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**WV Division of Culture and History Cultural Center
Solicitation # CRFP 0432 DCH1900000001
TV Studio in a Box**

Technical Proposal

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Technical Overview

Introduction

Digital Video Group, based in Mechanicsville, VA, is pleased to present this proposal to the WV Division of Culture and History Cultural Center for a TV Studio in a Box. This proposal consists of a turnkey designed system which includes engineering, hardware, and integration.

The design will provide a portable, broadcast quality production system that utilizes current generation equipment and advanced workflows. The goal of the project will be to provide the Cultural Center a state-of-the-art system to produce live, recorded, and streamed studio broadcast programming. The system will be designed to allow the Agency to add functionality as requirements evolve.

The design is based on best engineering and operating practices utilized by other commercial and governmental facilities with a viewing audience of at least 50,000 people.

The studio and equipment will:

- Switch video from multiple sources

- Record live video
- Streaming live content to multiple Websites
- Allow remote access and viewing
- Allow flexibility of location for cameras and monitors in the studio
- Utilize a network-based video workflow
- Include 4 remote controlled professional broadcast grade cameras
- Include a teleprompter system
- Include an audio mixer and wireless microphones
- Include appropriate desktop displays
- Include professional grade studio speakers
- Include profession grade headphones
- Include studio lighting and controls
- Include portable chromakey backdrops

Digital Video Group

Digital Video Group (DVG) is a leading television broadcast systems designer and integrator based in Mechanicsville, VA with a local office in Tysons Corner, VA. The company has been in business for over 15 years with hundreds of successful projects allowing our clients to produce amazing video and audio programming. Many employees individually bring over 30 years of experience in the television system integration business.

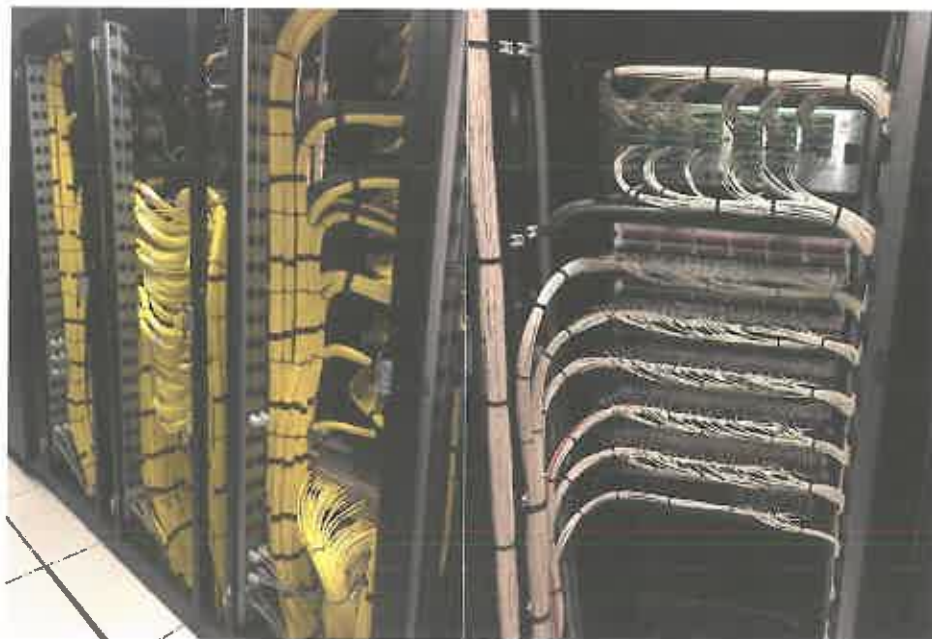
DVG's goal on every project is to customize the design and integration to meet the client's unique requirements. Unlike large, mill like operations, DVG takes the time to understand the client's operation and works with the client until all parties are satisfied with the design and build.

