

Quick EP 10 Deluxe

10-12cell Electric RC Helicopter

In the past, electric helicopters were considered a bit of a novelty; something fun, but not a very good performer. This has changed lately with the advancements in brushless motors and battery technology. With today's brushless motors and new NiMH battery technology, it's not uncommon to see 7-8 minute flight times for a helicopter this size. For maximum performance, users still prefer NiCd batteries because they can deliver more power without as much voltage drop, resulting in better performance. The drawback of using NiCd cells is the slightly shorter flight time. However, today's top NiMH cells, like the GP3300, will rival the performance of NiCd cells and at the same time give you the longest flight times.

Something else worth mentioning is the recent development of Li-Po batteries; they contain about three times the energy for a given weight, compared to NiMH. The problem with Li-Po and Li-Ion type batteries has been their ability to perform during high load; but technology has overcome even this barrier, and today's

Li-Po cells can handle very high power surges. This means that they now perform well in an R/C environment, even in helicopters, which is one of the most power hungry R/C applications. With the latest Li-Po technology it's not uncommon to see around 20 minute flight times.

The HHI Quick EP 10 is a 10-12 cell Electric helicopter of the latest design. It utilizes a 120° CCPM swash plate that gives you very precise and responsive control; but at the same time saves weight, which is important in an electric helicopter. Most new computer radios will support this type of swash plate. The helicopter is an all aluminum design with carbon fiber frames. The Quick EP shows excellent craftsmanship and looks very sharp with its combination of blue anodized aluminum and carbon fiber.

Assembly

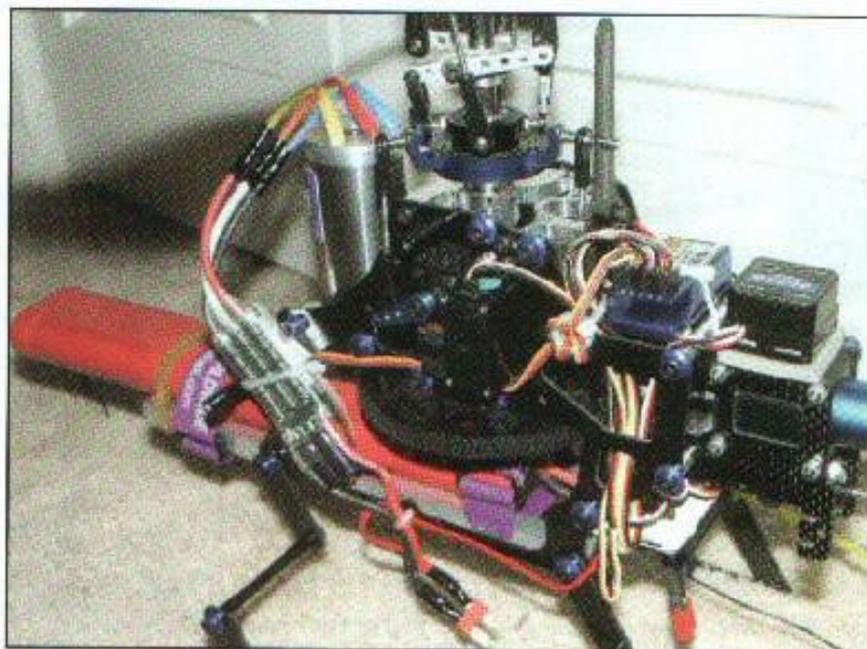
Building the Quick EP 10 wasn't very complicated and was finished in about two evenings, with a third evening used for setup and fine tuning. I have built a couple of



