COLLECTIONS AT RISK

Floppy disk

3 ½ INCH AND 5 ¼ INCH DISKS

Introduction

This guide aims to assist small to medium collecting organisations and individuals to care for floppy disks in their collections, specifically the common 3 ½ inch and 5 ¼ inch formats. The guide is not intended to replace the advice of a trained professional but provides the first steps in caring for floppy disk collections. This guide can be used in conjunction with other guides in this series: Digital, Film, Magnetic tape and Optical disc.

The information provided in this guide includes terminology and names of technologies and processes that are complex and specific to the format in focus. For many these terms and names may be challenging to recognise or understand. Please don't be discouraged, definitions can be clarified by consulting with a conservator, professional service provider, GLAM sector agencies as well as the references and further reading provided in this guide.

Background

Floppy disks have existed in various forms since the 1970s, including an 8 inch disk. The two most popular formats are the 5 ¼ and the 3 ½ inch floppy disks and these are the focus of this guide. Documents can be saved on a floppy disk and opened on another computer allowing for portability. Floppy disks can also be erased and rewritten. They have a plastic base with a magnetic recording layer on one or both sides on which the data is stored.

Assessment

When assessing your collection of floppy disks, ensure you have a clean workspace with enough room to carefully position the disks as you assess them. Allow space to document the condition of the disks and have any necessary equipment ready before you begin. This may include an additional light source, a notebook and pencil or a computer to record your findings, and a tape measure to distinguish sizes of the formats. It is recommended that you wear nitrile gloves when handling the disks, and to handle them with care.

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L-R: 5 ¼ & 3 ½ inch floppy disks

Media and materials

The two common-sized floppy disks are very different not only in appearance and size but also in materials. The 3 ½ inch disks are enclosed in a rigid plastic protective jacket while the older 5 ¼ inch diskette enclosures are more flexible. With both types, the slot in the jacket allows the read/write head to access the disk. As well as having the durable hard cover, the 3 ½ inch disk also has a sliding metal cover over the slot which protects the exposed magnetic disk when not in use. The 5 ¼ inch disk holds 160–360 kilobytes, and the 3 ½ inch disk has a storage capacity of 1.44 megabytes.

Condition issues

- Disks are vulnerable to strong magnetic fields, which can demagnetise the magnetic particles that store the data.
- Disks are especially susceptible to data loss from debris entering the cartridge – a small scratch can remove a single 'bit' of data that could make the disk unreadable.
- Each time magnetic media is used, a small amount of magnetic material is worn from the disk – frequently used disks may become unreadable due to data loss.
- Hardware obsolescence is a significant issue as floppy disk drives are becoming increasingly rare.

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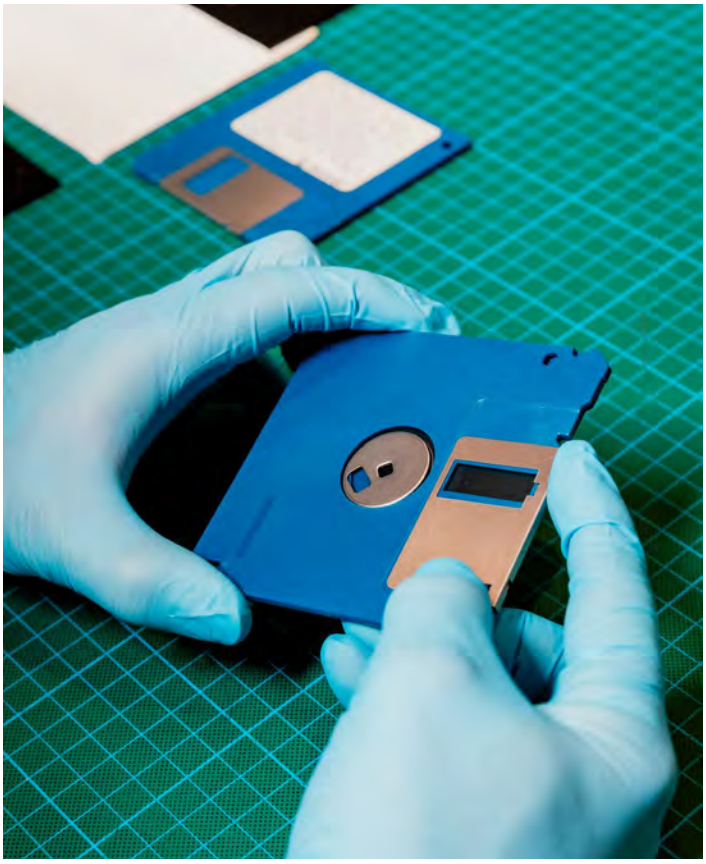
Retractable guard on 3 ½ inch floppy disks



Handling

- Do not touch the magnetic surface – the magnetic particles on the disk itself could be hazardous and the oils on your hands could damage the disk.
- Do not place heavy objects on top of floppy disks.
- Take care not to bend floppy disks as this could damage the disk.
- Do not drop the disks or handle the disks roughly. The shock of impact can disrupt some of the magnetic particles and result in a loss of information.

Preservation

Risks usually associated with art and heritage object-based collections such as incorrect relative humidity (RH%) and temperature, light, pest activity, pollutants and storage conditions can all adversely affect floppy disks. Good preventive conservation strategies will help to reduce these risks and assist in caring for your collection.

