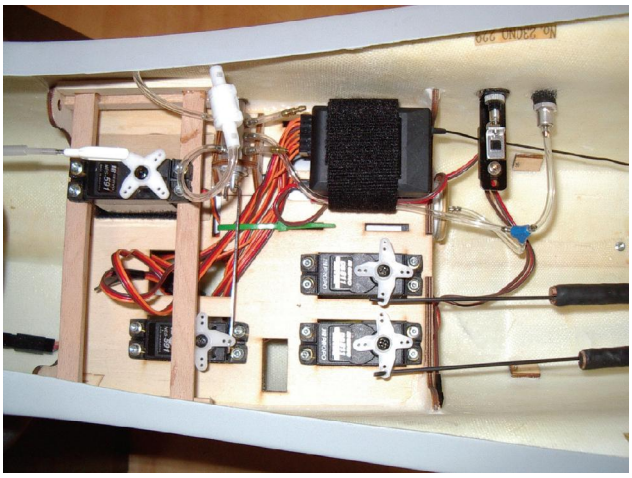
Following the instructions the ailerons are first. Furry hinges are already pre-fitted into the structure and simply require gluing into place using a thin type of CA glue and the ailerons, when attached, were very accurately aligned.

Individual aileron servo is located on pre-installed bearers on removable hatches in the under-wing surface each aileron. A slot already formed in the hatch allows the servo arm to pass through. None of the servo arms supplied with the radio were long enough to clear the hatch sufficiently, so extra long arms are required. Aileron servo extension leads will be required; I fitted 300 mm long leads to ensure sufficient lead at the centre section for connecting up the servos.

Trial fitting the hatches revealed that the position of the pre-installed bearers was causing the servo arms to foul on the balsa-lined servo wells. The bearers could be fitted approximately 2 mm further outboard to overcome this when using a standard size servo. I decided to carefully cut away at the balsa linings to achieve adequate clearance for the arm and pushrod assembly.

To complete the aileron set up, the position for the control horns were marked and holes for the retaining screws drilled. This revealed another snag; the horn screws provided were only 20 mm long. In order to pass through the ailerons and into the plate on the opposite face the screws needed to be in the range 25-30 mm in length.

'A lot of panel detail had been incorporated into the moulding'



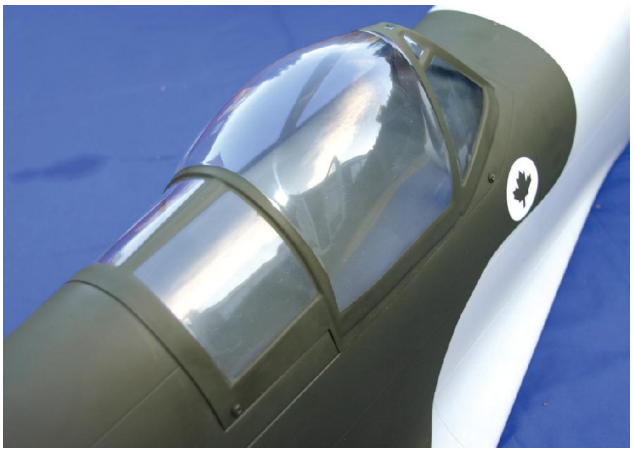
Installation shows new throttle servo position on bearers with air-valve servo now in throttle space

TOP TIP: Once satisfied with the aileron installation, I applied CA glue to the hatch screws to prevent them loosening.

Retracting Undercarriage and Hoses

The retract units are screwed onto pre-installed ply plates in the wing. Being fully constructed it isn't possible to fully assess the structural integrity of the mounting system employed. With the

Ply plate fitted to the rear former to provide additional pushrod support and prevent deflection



Super cockpit and framing attached by small screws

retract units in place, I gave the structure a good 'heave ho' in an attempt to replicate the sort of shock loads to be anticipated, even on a good landings! From this exercise I had reservations about the integrity of the mountings fitted and although I have not experienced a problem to date, only time will tell.

