

*Press release / application story:*

## **Power Jacks Helps Wimbledon Play On!**

Linear motion specialist Power Jacks has supplied 42 electric linear actuators for a new moving roof for the 2009 Wimbledon Championship

*Fraserburgh, Scotland, June 2009.* Wimbledon Centre Court can now play on with the installation of a new moving roof locked in place by Power Jacks!

In January 2004, The All England Lawn Tennis and Croquet Club announced plans to build and construct a fully retractable and weatherproof roof over its famous Centre Court in readiness for the 2009 Wimbledon Championship.

The new roof, three years in the making and five years in the planning, is a retractable 5,200 sq metre folding fabric concertina, made from a revolutionary translucent, waterproof material called tenara, which allows natural light in when the roof is closed.

The design and build of the roof was commissioned by a chosen consortium of companies which included, Sheffield based Street Crane Xpress (SCX), whose role in the build was to focus on the mechanisation and control of the roof, enabling it to open and close depending upon weather conditions.

Power Jacks Ltd designed, manufactured and supplied 42 bespoke electric linear actuators to create locking devices, 36 of which operate when the roof opens and closes. The Scottish based linear actuation and power transmission specialist was again delighted to have been selected by SCX as a prime technology partner. In providing specialised engineered solutions for this challenging application Power Jacks equipment play an integral part in improving playing conditions on centre court and contribute generally to a more pleasant spectator environment at this unique and historic venue, whatever the weather!

Andy Dowell, European Sales and Business Development Manager at Power Jacks commented: "We were extremely pleased to be again chosen by SCX Ltd as their solution provider, and this time for the highly prestigious and highly visible application at Wimbledon Centre Court. The exacting specification called for an acute understanding and close cooperation between SCX's highly talented project team and our Area Sales Manager Frank Shinn. Working successfully to fulfil the performance requirement defined, we were ultimately rewarded with the order that was placed at the end of December 2005 and delivered in March 2006. So now almost 4 years on, we are of course delighted to see this installation

finally fulfilling its purpose in readiness for the start of this years' summer championships, and all under the gaze of a truly worldwide audience."

The roof, measuring 80 metres long, is divided into two sections with a total of nine bays of structural fabric, four bays in one section and five in the other. Each of the nine bays is clamped on either side by prismatic steel trusses. Altogether there are 10 trusses spanning 77 metres across the court. At the end of each truss there is a set of wheels that glide until the two sections overlap, giving the equivalent coverage of 7,500 open umbrellas!

Much of the roof's working life will be parked in the open position. When the roof is ready for closing, one section is parked in its folded state at the north end of the court while the other is parked at the south end. Again a combination of actuators and arms form the mechanism for closing the roof at a maximum speed of 214 mm per second. The mechanism moves the trusses apart and, at the same time, unfolds and stretches out the fabric between the trusses over the court until the two sections meet in an overlapping seam above the middle of the court. At this stage 36 linear actuators from Power Jacks lock each section of the roof in place.

These linear actuators used for locking and unlocking the roof segments were specially designed by Power Jacks for the Wimbledon roof using 3D design technology to optimise the design process and integrate with SCX. The actuators design is based on Power Jacks Type-A Rolaram technology which has been used worldwide in varying industry sectors including automotive, medical, steel and nuclear. Each of the Wimbledon Rolaram's is designed to have a peak load rating of 160kN to withstand forces exerted by nature. They operate at 1500 mm/min over a 400mm stroke with the useable stroke set by limit switches integrated into the actuator. Drive for the actuator is provided by an electric brake motor with an IP66 weatherproof enclosure. Both the motor and the limit switches connect to the electrical control and power systems via plug-in connectors for quick and easy installation. The completed Rolaram actuator is mounted in the roof using a trunnion to clevis type arrangement that allows the actuator to pivot through an arc as it operates. Just like the players below the actuators are finished in a classic white paint for Wimbledon instead of Power Jacks standard Red.

With the roof closed over the court the arch shape to the tops of the trusses helps the structure to withstand loading from elements such as snow and wind. The shape also assists in providing 16 metres clearance sufficient for even the highest of lobbs.

A key element of the design has been to allow natural light to reach the grass, while an airflow system removes condensation from within the bowl to provide the optimum internal environment for the comfort of spectators and players when the structure is closed.

The roof has been designed to close in under 10 minutes. If the roof is being closed for rain, court covers will protect the grass in the usual way while closure is in progress.

After the roof has been closed, play can resume in approximately 20 minutes, depending on climatic conditions, allowing television companies to be able to broadcast almost unbroken coverage of play on every day.

The benefits of having a moving roof are clear to see. No longer will there be unpredictable and long-lasting rain, which in the past stopped play during prestigious games. It will also enhance the Wimbledon Centre Court with-out compromising on its long standing design.

The project is now complete and on May 17<sup>th</sup> 2009 the official inauguration and testing of the roof, was held on Centre Court. On the day under the watchful eyes of four grand slam players and 15,000 spectators, the roof closed in 7 minutes and 4 seconds to a rapturous applause from all who witnessed this historic event. Daniel Salthouse, Project Manager for SCX, said "Reliability was always the key issue when considering which equipment suppliers to use on the roof. We chose Power Jacks both as a result of the numerous successful projects that we have used their equipment on in the past and because of their ability to meet our demanding specifications".

The Power Jacks Group has been supplying products and after sales services to SCX for over a decade and has worked on projects with SCX ranging from building maintenance to glass manufacture to mechanical handling.

#### **Pictures:**

- 1: Wimbledon Centre Court With Roof Closed
- 2: Rolaram Actuator Locks Roof Segment
- 3: Wimbledon Roof Mechanism

#### **Information about Power Jacks:**

Power Jacks is a leading manufacturer for precision linear actuation, power transmission and mechanical jacking. The company is based in Scotland where its history for supplying high quality engineered product dates from 1903. The product ranges are detailed on the website [www.powerjacks.com](http://www.powerjacks.com) and include screw jacks, electric linear actuators, mechanical jacks, bevel gearboxes, planetary roller screws, reduction gearboxes, winches and rotary unions. They can be supplied worldwide singularly or as complete systems, whether in standard or specially engineered designs.

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