# HypeR? Super!

**Steve Uzochukwu** falls in love with P&M's latest high-speed tourer



P&M IS the UK's main manufacturer of factory-built two-seater flexwings by a huge margin.

Formed by the merger of Pegasus Aviation and Mainair Sports just after the turn of the century, it has a long list of aircraft well known on the UK and world microlight scene, such as the Q, Flash, Quasar, Blade, Quantum and Quik series.

It also makes the world's fastest flexwing, the QuikR, winner of numerous competitions up to the 2015 World Air Games in Dubai, to prove the pedigree.

The company was recently obliged to control costs by closing the Rochdale facility, with all design, production and support now based at Manton near Marlborough, and it was to there I went to fly the HypeR with its designer, Bill Brooks.

The HypeR GTR, to use its full name, is a brand new trike design with the 13m² wing seen previously on the Quik GTR.

P&M brought it out after market research showed a desire for more cockpit room, greater luggage space and adjustable seating.

The design was first shown at Popham in 2016, and was well received but for some comments about the aesthetics of the nose.

That's now been remodelled, and the HypeR certified to 472.5kg with a ballistic parachute, or 450kg without.

## The wing

The GTR wing has been developed to suit the Hyper trike. A strutted wing with no kingpost, it was originally offered with winglets, but now has undersurface venting and no winglets, making it slightly faster to roll and easier on the ground when there are gusts or side winds to deal with. Bill prefers the vertical stabilising surfaces on the trike.

All exposed tubing, with the exception of the base bar, is aerofoil section. The wing is trimmed by the electrical system used on the Quik series, where a motor alters tension on a bungee for slow flight.

In addition, the wing has the STARS system where the asymmetric application of trim to the outer washout rods (also known as sprogs) helps roll response.

The wing also has a roll trimmer to guarantee straight and level flight at any combination of power, speed and loading.

Bill has used a very slightly lower sail tension on this wing, as some pilots who flew it said the wing is heavy in roll.

The main body of the sail is Dacron, with laminate leading edges. The trailing edge and the full span to the tips have Technora reinforcement strips to help carry the high span-wise loads in a wing of this type, and the bands reduce the Betts-test figures for the main sail, although they also require their own dedicated testing. Technora is an Aramid fibre, in this case dyed black to protect it from UV.

Like other strutted wings in the Quik range, the wing folds on the trike to save hangar space.

To hobble the wing for overnight safety, the rear seat and baggage need to be removed, then a gas strut is clipped in place to help lower the wing after the front strut and screen have been removed.

## The trike

The trike is new, and very different from its conventional predecessors or the ground-breaking PulsR.

It has an alloy box-section chassis with a steel engine and undercarriage mount. All composite panels with the exception of the adjustable seats are fairings to reduce drag.

For the pilot, a lever under the seat allows a number of positions fore and aft to be chosen. The reach can be adjusted on the foot pedals, and one of the side effects of adjusting the pedals is that their rake changes, so a three-position setting is in the pipeline for the pedal rake. The pedal position is locked by pip pins, so it takes only seconds to change.

The passenger seat is adjustable for height, again with pip pins, and the rake can be adjusted by changing the length of the strop that supports the back of the seat and loops over the usual over-centre lever that secures the pylon.

The rear-seat steering footrests have two positions, also secured by pip pins, which allows a taller passenger or instructor to be more comfortable. P&M MD Andrew Cranfield, who's 6ft 6 in (198cm), has spent a lot of time in the rear of the HypeR being flown to demo weekends in France by Bill, and is very happy with the rear seat.

The pod is wider, so there's more room inside generally, and while the leg cutouts in the dash for the pilot are more than sufficient for pilots up to 6ft 1 in (185cm), the intention is to increase the cutouts to make the cockpit fit the tallest pilots of all. I'm 6ft 1 in, and it was roomy and comfortable for me.

