

Pilot Review

Words & photos by Joe Papa



Flight times of up to one hour!

AERIALPIXELS

FX8 Pro Elite

In the multirotor industry there is no shortage of inspiring innovation. While some companies hurry to follow the leader, others blaze their own way. Professionals worldwide trust Aerial Pixels for gear that works under brutal conditions and as the motors and payloads continue to get larger, an airframe had to be designed to meet customer demand as well as their own needs. This is a rare opportunity to get up close and personal with a truly professional machine capable of staggering feats of endurance and payload. Since the pros that use them are as secretive as Area 51, I took it upon myself to reveal one of the world-class titans as well as the tricks that go into the build. No matter what you

fly, this review will benefit you.

FEATURES

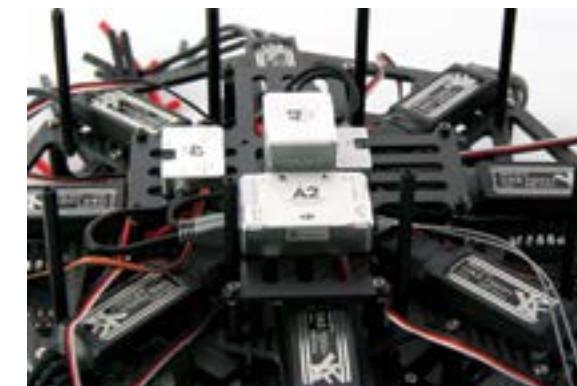
The FX8 Pro Elite is designed to be able to accommodate the largest UAV motors currently available such as the KDE Direct 7215 and the T-Motor U11. When you order the airframe, motor mounts are selectable based on the motor you plan to fly. The center section is



4mm thick carbon fiber quick release gimbal mount. The FX8 has been stress tested with over 100 pounds of weight .



FX8 is will max out at nearly 7 ft in diameter when fitted with 29 inch props. (26" props pictured)



The A2 has room to spare on the designated mounting plate.



ESC placement is perfectly suited for short efficient wiring.

jaw-dropping with precision CNC matte carbon fiber upper and lower decks that are a whopping 4mm thick each. Each plate has been strategically milled to be as strong and lightweight as possible. Numerous tapered standoffs and stainless hardware work together to make a super structure that wont fall apart with the booms removed. The FX8 features 30mm carbon fiber booms instead of the common 25mm tubes found on other heavy lift machines. To add even more rigidity to the structure, each tube is vice locked with three sets of aluminum clamps per boom.

VIBRATION

One of the biggest killers of smooth video is from vibration. Unlike most copters, the FX8 Pro Elite includes a quick release gimbal mount and four integrated premium wire vibration isolators designed for heavy lift applications. Nothing is more effective at isolating vibration from the gimbal than wire dampers. Unlike rubber or silicone dampers that fit into holes, wire isolators wont come apart either. The quick release plate is light-

ened and drilled to accept the FreeFly Toad in the Hole gimbal adapter for the Movi if desired or the Cinemilled mounting plate for the DJI Ronin.

NEED TO KNOW

MANUFACTURER

DISTRIBUTOR: AerialPixels

TYPE: Large heavy-lift X8

FOR: Professional applications

PRICE: \$2,570 (Frame only)

SPECS

OVERALL WIDTH/LENGTH: 5 feet, 10 inches

FRAME WEIGHT: 6.9 lbs.

MOTORS: (8) KDE 7208XF-110 brushless outrunners

ESCS: (8) KDE 75A

PROPS: (8) Quanum 26-inch Carbon Fiber

BATTERY: (2) 22,000mAh 6S LiPo

FLIGHT CONTROLLER: DJI A2

TRANSMITTER: Futaba 14SG

FEATURES

- ◆ 4mm thick center plates
- ◆ 4mm thick motor mount plates
- ◆ 30mm, 2mm thick 750mm carbon fiber booms
- ◆ 30mm CNC Machined Aluminum boom clamps
- ◆ Boom clamp design at the center plates for extra rigidity
- ◆ 3.5mm Heavy Duty dual battery trays
- ◆ Supports up to 29-inch props
- ◆ 4 x 30mm Extra Heavy Duty Landing Legs with optional 30mm to 25mm clamps for gimbals
- ◆ Universal fit for CineStar style gimbal mount plates.
- ◆ 4 Point Locking, 4mm Thick Gimbal Mount Plate with Quick Release
- ◆ Total frame weight: 6.9 lbs.

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Either way, you can be assured that no copter available will do a better job at keeping your video free of debilitating vibration.

ELECTRONICS

One of the things I really appreciate in this frame is that it was designed by guys that use them on real shoots and everything you need is available and where it belongs. It's so common to build a machine and realize there is no room for power distribution, flight controller or connectors. The FX8 was built to fit the Power Hungry Systems series 16 power distribution hub. This hub comes

pre-soldered with 10AWG power leads and bullet connectors to power everything. The copper plates are massive and can handle more current than you will ever have to worry about.

