

So You Want to Be a Composite RC Sailplane Manufacturer?

Part II: Inside the Devil's Fireplace

[James Hammond](#)



A nice shiny cherry Vector II awaits another launch. (image: Steve Dorling)

In this second of a new series of articles (see Resources, below, for the first part) I am going to go on with my story, as it transpired, and use my experiences to lead you along the crooked path and across the many pitfalls that you may encounter. They are all part and parcel of the frustrating process of realising your own moulded glider. — JH

1998 — The First Obstruction

If you remember in the first instalment of this gripping, wildly exciting, edge-of-the-seat tale, I'd decided to make my own fully moulded model; I was looking for a suitable partner, and I thought I'd found one. Well, that all went west; it didn't work out at all how I had hoped.

Out of the four European moulded glider manufacturers I got replies from, three said that they had never heard of me, so they weren't interested, and one looked at least to have some promise as they asked for a sketch. A few software compatibility problems ensued as the company in question — located in (just) post-communist Eastern Europe — had a version of Windows that was probably issued when the predominant European language was Latin. But we soon had that sorted, and the dialogue progressed quickly to how much it was going to cost and what business model was to be used. I was teetering, white knuckling it on the edge of my chair to say the least.



The late, great Steve Dorling heaves his second Vector II off The Great Orme, Wales.
(image: Steve Dorling)

After a good deal of — in hindsight — utterly pointless dialogue exchange it

was apparent that the dream I had was to come to naught. In the *OEM* business model, I would have paid about six thousand euros for CNC work and production mould manufacture, with a transfer price of about six hundred euros per airframe — which, even today for that model would have been far too much. So that was scuppered. Or the second, *Royalty* business model, whereby I sign over the design and all intellectual property rights, and the manufacturer — now design owner — would pay me a royalty of around 10 euros per model sold. Of course, they swore on a stack of bibles and several aged relatives that they would be very honest in letting me know how many models had been made, and how they'd be sure to pay the royalties regularly.

Really? Even I was not that naïve. Damn — my McLaren was retreating again. Yep, I was forced to admit that I was listening to the proverbial fat lady sing — and I didn't even know the language. Without doubt the tin hat was securely on the commercial idea. Again. Or so I thought.

Takeaways:

Contact several potential manufacturers, not just one or two.

Have a good idea which business partner best suits you — are they making similar models already?

Have a good idea beforehand which business model will best suit you.

If the manufacturer responds, then carefully consider their proposals.

Try to pre-qualify any potential manufacturer as much as possible by asking questions first by email.

A Beautiful Golden Beam of Light

For a while I was doing as well as could be expected. I was in full gepissedoff, uber-sulking mode and ready to heave all of my toys out of the stroller at the slightest provocation. My carefully laid plans had been dashed to smithereens on the sharp rocks of reality, and possibly over-ambition. So, I put the entire idea to sleep, sternly told myself that it wasn't to be, gritted my teeth and cancelled the McLaren 720. Then I made a few more models for myself and my friends and concentrated on generally enjoying the flying.

Am I one to give up so easily? Nah! Soon it was back on with the chase! The search around the planet began. And then?

One crystal clear day, a beautiful golden beam of light shone down from the heavens. A model shop owner friend of mine told me that he had done business with a couple of companies in China, and he had heard from one of them that there was a firm somewhere in that yawning vastness, that had started up making moulded models, possibly for a year or more. Could it be? Damn, that was like offering the equivalent of free crack cocaine to an addict. Hooked again, I'm afraid.



LP Hao's yellow Vector II — notice the missing rudder. (image: LP Hao)

China Beckons

I soon found who the aforesaid startup was: *Great Huge Flying Raptor Model Enterprises* — or something akin to that — and where they were: Henan province, China. And so, I contacted them or tried to. After a rather confusing stream of duck soup emails and equally befuddling telephone calls by SWMBO to the owner's assistant, no good information was forthcoming. So being the tenacious cove I am, I decided to visit the factory for myself. Sounds like quite a commitment but at the time it wasn't, due to the fact that I was over in China every couple of months for my engineering consulting business anyway. A visit to the factory was really just a side trip.

Although still highly skeptical but ready to be surprised — pleasantly, I

hoped, I arrived at Jinan 'International' Airport, one sunny but cool autumn morning after a flight from Shanghai. Then, after quickly completing the formalities — no baggage to collect, only a small backpack as it was best to travel light in those days, I sauntered out to the greeting area to be met by a crowded sea of identically smiling faces. I was waved at and then picked up easily, me being the only foreign face emerging, further aided by a sign with my picture and "JMAESHAMOND MODEL" (sic) emblazoned on it. *Wot, me?* I remember thinking.



Blast-from-the-past: me in Taiwan in September 1991 with a Greengrass/Hammond MOM Sigma Racer. Dayum — what a skinny handsome dude! Note the elephant grass — try and find your model in that stuff — its six feet high down the slope. (image: James Hammond)

We were soon speeding along the wide roadway towards the city of Jinan at a fine clip, in our limousine — an old and dilapidated van that had an exhaust leak which made it sound like a couple of badly adjusted through-pipe Harleys. My compadres, who turned out to be the owner and his able assistant, both managed to smile and grinned reassuringly throughout the rather nerve-shredding journey. I'm not sure it helped.