## The baggage compartment

The increase in storage isn't obvious until you're shown the rear seat hinging forward and the very large bag under it, which should take overnight bags plus a small tent with no problem. The bag sits between the fuel tank and the bottom of the passenger seat, and zips up.

The tank is the long-range 65-litre version fitted to the Quik range, but the space exists partly because it's positioned slightly differently.

All of this storage is internal, and unlike panniers doesn't compromise the airflow into cooling radiators. Nor does it saddle the trike with a large drag penalty.

## The techie bits

Mag switches are in a similar position to other trikes, on the right with guards. The throttle and trim adjuster are on the outside of the pod, on the left. The choke is inside the pod and looks little bit tucked away, but is easy to reach.

The screen is very tall and completely clear, with no visible lines or folds for shaping. It removes quickly, without tools: there are two Pro-Bolt fasteners (very similar to the Dzus type) where the screen fits into the main pod, a clip and a Velcro retainer on the front strut to remove, and it's off.

Four Pro-Bolt fasteners also secure the rear cowling. It probably would be best to remove this for your daily inspection, although you can see and reach some things through the vents either side of the pylon.

With the rear cowling off, things are where you'd expect them to be on a 912S, with the addition of carburettor steadying rods to solve the carb rubber fatigue problem, and a small stand off on top of the ▷

**Facing page** The big screen makes a huge difference to long-distance comfort

**This page** With back seat and wing removed, the HypeR is ready for transport

1 Rear steering can be adjusted
2 A lot of thought has gone into the seating arrangements
3 Pedal position can easily be adjusted
4 No panniers: storage is now inside the aircraft
5 Lightweight battery sits in front of radiator
6 Two levels of instrumentation are offered, the electronic version is illustrated
7 Throttle and trim adjuster mounted on the outside of the pod



gearbox to locate the cowling. The rods will become a factory mod for all 912-engined trikes.

The rear undercarriage is a cantilevered beam without suspension struts; it's the same as on the PulsR and is reminiscent of the rear suspension on the Quasar.

The battery lives just above this suspension beam, in the extreme rear of the trike. It's a lithium one, a big weight saving over a conventional lead/acid offering.

## In the air

Weight calculations had us flying at 459kg, so within the BMAA check flight criteria.

The Manton strip is 350m long, and the wind was only about 6kt, but very crossed and varying as thermals came through.

The brakes are powerful but progressive, with no tendency to grab. The trim was set for just above the top of the takeoff window on the P&M electric trimmer, since Bill had optimised it for long-distance work. Normally you'd set it just inside.

With checks done and full throttle down the runway, we rotated at about 55mph, and the HypeR then picked up speed very quickly.

For the first takeoff, I'd made that little check back on the bar to ensure speed was picked up correctly, but this wasn't needed.

On a subsequent takeoff, we'd used just over half the strip by liftoff, the reduction in resistance as the wheels left the ground was enough to pick up speed, and 75mph was on the ASI very quickly.

The day was fairly thermic, and after clearing the low-level minor bumps, we slowed down to about 65mph and a climb rate close to 1000ft/min.

Levelling off at just over 2000ft, the stall was the first manoeuvre I tried. Previous experience with the GTR wing had shown a very benign stall, with the wing very resistant to the last stage of control movement needed close to the front strut.

That hasn't changed: just before the stall there was an enormous amount of push back then some buffet, followed by a little nod of the nose to recover flying speed, with the bar allowed to push back to a sensible position for an easy recovery.

We were now flying in a fairly thermic environment, with paragliders from the Golden Ball takeoff on the Marlborough Downs already making cloudbase, but the thermals were having minimal effect on the HypeR.

This sort of air would lead to medium control bar movements in a Quantum in both axes, but in the HypeR virtually nothing in pitch, and only a little in roll.

The solidly planted feel of the wing gives confidence, since it's easy to hold the bar lightly between two fingers on the top of the bar and thumb below on each hand.