Above the top plate is a cross shaped platform designed to hold your flight controller. This works perfectly and solves a lot of headaches and frustration. Battery plates in three sizes are supplied and allow for nearly any configuration imaginable. These plates mount to eight extra long standoffs to keep the center of gravity right where it belongs...close to the flight controller.

LANDING GEAR

Some of you may be baffled to see a machine this high end with fixed landing gear. The truth is that retractable landing gear is great on light weight rigs, but have no place on anything intended to lift this kind of weight as they would simply wobble, buckle and crack. Aware of these limitations, the FX8 Pro Elite includes four beautiful heavy duty landing legs, complete with wide and stable feet. You will never have to worry about this rig collapsing and crushing your gimbal and camera.

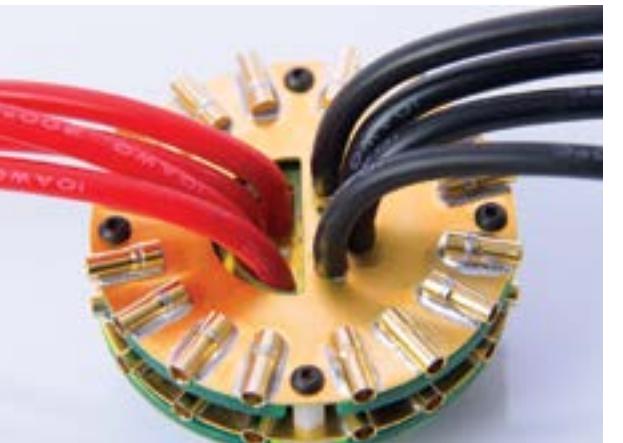


MOTOR MOUNTS

Motor mounts are also machined from the same 4mm thick carbon fiber plate used for the center frame. Perfectly finished, you can get them in two sizes and they are even drilled to fit both 25mm and 30mm tubes. Designed to hold motors with up to 40mm wide mounting hole patterns, these mounts aren't going to let you down. I like the holes drilled on each end to allow you to run the motor wires



Top: Motor wire guide holes were lightly chamfered to prevent chaffing. Bottom: A 10mm hole was milled to allow the KDE retaining bolt to clear the tube when mounted.



We opted for the recommended Power Hungry 16 series power distribution. It comes pre soldered.

through before entering the booms.

POWER PLANTS

I have looked forward to building a machine like this for over a year. I spoke with Patrick at KDE Direct and after a lengthy conversation, I decided on the new 7208XF-110 and 75 amp ESC's with their latest firmware. These motors are ultra efficient and can run on 6-12S LiPo and 26 – 29 inch props. With light payloads, it's possible to achieve flight times in excess of 1 hour! When I need to lift more weight I can simply change to a larger prop or switch to 12S by wiring two of my

6S packs in series and the machine transforms into an ultra efficient monster lifter. Because of this incredible versatility, the FX8 can be the right machine for nearly any application. Aerial mapping, long duration FPV and search and rescue missions will be right at home on 6S with packs in parallel. On set, I can switch to 12S and fly my Movi gimbal with any camera.

FLIGHT CONTROLLER

We are sticking by our tried and true DJI A2. Utilizing the latest firmware and GPS Pro Plus compass, no other flight controller gives us this much flexibility and confidence during flight. Our initial configuration for all X8 style rigs is to set gains to 280, 280, 280 for pitch roll and yaw. Attitude gains are around 130 and altitude is 150. With two 6s 22,000mAh LiPo packs mounted on the top, center of gravity was measured at 3cm above the IMU. With a gimbal I estimate it to be right around zero which is absolutely ideal.

CONSTRUCTION

When I unboxed the FX8, I was pretty surprised to find it mostly assembled. Each part was wrapped in layers of bubble wrap and could have easily survived a fall from the roof of my house. All that was needed to finish off the assembly was to install the booms, slide the landing gear on and then the motor mounts.

Having built many machines with carbon fiber booms, I knew that the aluminum clamps have sharp edges that can scratch the tubes as they are inserted. Since these booms would be removed and reinstalled during transport, I removed the clamps from the center frame and used a deburring tool to finish off the edges of each and every clamp. It took about 10 minutes to do all the clamps on both sides and I prefer the way they look. Next I took a countersink bit and made just a few turns on the holes where the wires from the motors will pass through. This will ensure the carbon fiber can't ever cut through the insulation. On the center frame, anywhere that wires would come into contact with the carbon fiber, a light pass with a file was made to round off the sharp edges. On radio control car chassis plates, we will always file sharp edges and then seal them with super glue to prevent the layers of carbon fiber from separating or delaminating in a crash. On multirotors I have seen carbon delaminate from impacts with the ground, but at that point super glue won't be enough to help you. With these steps completed, I unboxed the motors and test fit them to the mounts. During this step I realized that the booms included with the FX8 are longer than the wires on the motor. After a few quick measurements, I used a cutoff wheel on a Dremel to shorten the booms by roughly three inches each. This will still allow me to run the larger 29-inch props with room to spare.