GHFRME Co. Ltd. — The Final Frontier

Within a half hour we had swerved off the high-speed carriageway and were blaring through the countryside at the deafening and to me dangerous pace we had been doing on the highway. My companions did not seem worried at all, so I reassured myself that the van was actually self-announcing and that anyone who was not actually stone deaf would be adequately warned of its imminent arrival — and get out of the way. After a mercifully short time, the van careened into an unpaved parking lot surrounded by an eclectic jumble of low buildings of various sizes, ages, and persuasions. I later found out that it had originally been a pig farm. A discouraging sign was that I noticed a lot of small offcuts of carbon and glass cloth that had been blown into corners by the wind — not an encouraging sign.

Later, seated in the second floor *VIP Meeting Room* — according to the sign on the door — having completely forgotten to inform them I could actually speak and understand Mandarin, I managed to filter out from the broad Henan-accented discourse, that my hosts were experiencing a bit of conflict as to whether or not to allow me to peruse the top-secret facility. The factory manager was forecasting a wide-ranging fallout of doom and gloom that would certainly ensue when I had cunningly gleaned all their production secrets and transferred them to party or parties unknown. You can't trust these espionage-trained foreign devils, you know. In the end common sense prevailed, and after a smiling announcement in English, off we went traipsing round the connected buildings that formed the work spaces.

Le Tour de Factory (Après Moi Le Deluge)

I have to say that my initial impression of the place was about what I had expected, or at least imagined — a series of average-sized mildly untidy and grubby rooms arranged with working surfaces and equipment according to

function: cutting, painting, layups, curing, finishing, packing and storage. The curing *room* — no, it was not just an oven, it was a whole damn room — in particular would not have been out of place as an important feature of Dante's inferno. Three open braziers filled with yellow-hot charcoal dominated a space that was otherwise occupied by angle iron push trolleys, but I could not see any actual curing going on, though I did not comment on that. To say it was hot in there was a gross understatement. It was like the Devil's fireplace and had to be close to 150 degrees — skin burning heat. So much for temperature-controlled curing.



A Vector II, most likely at The Slot near San Francisco. (image: [tbd])

The layup room was actually more interesting as a three metre DG 600 scale sailplane layup was being conducted by a couple of young guys — in fact the only two workers I saw, who were working with the only mould set I saw. After a few minutes of observation, it soon became apparent that these guys had only the most rudimentary idea of how this process should be conducted. The moulds weren't much good due to very loose alignment methods, the halves were over-polished to the extent of losing sharp edges,

and the numerous mistakes they were making were obviously not corner-cutting, but in fact due to lack of knowledge. *Yahhhh!* A look at a finished model soon had me shuddering in fear, as, to put it bluntly, it was rubbish. I felt I'd been drenched with cold water once again, bugger it!

Or Maybe Not?

Yes, the factory tour had been quite disappointing, except for a couple of gleams of hope:

1. There was a new looking laser cutting machine that was actually working — cutting servo mounts — none of your plastic moulded trays back then.
2. Cunningly concealed in a new prefab building that stuck out like a sore thumb among the old farm barns, was a pretty large — at least three metre table — brand spanking new CNC routing machine.

Takeaways:

Make sure that you can gauge the capability of your potential partner.

Don't be daunted by the seemingly rather primitive production facilities.

Ask them by email before any face-to-face meeting about years in business, in-house skills, customers and other relevant facts.

Ask for pictures of moulds, and the models they have produced.

Remember that typically ANYTHING you ask for will be NO PROBLEM! — take that with a pound or two of salt.

Frankly, those last two pieces of equipment at GHFRME and the general potential of the place were the only things that stopped me from requesting to be returned to the airport there and then. Where I'd thought that this would be an open or shut case — basically a yes or no deal — I now found myself faced with a predicament. What would happen if I taught this crew the correct way to make moulded airframes? If I did, they could. If I didn't, they couldn't. A rare juxtaposition. What did I want the outcome to be? The question rolled around my brain.

A little inspiration: the Vector III in action. (video: Mike Evans)

Deciding not to decide on that gristly quandary until I had gleaned more information, I produced my rolled-up drawing of the *Vector II*, then sat down with the ever-grinning owner and the factory manager to see how much they knew about converting a line drawing to CAD. Then we moved on to CNC programming, and thence to making a mould or master on the CNC machine. The owner's assistant was the 'translator'. I soon found to my surprise and hidden joy that the dynamic duo were surprisingly knowledgeable on the CAD side, using the ubiquitous if a bit dated AutoCAD programme, and were confident on the CNC machine as well.

Takeaways:

If you have the chance then do visit the factory — if not, ask for pictures.

If an actual visit is not possible, then arrange a Skype or similar face-to-face meeting.

Have a list of important questions prepared.

Make sure you have a translator handy, and make sure you discuss the questions with them first.

My visit to the GHFRME factory was encouraging, so I started to become encouraged. But, the nagging question was, how had they survived until now?

That was soon to be revealed but for that, you will have to rejoin the odyssey in Part III.

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Resources

- [So You Want to Be a Composite RC Sailplane Manufacturer? Part I: The Road to Perdition Awaits](#)
- [James Hammond Sailplane Design Series](#)
- [The Aeroic Sine Wave Spar](#)

The third part of this series coming up in the October issue of the NEW R/C Soaring Digest. Signed up for the [RCSD mailing list](#) to be notified when that's out. Read the [next article](#) in this issue, return to the [previous article](#) in this issue or go to the [table of contents](#). A PDF version of this article, or the entire issue, is available [upon request](#).