DVG has designed, engineered portable production systems for Loudoun County (VA) Government, YorkTel, and New York University (Washington DC). Each production system reflected the unique production requirements of each client (see photos below)



Other recent projects include:

- A 13 camera high definition sports replay and broadcast production control room and technical core for Liberty University's Vine Center in Lynchburg, VA
- A five camera high definition sports replay and linear production control room and technical core for Elon University's Schar Center, Elon, NC.
- A 528x528 HD production video routing system, 4 M/E production switcher, and large audio mixer for Maryland Public TV, Owings Mills, MD
- A three camera studio, control room, and technical core for the State of Virginia Senate, Richmond VA.
- A four camera mobile broadcast production system built into a Sprinter van (and designed around ESPN3 production specifications) for WCVE, Richmond VA
- A four camera mobile full production system built into a 26' truck for Fairfax County Government Channel 16, Fairfax, VA
- A design contract, engineering, and integration of two production control rooms and technical core for Elon University in Elon, NC
- A four camera high definition broadcast production system and post production editing SAN for Radford University in Radford, VA
- A three camera high definition broadcast production system and post production editing SAN for Longwood University in Farmville, VA
- A three camera high definition broadcast production system upgrade, a post production editing SAN, and a Newsroom Computer System for James Madison University in Harrisonburg, VA
- A design contract for Loyola University in Baltimore, MD
- A five camera high definition broadcast master control and production system for the Prince William County (VA) Government PEG channel
- A five camera high definition broadcast master control and production system for the Prince William County (VA) Public School Board of Supervisors board room.
- A four camera high definition production system for the International Association of Fire Fighters in Washington, DC
- A four camera high definition mobile production truck system upgrade for the City of Chesapeake (VA)
- A three camera high definition production system for the Morgan State University in Baltimore, MD



System Overview

The proposal will include two sections – studio and production control. The system will be configured for 1080 video format with embedded digital audio. The system will support CEA-708 closed captions.

Note: The RFP did not directly indicate that the Agency requires virtual set functionality with this portable production system. The RFP only specifically mentions “portable chroma keying backdrops”. This requirement can simply be interpreted to refer to a portable green screen – and a rather large one is included in the proposal.

Addendum 2 introduces a virtual set requirement with a requirement for 100 Virtual Backdrops. “Virtual” means different things to various people and the interpretation can vary widely.

The terms “chroma keying” and “virtual sets” often are used interchangeably in the industry. In fact, while virtual sets require a chroma keying element, a chroma key is not necessarily a virtual set.

A chroma key substitutes a background image over a solid color background. When the camera moves or lens zooms, the background image remains fixed in place.

With a virtual set, when the camera moves or the lens zooms, the background image moves, zooms, and tracks with the camera.

Each is used in its own application.

There are two types of virtual set technology – tracking and non-tracking. A tracking system moves, zooms, and tracks the background image as the camera moves or zooms. A non-tracking system moves, zooms, and tracks the background image, but the camera remains static. The virtual set software simulates the camera move, zooms, and tracking.

A tracking system allows for 360 degree movement around the talent and background images. A non-tracking system limits the usable image around the talent to about 30-45 degrees – any farther off axis and the talent becomes distorted.

A tracking system is extremely expensive – requiring a virtual set processor, a dedicated chroma keyer, and special tracking lenses per camera. A non-tracking system is more affordable as only one virtual set processor is required for the system. In fact, the non-tracking processor will perform the role of the video switcher, graphics, and background generator – in one box.

Good chroma keying requires high quality cameras and excellent lighting. For a virtual set to look close to photorealistic, these factors are extremely critical. Otherwise, the set may take on a cartoonish effect.

The cost difference between good quality remote controllable cameras and high-quality cameras ideal for chroma keying is significant. In addition, the on air remote controlled pan, tilt and zoom motions on the higher quality camera systems are as smooth as the if a professional camera person was operating the camera. The good camera motion control tends not to be as smooth and generally on air moves are avoided.

These factors will impact the quality of any chroma key or virtual set output.

In order to be cost competitive, DVG will be proposing the good quality remote controllable camera systems. These cameras produce broadcast quality images under good lighting conditions. They are also about 70% less costly than the high-quality cameras. (And these are not even close in price to the real high end studio cameras).

