Becca Bender
Video Preservation 1
CINE-GT 3403
Assignment #1
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Video Distribution Amplifiers

A video distribution amplifier (VDA) is a piece of equipment that takes an incoming video signal, amplifies it, and divides it into multiple outgoing video signals that match the incoming signal with no degradation. VDAs come in many varieties with respect to signal type, connectors, number of outputs (and sometimes inputs), bandwidth, maximum cable distance, and signal to noise ratio, as well as other features. To begin, VDAs can be designed to distribute either digital or analog signals. In the case of digital VDAs, signals and connectors can include (among others) SDI (BNC), 6G-SDI (BNC), HDMI, CAT cable, and fiber optic, often with the VDA being able to auto-detect signal characteristics. Another feature of many digital VDAs is the ability to "reclock" the signal, which is essentially a refreshing of the 1s and 0s when long distances between the input and output devices could cause signal breakdowns along the path.[1] Reclocking capability adds to the cost of the device, and may have an impact on the transmission speed, but can be essential depending on the application.[2]

In the case of analog VDAs, the possible signal types are composite, component and Y/C (S-Video), with video interface options of BNC, RCA, and Mini-DIN 4-pin. The number of outputs per device is highly variable, with 4 and 8 seeming to be the most ubiquitous, but there are also devices with many more outputs such as Taiden Industries' TMX-0132V that includes 32 BNC outputs.[3] Some VDAs also include a looping output which allows multiple VDAs to be daisy-chained together. Other variations include VDAs that are coupled with signal converters, such as the Kramer 401C Video Signal Converter and Distribution Amplifier, which takes a Y/C input and distributes it to two Y/C outputs and 2 composite

[1] Mike DiFilippo, CUNY TV Video Engineer, interview by author, October 20, 2017.
[2] "SDI Video: 10 Things You Need To Know," Communications Specialties, Inc., November 16, 2011, http://www.markertek.com/attachments/manuals/SDI10Things.pdf (accessed October 22, 2017).
[3] "Products," *Taiden Industrial Co., Ltd.*, http://www.taiden.com/products_detail/productId=204.html (accessed October 22, 2017).

outputs.[4] In addition to variations related to input and output signal types and connectors, other VDA variables include video bandwidth capacities affecting the speed of transmission, signal-to-noise ratios introduced during the distribution, and options for gain controls that allow the user to adjust the degree of signal amplitude and voltage boost.

In the context of a setup to digitize analog video, utilizing a VDA allows the user to send the source signal to multiple pieces of equipment used to monitor and correct the signal in preparation for capture. One or more VDAs can be configured at different points in the chain depending on how exactly the user would like to monitor the signal, and perhaps also to compensate for limited outputs on the source VTR. For example, if your VTR only has one output, you could connect the VTR directly to a 1x4 VDA, sending one output to a CRT monitor, one to a TBC, and one to a waveform/vectorscope (the vectorscope will generally be connected to the waveform by a loop through), and then connect *another* 1x4 VDA to the TBC, using the corrected TBC signal as the input that then gets distributed to the capture card, the CRT Monitor, and the waveform/vectorscope. This setup would allow you to compare the raw signal coming off the deck with the corrected signal after it's passed through the TBC on each the CRT, waveform and vectorscope. In this example you would have one extra output on each VDA that would need a 75 ohm termination if the VDA outputs are not designed to be source terminating.[5] This is of course only one possible configuration, but the main point is that VDAs can allow tremendous flexibility to the user while also confirming that the signal being sent around is identical to the source.

[4] "Kramer 401C Distribution Amp/Converter 401C B&H Photo Video," *B&H Photo Video*, https://www.bhphotovideo.com/c/product/199900-REG/Kramer_401C_401C_Distribution_Amp_Converter.html, (accessed October 22, 2017).
[5] Mike DiFilippo.