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Using Livewire+™/AES67 to Build Complete Facilities over IP

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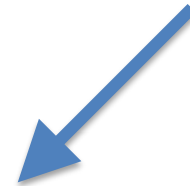
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12 years



2 years



**AES67
Livewire+**



Features

- Audio over IP
 - LiveStreams: low latency, 250usec packets, < 1ms network latency
 - Standard Streams: 4ms packets, 15 - 40ms network latency
- Multicasting, “all audio available everywhere”.
- Discovery & Advertising
- GPIO contact closures
- LWRP & LWCP Routing and control protocols
 - Online metering
 - Remote control
- Easy web GUI management



Features

- Audio over IP
 - Interoperable stream: moderate latency, 1ms packets, < 6ms network latency
 - Lower and higher latency streams are possible, optional
- Multicasting *and* Unicasting
- SIP protocol for connection management

- *No* GPIO contact closures
- *No* Routing and control protocols
- *No* online metering or remote control
- *No* Easy web GUI management



Value

- Industry Standard
- Vendor Interoperation
- Enables convergence of Studio Audio, Broadcast, Telecom and Intercom
- Foundation of future evolution of professional audio systems



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AES67 Livewire+

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 - **AES67 industry standard streams.**
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RAVENNA
Dante



The Future





WYOMING PUBLIC MEDIA



WYOMING PUBLIC RADIO

Case Study

WYOMING PUBLIC MEDIA

About Wyoming Public Media

Studios

- 1 primary control room
- 4 “production” rooms
- Multiple ISDN and IP codecs
- 24 channel satellite downlink
- KU satellite uplink
- Microwave STL

Broadcast Network

- 3 audio services
- 22 full service stations
- 8 translators
- Web streams

Previous Infrastructure

- 15+ years old
- Completely analog equipment
- Built for one program stream
- Documentation incomplete
- Changes difficult
- Increasing downtime and maintenance costs (failing console switches interrupting audio)
- Analog audio router was failing and becoming unreliable



Before:

WPR Main Control Room—PR&E RMX-20

Failing switches would interrupt audio on a regular basis



Before:

WPR Production Room "B"

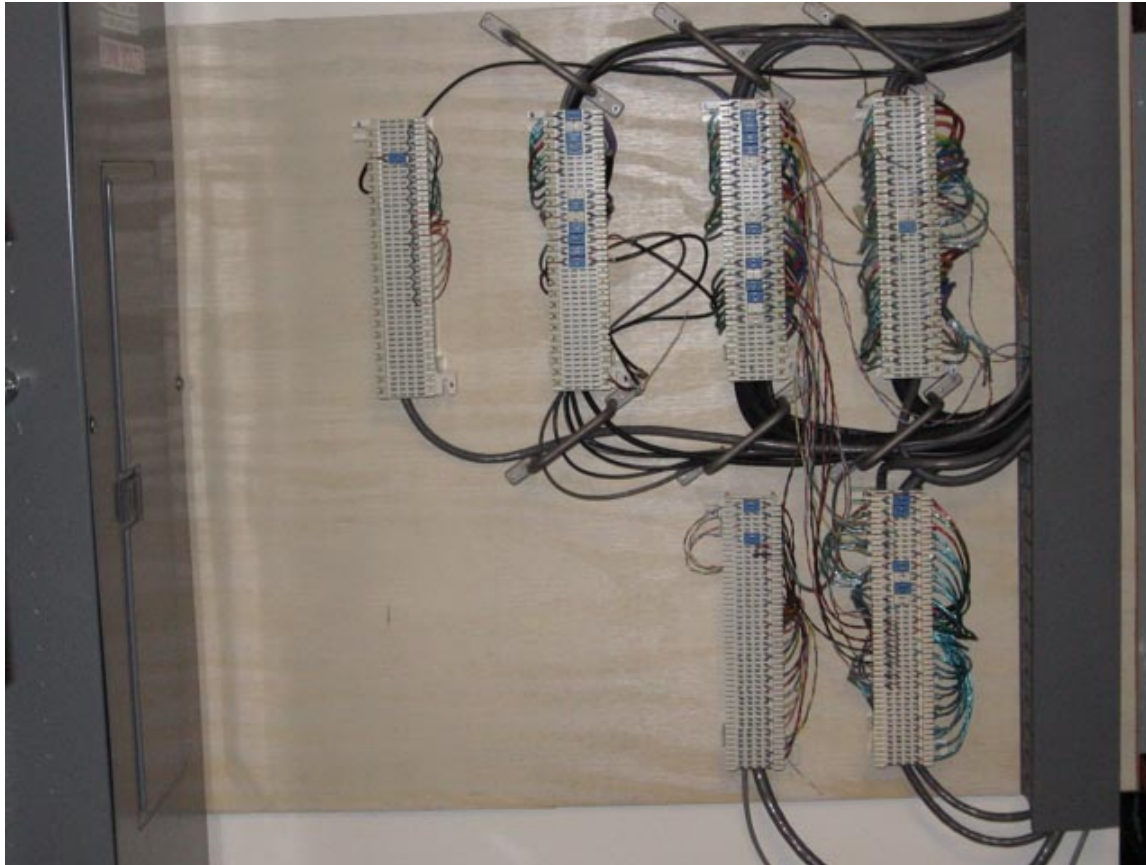
Rockwell-Collins IC-10a—No internal mix minus buss!



