



Module Four of Ten

Maintaining Microfilming Equipment

TRAINING *in* PRESERVATION MICROFILMING

Module Four of Ten

Maintaining Microfilming Equipment

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National Library of Australia
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Introduction

Welcome to Maintaining Microfilming Equipment.

The purpose of this module is to:

- I familiarise you with ways of making sure that microfilm equipment is properly maintained
- I introduce some systematic trouble-shooting techniques
- I introduce you to some equipment suppliers.

Prerequisites

This is the fourth module in the series of training materials on preservation microfilming.

Before you start on this module, you need to have satisfactorily completed the introductory module **Preservation Microfilming—Basics**. This will give you the background information which you need before you start on this module.

Learning outcomes

When you have successfully completed this module, you will be able to:

- I monitor microform equipment use and make sure that equipment is properly maintained
- I use trouble-shooting techniques to identify equipment problems
- I identify suppliers of new and replacement microfilm equipment.

In competency-based training models, the **learning outcomes** closely relate to the term **elements of competency**.

Recognition of current competencies (RCC)

You may already have knowledge, experience and skills which are relevant to this module.

This means that if you wish to complete a formal Preservation Microfilming course, you may not have to study all of it.

Please discuss this with your course coordinator, or lecturer. Evidence of your microfilming competence, and/or an assessment, such as a practical test, will be required.

Assessment

If you are formally studying the Preservation Microfilming course, you must meet certain **performance criteria** in order to demonstrate your competency in each unit or module. These criteria form the basis of your assessment. They are listed at the beginning and end of each topic.

As you work your way through these training materials, you will need to keep a record of the **performance criteria** and other learning **activities** that you have completed.

Conditions

You will also need access to the following, either in your own workplace or by arrangement with another organisation:

- I a range of microfilming equipment such as cameras, processors and readers
- I equipment manuals with trouble-shooting lists for identifying and correcting equipment problems

- I equipment maintenance and service history files
- I a list of whom to contact for technical assistance with equipment problems
- I supplier information about availability of equipment.


Check with your lecturer/assessor or mentor if there are any problems with access to the above equipment and information.

Activities

There are two types of learning activities in this module which are indicated by the icons below:

■ Activity

Responses to these activities are written in this book. They are usually short tasks which keep you involved with the issues you are considering and may also require you to apply what you are learning.

Some of the activities in these training materials require you to perform certain tasks, such as loading a camera or operating a processor. A lecturer or assessor will observe you performing the tasks and then examine the results or the product (e.g. the newly processed microfilm) to check that it meets requirements. Major activities are marked with the symbol .

● Reflect

Here you will be asked to think about key issues, usually in consultation with workplace colleagues, and come to some conclusions. The purpose of these activities is to allow you to share your understanding with others, and benefit from wider experience than your own.

You will need to be prepared to discuss your findings or conclusions with your assessor or lecturer who will be signing off the relevant **performance criteria**.

▲ Submit

When this icon appears, you are ready to record in the **Log book** that you:


- I can meet the **performance criteria**
- I have satisfactorily completed the activities for a topic.

You can record these by marking off the boxes in the shaded columns with a ✓ **yes** or ✗ **no**.

You can then ask your lecturer or assessor to verify that you can meet the performance criteria and that you have satisfactorily completed the activities.

If you work through the various activities along the way, you will find the assessment activities relatively easy to complete.

Resources

 **There are a number of resources available on preservation and preservation microfilming. A librarian can help you find out where these resources are available.**

Below are a few:

Printed materials

Adcock, Edward P. (ed. & comp.) 1998, *Principles for the Care and Handling of Library Material*, International Preservation Issues, number 1, IFLA-PAC, Paris.

Address: IFLA Core Programme for Preservation and Access (PAC) Bibliotheque Nationale de France, 2, rue Vivienne, 75084 Paris Cedex 02, France.

(Available online at IFLA website as *Principles for the care and handling of library material*, <<http://www.ifla.org/VI/4/news/pchlm.pdf>>, accessed 4 May 2003.)

Canadian Cooperative Preservation Project 1993, *Guidelines for Preservation Microfilming in Canadian Libraries*, Prepared by the National Library of Canada for the Canadian Cooperative Preservation Project, Ottawa.