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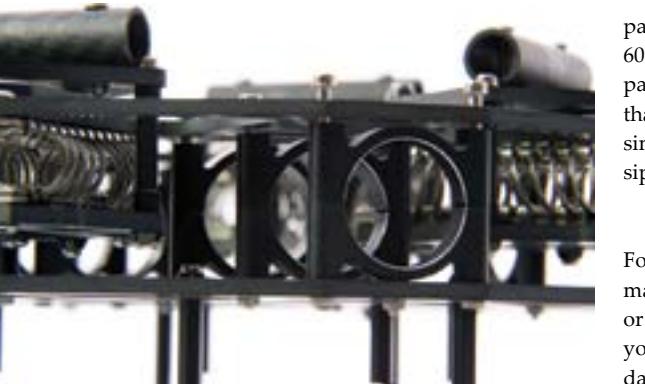
In this configuration the FX8 is four feet and three inches across from center to center and just over 6 feet across from tip to tip of our 26-inch paddles. With 29-inch props the total diameter will be just under 7 feet! With the motors mounted, I labeled the wires so I would know which was the top and bottom. After feeding the wires through the guide holes, I slipped them down the tube and folded them back in on themselves so I could slide the tube into the clamps of the center frame without fear of accidentally pinching a wire. Be certain to tighten the stainless 2.5mm hex bolts for each clamp evenly so the space between the upper and lower clamps is equal on each side. Tightening one side completely will cause the clamp to rotate and should be avoided. With each clamp tightened the tubes were literally impossible to move.

Mounting the ESC's was effortless. The top frame plate has eight locations ideally suited for esc mounting and with the power distribution hub centered and mounted, the power leads to the esc's only had to be about two inches long. This made wiring them up easier than any other build I've encountered. The motor leads simply make a U-turn and plug into the motor wires where they exit the tubes. Since there are only 6 bullets to connect, it is very feasible to loosen the clamps and remove the arms for transport abroad and then reassemble on location in about 30 minutes. All you need to do is label each bullet for reference and make sure the motors are level. Despite being one of the larger airframes I have built, the total time to construct the beast was less than I expected. More often than not I spend days contemplating wiring layouts, soldering bullets and then changing my mind. This machine is so well designed that everything fell into place. In many ways it was a relaxing experience. I will never worry about a folding mechanism failing or a retractable landing gear issue. The FX8's genius is in its simplicity, refinement and brutal Viking strength.

Since we have the ultimate in efficiency I've decided to configure this build for the longest flight times. Using dual 6S packs in parallel, the capacity will be doubled and flight times should be staggering. When we need more payload, we can simply change the way the packs are wired from parallel to series and the motors will spin with up to double the rpm for double the payload. Be aware that when running 12S, the A2 PMU must be connected to only the first 6S pack. The A2 cannot be connected directly to 12s.

IN THE AIR

In the air the FX8 Pro Elite is rock solid and hovers at an RPM that is far below what I'm accustomed to. Despite being large, it responds very well to stick inputs and feels incredibly stable even in windy conditions. During our tests we would routinely land, review photos, make small changes to our gains and go back up. Our first battery pack we landed after about 25 minutes of flight and checked the



packs, motors and ESCs. With 60-percent remaining in the packs, ice cold ESCs and motors that were barely warm, we've simply never seen anything that sipped power so conservatively.

THE FINAL WORD

For those of you with aerial cinematography careers in full swing or on the horizon, having a rig you can depend on day in and day out is crucial to your success. Anything that can reduce the stress that is so prominent on production set is not a joke. It can literally mean the difference between a successful job and future work or a career ending crash costing a small fortune. With the ability to lift more weight and fly longer, the advantages of this airframe will help you edge out the competition. All this being said, this frame isn't for everyone. It doesn't fold or have retractable landing gear since both of these features would dra-

matically reduce strength and reliability. While retracts could certainly be adapted for lighter payloads, I do admit that more than 75-percent of the problems I've encountered on production jobs were due to retract issues and the other 25-percent were due to folding mechanisms. So having this frame would have alleviated 100-percent of the problems I've encountered on high profile jobs.

For those of you looking for unobstructed 360 degree panning, AerialPixels has the answer. They offer a 25mm to 30mm tube upgrade for the Movi gimbal. Simply install three of the included



landing gear legs onto the Movi and you will have a rotating heavy duty tripod for full 360 panning. Photo of Movi with this option is pictured, but not included. They really thought of everything.

If you are serious about making a living doing cinema quality aerial video, you owe it to yourself to check out the airframe with no skeletons in the closet. The Aerial Pixels FX8 Pro Elite is the real deal. ☺

CONTACTS

AERIALPIXELS aerialpixels.com
DJI dji.com

For more information, please see our source guide on page 88.