Before:

Leitch Via32 analog crosspoint router

Leitch analog distribution amplifier chassis



Before:

One section of punch blocks for audio distribution

Various other punch block walls scattered throughout the facility

New infrastructure

- Initially invested in a single Axia control surface and associated hardware for main control room—Cost was \$15k
- Lower cost control surface option introduced for \$6k—Perfect for smaller production rooms
- “Modular” approach—System grew over several years to spread the project cost out
- Scalable to support additional program streams and sources
- Easy to maintain and configure, lower total cost of ownership



After:

Axia Element console in WPR main control room



After:

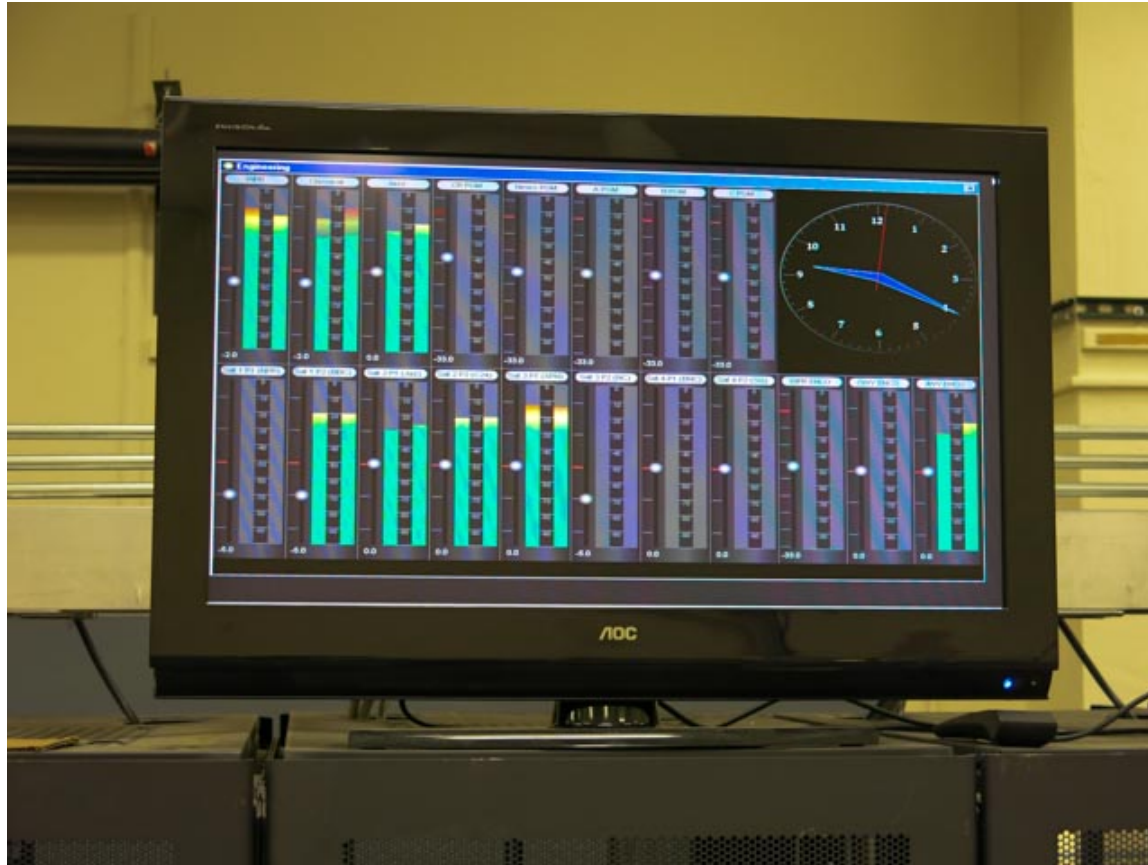
WPR Production Room A with Axia "Radius" console



