

Case Study

VSM



**FOX NETWORK OPERATIONS &
ENGINEERING, LOS ANGELES:
2013 MCR PROJECT**

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INTRODUCTION

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FOX NETWORK OPERATIONS AND ENGINEERING IS BASED IN LOS ANGELES, CALIFORNIA. THIS FACILITY HOUSES BOTH PRODUCTION STUDIOS AND MCR RESOURCES FOR HANDLING THE MAIN LIVE SPORTS CONTENT FOR THE FOX SPORTS NETWORK.

In 2013, coinciding with the launch of two new 24/7 sports channels (Fox Sports 1 and Fox Sports 2), an investment in new hardware technology was made in the main MCR environment to move away from the traditional Master Control Switcher/signal flow concept to that of adopting new 'channel in a box' technology from Harmonic.

In addition, the investment included expansion of other core system components: A Snell Morpheus Automation system, a new 1152 x 1152 Evertz EQX router for the main MCR environment and new processing gear from Snell and Evertz. A VSM system was included to provide essential control interfaces and logic to support the new workflow.

SIMPLIFY AND MAXIMIZE RESOURCES

THE GOAL OF THE PROJECT WAS TO SIMPLIFY AND MAXIMIZE THE FLEXIBILITY OF THE RESOURCES IN THE FOX NETWORK MCR ENVIRONMENT.

Previously there were 16 dedicated control rooms which were fixed to the Quality control (QC) work function and physical channel paths. Other MCR work tasks such as Ingest, VOD and BSNP were located in non-ideal locations and environments within the limited space of the MCR environment. With the investment in new hardware technologies, it was the ideal time to re-think the workflow practices from the traditional MCR environment into a more flexible and 'virtual' environment. The

concept of 'virtualization' would then allow Fox to maximize the use and investment in their new and existing resources and also bring in a further level of hardware redundancy not available before. The vision was to allow any of the 16 MCR control rooms to take on any task and any channel at any time. The key to allowing this possibility lays not in the hardware technology choices, but in a layer of control logic that provides an abstraction of the different core hardware elements from the control requirements from a purely operational perspective. There was the need to bring together a unified control interface combining the key parameters of each separate device into a single workflow based around touchscreen operational panels.

