

AUDIOTAPE AND VIDEOTAPE BASICS: A 15-MINUTE CRAM SESSION

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For volume users, one way to select tape is to first list different types of applications. Then, buy several brands of tape appropriate to each application. After comparing cost benefits of the tapes on trial, narrow down to one tape per category and standardize on it. Keeping alert of prices from different distributors and timing also saves money.

One university purchaser interviewed makes an annual estimate of how much tape will be used and what brands are acceptable. In his opinion, most of the major brands of videotape were comparable in quality for educational purposes, whereas, his budget was tight. So he buys from the dealer who can give the best price and service. Lately he has been buying cooperatively with a local television station for discounts.

Audiotape basics

Audiotape consists of a ribbon-like base with an emulsion of powdered metal oxide glued on with a binder. Recording takes place when the electronic signal magnetizes the oxide particles. The more particles individually magnetized, the better the recording quality.

Ferric oxide is the most popular recording oxide. It often gives tape the familiar rusty-brown coloring and comes in various qualities. Chromium dioxide, a more recent development, is generally more expensive and offers a higher fidelity recording. But to make full use of chromium dioxide's advantages, the school's tape recorder must have a built-in adjustment button for chromium dioxide or high energy. If one has such a recorder consider this type of tape for critical recordings such as good music.

Polyester has become the most popular base for audiotape. Polyester is durable, stores well, and has greatly improved its editing qualities. Its drawback is that it stretches thin under tension. Stretched tape can't be repaired and is only good for sound effects.

Acetate breaks rather than stretches under tension. Editing acetate is easy, because it cuts smoothly. Unfortunately, acetate breaks relatively easily and may stick to itself when warm. Polyvinyl bases are used for less expensive tapes. Not as strong as polyester or acetate, polyvinyl is also affected by temperature.

Tape base thickness is measured in mils (thousandths of an inch). Reel-to-reel audiotape often comes in three thicknesses: 1.5, 1.0, and 0.5 mil. Generally, the thicker the tape, the stronger or less stretchable it is. The thinner the tape, the more risk of transferring recorder signals from one layer of tape to another as layers are wound tightly on the takeup reel.

There is only so much space inside a cassette (see illustration), so one compromises strength if one wants length. Many cassettes use tensilized tapes, which are prestretched for greater strength. For the quality of sound, a cassette's housing and mechanical components are as critical as the tape contained within. Irregularities within a cassette or sticking mechanical part will bring about changes of recording or playing speed—called wow and flutter.

A good binder lubricates, reducing abrasion on the head while smoothing out the tape path. The binder must also hold the oxide to the base firmly and coat evenly. Weak binders will clog recorded heads with powdery oxide. A binder said to have good retentivity packs oxide particles together densely, raising the quality of the recording.

A few, widely-used terms

Dropouts are momentary losses of signal. Audiotape dropouts leave a sound gap or weakening. In videotape dropouts appear as white streaks through the screen, as a lapse or weakening of the audio, or both. Dropouts coming from the tape rather than the playing/recording system often points to uneven or baking tape coating that clogs the machine head, a bad splice, or to unevenly milled tape.

Bias is a signal added to the original signal to give a more uniform recording response. Ferric oxide uses the standard bias position while chromium dioxide requires a higher-energy bias adjustment setting.

A signal-to-noise ratio is loosely the ratio of the desired signal to undesired noise, usually expressed in decibels. The higher the ratio the better. Both audiotape and videotape manufacturers use that term to describe the quality of their tape.

People can hear the range of low to high sounds that specialists label 20 hertz to 20,000 hertz. Frequently response describes the range of frequencies that the audiotape covers. If one wants to make a faithful recording of music, pick a tape that approaches the range heard.

Videotape basics

Over a dozen formats for professional and mass use are currently circulating. Selecting a video system tailored to one's present and future needs is for the nimble. The first person in an organization to get a system had better do a careful study before buying hardware and setting precedents. Once the system is selected, buying blank tape is simple by comparison.

A quality videotape of a certain format will work in any machine in that format. Crossing brands is fine so long as the manufacturer is reputable and stands behind the product.

Choose from videotapes manufactured by traditional manufacturers of videotape, traditional manufacturers of audiotape, manufacturers of

video systems, and established dealers of tape. Do not buy videotape from unknowns who sell unmarked brands from behind trucks and risk damaging those fragile, expensive video recording/playing heads.

Making quality videotape is much more difficult than making quality audiotape. Videotape is wider, denser, and stronger; a much more complex signal is recorded. Missing or distorted scenes on a screen are more noticeable than a lapse in sound. The tape runs through a tortuous threading path, so it must be very strong.

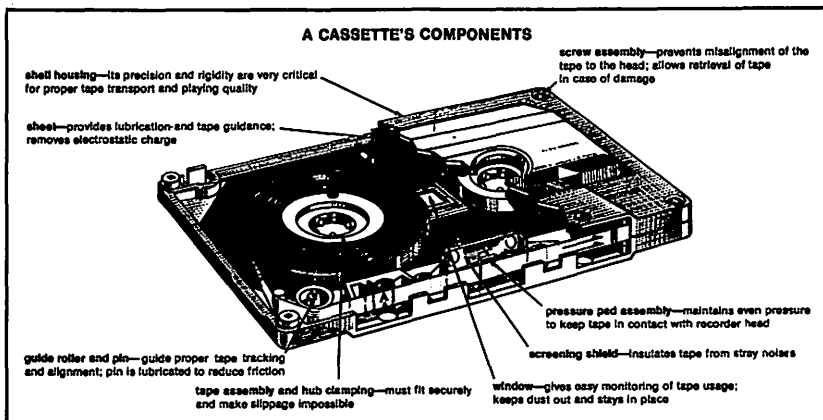
Furthermore, video heads revolve over the tape scanning the tape vertically, while in audio heads merely glide past the tape. The possible wear on videotape is therefore much higher, particularly in applications requiring slow motion playback and editing. Some manufacturers offer special, heavy-duty tapes for slow motion playback and editing.

Videotape cassette housings must also be of very high quality. Use the cassettes designed for extra-long play only when they are necessary and with great care: thin video tapes are especially fragile.

Fast forward and rewind a new videotape pack before use to loosen the tape and allow it to be wound by one's own system. Stored tape might stick slightly and cause wow and flutter.

Keep tape as close to 70°F and 50 percent humidity as possible. Changes in temperature put much stress on the tape. Putting cold tape that has been outside in the winter into a warm machine will result in condensation that interferes with playing. Protect all tape from dust and smoke. Store cassettes on end to prevent the tape pack from shifting.

To receive more specific information, scan the pages of this magazine for audiotapes, videotapes, and tape products.



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