New Requirements in a Multi-Channel World
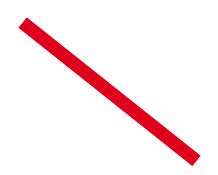
In this paper, you'll learn...

How to cope with the growing demand for increased channel count and multi-format distribution whilst controlling capital outlay and operating expense.

- **Why channel branding graphics and in-program promotions are key to improving channel identity and retention figures.**

- **How collapsing the channel equipment chain into a smaller number of devices leads to cost and power savings.**

Today's TV audience demands a broader variety of channels and a sophisticated viewing experience with features such as high definition video and multi-channel audio. In response, broadcasters of all sizes have taken advantage of the digital tier to emerge as multi-channel providers, delivering content to multiple audiences, in different formats. Even small market stations have become multi-channel operators, supporting SD, HD and 24/7 informational channels simultaneously. Now the scenario is becoming even more complex as broadcasters begin to deliver their content to new screens such as smartphones, tablets and PCs.

To successfully offer more channels, broadcasters must find ways to control the operating costs of each individual channel. This requires more affordable and more efficient equipment. The promises of highly automated, streamlined workflows that can help create sophisticated presentations with minimal equipment and staff is enticing, but may be difficult to realize with traditional technical solutions.

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The Rise of Branding

In the fight for revenue in a highly competitive market, it is critical to effectively brand each channel in order to foster a rapport with the viewing audience and, in turn, to entice advertisers with targeted opportunities for reaching clearly defined demographics. After arranging a unique lineup of content, graphics are the fundamental tool available to broadcasters who need to differentiate channels and present a consistent brand image across all their delivery platforms.

In response to these requirements, broadcasters look to retool Master Control to suit their evolving multi-channel operations. Rather than add new hardware and cost, some companies fall back on the most basic approach to delivering a channel -- using only a router and video server to simply playout the channel without the addition of appealing transitions, logos, etc.

That path contradicts the imperative for a polished presentation that differentiates channels, creates a brand identity, and most importantly, attracts and retains an audience. Under increasing commercial pressure, broadcasters have become reluctant to interrupt programming or paid advertising streams to run pre-packaged promos. As the use of interstitial time for self-promotion has been reduced, broadcasters have had to become increasingly creative in their use of in-program promotion.

Once upon a time, there used to be people working in a suite making 30-second promos. Preparation work used to be done ahead of time and playout was a simpler operation. Playout did not need graphics capability because it was handed completed material. That staff and process does not exist anymore, however, the capability to effectively brand channels is more important than ever.

Today branding has become part of the program stream and, therefore, it needs to be handled live on top of the program stream. Broadcasters have to create their graphics in real-time to be added over the top of program material at playout. As branding increases in importance, the need has emerged for full functionality branding graphics systems that function downstream of the master control switcher. The need for graphics sophistication in the playout chain has, in turn, raised interest in automation for branding and promotion.

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Today's typical master control switcher offers limited graphics capability. This makes sense, as historically master control switchers had no graphics capability other than an external key. Operators would mix between A/B signals and overlay a logo on top. That logo, in turn, generally came from an external character generator. Later, switchers were enhanced with the ability to store simple logos and play them internally within the switcher itself. This reduced the need for external CGs.

But in recent years the desire for an outboard graphics box downstream of master control has come back as the need for more sophisticated output has emerged.

A traditional approach employs master control switchers plus additional external devices to deliver branding graphics. While effective, the addition of a graphics platform downstream of master control necessarily adds complexity to the overall workflow, requiring the operators to manage additional pieces of equipment and learn additional interfaces in order to use the systems efficiently. The use of two systems, one for graphics and one for switching, also means more signal routing, more power consumption, and additional operating cost.

Sophisticated Automation for Simplified Operations

As broadcasters demand more efficient processes, they seek to leverage flexible, automatable technologies to meet their changing business, commercial and program-related needs. In the example of branding, it would be advantageous to eliminate the needs for an upstream character generator and a downstream logo inserter. At the same time, it would be beneficial to bring those functions under more direct, uniform, logical control.

Broadcasters can now look to integrated, condensed systems designed to maintain functionality and achieve the required flexibility in terms of content and output destinations, without sacrificing any of the graphics power they have become accustomed to having in high-end external devices.

