Using multimedia equipment

Introduction

Most libraries have some equipment for clients to use in the library or, less frequently, to borrow. This includes computers and related hardware (called peripherals), and audiovisual or multimedia equipment. If computer or other software - e.g., CD-ROMs, slides, videos, compact discs - form part of the collection, equipment is needed to access the information. Library staff also operate and maintain a range of office equipment, such as photocopiers and fax machines.

Library staff need to be able to use and maintain a range of equipment - audiovisual, office, computer and other equipment required for the operation of the library’s system(s).

When you have completed this section, you should be able to:

• use a range of equipment safely
• assist clients to use equipment safely
• keep appropriate records, including an equipment register, a maintenance schedule, and a booking system
• make a purchase proposal.

The main topics in this section are:

1. Multimedia and other equipment
2. Occupational health and safety
3. Sound
4. Projectors
5. Video and computers
6. Screens
7. Other equipment
8. Making purchase proposals
9. Keeping records

Multimedia and other equipment

‘Multimedia’ and ‘audiovisual’ are used interchangeably. They refer to equipment that is used to reproduce information from non-book material such as films, videos, microfiches, audiocassettes, and compact discs.
The term ‘hardware’ is also used to apply to equipment, including computer equipment. ‘Software’ refers to the materials that are shown, projected or played on the equipment. It is also used for computer programs. In general, a user needs hardware to access the information contained in the software.

Library systems make use of equipment such as barcode readers to make borrowing more efficient. There is also equipment to perform many functions previously done by staff - e.g., a book covering or self-checking machine. All this equipment needs to be operated correctly and maintained efficiently.

Some basic principles apply to the operation of all equipment. It is important to familiarise yourself with the equipment in your work area, and become efficient in learning to use any new hardware. You might begin at home, if you do not know how to program your video recorder, or connect a new CD player to your stereo system.

**Multimedia and other equipment**

Larger organisations usually have specialist staff to operate and maintain computer equipment. They may also have technicians who are responsible for audiovisual equipment; but often library staff maintain this as part of the collection.

Libraries acquire more and more equipment, and staff need to feel confident about installing it, operating it, maintaining it, and showing others - clients and staff - how to use it.

Concentrate on the principles of setting up and operating equipment. Most of the skills you gain setting up and using one piece of equipment are readily transferable to others. Learning to use written instructions, particularly the user manual, is an essential skill. Even badly written instructions can be helpful if you have a general familiarity with equipment, and you know what you are looking for.

**Occupational health and safety**

There are a number of issues that relate to health and safety in the workplace.

Legislation exists in each state and territory that requires attention to safe working practices, known and predictable hazards, and risk management.
Every organisation has a legal obligation to ensure that its clients and visitors, as well as its staff, are not put at avoidable risk.

Most adults also exercise common sense about danger and potential damage to their health and well-being.

In this section we will cover the specific health and safety issues of working with equipment. We will look at more general workplace health and safety concerns in the section on Staying healthy and safe at work.

The subtopics in this section are:

2a. General safety
2b. Handling equipment
2c. Setting up equipment
2d. Electrical safety

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### General safety 2a

Everyone working with equipment should be aware of the following general precautions.

- Inspect equipment regularly to keep it in good working order.
- Unplug broken appliances and have them repaired as soon as possible.
- Keep equipment away from water and wet areas.
- Always switch off equipment at the power point before pulling out the plug.
- Don’t overload circuits, fuses, and power points. Use a power board rather than double adaptors.
- Inspect plugs and electrical cables for damage. Have broken power points replaced by a licensed electrician.
- Keep electrical cords off the floor. This reduces damage and the risk of tripping.
- Know the location of the main electrical supply or fuse box.

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### General safety 2a

Here are more general precautions when working with electrical equipment.

- Know how to replace fuses and lamps correctly.

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Using multimedia equipment  page 3
• Take care when replacing a lamp that has just been used, as it may still be hot. Use a cloth or glove.

• Use trolleys to move heavy or bulky equipment.

• Use trolleys to raise equipment such as projectors to the correct height. Don't balance equipment on piles of books.

• When setting up rooms with equipment, make sure that people can exit easily and quickly. Check the position of equipment, screens and chairs.

• Know the location of fire extinguishers.

• Know the location of fire escapes and emergency exits.

• Use equipment correctly. Follow operational and safety instructions in the manual.

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Handling equipment

Here are some tips for handling equipment safely.

• Read the manual, and follow the operational and safety instructions.

• Never force parts of equipment that do not fit or operate easily. However you may need to ease or jiggle a part - for example, to fit the carousel onto a slide projector.

• Don’t drop or knock equipment.

• Wrap power cords around the leg or handle of a table or trolley.

• Do not use a machine if one part, such as the fan, is not working properly, as you may damage the equipment or software.

• Prevent heat build-up by allowing air to circulate. Do not place equipment on a soft surface, or operate it in an enclosed area, such as a shelf.

• Keep original operating instructions secure, and keep a photocopy with the equipment.

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Handling equipment

Here are more tips for handling equipment safely.

• Test the equipment before use.

• When you replace a lamp, do not touch the glass. Use a cloth, glove or the plastic sleeve that comes with the lamp.

• Unfold or unroll power cords when operating equipment.
• Keep all components of a machine, and the power cords, together. Label the equipment or case with a list of the components, and check when they are lent and returned.

• Remove batteries from equipment if they are not to be used for a while.

• Make sure equipment is switched off when plugging the power cord into the outlet.

• To disconnect any cord, grasp the plug. Never pull the cord.

Setting up equipment

Here are some principles for setting up most kinds of equipment safely.

• Place the equipment securely on a table or stand.

