

Digitization Equipment Budgeting Guide

About This Guide

This guide is intended to help create budgets for digitization projects without having to identify the exact equipment that will be purchased. It can take a significant amount of time to research available equipment. Use the following information to create a general budget for funding proposals or applications. Adjust the estimated costs to reflect any equipment you already own or are able to borrow. Add tax and probable shipping/customs costs.

Refer to the [Digitization Supplies Guide](#) and to the individual buying guides for the different formats or equipment for more information about options.

Note: Items are listed as potentially “free” if they might be donated by reaching out to personal and professional networks.

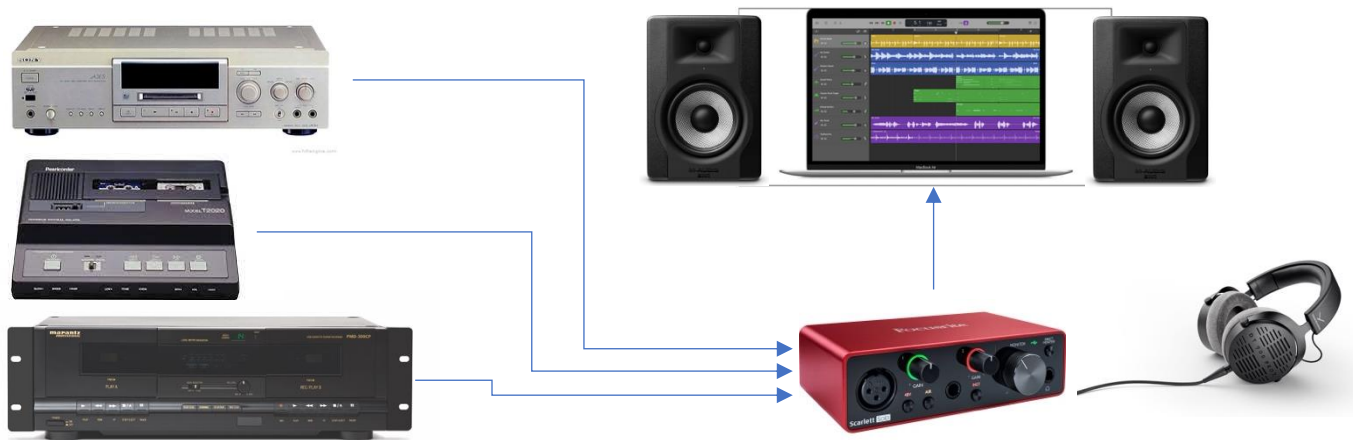
A Special Note About Digital Storage

It is our experience that many grant applications are unsuccessful due to a lack of consideration and budgeting for digital storage. Project planners usually try to estimate how much storage is required for digitized files. It is more useful to consider how much storage is needed for keeping multiple copies of the digitized preservation-files, local storage for managing access files, and temporary working space.

We recommend the “3-2-1” method of digital preservation. This means that you would keep 3 copies of your preservation files, using 2 different kinds of storage devices, and keep 1 copy of those files in an offsite location. For this reason, we recommend budgeting for digital storage for three copies of preservation files. You will also want to budget for the files that will be created for research and other access requests, and appropriate backups of those files. Lastly, you will need some fast storage for holding and transferring files during digitization.

Beyond the specific requirements of the current project, we recommend considering future needs for digital preservation storage. You should try to purchase more storage than is needed for just your current project. You should work with grant coordinators to see if you can purchase extra storage to leave room for growth in your digital collection. You should also start to advocate for yearly budgets for purchasing and replacing aging storage devices.

Audio-cassette, Micro/Mini-cassette, MiniDisc Digitization System



An audio digitization system includes a good quality audio player (audio-cassette, mini/micro-cassette or MiniDisc), an audio interface (analog to digital audio converter), speakers, headphones, cables, a computer, digital storage, audio software, and a power conditioner or power bar. If you wish to enclose your digitization system for portability or easy assembly then you will also want to purchase a rack case and shelf.

