Hyper Ava Pro-E F5J

The Hyper Ava Pro-E F5J isn't a beginner's model, but it flies very easily.

ANDY ELLISON SMASHES HIS PIGGY BANK AND RELEASES THE FUNDS FOR A LONG-LUSTED POWERED GLIDER

I've got fully moulded glider wings that are easier to bend than this one!

Ownership of a Vladimir Gavrilko (Vladimir's Models) Hyper Ava Pro-e F5J is an attempt to close a gap in my gliding arsenal. With other models repeatedly falling short of my expectations, I eventually realised that I needed to do what I should have done all along - bought the Ava in the first place!

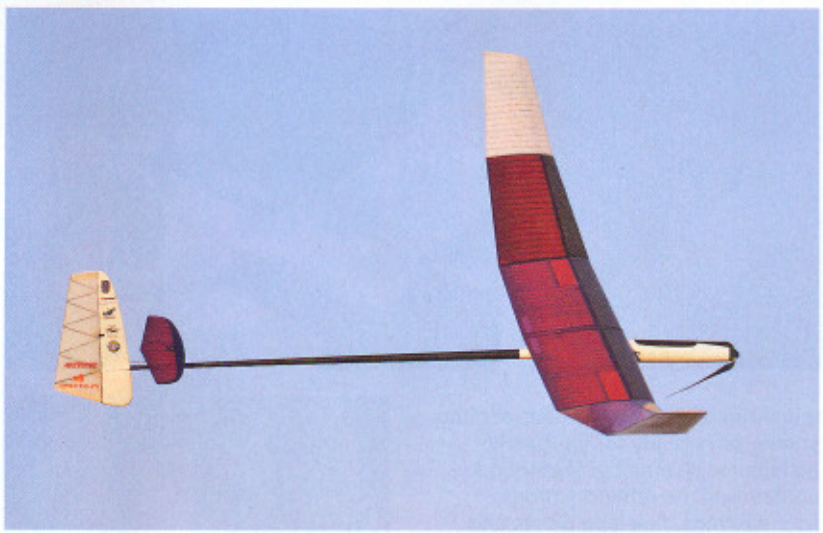
The Ava series has been around for a number of years now and is Vladimir's interpretation of Dr Mark Drela's stupendous Bubble Dancer thermal soaring glider design. In truth I've wanted one since I first saw a picture of it in *RCM&E* in an advertisement for FVK models many years ago. My budget didn't run to one then, though.

A succession of totally windless days with pristine clear blue skies, snow on the ground and abundant thermal activity saw me wishing even more that I could take full advantage with a little dawn till dusk, high level cruising. So, when the coffers were more full, I visited UK distributor Neil Stainton's website at www.hyperflight.co.uk and smacked the Hyper Ava Pro F5J 'buy it now' button. The deed was done!

BIG BOY

It arrived within a day and after a few minutes of wrestling with the large box it was assembled and held aloft by Slopetrash Jnr, whose opening remark was: "Oh, dad... what have

words » **Andy Ellison** | photos » **Andy Ellison**



All linkages and hardware are supplied and are kept as simple as possible. The direct control runs provide a crisp response even though the mode is only rudder and elevator control.

you done?" Mind you, it is big, especially when rigged up in your living room, yet it's impossibly light. Any aeromodeller worth his salt can see straight away where the £700 cost goes. It's fabricated by hand in the Ukraine and constructed like men's jewellery. It's reminiscent of a high-end competition specification F1A free-flight glider, but about double the span, using building methods invented in Eastern Europe and perfected by Vladimir for just that class of model.

The carbon / Kevlar moulded D-box, kevlar bound spar assembly, carbon-capped competition grade balsa wing ribs, knife-sharp carbon t.e. and pristine, wrinkle-free Oracover heat-shrink covering build into a wing whose weight belies its overall strength. I have fully moulded glider wings that are easier to bend and twist than this structure! Truly, I'm impressed.

Compared to that of the original Ava, the electric fuselage pod has been totally redesigned to use a beautiful carbon canopy hatch that clicks neatly into place. This allows the battery to be inserted and connected easily and improves field use, for no longer do you need to remove the wings or a nose cone every time. The very slim fuselage pod flows neatly into a carefully engineered wing pylon to reduce interference drag, and makes the model very easy to hold for launch. The wing mid-section and outer tips have been stretched on this Hyper version (made exclusively for Hyperflight) bringing the span up to 157" (3980mm) and decreasing induced drag compared to the stock 148" (3750mm) span version, further lowering the already unbelievable sink rate. The polyhedral is achieved via two 10° steps across both sides of the model (40° total between the two outer tip panels) and provides excellent rudder response.

