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English 21003

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Technical Description: Cassette Tapes

Cassette tapes are a form of audio and video recording device that were incredibly popular in the 1970s when new advances promised better audio quality. Cassette tapes were created by Philips in 1962 in Belgium, later releasing it to Europe and then the United States. They have, since then, become obsolete and are only used by a small group of people, mainly those who were alive by the time these were created or those part of the small niche that still use such devices. This niche could be a result of the vintage trends being brought back in the past couple of years alongside other musical technologies of around the same time period such as vinyls which have also seen a surge in its use the past years.

The most common cassette tape was the “Type 1” or “IEC I” standing for International Electrotechnical Commission, these were made up of iron oxide tapes. Their popularity stemmed mainly because of their affordability retailing for about \$7-\$8 dollars per album in the 1980s and nowadays can be found for \$1-\$2 each.

The cassette tape is made up of a plastic or lightweight metal rectangular container that encloses magnetic tape used for the audio and video recording. This tape is coated with magnetic particles which according to an article by *QUARTZ* are either iron oxide or chromium oxide ferric oxide is also often times used. The magnetic properties of these materials is what makes them perfect for tape recording. Ferric oxide, iron oxide, chromium oxide and ferric oxide become permanently magnetized by the magnetic field you expose it to which allows for

recording and playback, you can also erase the contents of the tape and begin once again. They take up a zig-zag form making almost a flat coil look-alike shape, “about 400 million [coils/needles] per inch”. The particles are then put through a process in which binder is added, this process needs to take place under solely dust-free conditions in order to avoid anomalies in the tape formation as this will later on lead to errors in the recordings and replays. These are then transferred onto rolls of plastic film, once the processing of this coating is finished the film is cut into 3.8mm wide strips, the widths of these tapes sometimes vary depending on the making and use of the cassette. (*QUARTZ*)

Sound is transformed into these magnetic waves as the tape passes through a number of magnets found in a tape recorder. These magnets would rearrange the magnetic particles found in the strip of tape in a way that corresponds to the sound being recorded. After these particles are arranged the playback mechanism contains a coil of wire which would create a certain electric current which would be alternating direction to reflect the arrangement of the magnetic particles. Lastly, this electric current is then amplified and sent to a speaker which will vibrate as the electric currents pass through (Science Clarified).

Parts of a Cassette Tape:

Pressure pad: the purpose of this part of the tape is to press it against the machine being used which will allow it to read the recording.

Window: the window's purpose is simple, it allows you to look into the cassette and get an idea for how long you still have left on the tape. It is not supposed to be an accurate measure, it is just used as an estimate.

Supply Reel: holds the unused tape and it is what is being passed through the magnets. In other words, the supply reel cleanly “supplies” the empty notebook for the magnet to write the message in.

Tape: tape is the notebook. This part of the cassette is where all of the information is stored.

Write-protect Tab: this tab ensures that the tape recordings are not accidentally erased, disrupted or modified.

Take-up Reel: the take-up reel is where the recorded tape is organized.

Following the process of the magnets recording the message the tape is taken by the tape guides from the supply reel through the magnetic field and into the take-up reel.

Tape Guide: the tape guides are vital to the proper functioning of cassettes. Without tape guides the risk of the tapes getting tangled in the middle of recording or not even getting through the proper channels to reach the recording stage is immensely increased.

Magnetic Shield: the magnetic shield prevents already recorded tape or tape that has yet to be recorded to be modified. This part of the cassette tape is a preventive measure to ensure its proper functioning.

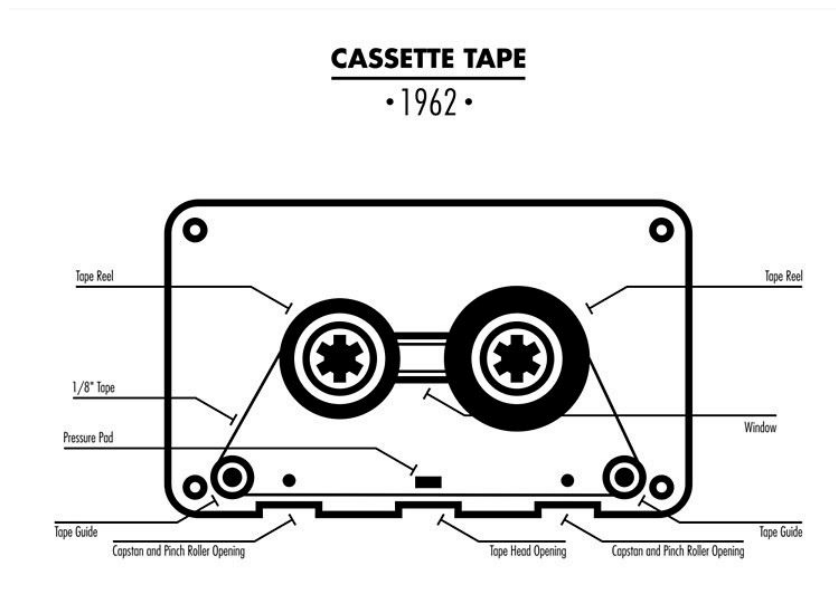


Figure 1: Parts of a cassette tape, “Cassette Tape Diagram’ Art Print by Luke Thornton.” *Redbubble*, www.redbubble.com/i/art-print/Cassette-Tape-Diagram-by-Feelklin/38824432.1G4ZT.

Capstan and Pinch-roller openings: the capstan is the rotating mechanism used to feed the tape throughout the tape recorder. This tape is specifically fed through the capstan and the rubber covered wheels, pinch-rollers. The pinch-rollers give the capstan the necessary friction to pull the tape through by pressing against it.

One of the main disadvantages of this type of technology is its relatively quick deterioration. Cassette tapes usually last an average of 30 years with proper care. The reason behind this might be due to a number of reasons some of the being: how thin the tape is which is directly correlated to how long the duration of such tape is, the type of coating used, how much one uses them, and lastly if its a double sided tape. First the longer the duration of a tape the thinner it is spread out which increases the chance of breakage. Chromium oxide is one of the coatings often used in the making of cassette tapes but it is one of the early deterioration-causing agents. Lastly double sided tapes will have a greater chance of deterioration as the risk of the magnetic fields colliding is greater.

The process of how the tape is read in a cassette tape by a recorder follows this sequence: the tape first begins on the supply reel at one side of the tape then moves through the magnetic heads of the recorder with the help of the tape guides to ensure the tape leaves the supply reel untangled, enters the magnetic field presented by the recorder properly and finally finishes at the take up reel undamaged. The magnets in the magnetic field “will realign the particles in correspondence to the volume and frequency of the sounds” (*QUARTZ*), creating the recording.

It would not be fair to denote what cassette tapes are and its uses without mentioning one of the largest companions of this advancement: the Walkman. Introduced to the public by Sony on July 1st, 1979, the Walkman, sold as “Sony Disco Jogger” during its early years in America, aided in the rise to popularity of cassette tapes as now people would be able to take their music

on-the-go. Although the company discontinued the making of this apparatus in 2010 as of March 31st, 2009 385 million units were sold proving its popularity.

Also, I would have liked to see more about how sound is transformed into magnetic waves, etc.

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