A trial fitting of the legs and well liners indicated that the legs needed re-bending in order to sit at the required angle, making allowance for the retract door fairings still requiring fitting.

I felt that the plastic used for the wheel well liners was too rigid, and the liners did not fit to the profile of the wing section accurately, fitting where they touched. The instructions show tape used to hold the liners in place while the glue cures. To achieve anything like a reasonable fit I had to employ both hands to press down onto the wells to maintain an acceptable fit while the epoxy cured.

The undercarriage door fairings were fitted using clear silicon as the instructions suggested. Surprisingly the fairings had only been prepared and painted on one face. Having bare timber exposed to exhaust fumes and possible moisture that will do nothing for their longevity. These faces were sealed and sprayed to match.

The up and down air hoses were installed into the wing and recovered at the centre section. Although not impossible, it would be quite tricky to fit the hoses after joining the wing halves.

The wing halves are next joined by two 6 mm ply joining braces. These were a very tight fit, and I was pleased to note that the two halves were perfectly aligned when first dry assembled. 30-minute epoxy was then used to join the wing halves permanently.

Wing Detail Accessories

The moulded radiators were fitted with 30-minute epoxy into position. I cut these out leaving a 10 mm flat area all around to ensure an adequate gluing surface. The way in which the radiators had been moulded caused a pronounced upward lip on the leading edge of both fitments. To prevent any possibility of the airflow entering into the mouldings I used clear silicon along the leading edge of both radiators to guarantee an airtight seal.

The two Aden canons plug into the wing leading edge by means of dowel plugs built into the canon. These are supposed to be glued into position. From the outset I had reservations about this on the grounds that they looked very vulnerable. I was pleased to discover that when dry fitted the canons were a tight fit and I have successfully flown the model with them simply plugged in. This leaves them readily removable for transportation and storage.

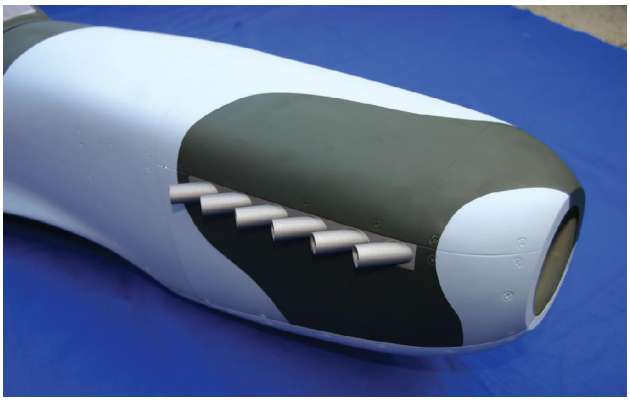
Tail Feathers

With the wing bolted to the fuselage for checking proper alignment, it's now time to fit the built up tailplane.

The opening for this is already incorporated into the fuselage moulding, and the instructions indicate that the tailplane is a very close fit. It certainly is! I was very aware that damage could occur to the tail's covering or the actual structure as it was reluctantly persuaded into the opening.

Once fully home, a series of check dimensions were taken to confirm alignment and symmetry with wing and fuselage. Everything seemed to be spot on. The necessary tailplane covering was removed before permanently epoxying into place.

I decided to use a covering iron to seal the cut edges prior to finally fitting, bearing in mind the very tight fit. With the tailplane partially pushed home, 30-minute epoxy was applied and I continued to ease the tailplane home. A ripping noise was heard as the tailplane neared the mark.