Typical budget ranges for cassette equipment

These ranges are current for the time that this guide was written. Please verify costs from online and local suppliers when you assemble your budget estimates. These estimates also do not include tax, shipping and possible customs charges (if ordering internationally).

<p>Audio cassette deck:</p> <ul style="list-style-type: none"> • good-quality used consumer deck • good-quality new deck or mid-range used deck • premium quality new or used deck 	<p>\$50 - \$200 \$200 - \$400 \$400 - \$1500</p>
<p>Micro or mini-cassette player:</p> <ul style="list-style-type: none"> • good-quality hand-held player • good-quality desk transcription style player <p>Note: like any equipment that can only be purchased on used marketplaces there is great variation in cost of this equipment.</p>	<p>\$60 - \$150 \$80 - \$400</p>
<p>MiniDisc player:</p> <ul style="list-style-type: none"> • good-quality hand-held player • good-quality deck • premium quality hand-held player (Sony MZ-RH1) <p>Note: MiniDisc recording capabilities increased over time. Early-model players will not be able to playback recordings in the later standards.</p>	<p>\$50 - \$150 \$80 - \$400 \$1000 - \$1500</p>

<p>Audio interface:</p> <ul style="list-style-type: none"> • low-cost option (i.e. Behringer FCA202) • mid-range option (i.e. Focusrite Scarlett 2i2) • Premium option (i.e. Focusrite Scarlett 18i8) 	<p>\$125 - \$200 \$200 - \$400 \$400 - \$1400</p>
<p>Speakers:</p> <ul style="list-style-type: none"> • low-cost option (i.e. Logitech Z200) • mid-range option (i.e. Mackie CRX-3) • Premium option (i.e. M-Audio BX-5 D3) 	<p>\$40 - \$100 \$130 - \$250 \$400 - \$600</p>
<p>Headphones:</p> <ul style="list-style-type: none"> • low-cost option (i.e. Tascam TH-02) • mid-range option (i.e. Audio-Technica ATH-M30X) • Premium option (i.e. Beyerdynamic DT-990PRO) 	<p>\$40 - \$80 \$80 - \$200 \$200 - \$400</p>
<p>Cables: 2X RCA-TRS, 2X speaker cables.</p> <ul style="list-style-type: none"> • Mid-range options • Premium options <p>Note: buy from reputable audio vendors and don't buy the cheapest cables you can find (also don't buy the most expensive).</p>	<p>\$40 - \$50 \$50 - \$100</p>
<p>Power:</p> <ul style="list-style-type: none"> • low-cost option (i.e. surge-protecting powerbar or power-conditioner) • mid-range/premium option (i.e. ART PRO SP4X4PRO rack-mounted power conditioner with voltage meters) <p>Note: power conditioners are definitely optional equipment and may not affect the quality of digitization where wall power is stable.</p>	<p>\$15 - 90 \$210</p>
<p>Rack shelf (optional): Middle Atlantic UTR1</p>	<p>\$40 - 70</p>
<p>Rack case (optional):</p> <ul style="list-style-type: none"> • Audio-cassette 6u case (i.e. Gator GR-6L) 	<p>\$250 - 400</p>
<p>Computer:</p> <ul style="list-style-type: none"> • low-cost option (i.e. new consumer or used PC) • mid-range option (i.e. Dell, HP, Lenovo business-line PC) • premium option (i.e. Custom or pre-built media workstation) 	<p>\$500 - \$1000 \$1000 - \$2000 \$2000 - \$4000</p>
<p>Software (optional):</p> <ul style="list-style-type: none"> • audio editing software (i.e. Avid Protools) • audio processing software (i.e. Izotope RX10) <p>Note: Most audio interfaces come with software included. Many software packages have educational or non-profit pricing that you may be eligible for.</p>	<p>\$200 - \$700 \$200 - \$1400</p>
<p>Digital Storage:</p> <ul style="list-style-type: none"> • low-cost option (i.e. project drive, 2X external hard drives) • mid-range option (i.e. project drive, RAID system, 2 external hard drives) <p>Premium option (i.e. project drive, external hard drive(s), RAID system(s))</p>	<p>\$300 - \$600 \$1000 - \$2000 \$2000 - \$4500</p>

Example cassette equipment budget

The list below describes estimates for a typical Indigitization cassette digitization kit. This is the hardware that we recommend as a good balance of quality, price and dependability. You can also consider the lower cost and premium options listed. Budget more or less depending on your own equipment needs and choices. It is also fine to add the price, tax and shipping into each line and round upwards. Be sure to give yourself a buffer in case some equipment costs more than expected.

