

WOW! Flying antics set new heights

By Madeleine Murray

Peter Faiman

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2000 when the whole world watched, both from seats in the stadium and on television. At that time we all shared this unique experience together, live, uncensored and unedited; both brilliant and blemished.

Australia should be proud of a great live show and a great live telecast both executed by some of the most professional and experienced people in the world.

Thank you for your comments. I can point to a lot more faults than you could possibly come up with but I am proud of our efforts and am sorry your experience was flawed.

- Peter Faiman

Some of the greatest of many dazzling moments in the Opening Ceremony were the flying antics of the fish, little girl, swimmers, and spinning cogs. The aerial work lifted the show right out of the grid of the stadium floor, and into another dimension. The choreography and costumes were so brilliant that no one noticed the complex rigging system behind it all, except of course, Richard Hartman, Aerial Effects Project Coordinator, and his team of 40.

The rigging was a triumph of ingenuity and innovation.

The stadium is all curves - not a straight line in the place, and it had never been properly surveyed. "We had to hand rig this thing from scratch," Hartman says, in his quiet American accent. "Because nothing was straight, we couldn't get up there with a tape measure. No one had ever done it before, not like this, not for theatre." The cross wires were ultimately slightly curved as well, as the span was so great.

The crew rigged nine motorised lines and two manual lines, taking the flying fox

of it. The Opening Ceremony show pushed the boundaries of the possible, and many departments, like rigging, brought in engineers and industrial techniques to solve problems. The flying fox rig has been used in areas such as mining, rescue, and elevators. One of the engineers who designed the stadium system was Bill Kellerman, who had worked on the Katoomba Railway.

"It's a very elaborate system we have here," Hartman says. "Nobody really recognises that - the fact that you've got all this motorisation up on the roof, and you're controlling things that are 45 metres below you, and trying to do it with absolute precision, and absolute safety."

The team used industrial techniques, combined with theatrical controllers. The winches, leased from APC in Adelaide, came from various big shows, such as Phantom.

They were incorporated into the drive mechanism; then the winch drums and transmissions were built.

The cross wires were smooth, anti-rotational wire, 16mm in diameter. A little car travelled across the wire, and from that, a block dropped down on a cable 4mm diameter. One winch controlled the east-west travel of the car, and the other winch controlled the elevation of the block. The two motors made it possible to put a person anywhere in the stadium air, but they could only travel along the path of their overhead wire. The choreography was so fluid, that it never looked like a series of parallel lines. The illusion was enhanced by the stadium itself, which has no straight lines.

The hardest part was flying the truss, which was supported by all nine lines. This picked up the G'Day drop, and the Eternity drop, and moved them from east to west. The crew had to fine tune all nine cross wires or catenaries to equal tautness, because they had to lift up a piece of truss, and float it over to the centre of the field. The G'Day drop was launched from a kabuki device made in Adelaide. The trick was to pick up the truss, and move it along the wires, without breaking its back. "As soon as you start to travel along the catenaries, you can snap the truss if it is not perfectly balanced. We spent several nights fine tuning that, with sandbags first, then the truss, adjusting cables and tensions. It's like tuning a violin. And then it was quite involved to coordinate it all through the electronics," Hartman explains.



Richard Hartman, Aerial Effects Project Coordinator with some of his apparatus

system between the roofs of the stadium. The lines, 42 metres above the ground, running east-west, were about 110m long.

Hartman had installed a similar system in the Dome in London, where the geometry was 45 metres high, and 45 metres wide, which made the job a lot simpler.

Because the stadium is more than twice as wide as high, they needed a flying fox rig - an overhead cradle with a block that drops out

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WAVEFRONT

NEW WAVEFRONT LONGTHROW™

Martin Audio launch long-throw derivatives of their award winning Wavefront 8 concert cabinets.

Martin Audio's research into sound projection over distance has culminated in two additions to the extremely successful Wavefront 8 range. The R&D departments stated aim was to create a truly long-throw array that eliminates the need for delays in configurations for large outdoor festivals and stadia as well as large arena events.

Now a hot topic in the industry, 'long-throw' means different things to different people. However, it is the line array format, pioneered by Martin with the modular system in the seventies and the F2 in the eighties, which is widely recognised as the basis of true long-throw. Martin Audio's designers got it right first time!



