

*The Museum Complex "The Kulikovo Field".*

*The main exhibition "The Legend of Mamai Great Battle. New reading".*

*AV & Multimedia outfitting.*

## Project Description

### About the project

#### *Historical Context*

*Battle of Kulikovo, that dates back to 1380, was a military engagement in which the Russians defeated the forces of the Golden Horde, thereby demonstrating the developing independence of the Russian lands from Mongol rule (which had been imposed in 1240). The battle occurred when Mamai, a Mongol general who effectively ruled the western portion of the Golden Horde, invaded the Russian lands. The Russians, whose respect for Mongol authority had been declining - particularly since a series of dynastic quarrels following the death of the khan Jani Beg (1357) had weakened the Horde - resisted Mamai.*

The new Museum Complex on the Kulikovo field, the construction of which was completed in late last year, is slated to fully open in September 2016. Its creators have been tasked to connect the Past, which keeps the Kulikovo field and its memorials, with modernity, which demands fresh ideas and ways of presenting information in a creative way, and to turn the museum into a modern tourist facility, which will promote the development of domestic tourism.



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The new museum's building was designed by Russia's Deserved Architect S.V. Gnedovsky. The project is developed in style of Russian postmodernism and best takes into account the specific character of the surrounding landscape and history of the Kulikovo field.

From the very beginning, a project team has been tasked to emotionally impact on the visitors and engage them into the action, help them to feel the drama of the Battle, make them a sense of empathy and complicity of those distant event, by extensive use of audio-visual and interactive technologies.

A3V LLC has carried out the AV and multimedia design for the two levels of the new permanent exhibition named "The Legend of Mamai Great Battle. New reading." and has implemented a turnkey solution (i.e., procurement of the equipment, on-site rack fabrication, installation, commissioning and programming) at the first level, that is turned to be the most sophisticated in terms of technical solutions.

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## **Details of AV installations**

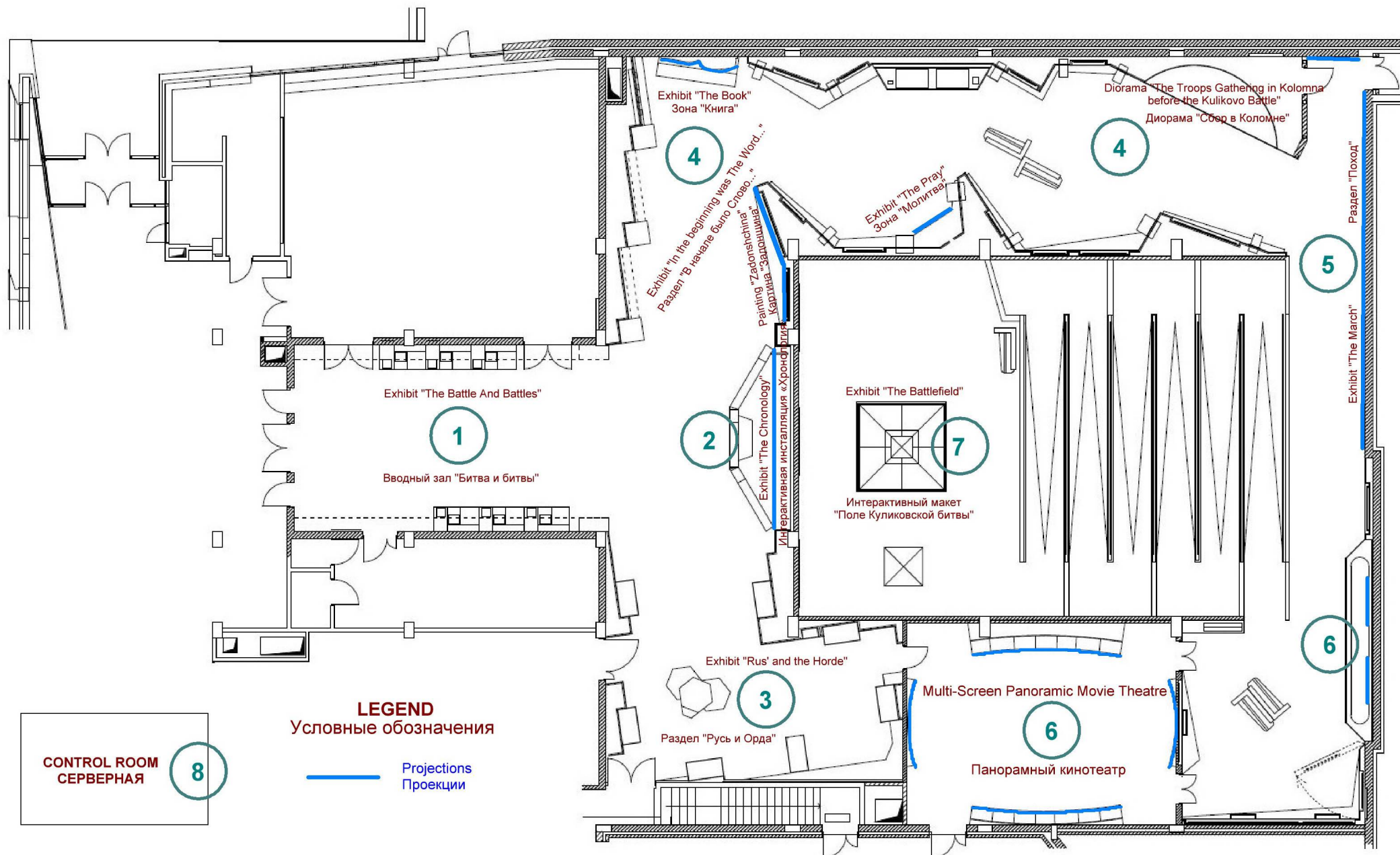
### **1. Opening Hall "The Battle and battles"**

