WHITE PAPER

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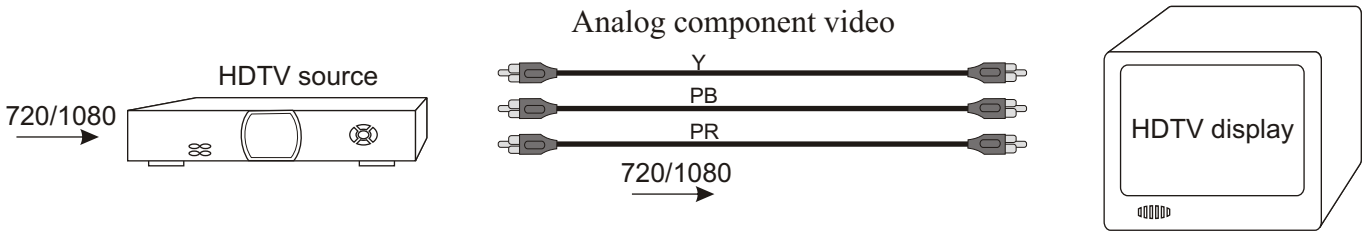
Resolution of HDTV with HDCP copy protection

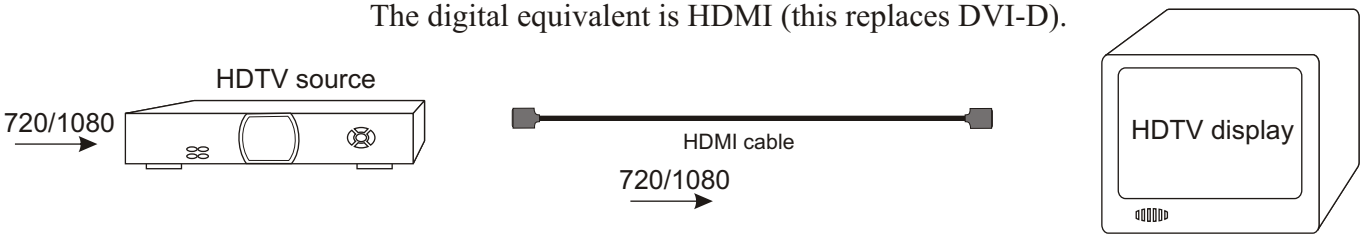
What's this about HDTV not working on some displays because of copy protection? Here is what all this hub-bub is about ...

There are two methods of connecting an HDTV source and display.
The most common continues to be analog component video (3-coax cables).

Under normal conditions, both are capable of 720 and 1080 resolutions.



The digital equivalent is HDMI (this replaces DVI-D).



