Hirobo Shuttle RG

IT'S BEEN SAID that if it looks like a duck, walks like a duck, walks like a duck and sounds like a duck, then it must be a duck. Though Hirobo Shuttles have been around since 1985 and are probably responsible for introducing more modellers to R/C helicopters than any other helicopter, they all kind of look the same, are built the same and fly the same-until now, that is, as Hirobo has introduced the Shuttle RG (Revolution Gold) .30-size helicopter.
The Shuttle RG is totally new and features a metal stacked-frame chassis and a new high-performance metal SZ-III rotor head. After checking out the world-class .60-size Eagle II at the Hirobo Cup this past fall, I can see where the design came from. This .30size heli looks like Hirobo shrunk an Eagle II, which is not a bad thing because Manabu Hashimoto won the 1997 F3C Helicopter World Championship using a Hirobo Eagle IIEX. Perhaps Hirobo should have named this new heli the "Eaglet"?
Other Shuttle RG features include closed-loop push/pull linkages on both cyclic controls (elevator and aileron), all-metal construction, ball bearings on all pivot points, a beautiful gel coated fibreglass canopy, new larger tail fins for better forward flight stability and a top start system.

WHAT'S IN THE BOX
When you open the box, you are immediately struck by the packaging. All of the pre-assembled components, such as the rotor head, tail gear, main gear, swashplate, washout assembly, clutch bell housing and bearing blocks are in a windowed foam shadow board box. The quality of the workmanship is very evident. The metal rotor head really jumps out at you; it's black anodized with natural metal highlights. The rest of the kit is in two boxes: one holds all the various parts in numbered bags that correspond to the numbered steps in the construction manual; the other contains the fibreglass canopy, tinted windshield, colourful decal sheet, construction manual and safety notes. Also, the tail boom and boom supports are painted white-a very nice touch. The kit does not include main rotor blades; a lot of other high-end heli kits no longer include main blades. I guess the manufacturers feel that the buyers already have a preference in this area and would not use the included blades. I wish that manufacturers would stop this trend, as some modellers cannot afford expensive glass blades after buying the kit.

CONSTRUCTION NOTES
This review is not intended to be a blow-by-blow breakdown of each assembly step. Instead, I'll cover those areas that need special attention or are not so obvious in the construction manual. So let's get started!
Elevator assembly; First mount the ball link ends to the A-arms because once the A-arms have been mounted on the elevator lever, getting to the screws that hold the ball links in place would be more difficult. There are several tiny washers in this assembly. Be sure to use them; they are spacers that prevent the pivot bearings from binding when the mounting bolts are tightened down. Also use a drop of Loctite* on the setscrews that hold the elevator pivot shafts in place.
X-levers; The screws that hold down the balls stick out past the moulded boss. These screws need to be ground down a little, as they will interfere with the pushrods when mounted. I used a Dremel tool with a stone to accomplish this.
Upper frames; First I check the frames for straightness; I use a large piece of plate glass to do this. I lay the frames on the glass to see if they are bowed. If they are, I gently tweak them until they're flat. Mine were OK. Next, two flanged bearings must be pressed into the frames. To avoid stressing the bearings, I put them in the freezer for about half an hour; after that, they just drop into place. When placing the bearings in the frame, make sure you make a left frame and a right frame. When the frames are assembled, the flanges on the bearings should face toward the inside of the frames. Before I start to tighten the frames together, I use the main shaft in the upper and lower bearing blocks to align them. Most important is to make sure that the frames are square and level with each

other. The rest of the upper frame assembly is simple and covered well in the manual with no surprises.
Engine/drive assembly; First, the cooling fan is mounted to the flywheel. The instructions are good here, but there's no mention of balancing or dial-indicating the fan and clutch; these tasks should be done now. The engine/cooling fan and clutch assembly are now mounted to the lower frames along with the cooling shroud. Again, just like the upper frames, make sure the lower frames are square and level before you tighten the bolts. The upper and lower frames are now mated. There are many spacers and bolts here; be sure to use the correct length bolts, as indicated in the instructions. The starter shaft and clutch bell are also installed now; be sure to lightly grease the starter shaft for smooth operation. When installing the fuel tank, be sure to put two layers of the supplied servo tape on the front of the tank to prevent it from chafing against the vertical frame support.
The pre-assembled main gear is installed next. You now must decide whether you want a driven tail rotor during auto rotation's. Two shims of different sizes are to be installed under the main gear. Beginners should not use these shims because if the engine sputters or runs rough, the tail rotor will kick. Be sure to pull up on the main mast tightly before you tighten the mast lock. The gear should have no up or down play in it.
Seesaw/flybar; Assemble the seesaw and flybar assembly and join to the pre-assembled SZ-III main rotor head. No surprises here; just make sure the flybar is centred and the paddles are screwed on equally. Speaking of the paddles, Hirobo has finally changed them for this kit; gone are the paddles that must be covered. Also, the new paddles have weights in them that can be removed for quicker cyclic response.

