By 1937 it was becoming obvious to the U.S. that neutrality in world events wouldn't last much longer. In foresight, the Curtis-Wright Corporation redesigned their radial engine P-36 to incorporate an Allison 12-cylinder in-line engine. When the U.S. called for a new fighter that could be produced easily and inexpensively, the newly dubbed P-40 won out over newer designs like the P-38 Lightning due to its more proven airframe.

The P-40 was the workhorse of the US inventory. It developed an undeserved reputation as a poor fighter because it was outmaneuvered by the Japanese Zero, but what is often dismissed is the fact that the Zero outmaneuvered ALL U.S. fighters!

At first, it did not fare well in combat, but as time went on, tactics were developed to utilize the Warhawk's strengths and avoid situations where its abilities were lacking. The P-40's lack of a two-stage supercharger made it inferior to Luftwaffe fighters in high altitude combat and it was rarely used in operations in Northwest Europe. But between 1941 and 1944, the P-40 played a critical role with Allied air forces in three major theaters: North Africa, the Southwest Pacific and China. The P-40's high altitude performance was not as critical in those theaters, where it served as an air supremacy fighter, bomber escort and fighter bomber.

Now, the P-40 Warhawk is the latest of the Top Flite Gold Edition Series to be created in ARF form. Their attention to detail is outstanding on this model which is presented in the color scheme and markings of the most famous of the P-40 squadrons, The Flying Tigers!

Let's get started!
Name: Top Flite P-40 Warhawk

Price: $349.98
Stock Number: TOPA0970
Wingspan: 64.5" (1640mm)
Wing Area: 722 sq in (46.6 sq dm)
Weight: 9.75 - 10 lb (4420 - 4536g)
Wing Loading: 31 - 32 oz/sq ft (95 - 98 g/sq dm)
Length: 55" (1395mm)

Airfoil: Fully-symmetrical, low-wing
Center of Gravity: 3-1/4" (83mm) Back from the wing's leading edge
Radio Used: Futaba 10CG
Engine Used: O.S. 91 Surpass II
Battery Used: HydriMax 4-Cell 4.8V 2000mAh NiMH
Channels Used: 6 total - Elevator, Aileron, Throttle, Rudder, Flaps, Retracts

<table>
<thead>
<tr>
<th>Control Throws</th>
<th>High Rate</th>
<th>Low Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevator</td>
<td>Up &amp; Down 5/8&quot; (16mm) 11°</td>
<td>7/16&quot; (11mm) 7°</td>
</tr>
<tr>
<td>Rudder</td>
<td>Right to Left 1-1/2&quot; (38mm) 18°</td>
<td>1&quot; (25mm) 12°</td>
</tr>
<tr>
<td>Ailerons</td>
<td>Up &amp; Down 5/8&quot; (16mm) 14°</td>
<td>1/2&quot; (38mm) 12°</td>
</tr>
<tr>
<td>Flaps</td>
<td>1-1/2&quot; (38mm) 32°</td>
<td>3/4&quot; (19mm) 15°</td>
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The full-color box looks great and displays some of the scale features as well as recommended accessories and options.

While some of the contents on top had shifted a bit, it was nothing major and no damage was done. The lower compartment had all items completely intact.
Some of the more noteworthy items are the painted cowl (no decals here) the detail on the inside of the split flap (Note: the picture above was taken after the flap had been installed in the wing) and the scale cockpit; All of which add to the scale looks of the Warhawk.

Other items that caught my eye were the aluminum spinner, a set of fixed landing gear (in case you choose to opt out of using retracts) and a set of decals that denote the famous "Flying Tigers".

**Manual**

While the manual was excellent overall, there were a few simple omissions which were covered in an added addendum.

Download the manual

**FLAP AND AILERON HINGES**

The flaps are hinged with hinge points. You'll need to open the front of the holes a little to fit the bulky center of the hinges, but the hinges go in straight which makes alignment very easy. I used Epo-Grip #30 paste to epoxy the hinges in.
The ailerons use CA hinges which you cut to size from a sheet of hinge material. If you haven't seen it yet, please read my article on CA hinges. Even if you think you know how to install these hinges, the article is worth your time to read: A Closer Look at CA Hinges

AILERON AND FLAP SERVOS

After you epoxy the hardwood blocks to the hatches, the servos can be mounted and the hatches installed. Be sure to harden all holes with thin CA. Each pocket has a pull string installed for routing the servo wires.

Now the pushrods for the flaps and ailerons can be formed and installed using "L" bends and "FasLinks".

WING ASSEMBLY

The landing gear mounts get epoxied into the wing. I will be using the supplied fixed gear for now, but I intend to upgrade to retracts in the future, so I installed a pull string now for pulling the air lines through at a later time.
Now it's time to join the two wing halves. Again, here I used Epo-Grip #30 paste which, as it turns out was the perfect adhesive to use as the joiner was a bit loose, but the #30 paste easily filled any gaps without oozing out of place.