• Uncoil the power cord, plug it into a power point or board, using an extension cord if necessary, and turn it on.

• Make sure that the power cord and extension cord are out of the way of people stepping over them. If you cannot run the power cord around the edge of the room, either tape it to the floor or cover it with a mat.

• Turn it on at the power switch on the machine.

• For a group, test the unit with the sound and/or visuals before they arrive. Check the volume and clear sight in all the areas where they will sit.

• For projected images, make sure the image fills the screen and is square onto it. If necessary, move the projector, and/or adjust the focus.

Setting up equipment

Here are more principles for setting up most kinds of equipment safely.

• If the machine has a built-in speaker, turn it so that the speaker faces the audience.

• For equipment with a separate speaker, plug the speaker into the external speaker jack or earphone jack. Place the speaker facing the centre of the audience on a table or stand, so that it is at the head height of the seated audience.

• If you are in a room that has a built-in public address system, you may be able to plug it into that system. Check
whether you need an adaptor to match your output plug to the public address input jack.

- After use, remove the material and store it.
- Turn off the power at the unit and the wall, and remove the power plug from the power point. Replace the power cord in its compartment or loosely coil and secure to the equipment.
- Store the unit. Most equipment should be covered when it is not in use to keep it free from dust.

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<tr>
<th>Electrical safety</th>
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<tbody>
<tr>
<td><strong>Electric shock</strong></td>
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<tr>
<td>Electric shock occurs when a person touches a live electrical cable or equipment that has become ‘live’ due to an electrical fault, lack of maintenance, or a short circuit. The person becomes part of the electrical circuit and the current flows through their body.</td>
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<th>Electrical burns</th>
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<td>Electrical burns are caused by the direct passage of electrical current through the body. A burn can also be caused by direct contact with a hot surface, such as a lamp. While the surface of the skin may not show evidence of burning, electrical burns may affect deep tissue. Electrical burns are often slow to heal, and medical treatment should always be sought.</td>
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<th>Electrical fires</th>
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<td>Electrical fires can be caused by overheating of electrical wiring or equipment. You need to know fire alarm and evacuation procedures.</td>
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**First aid**
The first few minutes are vital in the rescue and resuscitation of an electric shock victim. Contact expert help if it is readily available. Otherwise every staff member should know the basics of first aid.

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<th>Sound</th>
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<td>Sound is recorded in many formats. Most libraries limit their collections to audiocassettes and compact discs (CDs), since these are the easiest to maintain. They are also the formats most clients are familiar with, and have equipment for listening to at home.</td>
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</table>
Some libraries only collect and lend sound recordings. Others provide facilities for use in the library by individuals and groups.

Smaller machines usually have built-in microphones and speakers, while larger equipment may have separate parts that need to be connected to the main amplifier.

This section deals with the equipment for playing sound recordings. It includes information about care of audiocassettes and CDs.

The subtopics in this section are:

Audiocassette player
• 3a. Audiocassette recorder/player
• 3b. Using audiocassettes
• 3c. Sound quality
• 3d. Maintaining the player
• 3e. Repairing audiotape
• 3f. Troubleshooting tapes

CD player
• 3g. CD players
• 3h. Operating the player
• 3i. Care of CDs
• 3j. Troubleshooting CDs

Caring for a collection
• 3k. Care of an audio collection

### Audiocassette recorder/player 3a

Most audiocassette machines record as well as play back. Although some only play, it is more common for a library to have audiocassette recorder/players.

This means that you need to ensure that audiotapes in the library’s collection are protected against accidental erasure. This is done by removing the erasure lugs on the cassette. Commercial tapes have the lugs removed. Tapes recorded by library staff or clients may need to have the lugs snapped off to guard against them being erased or recorded over.

If you want to record onto a tape after the lugs have been broken off, put sticky tape over the hole(s).
Audiocassette players need to be maintained by keeping them clean, especially the heads that read the magnetic signals on the tape.

**Using audiocassettes**

To play an audiocassette, insert the cassette so that the tape touches the playing head (which in this case is located near the operating buttons).

The buttons perform standard functions, but may be arranged differently on other players.

**RECORD:** Press to record. You may have to press **PLAY** and **RECORD** together.

**PLAY:** Press to play the recording.

**REW/REV:** Press to rewind the tape quickly. Press **PLAY** then **REW/REV** to rewind while hearing changes in the sound (e.g., from music to speech).

**FF/CUE:** Press to fast-forward the tape quickly. Press **PLAY** then **FF/CUE** to fast-forward while hearing changes in the sound (e.g., from music to speech).

**STOP/EJECT:** Press to stop the recording, remove the cassette, or open the lid.

**PAUSE:** Press to pause the recording briefly. Do not overuse, as it may damage the tape. Press again for the tape to continue.

**Sound quality**

Sound is recorded on audiotape when the metal oxide coating on the tape is magnetised.

On playback, the playback head senses the changing magnetic field on the tape and converts it to a voltage. An amplifier boosts the voltage to drive a speaker, which converts the voltage back to sound waves.

The sound is erased when the recording button is pressed, destroying any magnetic pattern (the previous recording) on the tape, and leaving it ready for the new recording.

If the tape is reused often, the coating (and the sound quality) deteriorate.
Sound quality

Tapes stored for long periods get ‘print through’ of magnetic signals. This results in a ghosted signal like listening to two tracks at once. Fast-forward and rewind tapes once a year to avoid ‘print through’.

Also fast-forward and rewind new tapes to achieve the correct tension for your player.

Audiotapes are unlikely to remain in good condition for more than 5 to 10 years. Irreplaceable recordings should be retaped regularly to preserve them.