Since the proposed cameras generally are not considered appropriate for virtual set applications, DVG will not be proposing a virtual set solution. The proposed video production switcher, however, does include two very high quality chromakeys. Under good lighting, good quality chromakeys will be able to be produced with the proposed cameras. But virtual sets may not fare as well.

DVG will be receptive to propose the higher quality camera systems if the Agency requires this level of technology. Again, the higher quality camera systems are about 6-7X more expensive per camera.

In regards to IT networking and connectivity from the production system to the outside world, the Agency will be responsible for connectivity between the production system and the Internet or IT network. The Agency also will be responsible for providing analog POTS line connectivity for telephone call support.

4.2.1.3 The RFP requires 25 hours of operator training. Experience shows that 16 hours of training on this level of system has proven to be the sweet spot for the majority of facilities.

4.2.1.4 The RFP requires that the system facilitates studio mobility. The proposed system centers on two decent size double wide equipment rack cases. As the project requirements increased with the Addendums, it was necessary to expand the rack cases to accommodate the required system functionality. So while being on the large size, the cases will be able to be moved rather easily, but may require additional effort going up a ramp into a vehicle.

Also, there will be quite a few individual camera, tripod, lighting, monitor, microphone, etc. cases that will need to be transported as well.

Studio:

Four three-CMOS chip remote controllable broadcast cameras will be provided. The camera heads and remote units will be mounted on adjustable tripods with a dolly. A hard carry case will be provided to transport the camera heads. Soft carry cases will be provided for the tripods.

Cable reels for each of the cameras holding 150' of three video and one Ethernet control cable will be provided.

One cable reel holding 150' of Ethernet cable for the audio mixer's studio stagebox will be provided.

One cable reel holding 150' of video cable for the video talent monitor will be provided.

Two cable reels holding 150' of heavy gauge power extension cables to power the teleprompter monitors will be provided.

15" teleprompter monitors will be provided for two of the camera systems. A teleprompter creation/playback workstation will be provided and will be located in the production control area. A hard carry case will be provided for the teleprompter displays.

A studio lighting system will be provided that will consist of support trusses, 20 LED lighting fixtures, a lighting control surface, and associated rigging gear will be provided. Hard carrying cases will be provided for the lighting equipment. A 17'x10' portable chroma key backdrop will be provided. A hard case will be provided for the backdrop.

Four wireless microphones will be provided. Batteries and a charger will be included. Soft cases will be provided for the microphones

Four wireless IFB receivers with earpieces will be provided. Soft cases will be provided for the receivers.

A 43" talent video monitor will be provided. A hard case will be provided for this monitor.

Production Control Area:

A video production system consisting of a 13 input, 6 video and 10 audio output video production switcher, a single channel broadcast character generator, and dual channel clip player will be provided. A one mix effects bus production switcher control panel will be provided. The system will provide over 1TB of local RAID media storage

The production system will be rack mounted in the portable video rack. The control panel will be mounted on a pullout operator's shelf. The user interface for the character generator and the clip player will be access via a pull-out monitor and keyboard tray.

The switcher will include a dual multiviewer. The multiviewer outputs will be displayed on two 43" LCD monitors. Hard carrying cases will be provided for the monitors.

One 17" broadcast quality video monitor will be provided. A hard carrying case will be provided.

One camera remote control panel will be provided. The control panel will be mounted on a pullout operator's shelf on the portable video rack.

A professional audio mixer with 16 local analog inputs, 8 analog outputs, 16 faders, and 48 internal mixing channels will be provided. The audio mixer will include an on-board USB port that will allow audio MP3 files directly into the mixer. The audio mixer will be mounted on a pullout operator's shelf on the portable audio rack.

One digital "stagebox" that will consist of 16 analog audio inputs and 8 analog audio outputs will be provided. This stagebox will provide studio wired audio connectivity to the audio mixer over a single Cat-X cable. A hard, roll around case will be provided.

