

The care of a Magnetic Tape

Modern magnetic tape coatings can retain the information recorded on them for an indefinite length of time.

The recording itself is now basically permanent, unless changed by the presence of a large(r) magnetic field.

However, like another archival record which has proved its ability to survive – the parchment and script of the Domesday Book – a magnetic tape and its recording can only be preserved in its original form if it's looked after.

Curiously, the curators of the Public Records Office, the present home of the original Domesday Book, will tell you that the same things that cause the deterioration of an archival document will also significantly deteriorate magnetic tapes.

The recording can be threatened by:

- Dirt and dust on the tape surface
- Damage to the edges of the tape by abrasion
- Damage to the edge of the tape by folding
- Stretching or distortion of the base film
- Cartridges or cassettes distorted by excessive exposure to heat
- Tape splices deteriorating due to excessive heat
- The recording area may be scratched
- The running characteristics of the tape may be affected by condensation

X-Rays

There's also a general belief that the recording on a tape can be affected by exposure to X-rays.

Experiments have shown that a tape is *not* affected by exposure to even large doses of X-rays.

Magnetic fields

Accidental erasure due to the presence of magnetic fields will only occur if the field is massive, and the tape is very close to the source.

Although any kind of magnetic tape – from the domestic compact cassette to the high performance tapes used to store computer data – will suffer if exposed to these problems, it's in the professional product domain that the impact will be more quickly noticed.

Physical damage to the base film of the tape, caused when the edges of the tape get buckled or folded, can occur as the result of a number of problems.

In a perfect situation, the tape is wound in an even pack without stepped sides, and clear of the sides of its reel. If the tape comes into contact with the reel, this may happen because the sides have been bent by being dropped, or the tape guides are incorrectly adjusted.

However, there's a simpler reason for a scattered tape wind. The normal shuttling between points on the tape which involve starting and stopping the tape transport, or any abrupt changes in the speed of a tape wind, may cause adjacent layers to scatter sideways, making the edges vulnerable to folding or buckling.

When the tape pack is subjected to undue acceleration or deceleration, inertia – coupled to the low coefficient of friction between one layer and the next – causes the tape to cinch, and the pack to develop uneven mechanical stresses throughout its length. Obviously, a careful and smooth operation of the tape deck will reduce the problem. Nevertheless, after a session where the tape has been partially run through the recorder, scattered winds can be eliminated by running the tape to the end, and completely rewinding. It's also important to secure the free end of the tape to the next wrap, rather than taping it to the reel flange.

Large variations of temperature will cause distortion of a cassette or cartridge case. The combination of temperature change and excessive humidity levels can cause tape splice adhesives to ooze, or dust and dirt to stick to the tape surface.

Thus, environmental changes should be minimised. Where there's a significant variation between the tape storage area and the equipment room, time should be given for the tape to adjust to the new conditions.

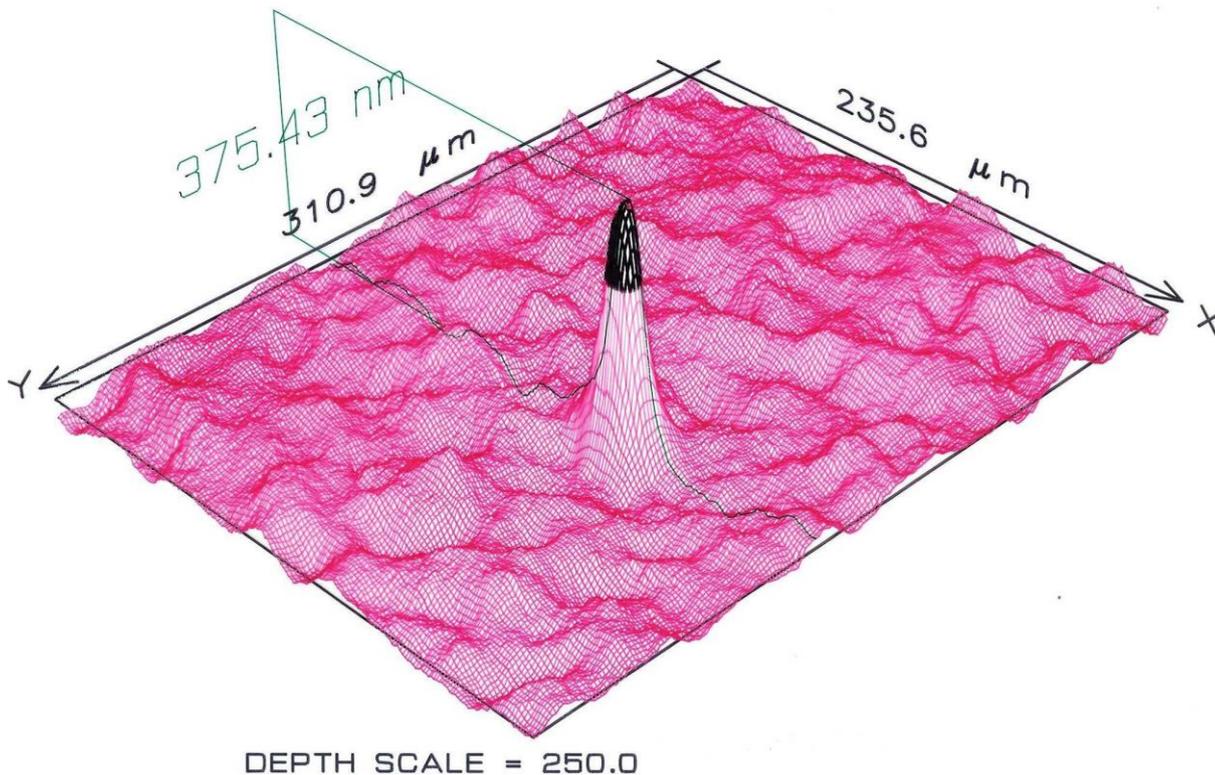
Indeed, a recording area should resemble a 'clean room' environment. This means careful control of temperature and humidity, and the maintenance of a positive air pressure to prevent dust entering when doors are opened.