The Gig: Hard in Hand Presents SWEAT
The Venue: Horzern Pavilion, Fox studios, Sydney
The Company: 3200 Lighting
The Rig: 20 x W8C's and 32 x WSX's
The Man: Ian Reed

WAVEFRONT LONGTHROW™ W8CT

Throwing high frequencies over distance outdoors has always been a problem because of air absorption. The air attenuates high frequencies as they pass through it, so high frequency losses increase as the distance from the source increases. At 200 metres air losses require a boost of 30dB to restore the frequency response. For large-format concert pressure drivers, which require 6dB of HF boost just to achieve a flat response at source, this is clearly impractical. The new Martin Audio W8CT achieves the necessary boost



The Gig: Australian Fashion Week
The Venue: RHI, Fox Studios, Sydney
The Company: 3200 Lighting
The Rig: 8 x W8C's & 8 x WSX's
The Man: Ian Reed

Wavefront Longthrow™ enclosures remain true to the original Martin philosophy by combining the high efficiency of horn-loading with the principle of vertical-in-line array. Columns of identical frequency elements are stacked vertically within each enclosure to increase efficiency on the main axis by narrowing vertical coverage. By stacking identical enclosures, the line length is increased, further narrowing the vertical directivity and increasing the efficiency on-axis.



The Gig: NSL Grand Finals
The Venue: Subiaco Oval, Perth WA
The Company: Phase One
The Rig: 12 x W8C's
The Man: John Caisley



The Gig: Permanent Installation
The Venue: Discovery Night Club, Darwin
The Company: Top End Sounds
The Rig: 12 x W8C's, 8 x WSX, 4 x W8T, 4 x W8S
The Man: Colin West

with no fewer than six 1" exit HF drivers optimised for maximum efficiency in the band from 3.5kHz upwards. With the vertical line array configuration and close spacing of these 1" exit drivers the W8CT can deliver a remarkable 147dB @ 1mtr! Further down the audio band, from 730Hz-3.5kHz, three high-mid devices are again arranged vertically-in-line for maximum throw. Each high-mid device is a sophisticated design featuring a 6.5in driver loaded by a toroidal phase plug and constant coverage horn radiating.

WAVEFRONT LONGTHROW™ W8CM

The compact low-mid enclosure features two vertically-aligned low-mid horns. Each is powered by a 12" drive unit covering the band 120Hz-750Hz. The low crossover point of the W8CM enables it to be separated from bass enclosures if required. It may also be used without bass enclosures for many applications such as speech-only reproduction. For stadium applications requiring throws of over 200 metres, a column of W8CM can be constructed within the main arrays.



The Gig: PROYECTO UNO.
The Venue: Hordern Pavilion, Fox Studios,
The Company: Jazzright
The Rig: 12 x W8C's, 12 x WSX
The Man: John Perez

WAVEFRONT LONGTHROW™ AND W8C COMBINED ARRAYS

By using the same acoustic elements and maintaining the same appearance as the W8C, the new Longthrows can be simply slotted into the upper rows of a W8C array. Same audio quality and tonality, same horizontal coverage angle, 55°, and the same rigging and loading considerations.

With their massive outputs the W8CT and W8CM can literally project for miles delivering the clarity for high quality, intelligible sound to audiences positioned way back from the stage. The Wavefront Longthrow™ technology now places an important new tool at the sound engineers disposal and gives Wavefront 8 users the capability to handle virtually any application using their inventory of W8C plus the new cabinets.



The Gig: St Patrick's Day
The Venue: The Domain, Sydney
The Company: Davidson Audio
The Rig: 4 x W8CT's, 4 x W8CM, 8 x W8C's, 4 x WSX's, 4 x W8CS's
The Man: Kevin Davidson

Opening Ceremony

Richard Hartman, flying
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The first test system was installed in April, when they did many tests, including acceleration and brake.

Hartman is pleased with the results, but pauses for several seconds when I ask him what the whole experience has been like for him. "I'm just trying to choose my words carefully," he says. "It's been a real introduction to Australian bureaucracy, but I think we managed to get through it, and put on a real good show. Everything worked magnificently. Our biggest enemy was going to be the wind. We had things that just couldn't fly previously because the winds were so high off the west. About two days before the Ceremony, the winds changed off the ocean, the temperature warmed up. About seven o'clock at night, the wind started to die. Perfect!

"The stage manager had all the wind tables on the scenery, and was in contact with the local weather department on site. On the night, he told us we had the go ahead, clear to fly! That was fantastic! The crew was ready to go for it, and did it as they had in all the practice sessions in all the months before."

One of the key figures in the success was Justin Harper, the board programmer and operator, who was controlling the APC equipment. Harper worked for more than six months with the equipment and the choreographers to get the cues to work with the machinery.

