"Will my disks go floo if I take them through?"

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The effects of a magnetic security system upon magnetic microcomputer storage media.

Computer diskettes have become as common a campus commodity as syllabi and chalk. Students and faculty think nothing of popping them in backpacks and briefcases and transporting them everywhere. Most computer users are aware that disks have certain handling and care requirements. Along with dust, fingerprints, heat and pressure, both the library and computer literatures resound with the commandment: avoid magnetic fields.[1,2,3]

Prompted by concern expressed by colleagues which was reflected in a question to *American Libraries* "Action Exchange"[4] and in reports to *Library Hotline*[5,6] concerning magnetic field damage to library media (including software), a series of experiments was designed to determine the effect of a magnetic security system (Tattle Tape model #31) on a standard 5 inch minifloppy disk.

Romeo and Watstein have succinctly outlined the basic structure of the 3M Tattle Tape security system:

> The Tattle Tape system operates on an electromagnetic principle. A thin pressure-sensitive detection strip is hidden in the book spine or between the pages in the gutter of a book or periodical. An exitway is formed by a detection post and lattice-like sensing unit which emits an electronic detection field from the floor to the top of the screen.[7]

> At the heart of the Tattle Tape Detection System is the Tattle Tape Detection Strip. This device is a small, thin, flexible, metallic strip which generates an electrical signal when stimulated by a low frequency alternating electromagnetic field.[8]

In addition to the exit gate sensor and the detection strips, the third component of the system consists of an activator/deactivator unit which mag-

[1] Ralph R. Dickman, "Choosing a Reliable Floppy Disk," *Interface Age* 9 (June 1984):70–72.

[2] Helen P. Harrison, "Software on the Shelf: Computer Materials in the Library," *Audiovisual Librarian* 9 (Winter 1983):45–48.

[3] Robert M. Mason, "All About Diskettes," *Library Journal* 109 (March 15, 1984):558–559.

[4] "Action Exchange, *American Libraries* 14 (December 1983):711.

[5] "More on Magnetic Field Damage to Videotapes," *Library Hotline* 13, no.15 (April 16, 1984):4.

[6] "More on Possible Damage to Magnetic Elements from Security Systems," *Library Hotline* 13, no.17 (April 30, 1984):7.

[7] Louis J. Romeo, "Electronic Theft Detection Systems, Part I: Small College Libraries," *Library & Archival Security* 2, no.3/4 (1978):1, 7–14.

[8] Sarah B. Watstein, "Book Mutilation: An Unwelcome By-Product of Electronic Security Systems," *Library & Archival Security* 5, no.1 (Spring 1983):11–33.

netically sensitizes and desensitizes the detection strips as part of the circulation process.

We considered the question: under what circumstances would the security system and any computer disks normally interact? We identified three possibilities. Repeated exposure to the exit gate sensor would be normal for any patron making frequent use of the library. Second, it is possible that disks might be exposed to sensitized or "hot" magnetic strips in the books used within the building. We also investigated an extreme case of prolonged exposure to the exit sensor, although this is unlikely to occur. Finally, the possible consequences of accidental exposure to the activator/deactivator unit were examined.

An Apple II computer was used to create a seqential text file, recorded on a Verbatim (Datalife) single density minifloppy disk. The Verbatim brand was chosen because of its widespread use.[9] The file contained 3,200 repetitions of the normal alphabetic sequence: A through Z. A verification program was then written to check that disk after each experiment to see if any data within the file had been lost, damaged, or altered. The verification program contained a "standard" alphabetic sequence against which each of the 3,200 alphabets was checked. The program recorded how many sequences matched its standard and how many failed the comparison. Thus, any deviation from the expected sequence of 83,200 characters (3200 × 26) would be detected and recorded.

Experiment I involved the help of a student assistant who carried the data disk past the sensor 100 times, as if exiting the building. The verification program showed no loss of data.

In Experiment II, a sensitized book was chosen at random from the collection. The Circulation Department checked the book to make sure the detection strip was "hot." The data disk was then placed inside the book and left undisturbed for 10 hours. As before, the verification program revealed the data to be unaltered.

Experiment III was designed to test an extreme situation: one unlikely to occur in practice. Particular concern had been expressed by some colleagues about carrying their disks past the exit sensor on a daily basis. The data disk was attached by its paper jacket to the exit gate sensor. It was left in this position seven days. The gate remained in continuous operation and continued to detect a number of sensitized books while the disk was attached to it. The verification program once again showed no alterations of the 3,200 alphabetic sequences during the 168 hour trial.

The first three experiments considered normal interactions between the disk and the security system. A less usual hazard is the accidental exposure of a computer disk to the activator/deactivator unit. The data disk was "accidentally" left as a bookmark in a book which was then passed through the activator/deactivator unit during routine check-in procedures. The verification program was unable to read the disk at all. Further examination of the disk by other programs revealed extensive damage to the operating system, disk directories, and data. For all practical purposes, the data disk was rendered unusable.

[9]See note 3.

Conclusions

This series of practical field tests supports the statements of Gene Heltemes, 3M engineer, that the Tattle Tape system has "such a weak magnetic field that it could not possibly damage a tape being carried through it."[10] Neither sensitized books nor the detection mechanism of the exit gate affected the type of disk used in these experiments. It appears that computer disks may be carried and used in the library without undue concern.

Accidents, of course, can still happen. The one that seemed most likely to occur (exposure to the activator/deactivator unit during check-in or check-out) constituted our fourth experiment. Such exposure did indeed render the disk unusable. It is the opinion of the authors that data disks, or in fact any magnetic media, should never be brought into close proximity with the activator/deactivator mechanism because of the demonstrated effects of its strong magnetic field. ■■

[10]See note 6.

New AAAS prize

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Nominations from ALA should be received at AAAS no later than December 31, 1985. The following information should be included: nominee's name, institutional affiliation and title, address, and brief biographical resume; statement of justification for nomination; and names, identification, and signatures of the three or more sponsors. The winner will be selected by a seven-member panel appointed by the AAAS Board of Directors.