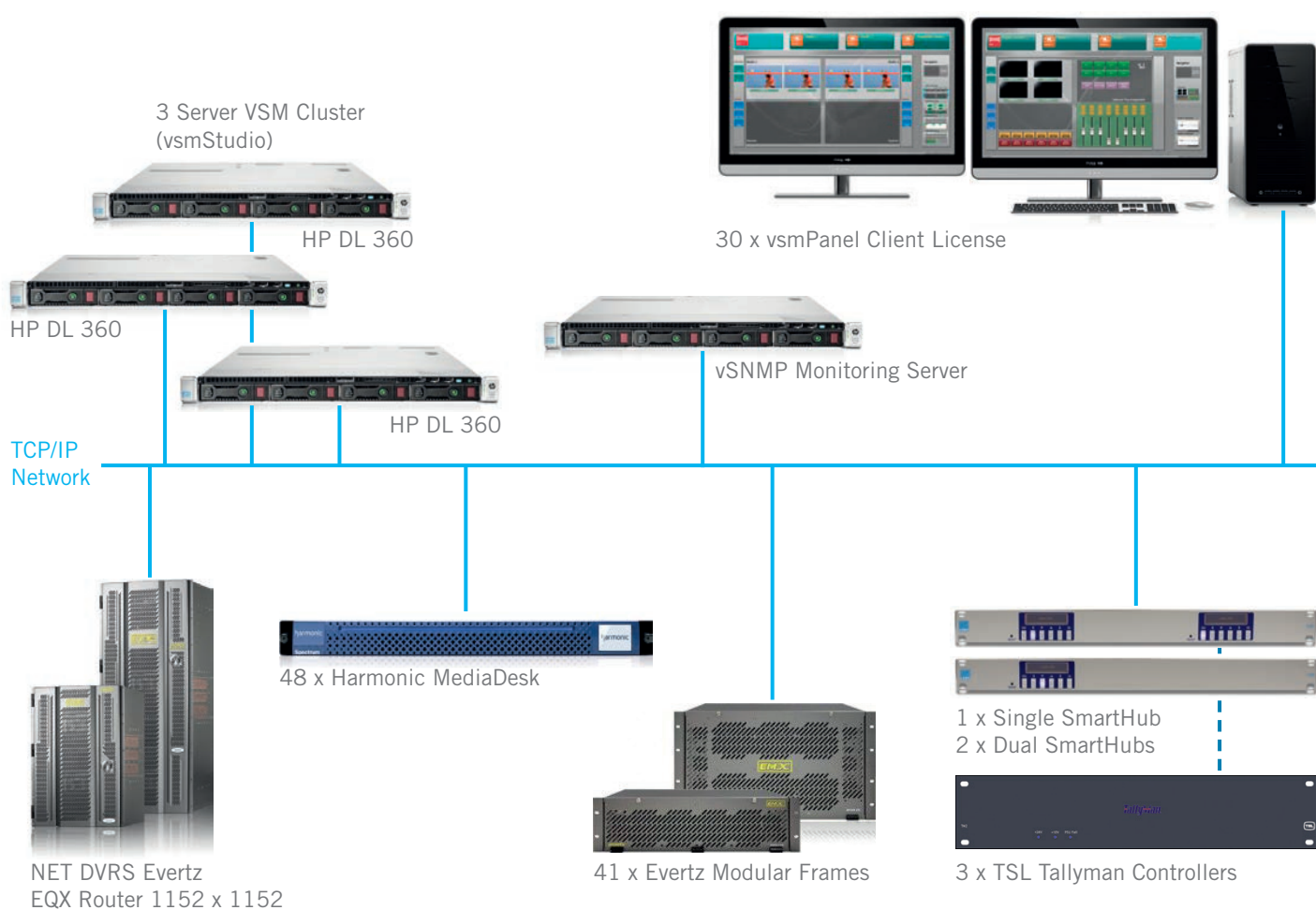


VSM Panel in one of Fox's MCRs

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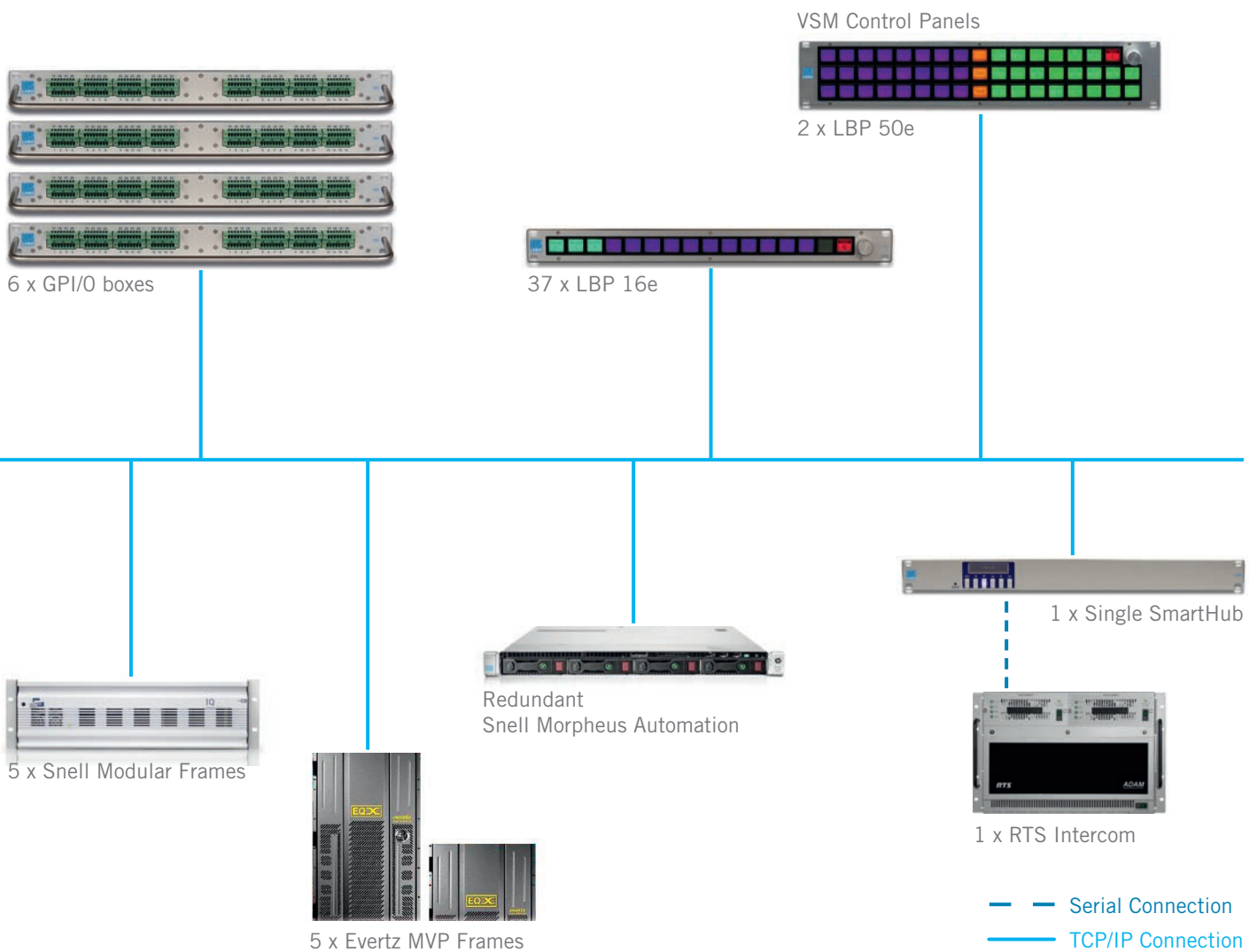
OVERVIEW OF THE INSTALLED VSM SYSTEM

Overview of the installed VSM system



THE FOLLOWING DEVICES ARE CONNECTED AND CONTROLLED BY THE VSM SYSTEM

- 1 x Evertz EQX Router (Quartz Protocol over IP)
- 48 x Harmonic Channel Port (Oxtel Protocol over IP)
- 5 x Evertz MVP Multiviewer system (Image Video Protocol over IP)



- 41 x Evertz Modular Frames (SNMP via IP)
- 5 x Snell Modular Frames (Snell Rollcall Protocol over IP)
- 1 x Snell Morpheus Automation (Probel SWP-08 over Serial)

- 3 x TSL Tallyman Controllers (Tallyman UMD Protocol 3.1 over Serial Connection)
- 1 x RTS Adam Intercom System (Command Line Protocol over Serial)