Item	Cost	Tax & shipping 12% tax, free shipping on most items
Cassette deck: Tascam 202-MKVII	\$950	\$114
Audio interface: Focusrite Scarlett 2i2	\$250	\$30
Speakers: Mackie CRX-3	\$140	\$16.80
Headphones: Audio-Technica ATH-M30X	\$120	\$14.40
Cables: 2X RCA-TRS, 2X speaker cables (shipping \$13)	\$80	\$9.60
Power: ART PRO SP4X4PRO rack-mounted power conditioner with voltage meters)	\$230	\$27.60
Rack shelf: Middle Atlantic UTR1	\$70	\$8.40
Rack case: Gator GR-6L	\$399	\$47.88
Computer: Dell OptiPlex tower, i7, 16GBram, 24" monitor	\$2500	\$300
Digital storage: 1 external project SSD, 3X 4TB USB3.0 hard drives (2 different models)	\$550	\$66
Total	\$4,240	\$634.68
Grand total	\$5,923.68	
Total without computer	\$3,123.68	

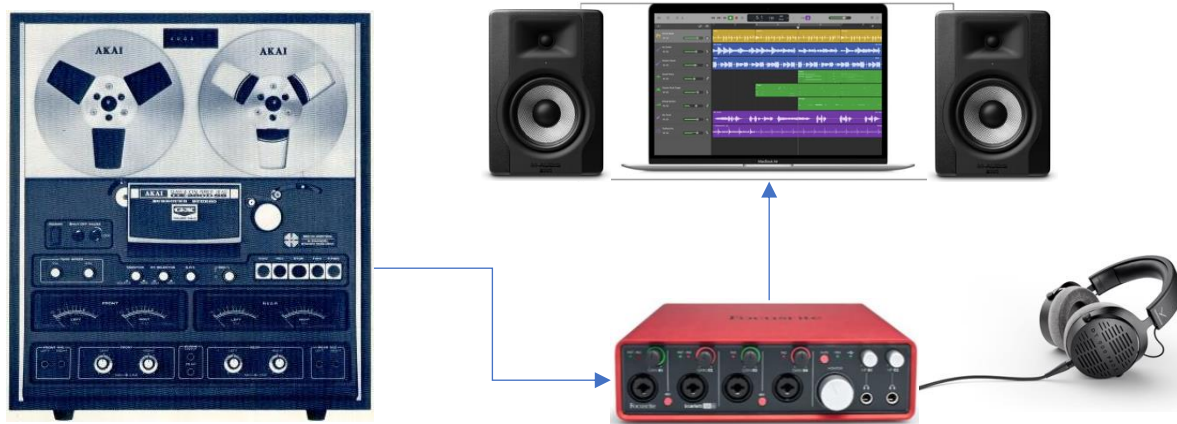
Supplies for cassette digitization projects:

Item	Cost	Supplier
Precision screwdriver kit	\$20	Online or local retailer
99% alcohol or head cleaner	\$10	Online or local drug store
cleaning swabs	\$20	Online or local drug store
splicing kit – block, splicing-tape and razor blade (optional)	\$60	Online specialty store
cassette shells (if any tapes are broken)	\$20	Online specialty store
labels	\$15	Online or local retailer
zip lock bags	\$15	Carr McLean, U-line or local retailer

Grand total	\$160
-------------	-------

See the [Audio Cassette Buying Guide](#) and [Digitization Supplies Guide](#) for more information.