The model is rudder / elevator / spoiler controlled, wing spoiling being provided by twin control surfaces that avoid masking the tailplane's airflow when open. The lack of effect on pitch trim makes accurate landings much easier to attain with this arrangement, particularly when compared to the original model's large single spoiler. The tailplane has an improved planform and, again, uses a similar carbon D-box construction to the wing, increasing strength and reducing trim drag. Meanwhile, the Hyper Ava's new fin design has a hollow moulded fixed version with a lower drag tail boom attachment, incorporating a very clever quick-release mechanism to allow removal of the fin and make the large airframe easier to transport.

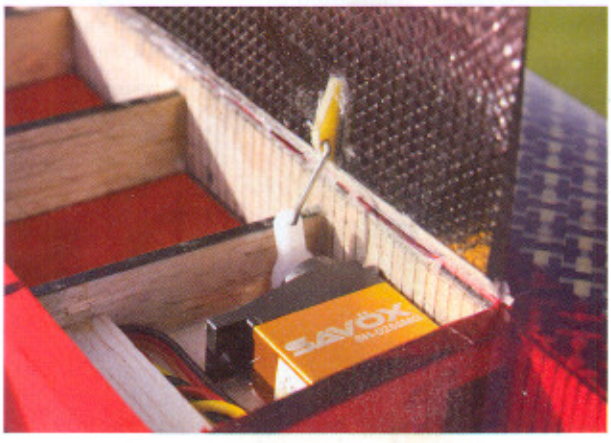
Wing spoiling is provided by twin control surfaces that avoid masking the tailplane's airflow when open.

The aerodynamics are outstanding, utilising Mark Drela's own aerofoils and a low drag, V-mounted, all-moving tailplane. A measured sink rate of 0.3m/s (60 ft / minute) is the result, and to this end the model can be built down to 60oz (1.7kg) AUW, yet despite low wing loadings of circa 6oz / sq ft. (1.8kg / sq. m), it can easily cope with 15mph winds.

NOT MUCH

There's little for the builder to do. The wing spoilers are pre-hinged with silicon and fit perfectly flush with the surrounding structure. Their control horns are already fitted and servo

The spoiler servo installation gave me the biggest headache. The first one took ages, the second just minutes.



The all-important rudder control is short and slop free. The neutral position is set by the fitting of the servo.

My tweak to the kit was to replace the elevator linkage with a higher spec 3mm pushrod and a clevis, this to aid removal of the fin and rudder set for transport.

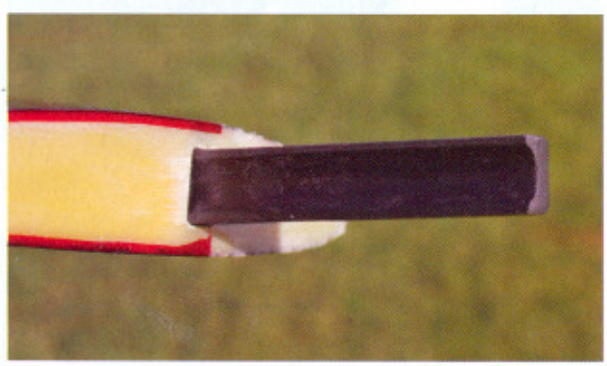
The rudder is pre-hinged with a long rod that's removable from the base of the control surface.

Sturdy carbon joiners are fixed into the outer wing panels. I'm not sure why they're fluted? Perhaps pneumatic locking has been an issue, or maybe they're indicative of the desire to reduce weight at every opportunity?

wires run from the wing centre to the spoiler bays ready for your servo installation. A small accessory pack contains all the other pushrods, screw fittings, tailplane pivots and servo covers for the fin, which houses the rudder and elevator servos. The only work one needs to do across the whole model is install the servos, attach the boom to the pod, fit the tailplane mount and the fin release clip, install a receiver, and fit a powertrain. With this, all I needed was a set-up good enough to do the model justice.