Scale panel fasteners and exhaust stack detail

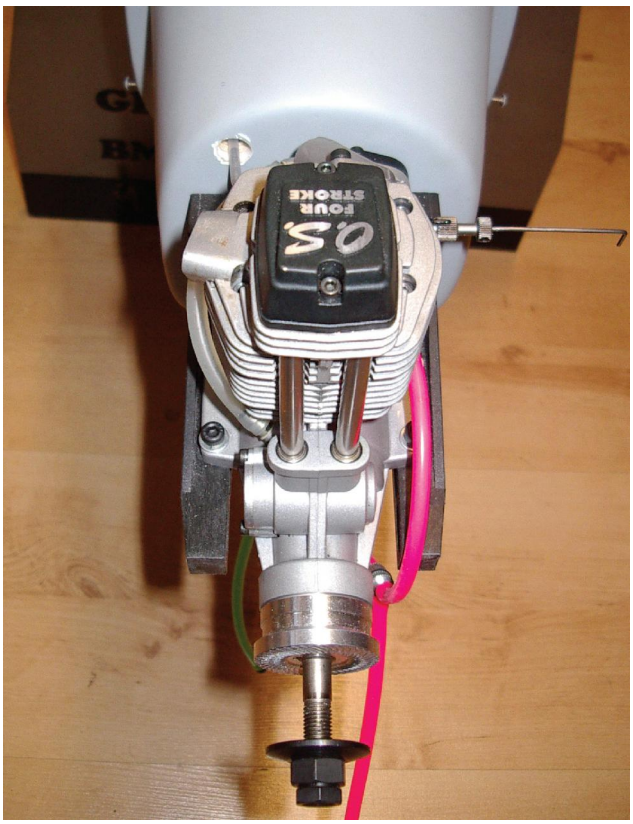
The leading edge of the covering had caught up on the fuselage moulding and started to rip away from the tailplane!

With a scalpel blade on its side I was able to persuade the damaged covering into the fuselage slot.

The elevators and rudder are hinged similarly to the ailerons. The steerable tailwheel is installed as part of the rudder hinging process. These parts all went together fine with no problems and were accurately aligned.

Engine Installation

I was surprised at the lack of thrustline information in the instructions. This was compounded by the lack of any form of datum on the bulkhead either, and there were no pre-drilled holes for the engine mount as the instructions had suggested. A visual inspection revealed that right thrust had been incorporated into the bulkhead, and a corresponding amount had been formed in the nose ring of the cowl.



OS120 installation (see text)

'found both connectors leaking past their seals'

Having made the necessary alignment checks for the motor mount and thrustline, I was confident to proceed and fit the M4 blind nuts to the rear of the firewall before installing the engine mount.

I opted to install an OS 120 pumped. With this set up, the throttle arm, (when fully open) was hard up against the bulkhead. To overcome this I fitted a 'Z' bend within the throttle snake as opposed to the supplied adaptor and clevis. A 10 mm hole was drilled to accommodate the angular displacement caused by the carburettor operation.

I didn't want a silencer hanging out of the cowl side, but I was keen to use the standard OS exhaust, as I know that with this configuration the engine performs very well and is adequately silenced. I decided to adapt an OS internal flexi-manifold to enable me to use the standard silencer and also ensure that it emerged below the engine cowl and was therefore far less intrusive.

When satisfied with the installation, the previously made 'trial' holes in the cowl were tidied up. Additional holes were made for the needle valve extension and two fuel dots.

Equipment Installation

Having flown a variety of Spits for people over the years, invariably the one common trait has been a tendency for them to be tail heavy. With this in mind I had chosen the bigger capacity motor, for its additional weight and power.

With the basic model assembly complete, it was possible to start the balance checks to assess what the likely equipment installation was going to be. These checks confirmed my fears; even with a bigger lump up front the model was showing a rearward balance point. My first decision was to ignore the suggested battery position on the pre-installed tray and to place the 1400 mAh pack hard up against the rear of the firewall. I then assembled, checked, and installed the tank.

The remainder of the radio installation followed the instructions, except I was unhappy with the suggested throttle servo position with regard to my engine. I installed a separate set of servo rails for the throttle servo and used the freed up servo tray space for the retract air valve servo as I was unhappy with the suggested position of this immediately adjacent to the air operating valve.