Avoid:
- magnetic fields - e.g., library security systems, hi-fi speakers, televisions, vacuum cleaners
- heat and humidity, direct sunlight, hot cars
- dust and fingerprints
- exposing the tape to dirt through the opening of the cassette.
- accidental erasure - snap off the erasure lugs.

Maintaining the heads

Small particles of the metal oxide coating on the tape are deposited on the moving parts of the recorder/player, especially the heads. Over time this builds up, reducing the sound quality and damaging the surface of the tape.

Other dust and dirt can also accumulate inside a player that has not been used or played for some time.

Use a cotton bud moistened with methylated spirits, head-cleaning fluid or isopropyl alcohol. Do not use other solvents that may damage the heads.

Press the PLAY button and wipe all the moving parts gently but firmly.

Brush other dust loose, and remove using a damp cotton bud, puffer brush or mini vacuum cleaner.

A head-cleaning tape may be used, provided it uses a solvent that loosens and removes the particle build-up.

Cleaning after 50 hours of operation is recommended.

Repairing an audiotape

You can buy a splicing kit from an electronics store.
To mend a broken tape, follow these steps.
If you can reach both ends of the tape, make sure that they come out between the same two guide posts. If the tape ends are inside the cassette, you will have to open it by undoing the screws. (It is very difficult to take apart a shell that is glued or welded.)
Trim away any damaged section of the tape.
Follow the kit instructions.
Rewind the section you have repaired by turning the spool with a pencil.
Completely fast forward and rewind the tape before use.

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**CD player**

Compact discs are increasingly popular. Although no longer regarded as indestructible, CDs are certainly hardier than audiocassette tapes, and last longer.
Recordable CDs are widely available for computer use, but are not yet a standard for individuals or organisations to record their own sound.
Many libraries have collections of CDs for loan and use in the library. However, portable players are much more expensive and vulnerable than audiocassette players, so libraries are less likely to lend them to clients. Nonetheless, libraries should have equipment that enables clients to listen to CDs on site.

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**Operating a CD player**

Sound is recorded on a compact disc by coding digital signals onto the plastic bottom layer of the disc. A laser beam reads the information from underneath the disc, and turns it into sound via a computer and amplifier.

**Caring for the player:**
- Never touch the lens.
- If you need to move the player, check the instructions to make sure all fragile parts are secure.
- Occasionally clean the CD compartment by brushing out any dust with a puffer brush.
- Avoid water or humidity. Condensation inhibits the laser beam and can damage the player.
- Avoid direct sunlight or inadequate ventilation.
- You may use a lens-cleaning CD.
Care of CDs

The label is on top of the disc. Do not write on the label with a sharp pen or pencil, as the indentations may affect the quality of the sound reproduction.

Keep the bottom of the disc clean. Do not touch or scratch it, and be careful not to scrape it on the edges of the cover. Always store discs in their protective plastic cases (called jewel cases).

Do not bend discs.

If you need to clean a disc, wipe it gently in straight lines from the centre with a soft, damp (water only) cloth. Do not wipe in a circular motion. Do not use cleaning sprays, benzine, thinner or other solvent.

Do not store discs in:
- direct sunlight
- humid or dusty places
- hot places such as the glove box or rear ledge of a car.

Care of CDs

CDs are usually stored in a jewel case. The lid of the case opens at the hinge.

The disc is kept in place with a central claw.

To remove the disc, grasp the lid of the case as shown, and grasp the outside edges of the CD with your thumb and one finger. Do this gently and do not pull the disc.

While holding the outer edges of the disc, place your forefinger in the centre hole of the claw.

Gently press the centre of the claw, still holding the edges. You are releasing the spring tension of the claw. The disc should come away from the claw. Never force the disc, as this may warp it.

Store a disc in its jewel case with the label facing upwards. Gentle pressure at the centre of the disc allows it to be gripped by the claw.

Care of an audio collection

Extra information about caring for sound recordings can be found on the ScreenSound Australia [http://www.screensound.gov.au/Expertise.nsf/Sub+Pages/Advice+Audio+Care/] website.
Consult this if you have a large, valuable, or archival audio collection.

You can also consult ScreenSound for assistance with particular questions or problems - e.g., if your library has a flood.

### Projectors

Four types of projectors are considered in this section.

The subtopics in this section are:

- **4a. Projecting images**

**Overhead projectors**
- 4b. Overhead projectors
- 4c. Operating an overhead projector
- 4d. Care of overhead projectors
- 4e. Troubleshooting overhead projectors

**Slide projectors**
- 4f. Slide projectors
- 4g. Operating a slide projector
- 4h. Care of slide projectors
- 4i. Troubleshooting slide projectors

**16mm projectors**
- 4j. 16mm projectors
- 4k. Operating a 16mm projector
- 4l. Care of 16mm projectors
- 4m. Caring for film
- 4n. Troubleshooting 16mm projectors

**Microform readers**
- 4o. Microform readers
- 4p. Operating a microform reader
- 4q. Care of microform readers
- 4r. Troubleshooting microform readers

### Projecting images

Simple projectors work by passing light through an image on a transparent film, then through a magnifying lens system, and onto a screen for viewing.
In more complex systems, the light may pass through several lenses before reaching the film. These lenses, called condensers, collect and direct the light so that as much as possible passes through the film, then onto the magnifying lens. Reflectors behind the lamp ensure that all light from the lamp is directed toward the film.

Many projectors also have a sheet of thick flat (sometimes lightly tinted) glass. This acts as a heat filter, protecting the film from the heat of the lamp.

Because of the heat output of the lamp, many projectors have a fan assembly. Some fans turn on and off with the lamp switch; others are turned off by a thermostatically controlled switch. To prolong lamp life, always allow the fan to cool the lamp.