The long nose pod allows efficient, large diameter propellers to be fitted, and the structure is rigid enough to permit kilowatt class powertrains to be installed. These would give reasonably fast and authoritative climbs to height for this type of model, yet seem contrary to the rules of the UK height limited E-Soaring competition class, where 30 seconds are permitted to reach 200m altitude. Still, I wasn't interested in the competition side of things and wanted to err towards international FAI F5J set-ups that would provide loads of grunt for many straight up climb-outs.

In the end, then, I settled on a Kontronik Kira 500/30 brushless in-runner with a 6.7:1 ratio gearbox turning an Aeronaut carbon 18 x 11" prop at 6100rpm on a 4s Hyperion 3300mAh Li-Po. This draws a measured 62A at full throttle and delivers 940W. With a Hacker 70A



ESC and a Hyperion UBEC soldered in off the flight pack, I was well within the scope of the electronics.

The model's scant, brief, but almost entirely adequate instructions are clearly aimed at a specific installation; this is especially true of the spoilers, and the document assumes that you'll use the specified servos. Care must be taken to avoid adding unnecessary weight to the rear of the long boom, and both Vladimir's Models and Hyperflight are fairly insistent that you use Hyperion DS09AMD servos (high torque, 9g units that cost around £25 each). This along with a home-spun, 4-wire loom to control both fin-mounted servos helps keep the back end as light as possible. As the fin on the Hyper Ava is also removable if required, I made up my wiring loom with 2mm bullet connectors that could be parted if I wanted to separate the fin (positive and negative servo wires each share a pin with the signal wires having a line each, of course).

AFT END FIRST

I concentrated my build at the back end of the model, first removing material from the moulded fin so as to fit in the tiny servos, add their linkages and fit the supplied covers. Fitting the fin release clip followed before squaring up the all-moving tailplane mount and gluing it onto the boom with high impact, carbon reinforced, Beli Zero cyano.

A word about the fin retention clip. It's known to become a little weak and has led to some spectacularly bad launches where the pilot hasn't observed that his previous landing shunted the whole fin back slightly. This moves the elevator servo along with it (which drives the AMT), giving him a whole boot full of unwanted up elevator trim. I added a small self tapping screw to prevent this happening, whilst keeping the fin removable. When all this is properly set you can screw the tailplane in place, fit the centre wing panel to the fuselage pod and square up the whole model before gluing the boom to the pod. I had to pack the fuselage pod spigot out a little with a thin strip of masking tape wrapped around until the boom was a tight fit, gluing the big joint with slow-set Araldite 'rapid steel' epoxy.

The rudder linkage is simplicity itself: a short wire, with no adjustment, connected straight to the rudder horn. This lack of adjustment means that centralising the linkage is achieved by the position of the servo, which can be juggled somewhat as the glue sets when you stick it inside the fin. The elevator linkage is quite different. Here, the elevator servo mounts upside-down and is connected to the tailplane mount actuator by a carbon rod equipped with glued-on threaded connectors for ball joint ends. Unfortunately, the threaded connectors bent every time I wanted to wrestle the linkage off the servo arm to remove the fin and, over time, this would have fractured them. So, my concession to the kit was to replace the elevator pushrod with a 3mm steel linkage and a metal clevis at the servo end, the tailplane end keeping the original ball joint as designed. This had an effect on the C of G, pushing it slightly rearwards and requiring a repositioning of the battery pack.

The spoiler servos and linkages weren't quite so easy to install. The instructions include a simple drawing and a dimension that assumes you're using servos much smaller than even the Savox 255s that I chose. After much faffing about with clashing linkages it dawned on me that other users must have had similar problems, so I turned to the internet. Sure enough there was a partial solution which involved drilling a hole in the (already fitted) spoiler actuation horns 5mm further away from the original. With this achieved and the length of the spoiler