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VSM CONTROL LAYER

VSM as the fundamental control layer

COMPLETE RESOURCE FLEXIBILITY – PHYSICAL RESOURCES

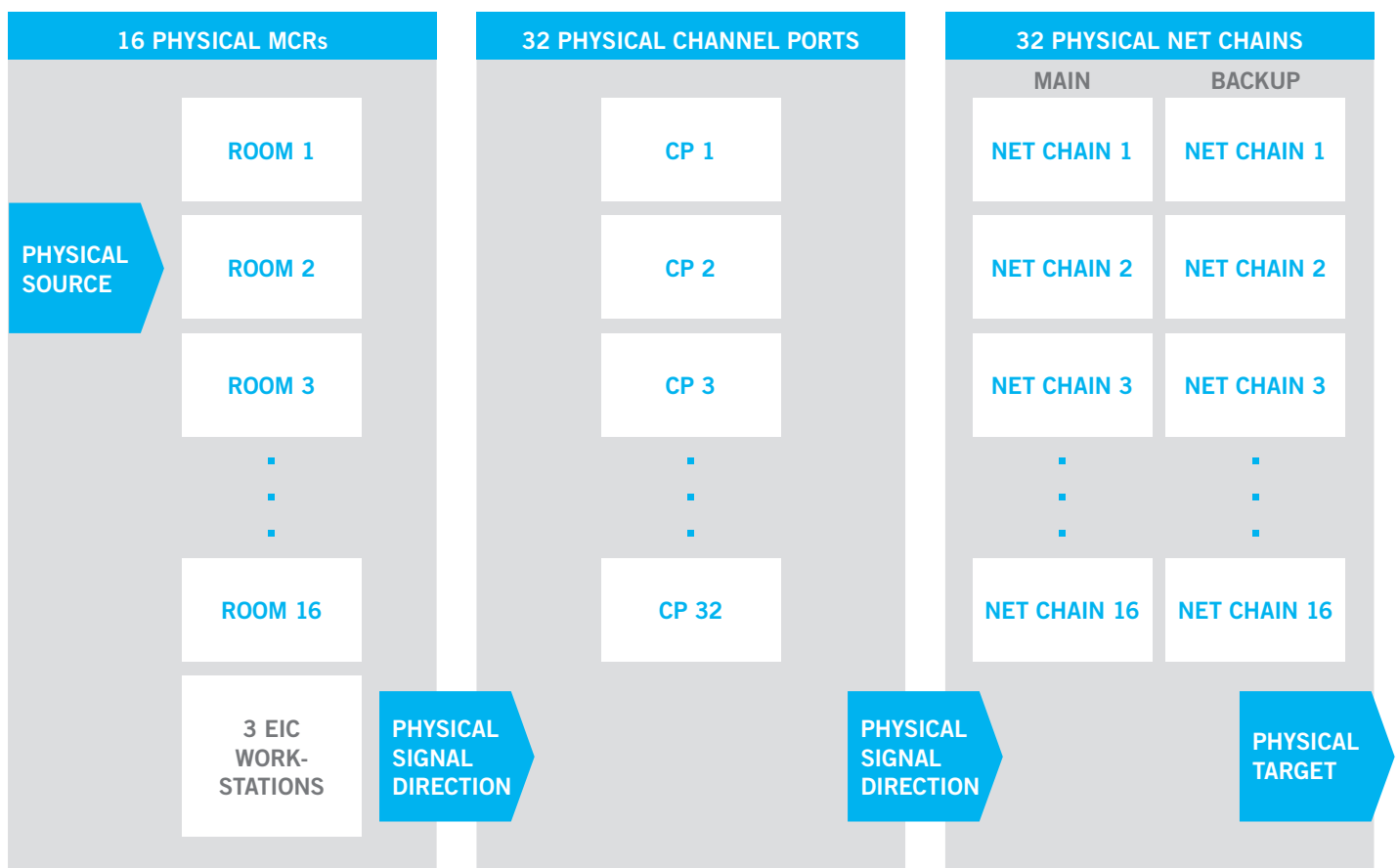


Figure 1: Physical Resources in the Fox MCR environment

VSM provides the control interfaces and logic to give the maximum flexibility of each environment. This is achieved by allowing any channel or operation to be recalled to any MCR control room with either a manual button push or a pre-scheduled recall. This includes signal routing, tally requirements, modular gear control and settings, monitor wall setups and intercom panel layouts. In essence, the control rooms are 'shells' containing hardware elements to which productions or Master Control signal chains can be recalled.

COMPLETE RESOURCE FLEXIBILITY – VSM VIRTUAL LAYER

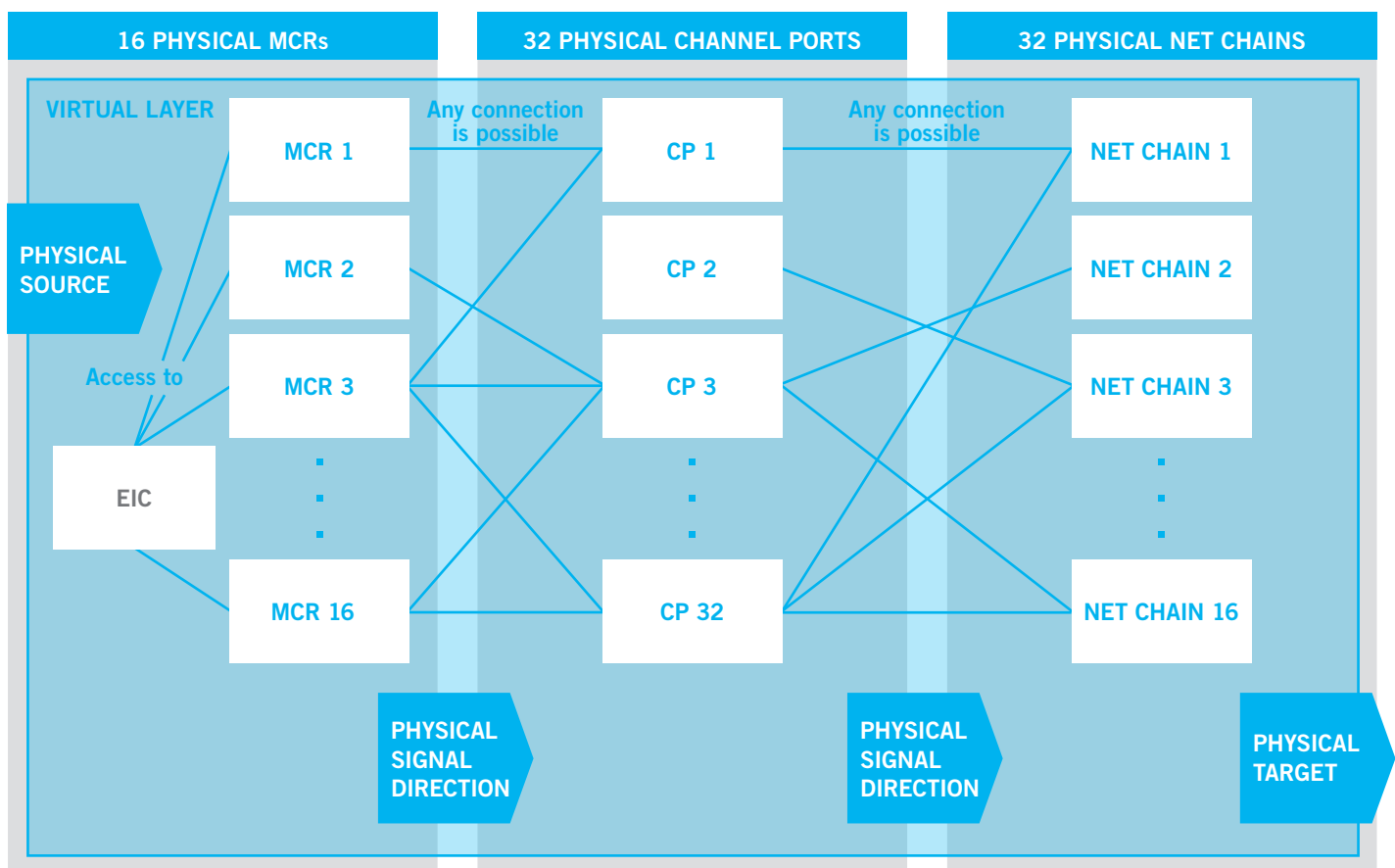


Figure 2: The VSM Virtual Layer in the Fox MCR environment

Numerous simplified user GUIs were designed to create an operational workflow which is focused to the exact nature of the work currently recalled to a particular room. In addition, there is a level of administration possible by the MCR managers (EICs) on custom VSM panels allowing both offline setup of productions as well the recall of productions to rooms either manually or by a pre-programmed schedule. In essence, live events and MCR tasks can be pre-planned and rooms automatically recalled to the correct channel settings and function based on a time base. Included in the workflow logic

is an improved overview from the central administration of the current function of a particular room by use of customized overview GUIs. The boxing logic of VSM allows this 'dynamic' moving and recalling of resources and their current settings to other studios within the MCR environment for handling emergency cases or last minute decisions. VSM handles all Tally requirements in the new MCRs with the possibility to also provide feedback and Tally information into the Live Production Control Rooms on the 2nd, 3rd and 5th floor of the facility to indicate actual on-air status.