### Projecting images

The size of an image is adjusted by changing the distance between the projector and the screen. The closer the projector is to the screen, the smaller the image. The further the projector is from the screen, the larger (but less bright) the image becomes.

Many projectors also have a zoom lens that allows the image to be resized without moving the projector. This allows you to set up the projector in a convenient position largely independent of the size of the image.

The shape of the projected image is determined by lining up the lens with the angle of the screen. A shape other than square is called a 'keystone'.

Vertical keystoning means that the image is wider at the top than at the bottom, or vice versa. Alter the height of the projector using the height adjustment knobs, or tilt the screen.

If the image is wider at one side than the other - horizontal keystoning - move the projector or the screen so that they are square to each other.

### Overhead projectors

Overhead projectors (OHPs) are widely used when a visual display is required. They are relatively inexpensive, easy to operate and maintain, are suitable for small or large groups, and can be used in a normally-lit room. This means that the audience can take notes while they watch the visual display - a feature not shared by other types of projector.
The main problem you are likely to encounter with an OHP is the lamp. Lamps burn out, or simply darken with age, so that the display may be dull and difficult to see in bright light. It is important to change lamps when they become dull, and maintain the light path by cleaning the glass, lenses, reflectors, and mirrors as needed.

Operating an overhead projector

In an overhead projector, light is directed through a transparency or a liquid crystal display (LCD) panel, and the image is projected onto a screen.

The light is directed to a Fresnel lens, which condenses the light and directs it through a glass plate on which the transparency or LCD panel is placed.

The light shines through the image and is collected by lenses at the head assembly. A mirror is needed to project the image. In some models it is separate; in others, it is an integral component of the projection lenses in the head assembly.

A focus knob is used to focus the image. In some projectors, the head assembly is moved up and down the post, in others the post moves up and down. Less often the projection lens is rotated.

The OHP faces the screen, and the presenter faces the audience. Make sure that the OHP does not block the presenter’s view of the audience, or the audience’s view of the screen.

The image should be square on the screen. It can be adjusted by moving the projector or screen so that they are square to each other. You can also raise the projector to reduce the angle of the head assembly to the screen, or tilt the screen forward.

Overhead projectors become quite hot, so they usually have a fan. Some fans turn on and off with the lamp switch; others are turned off automatically when they cool down. Always allow the fan to cool the lamp.

Many projectors have a safety device to stop the power to the unit when the lid is open. When the lid is not fully closed, the lid switch is disengaged. The lamp does not work and the fan does not run. When the lid is properly shut, the lamp and fan both operate.

Care of overhead projectors

It is important to avoid:
• direct sunlight - the heat may warp the Fresnel lens
• carrying the projector by the arm or post.

Keep the display as bright as possible by
• cleaning all the components in the light path, using a lint-free cloth and window cleaner
• replacing damaged parts - e.g., a scratched lens
• making sure the main lamp works
• keeping a spare with the projector if that is your organisation’s policy
• not touching lamps with your bare hands - this can shorten the lamp life

The Fresnel lens is central to the projector’s operation. Make sure that
• it is not warped or otherwise damaged
• it is installed the right way up. If it is not, the light will be concentrated through the centre of the image, and you will see projected a bright circle on a dark background.

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**Slide projectors**

A slide projector enables good quality still images to be shown in a darkened room. Slides are widely used for art reproduction, architectural and drafting images, scenes of landscapes and cityscapes, and so on.

Most slide projectors in libraries use a round magazine or ‘carousel’ to hold the slides. The magazine sits on top of the projector, and the slides drop through a slot in the base to be projected. When changing the slide, an arm under the slide lifts it back into the magazine and the magazine is moved to a new position by a lever.

It is important to ensure that all slides have been returned to the magazine before the power is turned off and the magazine is removed.

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**Operating a slide projector**

Load slides into a magazine attached to the projector. They are projected onto a screen in the order they are placed in the magazine.

Load the slides upside down and, depending on the projector, sometimes also back to front. Read the instructions for the
projector, and try screening one or two slides, before you load all of them.

Place the magazine on the projector with O on the tray next to the lug on the projector.

If it does not sit properly check that the slot in the metal base plate is opposite position O.

Turn the power on. Adjust the position of the projector to position the image properly on the screen. Adjust the focus.

Project the slides using the advance button on the remote control.

To move to a slide other than the next one in sequence, hold the advance button down, and advance the magazine by hand in either direction.

Project the slides using the advance button on the remote control.

If a slide jams in the machine, first turn off the power at the power point.

Using a coin or flat-headed screwdriver, push aside and hold the slide tray central release latch.

Lift first the side of the ‘carousel’ opposite the lug on the projector. Tilt the tray towards the lug then lift off the ‘carousel’ releasing the latch.

Using a locking ring or cover secure the slides in the tray, then turn the tray upside down.

Rotate the metal base plate until it locks in position. The slot will be opposite the notch at position O.

Retrieve the slide that may have remained in the projector and return it to the ‘carousel’.

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**Caring for the projector**

Most of the rules for slide projectors are the same as for other projectors. These include:

- not blocking vents
- not tilting the projector further than the height adjustment legs allow
- not touching the lamp with your bare fingers
- not moving the projector while it is in operation, or while the lamp is still hot
• cleaning the light path (glass, lenses, reflectors, mirrors) where necessary
• inspecting the power cord and plug for electrical safety
• keeping the fan assembly free from dust with a small brush.

16mm projectors

Movie film is a series of still images or frames. Each frame is separated from the others by a thin black band, called the frame border.