John Fairhall and Grant Fletcher, the lead flymen, developed the protocols with ground crew to make it all work smoothly on the floor. The problem was trying to coordinate the show over such a large area. "One had east side, and one had west side," Hartman says of the flymen. "There had to be a lot of coordination because things were launching and coming down on both sides. It was such a loud

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Inside the Glowing Barracuda

All those cables and batteries

By Madeleine Murray

Genetically programmed to be optimistic, Eve Bortz grew up in Pennsylvania, where her father had a business making chocolate Easter bunnies. So, it was a natural transition to lighting the astonishing fish in the Deep Sea Dreaming segment of the Opening Ceremony.

As Chief Lighting Technician on the fish segment, Bortz was responsible for supervising and building all the lighting that went into the ten fish and the deep sea diver. And the glowing flying fish were one of the most stunning effects in the show, according to me, who sat in Ric Birch's suite at the dress rehearsal.

The flying fish - such as the silver barracuda, the 12m sea dragon, and the lion fish - all had weight restrictions. The fly lines were rated at 150kg per fish, and 300 kg with a person. The 40m banana eel, and the manta ray were on the ground.

Each fish was built on a welded steel frame, and this affected where the lights could be mounted. The weight restrictions dictated the number of batteries possible - the crew used sealed lead tin batteries from America, which could be recharged, but didn't spill. The lion fish tipped the scales at 149kg, so they could only use one battery. They used the maximum possible wattage (up to 400W), and timed the battery drain for 10 minutes, the length of the segment. David Brown designed the internal lighting configurations, Adrian Green was the electronics technician, and John Harding from Battery Specialties was the power guru.

The eyes were lit in a light box effect. When there were two sockets, the lights were placed behind, with aluminium foil to scatter the light from the 12V lamps. If the eyes were close together, the crew made conduit pieces between the two eyes, and covered them with a Rosco soft reflector.

The lights were run to an electronics module, made up of dimmers and timers. The switch would start the timer, which then triggered the dimmer, and the lights would fade up as the fish left the ground. All the lights were 10, 20, 50 or 75W Osram 12V lamps. In some fish, such as the barracudas, they used MR16s. The barracuda eyes each had 200W of lights, and there were four dimmer modules in the whole fish. The mouth had 600W, that's 12 MR16s at 50W each, so that was 800W total, running off



two 13amp/hour rechargeable batteries.

The big purple angelfish had 1200W of light, because there was the weight space to put in three batteries. The sea dragon had a 26kg battery, with a 70amp/hour rating. It has 200W in the eyes, and many little 10 and 20W plastic coloured globes strung all the way down the body, all soldered by Adrian Green.

Despite the pressure and grim workshop conditions, everyone was fantastically helpful and friendly during the whole production period, according to Bortz. She spent hours fiddling with lights in the barracuda's mouth, wrapping electrical tape along 12m of aircraft cable to a battery, or running a lot of rigid 40amp cable a long way down the body from the dimmers just to put a little light bulb at the end.

'If you look inside, it looked fairly dodgy - wires, cables, batteries, little welded bits - but when it lit up it was magic, and I love that contrast,' she enthuses.

Bortz laughs about the whole thing now. 'The workshop was cold, dirty, loud - people would be welding on either side of you, in a crescendo like Dante's Inferno. The electricity department was this little teeny room in the back corner. To do anything, you had to walk through props, people fibreglassing things all over the floor, through the welding department, then carpentry. It was overwhelming!'

• Madeleine Murray wrote the programs for the Opening and Closing Ceremonies

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Olympics special

Richard Hartman, flying
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environment, that you couldn't rely totally on radio."

There were also spotters up on the roof, on each of the lines, and they had emergency stops for the lines. A lot of communication went on between the ground spotters, the roof spotters, and the desk operator. In the dress rehearsal on the 13th, the ribbon worm got tangled with the barracuda. The spotters saw it, stopped it, and separated them.