1/4" Open Reel Digitization System



A basic 1/4" open reel audio cassette digitization system includes a four-channel open reel player that supports the two most common recording speeds in your collection, an audio converter (audio interface) that supports four channels, speakers, headphones, cables, a computer, digital storage, audio software, and a power conditioner or power bar.

A more comprehensive digitization system would also include additional open reel players that can play back other recording speeds and track patterns that are represented in your collection.

Typical budget ranges for 1/4" open reel audio equipment

These ranges are current for the time that this guide was written. Please verify costs from online and local suppliers when you assemble your budget estimates. These estimates also do not include tax, shipping and possible customs charges (if ordering internationally).

1/4" open reel player(s): <ul style="list-style-type: none"> • good-quality used consumer stereo deck • good-quality used prosumer 4-channel player • good-quality used half-track deck 	\$200 - \$500 \$400 - \$1500 \$500 - \$1500
Audio interface (4 input channels required): <ul style="list-style-type: none"> • low-cost option (i.e. Native Instruments MK6) • mid-range option (i.e. Focusrite Scarlett 18i8) • Premium option (i.e. Apogee Quartet) 	\$320 - \$500 \$500 - \$800 \$1000 - \$3500
Speakers: <ul style="list-style-type: none"> • low-cost option (i.e. Logitech Z200) • mid-range option (i.e. Mackie CRX-3) • Premium option (i.e. M-Audio BX-5 D3) Note: studio quality speakers can cost much more than listed here. If matching with a very high quality audio interface you may want to purchase higher prices speakers.	\$40 - \$100 \$130 - \$250 \$400 - \$600

<p>Headphones:</p> <ul style="list-style-type: none"> • low-cost option (i.e Tascam TH-02) • mid-range option (i.e. Audio-Technica ATH-M30X) • Premium option (i.e. Beyerdynamic DT-990PRO) 	<p>\$40 - \$80 \$80 - \$200 \$200 - \$400</p>
<p>Cables: 4X RCA-TRS, 2X speaker cables.</p> <ul style="list-style-type: none"> • Mid-range options • Premium options <p>Note: buy from reputable audio vendors and don't buy the cheapest cables you can find (also don't buy the most expensive).</p>	<p>\$100 - \$120 \$150 - \$200</p>
<p>Power:</p> <ul style="list-style-type: none"> • low-cost option (i.e surge-protecting powerbar) • mid-range option (i.e. ART Pro Audio PDS8U power conditioner) 	<p>\$15 - \$30 \$90</p>
<p>Computer:</p> <ul style="list-style-type: none"> • low-cost option (i.e new consumer or used PC) • mid-range option (i.e. Dell, HP, Lenovo business-line PC) • Premium option (i.e. Custom or pre-built media workstation) 	<p>\$500 - \$1000 \$1000 - \$2000 \$2000 - \$3500</p>
<p>Software (optional):</p> <ul style="list-style-type: none"> • audio editing software (i.e. Avid Protools) • audio processing software (i.e. Izotope RX10) <p>Note: Most audio interfaces come with software included. Many software packages have educational or non-profit pricing that you may be eligible for.</p>	<p>\$200 - \$700 \$200 - \$1400</p>
<p>Digital Storage:</p> <ul style="list-style-type: none"> • low-cost option (i.e project drive, 2X external hard drives) • mid-range option (i.e. project drive, RAID system, 2 external hard drives) • Premium option (i.e. project drive, external hard drive, 2X RAID system) 	<p>\$300 - \$600 \$1000 - \$2000 \$2000 - \$3500</p>

Example ¼" open reel audio equipment budget

The list below describes estimates for a basic open reel audio digitization system. This is the hardware that we recommend as a good balance of quality, price and dependability. You can also consider the lower cost and premium options. Budget more or less depending on your own equipment needs and choices. It is also fine to add the price, tax and shipping into each line and round upwards. Be sure to give yourself a buffer in case some equipment costs more than expected.