Each frame is held stationary between the lamp and the lens, and projected for one twenty-fourth of a second. The next image is moved into position by a claw that engages the sprocket holes and pulls. So that the viewer does not see a blurred image as each frame is moved, the lamp is covered. When the next frame is in position, the shutter covering the light is opened to project the next image. The film moves between lamp and lens in a series of rapid jerks.

The soundtrack recording runs along the edge of the film on the other side from the sprocket holes. The soundtrack may be a magnetic strip or patterns of dark lines (optical recording system).

In an optical recording system the soundtrack is played when light from the exciter lamp passes through the patterns of dark lines. An electrical signal is generated, amplified and fed to the speakers. The film needs to pass smoothly over the sound drum for good quality sound.

16mm projectors

In order for the film to be held stationary between the lamp and the lens and then jerk forward, and at the same time to pass smoothly over the sound drum, there needs to be some slack in the film. If there is no slack, the film breaks or the sound is poor. A loop of film between the feed spool and the film gate (upper loop) allows the film to be jerked down by the claw without breaking. A loop of film between the film gate and the sound drum (lower loop) allows the film to pass smoothly over the sound drum.

Operating a 16mm projector

To set up a 16mm projector, remove the lid, unpack the power cord, and extend the projector’s arms.
Clean the film path, film gate and the area around the sound drum with a soft brush.

Put the feed spool with the film to be shown on the front arm and an empty take-up spool of the same size (or larger) on the rear arm.

Thread the film and secure the leader to the take-up spool. The leader is the clear or coloured film at the beginning of the reel. Wind the film a couple of turns around the spool.

When the switch is turned on, the film runs past the lamp and the exciter lamp, and onto the take-up spool. It may need to be focused and/or framed manually.

The film can be rewound by running it backwards through the machine.

When you have finished showing the film, turn the volume down and turn off the lamp before any tailer film is projected. The tailer is a piece of clear or coloured film which comes at the end.

Rewind the film directly from the take-up spool to the feed spool, bypassing the film path of the projector. Halt the rewinding before the final piece of film comes off the take-up spool to avoid it flapping about. Wind this last piece of film on by hand.

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**Care of 16mm projectors**

It is important to keep the parts of the projector clean, as dirt can prevent the film from running smoothly, affect the sound, and even damage the film.

- Dirt and film emulsion accumulate in the gate. Clean it with a puffer brush.
- Dirt also collects in the aperture. Clean it with a puffer brush.
- Clean the lens with a soft lens cloth.
- Clean the film rollers with isopropyl alcohol, and dry with a soft lint-free cloth.
- Do not move the projector while the lamp is still hot.
- Take care not to touch lamps with bare fingers.
- Make sure you keep a spare reel with the projector to use as a take-up spool.
- Keep the projector covered when not in use.
Caring for film

Very few libraries have 16mm film collections, as film is more expensive than video and requires more complex equipment to screen. Video has replaced film in most library collections.

However, there are several significant film collections, from which other libraries can borrow.

Film is valuable in particular situations: for instance, film can be shown to much larger audiences than video, as the image is much clearer. It also provides an ‘occasion’ for children, for whom video is part of their daily lives.

If a library borrows films, for example for a school holiday program, it is essential that staff know how to take care of them. Details about the care of film are available from ScreenSound Australia. [http://www.screensound.gov.au/Expertise.nsf/Sub+Pages/Advice+Film+Care/]

Microform readers

Microfilm and microfiches are the main types of microform used in libraries. They require special machines, called readers, that magnify the image so it can be read.

Microform readers use simple principles of projection. They have a light source, an arrangement of mirrors, a magnifying lens, a focus facility, and a screen to project the image.

As the microform image is very small, the film (in a roll or as a fiche) is placed very close to the lens. This enables as much light as possible to pass through the frame before it is magnified. The lens must be very good quality to magnify evenly over the whole area. The film must be held at the correct focal length to the lens. This is achieved by using glass flats (or plates).

Most readers have interchangeable lenses to provide more than one size of magnification. Microforms come in a variety of reduction ratios and need different lenses. 21 times (21X) to 48 times (48X) magnification are commonly available. In some readers two lenses can be installed at once.

Some models can only be used to read microfiche or microfilm. Others have interchangeable film carriers that allow the user to read either fiche or film. In some models users turn a handle to advance the film; others have motorised advance and rewind.

Reader/printers print the magnified image using some form of photocopy process.
Operating a microform reader

The reader needs to be positioned so that bright light does not fall on the screen, or the image will be difficult to see.

Place the microfiche on the lower glass plate (or flat). Make sure it is completely flat, and close the upper plate over it.

Light shines through the fiche and is projected onto the screen. A focus knob enables you to focus the image.

Most fiches have an index frame in the bottom left-hand corner. Use this, and the numbers and letters on the edges of the fiche, to find the frame(s) you need.

Care of microform readers

The glass flats, lens and screen must all be kept clean to provide as clear image as possible. They can usually be cleaned without removing them from the reader.

However, if they are really dirty, they can be removed for cleaning. Clean

- the glass flats with a lint-free cloth and gentle window cleaner
- the projection lens with a puffer brush or lens cloth
- the screen with a lint-free cloth and gentle window cleaner.

Make sure the lamp is still working after you have cleaned the reader.

Do not leave the fiche in the reader when it is no longer being used, as prolonged light can damage it.

Video and computers

Videos are widely available in libraries, since they are inexpensive, cover a wide range of information and entertainment, and can be viewed at home by most people.

Many libraries also have videocassette recorders (VCRs), so that clients and staff can view videos in the library.

Some libraries also have data projectors, devices that can project an image of a computer screen.

Both of these devices are covered here.

The subtopics in this section are:

Video recorders

- 5a. Videotape
Videotape

Videotape is similar to audiotape. Sound and images are recorded by magnetising the metal oxide coating on the tape.