After:

New “Tech Center”

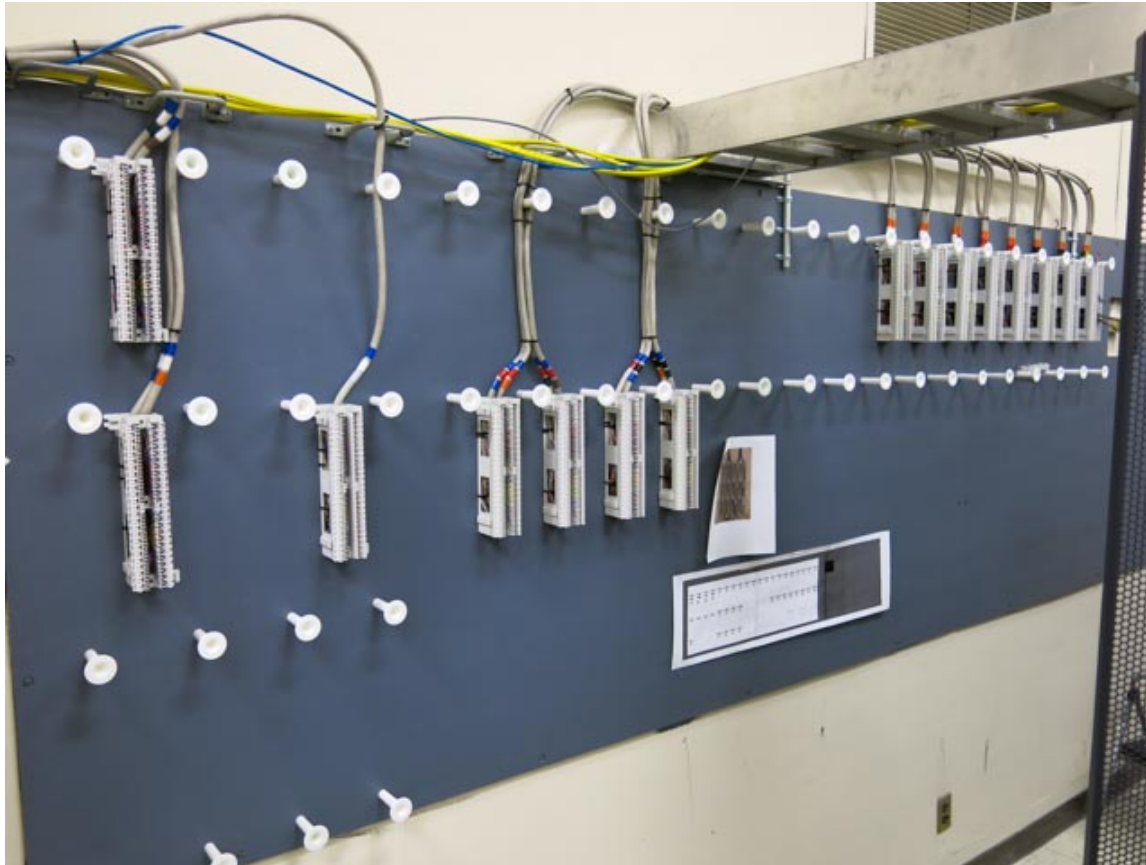
Equipment transition in progress



After:

Audio path metering on the Axia system

Allows for quick troubleshooting of issues at key points



After:

New punch block installation in progress

Cross connects not completed yet



After:

Satellite receivers integrate directly with system

“Nodes” allow other audio sources to be integrated

Benefits

- Any source anywhere (can now do any show or any operational function in any studio)
- Distributed system—No “central” audio router, can more easily be designed to minimize single points of failure
- Easier to configure and manage, Remote access for maintenance
- No more mix-minus issues (easier remote broadcasts)
- Still able to integrate other manufacturer’s equipment into the system (Codecs, Sat Receivers, etc.)
- Less regular maintenance required (no more failing mechanical switches)

Growing Pains

- Network switch configuration issues...Using same network switches for multiple purposes (Can be done—WITH CAUTION)
- Certain 3rd party hardware claimed to be natively compatible with system but suffered issues
- Transitioning from old to new in an existing facility while still keeping everything on the air..."Like changing the oil in a moving car!"

Summary

- Livewire+/AES67 based infrastructure offers many operational advantages for facilities of all sizes
- Initial equipment costs can be spread out over several years as system is expanded, migration path from existing infrastructure
- Lower overall total cost of ownership, particularly when upgrading an older analog facility
- Various equipment options available, slightly different approaches—Talk with the manufacturer to discuss your needs and budget.

Questions?

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