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VSM CONTROL LAYER

COMPLETE RESOURCE FLEXIBILITY – PHYSICAL RESOURCES

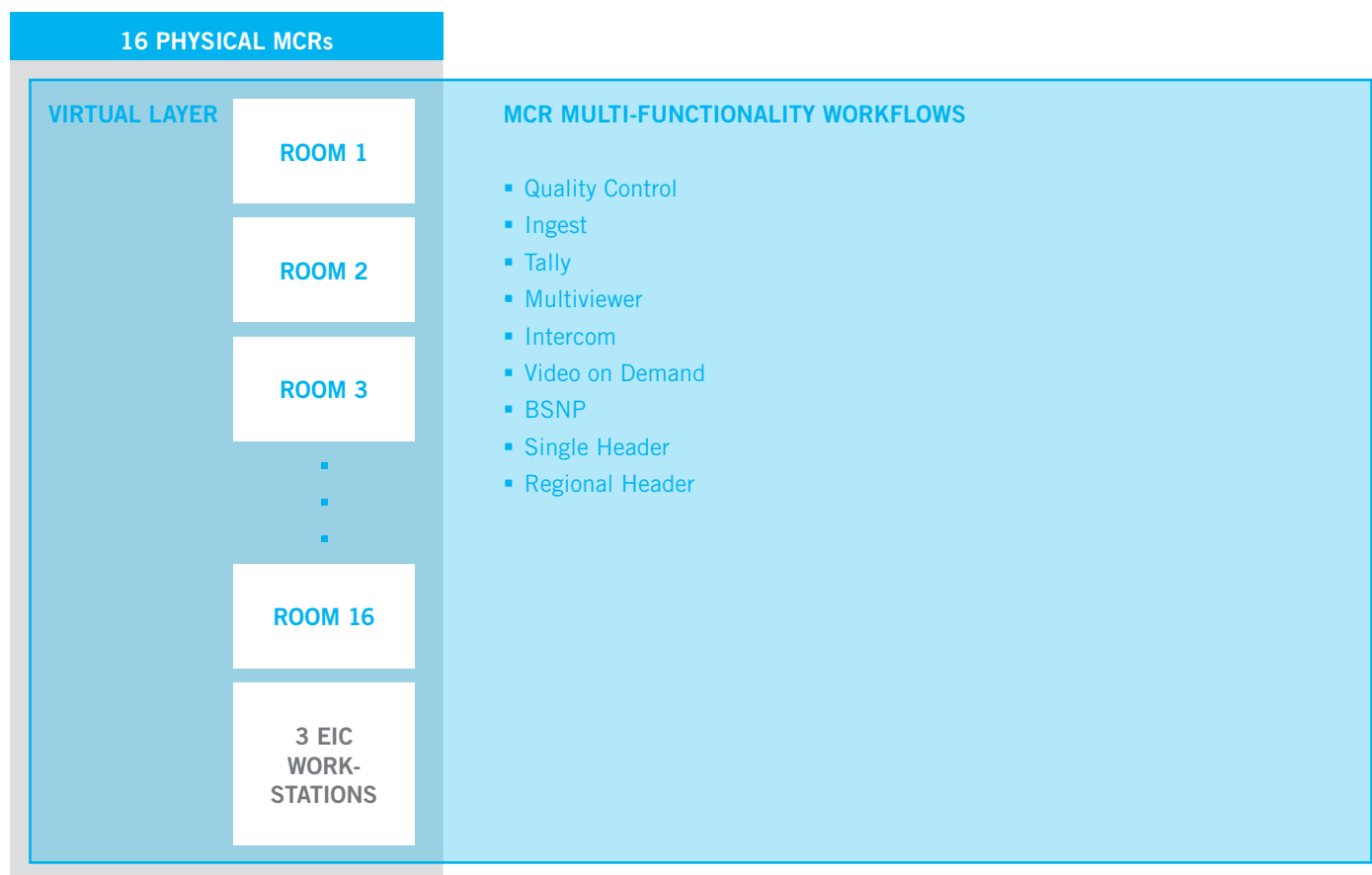


Figure 3: VSM has access to various functional workflows

A key task of VSM is providing a tactile and simplified GUI to control parameters of the Harmonic Channel Port device and Snell Down Stream Keyers so that manual override capabilities are possible when programmed mistakes or failures occur from the Snell Automation. In addition, VSM integrates with the Snell Morpheus Automation system so that there can be more centralized recall of the resources if needed from the main playout automation. VSM is the only control system (no Evertz control system installed) for the main Evertz EQX MCR router as well as providing customized interfaces and logic for Evertz Glue. Further