The belly pan comes next. With the wing mounted to the fuse, you align and mark the pan, remove the covering, and epoxy the pan in place.

As I said earlier, I'm going to use the fixed gear for now. Top Flite provides an interesting gear arrangement where the fixed gear are mounted into plugs which fit the same mounts used for the retractable gear unit.

The addendum warns that the fixed gear's wire must sit above the surface of the plug, so a shim might need to be used - and indeed, it was. I found that a small strip of a plastic outer pushrod tube worked perfectly for this.

Finally, the wheels and fiberglass covers are added and the wing is complete.

TAIL SECTION
The tail section begins by installing the stab, aligning it and marking the covering with a felt-tip pen. The lines are now used as a guide to remove the covering and the stab is epoxied in place. For this, I used 30-Minute Epoxy.

Next, the rudder and elevators are installed with CA Hinges.

As you attach the rudder, the tail wheel assembly is also epoxied in place.

Now the Control horns are added. Do not forget to remove them and harden the mounting holes with thin CA.

ENGINE AND TANK
The tank components are packaged together and Top Flite supplies everything needed for a 3-Line system.

Once the tank was assembled, I used some colored DuBro fuel line for easy reference.

The tank slides in behind the firewall and will be secured with the throttle servo tray.

The engine mount can now be installed. Blind nuts are pre-installed in the firewall, so the mount just screws right in. Now the engine can be placed and marked for an 8-32 tapped hole.

Using an optional 90° exhaust header, you can fit the muffler completely inside the cowl.

OS FS-91 II Surpass Closer Look

The OS 91 four stroke is a ringed piston engine which puts out 1.6bhp while weighing in at only 23 oz with muffler. It's practical rpm range is 2,000 to 12,000 rpm. Full specifications are below:

- Bore: 27.7mm (1.09")
- Stroke: 24.8mm (.976")
- Displacement: 14.95cc (0.912 cubic inch)
- Power Output: 1.6 BHP at 11,000 rpm
- Practical RPM Range: 2,000 - 12,000 rpm
- Crankshaft Thread Size: 5/16" x 24
- Weight: w/o muffler- 21.3 oz (603g) with muffler- 23.0 oz (655g)

The manufacturer recommends this engine be run on fuel containing 5% to 15% nitromethane and oil content at a minimum of 18%. I chose to use Cool Power with 15% nitro and 18% synthetic oil as I've found it runs extremely well in all my engines and especially the 4 strokes. The synthetic oil helps to keep the 4 stroke cleaner while castor can gum them up over time.

Some of the advantages of the 4 stroke engines are fuel economy, their ability to swing a larger prop, and (My favorite) that cool 4-stroke sound!

Props recommended by the mfg. for the OS 91FS are:
- Stunt planes: 11 x 11-12, 12 x 10-12, 13 x 9
- Scale models: 13.5 x 8, 14 x 7, 15 x 6, 16 x 6, (12 x 8 & 12.5 x 7-3 blade)

The prop used for this review was a Graupner 14 x 7

This version II of the OS 91 sports more power than its former model and comes with a full 2 year warranty from OS.

Download the manual in PDF format - Click here

RADIO INSTALLATION
With the engine in place, you can now mount the throttle servo. There is a pushrod tube pre-installed on both sides of the engine, so all that's left is to bend a pushrod to shape and secure it with the provided connectors.

The rudder and elevator servos mount in the rear of the compartment. The two elevator pushrods connect to one servo. There is not much room back there, but the manual guides you through the process very nicely.

Next, the battery and receiver are installed with Velcro. I used some 1/4" DuBro foam under each. Finally, I added a DuBro DuBro Kwik Switch & Charging Jack.

**COWL**

Cowl installation is typical, but here again is one of the notes from the manual's addendum - In the manual, the bottom, rear screw is 1 1/4" from the bottom and the measurement from the bottom screw to the top screw is listed as 4 1/4". In reality, the top screw is 4 1/4" from the **bottom of the plane**, but only 3" from the **bottom screw**.

I added a Graupner 14x7 prop and the spinner and she is lookin' good!

**COCKPIT**
Top Flite provides an easy-to-install scale cockpit that really adds to the looks. I added a Century Jet Models pilot for added realism.

**OPTIONAL RETRACTS**

If you choose to install the optional retracts it's an easy switch from the provided fixed gear. The retracts just bolt right in, then you measure and cut the struts and axles to size.

The air tank fits into an opening in the rear fuse and a place is provided for the air valve servo and the valve itself. A bracket is provided if you are using the new Top Flite retracts, but I was using Robart's. I found that by enlarging the pushrod hole, I could make a bracket from scrap plywood to which I could mount the valve. Then the bracket can be screwed in place.