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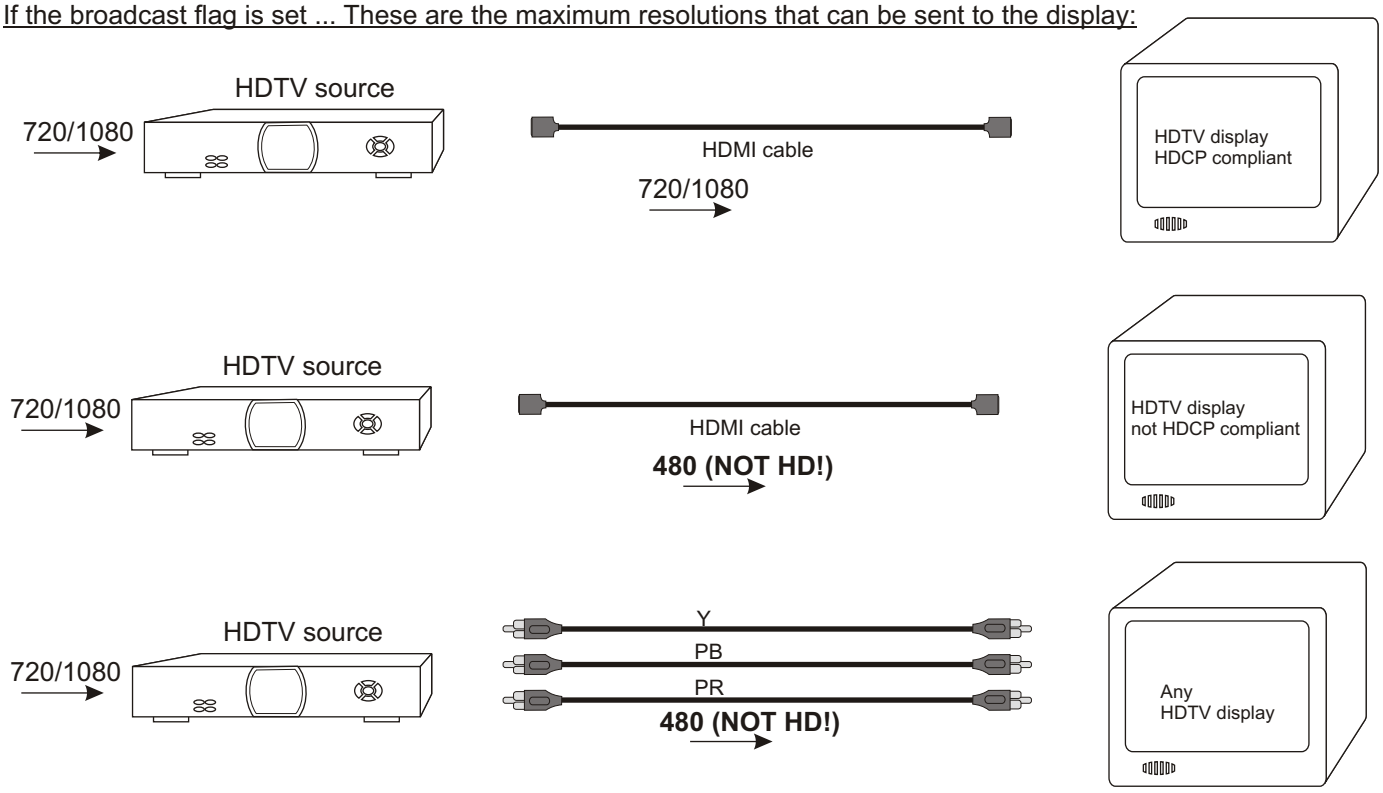
HDCP - High-bandwidth Digital Content Protection is a security measure that major film studios have insisted be added to HDTV definitions. This is a method to insure that high definition content be provided only to displays that are HDCP compliant, in other words, digital interfaces only. HDCP is invoked when the data stream contains a "broadcast flag" (also called the "ATSC flag" or "HDCP bit".)

<u>If the broadcast flag is set ... These are the maximum resolutions that can be sent to the display:</u>



- Virtually all HDTV source devices have the ability to recognize the broadcast flag and limit resolution. This includes satellite receivers, cable HD boxes and off-air HD tuners.
- Only a small percentage of HDTV viewers have HDCP compliant displays and use HDMI cables to drive them. The broadcast flag is not set today because this would remove HDTV for the vast majority of users.
- HDMI equipment is still rare and often difficult to use in home theaters. For example, most home theater receivers have video, S_video and often component video switching to choose from several video sources to connect to the display. None have HDMI switching.
- It is possible that the broadcast flag will be set on high definition DVDs when they arrive late this year. (Both BlueRay and HD-DVD.) This will require users have digital connections and an HDCP compliant display.
- FCC has mandated that July 1st, 2005 be the turn on date for use of the broadcast flag. After July 31st all PC HDTV tuner cards must support the broadcast flag.
- It is possible that the broadcast flag will never be set for broadcast HDTV. Suit has been brought against the FCC for overstepping its charter to require the broadcast flag.
- Current HDTV users are understandably worried that they might lose HDTV on their current sets.
- This concern has already affected the sales of HDTVs. There could be a consumer backlash if this occurs and may further confuse and harm the roll-out of high definition DVDs.
- So far, the threat of HDCP has prevented the introduction of VCRs that can digitize and record analog component HDTV. It is about this recording that the studios are most concerned. If a company markets an analog HDTV recorder, the broadcast flag could be set and these recorders would cease to function. So, HDCP could be a threat that is held in reserve and never used.
- **Slightly related issue** ... The latest generation of "up-converting" DVD players will up-scale the DVD's 480p video to 720p or 1080i formats. These will only provide the up-scaled video on the digital outputs, and not the analog component outputs. (Apparently, there was a Zenith model that initially provided upscaled video on the component outputs, but this has been changed in the current production of the same model.) Note that if a DVD player provides a 480 signal to an HDTV display, the display itself will up-scale the video. These up-scaling DVD players can be capable of improved video performance, but are not true HDTV devices.