

Precision Aerobatics

# ADDICTION

## THE GROUND IS THE LIMIT

by Clarence Boudville

Flying Photos by

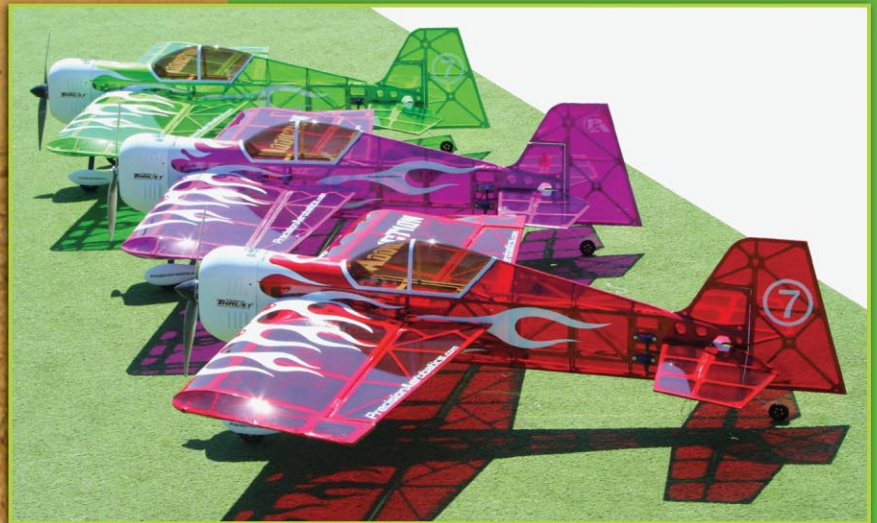
S. Suntharesan & Oliver Decker

Having previously learnt 3D the hard way and subsequently experienced and bore witness to the abnormally quick progress of others flying the PA Electric Shock, the news of the PA Addiction's potential was certainly met with a mixed feeling of enthusiasm and curiosity.



### SPECIFICATIONS

Wingspan:	1000 mm
Length:	1063 mm
Wing Area:	485 sq. in
Wing Loading:	7.9 oz/sq. ft (approx)
Ready To Fly Weight:	750g / 26.5 oz
Rec Motor/ESC:	PA Thrust 20 motor with PA Quantum 30A programmable brushless ESC
Rec Battery:	3S1P, 1800mAh-2200mAh, 20C Lipo (up to 150g)
Rec Receiver:	4 Channel or more micro receiver
Rec Servo:	1.5 kg/cm torque, micro-servos
Rec Prop:	APC 11X5.5E, APC 11X4.75F
Construction Type:	PA FiberFusion™- Laser Cut Balsa and ply with carbon fibre
Aircraft Type:	3D Electric Park Flyer
Skill Level:	Beginner to Expert 3D



There is finally, a hardcore, no-holds-barred, ultra light and robust 3D machine that is neither a foamie nor a profile, fully capable of precision flight all bundled in a neat mid-sized, sexy transparent coloured package and most importantly, capable of using my existing high capacity Lipo packs. The holy grail of 3D has finally arrived and it's only a matter of deciding which colour to go first....."Shrek" Green it shall be...this time and I shall name it my Hover Ogre!

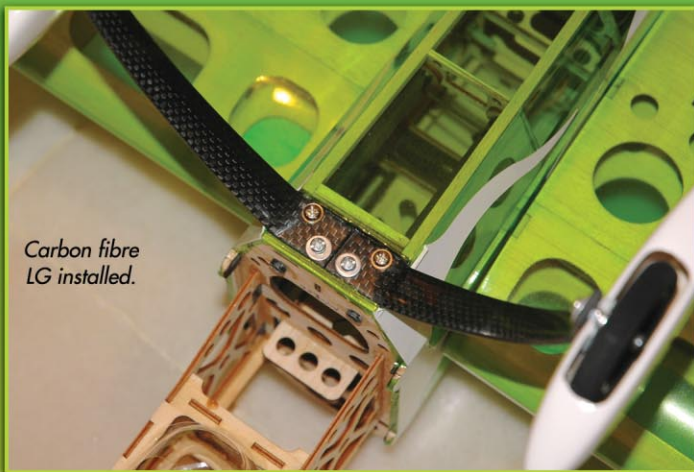
### First Impressions

The parcel arrived intact and was quickly ripped opened to reveal the contents inside. What immediately caught my eyes was the beautifully sculptured airframe structure seen through the yummy transparent covering as well as the blinking carbon fibre parts inside the fuselage.