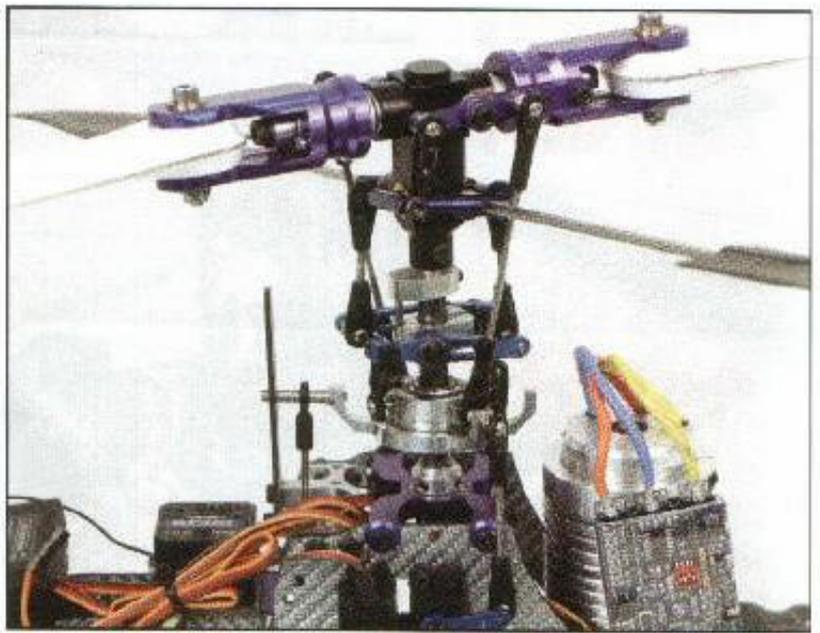


Bjorn Kronquist

The HHI Quick EP 10 is a 10-2cell Electric helicopter of the latest design. It utilizes a 20° CCPM swash plate that gives you very precise and responsive control. Most important, this system is supported by most all radio manufacturers.



Sweet 16 Version



Top: Main rotor shot showing the Sweet Sixteen layout.

Left: The Sweet Sixteen motor is securely mounted to the frame set and located up and away from the battery packs to provide ample cooling.

Below: The Sweet Sixteen is indeed a showpiece of electric helis.



helicopters before and this is a very straight forward design. The manual is on the thin side and this could cause a problem for people without any prior helicopter experience.

Building Tips

The Quick EP 10 has a simple but effective construction and is fairly easy to build. However, there are a few things regarding the assembly that I would like to point out.

The tail pitch slider can bind with the tail linkage arm if you don't use spacers when mounting the linkage arm. This will most likely not happen in the air because you need extreme travel for it to happen. As a precaution, I used a combination of spacers and a mechanical stop (small rubber O-ring) to eliminate this problem. Now I can spin the tail blades through full travel range without binding. The A-arms that connect the swash plate to the washout arms need to be attached using a single, small hex bolt and a 1mm spacer. Insert the screw through one side of the A-arm then thread it through the mixing arm while adding a little thread lock. Then finally, thread it through the 1mm spacer and out the other side of the A-arm. The only thing that holds it in place is the thread lock. There isn't much force on the bolt, so it will most likely be sufficient but worth checking every now and then. An electric helicopter has limited power so make sure that everything is running smooth and easy. Make sure the motor pinion and tail pulley have the right backlash against the main gear. The right backlash can be achieved by inserting a piece of paper between the two gears and tightening the screws. Then check for a small amount of play, if there is no play, then it's too tight. There should be a very small amount without losing it completely. Check this regularly to minimize wear on pinion and main gear.

The tail belt tension is another critical part of the setup. With too much tension you will lose flight time. A loose belt can cause tail wag; and in worst case, the belt teeth on the two sides of the belt can lock up inside the tail boom. So make sure it's tight enough, but still running smooth. Also, make sure that the blade grips for both the tail rotor and main rotor are attached so that leading edge control is achieved.

Setup

The helicopter can be set up for any type of flying. I currently have it setup for full 3D and 19mm servo arms are sufficient. I have it set so at half stick, I have 0°

pitch and the washout arms are level. The linkage above and below the swash is adjusted as needed in relation to this. My current pitch travel is about 20° resulting in +10° to -10° pitch and there is room for more travel if needed.

Prior to flying the Quick for the first time, I spooled up without blades to make sure that everything was working correctly and that nothing was binding during full swash plate travel. I also checked the movement of the fly-bar by using full cyclic in all directions with the motor running and no blades attached.

I also took this opportunity to program the Castle Creation Phoenix 80 speed controller. I set it up in governor mode and used a straight 85% throttle curve in Idle up 1, and 100% in Idle up 2. Using 85% I was able to get a pretty constant headspeed except during max climbout. This is the mode I normally fly in.

Motorization

I'm using an Aveox 36/30/2 (Kv 1460), an 11 tooth pinion, and a 12cell HRSC2600 NiMH pack. If you decide to use a 10cell pack, you can probably use an Aveox 26/24/2 (Kv 1950) with a 10 or 11 tooth pinion; but I have not tried this setup, so I don't know. Any other brushless motor with about 1300-1500 Kv will most likely work well using a 12cell pack. With a 10cell pack you need about 1700-2000 Kv. The Quick use a 120 tooth main gear and seems happy with about 1750-1950 rpm headspeed. I have not tested any other headspeeds as of this time, but they might work just as well.