According to the concept of the new museum, the visitors begins to dive into the history of the Battle in the opening hall "The Battle and battles", where they can get an answer to a question about what the Kulikovo battle is different from many other battles that took place in Russia and abroad.

Six horizontal glass display cases enable visitors to learn about the most epic and significant battles in history. Each display case is outfitted with a 22-inch monitor mounted inside the case, and a thin clear capacitive foil applied to the back of the glass lid to make it interactive.







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## 2. Interactive Exhibit "The Chronology"

This exhibit continues further development of the opening hall's theme with help of projection and a custom-made interactive table in front of it.

The projection zone is divided into three parts, featuring the different periods in the history timeline. Table's panel has three sections, as well, logically connected with appropriate parts of the projection. Each section in its turn comprises of ten touch sensors to allow visitors to select from a wide variety of topics.

High-sensitive capacitive touch sensors, as well as network controller for them, were specially designed and manufactured according to the project needs. Special design lets them reliably detect touches through the surface that is composed of MDF board by 10 mm in thickness, covered with a tempered glass with applied graphic image.

Three Canon XEED WUX400ST projectors are powered by Alcorn McBride A/V Binloop HD multichannel synchronous player. Its unique feature of displaying synchronized images across different outputs makes it possible to provide the united image over the whole projection area when needed.



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### 3. Exhibit "Rus' and the Horde"

A pair of display cases in the zone are outfitted with pseudo-3D projection platform Holocube's HC32 accompanied by touch kiosks iTouch KM2206 which allow visitors to select and view through Holocube three-dimensional models of some museum objects relating to the theme of the confrontation Russians and the Golden Horde, but missing in the museum's collection.

The exhibit also features 12-inch and 32-inch ELO touch screen monitors (the latter in portrait format) that are positioned within the display cases enabling visitors to learn about ancient costumes and coins respectively.





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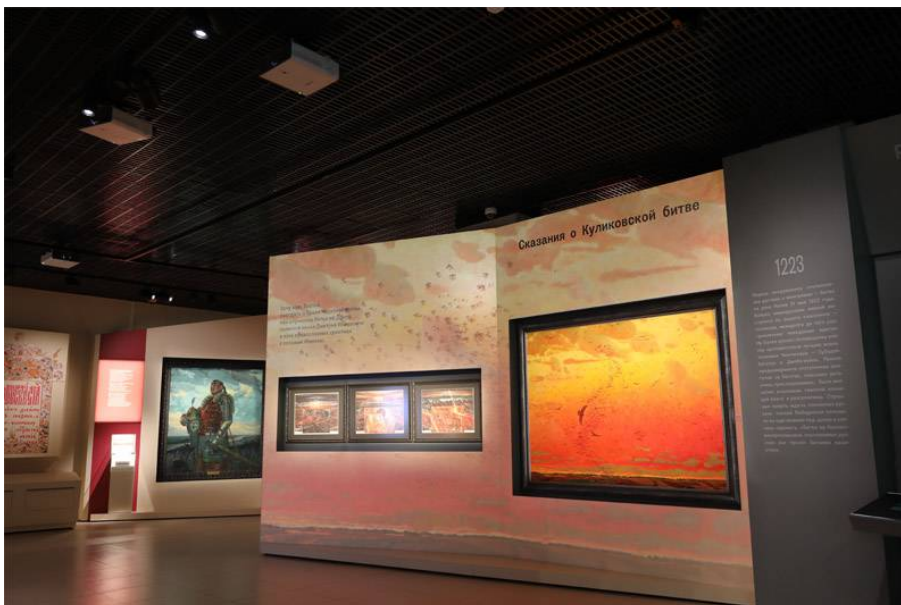
#### 4. Exhibit "In the beginning was The Word..."

In the exhibit "In the beginning was The Word..." the Kulikovo Battle is considering through the prism of saga "The Legend of Mamai Great Battle".

