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### TSA MODEL FACTORY VISIT

A NEW FACTORY FOR A NEW MODEL...

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EXCLUSIVE

WORDS / PICTURES: JON TANNER

# TSA MODEL FACTORY VISIT

## A NEW FACTORY FOR A NEW MODEL...

It's not often you are invited to visit a model helicopter factory, let alone a new one before production has started, but that is exactly what happened last November in China when I met Nigel Brown of TSA Model. I was attending the 3DX China event in southern China and met Nigel. He confirmed the invitation and so I was obviously very happy to extend my time in China... The background to the visit was a growing rumour around the model helicopter community that TSA Models' Infusion 90 would not be produced and I had suggested that one way to disprove the rumours would be a well-timed article...



Chief CNC Production Manager Mr Liang with Nigel Brown at the TSA Model entrance



The Administration building, to the left is the manufacturing complex and to the right one of the new accommodation blocks

I was met by Nigel and Chief CNC Production Manager Mr Liang, who explained how TSA was establishing a completely new manufacturing unit for the Infusion range of models. At the time I did not really understand what they meant, but when we drove up to the TSA Model complex, past the saluting security officer, I began to understand. I was looking at a brand new administration building, and to the side was another new and larger building that housed the manufacturing centre and to the rear and side were new, large accommodation blocks including recreational facilities for the employees.

At the time of my visit, November 2010, the machine shop housed 18 brand new multi axis CNC machines (mostly 4 and 5 axis) just to produce the Infusion helicopter parts. The top quality machines were imported from Japan and were ready to use, including a 7-axis 'Space Turn', which had taken 18 months to import and cost .5 million USD excluding taxes. It was at this point that I began to understand the scale of investment, commitment and drive to produce a range of models to the highest standard.

TSA Model also has their own injection moulding machines and produce their own mould tools, thus everything is manufactured in house. For example the U/C was strong and flexible, while the main gear is from a 'polymer impregnated metal' (POM), which can be withdrawn from the moulds without distortion. As the gears are hot when they leave the moulds, they are moved to a cooling 'oven' so the cooling process is controlled resulting in a perfectly symmetrical and concentric gear.

The one piece moulded engine mount is from the same POM material as the main gear, while the side frames are a laminate of 30% carbon sheet layers (including the outer layers) with glass cloth inner layers, the combination provides great strength and rigidity and at the same time absorbs vibration. Even the threaded pushrods are produced on a dedicated machine – no stamped threads here, thank you.



This is the 7-axis CNC machine, there are a further 17 multi-axis machines...



This is a side frame machining blank, 5 sheets of material are stacked onto it and cut at the same time



The finished FBL rotor head, note the centre teeter block, it also has oval inserts so the 8 mm spindle will feather but not lead/lag



I saw a blank head block machined into what you see on the right

A lot of thought has gone into the ease of building and replacement of component parts, for example the swashplate ball is mounted in a plastic carrier, which can be replaced, so if you damage the ball you do not have to replace the whole swashplate. An 8 mm tube drive is used with fluted couplers – these are threaded into the tube drive, opposite threads are used so the torque can never unthread them. Again we find bearings moulded into plastic, in this case in the tail pitch links; I have often found ball races used in the links, which is great, but their fit can be loose – not so with the Infusion 90.

In terms of building and bench set-up, again there is a lot of attention to detail, for example insert nuts are used in the frames to help the assembly, and bellcranks etc. can be locked in their neutral position to ease set-up. Lock tabs are used to ensure correct alignment of parts and even wiring support clips are supplied so there is



*Nigel demonstrated the prototype Infusion 90 FBL, which has since been further developed...*



*... To become this pre-production Infusion 700n that we will soon be seeing*



At the time of my visit Nigel was testing the flybarless Nitro version of the Infusion 90. He was also testing the electric version of the machine, and these were expected to be the first models in the range to be released.

Flybarless kits will first be released and these are expected to include the 'TSA Trajectory' stabilisation unit, which will use Beast-X technology in the TSA product. The Trajectory will be pre-programmed for the Infusion and so be a 'plug 'n' play unit', plus it will include settings for both full 3D flying and a softer set-up for total beginners.

The models I saw included the electric version and a gasser using a rubber mounted Zenoah engine, plus the Nitro version I saw Nigel fly. These featured a narrow frame set and since then, the design has continued to be refined leading to a wider frame set that has proved superior and it will be this version that will be released in the near future. Personally, I can't wait... **MHW**



*Rockwell testing instrument for checking materials are up to spec*

no excuse for untidy wiring. The I.C. engine version allows the engine and cooling shroud to be removed complete and so is only a matter of a few minutes work.

Quality is everything in the production, and a high percentage of quality sampling is undertaken using 3-axis computer controlled measuring equipment. I also saw a Rockwell hardness testing instrument, so material testing will, take place as well.



*This lady is quality checking a clutch for accuracy*



*This machine was producing tail rotor hubs*