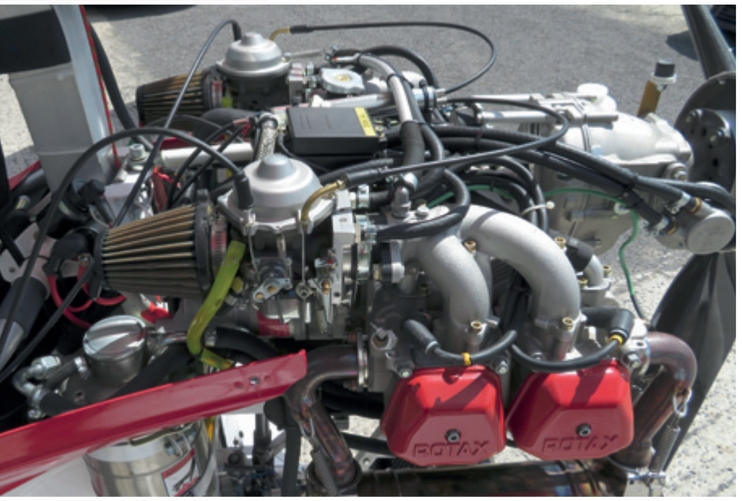
When the movements in roll from turbulence come through, the smallest ones can be ignored, and the other ones just lightly weightshifted against.

That was the case at all speeds, from about 60mph all the way through the envelope to about 95mph, with fuel consumption at maximum speed about 17 l/h.

The aircraft is very relaxing to fly even through a fair amount of thermal activity. It's simply a case of matching power to desired trim speed, which would make it very good for covering distance.

At 80mph you can lift the visor and feel just a slight breeze on your face, and you could very comfortably fly like this, although the breeze is probably just a little much for your microphone. Conversations with the visor up were possible, though, due to the much bigger screen.

**Above**
Despite having the same wing as the Quik GTR, the HypeR is a shade quicker and easier to handle



> As a high-speed, long-distance cruiser with ample storage, the HypeR has met all its design goals

## Turn time

The HypeR seemed to resist large roll inputs, but rolled in smartly, precisely and immediately with a small to medium movement of the bar.

It seemed that a medium movement resulted in more measured and positive turning than a large input does on an older machine.

I also found that tensioning the trim system by pulling in, even slightly, then making the roll input, resulted in a very quick roll response, with 45° coming up rather swiftly. Tensioning the trim was done just a split second before or at the same time as the roll input, and did not result in an increase in speed.

Once the desired angle of bank had been achieved, the bar could be centralised, there was no need for further input, and the HypeR felt like it was on rails. Even at 60° angle of bank there was no need to high side to hold off the tendency some flexwings have to wind into the turn.

All inputs were made with just the light grip of two fingers and thumb mentioned above, so it certainly feels different from the older machines.

If you've flown the Quik GTR, it's very much like that, but feels a bit more slippery in the way it picks up speed. It's the way it deals with the bumps that also sets it apart from previous generations of flexwings.

## Smooth operator

Next it was time to see how things were in smooth air and put the roll trimmer to the test. With such a huge speed range available, it's important to trim at or close to the best climb speed, which is 60mph.

Once above the convection layer, we ran through the range of speeds again. One hand in the middle of the base bar is all that's needed at any speed, and if there should be a slight turn in the aircraft, again at any speed, the roll trimmer on the right-hand upright will deal with this easily and effectively.

The trimmer only needs to be moved a small angle to trim the aircraft, and in the calm air it was possible to very precisely set the HypeR to fly absolutely dead straight.

Every flight ends with a landing, and I did two. With a small strip, it's important to nail the approach speed of 65mph correctly.

The foot throttle feels lighter than 80hp 912-powered machines I've flown, and this helps with controlling height and speed on final, so it was easy to get into the 350m Manton strip despite the thermic activity and crosswind.