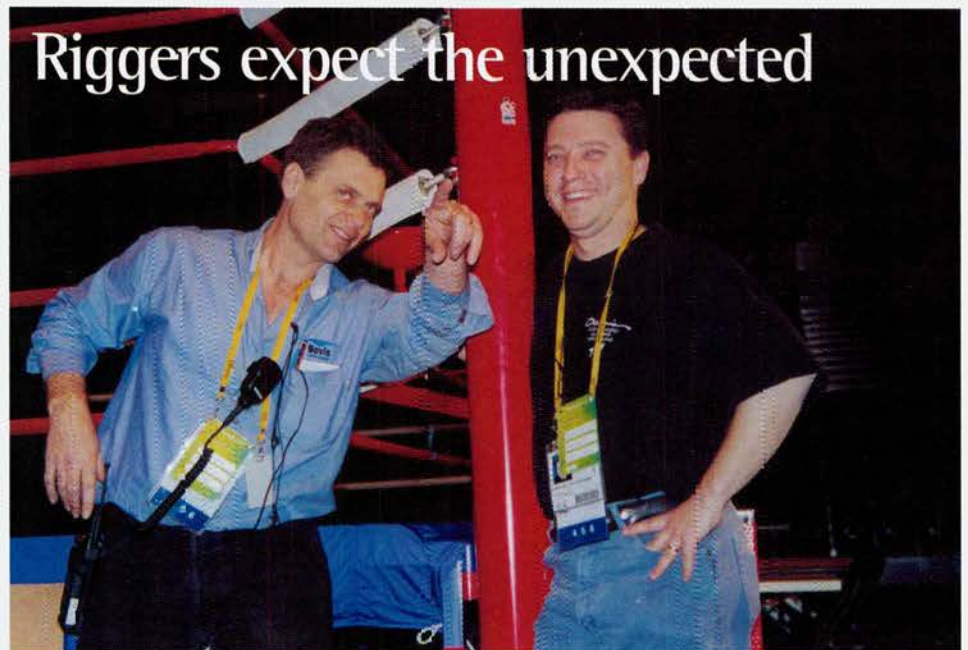
Among the crew were 15 rescue specialists, brought in from Rescue Equipment. They had practised with 200kg loads at the stadium tests. If any of the lines fouled, and the performer or prop couldn't be gotten out of the air, rescue experts, stationed on the roof, were ready to come out onto the line, detach the load, transfer it, and lower it (ie the performer and/or prop), onto the ground.

Another challenge was the choreography of getting the pieces on and off the lines quickly, and keeping the performers on the ground from getting hit by things coming in. The crew had to be totally aware of the aerial space, the ground domains, and the landing zones. "It was quite a risky business, especially in some of those costumes, where the visibility was low, or the performers were so hyped up from the energy of the event, that they strayed off into the wrong area.

"We had to keep track of all of that, and make sure that we could launch and retrieve performers, not hurt or hit anybody, and make sure there were no mechanical hangups due to something happening up in the air.

"It was quite a daunting task. It wasn't the most serene of conditions.

"Thank God we didn't have a wind, which increases the probability of screwups!" •



More to Olympics than an Opening Ceremony!

By Julius Grafton

It's

punishment - the jigsaw puzzle from Hell!" Lead rigger Michael 'Shackles' Kent (above, right) is gesticulating up to the window dressing in Hall 3 at Darling Harbour. What a bunch of entertainment riggers are doing here is what this the story is about. It's a big job.

The Olympics is a deceptively expensive event to stage.

For example, the sports of fencing, wrestling and boxing occupy almost the entire Sydney Exhibition Centre. Aside from seating system (30,000 seats) shipped from the UK there are stages, rises, and a lot of flown stuff. Like flags.

It was the morning after the flag master had done a snap inspection. "There are flags with the emblem the wrong way, there are whole countries missing - it's a big job" says Michael. They had methodically hung the supplied flags and banners according to the flag manual, which of course was wrong in parts. So, do it again!

The rigging team are from Scafform Australia, which is an arm of the international company. Headed by Michael Condon, Scafform won a contract to supply rigging in a host of venues, aside from a vast amount of scaffolding and staging work elsewhere around the harbour city. There are camera platforms just everywhere, for example.

Indoor events need lights too, and I was not surprised to see upwards of a hundred lights for the preliminary fencing arena alone. "There is about 1.5 kilometres of truss here alone" says Michael. The largest item is a

scoreboard, weighing 1.8 tonnes - considerably more than most entertainment industry single loads.

Starting work back in May, Michael Kent and rigging site manager Roger Cameron (pictured, left) oversaw a lot of contracted work, and plenty that wasn't. The window dressing alone took over 700 man hours, way more than contracted.

There's 'look' stuff everywhere. Like the 'Tribune's' - which are kind of fancy tables for press, set up amongst the seating. There's the victory dais, which in the case of boxing, is flown in. And camera tracks. And more!

Scafform got a lot of equipment from Charneleon, and Clifton productions. They also purchased extra chain motors and miscellaneous equipment.

Out at the Baseball Arena a novel solution was discovered to the problem of flying some customised beams off the main lighting towers 60 metres up. They used a helicopter.

• The Rigging team!

Nils Bendix • Huckle Cleary • Carly Thomas • Rob Llewellyn • Dave Hartley • Indra Cook • Greg Anderson • Kane Goré • Trevor Gilbert • Andrew Warrington • Haydn Griffith • Dave Froggatt*

* Dave is a veteran of the Al Faisaliah Tower launch in Saudi Arabia earlier this year. Protec won a massive contract to light the opening of biggest new skyscraper in the middle east. The UK crew discovered their thermometers were maxxing out at OVER 50°C! Far broiled crew?