



ASIA PACIFIC



THIS MEANS WAR

Meeting Sky High Expectations at Dutch Military Museum

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Night at the (Military) Museum

AV Editor Andy Ciddor takes an after hours, behind the scenes tech tour of the enormous Netherlands National Military Museum.

Text:/ Andy Ciddor

Images:/ Jeffrey Steenberg (Courtesy of NMM-NL)

Displays at NMM include a lot of impressive pieces of military hardware, ranging from fighter jets and helicopters, to courier bikes, armoured personnel carriers and a WWII German V2 rocket. The largest aircraft in the collection can be seen through the windows, parked outside under cover on the tarmac.

CREATING A MILITARY MUSEUM from (literally) the ground up is a once-in-a-century opportunity to deploy the entire armoury of audiovisual presentation and design tools to tell a wide range of stories. Constructed for the Netherlands Ministry for Defence in the Soesterberg Airbase Park, a former military airbase located near the city of Utrecht some 60km from Amsterdam, the recently-opened National Military Museum brings together the collections of the Military Aviation Museum in Soesterberg and the Army Museum in Delft in Europe's largest military museum. The building, a EUR€30 million ground-hugging 10m x 240m black steel and glass box in the contemporary Dutch style, features some 35,000sqm of exhibition spaces in a mix of daytime viewable exhibits of military hardware on a grand scale, complemented by 17 widely-varying exhibition spaces in the 'black box' section of the museum.

PROFESSIONAL MUSTER

The Netherlands government called for tenders to design, finance, construct, maintain, manage and operate both the museum and its exhibitions and displays, over a 25-year period. The winning bid was submitted by a group put together by Heijmans, one of The Netherlands' largest construction firms. Felix Claus Dick van Wageningen architects designed the project in partnership with H + N + S Landscape Architects and exhibition designer Kossman.dejong. Project managers Bruns handled the interior, project management, development, engineering, production and installation of exhibits, while the audiovisual systems, lighting design, system integration and control was placed in the hands of Rapenburg Plaza.

"Rapenburg Plaza was brought in at the beginning of the project to develop a wholly

integrated lighting design, multimedia, audio and show control system," said Maarten Taborsky, Project Director at Bruns B.V. "It needed to be simple to use, maintain and deploy combining all media over an IT infrastructure."

On the December 13, 2014, His Majesty, King Willem Alexander of The Netherlands opened the museum at a spectacular military ceremony complete with the Royal Military Band, cannon shots and groups of the services marching about amidst shouting and boots stamping. With all the publicity, crowds came flooding into the museum and by January 25 the 100,000th punter passed through the turnstiles and won a ride in a military balloon.

AFTER HOURS TECH TOUR

In mid-February, when I was in Amsterdam for the Integrated Systems Europe show I was privileged to join an after-hours

technical tour of the museum conducted by Rapenburg Plaza the AV designers, suppliers and integrators for the project.

It's a pity we'd all been on the frantic trade show floor for the day (1000+ booths and 59,350 visitors) and only had the opportunity for a 90-minute fast-paced backstage tour of a museum that could easily engage any visitor for well over a full opening day. At least our group of technical tourists were in the knowledgeable hands of systems designer Sierk Janszen, who when not busy as a partner and Technical Director at Rapenburg Plaza, has a side gig as founder of show control equipment builder, Kiss-Box.

As you would expect, the displayed collection features a vast array of military hardware from the last 1000 years, ranging from jet fighters and ejection seats to uniforms, swords, muskets, suits of armour and amphibious vehicles. While



these objects are fascinating and superbly displayed, they aren't actually at the heart of the museum experience.

As a responsible and thoughtful member of the 21st century European Union, the voice of the National Military Museum (NMM) is far from militaristic and far from being a celebration of the Netherlands' glorious history as an enthusiastic imperial trading nation and colonist. Indeed a great deal of emphasis is placed on the defensive nature of its military history and its present peacekeeping, disaster relief and civil defence roles.

FULL AV BAG OF TRICKS

Like any national museum the NMM has three main duties: to engage and inform the population about their heritage and their place in the world; to generate tourist income for the region by being a fun and interesting place to visit; and most importantly, to act as a national teaching resource for the coachloads of children that arrive every day of the school year. The design and content of the galleries and exhibits and the AV content and presentations at the NMM meet all of these goals with subtlety and style, using the entire repertoire of audiovisual tools and techniques.

The NMM itself may be a brand new museum, but of course the items in its collections vary between being old and very old. Some of the displays also use ancient

museum presentation techniques.