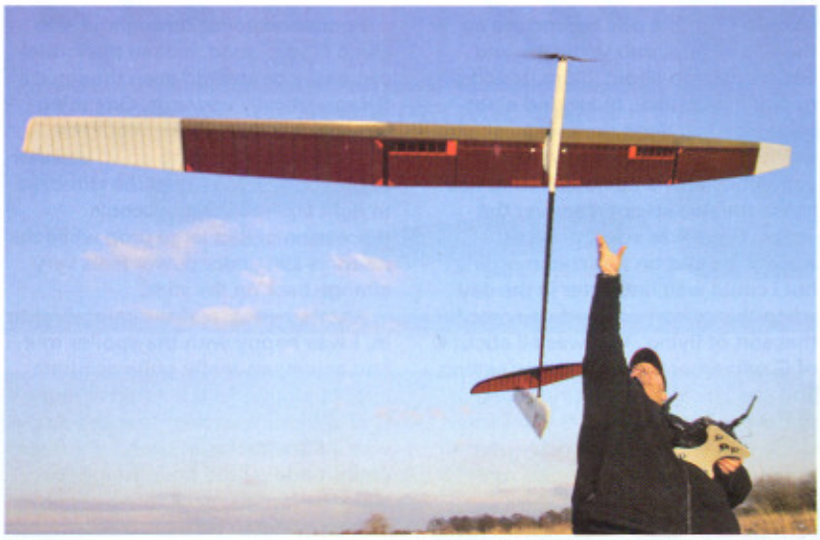
An all-moving tailplane avoids incidence issues, but it needs to be well supported. Here, then, the Hyper Ava uses Vladimir's models favoured V mount to good effect.

pushrods fixed in the kit, I then became aware that the horn itself was also striking the servo arm hub as the spoiler retracted. The remedy was to remove the servo lugs and push the servo closer to the spar. The solution worked first time and I could eventually glue the servo in. The first spoiler took almost three hours to get right; the second one, about three minutes! In the event, a full 90° of movement is easily achieved, and I chose to operate them on a side slider. I also set up a free mixer to dial-in some elevator compensation later, should it be required.

I mentioned earlier that my battery of choice was a 3300mAh Hyperion 25C 4s pack. I initially purchased a similar 4000mAh pack in the hope that the dimensions given online were correct. However, this larger battery wouldn't slide back far enough to allow the canopy to be fitted, so I had to opt for the smaller version. At 3300mAh it's far in excess of the packs carried in either the E-Soaring classes or F5J, but for sport flying it would mean long flight times and infrequent charges.

Whilst shopping at Hyperflight I also took the opportunity to purchase one of Neil's offset folding prop spinners and one of his new, most excellent model bags bearing the Hyperflight logo. Very nice they are too, but the Ava's fuselage is a little bit tight in the fuselage sock. It does however come with the added facility of a hanging strap, which keeps the wings safe and out of harm's way in the Skunkworks. Very neat. Incidentally, the purpose of the offsets on the spinner are to allow the propeller blades to fold almost flat against the fuselage sides, saving drag. A simple design feature than works brilliantly.

My receiver was a Spektrum 6255 carbon-friendly version, secreted at the back end of the fuselage pod right behind the flight battery, the twin antennae poking through the fuselage side and into the breeze for adequate reception. With this tucked away and the model assembled and ready to fly my C of G came in at 4.1" (105mm) back from the centre-section I.e., which is within the 3.9 - 4.2" (100 - 108mm) range.



It goes like the proverbial...

SEE ME?

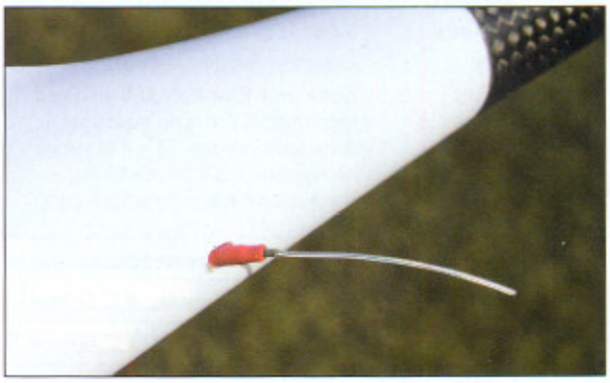
First flights took place in fog. I know, I know... But when you have the fever, you have the fever! I was glad to see that the glide is quite remarkably, perhaps even ridiculously, flat. Even though I couldn't properly assess the powertrain, as the model faded almost from sight within just one second post-launch (this with the motor still not achieving full revs on the speed controller software ramp) it was clear that power was certainly more than adequate.