Flying

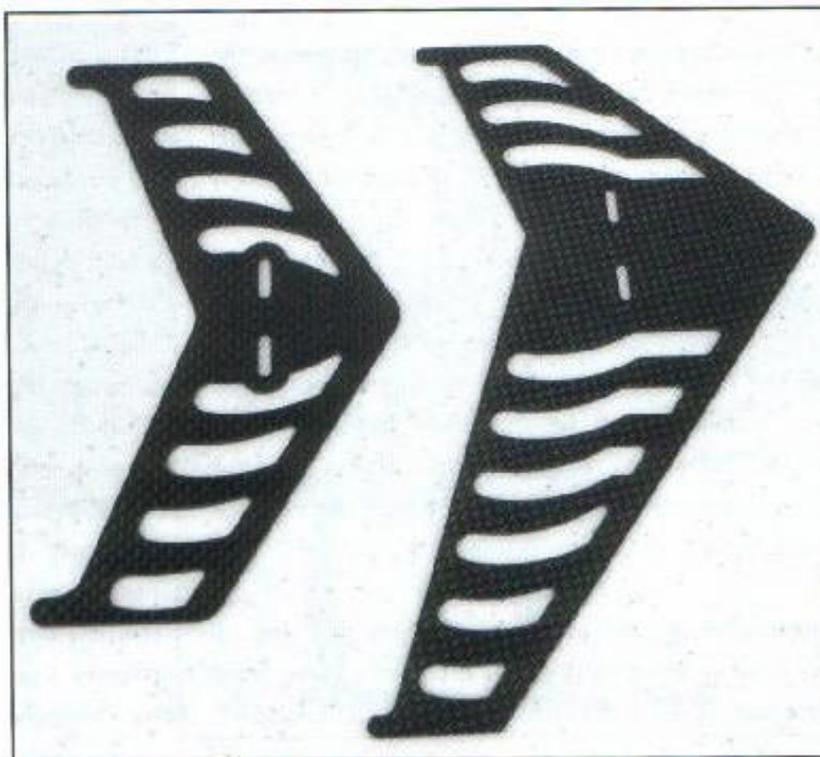
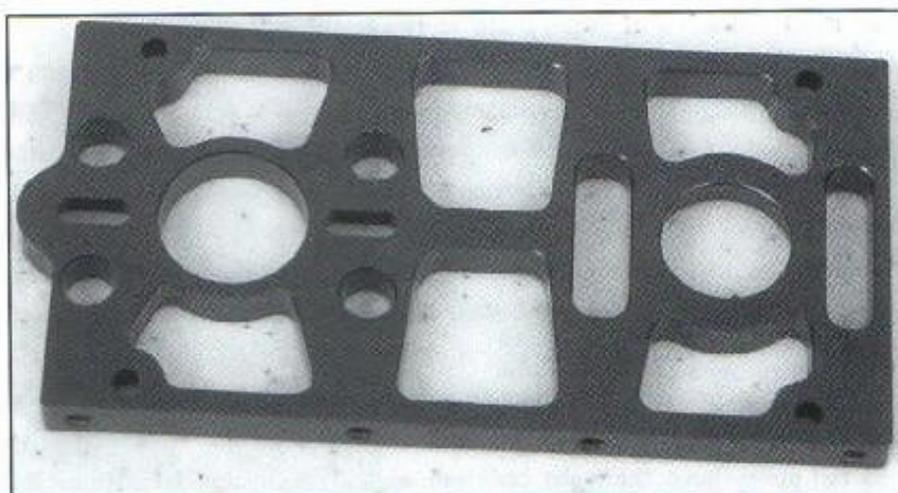
Prior to the first flight, I checked the blade tracking and to my surprise it was perfect. You can get very good results using a pitch gauge during the initial setup. After the tracking was checked, I spooled up again and slowly added collective. At a little over half stick, the helicopter lifted off into a very stable hover. It didn't need much trim to keep it from drifting. After a few clicks on the trims, I kept hovering until the pack was drained and the helicopter settled down in front of me. A very successful flight and only minor trim was needed. I changed the linkage, zeroed out the trim and lifted off again with a new battery pack. This was also an uneventful flight, much like the first. I tried some climbouts and checked the pirouette rate. My travel on the rudder channel was set a little low but after changing it to 120%; I got the tail authority I wanted. Just after this flight, night settled over Pennsylvania and I had to wait until the next day

Right: Photos show the optional skids, motor mount, and carbon rail sets to increase the performance and looks of your electric heli.

before I could continue flying.