The exhibit features:

- Two 42-inch ELO touch screen monitors in portrait format that are positioned within the display cases enabling visitors to learn ancient texts in the Old Slavonic language and translation with hypertext, as well as playing a variety of themed games.
- Video mapping images from Canon XEED WX450ST projector onto a large 3x3 m in size three-dimensional model of an opened book enabling visitors to learn snippets from the saga "The Legend of Mamai Great Battle".
- Image projection onto the surrounding space of "Zadonshchina" painting by two Canon XEED WX450ST projectors which visually expands the painting borders to enhance visitors emotional perception. Video playback along with warping and edge blending are done by two-channel Dataton WATCHPAX media player.
- Canon XEED WUX400ST projector displays images on a 90x150 cm rear projection screen made from a special film applied to a glass substrate.
- The exhibit ends with an image projection on the wall next to the diorama "The Troops Gathering in Kolomna before the Kulikovo Battle". Canon XEED WUX400ST projector displays looped media, while ceiling mounted sound-focusing dome speaker SoundTube FP6020-II provide audio.

The multichannel background audio system in the zone comprises JBL CONTROL 67 P/T loudspeakers.



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## 5. Exhibit "The March"

"The March" is a large image 14 x 3 m in size projected via six Canon XEED WUX400ST short-throw projectors onto a wall screen, which shows the stylized movement of Russian troops into battle.

Using such projectors with an unique in a short-throw segment wide range of vertical and horizontal lens shift gave unbeatable flexibility in projector placement that allowed not only to create a seamless image, but also made it possible to visitors comfortably pass through the hallway only three meters in width almost without drop-shadows on the wall screen.

Projectors are sourced from three Dataton WATCHPAX media players. The exhibit is outfitted with eight JBL CONTROL 23T loudspeakers.





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## 6. Multiscreen Panoramic Movie Theater

At the core of the museum is a multiscreen panoramic movie theater. The theater space is surrounded by four curved screens sizes of 1.7 x 5.9 m and 1.7 x 3.3 m, arranged in pairs opposite each other. The video presentation makes visitors feel as though they are at the heart of the battle.

To deliver the video, ten Canon XEED WUX5000 projectors with optional short-throw zoom lens are edge blended to fill the screens with seamless images. Video playback along with warping and edge blending are done by five two-channel Dataton WATCHPAX media players. The projection is accompanied by 8-channel surround sound delivered through JBL CONTROL 25 loudspeakers.

Two monitors at the theater entrance displaying the time remaining to the next show are powered by SpinetiX HMP200 digital signage players.

Interior theater lighting as well as display cases spotlights are synchronized with the video presentation and controlled via DALI protocol.

A huge display case at the entrance of the theater is outfitted with two ultra short-throw Canon LV-8235UST projectors mounted in the top base displaying the successive images on display case's back side. Using ultra short-throw projectors made it possible to obtain maximum images sizes in a display case with a depth of just 50 cm.



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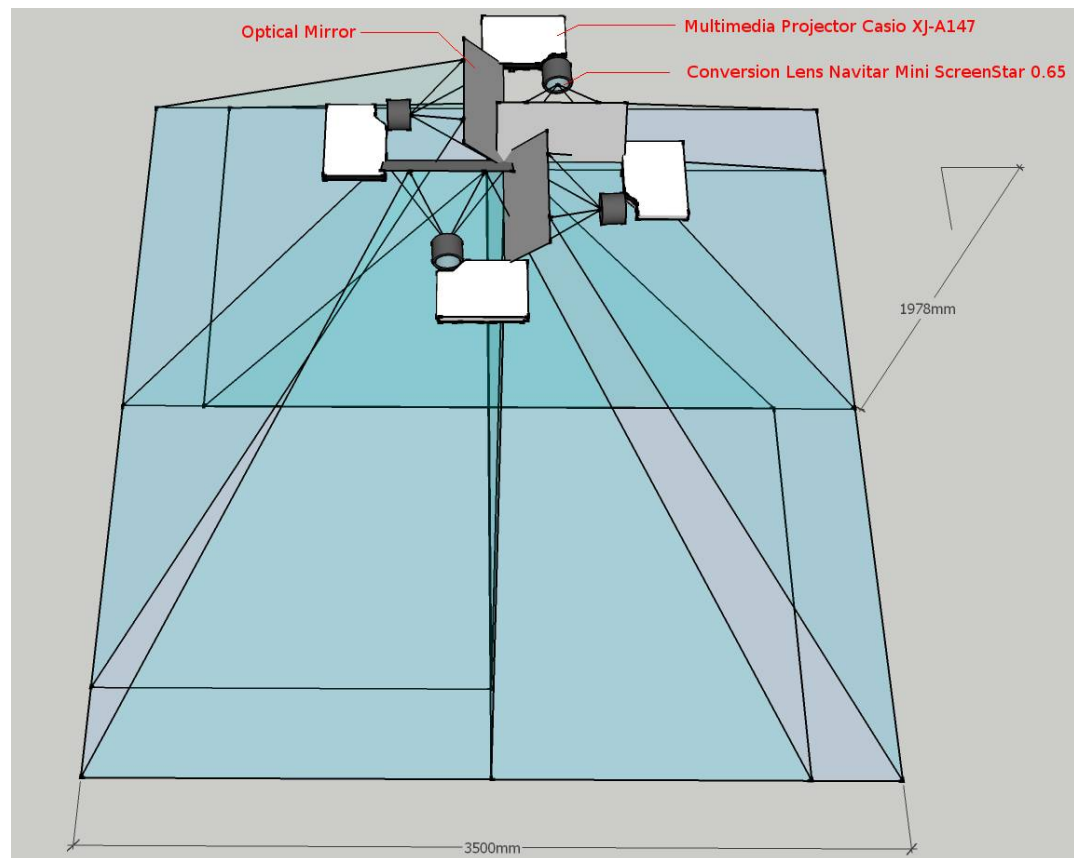
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## 7. Interactive Exhibit "The Battlefield"