As more automation comes to master control, broadcasters have looked for systems to work together to streamline the delivery of their signal. Integrated systems make it possible for an automation system to control both graphics and switching in a unified way through a single interface, helping to reduce broadcasters' overall equipment costs significantly. The ability to have master control and graphics controlled from one automation interface connection provides additional cost savings.

PLAYOUT, CONTRIBUTION & DISTRIBUTION

In most master control environments, one or two operators are busy 24 hours per day to guarantee the uninterrupted operation of channels. Switching itself has been an area of extensive automation technology development yielding advanced devices that automate routing changes and require little to no operator intervention. With the exception of live events, most master control functionality is driven by automation. Instead, operators are faced with the often daunting task of monitoring the quality and accuracy of each channel which can number from one to hundreds, ensuring that the transmission is in line with regulations, overseeing the operations response to equipment problems, and preparing content for future distribution.

From an operations point of view, operators in a multi-channel master control environment cannot be expected to have the time to complete tasks manually. In an environment where one person could be managing a dozen channels or more, controls must be both intuitive and appropriate to the specific tasks in hand. Automation is not a "nice thing to have," but rather a key ingredient for success.

Graphics are perceived as technically challenging, requiring specialized expertise to achieve the dynamic, multi-dimensional looks, audio and integrated information functions that typify today's channel branding. Attempting to bring the creation of branding graphics into the master control environment would, therefore, understandably be met with skepticism.

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Having a robust graphics platform at master control makes it easier to reuse graphics produced in other functional areas of the media company. A graphic designed once can be used in news, traffic, master control, etc.

There is the potential to simplify operations by having triggers and transitions on master control easily synced with playout of snipes or automated graphics. By building that capability into the master control switcher, controls for branding graphics can be presented inline and intuitively, with other master control functions. This means that the creation of graphics can be simplified, minimizing the burden on operators while adding tremendous value to channels.

Controlling Multi-Format Content Delivery

To this point, we have looked at delivery of traditional TV channels however, one of the most daunting challenges facing broadcasters today is also one that is rich in untapped opportunity--the rise in demand for multi-format content distribution. What began more than a decade ago with the emergence of high definition formatted material for TVs has been followed more recently by need for content formatted for other platforms—PCs and laptops, smartphones, tablets, connected TVs, and game consoles.

Many broadcasters, particularly in small and mid-sized markets, are still coming to grips with the investment of their initial push to HD. Even today, many of them simply feed their network's HD programming directly to their transmitter.

Larger markets, content providers and other distributors must not only wrestle with the added costs of serving these new platforms, but also the complexity of building and managing them. While most at this level have HD master control infrastructure, the prospect of further expanding master control to deliver output to new platforms will cause many to remember their recent HD trials.

Consolidating functionality in integrated systems offers the broadcaster a streamlined signal chain for these new channels, marrying much if not all of the functionality required by these secondary channels into a single system. This approach can dramatically reduce the complexity, management costs, equipment requirements and other hindrances to successful multi-format distribution.

Graphics are critical to consumer perception of a channel's HD prowess—for example, it is easily apparent when a station is laying their SD-formatted graphics onto an HD feed. By introducing graphics capability closer to the point of transmission and including automated, template-based functionality into the environment, it is possible to readily create graphics that are appropriate for the intended viewing platform. Well-designed systems allow each format to have its own template with common shared fields in the templates. This means that after the initial outlay to design the templates and install the playout systems, there is no incremental operating cost for the extra formats – channels can be slaved and share common data feeds.

The High Price of Power

Consolidating functionality and reducing the number of individual systems that need to be "lit up" to deliver a channel provides significant practical benefits--less equipment means less, power, less cooling, and a reduced equipment footprint to be re-utilized.

To achieve this, there has been a move by some to adopt products based on "off-the-shelf" IT hardware in the belief that modern PCs do not use as much power. There is some truth behind those notions, as more efficient CPUs have lowered PC power consumption in general terms.

The catch lies in the demanding processing requirements of HD video and graphics. These require the use of powerful CPUs and GPUs, which are often far from low power. Broadcast specific graphics cards will always be required to provide HDSDI I/O which moves the platform further from "off the shelf hardware" commonly used in a general business IT environment.

Today's equipment designers typically have a choice when it comes to implementing a particular function – and that choice can radically affect power consumption. Code can run on a general-purpose processor such as a CPU or GPU. It can also be implemented in "virtual hardware" within programmable devices such as FPGAs. A third choice is to run on fully custom devices. Typically the flexibility is greatest with the general-purpose processor, but so is the power consumption.