**FINISHING**

To finish things off, I mounted the air inlet valve just below the remote glow fixture and the canopy was glued in place with Pacer Formula 560 Canopy Glue. I also replaced the supplied canopy screws with some socket head screws.

**BALANCING**
I rarely say much about balancing, but I have to make an exception here. The P-40 needs a whopping "Hunk-O-Lead" up front. Mine required 22oz to balance at the recommended CG.

Now, I can imagine that a lot of people out there are breaking out in a sweat over that - Relax, adding that much weight to a warbird is not unusual, nor is it anything to get excited about. Since the advent of 3D flying, a lot of people think that adding weight is some sort of sacrilege - it's not. It is far more important that the plane is properly balanced than you skimp on weight for the sake of skimping on weight.

That said, if you're one of those people who would rather die than add dead weight, there is plenty of room on top of the engine mount to "piggy-back" a plywood plate to which you could mount the battery. This may not completely eliminate added weight, but it will save you quite a bit.
Due to production delays, I didn't receive the P-40 until late October - which in Minnesota is like mid-winter for most of the country. By the time I had her ready, the weather had turned pretty bad and before long we had a good blanket of snow on the ground. My only hope of flying it before spring would be to make a trip down to Florida to visit my folks.

I wasn't really looking forward to doing that drive again, but as it turned out, my friends Loren and Garret were driving down there with their wives in late February and were kind enough to haul a few airplanes down there for me (it's good to have friends in this hobby!). So I flew down to West Palm Beach, and my dad and I drove up to Orlando to meet up with the guys.

Back at my dad's field a few days later, we fueled her up and cranked over the OS 91 for the first time. She sprang to life like a well-used engine (I even had the needle set perfectly!). In no time she was taxiing out to the paved runway. A few medium-speed taxis showed her to be a little squirrely on the ground, but this is not uncommon for a plane with such a narrow undercarriage.

Once I got the feel for how it rolls, I went to the far end of the runway and poured the coals to it. It took a good amount of right rudder, and even then she was pulling to the left. Once airborne, I needed a fair amount of right aileron trim to get her flying hands-off, (which explained the tendency to pull to the left so much on takeoff) but once she was trimmed out, she flew steady and true.

I then put it through a few basic maneuvers. Rolls were very scale-like and loops tracked very well. In fact, it flew with a very scale feel throughout the flight. The full-scale P-40 was no aerobat, it was a workhorse, and this Top Flite model was very true to the nature of its namesake. She feels heavy, yet she can pull some surprisingly good aerobatics, and the 91 Surpass was an ideal choice of power!

After a few more circuits, it was time to land. Once some speed had been bled off, the flaps were lowered and very little ballooning occurred. The gear came down nicely and she settled in on a perfect final. Knowing that the plane has a heavy wing loading, I didn't allow it to get too slow - I just flew it to the ground. She touched down on the mains and I slowly allowed the tail to drop. A few more landing attempts proved that you really need to keep a little speed going. This baby will not "float" in and if you try to do so, it will most likely stall and fall.

The weather conditions were perfect and my buddy Jim Record was at the field that morning, so I asked him to take the sticks while I shot some video. Jim was happy to oblige, so I got out the cameras and started shooting.

Check out the video to see her in action!
The Top Flite P-40 Warhawk is not a sport plane disguised as a warbird, and anyone who is less than an experienced pilot will find takeoffs and landings more than they bargained for. She looks great in the air or on the ground and she’s a very steady, rock-solid flier. Assembly is very well engineered. A few basic building skills are required, but nothing too difficult and assembly time is just under 20 hours. So if you are a warbird fan who has always dreamed of having a true-to-scale P-40, this is it!

Comments on RCU Review: Top Flite P-40 Warhawk

Posted by: Kostas1 on 05/30/2011
Excellent review! Well done! Ah and a friendly suggestion.... Use some glow fuel tubing with small diameter between the washer and wing servo hatches.....it will absorb the vibration and work as a safety-lock.... It worked really great on my GreatPlanes Cherokee 40 ARF : http://www.rcuniverse.com/forum/fb.asp?m=10542903

Posted by: LUM on 06/01/2011
Nice flying, curious why the warning on wing loading? I did not see your final weight, but earlier reports were good on weight vs the Gold Edition kit built verion. Also do you feel right thrust (engine) will take all the right aileron trim needed out or at least some?

Posted by: MinnFlyer on 06/01/2011
Could a retractable tailwheel be installed without too much trouble? Jake

Posted by: rcjake on 06/01/2011
Double post...sorry! Jake

Posted by: rcjake on 06/01/2011
Triple post??? Sorry, AGAIN!!! Jake

Posted by: MinnFlyer on 06/01/2011
I don’t see why not

Posted by: EFHANC on 06/01/2011
$350?