There have been three formats of videocassettes available in libraries. None of them are compatible, and each format requires a different type of VCR. They are:

- **Beta**: 1/2 inch wide; now obsolete
- **VHS**: 1/2 inch wide; now the standard except for broadcasting
- **U-matic**: 3/4 inch wide; was widely used in educational institutions, but is now rare.

Heat and humidity are the greatest enemies of videotape. It is important to keep tapes dry and clean. Dust and dirt can also damage them. Strong magnetic fields, like some older security gates, may affect the magnetised tapes.

Tapes do not last forever. Valuable material should be copied so that a backup is kept. Tapes should be rewound or played at least once a year.

Videocassettes have tabs to prevent accidental erasure. A videocassette has only one tab because - unlike audiocassettes - information can be recorded on one side only.

On some machines, when the erasure tab is removed, the tape starts as soon as it is inserted in the player. Put sticky tape over the lug if you want to record over existing material.

Videocassette recorders

Different countries have different systems for transmitting TV signals. The most common are:

<table>
<thead>
<tr>
<th>PAL</th>
<th>NTSC</th>
<th>SECAM</th>
</tr>
</thead>
</table>
Videocassettes must be compatible with the library’s equipment. Some modern VCRs have the capacity to play PAL, NTSC and SECAM tapes.

If a tape gives a poor quality picture, first check the tape by playing it on another machine. If it is not good, throw it away (having first copied the content if it is valuable). A defective tape can damage the VCR.

If you are sure the tape is OK, the heads of the VCR may need cleaning. This is best achieved by having the machine serviced professionally.

**Connecting the VCR to a TV**

There are standard connections between a VCR and a TV. A number of different types of connectors are used with VCRs.

All these cables are needed:
- VCR to power - A cable connects the VCR to power.
- TV to power - A cable connects the television to power.
- RF out (VCR) to RF in (TV) - A cable sends the TV signal from the VCR to the TV.
- VCR to aerial - A cable connects the VCR to the aerial. VCRs usually get better reception.
- Video out (VCR) to video in (TV) - A cable sends pictures from the VCR to the TV to watch TV or a video.
- Video out (TV) to video in (VCR) - A cable sends pictures from the TV to the VCR when you are taping.
- Audio out (VCR) to audio in (TV) - A cable sends sound from the VCR to the TV to watch TV or a video.
- Audio out (TV) to audio in (VCR) - A cable sends sound from the TV to the VCR when you are taping.

**LCD panels**

You can project computer images onto a large wall screen, using
- a computer and a liquid crystal display (LCD) panel
• a data projector.

Both methods can be used for projecting text, data, graphics and animation.

An LCD panel is plugged into a computer and placed on a high intensity OHP. The liquid crystal display within the panel represents the image to be projected, and the light from the OHP shines through a glass window in the panel. An LCD panel may need to be used in a darkened room for best results.

Data projectors

A data projector has its own powerful light source and internal speakers, so that video can be projected. Data projectors have stronger light sources, and are able to be used in brighter locations than LCD panels.

Some newer data projectors use digital light processing (DLP) technology. These projectors use thousands of miniature mirrors to reproduce the image very accurately.

There are standard connections between a data projector and a computer.

• Data projector to power - A cable connects the projector to power.
• Computer to power - A cable connects the computer to power.
• Audio out (computer) to audio in (projector) - A cable sends the sound signal from the computer to the projector speakers.
• Video out (computer) to video in (projector) - A cable sends pictures from the computer to the projector.

Data projectors

Here are some things to be aware of when you are setting up a data projector.

• For older models, you usually need to turn the data projector on before you turn on the computer. (This is not necessary for newer models.) Read the computer's manual for instructions on adding devices.
• Turn the data projector on and wait for the lamp to warm up (if it is a metal halide lamp).
• If you are using a VCR, turn it on and make sure that a videocassette is ready to play.
• Adjust the image using the controls on the projector (or on the remote control). They should include focus, zoom, and
keystone adjustment. Make sure the image is square on the screen.

**Screens**

Setting up a screen is as important as positioning the projector correctly.

You may not have a choice as to which screen to use - your library may only have one. However, you need to be aware of several factors that enable the best possible image to be projected.

This section looks briefly at screens, and their effect on a presentation. For more detailed information, explore the website of the Da-Lite Screen Company [http://www.da-lite.com/educational_materials].

The subtopics in this section are:

- 6a. Terminology
- 6b. Types of screen
- 6c. Screen position

**Types of screens**

Front projection - that is, when the screen is in front of the audience - is the most common form. This is so whether the projector is at the front (e.g., an overhead projector) or the back (e.g., a slide or 16mm projector) of the room. The Da-Lite website lists many screen types [http://www.da-lite.com/educational_materials/front_projection.php]. Differences between them include

- type of surface
- whether the screen can be cleaned
- flame-resistance
- mildew-resistance
- size of viewing angle
- brightness of image.

**Screen position**

When you arrange a room for an audiovisual presentation, consider where you place:

- the screen
- the projector
• the first row of seats
• the last row of seats
• the width of the rows.

The screen
Position the screen to suit the audience - not the projector. It must be placed to allow everyone to see the images clearly. The bottom of the screen should be at least 1.2 metres above the floor. The image is brighter if there is no direct light on the screen.

The projector
Place the projector so that the image fills the screen. Moving it closer makes the image smaller; further away makes it larger. Be sure the cord is secured so that no-one can fall over it, and that it doesn’t prevent easy access to and from the room.

Screen position

The first row of seats
Seats should be no closer to the screen than twice the height of the image.

