



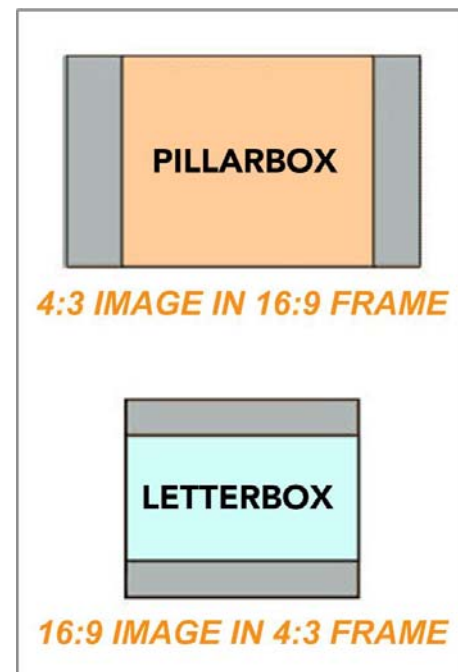
Managing Aspect Ratio through Production and Distribution

The transition to digital TV broadcasting is complicated by the fact that two different aspect ratios, 4:3 and 16:9, are currently in use. A session at the upcoming NAB Broadcast Engineering Conference (BEC, April 12-17, 2008, Las Vegas, NV – see below for additional information) entitled “Video Content Creation and Manipulation” includes a paper by Larry Thaler, Vice President of Distribution Technology, NBC Universal Inc. on “From Camera to the Home: Managing Aspect Ratio Through the Production and Distribution Process,” which describes how NBC Universal is meeting this challenge, and which is excerpted here.

INTRODUCTION – As the percentage of high definition televisions in the home continues to grow, networks face increasing pressure to tailor their programming for both the SD and HD audiences. High on this list of challenges is aspect ratio. Programming will continue to originate and will be distributed in both SD and HD formats for years to come. Broadcasters must have a strategy that maximizes production and distribution efficiencies while maintaining the presentation quality for each home viewer, even though their screens may differ greatly. This paper will describe steps that NBC Universal has taken to prepare for this transition and makes recommendations that stations can use as the transition approaches. It highlights techniques available to every broadcaster and production company that can ensure all programming is optimized for both the SD and HD viewer.

THE CHALLENGE – When formatting an HD program for the SD audience, the choices are normally center-cut (and produced center-cut safe) or letterboxed (giving up roughly 1/3 of the SD screen – see figure at right). Alternatively, when formatting an SD program for the HD audience, the material is normally pillar-boxed (which can sometimes result in home viewers stretching or zooming the content to fill the screen). There are other options such as shooting material in a compromise 14:9; however building a library in 14:9 may limit its value after the digital transition. Alternatively, material may also be produced and edited twice (in each HD and SD), but production costs make that approach prohibitive.

ACTIVE FORMAT DESCRIPTION – NBC needed a way to permit a show producer to identify the format of the content upstream, and provide instructions to the down-converter further downstream. The answer came in the form of Active Format Description (AFD - see the [June 4, 2007 issue](#) of *TV TechCheck* for additional information about AFD). NBC proposed to our vendors that we carry an AFD flag in the Vertical Ancillary Data Space (VANC) of our HD video signals in our upstream production equipment. Downstream, downconverters would interpret this flag and automatically switch between 16:9 and 4:3 segments in real-time. This would produce an optimal viewing experience to both SD and HD viewers with one set of production facilities. AFD was inserted in the control room’s embedder, which is used to combine the audio and video signals after the production switcher and audio console. NBC standardized on two main flags (“AFD Full 16:9” and “AFD 16:9 with 4:3 center”) to identify material that should be letterboxed or center cut on down conversion.



All of NBC’s programming has been using AFD technology to produce the proper down-converted aspect ratio since the fall season in 2006. Our audience has been enjoying shows such as Heroes, Scrubs, SNL, Late Night, Today and Nightly News with Brian Williams with the SD version properly formatted by the production requirements.

SKYPATH HD - NBC's new "Skypath HD" system will be the next step in the natural evolution to a fully high definition network. Once Skypath HD is deployed, NBC programming will be distributed to its broadcast affiliates exclusively in HD, simplifying the distribution process. What makes this all possible is NBC's aforementioned HD/SD infrastructure that has seamlessly incorporated AFD. A local downconverter will generate the main NBC SD feed for its local stations – presented at the proper aspect ratio under dynamic AFD control. With almost 3 years of experience, we have faith that these devices can reliably handle all aspects of the down-conversion accurately. Once NBC's signal is fed primarily in HD, the local stations' signal path will also evolve as shown in the block diagrams to the right.

This paper will be presented on Tuesday, April 15, 2008 starting at 3 p.m. in room S226/227 of the Las Vegas Convention Center. It will also be included in its entirety in the *2008 NAB BEC Proceedings*, on sale at the 2008 NAB Show. For additional conference information visit the NAB Show Web page at www.nabshow.com.

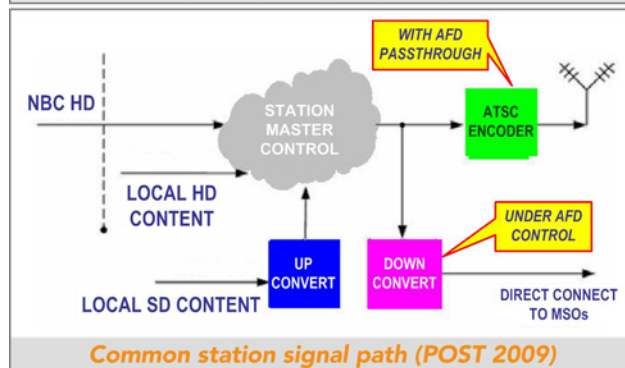
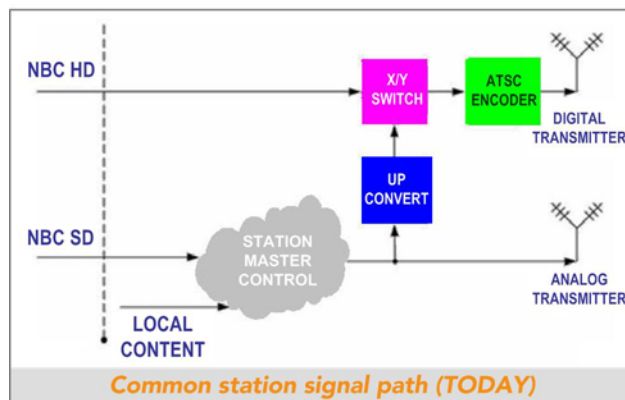
2008 NAB Broadcast Engineering Conference Summary of Presentations

Check out the [papers](#) that will be presented at the 2008 NAB Broadcast Engineering Conference in Las Vegas, April 12 -17, 2008.

Mobile TV: Opportunity at 100 MPH!

Monday, April 14 • 7:30 a.m. - 8:30 a.m.
Las Vegas Hilton Ballroom A

The Open Mobile Video Coalition (OMVC) invites engineers from television, telcos, cable and OEMs to learn more about breakthroughs and milestones in engineering, consumer interest and testing, as well as new revenue opportunities in the fast approaching locally broadcast Mobile TV world. Join them for [breakfast](#) on Monday, April 14 in Ballroom A.



Welcome to the place where creativity originates,