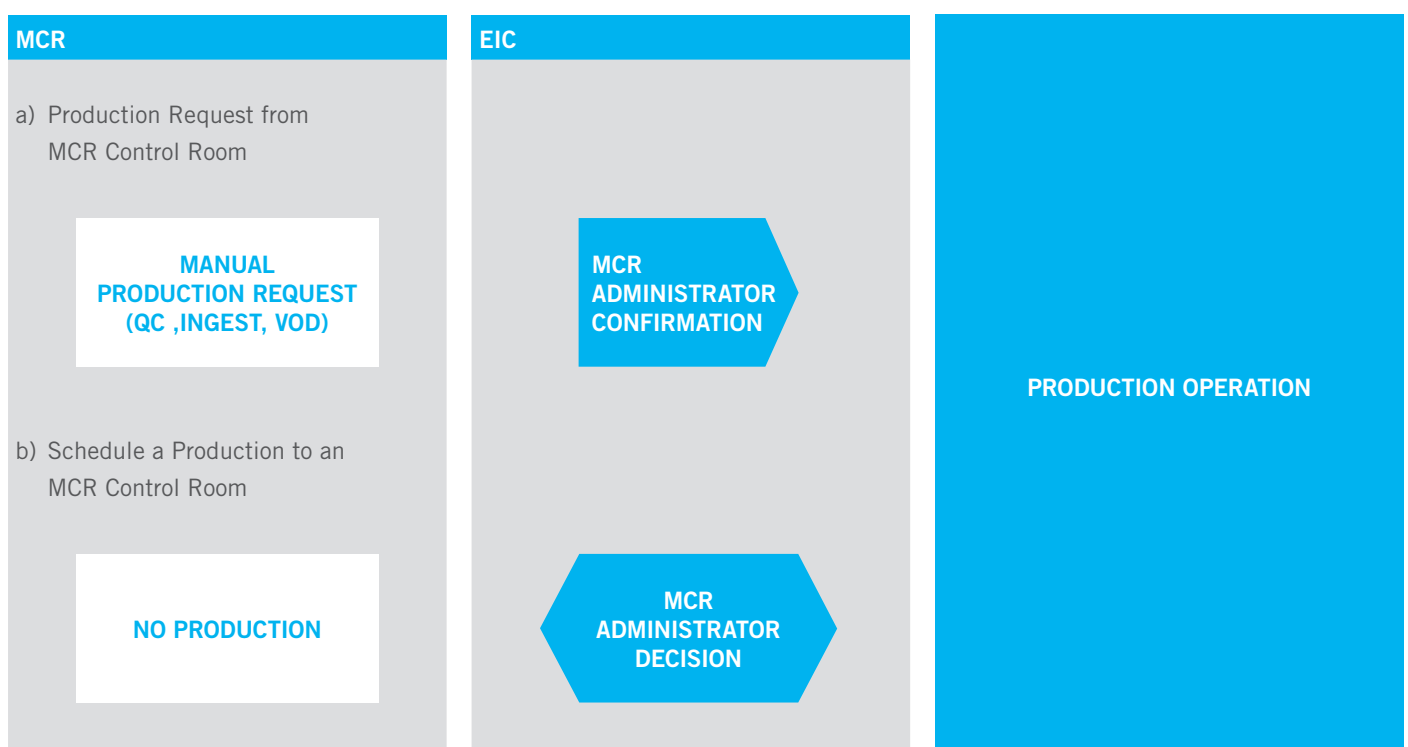
functionality offered by VSM includes multiviewer routing and layout recall of the Evertz VIP system in every MCR control room and also allowing operator panel layout changes and recall of the RTS intercom system. In all, VSM creates a simplified control layer for all elements of the MCR production environment allowing complete control rooms to be recalled to optimized setups either manually with a single button push, or automatically with an internal scheduler.

MCR WORKFLOW CONCEPT

MCR WORKFLOW CONCEPT

One of the key benefits of installing the VSM system was the possibility to change the workflow thinking from physical resource needs to production requirements. Operations are no longer restricted to channels or productions being tied to particular studios or hardware resources. Productions can now be prepared off line in a virtual way and then recalled to any free control room either by a manual action or via a pre-scheduled recall. The manual recall of a production can be triggered either by an MCR operator from within the control room in conjunction with approval from the MCR administrator or by the MCR administrator directly from the central administrators position.

The request and approval workflow is handled through custom configured logic that also takes into account any on-air Tally status so that no On-Air studio can be changed at any time to another production accidentally. Additionally, based on the production type that is requested (such as 'Quality Control' or 'Ingest' for instance), an operationally optimized panel layout based on that workflow is presented to the operator. This is only possible due to the dynamic and freely configurable nature of VSM panels.



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PANEL WORKFLOW

PANEL WORKFLOW

The basis of the MCR control workflow is focused around 3 main software touchscreen operated panels. MCR Panel – a panel that lives in each of the 16 MCR control rooms. MCR Status and MCR Administration and Setup Panels – panels that work together at the main MCR administrator's work position (EIC panels).

Each panel has multipage functionality with an individual operational workflow dedicated to the appropriate task. Basic tasks such as signal routing, multiviewer setup and Intercom panel assignment functions are available on all panels.