One rack mounted high quality audio speaker will be provided. One high quality audio headset will be provided.

One dedicated appliance for network-based video Skype calls will be provided. The "Skype box" will two way communication between the caller and the production system.

One analog POTS telephone bridge will be provided to allow viewers to talk directly to the talent via the IFB system.

One analog POTS telephone hybrid will be provided to interface telephone calls to the audio mixer.

A wireless IFB system will be provided to allow the director to talk directly to on set talent. Four independent channels will be provided. An IFB master control panel with a gooseneck microphone and an IFB controller will be provided.

Two broadcast quality, rack mounted digital disc recorders will be provided to record live programs. Each disk recorder will include one 1TB removable SSD media drive. Each disk recorder will include an on-board video display monitor. One USB-3 PC dock will be provided to mount a media disk to a post-production system.

Four streaming encoders video encoder appliance will be provided. The encoders will feature a single push button operation.

The video rack's technical core will consist of a video router switcher, a reference generator, video and audio distribution amplifiers, audio embedders, and a dual channel frame synchronizer.

A video routing switcher will be provided with 34 inputs and 34 outputs. All camera and source signals will be connected to the routing switcher. Router outputs will connect to production switcher destinations, recorders, encoders, and monitors. The video router provides an independent and redundant signal pathway for the production system. One router remote control panel will be provided.

One PC to HD-SDI converter will be provided. This converter will allow a user furnished PC to be connected to the SDI video production system.

A closed caption encoder with an automated captioning service will be provided. The automated captioning system will generate the captions from the live audio and send the caption data to the caption encoder. The caption encoder will embed the caption data into the HD video signal. The included 17" broadcast grade monitor will be used to monitor the captions over the video signal.

A 24 port Ethernet switch will be provided. The switch will allow IP network-based control of the video cameras, production switcher, character generator, clip player, audio mixer, disk recorders, streaming encoders video router, terminal gear, and captioning system. The Ethernet switch also will provide PoE+ power over Ethernet. This feature will be used to power the four studio cameras over an Ethernet control cable. This will eliminate a local power supply for each studio camera.

The production control equipment will be rack mounted in two dual wide portable, shock-mounted cases. Pull out operator shelves will be provided for the switcher control panel, the camera remote controller, the audio mixer, and the character generator user station. Video, audio, and control IO connection panels will be provided and mounted in the rear of each rack. This will allow for efficient setup and teardown of the production system.

Integration

The system will be integrated at DVG's Mechanicsville, VA facility. Equipment will be rack mounted, cables will be cut, terminated, and labeled. Equipment will be "burned in" and initial commissioning will be performed

Agency personnel will be invited to oversee the integration.
The off-site integration will require approximately two weeks.

After completion of the off-site stage, the equipment will be transported to the Agency.

All equipment and systems will be deployed, cabled, commissioned, and tested.

DVG engineering will then provide a final test with Agency personnel present.

Training will commence directly after final acceptance. Agency staff will be trained on the cameras, video switcher, audio mixer, the character generator and clip player, the video router, and the recorders.

The on-site integration will require approximately one weeks of on-site labor.

Project Time Table – (after receipt of order)

Engineering	2 weeks
Agency Engineering Review	1 week
Equipment purchase	4-6 weeks
Off-site integration	2weeks
On-site integration	1 weeks
Final test	1 days
Training	3 days

Documentation

Complete schematics of the as-built audio and video wiring will be provided. All cabling will be marked with unique designations at both ends. All cable designations will be marked on the schematics. Schematic will be provided as hardcopy prints and as files on a CD. DVG utilizes the WireCAD application. Operations manuals in PDF format will be provided.

Warranty

Digital Video Group warrants its *system integration* for a period of one year. Individual product warranties from their respective manufacturers will be passed through to the Agency.

Please note that during the first year of the DVG system integration warranty, DVG will provide telephone support during normal business hours at no additional charge. Under the system warranty, DVG will respond as “soon as possible” to a support request.