Lifting the individual major components

out of the box, I was totally blown away by how unbelievably light the airframe felt in proportion to its size and for a moment my brain could not comprehend the apparent disparity between the lightweight feel in my hands and what my eyes were telling me. Exceptionally light as it maybe, I was quick to note how stiff the airframe and wings were and upon closely peering through transparent covering revealed the extent carbon fibre is employed to achieve superior structural integrity. I thought to myself this is going to be one robust and survivable airplane with precision to boot; quite a rarity among lightweight 3D models which tend to be either light and fragile or strong and heavy.

The fuselage features PA FiberFusion™ construction spotting CF (carbon fibre) stingers running the entire length of the fuselage as well as CF strips and rods



Carbon fibre LG installed.



Rudder installed.

strengthening the cross members, reducing the likelihood of the fuselage breaking in the event of the many hard landings that I “plan” to make while perfecting my rolling harrier landings. Beneath the fuselage lies the recessed landing gear mount that is also robustly reinforced with CF to address another common problem of the LG ripping out. Many other light weight 3D models, either glow or electric powered, are frequently prone to weakness in this area. It became very apparent to me that the Addiction is indeed a very tough aeroplane and when it comes to learning hardcore 3D, especially at low level. Robustness is paramount to allow the safest (cost effective to some) way to learn challenging and risky manoeuvres.

Putting the fuselage aside, the two piece removable wings were inspected next. The ailerons were already pre-hinged at the factory and appeared to be slightly twisted which is normal for lightweight ailerons of this nature and the manual specifically addresses how to untwist them. The ailerons are pre-hinged with clear transparent heat-shrink covering similar to the ones on the PA Electric Shock providing massive amounts of throw. I peered through the wing tips and saw the ends of three CF rods, i.e. one at the leading edge and two at where the spar would usually be, making the wings, in spite of its exceptionally light weight, very stiff and equally robust as well.

The touch of quality even extended to the hardware package itself. All control surface horns were CNC produced CF making them light, stiff and slop free meaning crisp controls without sacrificing weight. The predominant use of CF is still relatively rare in most balsa models at the current time. Even some top dollar composite giant scales still use, at best metal or Phenolic control horns. The one piece fibreglass cowl was unpacked and inspected. It had all the major openings pre-cut saving more build time. This is certainly welcome especially considering the potential health risk associated with fibreglass dust and the only thing that is left to be done is to drill the four cowl mounting screw holes.

## The Build

As most of the Addiction major components are pre-built at the factory (including the pre-hinged ailerons, motor cage with carbon fibre pre-drilled firewall, one piece canopy/hatch, pre-hinged elevator and cowl) there is really not much effort and time required in the build and most modellers working at a leisurely pace should be able to complete the model in two short evenings without the need for special tools or the

much dreaded task of cleaning up after the build. Very little glue is required because essentially glue is only needed for the motor mount, horizontal stabs, rudder hinges and control horns.

Prior to commencing the build, I religiously went through the manual and I found the pictorial manual to be very concise, clearly describing each phase of the build process. Next came making the required openings in the fuselage and wing covering using a soldering iron to facilitate the dry fitting process and some were already pre-made at the factory.

I started the build in the usual way by first ironing down the covering to seal the areas where I need to make openings. The transparent covering makes it very easy to spot where the openings need to be easily made with a sharp X-acto blade.

The CF landing gear, along with the lightweight wheels were then bolted on to the fuselage to double up as a stable work stand and to stage the next phase of the build; the alignment of the horizontal stab referencing the wings for better precision.

The CF wing tube was inserted along with both wing halves and the ailerons were taped to remain in the neutral position and then untwisted as described in the manual. A slot was then cut at the rear of the fuselage and the horizontal stab was then inserted and eyeballed against the top of the wings. A little sanding was required to

the horizontal stab slots to achieve precise alignment and the horizontal stab was removed to have the CA hinges installed. A quick eyeball on the stab alignment, a quick measurement to both wing tips to reconfirm the laser cut alignment holes and a little CA is applied to permanently bond the stab to the fuselage. Next the slot at the rear of the fuselage is filled with the supplied balsa block, trimmed down and then recovered with supplied transparent covering hiding the evidence of the minor surgery.

The vertical stab and rudder is then assembled with CA hinges and the tail wheel installed. The motor mount is then glued in to the fuselage with glue, pinned with the supplied CF pins and clamped in place to allow the glue to cure over night. It is best to test fit the CF pins first prior to gluing. Additional wood glue is also brushed over all the joints of the motor mount to ensure maximum strength. The moulded air-scoops are then installed with CA.

Next came preparing the HS65HB servos for installation. Both elevator and rudder servo cables were extended by soldering light weight servo cables and terminated with JR compatible connectors. The optional CF long servo arms were then installed on the servos to get the maximum throws on those huge control surfaces.

