



LUXAM MUSEUM LIGHTING - FIBER OPTIC INFRASTRUCTURE -

Exhibit Interactives and A/V Installations

Infrastructure Requirements

Electronic Displays and Computer Interactives

The National Air and Space Museum (NASM) averages about 7 million visitors a year making it one of the most visited museums in the world. While interactivity is desired by many of the visitors, the large numbers of people interacting with the equipment takes a toll on most hardware. After years of maintaining different computer and AV configurations, NASM has found the following specifications to work the best. Currently, NASM has an environmentally controlled room in P-602 Exhibits Technologies Computer Central location with remote connectivity to the gallery.

All audiovisual equipment shall be purchased and/or installed as specified for each project. All audiovisual equipment must verify to fit and operate with the exhibit structures.

- When specified, pushbuttons or other user interfaces will be installed in the exhibit structures and wired to be fully operational. The pushbutton and/or interface assembly shall fit snugly into the panel with the outermost ring sitting flush against the panel surface. All wiring shall have labels attached to clearly identify what component activates when pushed.
- All audiovisual equipment shall be tested to ensure operation. One month of live burn at a minimum.
- All audiovisual equipment must have adequate heat ventilation while operating in the exhibits, and there is access to the equipment for staff to perform maintenance or repairs.

Monitors/Touch Monitors

The most robust interface for a computer is a touch monitor, 4K resolution preferred for 42" and up.

There are fewer moving parts such as keyboards, buttons, or joysticks.

16:9 aspect ratio, 1920x1080 resolution

4:3 aspect ratio, 1280x1024 resolution

Touch type – Surface Acoustic Wave, (SAW/Intellitouch), capacitive touch

Input/s – HDMI, VGA, DVI & display port

Touch interface, Serial-RS232, USB

Open frame style for installation in housing/kiosk; closed frame style for stand-alone installation.

Some examples that are being use are:

<http://www.elotouch.com/Products/LCDs/1939L/default.asp> 19" open-frame part # E215546

<http://www.elotouch.com/Products/LCDs/2401LM/default.asp> 24" closed-frame part # E000140

<http://www.elotouch.com/Products/LCDs/2440L/default.asp> 24" closed-frame

<https://oneworldtouch.com/large-touch-monitors> 32" – 55" touch monitors



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Media Player/s

For video loops and light demand/simple touch interactivity, media players are more rugged and less expensive. The following examples have been successful:

BrightSign HD1020 1080HD: <http://www.brightsign.biz/digital-signage-products/hd-product-line/hd1020/>

XD1032 1080HD resolution (or comparable): <http://www.brightsign.biz/digital-signage-products/xd-product-line/xd1032/>

Distributed Video

For distributing videos from a central location, NASM uses an HD Binloop player, video over fiber, such as Alcorn McBride or similar.

Distributed Audio

For central control of audio sounds, such as the ability to turn off all sound at once, NASM uses an audio processor/amplifier, such as Ashly or similar.

Central Processing Unit (CPU)

For higher demand and multi-touch interactivity, CPUs are required. Full tech specs on the CPU will be finalized once content need/demands are determined.

Large form factors will be located centrally in an environmentally controlled room. An example is:

Dell Precision R7910: <http://www.dell.com/us/business/p/precision-r7910-workstation/pd>

Small form factors can be used for less interactivity and located locally. Some of these include:

Intel Edison, Galileo, Raspberry Pi, Arduino or equivalent; must be able to run LINUX operating system, <http://www.intel.com/content/www/us/en/do-it-yourself/edison.html> ,

<http://www.intel.com/content/www/us/en/do-it-yourself/galileo-maker-quark-board.html>

KVM (Keyboard Video Monitor) Hardware

For all extension of signals from central locations, NASM uses CAT5/6 copper. The goal with Revitalization is to switch to a fiber/copper combination for more flexibility.

Existing gallery installations use copper – Magenta Research (not used anymore):

http://www.magenta-research.com/files/MultiView_overview_2012.pdf (UTP)

New Gallery installations – Model and spec's dependent on content to be viewed. Matrox Avio or equivalent: <http://www.matrox.com/graphics/en/products/kvm/avio/> (Fiber)

Data Infrastructure

Currently, cables are fed from P-602, (Exhibits A/V Control Room), on garage level to gallery patch panels, then distributed to gallery A/V & interactives locations. All data cable installations follow manufacturers recommended installation methods and are enclosed in protective casings, conduit, inner duct, and/or raceways. Future cabling at each A/V and or interactive location should have a minimum of:

Fiber Optic, 2 ea. OM3 or OM4 multimode 50/125 fiber strands with LC connectors.

UTP, 2 ea. CAT6 cables with RJ45 connectors.

All data cables are to be terminated, tested, and certified.



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Design Standard Considerations

Video

- Resolution
- Aspect %
- Signal type, (HDMI, DVI, Composite, etc.)
- File type, (.mov, pro-res, MP4, etc.)
- Compression
- Player/s – Bright sign, Alcorn-McBride, Carousel, Four Winds?

Monitors

- Touch type, (SAW, APR, Capacitive, etc.)
- Commercial grade, (i.e., Gorilla Glass or similar)
- Power draw/heat displacement
- Mounting/cover/housing
- Button/control access by visitors
- Standardized

Audio

- Type, file type
- Rate
- Central control, on/off
- Amplifier type
- Speaker type/mounting
- Distribution

Computers

- Rack mountable
- Dual video cards
- KVM

Data

- Fiber
- Copper, (CAT5/6)
- Switches/routers
- Conduit/Interduct

Software standards, (SI/OCIO?)

Remote hardware infrastructure

- Currently Magenta, (signal over Ethernet)
- Fiber-future, (Extron, Matrox)



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Lighting

- LED, (active dimming)
- Easily serviceable
- Standardized
- Conservation limits
- Central control, (DMX RDM)

Mechanical

- Durable
- ADA compliant
- Safe – Free from pinch points, sharp corners, or edges, protruding fastening hardware and gaps where fingers or hands could get stuck.
- Easily serviceable
- Material selection
- Effective

Electrical

- Circuits
- Feeds
- Conduits
- Devices, (outlets & switches)
- Control system, (ETC Sensor IQ)

General

- Exhibits/kiosks, easy access for hardware installation & service
- Power feeds and access, NEC/NFPA compliant
- Data follows infrastructure guidelines
- Security considerations
- Environmental considerations, (artifacts/data loggers, Environmental Control Units)
- Exhibits proximity to other exhibits and artifacts for future access and servicing