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Preventive conservation

- Store the floppy disk in a sleeve or box when not in use. Archival quality materials such as acid-free paper, Tyvek or inert plastics such as polypropylene are ideal. The enclosure should be static-free and non-abrasive.
- Store floppy disks in a stable environment. Hot, humid storage conditions will reduce the lifetime of media and cause irreversible physical damage.
- Store disks vertically, not at a slant or horizontally. Provide vertical supports every 10 to 15cms.
- Do not pack storage units too tightly. Shelve with enough density to allow items to remain vertical, but not so dense as to result in excess sideways pressure.
- Keep away from heat and light, especially ultraviolet radiation (UV). Warm plastic can easily deform, and light can accelerate degradation processes.
- Magnetic media should be at least a metre away from magnetic fields, such as 12-volt transformers and electric motors. Anti-theft detectors in libraries and stores can also cause damage.
- Keep relative humidity and temperature levels constant. Fluctuations can be damaging. Avoid abrupt changes in temperature. Relative humidity should not vary more than ± 3% in a month.

Floppy disks in storage

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- Acclimatise materials stored at cooler temperatures for 24 hours before use in warmer work areas.
- The following table demonstrates the recommended storage environment:

CONDITIONS	RECOMMENDED PARAMETERS
Temperature	9–15°C. Do not exceed 23°C.
Relative Humidity (RH%)	25–45 RH%
Light	Avoid direct sunlight and limit light exposure
Storage area	A dark, cool, dry, clean and stable environment

Potential treatment

- Clean disk drives regularly. Commercial head cleaning materials can be purchased online.
- Use a soft brush or microfibre cloth to gently wipe away dust when cleaning a floppy disk. Avoid the protective sliding metal cover or other fragile areas.
- If the disk has a broken protective sliding metal cover or other form of physical damage and is unreadable, contact a conservator or computer specialist to repair the cover so the disk can be accessed again.
- Further advice can be sought through a conservator via the AICCM directory of conservators.

Migration

Migration is a key method for ensuring ongoing access to content on floppy disks. It can be the act of transferring content from one storage technology to another, usually from an obsolete technology.

- Choose which disks you will migrate and create a priority list. Migration services can be expensive so perhaps not all disks will be able to be migrated. It will be harder to find a service that can migrate 5 ¼ inch disks.

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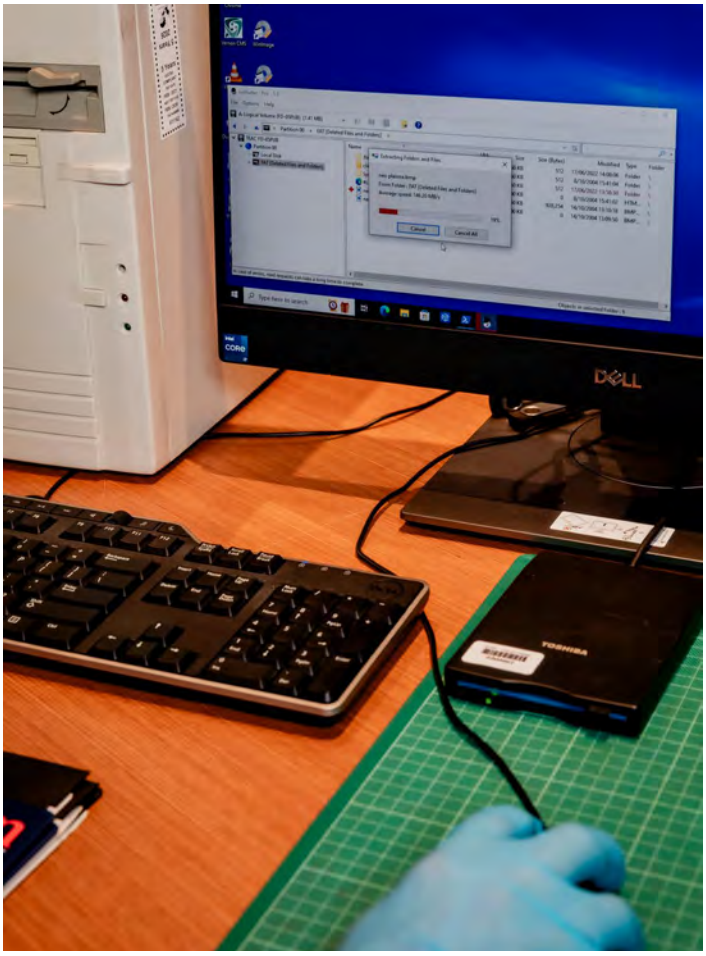
- External USB floppy disk drives can be used to migrate the material from a 3 ½ inch disk. These are available for purchase online.
- Check the condition of the disks to establish if any require treatment before migration.
- Labels on the disks that are lifting and peeling off should either be re-adhered or removed. Remember to document any important information on the labels before they are removed. As the migrated file will be separated from the original disks, thoroughly document any labels that are important for the provenance of the disk.
- Material on floppy disks can be migrated in two ways: by copying individual files from the disk to another storage device or by creating a disk image to preserve the complete disk structure and data including hidden contents.

Floppy disk capture station



Floppy disk

- It's advisable to make a preservation copy and an exhibition copy, and keep back-up copies in separate geographical locations as a preventative conservation measure.
- Migrated content may be incompatible within contemporary computer systems. An emulator designed to replicate compatible hardware and software might enable access to material within a contemporary system.

Disposal advice

Some components of these disks might be recyclable. However, the magnetic particles could be hazardous and should be handled by a professional. Check with your local council for an appropriate recycler near you.

References and further reading

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All photos by Matto Lucas. Captured onsite at ACMI in the Blackmagic Design Media Preservation Lab.