My earliest recollections of the museum in my childhood, the National Museum of Victoria, are of stuffed birds, mammals and monotremes carefully placed in painted panoramic plaster diorama displays and lit with simple effects to simulate animal activity at different times of the day (pushing the start button was my favourite part). The NMM uses a similar approach with its huge scale-model of a military garrison which cycles through its daily military activities with the aid of sound and theatrical lighting in a miniature son-et-lumiere presentation. The 21st century touch is the six video cameras linked with their ruggedised, military-style (ie. in a Pelican case) integrated monitor screen and PTZ controllers that enable visitors to zoom in on a particular activity then seek more information about it from the online knowledge base.

At the other end of the spectrum, are the many multi-screen, panoramic, 3D surface-mapped and even spherically-mapped projections used in a wide variety of the exhibits. Perhaps the most impressive is the 14-metre perforated-metal dome covered by nine Digital Projection projectors driven by a 7thSense Delta media server to provide full-surround vision and audio for an immersive presentation about Dutch forces throughout the centuries. One interesting moment is the description of how the Dutch forces soundly defeated the first onslaught of the German



blitzkrieg at the beginning of WWII, only to be completely overrun just a few days later, at which point the Dutch wisely surrendered to avoid further unnecessary bloodshed.

MINIS, MICROS & PICOS

Micro-movies and mini-docs are a major storytelling tool for the exhibits. Whether it's LED pico-projectors inside replicas of old televisions, individual screens framed as pictures and wall posters or mini single-couch theatres, there is a lot of narrative story-telling rather simple slideshows or loops of archival footage. Delivery for this material is not streamed from a central media server or even from a media server for each gallery or exhibit. The Raapu media player used to deliver video material throughout the museum was developed by Tony ter Neuzen, network and systems engineer at Rapenburg Plaza when a previous museum project called for a stand-alone media player with remote triggering, content updating and status monitoring capabilities.

Rapenburg Plaza is a very technology-oriented company, producing in-house hardware and software to solve some of

the unique problems in the projects they undertake. The museum-wide systems management, control and monitoring software that effectively runs the AV and lighting for the NMM via its IP network and a collection of Kiss-Box interfaces is another such project.

Nevertheless, the majority of the technology employed across the museum is based on the usual range of off-the-shelf solutions, such as the touch-interactive Pufferfish sphere and Dataton Watchout for the 4.5m four-projector spherical display in the *Present, Past and Future* exhibits in the Exit hall; Watchout and Watchpax servers for several curved and blended multi-projector and multi-panel screens; and 7thSense's dome projection solution. Lighting control is via a distributed network of 23 Pharos DMX controllers between them driving some 8000 channels of LED sources, all orchestrated through a Medialon show controller talking to a collection of Kiss-Box interfaces.

PHILIPS LIGHTING TREAT

Lighting for the thousands of objects on display is by a fleet of around 3900 LED

sources based around a custom Philips RGBW chip array (it is The Netherlands after all). The inventory includes 1519 custom-built zoom display profiles and not a few display and theatrical fixtures from Selecon in NZ (now of course owned by Philips). The use of RGBW LED means zero UV and acceptably little IR to damage the exhibits while overall illumination levels can be kept in the safe range for delicate exhibits with little or no colour shift due to dimming. Rapenburg Plaza's theatrical lighting roots came to the fore in the design of the overhead rigging facilities for the exhibition spaces, with the architects and the builders won over by the idea of theatrical-style lighting bridges to allow rigging and maintenance staff to gain easy access to the overhead gear for maintenance purposes. I'm pretty sure it's only going to be projector lamps that get changed most of the time from the bridges, because the LEDs in the luminaires are probably going to last about half-way into the 15-year maintenance contract before they start to become much of an issue.

Of course, the museum caters to the bored, caffeine-loaded children who



Left: One of the few tilted 360° dome projection screens in Europe, the 14m perforated dome carries full-surround images from nine Digital Projection Highlite projectors on the front surface while an array of speakers behind the dome provides immersive surround sound to match. Projectors are secreted in slots around the audience entrance doors and near the floor at the sides of the seating (and as in all 360° systems, many of the audience have at least one projector pointing pretty much straight into their eyes).

Above: The use of hundreds of individual LED profile spots in the display cabinets throughout the museum allows safe and appropriate levels of light for the exhibits while the high colour-temperature sources give the objects a sense of strong visual presence and sparkle.

