

## AFD AND BAR DATA IMPLEMENTATION

### SMPTE, ATSC and CEA Standards

Two standards, SMPTE 2016-1 *Format for Active Format Description and Bar Data* and SMPTE 2016-3 *Vertical Ancillary Data Mapping of Active Format Description and Bar Data*, were published on May 17, 2007. These two documents complement the standards for carriage of Active Format Description (AFD) and Bar Data metadata as now defined for DTV transmission in ATSC standard A/53 Part 4 and the recommended practice for use by consumer receivers in CEA-CEB-16. This completes the chain from production, through encoding and emission to the receiver.

As reported in the November 6, 2006 edition of *TV TechCheck*, AFD and Bar Data carried with a DTV signal will enable DTV receivers and displays to intelligently adjust the displayed image to reduce or eliminate the black bars that currently occur when program source and displayed aspect ratio do not match. Consumer electronics manufacturers have not yet announced DTV products that automatically adjust displays based on AFD and Bar Data, but it is very likely they are in development.

### FCC Request for Comments

In 116 of the *Third DTV Periodic Review* released in an NPRM on May 18 (see last week's *TV TechCheck*), the FCC discusses implementation of AFD, saying:

"In the *Second DTV Periodic Report and Order*, the Commission declined to mandate that broadcasters use the AFD when the active video portion picture does not completely fill the coded picture. The Commission stated that the revisions in the new standard were developed through careful consideration and deliberation within the technical committees of ATSC and thus reflected a consensus agreement based on the input of parties from various segments of the industry. As a result, broadcasters were given the option to use AFD, but if a station included AFD data it had to follow the ATSC standard. The Commission noted, however, that as more consumers acquired widescreen aspect ratio sets, the problem of "postage stamp video" would become more prevalent if not addressed by broadcasters. At the time, the Commission believed that broadcasters would want to make their programming attractive to viewers as they begin to adopt DTV. A coordinated effort on clarifying AFD and bar data standards between ATSC, CEA and the Society of Motion Picture and Television Engineers ("SMPTE") resulted in a CEA recommended practice (CEA-CEB16) titled "Active Format Description (AFD) & Bar Data Recommended Practice," and a proposed SMPTE 2016-1 standard for television – *Format for Active Format Description and Bar Data*. These efforts were designed to encourage the use of AFD by broadcasters. We thus seek comment on whether these voluntary, industry driven efforts are sufficient, or if, instead, we should require broadcasters to provide AFD and bar data. If we do impose such a requirement, should broadcasters be required to provide AFD data for all programming broadcast, regardless of its source? Should such a requirement extend to live and other events where a combination of SD and HD equipment may be used)? Assuming that we did require programming (e.g., sports the inclusion of AFD, what effect would the imposition of such a requirement have on small broadcasters? We seek comment on these issues."

## Station Systems

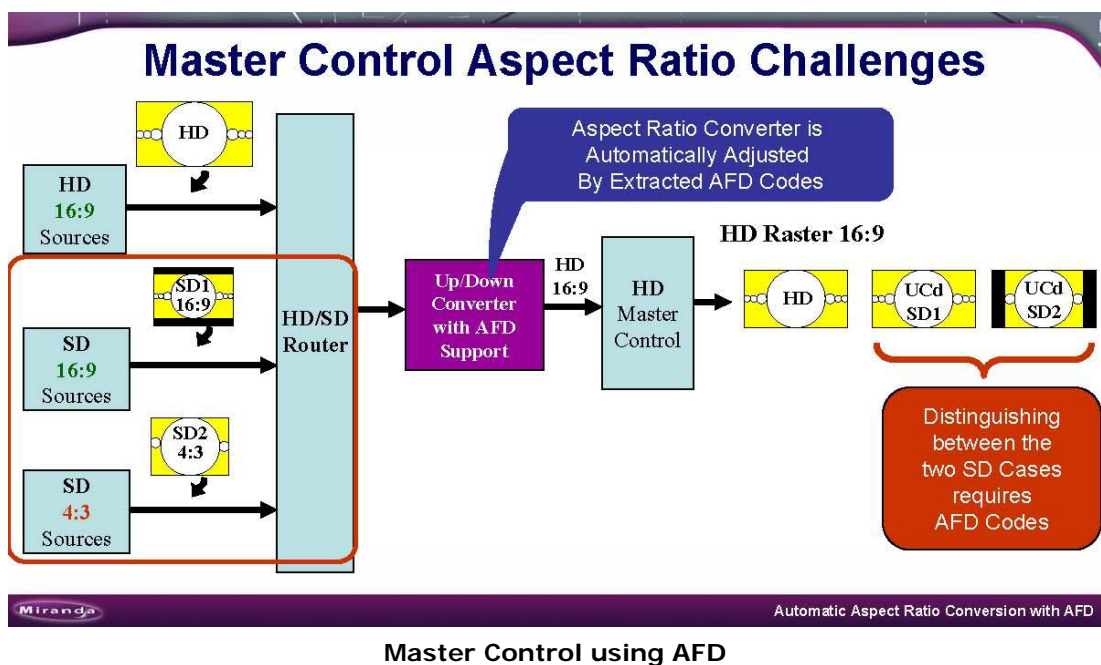
Several ATSC encoder manufacturers are now planning upgrades to add the capability to read the AFD and Bar Data from the VANC data space of incoming video and automatically insert it into the video user bits of the transmitted bitstream. Product releases are expected later this year.

Video format conversion products from at least three equipment manufacturers (Miranda, Evertz Microsystems and Harris) are already available to generate the new metadata and also process video based on incoming codes. In fact, the first implementation of the new SMPTE standards was for format conversion signaling and control in the professional domain. As an example, more than a year ago, Miranda Technologies provided NBC Universal with over 1000 XVP-811i up/down/cross converters to handle HD/SD signal processing for its control rooms, production facilities, routing infrastructures, and the transmission area at the NBC Rockefeller Center in New York. In a Miranda press release, Larry Thaler at NBC Universal is quoted as saying:

"Our operators no longer need to worry about how to convert material for their specific activities. If they're working in HD, SD signals will automatically be upconverted and translated to the required format. Likewise, if they're working in SD, the HD signals will be downconverted. In either case, the only action our operators need to perform is to dial the source on their router panel."

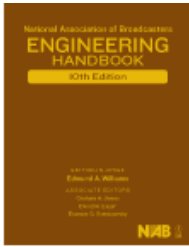
A full version of the press release is at: <http://www.vertigoxmedia.com/press.php?i=157&l=1>.

A simplified diagram of the system in master control is shown in the figure, provided by Miranda.



The Miranda XVP-811i accepts HD or SD at its input, and provides simultaneous HD and SD outputs. The interface automatically detects the input format and performs the up-, down- and cross-conversion required to maintain a consistent output format on the HD and SD outputs. The specification for this unit was expanded in collaboration with NBC to include automatic, frame-accurate aspect ratio conversion, controlled by embedded signals using AFD in accordance with the SMPTE 2016 standard.

## Completely Revised NAB Engineering Handbook Available Now



**The Definitive Resource  
for Engineers**

The 10th Edition of the *NAB Engineering Handbook* is now available. The *handbook* is the definitive guide to broadcast engineering for radio and television, providing detailed information on virtually every aspect of the broadcast chain. This most recent updated text is an objective, reference work of more than 100 articles organized in 10 major sections, reflecting revolutionary changes in broadcast engineering, media, systems, and components. You can order online at the [NAB Store](#) or call 1-800-368-5644.