Item	Cost	Tax & shipping 12% tax, free shipping on most items
¼" open reel playback deck: Akai 280d-ss	\$450	\$26.40
Audio interface: Focusrite Scarlett 18i8	\$600	\$30
Speakers: M-Audio BX5 D3	\$400	\$15.60
Headphones: Beyerdynamic DT990PRO	\$230	\$12
Cables: 4X RCA-TRS, 2X speaker cables)	\$120	\$
Power: ART PRO PDS8U power conditioner	\$100	\$25.20
Software: <ul style="list-style-type: none"> • Avid Protools • Izotope RX9 Note: Most audio interfaces come with software included). Many software packages have educational or non-profit pricing that you may be eligible for.	\$250/yr \$500	\$30 \$60
Computer: Dell OptiPlex tower, i7, 16GBram, 24" monitor	\$2500	\$300
Digital storage: 1 external project SSD, 3X 4TB USB3.0 hard drives (2 different models)	\$550	\$42
Total	\$5,490	\$658.80
Grand total	\$6,148.80	
Total without computer	\$3,348.80	

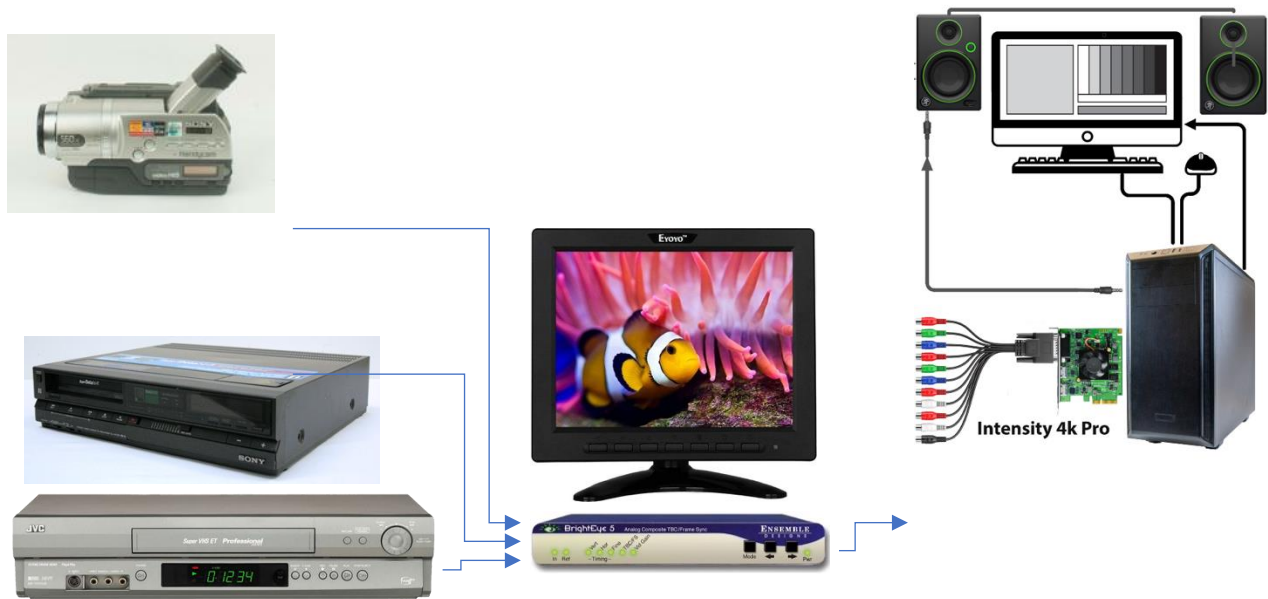
Supplies for ¼" open reel audio digitization projects:

Item	Cost	Supplier
99% alcohol or head cleaner	\$10	Online or local drug store
cleaning swabs	\$20	Online or local drug store
splicing kit – block, splicing-tape and razor blade (optional)	\$70	Online specialty store
Leader tape (200')	\$40	Online specialty store
empty reels (20X 7")	\$250	Online specialty store
Reel boxes (20 X 7")	\$140	Online specialty store

labels	\$15	Online or local retailer
zip lock bags	\$30	Carr McLean, U-line or local retailer
Grand total	\$575	

See the [Open Reel Audio Buying Guide](#) and [Digitization Supplies Guide](#) for more information.

