FREEMAN

AUDIO VISUAL OPERATIONS STANDARD

CHOOSING CORRECT VIDEO CONDUITS AND DISTANCE LIMITATIONS

General Principles

- ***The best video conduit available should always be chosen.***
  - EXAMPLE: DVD player and PDP display both support component video, thus the component video conduit should be used to connect the devices.
- ***The highest quality/bandwidth cable available must always be used.***
- ***Distance limitations (without inline signal amplification) must be observed.***
- ***Connector selection:***
  - Professional/Industrial video equipment most often utilizes **BNC connectors.**
  - Consumer video equipment most often utilizes **RCA connectors.**
  - Specialized adapters are used to change connector type/gender (barrels, bullets, reverse bullets).

Video (Analog/Standard Definition) Conduits

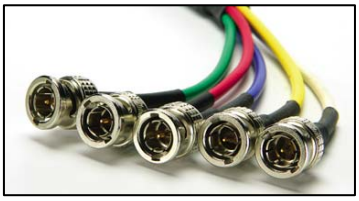
- ***Component Video (Y,R-Y,B-Y / YPbPr / YCbCr / YUV) – 3-conductors***
  - Highest-quality/bandwidth; most preferred video conduit
  - Primary sources: Professional camera CCUs, DVCAM decks, Betacam decks, DVD decks (also supports analog High Definition)
  - **EASY MR/EX SETUP FROM DVD PLAYER TO DISPLAY: Use a short 5-wire BNC cable with RCA bullets – R/G/B for YPbPr, and H/V wires for L/R audio.**

- ***S-Video (Y/C) – 2-conductors***
  - Medium-quality/bandwidth
  - Primary sources: Consumer/prosumer camcorders, S-VHS decks, some computer NTSC video outputs, some gaming consoles
  - Utilizes 4-pin Mini-DIN connector or 2BNC (Y/C)

- ***Composite Video (CVBS) – 1-conductor***
  - Standard-quality; most common conduit for low-priority video
  - Primary sources: Consumer video devices, VHS decks, "Super"/monitor output/loop-thru on professional/industrial decks
    - **NOTE:** 75Ω termination may be required.

- ***Radio Frequency (RF) – OTA/CATV broadcast / 1-conductor***
  - Lowest-quality/bandwidth AV conduit
  - Composite video + audio, modulated on VHF/UHF carrier frequency band (TV channel); utilizes F-type coax connector
  - Primary sources: Over-the-air (OTA) broadcast TV antennas, CATV/MATV, satellite decoders
    - **NOTE:** RF is not used in professional video applications. ***RF should never be selected as a video conduit unless intentionally distributing OTA/CATV/MATV broadcast signals as requested by customer.***

Computer/Data Video (Analog) Conduits

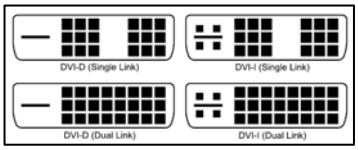


- ***RGB(HV) – 5-wire***
  - Most preferred analog data video conduit, especially for cable runs exceeding 50'
  - Full-bandwidth RGB signal, plus Horizontal and Vertical sync
  - Alternate configurations:
    - RGBs (composite sync – 4-wire)
    - RGsB/SoG (sync-on-green – 3-wire)

- ***VGA – specialized cable/connector***
  - Uses RGB signal over single computer cable; HD-15 connector
  - Preferred data video conduit for simple setups (*i.e.* connecting computer video card directly to display 50' or less away)

Digital Video Conduits

- ***DVI – specialized cable/connector***
  - Preferred digital data video conduit
  - May contain digital signal only (DVI-D), or analog and digital signals (DVI-I).
    - **NOTE:** DVI-D connectors may connect to DVI-I ports. DVI-I connectors cannot connect to DVI-D ports.
    - **NOTE:** DVI-D and VGA/RGB are incompatible signals and cannot be adapted. DVI-I and VGA/RGB may be adapted using a DVI-I/VGA adapter/cable.
    - **NOTE:** MacBook computers feature a "mini-DVI" port which requires a specialized dongle to output to VGA or DVI-D. MacBook Pro computers feature a DVI-I port onboard – a DVI-I to VGA adapter/cable is required to output to VGA.



- ***HDMI – specialized cable/connector***
  - Most common digital consumer High Definition video format
  - Same signal as DVI-D + up to 5.1 digital audio
  - May be adapted to DVI-D using HDMI/DVI-D adapter/cable (audio lost)
    - **NOTE:** Signal may contain HDCP content protection, especially from 1080p/Blu-Ray and HD-broadcast sources – all devices in display chain must be HDCP compliant to display image
- ***SDI / HD-SDI – 1-wire (high-bandwidth coax/BNC connector)***
  - Emerging high-end digital conduit for Standard Definition (SDI) or High Definition (HD-SDI) video

Conduit Distance Limitations *(dependent on quality/bandwidth of cable)*

- ***Analog SD video conduits / RGB(HV) data video conduits / SDI/HD-SDI conduits:***
  - **325' before amplification** (using high-bandwidth coax – 22AWG)
- ***VGA conduits:***
  - **75' before amplification** (using high-bandwidth VGA cable)
- ***Digital (DVI/HDMI) conduits:***
  - **15'** (using standard cables)
  - **230'** (using specialized copper cables)
  - **325'+** (using fiber-optic cables, limited only by cable length/type)