The interactive exhibit "The Battlefield" is one of the highlights of the new museum's exposition.

The exhibit utilises four Casio Green Slim XJ-A147 projectors mounted on a custom frame at the top of the pyramidal showcase with a base of 3.5 x 3.5 m. Projectors throw the image through Navitar short-throw conversion lens and 45-degree mirrors down to the amazing terrain model of the battlefield. Projectors are sourced from two Dataton WATCHPAX media players so, that video mapping images fill the model with seamless images.

The exhibit is outfitted with six interactive push-buttons which enable visitors to learn about the layout of the Russian and the Horde regiments, the course of the battle, changes in the landscape of the battlefield for centuries and other.



Interactive Exhibit "The Battlefield"



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## 8. Control Room

To meet the goals of the new museum with the given budget and allotted exhibit space, we have tried to standardized the equipment as much as possible to minimize the amount of different gear and to promote easy operation and maintenance. Many of the AV sources, such as Alcorn McBride's A/V Binloop HD's and 8-TraXX, as well as Dataton WATCHPAX media players, are based on solid state technology, which offers increased reliability and maintenance-free.

Most source equipment (except Dataton WATCHPAX media players that are located adjacent to the projectors they serve), three multichannel CROWN CTs power amplifiers, audio DSP and I/O server, AV control system and all PCs have centralized location in two 42U equipment racks in a dedicated control room.

Ten PCs supply PC-driven interactive content throughout the museum. One PC is turned into a show controller with Medialon Manager V6 Pro software.

Alcorn McBride 8-TraXX multichannel audio player is used for background music and exhibit-specific sound effects throughout the museum. Many of the exhibit projectors are powered by two Alcorn McBride A/V Binloop HD multichannel players.

BIAMP TESIRA SERVER-IO handles audio routing and processing throughout the museum. JBL Control Contractor Series loudspeakers are used in connection with multichannel CROWN CTs series power amplifiers over a 100V constant voltage speaker lines. Digital-audio transmission over CobraNet protocol is used in between some of audio sources, audio DSP & I/O server and power amplifiers. All loudspeakers in the exposition are housed above the suspended ceiling.

Displays and projectors are largely feed using CAT-6 cables and Cypress extenders, except some fiber-optic links to the remote exhibits.

General lighting control is based on the DALI open standard protocol.

Considering that the scale of the project was absolutely massive, we rose to the challenge of making control as easy as possible for the operator. The Medialon Manager V6 Pro show control system is installed to provide the entire AV system control and to schedule the daily operations. The system is fully automatic and easy to operate. Each morning it can be started by a staff member whether from a single push of "start" button located on the custom Medialon GUI console or the push-button mounted inside the control room, and similarly at the end of the day a single push of a button closes down all the AV based exhibits.

Staff facilitating the whole exhibition are equipped with Samsung Galaxy Tab4 tablet computers that allows overall and individual control of all the exhibits in the new museum through a Medialon Web-based GUI and the browser.

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## **Future expansion**

Every part of the system is fully scalable and can be expanded to accept more features.

Possibilities for further project development include the installation of Medialon OVERTURE facility-wide AV Control system to help the main technical staff, that are located at a considerable distance from the facility (it's about 150 km), remote monitoring and control of the equipment.

## **About A3V**

A3V, LLC is the leading Russian company in the field of professional audio-visual systems integration primarily for the museum, leisure and visitor attraction sectors. It provides a comprehensive scope of services, including design, project management, engineering, installation and support of AV systems and products. For more information, visit [www.a3v.ru](http://www.a3v.ru).

## **Contacts**

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