VHS/Betamax/Video8/Hi8 Digitization System



A VHS/Betamax digitization system consists of a good-quality video player for each format that will be digitized, a time base corrector (TBC), one or two NTSC video monitors, a video converter (video interface), speakers, headphones, cables, a computer, and digital storage.

Typical budget ranges for NTSC equipment (VHS/Betamax, VHS-C, Hi8/Video8)

These ranges are current for the time that this guide was written. Please verify costs from online and local suppliers when you assemble your budget estimates. These estimates also do not include tax, shipping and possible customs charges (if ordering internationally).

<p>VHS</p> <ul style="list-style-type: none"> • good-quality used consumer VHS deck • good-quality used prosumer S-VHS deck • good-quality used broadcast S-VHS deck 	<p>Free, \$20 - \$60 Free, \$75 - \$200 \$500 - \$1500</p>
<p>Betamax</p> <ul style="list-style-type: none"> • good-quality used consumer Super-Betamax deck • good-quality used late-model Super-Betamax Deck 	<p>\$100 - \$500 \$700 - \$1500</p>
<p>Hi8 Deck (for playing both Video8 and Hi8 recordings)</p> <ul style="list-style-type: none"> • consumer camcorder • professional camcorder • walkman-style player • Hi8 desktop deck <p>note: these decks will not play Digital8 recordings</p>	<p>\$50 – 250 \$100 – 400 \$250 - \$800 \$250 - \$1000</p>

<p>Video interface:</p> <ul style="list-style-type: none"> • low-cost option (i.e Blackmagic Intensity Pro 4k) • mid-range option (i.e Blackmagic UltraStudio HD Mini) • Premium option (i.e. AJA KONA LHe Plus) 	<p>\$270 - \$500 \$500 - \$1000 \$1000 - \$3500</p>
<p>NTSC video monitor (you will want one or two monitors):</p> <ul style="list-style-type: none"> • CRT television • LCD television • CRT NTSC reference monitor • LCD reference monitor 	<p>Free, \$20 - \$100 Free, \$25 - \$100 \$100 - \$300 \$300 - \$800</p>
<p>Speakers:</p> <ul style="list-style-type: none"> • low-cost option (i.e Logitech Z200) • mid-range option (i.e. Mackie CRX-3) • Premium option (i.e. M-Audio BX-5 D3) 	<p>\$40 - \$100 \$130 - \$250 \$400 - \$600</p>
<p>Headphones:</p> <ul style="list-style-type: none"> • low-cost option (i.e Tascam TH-02) • mid-range option (i.e. Audio-Technica ATH-M30X) • Premium option (i.e. Beyerdynamic DT-990PRo) 	<p>\$40 - \$80 \$80 - \$200 \$200 - \$400</p>
<p>Cables: various depending upon equipment purchased - S-video, composite, stereo RCA, BNC).</p> <ul style="list-style-type: none"> • Mid-range options • Premium options <p>Note: buy from reputable vendors and don't buy the cheapest cables you can find (also don't buy the most expensive).</p>	<p>\$120 - \$200 \$180 - \$250</p>
<p>Power:</p> <ul style="list-style-type: none"> • low-cost option (i.e surge-protecting power bar) • mid-range option (i.e. ART Pro Audio PDS8U power conditioner) 	<p>\$15 - \$30 \$90</p>
<p>Computer:</p> <ul style="list-style-type: none"> • low-cost option (i.e new consumer or used PC) • mid-range option (i.e. Dell, HP, Lenovo business-line PC) • Premium option (i.e. Custom or pre-built media workstation) 	<p>\$500 - \$1000 \$1000 - \$2000 \$2000 - \$3500</p>
<p>Digital Storage:</p> <ul style="list-style-type: none"> • low-cost option (i.e project drive, 2X external hard drives) • mid-range option (i.e. project drive, RAID system, 2 external hard drives) • Premium option (i.e. project drive, external hard drive, 2X RAID system) 	<p>\$400 - \$800 \$1000 - \$2500 \$2000 - \$5500</p>

Example VHS digitization equipment budget

The list below describes estimates for a basic VHS digitization system. This is the hardware that we recommend as a good balance of quality, price and dependability. You can also consider the lower cost and premium options. Budget more or less depending on your own equipment needs and choices. It is also fine to add the price, tax and shipping into each line and round upwards. Be sure to give yourself a buffer in case some equipment costs more than expected.