The CF control horns were then attached to all the surfaces and with the servo arms and control surfaces positioned in neutral, the CF push rods were assembled to ensure precise mechanical geometry and to avoid introducing unwanted differential.

The PA Thrust 20 was then bolted on without a fuss and followed by the PA Quantum 30 and the cables connected. The JR 610M receiver was next installed and the antenna cable carefully routed to avoid any CF components to ensure maximum radio reliability.

The servos were then centred with the sub-trim and then deflection was checked and adjusted to ensure a bind free travel on all rates. I was happy to note the massive amounts of controls afforded by the linkage geometry promising excellent control authority especially in the post stall region of flight. Since the PA Quantum 30 is already pre-programmed to suit the Thrust 20, connection was merely a plug and play affair.

As I anticipate that the Addiction will be flown very hard, I opted to install non-slip material on the battery Velcro strap and tray to avoid repeating the hairy experience of landing with the pack dangling on the side of the fuselage. A small strip of non-slip is CA'd onto the strap and CF battery tray in-lieu of attaching a Velcro strap on the battery.



Thrust 20 bolted onto the CF firewall.



*FiberFusion  
construction.*

Once the avionics was complete, the cowl and prop were installed last and ready for its maiden flight. The hard part was to wait for the weekend to arrive.

## The Check Ride

Saturday arrived and I rushed to the field like a bat out of hell. It was gusty and threatening to rain but I was desperate to check this baby out, so whatever the weather maybe, the Addiction must absolutely fly. I popped the Lipo pack in, quickly re-checked the controls and did a quick and short rolling take off straight into a hover. The first impression I got was that the Addiction was extremely easy to hover and in spite of the gusty conditions, it happily torque rolled and drifted downwind and required relatively little control corrections. The throttle was then advanced to climb out and check the trims; two clicks up elevator and two clicks left aileron and she was roughly trimmed out and I quickly put it into a quick inverted elevator and popping back into a hover. The massive aileron throws gave it ample authority to counteract the torque and adding more aileron allowed it to roll in reverse with ease. Despite the large control surface, the Addiction did not feel twitchy and immediately switched to rate 3 to get the maximum throws and 0% expo to maximize its agility and response. It handled so well even under these extreme throws that the expo was later removed out of rate 1 and 2 and all subsequent flights thereon were only rate 3.

The Addiction was later put into quick set of

rolling harriers and by the time it completed the second circuit, it started to rain requiring a very quick emergency landing to scurry off for cover. After about an hour, the rain stopped and the sun came out and flights resumed. It was still very gusty but the Addiction flew nevertheless, and I had loads of fun until it was too dark to fly.

I made it a point to fly on Sunday morning to get more stick time on the Addiction and to put it through its paces for the review and this time I took notes! It was sunny and windless; perfect condition for 3D flying. The hovers this time were spot on and the torque rolls were almost hands free and very relaxing indeed. The Addiction felt very friendly and easy to fly. The vertical stability was exceptional, making this one of the easiest 3D airplane to hover, torque roll and hand catch. Despite its size, its predictability allowed it to be safely hand launched and caught on demand allowing this airplane to be flown without the need for a suitable runway or even a runway for that matter.

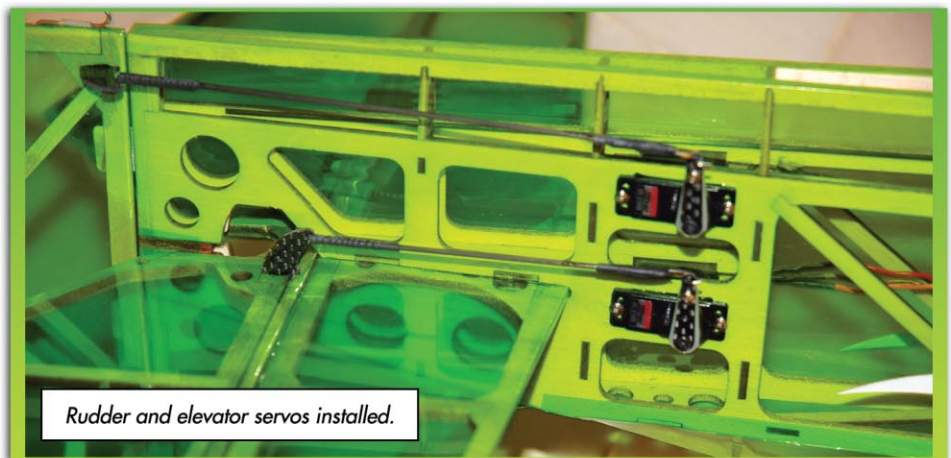
Moving on from the "hoverbatics", (is there such a word?) the Addiction was taken through a series of manoeuvres starting with the 'blender' into an inverted flatspin. Entry was easy and it stopped dead when the aileron and rudder was released into a nice smooth inverted 'elevator' continuing on to a slow and stable 'harrier'. With the lighter pack, climbing flat spins are easily accomplished and it's really awesome to watch it flat spinning whilst stationary and with a bit more throttle starts to climb upwards and altitude is controlled by merely managing the throttle.

