TIGER 50 ARF

Audacity Models

By John Benario

The Tiger 50 is a new entrant into the 50 size market. It is produced in Korea and imported in the U.S. by Audacity Models. A previous version was sold in Europe by Robbe, although the Tiger has undergone many changes from that version and is essentially a different model. The Tiger is available both as a kit and as an ARF. The model provided to RCM was an ARF, but as my regular readers know, the first thing I do with an ARF model is take the model apart and then put it back together to inspect the construction and fit of the parts.

The Tiger is similar to a Venture, but with Sceadu style sideframes. The goal was to incorporate the best ideas from both helicopters. The rotor head uses CCPM, and the cooling fan is very good for the 50 size engine, like the Venture. The sideframes have a rear fuel tank position and the tail rotor control is a pitch fork design similar to the Sceadu. The tail rotor is not driven during autos, making the Tiger 50 suitable for learning autos. A slipper unit is available for just the cost of postage for those pilots who want a driven tail. Simply register your Tiger with Audacity Models.

Since the Tiger is an Asian model I was expecting to use JIS screwdrivers on the crosspoint bolts. It turned out that the crosspoint bolts didn't really match JIS or Phillips. This was my first indication of the unusual fasteners. The socket head bolts that the Tiger uses are soft steel, which is not an issue for bolts that hold plastic parts together, but I rounded the socket on one of the engine mount bolts. I ended up replacing the bolts that hold the engine to the mount and hold the mount to the frame with normal 3mm socket heads from my hardware cabinet.

The Tiger 50's Kit and box .

Reviewer's Note: Some months ago, Audacity Models provided RCM with the Tiger 50 to review. At that time, we did not feel that the original model adequately lived up to the expectations of Audacity, so we provided our comments to Audacity Models and are pleased to report that Audacity not only addressed our concerns but made additional improvements. The above review is of the Tiger 50 as it is now being supplied by Audacity Models. The Tiger is now provided with an extra parts bag containing a longer radio tray, a dual ratio seesaw with button head bolts, improved servo inserts, instructions for the swashplate ball spacers, and a shoulder bolt for the head.

SPECIFICATIONS

Heli Type
Beginner-Intermediate
Mfg. By
Audacity Models
Box 952765
Lake Mary, Florida 32795
ph. (407) 302-3361, fax (407) 302-3363
www.audacitymodels.com
Expected Street Price
$280-$300
Available From
Both Mfg. & Retail
Main Blade Included
Yes, 600mm, Wood
Tail Blades Included
Yes, 85mm, Plastic
Rotor Span w/600mm Blades
52.5 Inches
Tail Rotor Span w/85mm Blades
9.5 Inches
Overall Length
47 Inches
Mfg. Rec. Engines
50-size

Frame Material
Plastic
Rotor Head Material
Plastic
Main Gear Ratio
8.9:1
Tail Gear Ratio
5.24:1
Tail Boom Material
Aluminum
Tail Gearbox Material
Plastic
Tail Fin Material
Plastic
Tail Drive Type
Belt
Instruction Book
61 pages
Set-up Inst. plus Assembly Inst.
Yes

RCM REVIEW MODEL

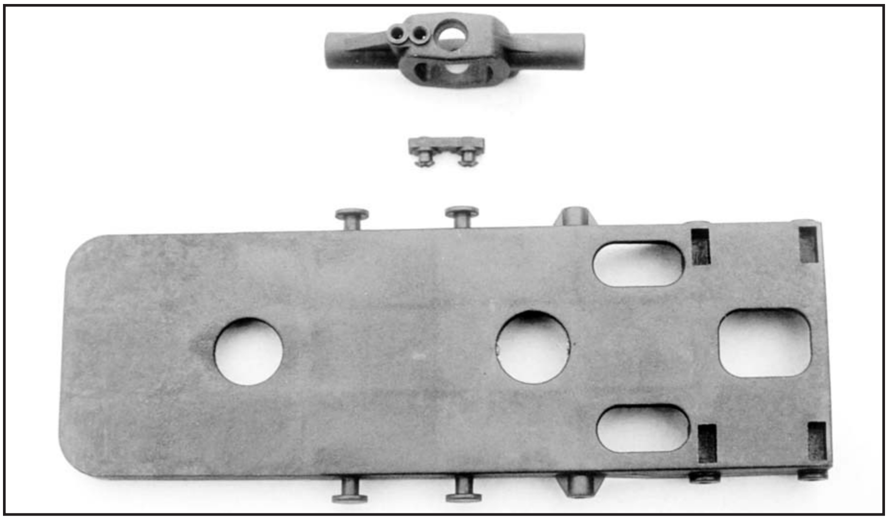
Weight
122 Oz. (7 Lbs. 10 Oz.)