Item	Cost	Tax & shipping 12% tax, free shipping on most items
Prosumer S-VHS player	\$200	\$24
Timebase Corrector: Ensemble Designs Brighteye 5	\$1700	204
Used LCD Television	\$80	\$9.60
Video interface: Blackmagic Intensity Pro 4k	\$350	\$32.40
Speakers: Mackie CRX-3	\$130	\$15.60
Headphones: Audio-Technica ATH-M30X	\$100	\$12
Cables: <ul style="list-style-type: none"> • 2X S-Video • S-Video – dual RCA • 2X composite RCA • Stereo RCA 	\$30 \$20 \$20 \$20	\$3.60 \$2.40 \$2.40 \$2.40
Power: ART PRO PDS8U power conditioner	\$90	\$10.80
Software: Free open source	na	Na
Computer: Dell OptiPlex tower, i7, 16GBram, 24" monitor	\$2500	\$300
Digital storage: 1 external project SSD, Synology 4-drive 24TB NAS, 2 X 8TB ext HD	\$3000	\$360
Total	\$6,380	\$766.60
Grand total	\$7,146.60	
Total without computer	\$4,346.60	

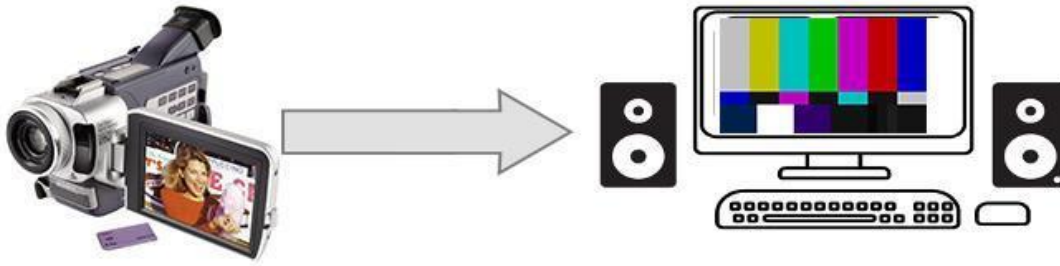
Supplies for ¼" open reel audio digitization projects:

Item	Cost	Supplier
99% alcohol or head cleaner	\$10	Online or local drug store
chamois cleaning swabs	\$30	Online
½" splicing kit – block, splicing-tape and razor blade (optional)	\$70	Online specialty store

Blank VHS tapes	\$20	Online or local used market
labels	\$15	Online or local retailer
zip lock bags	\$30	Carr McLean, U-line or local retailer
Grand total	\$175	

See the [VHS Buying Guide](#) and the [Betamax Buying Guide](#) for more information.

MiniDV/Digital8 transfer system



A MiniDV or Digital8 transfer system consists of a good-quality video camera or deck to play the video tapes, an NTSC video monitor if the player does not have an integrated screen, speakers, headphones, cables, a computer with FireWire ports, and digital storage.

9.4.1 Typical budget ranges for MiniDV/Digital8 system

These ranges are current for the time that this guide was written. Please verify costs from online and local suppliers when you assemble your budget estimates. These estimates also do not include tax, shipping and possible customs charges (if ordering internationally).