Where tapes are to be stored for long periods, random samples should be inspected at periodic intervals to search for evidence of damage.

With modern polyester tape backings, it's no longer necessary to rewind reels regularly to relieve internal pressures. Large changes in temperature or humidity should be avoided.

Finally, for archival recordings, more extreme care may be needed, including storage in a sealed container filled with inert gas if the material needs to be archived "forever", in case it is unique historical material that we want to remain in its original existence. (like the first ever TV-recording on tape)

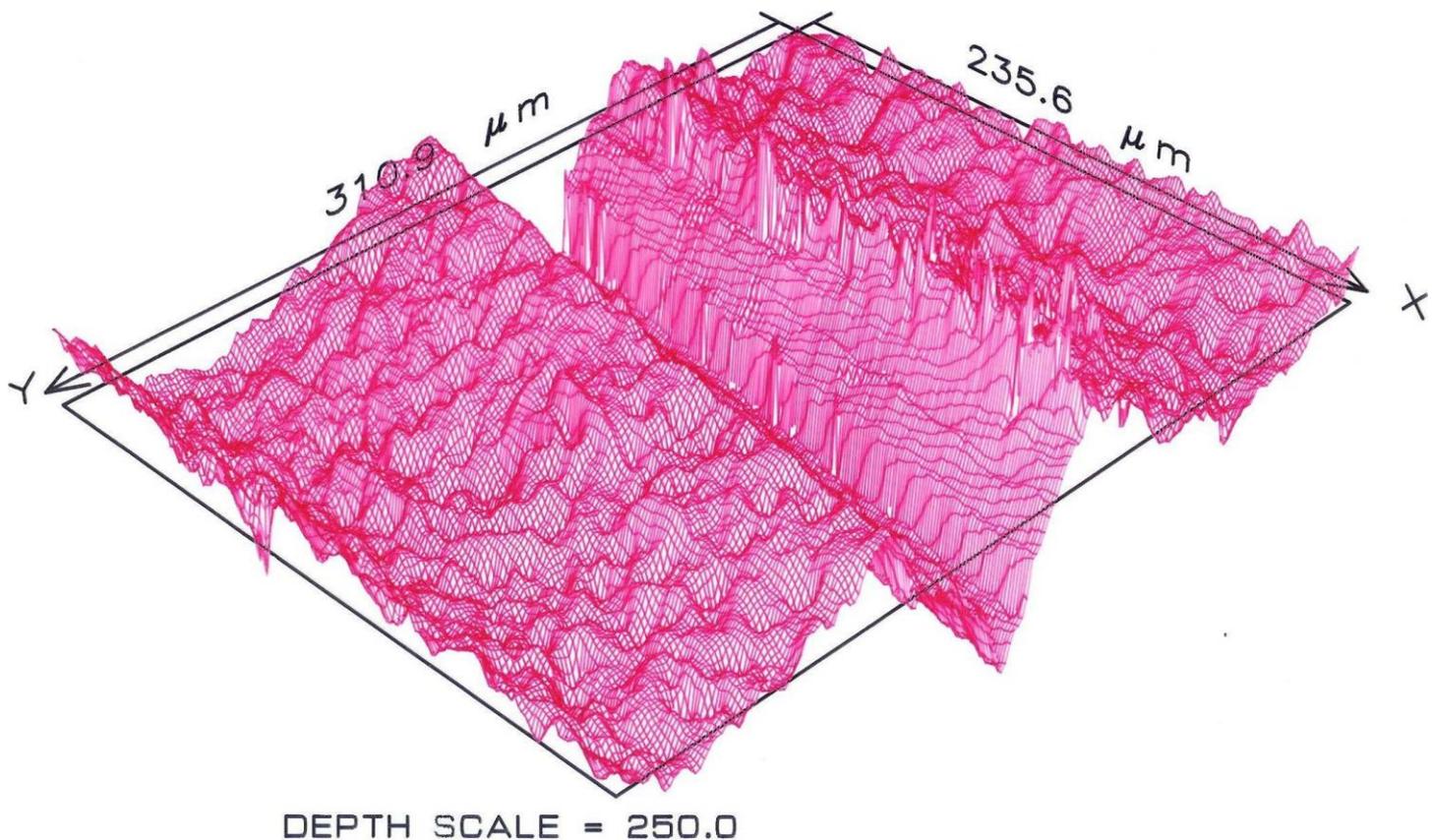
PARTICLE ON TAPE SURFACE



Impact of dust / debris on magnetic tape

The picture visualizes the impact that a dust particle can have on the quality of a recording. Particles which come in contact with the recording head will create a “spacing loss” between the recording/playback head and the magnetic tape, which leads to a “drop-out” in the recorded signal.

SCRATCH ON TAPE SURFACE



Scratch caused by dust / debris on magnetic tape

Dust particles can build up on a recording head and once big enough create a significant scratch on the tape surface. Where a scratch occurs the magnetic coating is partly removed and with the coating also the recorded signal(s) it contained.