Conclusion

Digital Video Group appreciates the opportunity to present this schematic design to the WV Division of Culture and History Cultural Center. Please note that all recommendations are made based on over 15 years of experience in designing and integrating television systems. DVG is a registered reseller and integrator for all of the products recommended in this proposal. However, recommendations for this report are not made solely based on any established business relationships between Digital Video Group and the manufacturer. All efforts were made to clearly identify the requirements of the WV Division of Culture and History Cultural Center and provide the proper equipment and implementation recommendations, based on merit and value, rather than on affiliation.

Submitted by:

Chuck Heffner
VP Broadcast System

David Thomas
Director, Contract Sales

Digital Video Group

Equipment Web Links:

Studio

Panasonic AW-HE130 Camera:

<https://na.panasonic.com/us/audio-video-solutions/broadcast-cinema-pro-video/professional-ptz-cameras/aw-he130-full-hd>

Canare Cable Reels:

https://www.tecnec.com/Attachments/ProductSpecs/R-Series-Reel_Specs.pdf

Panasonic AW-RP10GJ PTZ Controller:

<https://na.panasonic.com/us/audio-video-solutions/broadcast-cinema-pro-video/camera-controllers/aw-rp150-touchscreen-remote>

Miller AIR Toggle Tripod:

<https://www.millertripods.com/en/catalog/product/view/id/360/s/system-air-toggle-lw-alloy/category/775/>

Cuescript CSEMCP15PTZ Teleprompter:

<http://www.cuescript.tv/product-profile.php?pid=PTZ-Mounting>

Cuescript Cue iT Premier Prompting Software:

<http://www.cuescript.tv/product-profile.php?pid=CueiT-Software>

Monitor Stands Now Flat Screen Moving Case:

<https://www.monitorstandsnow.com/P-31849/Flat-Screen-TV-Shipping-Cases-Included-Laptop-Tray>

Ikan Lyra 1x1 Studio Light:

<https://ikancorp.com/shop/lighting/ikan-lbx10-lyra-1-x-1-bi-color-studio-field-light-w-dmx-control/>

ADJ Scene Stealer Lighting Console:

<https://www.adj.com/scene-setter>

Chromawall Green Screen Kit:

<https://www.chromawall.com/green-screen-kits/largest-green-screen-kit>

Production Control

Ross Graphite Production System:

<https://www.rossvideo.com/products-services/acquisition-production/production-switchers/graphite/>

Sony FW-43BZ35F 43" Multiviewer and Talent Monitor:

https://pro.sony/ue_US/products/small-displays/fw-43bz35f?cmp=ppc-ngp-25094&aaca=1491998776&aaad=56603001734&aake=sony%20fw-43bz35f&aama=e&aapl=&aata=&aacr=285057099241&aade=c&gclid=EA1aIQobChMIicvKlseh4QIVF7bIChlrNwPgEAAYASAAEglsfvD_BwE

Monitor Stands Now Flat Screen Moving Case:

<https://www.monitorstandsnow.com/P-31849/Flat-Screen-TV-Shipping-Cases-Included-Laptop-Tray>

Sony LMDA-170 Broadcast Grade Monitor:

https://pro.sony/en_EE/products/broadcastpromonitors/lmd-a170-v2.0

Yamaha QL-1 Audio Mixer:

https://usa.yamaha.com/products/proaudio/mixers/ql_series/index.html

Sennheiser DW-4-US-R Wireless Microphone System:

<https://en-us.sennheiser.com/wireless-lavalier-microphones-set-sl>

Newtek VS-1 Talkshow Skype Interface:

<https://www.newtek.com/talkshow/vs100/>

JKAudio Interchange LTD Telephone Bridge:

<https://www.jkaudio.com/interchange-ltd.htm>

JKAudio Innkeeper Rx Digital Telephone Hybrid:

<https://www.jkaudio.com/innkeeperrx.htm>

Clearcom MA-704 IFB Panel:

<https://www.clearcom.com/product/ma-704/>

Clearcom PIC-4744 IFB Controller:

<https://www.clearcom.com/product/pic-4744/>

Shure P9TRA425CL Wireless IFB System:

<https://www.shure.com/americas/products/personal-monitor-systems/psm-900/p9tra425cl>

AJA KiPro Ultra Digital Disk Recorder:

<https://www.aja.com/products/ki-pro-ultra>

AJA Helo Streaming Video Encoder:

<https://www.aja.com/products/helo>

Ross NK-3G34 Video routing Switcher:

<https://www.rossvideo.com/routing-systems/nk-3g-series-3g-hd-sd-sdi-utility-routers/>

Ross RCP-QE18 Router Control Panel:

<https://www.rossvideo.com/routing-systems/rcp-qe-series-remote-control-panels/>

Ross openGear Terminal Equipment:

<https://www.rossvideo.com/products-services/infrastructure/signal-processing/opengear/>

AJA FS2 Frame Synchronizer:

https://www.aja.com/products/fs2?gclid=EAIaIQobChMIIn6Tcjsmh4QIVCLbICh1riw1aEAAYA SAAEgK1x_D_BwE

Apantac OG-US-4000 PC to Video Scan Converter:

<https://assets.ctfassets.net/vd4y94r5n5vv/5Jt7nw6WCIqSCFiDK62zjR/5c9cf5250b7bb2741e933e366b2fec6c/Apantac-Datasheet-OG-US-4000.pdf>

Wohler AMP1-2SDA+ Rack Mount Audio Monitor:

<https://www.wohler.com/product/audio-monitoring/amp1-2sda-plus/>

EEG HD493 Caption Encoder:

<https://eegent.com/products/UZNIZP3RN7GLM2GC/hd492-icapTM-encoder>

EEG Lexi Automated Captioning:

<https://eegent.com/products/OAM44XW07EVXHHZS/lexiTM-automatic-captioning>

Loudoun County Government, Loudoun County Virginia

<https://www.loudoun.gov/392/Cable-Channel-Webcast>

Project Description: Mobile Video Production Kit This kit serves as the:

- backup control for the primary boardroom operations
- the primary control for the Dulles Room, which is their backup boardroom and/or committee breakout conference room
- primary field production kit for use around the county; activities can be...
 - o ribbon cutting and dedication type ceremonies
 - o political coverage for local gov candidates
 - o talks, speeches, seminars
 - o Co-op with school functions

They are capable of broadcasting separate meetings out of the Boardroom and Dulles room simultaneously.

DVG Project Manager: Joe Bradford

Customer Contact: Stan Rogers, Media Operations Manager

York Telecom, Herndon Va.

<https://www.yorktel.com/our-media-services/>

Project Description:

York Telecom had a requirement for a mobile Video Production System to support their Corporate Media Services efforts. They contracted Digital Video Group to provide a three camera High Definition Mobile Product System for that effort. The system consisted of three Hitachi High Definition Video Cameras with 20X Canon Broadcast lens, a Ross Video High Definition Video Production Switcher, and supporting audio and video signal management hardware and custom shipping cases.

DVG Project Manager; Joe Davenport

Customer Contact: James Ray

New York University (Washington DC)

<https://www.nyu.edu/washington-dc.html>.

Project Description:

New York had a requirement for a mobile Video Production System to support their Media Curriculum efforts. They contracted Avitecture, Inc., who then brought Digital Video Group in to provide a three camera High Definition Mobile Product System for that effort. The system consisted of three Panasonic AWHE120 Integrated PTZ Cameras, a Ross Video High Definition Video Production Switcher, and supporting audio and video signal management hardware and custom shipping cases.

DVG Project Manager: Chuck Heffner

Customer Contact: Herb Lee Avitecture Account Manager for NYU DC

Digital Video Group Design Build Capabilities

Digital Video Group's has a solid resume for delivering exceptionally designed, engineered, integrated, and supported Design/Build systems for many satisfied clients for over 13 years.

Unlike many other video system integrators, DVG main business model is not to solely integrate projects based on an outside consultant's design. DVG is focused on working with its clients from the beginning of the project to deliver the system that meets and exceeds the project's requirements from a technical, operations, and financial perspective.