The last row of seats
Seats should be no further from the screen than six to eight times the height of the image.

The width of the rows
Seating should all be within the viewing angle recommended for the screen type, usually 30-40° from the centre line of the projector to the screen.

Other equipment
Library equipment includes computers, printers, barcode readers, scanners, photocopiers, and fax machines. More automated equipment is being developed all the time - for example, machines to cover books and charge out loans.

The subtopics in this section are:

• 7a. Responsibility for equipment

Personal computers

• 7b. Personal computers
• 7c. Setting up a computer
• 7d. Safe operation of a computer
• 7e. Healthy use for the operator
• 7f. Networks
• 7g. Modems
• 7h. Cleaning computers

Other equipment
• 7i. Printers
• 7j. Scanners
• 7k. Barcode readers
• 7l. Photocopiers
• 7m. Fax machines

Responsibility for equipment

As well as sound equipment and projectors, most libraries have a lot of other equipment. In large organisations, there are sometimes specialist technical staff to look after, for example, all the computer equipment. In others, the library maintains everything itself. If you demonstrate competence (and confidence!) with any hardware, you may well be asked to take care of all the equipment, including some things that are new to you.

Fortunately, this is not too difficult. Once you have an understanding of the principles, know how to consult and apply the advice in the manual, and feel confident that you can manage equipment, it is very likely that you will be able to work most things out yourself.

Personal computers

Large organisations have computer networks and usually specialist information technology (IT) staff. Sometimes there are technicians on the library staff; more often they form a centralised section to serve the whole organisation.

Smaller libraries may have an internal library network, and are more likely to be responsible for their own computers.

This section deals only with the most basic computer hardware issues. More complex situations will require specialist training and/or assistance.
Setting up a computer

To set up a computer, first unpack all the boxes and make sure that you have at least the following:

- the central processing unit (CPU) / box / computer / tower / brain
- the monitor and its cable
- a power cord for the monitor
- a keyboard and its cable
- a mouse or trackball and its cable
- a power cord for the computer
- documentation - set up booklet or chart and users’ guides
- floppy discs or CD-ROMs.

You may also have a printer and a modem (to connect to the Internet via a telephone line). Some computers (e.g., the Apple iMac) have a combined monitor and CPU.

Keep the packaging material (if you have room to store it), in case you need to move or return a piece of equipment for servicing.

File the paperwork for each machine. Record details of the specifications of the computer, software licenses, original software, serial numbers, supplier and service details.

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Setting up a computer

To connect the parts of a computer, follow the instructions that came with it. Different manufacturers have different plugs and connectors. If you are connecting up a new computer, the plugs and connectors will match. If you are connecting parts of different computers together, the plugs and connectors may be incompatible, and you may need to buy adaptors.

The CPU controls all the computer’s actions, so it must have power, and communicate with the monitor, keyboard, mouse, and any other peripherals, such as a printer, scanner, or modem. Sometimes it communicates with the mouse via the keyboard.

The monitor displays what happens in the CPU, so it must have power and communicate with the CPU. Sometimes it gets its power via the CPU.

The keyboard communicates with the CPU. Sometimes the mouse communicates with the CPU via the keyboard.
Safe operation of a computer

It is important that the workspace is:

- a sturdy, level surface
- at a height that allows the user to look forward to the middle of the monitor
- near power points (or a surge-protected power board)
- large enough to allow air to flow around the back of the CPU
- large enough for the CPU, keyboard, monitor and mouse
- free from dust or damp
- positioned to avoid light shining directly onto the monitor or the user
- not likely to be bumped.

You should also

- secure cables and power cords with plastic ties
- keep power cords out of the way of users
- keep the work area free of clutter
- place clients’ computers where staff can monitor use and help clients.

Healthy use for the operator

Much discomfort and even injury are caused by bad posture and poor positioning of computers and related equipment.

There is more about healthy computer use in Managing work.

Eyes need to be level with the top third of the screen. The monitor should not be in the glare of any light. Otherwise neck and eye problems can result.

You must sit up straight, or back problems can result.

Arms and wrists must be level with the keyboard, or pain in wrists and forearms can result.

Legs should be comfortably straight, and feet touching the floor or a footstool.

Networks

If your computer is part of a network, it may need a network interface card (NIC) installed, and networking software loaded. The cable will connect from the wall to your CPU.

Your network is likely to provide a connection to the Internet.
You need to know:

- whether the organisation has one network or more than one
- whether you are connected to a wide area network (WAN)
- who your network administrator is.

**Modems**

Most new computers have internal modems. However older stand-alone computers may need a modem to enable them to connect to the Internet. They also need modem software; this is often bundled with the computer.

The CPU communicates with the modem, which converts the computer’s digital signals to the analogue signals recognised by the telephone system, and vice versa. The modem connects to a telephone wall socket with a cable that looks like a telephone line.

The modem communicates with the CPU, and needs its own power. It converts the computer’s digital signals to the analogue signals recognised by the telephone system, and vice versa. The modem connects to a telephone wall socket with a cable that looks like a telephone line.

The signal from the Internet comes via a phone line to the modem, which converts the analogue signals of the telephone system to digital signals for the computer, and vice versa.

**Cleaning computers**

**Monitor**

- Dust the screen with a soft lint-free cloth.
- Avoid aerosol sprays, solvents and general commercial cleaners.
- Antistatic cleaning wipes are available if the screen is dirty.

**Mouse**

- Keep the workspace clear, dry and free from dust.
- Use a mouse pad.
- Clean the connections inside the mouse from time to time. This makes the mouse more sensitive to movement.

**Floppy disk drive**

Residue and metal oxide build up on the read/write heads. You can clean the drive with a special head cleaning diskette. It
should contain a solvent and a nonabrasive cloth-covered disk, so that it doesn’t damage the head.