During the day's exploits I noticed that the wing joint trailing edges, rather than just the D-box, required taping together with a touch of Sellotape Diamond to prevent them pulling apart. Anyway, at the very least, these early dabbles allowed me to get the model trimmed out ready for the next day, which dawned clear, bright and windless.

INTO THE LIGHT

With the battery fully charged I went for a full power, vertical climb-out. Wow! Chuff me! Holy smoke! etc. etc., were just some of the expletives

The tell-tale whiskers of a carbon friendly 2.4GHz radio system are becoming quite commonplace these days. My Spektrum 6255 is buried beneath.



Really, I should have bought one years ago...

Post your views on the Ava Pro at modelflying.co.uk

uttered from the pits behind me as the Ava rose plumb vertically and very rapidly to about 200m (towline height, if you like), in around eight seconds! The hang time was ridiculously good in the windless conditions and is obviously what has made the Ava so popular over the years. There was scant thermal activity around on this cold morning but I could wait until later in the day when things had warmed up some for that sort of flying. This was all about C of G refinement, control throw setting and spoiler mixes. I was surprised to find when I landed after that initial climb-out, that my flight had lasted 12 minutes, with no other motor run!

Rudder response throughout the climb is very good, indeed the model can easily be steered even though it's flying vertically upwards. One thing I did notice is that power should be shut off before pushing down elevator to part bunt at the top of the climb, as to fight against the gyroscopic precession of that large prop while the motor is still under power feels very strange back on the stick.

Another couple of trimming flights in, I was happy with the spoiler mix and achieving really quite accurate spot landings. I'd persisted with the C of G but it was clear that the model was a little 'tucky' at speed. Perhaps I might add a little nose weight or slide the battery pack forward some if this proves to be a problem in turbulence at height.

Overall the model is fast enough when tracking back from a downwind position, although I think that winds much above 15mph would begin to give it some problems. Since it's so lightly loaded and doesn't have the benefit of variable camber mixes, you do have to chose your days for flying the Ava.

Now it was time to look for some lift. I launched again and set the model into a thermal search pattern over the top end of the field, tracking back and forth and flying through as much air as possible. A tell-tale wing waggle occurred, I turned towards it and immediately hit the rising thermal. Oh, that was too easy. No work at all! All I had to do was let the model fly itself and concentrate on steering it around the sky. You can clearly see why this airframe is a winner.

The large span permits very high climbs without disorientation under thermal, although the white wingtips tend to display some evanescence at certain angles. On occasion they, and the white opaque rudder covering, do light up like neon lights, but I think I might have to add a little colour to the extremities to aid my fading vision in my middle age!

In the first three weeks of testing I've had around six flights per day over three consecutive weekends - some of over an hour, some perhaps only ten minutes. On the sixth flight of the sixth day, the flight battery eventually went flat. That's right, I hadn't charged it during the three weeks of flying. That alone demonstrates how good this model is at thermal soaring with minimal power assist. I can't describe how much I wish I'd bought one all those years ago when they were cheaper.

OH, JOY

The Hyper Ava Pro-E F5J isn't a beginner's model, but it flies very easily. It's a competition thoroughbred requiring minimal work to get airborne, a duty of care in ownership and a little nurturing. Treat it like this and you'll get the best from it, enjoying every minute you have it in the air.

Hyperflight sells beautiful lightweight model bags for its range of kits. This permanent home for the Ava will protect my purchase for a long time to come.

DATAFILE

Name:	Hyper Ava Pro-E F5J
Model type:	Electric glider
Manufactured by:	Vladimir's Models
UK distributor:	Hyperflight Tel. 01926 314011 www.hyperflight.co.uk
RRP:	£699
Wingspan:	157" (3980mm)
Fuselage length:	73" (1854mm)
Wing area:	9.3sq. ft. (0.9sq. m)
All-up weight:	60.1oz (1.5kg)
Wing loading:	6.5oz / sq. ft. (2kg / sq. m)
Functions:	Elevator, rudder, spoilers
Powertrain:	Kontronik Kira 500/30 brushless inrunner; 6.7:1 ratio gearbox; Aeronaut carbon 18 x 11" prop; 4s Hyperion 3300mAh Li-Po; Hacker 70A ESC; Hyperion UBEC
Quality:	Poor | Acceptable |
Assembly:	Easy | Intermediate | Difficult
Flying:	Novice | Improver | Experienced