DVG's engineers are not strictly structured to perform just one specific role on any given project. DVG project engineers also create CAD drawings and wire run lists. This helps eliminate translation issues between the engineering and CAD stages. The same engineer will also oversee integration. The engineer's responsibilities continue with commissioning and system training.

This provides the client and project a continuity from start to finish – there is one person who is *totally* responsible for the entire project. Many system integrators divide a project between numerous engineers and technicians – handing off responsibilities from one person to the next. Experience shows this scenario often leads to a higher percentage of system failures and support issues.

DVG's engineers commission a significant amount of a project. This allows the engineer to fully understand the capabilities and complexities of the system's operation. It also allows DVG integration services to be more efficient and economical. Manufacturer commissioning is enlisted when required.

DVG engineers work alongside of the manufacturer during these commissioning sessions in order to provide more responsive support.

DVG has an Avid certified support representation on staff who provides detailed design, commissioning, training, and support. This is unique in the system's integration world.

Many DVG engineers have a production background. This allows the design process to be responsive not only to the engineering requirements but also to the operational nuances. These engineers will provide product training on production switchers, character generators, routing switchers, intercom, audio mixers, and editing systems. The training is not only product specific but also system specific. This is a level of training often beyond what a manufacturer can offer, as the factory trainer generally only understands his/her specific product.

DVG does not live and die by change orders. All reasonable client requests will be considered, and many are implemented under the original scope of the project. More involved requests or substantial system modifications will be negotiated.

Engineering Team Resumes

Joe Davenport, VP of Engineering

Mr. Davenport will be the engineering lead and project manager for this project. He will be responsible for engineering the project. He will create the CAD drawings and wiring run lists. Mr. Davenport will also work with the various manufacturers to commission and train on the system.

Mr. Davenport has been employed by DVG for over 10 years. He was the project lead for the Liberty University Vines Center control room, Maryland Public TV router, and Norfolk State University studio and auditorium projects.

Mr. Davenport has been the lead engineer and project manager for production projects at High Point University, WCVE, WETA, Maryland Public TV post production upgrade, Elon University, Radford University, Longwood University, James Madison University, Arlington County (VA) Government TV, Loudoun County Government (VA), Prince William County (VA), Montgomery County (MD), International Association of Firefighters, the US Federal Reserve, and many others.

Chuck Heffner, VP of Broadcast Systems.

Mr. Heffner will provide assistance and consulting to the project leader during the early stages of the project. He will coordinate planning between the Church, DVG and the manufacturing vendors. He will also assist with the system commissioning and will provide any optional operator training.

Mr. Heffner has over 35 years in video systems integration and broadcast equipment manufacturing. He has been employed by DVG for over five years. Prior to DVG he was the senior applications engineer for Professional Products, account manager for Miranda and the Grass Valley Group, and product manager for Dynatech Broadcast Group.

Mr. Heffner has been technical lead for large projects for the Associated Press in Washington DC and NY, the US House of Representatives, WJLA, and the Hope Channel.

At DVG, Mr. Heffner has been the designer and technical lead for productions projects for MPT, WCVE-TV, Norfolk State University, High Point University, Elon University, Radford University, Longwood University, James Madison University, Arlington County (VA) Government TV, Loudoun County Government (VA), Prince William County (VA), Montgomery County (MD), International Association of Firefighters, the US Federal Reserve, and many others.

Jeff Rubeck, Integration Supervisor

Mr. Rubeck will be project supervisor and lead integrator for this project. He will be responsible for coordinating the installation logistics and managing the integration team members.

Mr. Rubeck has been in the system integration business for over 30 years. Mr. Rubeck has been employed as at DVG for over three years. He has been employed by McLean Bible Church, Innovative Technologies Inc., Slingshot Networks, and Wang/I-Net

He has supervised major router installation projects for the US Defense Media Activity, Maryland Public Television, Elon University, and Norfolk State University.