I was surprised that there was a dearth of information regarding the setting up and operation of the retract air system. Having installed many varied systems over the years it didn't bother me, but I can imagine somebody with no experience of an air retract system being a little puzzled.

The illustrations of the retract system only confused the issue as they do not show the operating valve supplied – a five-port affair with no facility for adjusting the operating speed. For the Spit installation, it is necessary to seal off a pair of the valve nipples on one side. The other pair of nipples are then connected with lengths of air hose sufficiently long to allow easy coupling of the wing.

The wing's air connectors are of plastic construction and surprisingly the nipples on the body of the connector are fixed. The connectors take almost a complete turn to lock, and with the nipples being rigid this tended to kink the hoses which made connecting and disconnecting unnecessarily fiddly. Additionally, the size of the nipples was incompatible with the air hose, resulting in the hose being over-stretched.

I undertook a quick air test to establish the system was sealed. I pressured the retracts to 60 p.s.i and quickly found both connectors leaking past their seals when that particular line was live, causing a loss of pressure.

In addition, the hose seals to the connectors were all weeping due to the incompatibility of the aforementioned nipples and hose. Admitting defeat, I fitted a pair of Robart connectors. The problems were resolved instantly.

The air tank was fitted into its position beneath the tray and the filler valve was located in the fuselage side.

The supplied rudder and elevator servo pushrods were made up and connected. The instructions suggest that the pushrods might benefit from additional support so I installed a plate across the rear former with guide holes to limit the amount of pushrod deflection.

Finishing Touches

To avoid damage, the canopy and dummy aerial were left until after installation.

The supplied canopy is superb and the frame is already lined. It is retained by four self-tapping screws.

The dummy aerial is attached by means of two self-tapping screws inside the fuselage. The instructions suggest running the Rx aerial through this mast, but the mast was almost solid with resin which made it difficult to achieve.

The final fitment was the underside oil-cooler scoop. Initially I decided that I would simply glue this into position, however if I did this the wing's movement would be limited when fitting to the fuselage, and access to the radio compartment would be compromised, so I made the scoop removable by utilising heavy-duty Velcro that has worked fine to date.

Setting Up

The instructions provide suggested control throws for initial flying trials.

I decided to adopt the 18 mm up aileron throw suggested, but limited the down travel by programming in 20% differential.

I thought that based on previous Spitfire experience that the stated 25 mm elevator throws were excessive so I set this up at a maximum of 20 mm each way. The rudder was left as suggested at 37 mm each way. I then applied exponential travel to all the flying surfaces to ensure a smooth control response.

The end point travel function was then used to ensure that the air-operating valve moved its full extent without stalling the servo.

This left the balance point. I had already guessed that there was going to be a certain amount of nose ballast required in order to achieve the correct position, despite the 1.20 size engine and the revised battery position. The desired C of G is 100 mm from the leading edge at the root. When tested, the model balanced at 115 mm. Four 2 oz strips of steel were added to the bottom of the engine mount to balance the model correctly.

The all-up-weight of the Spitfire came in at 11 lb 4 oz which, allowing for the nose weight, had exceeded the 9-10 lb quoted in the instructions. I think it would be difficult under any circumstances to

The superb matt finish just needs weathering; this Spit' does look so attractive

'the Spitfire really does fly superbly!'

achieve the manufacturer's suggested weight as the model is inherently tail heavy and additional nose ballast will be required.

Testing Times

Initial ground tests highlighted one retracting undercarriage problem. Having worked faultlessly, one of the units was now 'hanging up'. Having lubricated both units before use, the air pressure was holding up and I was satisfied the legs or wheels were not fouling the well liners. I returned to the workshop mystified, but tiny marks on the bottom of the plastic wheel well liners gave it away. The wheel retaining collets were 'bottoming out' on the liners when the undercarriage was retracted, and in the case of the offending unit, the interference was sufficient to seize the unit. I carefully made holes in the bottoms of both liners to relieve the collets, and cured the problem. (The latest models now come supplied with Air up/Spring down retracts for added security; Ed.)

