

## RTI and Coherent at the Asian Games in Guangzhou

17 January 2011

**It seems that opening ceremonies for international sporting competitions and prestige events such as the World Trade Show just get more and more spectacular. This is particularly true in Asia, as each organising body tries to top all previous ceremonies for the sheer wow factor.**

The November 12 opening of the Asian Games in Guangzhou was certainly no exception to this trend. With 20,000 actors and nearly 500,000 volunteers, just the manpower employed alone was beyond impressive. Combine that with 800 MAC luminaires, over 400 7kW searchlights and eight foldable LED screens (each measuring 24 x 20 metres) and it's even more so.

Plus, there were more than ever of the usual water screens, which are always a crowd favourite. And, of course, the laser component was similarly awesome in its unique size and scope.

After RTI won the bid to provide the laser hardware and software for Guangzhou (which was just one month before the first rehearsal), one of the first decisions we had to make was where to locate the laser projectors.

It turns out that Guangzhou has two very tall towers: the 470 metre IFC tower and the 610 metre Canton TV tower - the second highest

structure in the world. The opportunity to project from these towers was just too good to resist. That's because these tall and well-spaced projection sites were ideal for creating huge beam projections in the night sky.

For instance, it gave the helicopters from the TV stations a very good shot while the two lasers made a vertical grid, leading from the event stadium to the sports stadium.

However, these projection locations were also incredibly challenging for the opening stage show because of the extremely long projection distances from the towers to the stage floor (720 metres and 607 metres) and to the water screens (400 metres and 800 metres).

To put this in perspective, these authors have been involved in laser shows for many years and have never heard of any stage or screen projection anywhere involving such huge projection distances.

Without being too technical, there are two equipment challenges in using very large projection distances; beam collimation and beam pointing. Beam collimation refers to how much the laser beam diameter increases over the projection distance.

A well-collimated beam enables projection of a small and circular spot at distance, which is essential for creating high quality graphics (by scanning the spot while rapidly turning the laser on and off). Conversely, a poorly collimated beam quickly spreads out and shows as a large and often misshapen blob on a distant screen.

The term beam pointing is fairly self-explanatory – the precise direction of the beam leaving the laser must stay constant with time and constant with any changes in ambient temperature. Dithering and/or drifting of the beam would distort and possibly blur any projected images.

In addition to the beam effects in the sky, the lasers were used to project characters spelling out 'Welcome Guangzhou' on the stage, as well as symbols showing the countdown to opening. The lasers were also used to create images of waves at the visually stunning sailing performance sequence. Specifically, these were projected onto a 140 nozzle x 30 kW pump water screen.

The size and required brightness of all the various laser effects also placed huge demands on laser power; we used a total of eight 17W RTI Nano (RGB) projectors and eight 8W green-only units. These projectors were all powered exclusively by Coherent Taipan lasers. Based on Coherent's unique optically pumped semiconductor laser (OPSL)

technology, these all solid-state lasers deliver both the requisite collimation and beam pointing for this very demanding application.

Moreover, the wavelength scalability of this technology supports balanced colour, by use of wavelength-optimised red, green and blue Taipan laser modules. And just as important, Taipan lasers provide high reliability ensuring the Guangzhou show went flawlessly with not a single laser having any problem. Plus, the combination of reliability and remote hands-free operation meant that the entire laser show could be controlled from one console by a single individual (K-H K) located in the TV tower.

So Guangzhou set a new milestone in terms of projection distance. But while projecting from this TV tower is impressive and very demanding on the laser technology, undoubtedly this will be topped by something else soon. Stay tuned to find out what...

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