Engine Make & Displacement
O.S. 50
Muffler
Hatori 666
Main Blades
V Blade 600 N
Tail Blades
Included
Radio Used
Futaba 7CHP
Gyro
Futaba 401
Servos
Futaba 9202 (for Pitch, Roll, Collective, Throttle, and Tail Rotor)

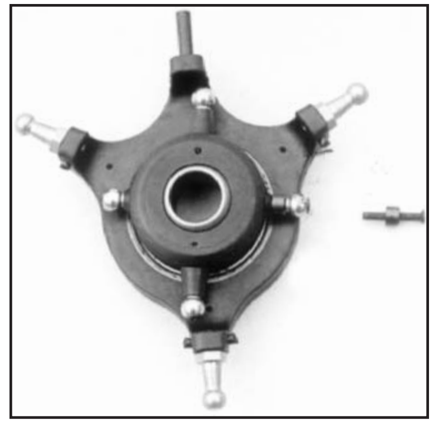
SUMMARY

WE LIKED THE:
Wide range of cyclic set-up, high power tail rotor.
WE DIDN'T LIKE THE:
Low main gear ratio, tight ball links, soft bolts.

The Tiger 50 with the Futaba 7C transmitter.



The new seesaw with adjustable flybar ratios, the new servo inserts and the longer radio tray.



The swashplate ball spacers. One is installed on the right ball with the other spacer and long bolt next to it. Note the difference between the stock configuration on the left and the ball that has been spaced out on the right.

For the crosspoint bolts I used the best fitting crosspoint screwdriver I could find for each bolt.

Green Loctite , #290 (Permatex 29000), was used where necessary.

I'll follow the sequence of steps in the instruction manual and provide my comments.

Step 1.3: The elevator bellcrank has a neat clamp feature that allows one to compensate for wear and keep the bellcrank slop free. The Tiger bellcrank dimensions are not a 1:1 ratio, but rather is a throw reducer. The reduction in throw will be accounted for later during radio set-up.

Optional parts from Audacity: 3D paddles and flybar, a fan hub for the O.S. 50 Hyper, and hard and even harder dampers.

Step 2.1: The original servo inserts that are installed in the frames allow the servos to move in the adjustment slots. The movement is not an issue for the roll and collective servos, but for the elevator servo, the movement is in the same direction as the pushrod movement, which makes precision flying difficult. The new servo inserts are molded such that they do not allow the servos to move in the slots. The original inserts are simply pushed out of the slots and the new inserts are snapped in place.

Step 3.3, 3.4, 3.5: The included fan hub is designed for use with the standard O.S. 50 which includes a thrust washer. The O.S. 50 Hyper engine does not come with a thrust washer; however, a taller fan hub is available from Audacity for use with the Hyper. As mentioned above I replaced the soft engine mount bolts with normal hardened bolts. *(Editor's Note: Audacity Models is now including hardened engine mounting bolts in all models.)*

Step 4.1: There is a note stating that for 3D flight the short balls on the swashplate should be extended. The note, however, does not mention that the spacers are included along with long 2mm bolts in the servo hardware bag. The instruction supplement now details the installation of the spacers.

Step 4.2, 4.3, 4.4: The head on my ARF model was balanced very well; however, when I disassembled it I found that the 4mm nuts that hold the blade grips on the spindle were not fully tightened. Regardless, the blade grips should be removed from the spindle to grease the thrust bearings. The instructions state that the bolt that holds the head on is a 3 x 20mm shoulder bolt. The bolt in my kit was not a shoulder bolt, and that fact coupled with the soft steel used in the kit bolts concerned me. A non-shoulder bolt is probably satisfactory for a 50 size model, but I replaced the bolt with a shoulder bolt, and a shoulder bolt is now included with the kit.

