

HIROBO SHUTTLE SXX BUILD REVIEW

Enhanced performance with CCPM control

It never ceases to amaze me how Hirobo can develop a product like the Shuttle 30-class helicopter, and over the years, continue improving and changing it to meet modellers' demands. From the top-of-the-line Shuttle ZXX to the budget-minded Shuttle Z-TS and the Shuttle Challenge for beginners, whatever you want in a 30-size heli can be found with a Shuttle. The newest Hirobo Shuttle, the SXX, offers the popular CCPM (cyclic, collective pitch mixing) format that Hirobo calls SWM (swashplate mode).

By using CCPM, the control systems on helicopters are simplified by reducing the number of linkages, bell cranks and pushrods needed to operate the rotor head. Collective pitch and cyclic mixing are now accomplished electronically, rather than mechanically; this, in turn, minimizes slop and play in the control system and makes the heli "feel" tighter. The Shuttle uses a swashplate with three "120-degree" pickup points, so three servos are used for cyclic and collective pitch control. Two servos are used to tilt the swashplate for roll, and all three servos (mixed together) provide elevator and collective pitch control. Besides simplifying linkage setup, CCPM directs more servo power to the swashplate; you have three servos moving the elevator cyclic instead of one. Another benefit is less maintenance.

SPECIFICATIONS

Model: Shuttle SXX

Manufacturer: Hirobo

Main rotor diameter: 48.8 in. (1,240mm)

Length: 42.3 in. (1,075mm)

Radio used: JR 1 OX with DS8231 servos

Engine used: Enya .35X TN type

Gyro used: JR Piezo G450

Street price: \$369.95

Features: the SXX has the cyclic, collective pitch mixing (CCPM) control system, ball bearings on all pivot points, a one-piece canopy, a Shuttle RG-style tail fin and stab, decals and an illustrated instruction manual.

Comments: the Shuttle SXX is a good, solid performing helicopter. It's easy to build and maintain and looks great. Because it uses many of the same parts as the Shuttle ZXX, replacement parts are readily available. The setup values in the manual are a good starting point and work well. The CCPM system is also easy to set up and provides a good feel to the helicopter.

Good

- * CCPM control system.
- * Easy to build.
- * Ball-bearing pivot points.
- * Very good instructions.

Poor

Main rotor could be a bit heavier.

KIT CONTENTS

The SXX is typical of Hirobo's high-quality kits. All parts are grouped in numbered bags for each construction step, the one-piece canopy requires only decal application and the weighted, main-rotor blades are finished and ready for final balancing. The tail boom comes covered with white heat-shrink film for a classy look. The instruction manual is very detailed with many illustrations. Although there are few written instructions, the clarity of the drawings makes assembly easy. One

nice feature is the CCPM setup detail that's provided. Because the controls are mixed electronically, the servos need to move in unison and the manual is very clear about how everything should work, including details for mode-1 and mode-2 transmitters.

The main rotor head, chassis, transmission and tail rotor are the same as on the Shuttle ZXX, and all moving parts are supported with ball bearings. Except for the control layout, SXX is the same as the ZXX, which means you know that the model is well proven.

CONSTRUCTION NOTES

Because so much of the SXX is the same as the ZXX, I'll cover those areas that need special attention in the construction. First is the cyclic/collective system bell crank assembly--two for aileron and one for elevator. Be sure to use the tiny shim washers in between the bearings in the aileron bell cranks; they prevent the bearings from binding when tightened down. Three main bearings are now pressed into the chassis. Make sure they are tight in their sockets; if they don't fit tightly, use 5-minute epoxy to secure them.

The aileron bell cranks and each half of the elevator bell crank are mounted to stays that are screwed to each of the chassis halves. Again, don't forget to use the tiny shim washers where indicated. I then assembled the halves and captured the elevator bell crank between them, making sure the elevator bell crank halves mated properly before I screwed the chassis together. All bell cranks should move freely without binding.

The seesaw, flybar and main-rotor head are assembled next. I encountered no problems; just be sure to centre the flybar in the hub and use thread-lock where indicated. I also added a wheel collar to each side of the flybar to aid in balancing later.

Some of the control ball attachments are longer than the others on the swashplate, so be sure to install them in the correct positions and use thick CA to secure them. The washout unit is a standard tried-and-true Shuttle ZXX unit that poses no installation problem. After you've installed the fuel tank and radio tray along with the main shaft, main gear and rotor head, install the main gear. Pull up on the drive gear and then tighten the mast lock-down collar in place so there is no up or down play in the main mast.

After snaking the drive belt through the tail boom, I built and balanced the tail-- rotor assembly and tail gearbox, and I secured them to the tail boom. I then attached the tail boom to the chassis along with the clutch assembly and the drive pulley. To prevent the tail rotor from turning backwards, make sure the drive belt is twisted 90 degrees in the proper direction.

Before I installed the engine and clutch in the chassis, I ran a few tanks of fuel through the engine on a test stand to break it in and adjust the carb. I also balanced the cooling fan and clutch bell before installing them on the engine. I used a dial indicator to check the assembly's run out. The manual doesn't mention these important tasks, but they should be done for smooth running. To complete the basic helicopter assembly, I installed the engine/ clutch assembly, muffler, landing gear, boom supports, tail rotor pushrod and tail fins.

RADIO INSTALLATION

Assemble all of the pushrods using the dimensions shown in the manual, and then attach them to their respective bell cranks and levers on the heli. Install the servos, the gyro and RX switch. Use high-quality servos for the cyclic control, as any servo output slop will show up in the CCPM control system. After programming my radio for 120degree CCPM mixing, I turned on the radio and receiver and moved the sticks to check for correct control movement and found that some of the stick commands did not produce the correct swashplate movement. To correct the mixing, I needed to change the aileron and pitch values in the radio from positive to negative. The initial setup was very easy to accomplish, and I made final adjustments to the throttle and pitch curves during my first flight at the field.

FINAL THOUGHTS

The Hirobo Shuttle SXX is a very easy helicopter to build and fly. Given that it's a descendant of the Shuttle ZXX, I expected nothing else. The CCPM control system is a new experience for me, and I am very impressed with it. The setup is easy, but you do need a computer radio that offers CCPM programming (found in most, if not all, newer heli radios). Flight performance is better than that of the ZXX because the control system is tighter and has a faster response. From learning to hover to aerobatics and mild 3D manoeuvres, this hell is a winner!