The next morning arrived and I went to the local field. I arrived with 4-packs fully charged and started flying right away. This was the first flight with the canopy on and there was a small but noticeable difference in performance and duration. The helicopter was just as stable as I remembered it being; so feeling confident, I started flying around in large circles, followed by figure eights and fast forward flight. The first thing I noticed was how stable and precise the helicopter felt. Feeling very comfortable and relaxed I started flying around and just enjoyed my four packs.

With the fairly small stock paddles, it's behaving very nicely but the pitch/roll rate was rather slow. After my four flights, I went home and recharged the battery packs and changed to Quick 3D paddles. With the 3D paddles, the helicopter became very agile without losing its stability. The stock paddles are 16g and the 3D paddles are 21g; the added weight helped maintain the stability but the larger surface area increased the pitch/roll rate. With a high swash mixing and 3D paddles, I was now able to perform almost stationary flips and rolls. This has to be the best upgrade \$6 can buy. I now like the way the helicopter flies and I have not changed anything since. I did however dial in a little exponential on the aileron and elevator channel to smoothen out my hover. This helped, and the hover is now very stable. I also had the opportunity to try it on a windy day; it



Test Setup

Helicopter - Quick EP 10 Deluxe
Radio - Airtronics RD8000
Motor - Aveox 36/30/2
ESC - CC Phoenix 80
Receiver - Hitec Electron 6
Swash Servo - Hitec HS-2258B
Tail Servo - Hitec HS-2258B
Gyro - Futaba GY240
Batteries - 12cell HR5C2600
Radio Power Source Motor Pinion - UBEC
Main Gear - 120 Tooth
Pinion - 11 Tooth
Blades - Quick 475mm CF

HHI Quickie

Weights

Helicopter - 1404g
Canopy - 155g (lighter available)
Blades - 104g (2 x 62g)
12cell Battery pack - 768g
Total Flight Weight - 2451g

handled a 12-17mph wind with ease and I had no problem controlling the helicopter.

I get about 6-7 minute flight time using a 12cell HR5C2600 NiMH pack; with my GP3300 I got just over 7 minutes. After a flight, the batteries and speed controller are slightly warm, and the motor is warm but not hot. Right now it's only about 40°F outside, so it might be on the warm side on a hot summer day. A hole in the canopy and a heatsink on the motor will probably solve that problem.

Conclusion

The canopy I'm currently using is a custom painted canopy of the new style. It's a little heavy at 155g, but Quick sells the old style canopy, which is supposed to be about 80g, and might be worth considering.

The pinion is made of aluminum and it tends to wear fairly fast, so make sure you adjust the play after every couple of flights for maximum lifespan. If the pinion wears down without adjusting the backlash, it will start to wear on the main gear making a loud whining noise. The good news is that a pinion is only \$6 and if adjusted correctly, it will last a fair amount of time.

I have flown with both 10 and 11 tooth pinions and the performance and runtime is very similar. With the 11-tooth pinion, performance is a little better but you lose a little flight time.

Overall, I really like the way the Quick EP feels and flies. Like I said before, it feels very smooth and stable,

but can still perform 3D.

I don't think you will be disappointed with this helicopter. I find myself liking it more and more with every flight; and because of this, I have flown it frequently.

Pros

- ✓ Very rigid design.
- ✓ Smooth flying characteristics.
- ✓ Handles gusty winds very well.
- ✓ Nice craftsmanship, it's a good looking helicopter.
- ✓ Wide selection of blades, 440-475mm.

Cons

- ✓ A little on the heavy side, mostly because of the new heavier canopy. Quick still sells the older light canopy.
- ✓ Aluminum pinion wears down, and as a result, puts wear on the main gear.
- ✓ Tail servo mounts are for a standard sized servo only. This is about to change and there will be a cut for both standard and mini servos (using left and right frame).
- ✓ The manual is on the weak side, but will get the job done. This could be a problem for a person without any prior helicopter experience.

For Further Information:
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