Prepared for flight, and with final checks completed, the Spit was lined up into wind and the power slowly applied. Holding in a small amount of up to prevent any tendency to nose over, the model's tail quickly rose, and after a short run became airborne. One advantage of choosing a larger motor is the large reserve of power available! No more than 60% power had been applied, yet this resulted in a brisk take-off and positive climb out.

I was instantly drawn to the model's superb handling characteristics, and as the Spit' climbed away it immediately felt right! The trim seemed to be almost perfect, and a couple of clicks of down cured a slight tendency to climb. Before getting too carried away however, I settled into some gentle circuits in order to check the responses and general handling characteristics.

The model behaved impeccably! Even with the reduced elevator throw the pitch response could be toned-down even further. I had set up a lower rate of 80% throw, and with this selected the elevators were just about perfect. I couldn't fault the Spits' manners.

The manufacturer had made big claims about the slow speed handling, so it was time to test this. With power reduced to idle, the nose was increasingly raised until full up elevator had been applied. The model established a 'mushed' attitude in the air, and there was a pronounced wobble before the stall came. There was a very gentle wing drop to the right, but the release of the back stick instantly restored order. Very benign, and reassuring!

A series of low passes and scale-like manoeuvres only served to increase the buzz! Apart from the superb handling, what was pleasing was the way in which the oodles of reserve power could be used to stretch manoeuvres realistically.

The wind strength had increased significantly, and a quick glance at the windsock revealed that this was now horizontal and the direction had swung 45 degrees to the runway. Reassuringly the Spit' had handled the worsening conditions with ease, but it now presented a tricky landing approach, but was soon safely back on the runway.

Subsequent flights served to endorse the initial findings that the Spitfire really does fly superbly!

Conclusion

Producing an ARTF scale model to please everyone is always going to be a tall order, especially one as comprehensively packaged as this Top Gun model.

Overall, I think the manufacturer has succeeded and the model represents excellent value for money. Anyone wanting to get a Spitfire in the air quickly will not be disappointed and the flight performance is such as to please the most discerning of pilots!

I'm really looking forward to some more flights – it really is that good! The only thing to slightly detract from the overall 'wow factor' for me was the series of niggling faults, discrepancies and omissions that I have highlighted as most of these issues could have been readily resolved. A great model would then truly ascend! **RCMW**

Contact Details

CML Distribution
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SPECIFICATION

MODEL INFORMATION
Name: Spitfire Mk.IX
Manufacturer: Top Gun R/C Aircraft
Distributor: CML Distribution
Price: £299.99
Model Type: Scale (1:6.2)
Engine: .91 (2C) 1.20 (4C)
Test engine: OS 120 Mk.3 pumped four-stroke using modified OS standard four-stroke exhaust system
Construction: ARTF: Balsa and plywood

R/C FUNCTIONS
4 kg torque digital servos on all flying surfaces; standard servos on the throttle and air retract valve
1 Ailerons
2 Elevator
3 Throttle
4 Rudder
5 Retracts

MODEL DETAILS
Wingspan: 71"
Wing Area: 852 sq in
Length: 62.2"
Target weight: 9-10 lb (review model AUW 11 lb 4 oz of which 8 oz was nose weight ballast)

TEST
Dislikes
Vague instructions were totally lacking in parts, elsewhere described work undertaken during manufacturing
No info for thrust line
No retract information
Aileron horn screws too short
Difficulty fitting moulded wheel wells
Air retract couplers supplied were unsatisfactory
Structural integrity of retract mounting blocks in doubt
Necessity to include nose weight to achieve correct balance point

Likes
High quality of the components in terms of construction, covering and spraying
Outstanding quality and detail of moulded fuselage and cowl
Comprehensive hardware pack including complete air-operated retract system
Easy assembly
Outstanding flight performance and predictable characteristics
Overall excellent value for money