Figure 4: MCR Panel

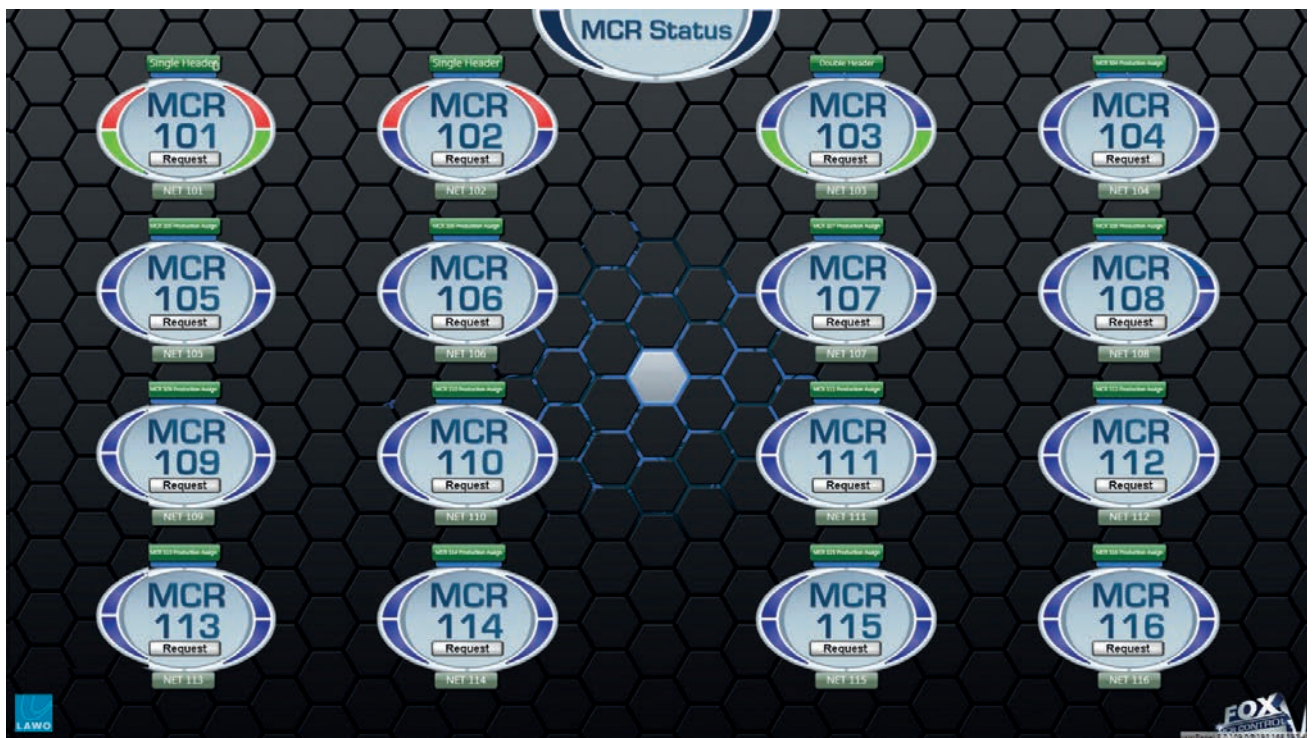


Figure 5: MCR Administration and Status Panel



Figure 6: MCR Administration and Setup Panel

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PANEL WORKFLOW

MCR PANEL: QUALITY CONTROL 'QC' FUNCTION PANEL

The primary task of the MCR panels is to support the Quality Control job function. The main interface for the MCR operators is a single 24 inch touch screen which gives an optimized layout of live control functions and an overview of signal path, Tally and system status.

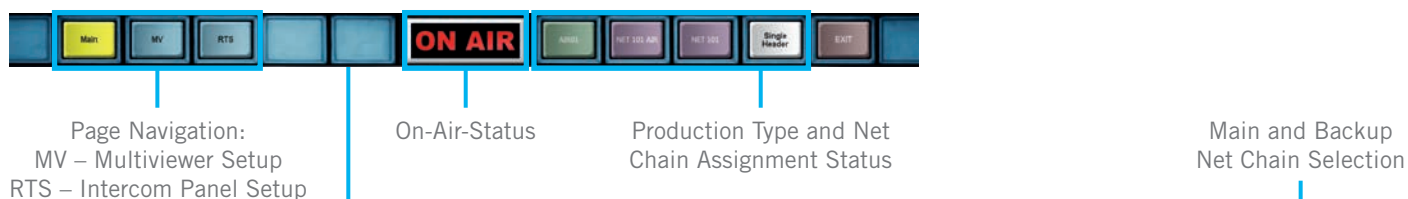
The primary function of the panel 'QC' workflow is to provide manual control of the functions of the Harmonic Channel Port device so that programmed errors in the Snell automation (which is typically the main controller of the device) can be overridden in the fastest time possible – in essence the panel simulates the Master Control Switcher interface. VSM connects to each of the 32 Harmonic Channel ports via IP and utilizes the Oxtel protocol to provide control over the following parameters:

VSM CONTROL OVER HARMONIC CHANNEL PORTS INCLUDE

- Mixer Source selection with mix transition style
- Keyer control - switching of all 8 keyers independently or all together with a selection mode of the key fade
- Selecting the input source of each mixer between External or Internal Sources
- Internal File query and selection for keyers
- Stop/Start/Restart/Set start point etc. of internal Animations
- Tally status and changes

2 Channel Port devices are assigned to each 'channel' for main and backup 'Net chain' paths and VSM synchronizes up to 12 devices at the same time in regards to both routing possibilities and the current status.

PANEL NAVIGATION AND STATUS

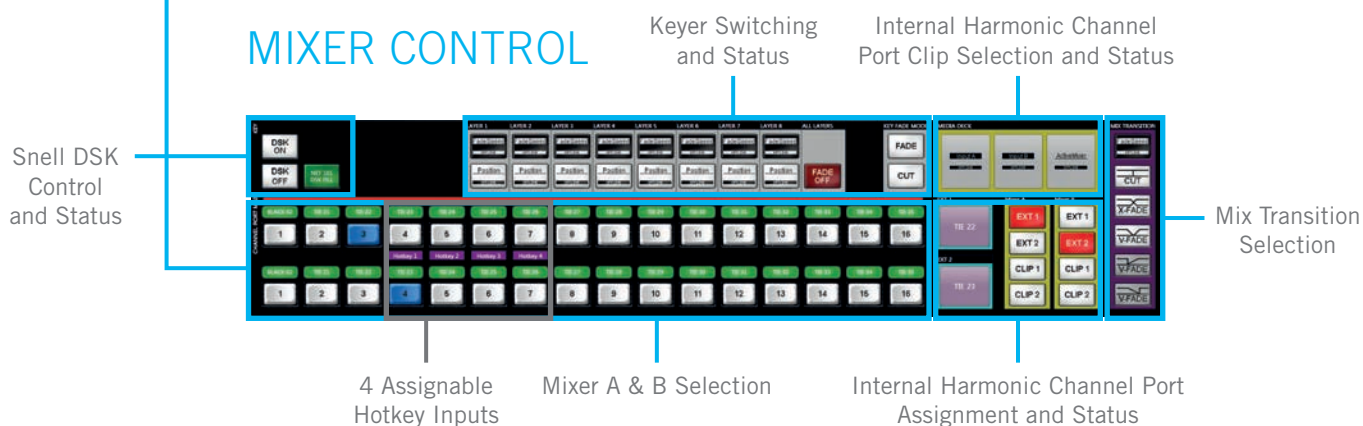


ROUTING AND NET CHAIN STATUS



Figure 5 MCR Panel for Quality Control

MIXER CONTROL



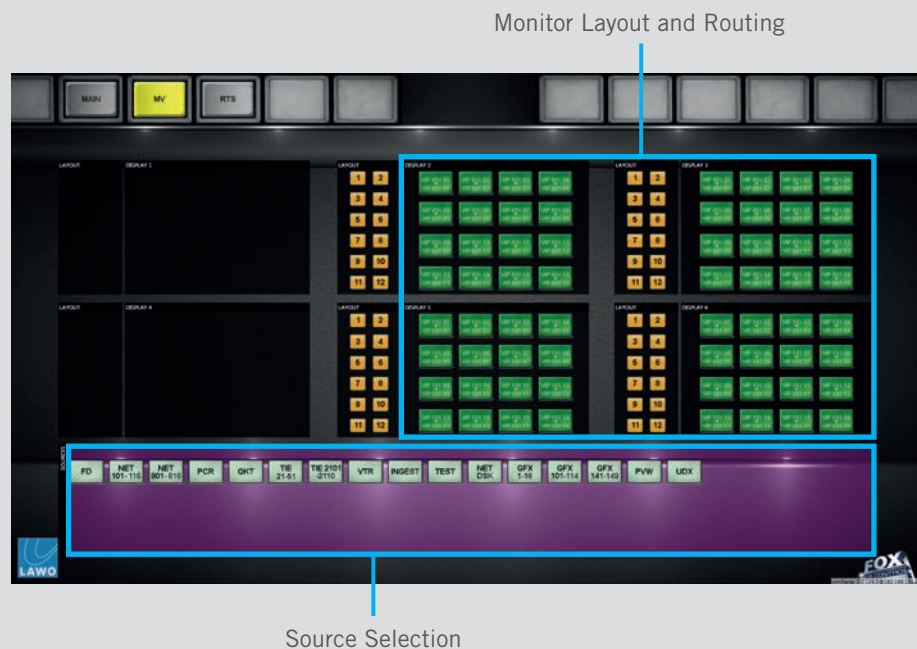
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PANEL WORKFLOW

