

## HDMI – One Cable To Replace Them All?

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*Writer Bryan Daley has written a superb in-depth but not high-brow article on how and why HDMI cables can benefit A/V consumers. We think you will enjoy it.*

Staring at the back of a modern home cinema Receiver or A/V preamp can be a scary thing for inexperienced A/V enthusiasts. The number of connections on a higher-end piece can be overwhelming, with multiple video input and output types ranging from composite to component to S-Video and DVI/HDMI. The audio options can be just as daunting with toslink, AES-EBU, composite and digital RCA audio connections all filling up a great deal of real estate on the Receiver or AV preamp. Assuming a user can figure out how to best configure the system and put the right cables in the right connections on the back of the gear, the process is only half over at this point.

Programming each input of the Receiver/Preamp is a whole task in itself and requires some planning and foresight to be sure that each video and audio input is properly assigned. Since all Receivers and Preamps differ in configuration, getting the right audio input and video input lined up properly can sometimes prove difficult.

When all the cables are plugged in and the programming has been completed, even some of the most well thought out cabling set-ups often result in a large rat's nest of cables cluttering the back of the equipment rack. Surely anyone who has gone through the task of installing a system has said to himself

or herself at some point, **“Can’t they just make one cable that replaces all of these?”** Unless you have been living under a rock and don’t know what HDTV is, chances are you have heard of HDMI, and it just might be the answer to cleaning up a considerable number of these cables and improving the performance of your system.



HDMI, which stands for High Definition Multimedia Interface, is the only interface in consumer electronics that can carry both uncompressed high-definition video and uncompressed multi-channel audio in all HD formats, including 720p, 1080i and even the granddaddy of them all, gigabit HD 1080p.

Besides the technical specs of HDMI that are superior to other video cable formats, the physical connection itself is a much improved design over its predecessors. S-Video cables are the bottom of the barrel when it comes to the quality of the connector. The very small pins on these cables are notorious for getting bent or broken off and have collectively caused more hours of grief

than any other connection in all of AV. Just like computer tech support people are trained to tell customers to try re-booting their systems when problems occur, the number one rule in AV when you don't have a picture and are using S-Video is to check to see if one of the pins on the cable is bent. S-Video of course does not transmit HD signal. However, high-end receivers and AV preamps are now able to video transcode S-Video signals and output them via HDMI.

Before DVI and HDMI, component video was the cable of choice for transmitting megabit 720p and 1080i HD video. This connection is actually comprised of three separate cables that you commonly see on video displays and sources with red, green and blue RCA connections, labelled Y, B-Y and R-Y. On higher-end pieces, professional grade BNC twist lock connectors are often used. This connection is still commonly used, but it is an analog connection that requires digital to analog back to digital conversions that cut down on the integrity of the HD signal. Having seen an [ISF-certified](#) technician run tests on my display, using the same source via HDMI and Component into my HD display, he showed me the dramatic benefits to using the HDMI all-digital connection.



One issue that has kept component video popular for delivering HD content

to video displays and projectors is the fact that long HDMI runs have been plagued by signal loss over 15 feet and over 30 feet for DVI. Systems where the components and display are close together tend to not have this issue, as they are usually located near the source components, but projectors that hang on the ceiling and modern flat panel installations are more often than not well over the 15-foot distance from the source that causes problems with HDMI cables.

Some people prefer the screw-on DVI cable to the small, slender HDMI connector. However, I have recently learned to love the simplicity of the HDMI connection when I had to reach my hand into a virtually inaccessible space and plug in an HDMI cable with one hand. It would have been impossible to get a bulky DVI cable plugged in and would have required me to take out most of the components in the cabinet. The HDMI plug is robust enough to let you know when it is properly connected and yet very simple to plug in and out and does not get stuck and require an extreme amount of force as some RCA connectors can do when jammed together in close quarters.

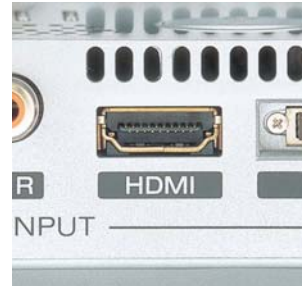
HDMI comes on the heels of the previous direct digital HD video cable connection DVI. HDMI is backwards-compatible to DVI with the use of adapter or conversion cable. However, when HD-DVD and or Blu-ray hits the streets with a high definition audio format included, HDMI will really begin to shine as DVI does not have the capability to carry audio. What sets HDMI and DVI apart, besides the obvious different-looking connectors on the ends of the cables is the fact that HDMI has the ability to carry an audio signal along with the video signal and other control signals. Both formats carry the HDCP digital encoding that Hollywood movie studios endorse to

prevent people from being able to make direct digital copies of high-definition content, but in the real world of installations of HDMI-based systems, this is one of the reliability issues that AV installers are beginning to face.

When the signal from a digital source is sent via HDMI, the digital HDCP encoding information is encrypted and sent along with the audio and video signals. At each step of the chain, whether it is sent directly to a monitor or through some kind of switching system, the HDCP "handshake" must be maintained. If the HDCP signal is compromised in any way before it reaches the display to be un-encoded, the picture will simply not appear on the screen. It is important to make sure that any cables, switches and components that you use are fully HDCP compliant.

Currently, many HDMI devices exist on the market and most next generation 1080p-capable TVs are starting to include multiple HDMI inputs for those who do not yet have HDMI switching capabilities. There are HDMI switchers available from companies like Dtrovision and Geffen, but not all of them pass 1080p video or any audio through them, so when HD audio signals such as DTS-HD begin being broadcast along with the video signals, you will want to check with the manufacturer of your switching solution to see if it is able to pass the audio along with it.

Currently, this is not an issue as you just run your video and audio separately, most likely using the dedicated digital outputs of your satellite receiver, cable box or DVD player and running them into your receiver or AV preamp to be properly decoded.



The Blu-ray vs. HD-DVD battle is still raging on, but one thing is certain: the studios have all agreed that HDMI is their approved standard and although there are a few little hurdles including switching, length of cable runs and the HDCP encoding issues, there are solutions to almost every setup issue. Receivers with multiple HDMI inputs and digital amps inside will start to become smaller, as the massive amount of real estate for connectors will not be needed as much. The high bandwidth promise of 1080p video will take HDTV to the next level and, although it is not a perfect connector, HDMI is the new standard that will be transmitting it and it's going to be here to stay for a long time.

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**- Written by Bryan Dailey**

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