## And finally…

As a high-speed, long-distance cruiser with much more storage than other aircraft in the range, the HypeR has met all its design goals.

Two levels of instrumentation are available, all-analogue or twin MGL Xtreme (EMS + EFIS) with analogue ASI and altimeter.

The all-analogue option costs £57,358, which is a very tidy sum for a flexwing, but to put it in context, the Evolution Trikes Revo (if you could legally fly it here, but you can't) starts at $79,900, which is about £62,500, and the Tanarg with the Bionix 1 13m² wing is about €48,000-€50,000 for the UK-specification self-assembly kit, giving a bottom line of about £41,800 – and then you have to build it and get it signed off.

In other words, the price is commensurate with a top of the range flexwing microlight, which is what it is, and an enormously capable and pleasurable aircraft to fly. □

**Above** Familiar 912S differs only in detail from earlier installations



TECHNICAL DATA

# P&M HypeR GTR Explorer

### MANUFACTURER

P&M Aviation, Elm Tree Park, Manton, Marlborough, Wiltshire SN8 1PS; 01672 861350; pmaviation.co.uk. Directors: Andrew Cranfield and Dr Bill Brooks.

### SUMMARY

Tandem two-seat flexwing aircraft with weight-shift control. Rogallo wing with keel pocket and vented leading edge. Pilot suspended below wing in trike unit, using bar to control pitch and roll/yaw by altering relative positions of trike unit and wing. Wing braced from below by struts; floating cross-tube construction with 80% double-surface enclosing cross-tube; 21 battens on top surface, 14 battens on undersurface. STARS roll and trim stability system. Undercarriage has three wheels in tricycle formation; coil-spring suspension on nosewheel and composite construction main undercarriage beam. Push-right go-left nosewheel steering independent from aerodynamic controls. Hydraulic disc brakes on mainwheels (optional on nosewheel). Aluminum-alloy tube trike unit with GRP pod. Engine mounted below wing, driving pusher propeller.

### EXTERNAL DIMENSIONS AND AREAS

Length overall 3.20m. Height overall 2.75m. Wing span 9.26m. Chord at root 2.10m. Chord at tip 0.47m. Dihedral -1°. Nose angle 130°. Wing area 13.00m². Aspect ratio 6.6/1. Wheel track 1.65m. Wheelbase 1.80m. Mainwheels dia overall 38cm. Nosewheel dia overall 38cm.

### POWERPLANT

Rotax 912S liquid-cooled engine. Max power 100hp at 5800rpm. Warp Drive propeller, diameter and pitch 1.72m x 16° at tip. Gearbox reduction, ratio 2.43/1. Power per unit area 7.69 hp/m². Fuel capacity 65 litre.

### WEIGHTS AND LOADINGS

Empty weight 260kg. including parachute. Max take-off weight 472.5kg. Payload 212.5kg. Max wing loading 34.3kg/m². Max power loading 4.72kg/hp. Load factors +4 -0g recommended, +6 -3g ultimate.

### PERFORMANCE*

Max level speed 105mph. Never exceed speed 120mph. Economic cruising speed 80mph. Stall speed 39mph. Max climb rate at sea level 1000ft/min. Min sink rate 500ft/min at 57mph. Best glide ratio with power off 10/1 at 57mph. Take-off distance to clear 15m obstacle** 302m on grass. Landing distance to clear 15m obstacle 320m on grass. Service ceiling n/a. Range at 80mph 345 miles. Noise level n/a.

***Under the following test conditions***
Airfield altitude 0ft. Ground temperature 15°C. Ground pressure n/a. Ground windspeed n/a. Loading 472.5kg.

***Includes a safety factor of 1.3*

### PRICE INCLUDING VAT

£57,358 for HypeR GTR, including basic instruments. P&M has a demonstrator available.

*n/a = not available*
*Data above provided by manufacturer*
*Data in text is tester's experience*