While I had the head apart I changed the seesaw to the new piece with the adjustable flybar ratio. The new seesaw is made from a very strong plastic and requires care when pressing the bearings in. As per my norm I installed 1/8" wheel collars on the flybar for balancing.

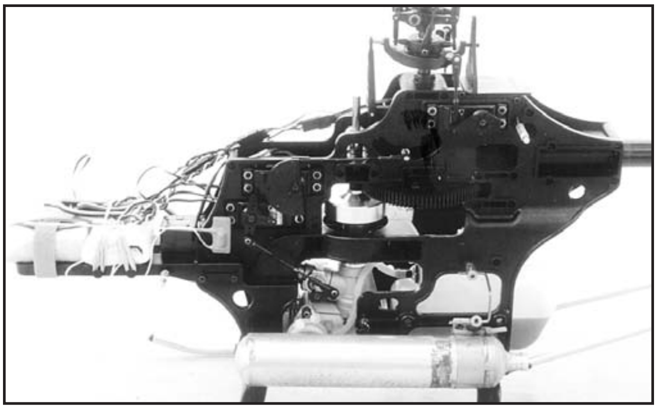
Step 4.5: There is a note stating that the "HD" on the ball links should be away from the ball when the links are snapped on. There is no "HD" molded on the links, but the links are unidirectional. The side of the link that faces the ball has an "indented" ring circling the hole.

Step 5.4: One of the 3mm nuts holding the blade grips on the tail rotor hub was not tight on my model. The tail rotor hub has two setscrews 180 degrees apart. Only one setscrew should be used, otherwise a "seesaw" rocking can occur with the tail hub. The tail rotor balanced easily by drilling a few holes in the tip of one blade with a number 60 bit.

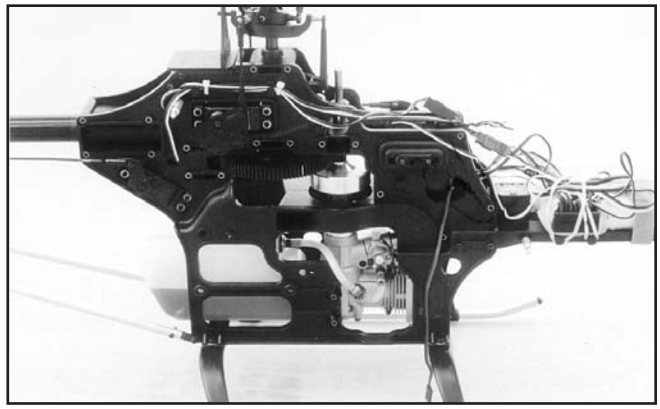
Step 5.7: The sideframes did not hold the tail boom securely even when the boom bolts were tightened fully. I wrapped electrical tape around the tail boom on the part that goes in the sideframes to make the fit tight.

Step 6.3: The tail rotor pushrod guides were a loose fit on the tail boom. I put small strips of electrical tape inside the guides so they would hold tightly. The tail pushrod guides on the Tiger are an ingenious design with a floating ball that supports the pushrod. It was very easy to get a perfectly free pushrod run. This one item saved me about an hour compared to some other designs.

I drilled two holes in the horizontal fin so that I could get an Allen wrench to the tail boom clamp bolts without removing the fin. With the belt drive it is good to be able to adjust the belt tension without having to remove parts.



The main frame left side.



The main frame right side.

The pitch fork tail rotor control.

The ball links were molded to be similar to the original Rocket City links. An unintended consequence of this goal was that the hole for the pushrod is sized for 2mm threads and the pushrods on the Tiger use the now standard 2.3mm thread. I discovered this fact when I tried to thread the links on the long tail pushrod and the fit was so tight I couldn't hold the wire securely enough to keep it from spinning. The links should be drilled out with a number 44 bit to fit the 2.3mm thread. The preassembled pushrods are hard to adjust because the fit of the links is so tight. It would be worthwhile to unscrew one link from each flybar and blade pushrod and drill out so that those pushrods can be adjusted easily.