Right: *Netherlands and the World*: A 25m-wide panoramic projection is positioned above a 7 x 10m elevated map. Projected video, surround audio and lighting on the map provide a presentation of the tactical and strategic posts in the Netherlands. The four custom designed 'binoculars' at the foot of the map zoom into the map positions, providing information about weapons used and map locations.





Soldiers in the Spotlight Exhibit: Each booth is a dedicated mini-theatre complete with a couch, 42-inch monitor, Raapu media player and a memento or artefact related to the story of survival told from the perspective of a participant in a military operation. Stories range from those of active participants to support forces and innocent bystanders.

EQUIPMENT LIST HIGHLIGHTS

Video Projectors

DP E-Vision 7500 WUXGA × 11
 DP E-Vision 6500 WXGA × 20
 DP Highlite 660 WUXGA × 9
 DP Highlite 740 1080p × 1
 Panasonic PT RZ470EKJ × 10
 Panasonic PT TW330 × 23
 Panasonic PT DX610 × 2
 Panasonic PT-EW530ELJ × 1
 Vivitek Qumi Q2L × 12
 Projection Design F35 × 2

Video Servers

Dataton - Watchpax × 20
 Raapu × 16
 7thsense - Delta Nucleus F-12 × 1
 NewHank - MPI03 × 1
 NewHank - BDP-620 × 1

Touchscreens

Elo 0700L-NoTouch × 17
 Elo 2244L-PCAP × 17
 Elo 3243L-IT-P × 21
 PQ Labs IR touchframe × 2
 Winsonic OPI010TH PCAP × 1
 DTL101 × 6

Amplifiers

Basetech AP-2100 × 20
 Dynavox DA-30 × 30
 Kemo M032S 12W Mono versterker × 1
 Renkforce E-SA9 × 3
 Caliber CA 250 × 2

Loudspeakers

Meyer MM-4XPD × 21
 Meyer UMS-1P SM × 1
 Meyer UP-4XP × 13
 Meyer MM-10XP × 7
 Meyer MM-4XP × 27
 Meyer UMS-1P × 2
 Meyer UPM-1XP × 3
 Meyer CAL-32 × 1
 Visaton FRS 8 × 8
 Visaton FRWS 5 × 84
 Tannoy Di 5A × 30
 Creative inspire T12 × 18
 Yamaha DXS 15 × 1
 K-Array KT20MA × 15
 Fischer Bass Shaker Pump III × 2
 Skytec SWMA-15 × 2

Computers

Aaeon AEC-6646 × 40
 AEC-6646 i5-3550S 8GB HD32GB × 2
 Arbor Elit-1250 × 76
 Flytech K757-C30 × 2
 Zotac XS-AD13 × 14
 HPS Antec i7 × 16
 Apple MacMini × 2
 Advantech HPC-7242 × 2
 Chenbro GZ Server × 1

Switches

HP ProCurve 2530-24 × 12
 HP ProCurve 2530-24-PoE+ × 7
 HP ProCurve 2530-24G × 2
 Netgear FS108-200PES × 8

Software

Microsoft WIN7 Pro × 67
 Raapu Linux Debian × 87
 Medialon Manager Lite × 1
 Medialon Manager Pro × 1

would much rather be sitting at home with a game-controller or hurtling around the neighborhood on a skateboard or a mountain bike rather than following their parents or siblings round some 'boring old' museum. There are a range of interactive exhibits that allow the little darlings to test the effectiveness of various historical weapons and types of armour or even take a flight in an F16 fighter simulator. I'm still uncertain as to the need for such exhibits and I know I've questioned their necessity in writing about other museums, perhaps now that I too have a hyperactive grandchild I may come to appreciate these travesties of

the art and science of museum design.

I really wish I'd had a lot more time to explore this amazing museum and had a proper chance to take in the vast amount of content that has been incorporated into the exhibits through the impressive range of display and presentation techniques. I'd like to take a more detailed look into the very humanist and culturally sensitive approach the Netherlands' government is taking to informing its populace about the long-term impact of war and the military on the future of humanity. 🐣

PROJECT CREDITS

Lead Partner & Construction: Heijmans – heijmans.nl

Architecture: Felix Claus Dick van Wageningen – www.clausvanwageningen.nl

Landscape: H+N+S Landscape Architects – www.hnsland.nl

Exhibition Design: Kossmann.dejong – kossmanndejong.nl

Project Management: Bruns – www.bruns.nl

AV & Lighting Design & System Integration: Rapenburg Plaza – www.rapenburgplaza.com

Interactive Content:

Shosho – www.shosho.nl

Fabrique – www.fabrique.nl

Aanpak film – www.aanpakfilm.nl