



**LPB Communications, Inc.**  
**960 Brook Road, Unit 5**  
**Conshohocken, PA 19428**  
**610-825-4100 phone**  
**610-825-4047 fax**

**Digital Audio and Video Resources on the Internet:**

WHERE	WHO	WHAT
<a href="http://www.atsc.org">www.atsc.org</a>	<b>Advanced Television Standards Committee</b>	ATSC Digital TV Standards include digital high definition television (HDTV), standard definition television (SDTV), data broadcasting, multichannel surround-sound audio, and satellite direct-to-home broadcasting.
<a href="http://www.nab.org/SciTech/nrsc.asp">http://www.nab.org/SciTech/nrsc.asp</a>	<b>National Radio Standards Committee</b>	The NRSC is jointly sponsored by the National Association of Broadcasters and the Consumer Electronics Association. Its purpose is to study and make recommendations for technical standards that relate to radio broadcasting and the reception of radio broadcast signals. The NRSC is a vehicle by which broadcasters and receiver manufacturers can work together towards solutions to common problems in radio broadcast systems.
<a href="http://www.aes.org">www.aes.org</a>	<b>Audio Engineering Society</b>	The Audio Engineering Society, is the only professional society devoted exclusively to audio technology. Its membership of leading engineers, scientists and other authorities has increased dramatically throughout the world, greatly boosting the society's stature and that of its members in a truly symbiotic relationship.
<a href="http://www.smpte.org">www.smpte.org</a>	<b>Society of Motion Picture &amp; Television Engineers</b>	SMPTE was founded in 1916 to advance theory and development in the motion imaging field. Today, SMPTE publishes ANSI-approved Standards, Recommended Practices, and Engineering Guidelines, along with the SMPTE Journal and its peer-reviewed technical papers. SMPTE holds conferences and local Section meetings to bring people and ideas together, allowing for useful interaction and information exchange.
<a href="http://www.dvb.org">www.dvb.org</a>	<b>Digital Video Broadcast Organization</b>	The DVB (Digital Video Broadcasting Project) is an industry-led consortium of over 300 broadcasters, manufacturers, network operators, software developers, regulatory bodies and others in over 35 countries committed to designing global standards for the delivery of digital television and data services.
<a href="http://www.ce.org">www.ce.org</a>	<b>Consumer Electronics Association</b>	The CEA Technology & Standards mission is to grow the consumer electronics industry through technical support. We are a vital connection between consumers, retailers and manufacturers of consumer electronics. The CEA Technology & Standards provides project management and a forum for industry to develop standards and technical publications.
<a href="http://www.itu.org">www.itu.org</a>	<b>International Telecommunications Union</b>	The ITU, headquartered in Geneva, Switzerland is an international organization within the United Nations System where governments and the private sector coordinate global telecom networks and services.

## What are the formats for the new Digital TV?

Reprinted from <http://www-personal.engin.umich.edu/~balazer/dtv/#formats>

The ATSC digital TV standard includes several picture formats. All ATSC-compliant displays can show every one of these formats, no matter which the broadcaster chooses to transmit. The display will convert as necessary.

- 640 x 480 pixels, 4:3, at 24, 30, or 60 frames per second (fps) progressive, or 30 fps interlaced
- 704 x 480 pixels, 16:9 or 4:3, at 24, 30, or 60 fps progressive, or 30 fps interlaced
- 1280 x 720 pixels, 16:9, at 24, 30, or 60 fps progressive
- 1920 x 1080 pixels, 16:9, at 24 or 30 fps progressive, or 30 fps interlaced

The formats are usually referred to by the number of scan lines followed by an *i* or *p* to indicate the scanning mode, e.g. 480p, 480i, 720p, 1080i. The 480-line formats are considered SD, and the other formats are considered HD. The highest spatial resolution mode is 1080p. Film-source programming such as movies and primetime series are almost always 24 fps. Sports and other programming with lots of movement are best shown at 60 fps.

ABC and FOX have chosen 720p as their HD broadcast format. CBS, NBC, HBO, and Showtime have chosen 1080i as their HD broadcast format. (Although 24 fps film-source programming could be broadcast in 1080/24p, or at the very least in 1080i with progressively encoded frames, as HBO does)

You cannot judge the resolution of a display device by what scanning modes it supports. E.g., a 1080i display is not necessarily any higher resolution than a 720p display. In fact, most HDTVs today have a resolution of about 1 million pixels, i.e., about the resolution of 720p.

Both HD modes contain a lot of picture information. You need a very large TV to appreciate this level of detail. At normal viewing distances on a 30" or smaller HDTV, most people cannot tell the difference between HD and progressive SD.

## What standards are there for digital audio? What is AES/EBU? What is S/P-DIF?

Information reprinted from <http://www.hr/josip/DSP/FAQ/26.html>

The "AES/EBU" (Audio Engineering Society / European Broadcast Union) digital audio standard is probably the most popular digital audio standard today. Most consumer and professional digital audio devices (CD players, DAT decks, etc.) that feature digital audio I/O support AES/EBU.

AES/EBU is a bit-serial communications protocol for transmitting digital audio data through a single transmission line. It provides two channels of audio data (up to 24 bits per sample), a method for communication control and status information ("channel status bits"), and some error detection capabilities. Clocking information (i.e., sample rate) is derived from the AES/EBU bit stream, and is thus controlled by the transmitter. The standard mandates use of 32 kHz, 44.1 kHz, or 48 kHz sample rates, but some interfaces can be made to work at other sample rates.

AES/EBU provides both "professional" and "consumer" modes. The big difference is in the format of the channel status bits mentioned above. The professional mode bits include alphanumeric channel origin and destination data, time of day codes, sample number codes, word length, and other goodies. The consumer mode bits have much less information, but do include information on copy protection (naturally). Additionally, the standard provides for "user data", which is a bit stream containing user-defined (i.e., manufacturer-defined) data. According to Tim Channon, "CD user data is almost req CD subcode; DAT is StartID and SkipID. In professional mode, there is an SDLC protocol or, if DAT, it may be the same as consumer mode."

The physical connection media are commonly used with AES/EBU: balanced (differential), using two wires and shield in three-wire microphone cable with XLR connectors; unbalanced (single-ended), using audio coax cable with RCA jacks; and optical (via fiber optics).

"S/P-DIF" (Sony/Philips Digital Interface Format) typically refers to AES/EBU operated in consumer mode over unbalanced RCA cable. Note that S/P-DIF and AES/EBU mean different things depending on how much of a purist you are...  
[The above from Phil Lapsley, phil@ohm.Berkeley.EDU, and Tim Channon, tchannon@black.demon.co.uk]

## What is happening with Digital Radio in the US?

An EXCELLENT article regarding In-Band-On-Channel AM/FM Broadcasting recently appeared in Radio World Magazine. The article may be found at <http://www.rwonline.com/reference-room/skippizzi-bigpict/FMX.shtml> and is HIGHLY recommended for those that want to know more about the pending selection of a digital standard for Radio.