Step 7.1: The servo pushrods come preassembled. The pitch and roll pushrods were close to their final length, but I had to lengthen the elevator pushrod for my Futaba servo. The pushrod used for the elevator servo is 50mm long, which only left about 4mm of thread in the links after I lengthened it. While 4mm of thread is probably sufficient, especially for beginner level flying, I wanted a higher comfort level so I replaced that pushrod with a 65mm one. While I had the two links off the pushrod, I drilled them out with a number 44 bit.

I mentioned above the elevator bellcrank is not a 1:1 ratio. I discovered this fact when I was setting up my Tiger. With 120 degree CCPM there is a bump in the swashplate when a large elevator command is given because of the different distances the elevator servo travels compared to the pitch and roll servos. In addition to the elevator bump, I noticed a bump in the swashplate when I gave a collective command, which I traced to the reduction in throw in the elevator linkage caused by the elevator bellcrank. I ended up with 114/113 on the elevator ATV with 100/100 on both the pitch and roll servos to account for the bellcrank. These values were determined experimentally using the standard procedure for eliminating interaction in CCPM, as I described in the February 2004 Hover.

To power my Tiger, I used an O.S. 50 (non-Hyper), in my opinion, the most perfect helicopter engine made (I haven't tried a Hyper yet), and a Hatori 666 60 muffler that I have fitted to the O.S. 50. A Futaba 7CHP radio handles the control, with 9202 servos and a 401/9253 gyro and tail rotor servo. Even with the longer radio tray the Tiger is still tail heavy. For those who are interested in getting the C.G. on the main shaft, the quick fix is to replace the aluminum tail struts with carbon or aluminum arrow shafts.

The gear ratio for the Tiger is 8.9. Audacity has gone the way of Thunder Tiger and Hirobo by using a gear ratio that is a bit too low for the O.S. 50. The 8.9 ratio yields an ideal in-flight RPM of about 1950, which is a bit faster than I like. The tail rotor ratio, however, is very good at 5.24. Tail rotor control on the Tiger is not an issue.

I first flew the Tiger in the as-delivered condition with the included wood blades. The wood blades flew as well as can be expected from heat shrink covered blades, good enough for learning to hover, but they did not stay in track with large pitch changes. I then changed over to my trusty V-blade 600 N's.

The cyclic on the Tiger out of the box is set up for hovering and forward flight only. With the stock thick paddles the Tiger is extremely stable and smooth. A beginner would do well with this set-up. It was only possible to do very gentle aerobatics with the stock configuration.

I then added the spacers to the swashplate balls and changed to the 3D paddles and flybar that Audacity offers. The 3D paddles are very similar to the KSJ design. With this arrangement the Tiger was a completely different helicopter. Very quick response but still smooth and not pitchy in forward flight. It was at this point that I realized how much I have come to depend on the governors. I am not used to the RPM bogging as I fly through maneuvers!

For the next day I changed to the harder yellow polyurethane dampers and moved the mixing levers to the inner holes on the new seesaw. I discovered the 3mm seesaw bolts interfere with the mixing levers in the inner hole so I changed the seesaw bolts to 3 x 8 button head bolts which provided the necessary clearance. Two 3 x 8 button heads are now included with the new seesaw.

With the harder dampers and the lower flybar ratio the helicopter was very responsive. Engine bogging became a real issue since the control is so powerful. I have not determined if I can use the p-mixes in the 7C for swashplate-throttle mixing, but the obvious solution would be to install a governor.

The cyclic control available with this last configuration, coupled with the very capable tail rotor make the Tiger an excellent 3D practice helicopter.

With the included improvements provided by Audacity Models, the variation available in control set-up allows the Tiger to be set up anywhere from very docile to very responsive. This makes the

Tiger a very good one-stop-shopping helicopter that a beginner can start with and then use all the way through beginning 3D flying. The plastic parts are made out of an extremely strong material and most should never break, which coupled with the low cost of the metal parts makes for a low stress 3D trainer model, as well as a low stress beginner model. Additional information is available at:

www.audacitymodels.com

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