Posted by: MinnFlyer on 06/01/2011

Top flite are more expensive than some, but the quality makes up for it.

Think a 1.20 size 4 stroke is too much?

The comments, observations and conclusions made in this review are solely with respect to the particular item the editor reviewed and may not apply generally to similar products by the manufacturer. We cannot be responsible for any manufacturer defects in workmanship or other deficiencies in products like the one featured in the review.

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<table>
<thead>
<tr>
<th>Photo</th>
<th>Manufacturer</th>
<th>Product</th>
<th>Summary</th>
<th>Reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTIV</td>
<td>“M-Code” Brushless RC Moto</td>
<td>Ok, enough about Paul because this article is about the MOTIV line of “M-Code” line of motors. The “M-Code” motors come in ma...</td>
<td>12/06/2015</td>
<td></td>
</tr>
<tr>
<td>Trinity</td>
<td>D4 1S</td>
<td>In late June, 2014, Trinity released the D4 motor to replace the D3.5. Since that time, the D4 has powered cars to 8 ROAR Nat...</td>
<td>12/06/2015</td>
<td></td>
</tr>
<tr>
<td>Matt Lemay</td>
<td>Airbrushing – Take Your Painting To</td>
<td>I've decided to create a series of articles dedicated to helping the average hobbyist get into, or at least consider whether ...</td>
<td>12/06/2015</td>
<td></td>
</tr>
<tr>
<td>Tamiya</td>
<td>Amarok Custom Lift</td>
<td>As an official vehicle of the 2014 Sochi Olympics, Volkswagen built specialized polar edition custom lifted Amarok vehicles u...</td>
<td>11/24/2015</td>
<td></td>
</tr>
<tr>
<td>Tower Hobbies</td>
<td>J-3 Cub</td>
<td>With its distinctive looks, it is probably safe to say that the J-3 Cub is one of the most recognized and known airplanes in ...</td>
<td>11/23/2015</td>
<td></td>
</tr>
<tr>
<td>Traxxas</td>
<td>Slash VXI Brushless with OBA</td>
<td>In June, I tested and wrote about the Traxxas Slash w/ OBA and how much I enjoyed what the Slash offers. It's been a goto veh...</td>
<td>11/23/2015</td>
<td></td>
</tr>
<tr>
<td>RCGF</td>
<td>21cc Twin Cylinder Gasoline Engine</td>
<td>RCGF, a Chinese manufacturer of gasoline engines, designs and manufactures engines specifically for 'the RC aircraft market. ...</td>
<td>11/23/2015</td>
<td></td>
</tr>
<tr>
<td>RCGF</td>
<td>120cc Twin Cylinder Gasoline Engine</td>
<td>RCGF, a Chinese manufacturer of gasoline engines, designs and manufactures engines specifically for the RC aircraft market. T...</td>
<td>11/23/2015</td>
<td></td>
</tr>
<tr>
<td>Seagull Models</td>
<td>Maule Super Rocket 10-15cc ARF</td>
<td>When Seagull Models announced that they were going to produce not just a model, but an ARF of the Super Rocket, I just had to...</td>
<td>11/22/2015</td>
<td></td>
</tr>
<tr>
<td>Flitework</td>
<td>Edge 540</td>
<td>The Flitework Edge 540 is an electric only ARF airframe with a generous wing span of 66.9&quot; and also beautifully dressed up in...</td>
<td>11/21/2015</td>
<td></td>
</tr>
<tr>
<td>Seagull Models</td>
<td>Steen Super Skybolt 15cc ARF</td>
<td>Seagull Models introduced this biplane early on in 2015, and SIG mfg. had a pre-production sample at the Toledo Expo. That pr...</td>
<td>11/20/2015</td>
<td></td>
</tr>
<tr>
<td>ST Model</td>
<td>Salto</td>
<td>ST model brings us a fun aerobatic glider with the H101 Salto. The self-launch electric glider has no bad tendency and will b...</td>
<td>11/19/2015</td>
<td></td>
</tr>
<tr>
<td>RCGF</td>
<td>10cc Gasoline Engine</td>
<td>RCGF, a Chinese manufacturer of gasoline engines, designs and manufactures engines specifically for ‘the RC aircraft market. ...</td>
<td>11/17/2015</td>
<td></td>
</tr>
<tr>
<td>Seagull Models</td>
<td>Funky Cub 10-15cc ARF</td>
<td>The new Funky Cub has some really cool attributes, borrowed from scale aircraft, that should add up to make it a great flying...</td>
<td>11/16/2015</td>
<td></td>
</tr>
<tr>
<td>RCGF</td>
<td>20cc Gasoline Engine</td>
<td>RCGF, a Chinese manufacturer of gasoline engines, designs and manufactures engines specifically for ‘the RC aircraft market. ...</td>
<td>11/15/2015</td>
<td></td>
</tr>
</tbody>
</table>