MULTIVIEWER ROUTING AND SETUP PAGE



Pressing the MV button navigates to the Multiviewer Setup Page



INTERCOM PANEL BUTTON SETUP PAGE



Pressing the RTS button navigates to the Intercom Panel Setup Panel



MCR ADMINISTRATOR PANELS

The concept behind the 2 MCR Administrator panels is that they sit side by side and there is interaction between them both. Each panel is displayed and controlled from 24 inch touchscreen monitors.



MCR Status Panel

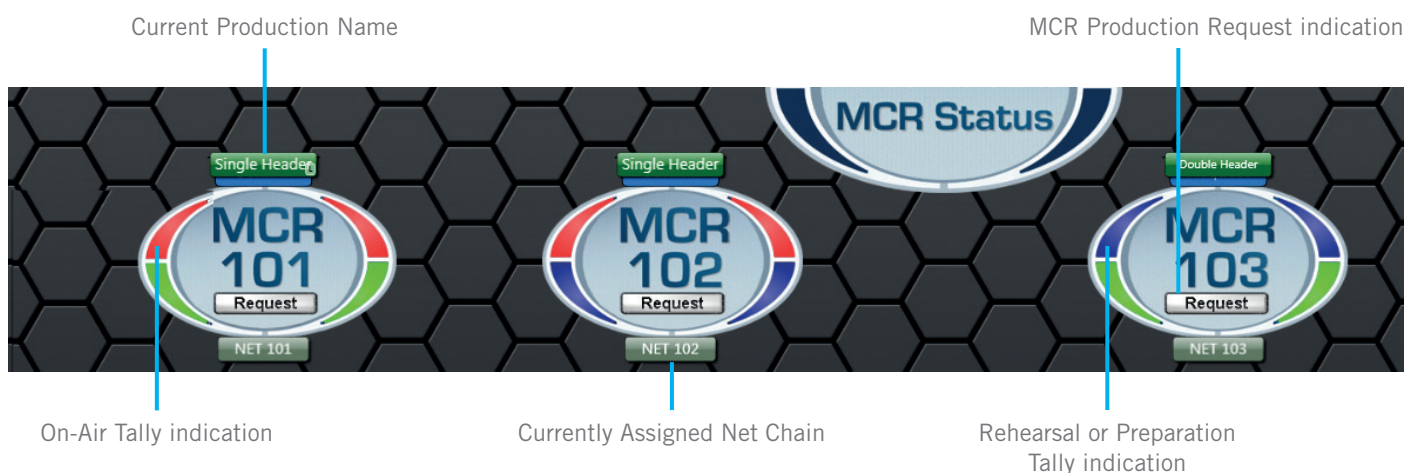


MCR Administration and Setup Panel

MCR STATUS PANEL

The MCR Status panel provides an overview of the current status of each of the 16 control Rooms. This includes on-air status, current Net Chain assignment and the current production in the room. In addition, if an MCR operator is manually requesting to

make a production, this is also indicated by a flashing 'Request' button. If this area is then touched, it automatically navigates the MCR administration panel to the MCR setup page in question.



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PANEL WORKFLOW

MCR ADMINISTRATION PANEL

The Administration and Setup panel provides the functions to prepare productions offline, schedule productions to MCR control rooms, confirming MCR Control Room requests to manually recall productions, Net chain to MCR Control Room assignments and also to handle the switching of a current production from one MCR Control room to another in an emergency.

ROUTING PAGE

The 'Main' Page of the panel provides complete Router Control via an XY operational concept:



MCR STATUS AND ASSIGNMENT PAGE



Pushing the MCR Status button navigates to the page where MCR Setup functions are handled.



MCR Control Room Selection



Confirm Production Request

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WORKFLOW EXAMPLES

WORKFLOW EXAMPLES

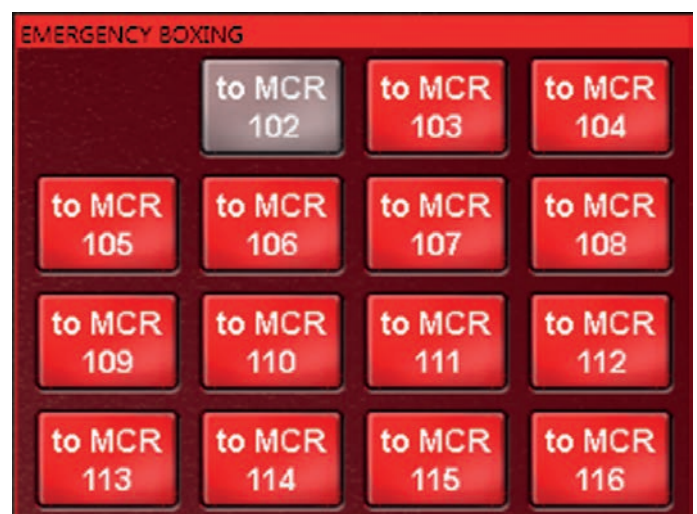
SCHEDULING A PRODUCTION TO AN MCR CONTROL ROOM

Utilizing the internal scheduler of VSM, a pre-prepared and stored production can be scheduled to be automatically loaded into an MCR Control Room. There is some safety that if an MCR Control Room has On-Air Tally, then the recall is not activated.



EMERGENCY SWITCHING OF PRODUCTION FROM ONE MCR CONTROL ROOM TO ANOTHER

Utilizing the 'Boxing' functionality of VSM, a complete production with real time settings (routing, net chain assignments, MV Setup, Intercom Panel Assignments, etc.) can be switched from one MCR Control Room to another in an emergency. Again this is not allowed to an MCR Control Room that is currently on-air.