 I splurged and bought a CSM* heading-lock gyro and the new JR* 2700 Super Servo for the tail. Is it ever neat! Response is really quick and precise. I tend to fly without heading lock most of the time because practicing tail-rotor control is something that a beginner should do-a lot. But it's pretty neat to turn the heading lock on when I practice hovering at new attitudes and attitudes, as I can work on the visual aspects of hovering with the heading lock helping me to maintain helicopter orientation. I'm using my trusty JR8103 transmitter to talk to this hardware.
I didn't like having to go hunting under the RG for the glow plug during the start-up procedure, so I wash-out unit and swashplate; be sure to use Loctite on the screws. The swashplate, washout assembly, radius block and main rotor head are now slid onto the main shaft. Be sure to line up the radius block per the manual; if you don't, the cyclic response will not match the transmitter commands.
Tail rotor; The tail box is pre-assembled, but grab the output shaft and see if there is any play back and forth. If there is, it must be eliminated. The kit provides shim washers for this, but no mention of them is made in the manual. If you need to remove any play (as I had to), remove the left side plate (you need to do this anyway to install the drive belt on the pulley), and use the appropriate number of shims. I needed only one shim. An improvement that Hirobo made in the tail rotor is in the blade grips; there are now two radial bearings to support them. The drive belt is snaked down the tail boom, and the tail rotor assembly is installed in the tail boom along with the vertical fin. The boom is now mounted on the chassis and the belt tension is adjusted per the manual. Be sure the drive belt is twisted as illustrated in the manual. Install the horizontal fin and boom supports, and that completes the basic helicopter.

RADIO INSTALLATION AND SETUP
Servos are installed in the chassis using the supplied spacers and screws. Pay attention to the placement of the spacers. If you're confused, check the pictures on the box; this will help make their positions obvious. Next, make up all the pushrods to the lengths stated in the manual (a handy metric ruler is printed on the page). Follow the manual for pushrod installation and for servo-arm placement. Hirobo has done a great job of clearly illustrating where the pushrods attach to the servo arms and how all the bell cranks and levers should be in relation to one another. Once this has been done, you can use the graphs in the back of the manual to set up the pitch and throttle curves. Now

assemble the canopy, decal the model, do a final check of all components, and it's finished-ready for flight.

FINAL THOUGHTS

The Hirobo Shuttle RG is a very high-quality, top-of-the-line, all metal .30-size helicopter. It assembles quickly and easily; I had no problems with any parts fit. While the manual could use a few more written notes, the exploded illustrations and full-size drawings of the small parts for each assembly step do help make assembly easy. Flight performance is outstanding, as it should be, considering what its big brother is. Even though it's a .30-size heli, it feels much more like a .60-size heli, only lighter. After several gallons of fuel through it, the heli shows no sign of any wear; I've only had to keep it clean. All in all a very nice helicopter that will give many years of service. I also installed a KSJ* remote glow extension. While I was talking with the KSJ guys, I also got one of their new tail-brace supporting bridges (KSJ535). This really stiffens up the tail and looks cool, too.

I installed a Century Helicopter Products 2-ounce header tank. I'm a big advocate of header tanks in both airplanes and helicopters, and this thin, square tank is a great solution, as it fits so nicely against the heli frame. if you need info on installing such a tank, check my diagram and description in "Getting Started in Helicopters" in the November 1998 issue. They really help improve fuel flow, and in the case of helicopters, they give you a good indication when you're into the last 2 ounces of fuel.

One last thing I did was install a YNT uDesign* (YNT stands for "You need this") BC-6 flight monitor. I figured that if I was going to fly a first-class helicopter, I should have first-class battery monitoring. The YNT monitor reports the lowest voltage experienced during a flight, which provides a much better indication of battery condition than checking them on the ground without flight loads on the control system.

But the BC-6 provides a lot of bonuses that are well beyond a battery monitor. First, it will report the number of glitches the radio saw during the flight. It also has a "lost-model locater," which amounts to a beeper that goes off if your radio loses signal. I'm unlikely to lose my helicopter, but I've found this to be one of the most valuable parts of the BC-6. There are two reasons I say that: first is that if I fail to turn my transmitter on (ever had a hot start on a heli because you forgot to turn the TX on?), I'll get a beeping noise that reminds me to turn it on; second, heading lock gyros require a calibration period before they will activate. With the CSM, this is several seconds, and the end of the period is indicated by a slight wiggle in the tail rotor. Then it's OK to fire up. I find myself transfixed on the tail rotor waiting for that twitch, and sometimes I see it and sometimes I don't. But with my BC-6 wired via a Y-harness into the same channel as my gyro is plugged into, voila; I had an audible indication of when the gyro is armed. The beep continues until the gyro is activated. This came, of course, as a complete surprise, but it was a pleasant one.

I've only flown a few helicopters other than my own. I like the two Shuttles I own, but it's clear there's a difference between the level of precision and response that I get from the RG and the Z-TS; in fact, I find the RG as responsive and precise as Rick's Schluter Futura SE .60-size machine, though the extra weight helps the Futura SE in a wind. I think that's saying a lot about the quality and design of the Shuttle RG, as you can buy two RGs for the price of a Futura SE.