

➤ CATIA V5, the easiest to use and also the most productive methodology.

The magical flying car in Chitty Chitty Bang Bang.



design and production methodologies in the past but find CATIA V5 the easiest to use and also the most productive. Our partner Desktop Engineering trained us in the use of CATIA V5 in conjunction with FEA. The software allows us to generate designs very quickly and to analyse them as they are developed. This means that there are no hold-ups and no waiting for FEA results and that our designs are always optimised for maximum efficiency and most importantly safety."

"The use of FEA is not at all daunting and we now use it at every stage of the design. The software shows us if we are on the right track and makes our work much more productive and creative. For example we can try out new ideas and check them for strength very quickly so that by the time a design has reached maturation we know that it will work"

THE FUTURE

Stage Technologies is expanding its V5 PLM functionality by exploring areas for further direct use of the single 3D model. Stage Technologies Senior Designer Phillip Lewis explained. "We are looking at exporting 3D data to fabricators to improve accuracy of design data communication. We are also considering implementing Dassault Systèmes ENOVIA Digital Mock Up, which would allow us to show customers' designs without burdening them with all the detail that accompanies a model." This technique would also allow the company to retain its intellectual property while revealing designs •]

For further information:
www.stagetech.com
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Performer flying at the Toyota Expo in Japan.

Stage Flight

By Nick Lerner

Stage Technologies Limited provides the magical effects that leave audiences gasping at what they have just seen. Flying actors, stage elevations and revolves, super-quick scene changes and more. Behind the scenes Stage Technologies is bringing these new ideas to life through Dassault Systèmes PLM solutions.

AERONAUTIC DISPLAY

Dassault Systèmes V5 PLM is well known in the world of aeronautics and at Stage Technologies that is proving no exception. However the company, based in London's Neasden, and Nevada, US specialises in a form of flying that does not require an aeroplane.

Stage Technologies produces mechanical solutions for 'power flying' - the professional terminology for lifting and moving scenic items and performers above a stage. They also design, build and install other stage machinery, wagons and powered track drives to operate quick scene changes and other dramatic effects. Currently the company is designing, building and installing a new lighting and equipment support structure inside the roof space of the Royal Festival Hall in London. This flexible system comprises hoisting and traversing lighting and loudspeaker systems, and allows a total lifting capability of nearly 50 tonnes."

Ewart Richardson, the company's Director of Mechanical Engineering, takes up the story. "We produce the mechanisms, rigs and control systems that allow scenery, and sometimes people, to fly. Using our equipment it is possible to fly a performer in a helix or to have an aerial ballet with a number of

dancers in the air simultaneously." The degree of precision required for these operations is a major engineering challenge and that is why Stage Technologies numbers among its customers Cirque du Soleil, The Hong Kong Cultural Centre and the Royal Opera House, and has produced effects for, Mary Poppins, Chitty Chitty Bang Bang, and Mission Impossible 3.

CRUISE CONTROL

Ewart Richardson gave an insight into the engineering underpinning the amazing stage effects that the company delivers. "Every show is different because producers want to achieve new and ever more dramatic effects. However, there are some constants including the often-tight spaces into which we have to fit our equipment or the difficulty in finding secure fixtures in old buildings." The company supplies equipment to cruise ships where headroom is very limited but dramatic ambitions persist. Cruise liners also present the challenge of wave motion rocking the scenery. Some of the company's work for film and television involves supporting a performer - or a camera - by a number of lines from a number of winches thus allowing the "node" or junction of the ropes to be driven through complex paths. Up to five cables can be attached to a performer, each one tensioned by a very precisely indexed motor, which is in turn

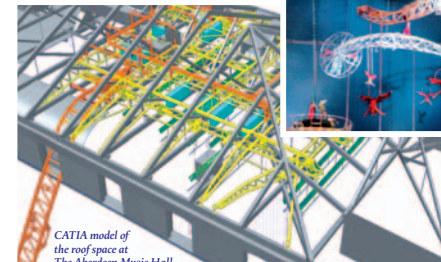
controlled by a Stage Technologies control-desk. Ewart Richardson continued. "We have been using Dassault Systèmes V5 PLM at Stage Technologies to generate and analyse designs and then communicate those to suppliers and customers. Typically, we survey the location and may use non-contact laser scanning as a starting point for developing an installation. Where a roof mounted or other type of rig is required to carry winches, fixtures and circuitry, this will be designed in CATIA V5. Our designers analyse their own design using Dassault Systèmes integrated Finite Element Analysis (FEA) software, Generative Structural Analysis (GSA). This allows them to make designs robust and elegant while also saving as much space and weight as possible."

All of the company's other standard, and custom equipment, is designed in the same way with the advanced analysis capabilities supported by the Dassault Systèmes ELFINI solver. This extensive use of FEA has paid dividends at component and assembly level as the company has been able to supply smaller and more efficient equipment into ever-tighter spaces.

SAFETY IN STRENGTH

Stage Technologies Designer, Alec Gass, spoke about FEA. "We have used several

Central show at the Millennium Dome.



CATIA model of the roof space at the Aberdeen Music Hall.

Performer flying at the Toyota Expo in Japan.