OFFLINE PRODUCTION PREPARATION AND STORAGE



Pressing the 'MCR Prepare' button navigates to the page for preparing offline virtual productions. This includes Harmonic Channel Port input assignments, Multiviewer setup, and Intercom Panel Setups which are stored and recalled together as a complete production setting.



Once the production settings are defined, the 'Save Preset' button navigates to the preset administration page.



Preset Administration Page

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PRESETS

PRESET MANAGEMENT



PRESET OVERVIEW

Provides an overview of when the preset was last stored and a list of the stored settings of the preset.

Single Header		Index	Storage Object
Preset 01	20/01/2014 09:11:01	1	Connect "QC A" = "BLACK 02"
Preset 02	29/07/2013 11:42:22	2	Connect "QC B" = "BLACK 02"
Preset 03	15/07/2013 00:24:22	3	Connect "VIP A 01" = "BLACK 02"
Preset 04	23/01/2014 10:22:39	4	Connect "VIP A 02" = "BLACK 02"
Preset 05	23/01/2014 10:21:59	5	Connect "VIP A 03" = "BLACK 02"
Preset 06		6	Connect "VIP A 04" = "BLACK 02"
Preset 07	29/07/2013 11:38:56	7	Connect "VIP A 05" = "BLACK 02"
Preset 08		8	Connect "VIP A 06" = "BLACK 02"
Preset 09		9	Connect "VIP A 07" = "BLACK 02"
Preset 10		10	Connect "VIP A 08" = "BLACK 02"
Preset 11		11	Connect "VIP A 09" = "BLACK 02"
Preset 12	23/01/2014 12:02:08	12	Connect "VIP A 10" = "BLACK 02"
Preset 13		13	Connect "VIP A 11" = "BLACK 02"
Preset 14		14	Connect "VIP A 12" = "BLACK 02"
Preset 15		15	Connect "VIP A 13" = "BLACK 02"
Preset 16		16	Connect "VIP A 14" = "BLACK 02"
Preset 17		17	Connect "VIP A 15" = "BLACK 02"
Preset 18		18	Connect "VIP A 16" = "BLACK 02"
Preset 19		19	Connect "VIP B 01" = "BLACK 02"
Preset 20		20	Connect "VIP B 02" = "BLACK 02"
		21	Connect "VIP B 03" = "BLACK 02"
		22	Connect "VIP B 04" = "BLACK 02"
		23	Connect "VIP B 05" = "BLACK 02"
		24	Connect "VIP B 06" = "BLACK 02"
		25	Connect "VIP B 07" = "BLACK 02"
		26	Connect "VIP B 08" = "BLACK 02"
		27	Connect "VIP B 09" = "BLACK 02"

IMMEDIATE ASSIGNMENT OF PRESET TO MCR CONTROL ROOM



It is possible to immediately assign a preset from the list to an MCR Control Room. Again this is not possible if the MCR Control Room is on-air.

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PRODUCTION REQUEST WORKFLOW FROM MCR CONTROL ROOM

PRODUCTION REQUEST WORKFLOW FROM MCR CONTROL ROOM

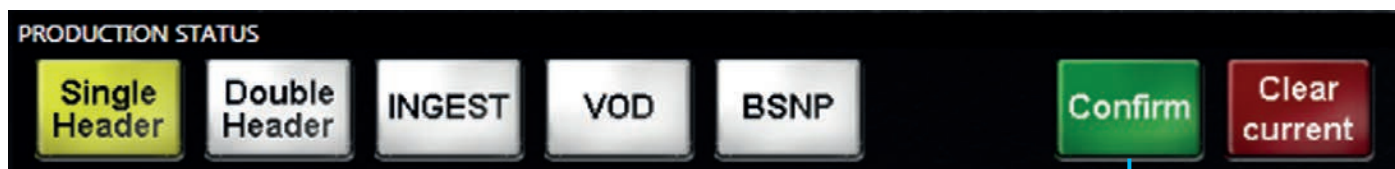
A level of administration is included that allows an MCR operator to request a production type manually for the MCR Control Room directly. This needs confirmation from the MCR Administrator before the production settings are recalled to the Control Room in question. This is handled in the following way.

When a production is not allocated to an MCR Control Room, the room sits in a default state with the MCR Control Room Panel looking is shown to the right.



Request button Flashing

Along the bottom of the screen is a schedule bar that shows the usage of the room in the upcoming hours so the operator has an overview as to how long the room is free before a scheduled production will utilize the room. Using the Production Selection buttons along the top of the screen, the operator may now request one of the production types that they wish to recall. Once selected, the production is not instantly recalled to the room, but the selection button flashes indicating that the request has been sent to the MCR Administrator. In conjunction with this action, the MCR Status panel at the MCR Administrators position will indicate the request by the flashing request button shown below:



Section from MCR Administration and Setup Panel

Confirm Production Request

By pushing this button, the MCR Administrator navigates his MCR Administration panel to the appropriate MCR Status page where he may confirm or deny:

Upon confirmation, the MCR Control Panel will dynamically change to show the appropriate GUI for the production that has been recalled to the Control Room at that time.

Summary

VSM HAS BEEN INSTALLED IN THE FOX NETWORK MCR ENVIRONMENT IN LOS ANGELES TO PROVIDE A UNIQUE OPERATIONAL WORKFLOW THAT COMBINES THE CONTROL AND RECALL OF MULTIPLE DEVICES INTO SIMPLIFIED AND OPTIMIZED OPERATIONAL SOFTWARE PANELS.

The MCR workflow has been changed from a hardware resource managed environment to a production orientated workflow. MCR Control rooms can be freely assigned to any pre-prepared production settings either by simple manual actions or automatically via scheduled events. Many logical safety mechanisms are included in the workflow to avoid on-air errors. In addition, VSMs 'boxing' functionality allows the real time and dynamic moving of productions to any other control room in case of emergency.

VSM acts as the main router control system for the environment as well as handling all Tally requirements. In addition, a primary role of VSM is to provide the Master Control manual override interface for the Harmonic Channel Port 'channel in a box' solution so that any errors in automation can be quickly and simply rectified. All in all, the MCR solution at Fox is an excellent example of how VSM can maximize hardware and physical room resources by 'virtualizing' the environments so that physical signal path chains or production settings are no longer dedicated to physical hardware.

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VSM

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