**Cleaning computers**

**Keyboard**

- Most problems with keyboards arise from food and drink being spilled into them. It is essential to require users (clients and staff) not to eat or drink while using computers.
- You can turn the keyboard over and tap it gently, or use a soft brush or a can of compressed air, to remove dust and dirt. You can buy long lint-free swabs for cleaning between the keys.
- For sticky keys, turn the computer off first and pop off the top (cap) of the key. Clean using a lint-free swab and isopropyl alcohol. Dry with compressed air and replace the cap. Clean one key at a time.
- Most technicians advise against removing the housing, as it is notoriously difficult to replace and keep all the cables intact.

**Printers**

**Setting up**

- Place the printer near the computer, so that the printer cable can reach easily.
- Following the instructions in the user guide, connect the printer cable to the CPU.
- Plug the printer into a power point or power board.
- Load the appropriate printer driver. This is the software that allows your CPU to communicate with the printer. Read your printer user’s manual for instructions.
- Load the printer with paper.

**Care and maintenance**

- Printers often have their own cleaning equipment (e.g., a soft brush) and/or cleaning program (e.g., hold the GO button for 20 seconds).
- Follow the instructions in the user guide.

There is extensive information about getting the most from your printer in the online magazine CanadaComputes.com [www.canadacomputes.com/v3/print/1,1019,4533,00.html]
Scanners

A scanner is used to digitise text and images. It connects to the CPU by a cable, and uses scanning software installed on the computer.

The scanner passes a bright light over the original, and converts the light and dark areas into digital signals. These signals are stored in the computer and interpreted as an image. Optical character recognition (OCR) software enables the computer to interpret and store text.

Keep the glass clean with a damp cloth and, if necessary, mild detergent or glass cleaner (on the cloth, not directly on the glass).

Barcode readers

A barcode reader decodes a barcode by shining light on it and decoding the pattern reflected back to it.

Barcode readers used in libraries include wands and scanners. A wand, or light pen, is swiped across the barcode.

Scanners are held a few centimetres from the barcode. Some are enclosed in a hood which can be rested around the barcode while scanning. Scanners are generally better than wands for reading barcodes on irregular surfaces.

Do not touch the lens of a light pen or scanner, as fingerprints affect their precision. The lens can be wiped with a soft, lint-free cloth if necessary.

Photocopiers

Photocopiers have a wide range of functions, including

- double-sided copying
- copying from books without stressing the spine
- enlarging and reducing copy size
- darkening and lightening the copy
- collating and stapling multiple copies.

It is important to keep the photocopier clean, and ensure that it always makes good copies.

Clean the following once a week or whenever copies are poor:

- the glass and inside the cover - use a damp cloth and, if necessary, mild detergent or glass cleaner
- the corona wire in some copiers - check the user’s manual.
Check the paper to see which side should be printed on. Keep unused paper in the wrapper, as it may dry out and jam the copier.

Replace toner according to the user’s manual. Take care not to get any toner on your skin or clothes. Gently brush off any toner and wash your hands in soap and cold water as heat sets the toner. Read the user’s manual for instructions on cleaning up spilt toner.

Fax machines

A fax (facsimile) machine is both a scanner and a printer.

The scanner digitises text and images.

The digital signals produced by scanning are converted to sound which is communicated via telephone lines.

When the fax machine receives the sound, it converts it back into digital information.

Some fax machines use a thermal printing technique which prints onto special thermal paper. The image is not permanent, and fades with time and storage in plastic.

Plain paper faxes mainly use ink-jet or laser printing techniques.

Fax machines do not usually need much care. Check your user’s manual for any required routine maintenance. In general, once a fax machine jams frequently or makes poor copies, it is likely that it needs service from a qualified technician.

Making a purchase proposal

A purchase proposal (also called a submission) is a formal document that aims to persuade a person at a higher level to authorise some spending. It contains factual information in enough detail to support your recommendation.

Some organisations have a standard form or preferred format for purchase proposals.

Keeping equipment records

Libraries need to keep proper information on equipment use, maintenance, and service history. They vary as to the details, and the way in which the information is recorded.

The subtopics in this section are:

- 9a. Procedures manuals
• 9b. Registering new equipment
• 9c. Arranging routine maintenance
• 9d. Operating a booking system
• 9e. Providing instructions

**Procedures manuals**

A procedures manual should always be kept. This manual outlines processes such as ordering, registration, maintenance, loans, and disposal of the equipment.

An equipment register is the easiest way to store information about your equipment. It is also useful for insurance and auditing purposes.

Many organisations also have procedures for recording the equipment which is sent out to be repaired, following up repairs, recording what repairs have been carried out by whom, when, and at what cost, and noting the reliability of repairers.

You also need a system for reserving and lending hardware and software, as well as booking specialised viewing rooms and setting up equipment. A procedures manual should record details of the booking system.

**Providing instructions**

Equipment always comes with written instructions, like a user manual or guide. However, if they are not filed away immediately, they are very easily mislaid. The most effective way to manage manuals is to copy the necessary instructions, keep the copy with the equipment, and file the original safely.

The language of user manuals is not always simple to follow. They are usually written by technical people, who may not understand the difficulties non-technical people have operating equipment.

It may be useful to write a simple set of instructions for users, whether clients or library staff. Signs are especially helpful if they are displayed where they can be read easily while looking at the equipment.

To write instructions, keep your language simple. Use short sentences in the active voice, such as ‘Insert the batteries. Make sure...’

Diagrams or pictures are useful if they show exactly what the user is looking at. Keep diagrams simple, and label them where appropriate.