For example, encoding two streams of HD video into long GOP MPEG can use a large part of the capacity of a PC and consume as much as 150 Watts. Using purpose-designed hardware from a well-known manufacturer for the same task allows it to be carried out consuming only 6 watts (and leaves the CPU and GPU free to carry out other graphics tasks without conflict).

Reducing the number of systems deployed also helps to reduce the footprint of the operation and control the amount of cooling required.

The Hidden Costs of "off-the-shelf"

Power is not the only place where IT-style equipment raises questions. Broadcasters' prime motivations are to save cost and make support simpler by relying on more "mainstream" IT resources where economy of scale and enterprise rather than specialist pricing dictates support.

Broadcasters look to strike a balance between implementing functionality in specialized hardware as opposed to general-purpose software running on a CPU/GPU. Hidden costs are a factor in any engineering project and ongoing software support costs due to unsupported functional requirements are a consideration.

Many of today's converged systems utilize standard PCs with video cards which purport to do most anything a broadcaster will require. Although it is perfectly possible to carry out most functions of a high end integrated channel playout device on the powerful CPUs/GPUs now available it may well not be possible to do them all at the same time. It is far from unusual to install a "channel in a box" and then to add a downstream system to carry out high end branding graphics that cannot be performed on the integrated system.

But even accepting the limitation that certain functions may be beyond the capability of software running on a standard PC, this approach can be more rather than less expensive in terms of power consumption and heat management.

New Solutions for New Goals

Broadcasters have been hampered in their ability to take full advantage of potential digital channels. In some cases, legacy equipment and reduced staffing are not up to the additional workload. For others, the cost of a separate switcher, character generator, logo generator and clip server for each channel is too high. For many, the initial equipment costs and manpower requirements associated with traditional workflows are prohibitive. A difficult economic climate has further exacerbated the situation.

Pixel Power's BrandMaster provides a solution, integrating a complete master control switcher with broadcast graphics for channel branding. Used at the point of transmission it reduces the complexity of the signal path and streamlines the channel branding process. BrandMaster tightly integrates with deployed routers and other infrastructure systems. Significantly, BrandMaster also works with all major automation systems in use today, meaning its benefits are available without any changes to a channel's underlying automation infrastructure. By integrating multiple functions in a single device, BrandMaster reduces the amount of equipment, power consumption and investment required to deliver single or multi-channel services.

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BrandMaster supports the full range of basic branding requirements for both standard and high definition channels including multi-layer static and animated logos, clocks, text crawls, multiple tickers, DVE moves such as squeezeback, automated schedules, EAS and many other graphics elements. Full audio handling is included for multi-channel sound with shuffling and voiceover capabilities.

Available dual HD video clip players with video and key streams, as well as 2D DVE can deliver animated backgrounds, snipes, bumpers or complete promo playback. Real-time 3D and multi-channel 3D DVE capabilities support the needs of premium channels that require sophisticated branding graphics. Dynamic text and live video from internal and/or external sources can be mapped onto sophisticated 3D models with keyframe animation

Consolidated systems like the Pixel Power BrandMaster enable a broadcaster to more effectively build a channel by addressing requirements for:

- Lower power requirements.

- Less demand for space.

- More reliability.

- Greater ease of use, flexibility and scalability.

The financial incentives at play are significant. Today it is possible to get an integrated system like BrandMaster with both master control and branding graphics capability for the same or less cost than a traditional master control switcher. Those initial costs, coupled with ongoing operational benefits make a compelling case for the new breed of system.

Scalability

Recent years have seen a move to running larger numbers of channels from fewer control locations. Streamlined systems make it possible to easily and cost-effectively scale to higher numbers of channels. For example:

Prime TV Australia

Prime Television Network in Australia makes extensive use of consolidated systems in its master control facility. Prime selected to deploy an integrated master control/branding graphics system for each sub-channel. In the past, Prime used a master control switcher for every channel. They then sent the channel as a separate stream for different sub-regions, which would each then have their own graphics system. This configuration proved to be inflexible, leaving Prime with only one master control.

The network considered deploying a traditional master control switcher for each channel, but the cost of these systems with graphics was deemed too high. Instead, Prime opted for a Pixel Power BrandMaster for each of its channels. This has given the network flexibility in its operations. It still has the option of delivering an identical stream to every sub-region as needed, but now it can also split off any region any time to support special programming.

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