Next, the Addiction was flown on full throt-

tle and into an upright snap into an immediate hover and then smoothly transitioning into a slow knife edge. It does it effortlessly. The Addiction performs amazingly slow KE with very little roll coupling and can completely come to a dead stop in light winds by varying the AOA and carefully balancing the aileron inputs. Inverted snaps were then performed at high throttle followed by a series of walls. It performed all those without a hitch.

Taking the Addiction vertical and then executing a 'waterfall' at the apex, it goes into a nice smooth inverted 'elevator'. Consecutive sets of 'waterfalls' are performed by merely ramping up the throttle when the nose is pointing up and throttling down when it is pointing down and ample thrust from the motor allows consecutive 'waterfalls' to be safely performed as low as 3 meters off the deck. Both upright and inverted 'elevators' were stable and can be performed slowly with smooth transitions to 'harriers' or even a spot landing if desired. The Addiction performs well in both upright and inverted 'harriers' and speed is controlled by adjusting the AOA and throttle. Steering is easily accomplished with little rudder input to fly slow and lazy tight circles without the risk of dropping the wing as low as you want and even land. This adds another avenue to the number of fancy ways to land this bird.

When the lighter PA1800mAh 18-30C 3S packs were installed, the Addiction performed beautiful high AOA and smooth rolling harriers on the stock CG location. Smooth rolling 'harriers' can also be replicated with the slightly heavier PA2200mAh pack located 1/3 its length



*Rudder and elevator servos installed.*

aft with the APC 11X4.7SF prop. The Addiction felt well balanced and the rolling harriers could be slowed down allowing ample time for any modeller to “think” the rolling harrier manoeuvre though as they attempt it for the first time.

The knife edge spins are really out of this world; slow spins and descending at the speed slightly faster than a regular ‘elevator’ or ‘parachute’. All it requires is just to kick the rudder at the apex to drop the Addiction sideways and immediately hold up elevator and a little aileron correction and apply æ throttle, it goes into a slow knife edge spin almost pivoting on the wing tips.

With most of my pre-planned manoeuvres bagged, I spent the later part of the afternoon just having a little fun with the Addiction over a patch of tall grass. The excellent control authority allowed very close in flying to basically

muck around by flying as low as possible to touch the grass without snagging. It was really fun and the manoeuvres got lower and lower to the ground pretty quick.

## Conclusion

The Addiction is one of the easiest hardcore 3D airplanes that I have ever flown. It has a rare mix of excellent attributes ranging from stable, predictable, reasonably precise to agile and aggressive, which is an excellent departure from the run of the mill 3D airplanes and provides versatility to varying levels of skill sets. It offers considerably more scope for advanced aerobatic pilots to mix a multitude of aerobatic manoeuvres into their existing repertoire while at the same time it’s stability and predictability provides beginners with an exceptionally gradual learning curve

to get into the advanced stuff. This is one of the few airplanes where a modeller is able to quickly progress at any stage of his skills development.

As for me, I have found the Addiction to be pure addictive fun and in just two weekends have already found it to be a valuable advanced learning tool by allowing me to bag three new tricks. I would certainly recommend the Addiction to any modeller, may it be plain vanilla aerobatics, freestyle, serious hardcore 3D or just out to have pure unadulterated fun with the sticks. Whatever it is, I don’t see myself getting bored with the Addiction and the more I fly the more addictive it gets. The Addiction ARF and its power components are available directly through Precision Aerobatics at 02-9558 0443 or [PrecisionAerobatics.com](http://PrecisionAerobatics.com) and through all good hobby shops.



## THE INITIAL RADIO SETUP

Control Surface	Rate 1 (Low)	Rate 2 (High)	Rate 3
Aileron	Expo 30% Throw 25Deg (adjusted via DR)	Expo 30% Throw 45Deg (adjusted via DR)	Dual Rate 100% Expo 0% Throw 100% full travel
Elevator	Expo 30% Throw 25Deg (adjusted via DR)	Expo 30% Throw 45Deg (adjusted via DR)	Dual Rate 100% Expo 0% Throw 100% full travel
Rudder	Expo 30% Throw 25Deg (adjusted via DR)	Expo 30% Throw 45% (adjusted via DR)	Dual Rate 100% Expo 0% Throw 100% full travel
Transmitter Mixing	None at the time of review		