MiniDV playback unit <ul style="list-style-type: none"> • used consumer camcorder • used prosumer video camera • used MiniDV Walkman-style player • used MiniDV desktop deck 	Free, \$150 – 350 \$150 – 500 \$300 - \$1000 \$400 - \$1500
Digital8 playback unit <ul style="list-style-type: none"> • used consumer camcorder • used prosumer video camera • used Digital8 Walkman-style player 	Free, \$150 – 350 \$150 – 500 \$300 - \$1000
NTSC video monitor (optional): <ul style="list-style-type: none"> • CRT television • LCD television • CRT NTSC reference monitor • LCD reference monitor <p>Note: it is not generally necessary to monitor the “source” video feed. If you wish to watch the “source” as the video transfers then an external monitor is more comfortable due to the screen size.</p>	Free, \$20 - \$100 Free, \$25 - \$100 \$100 - \$300 \$300 - \$800
Speakers: <ul style="list-style-type: none"> • low-cost option (i.e Logitech Z200) • mid-range option (i.e. Mackie CRX-3) • Premium option (i.e. M-Audio BX-5 D3) 	\$40 - \$100 \$130 - \$250 \$400 - \$600
Headphones: <ul style="list-style-type: none"> • low-cost option (i.e Tascam TH-02) 	\$40 - \$80

<ul style="list-style-type: none"> • mid-range option (i.e. Audio-Technica ATH-M30X) • Premium option (i.e. Beyerdynamic DT-990PRO) 	<p>\$80 - \$200</p> <p>\$200 - \$400</p>
<p>Cables:</p> <ul style="list-style-type: none"> • firewire cable (ieee1394) • composite or s-video cable (optional) • stereo RCA cable (optional) 	<p>\$10 - \$30</p> <p>\$10 - 25</p> <p>\$10 - \$20</p>
<p>Power:</p> <ul style="list-style-type: none"> • low-cost option (i.e surge-protecting powerbar) • mid-range option (i.e. ART Pro Audio PDS8U power conditioner) 	<p>\$15 - \$30</p> <p>\$90</p>
<p>Computer:</p> <ul style="list-style-type: none"> • low-cost option (i.e new consumer or used Mac or PC) • mid-range option (i.e. Apple Mac Mini, Dell, HP, Lenovo business-line PC) • Premium option (i.e. Apple Mac Pro, Custom or pre-built media workstation) <p>Note: the computer requires a firewire (iee1394) port for transferring DV video. This can be be functionality built into the computer, or via an add-on PCIe expansion card in a tower PC.</p>	<p>\$300 - \$1000</p> <p>\$1000 - \$2000</p> <p>\$2000 - \$3500</p>
<p>Digital Storage:</p> <ul style="list-style-type: none"> • low-cost option (i.e project drive, 2X external hard drives) • mid-range option (i.e. project drive, RAID system, 2 external hard drives) • Premium option (i.e. project drive, external hard drive, 2X RAID system) 	<p>\$400 - \$800</p> <p>\$1000 - \$2500</p> <p>\$2000 - \$3500</p>

Example MiniDV or Digital8 transfer system

The list below describes estimates for a basic MiniDV or Digital8 transfer system. This is the hardware that we recommend as a good balance of quality, price and dependability. You can also consider the lower cost and premium options. Budget more or less depending on your own equipment needs and choices. It is also fine to add the price, tax and shipping into each line and round upwards. Be sure to give yourself a buffer in case some equipment costs more than expected.

Item	Cost	Tax & shipping 12% tax, free shipping on most items
MiniDV consumer camcorder (used)	\$150	\$18
Cables: Firewire cable	\$20	\$2.40
Software: Free open source	Na	Na
Computer: used Apple laptop computer with firewire ports	\$450	\$54
Digital storage: 1 external project SSD, 3X 8TB USB3.0 hard drives (2 different models)	\$700	\$84
Total	\$1320	\$158.40
Grand total	\$1,478.40	

Supplies for MiniDV or Digital8 transfer system:

Item	Cost	Supplier
head cleaning tape	\$30	Online store
MiniDV splicing kit – block, splicing-tape and razor blade (optional)	\$70	Online specialty store
Blank MiniDV tapes (if any tapes require parts for repair)	\$20	Online or local used market
labels	\$15	Online or local retailer
Grand total	\$135	

See the [DV/MiniDV Buying Guide](#) and the [Video8, Hi8, and Digital8 Buying Guide](#) for more information.