

## Renishaw precision meets the challenge of Games Workshop

UK based Games Workshop Tooling sells a large range of incredibly detailed miniature figures worldwide. It has recently transformed its tooling development by changing from proven traditional pantographs to Renishaw's Cyclone scanning system. Cyclone rapidly scans prototypes, providing the data required to machine the moulds from which the highly detailed figures are moulded.

As its name implies, Games Workshop Tooling designs and manufactures injection mould sets for the mass production of the company's highly sought-after war-game figures, such as the hugely successful Warhammer series.

With long-term planning up to five years ahead of the launch of products, it is vital for the group to keep designs confidential. Keeping as much work as possible in-house and with a close



Highly detailed figure, brought from prototype to production in a quarter of the time taken previously by a labour-intensive process, using Renishaw's automated Cyclone system



The two Renishaw Cyclone scanning machines are running un-manned 24 hours a day, seven days a week at the Wisbech, UK works of Games Workshop Tooling.

vertical integration of the different arms of the group, it is easier to maintain the required level of confidentiality.

Initial concepts, sketches and drawings are sculpted by craftsmen into 3D figures, usually three times larger than the final product, from which it has been customary to produce resin patterns. The traditional pantograph techniques previously used were slow, labour intensive and involved much work by highly-skilled patternmakers. The process was, however, well-proven and could be guaranteed to provide the superb detail expected by the discerning gamers, who are always eagerly awaiting release of the latest product.

### **New technology**

With the challenge of meeting and exceeding this quality of work, Renishaw engineers set about proving that Renishaw's Cyclone scanning system was indeed up to the job, by producing sample die sets. This initial work was backed up by arranging visits for Games Workshop Tooling's managing director, Terry Ardener, to meet key Renishaw Cyclone users so he could satisfy himself on the suitability of such a system, when working in conjunction with modern CNC machine tools.

Suitably impressed, Mr Ardener has invested heavily in a state-of-the-art, automated mould production shop. This includes a full computer-editing suite, linked to the two Renishaw Cyclone systems, as well as DNC links to four new Bridgeport CNC vertical machining centres and four Lang Impala CNC machines.

### **Automation**

With the very small data intervals involved (due to the very high level of detail), the scanning of a typical four-piece mould can take

up to 48 hours. This is even at a scanning speed of 700 mm per second and a data capture rate of up to 400 points per second. Once set into operation, however, there is no need for any further human involvement, the Cyclones can be left running without supervision. With the amount of different figures Games Workshop now develop, both are in use 24 hours a day, seven days a week.

Analogue 3-axis probes with 0.5 mm diameter styli balls are fitted to the Cyclone machines, which constantly maintain contact with the surface scanned, and are proving to be perfectly suited to the fine detail of the prototypes. Games Workshop is also considering the use of Renishaw's non-contact laser scanning option for its next two systems.

The Cyclone systems are controlled during data capture with Renishaw's own Tracecut software, allowing subsequent 3D data manipulation and the generation of machining programs for the Heidenhain TNC 426 CNC control system fitted to Games Workshop's new Bridgeport machines.

Typically, the steel production moulds manufactured on these machines are made with up to eight 'inserts' per mould from the programs directly downloaded from the editing suite. Again, this requires very little human intervention during machining.

Games Workshop Tooling can now look forward, secure in the knowledge that future fantasy figures can be made with significant productivity savings in time, material, labour costs and reliability, thanks to their major investment in new technology.