Elkington, Nancy E. (ed.) 1992, *RLG Preservation Microfilming Handbook*, Research Libraries Group, Mountain View, California.

Elkington, Nancy E. (ed.) 1994, *RLG Archives Microfilming Manual*, Research Libraries Group, Mountain View, California.

Fox, Lisa L. (ed.) 1996, *Preservation Microfilming: A Guide for Librarians and Archivists*, 2nd edn, ALA, Chicago.

Genealogical Society of Utah 2001, *Camera Operator's Manual*, 2nd edition update, Genealogical Society of Utah, Intellectual Reserve Inc., Salt Lake City.

Harvey, Ross 1993, *Preservation in Australian and New Zealand Libraries: Principles, Strategies and Practice for Librarians*, 2nd edn, Charles Sturt University, Wagga Wagga.

Heritage Collections Council Secretariat, Department of Communications, Information Technology and the Arts 1998, *ReCollections: Caring for Collections Across Australia*, Heritage Collections Council Secretariat, Department of Communications, Information Technology and the Arts Canberra. (The resource *ReCollections* is also available online from the Museums Australia website, <<http://amol.org.au/reollections/>>, accessed 15 May 2003.)

Manuals for the installation and operation of microfilm equipment.

Meyer, Lars & Gertz, Janet 1993, *RLG Guidelines for microfilming to support digitization*, Research Libraries Group, Mountain View, California. Available online at <<http://www.rlg.org/preserv/microsuppl.pdf>>, accessed 12 May 2003.

Microform and Imaging Review 1972–, (journal), quarterly, K. G. Saur, Munich, Germany.

Micrographics Year Book 1981– 2001 (annual), G. G. Baker, Windlesham, Surrey, UK. (Last edition 2001).

National Library of Australia 1995, *Preservation Microfilming: Does It Have a Future?* Proceedings of the First National Conference of the National Preservation Office, at the State Library of South Australia, 4–6 May, 1994, National Library, Canberra.

National Library of Australia 1998, *Guidelines for Preservation Microfilming in Australia and New Zealand*, National Library, Canberra.

National Preservation Office 2000, *Guide to Preservation Microfilming*, The Office, London.

Saffady, William 1990, *Micrographic Systems*, 3rd edn, Association for Information and Image Management, Silver Spring, MD.

Saffady, William 2000, *Micrographics: Technology for the 21st Century*, Association of Records Managers and Administrators, Prairie Village, Kansas.

SEACAP (Southeast Asian Consortium for Access and Preservation) 2000, Proceedings of the International Meeting on Microform Preservation and Conservation Practices in Southeast Asia: Assessing Current Needs and Evaluating Past Projects, February 21–24, 2000, Chiang Mai University, Chiang Mai. (Available from the SEACAP website, <<http://www.seacap.chiangmai.ac.th>>, accessed 4 May 2003.)

Standards (relevant):

ANSI/AIIM MS23 – 1998 Standard for Information and Image Management – Standard recommended practice for production, inspection and quality assurance of first-generation silver microfilm of documents.

MP 25 – 2002 Basic Guide to microfilming – Miscellaneous Standard. Standards Australia.

See also the list of international standards in the **Learning Guide**.

Internet sites

(As internet sites change frequently, you may need to use a search engine to identify the latest location)

AICCM (Australian Institute for the Conservation of Cultural Material Inc.), <<http://www.aiccm.org.au>>, accessed 15 May 2003. Address: GPO Box 1638, Canberra ACT 2601, Australia.

AIIM (Association for Information and Image Management), <<http://www.aiim.org>>, accessed 4 May 2003, and its sub group the Film-based Imaging Association, <<http://www.fbi.aiim.wegov2.com>>, accessed 14 May 2003. The film-based imaging association has a buyers guide of U.S. manufacturers and distributors of micrographic equipment and supplies. Address: 1100 Wayne Avenue, Suite 1100, Silver Spring MD 20910 USA

ANSI (American National Standards Institute) <<http://www.ansi.org>> accessed 15 May 2003. ANSI administers and coordinates the U.S. standardisation system. Address: Customer Service, American National Standards Institute, 25 West 43rd Street, New York, NY 10036.

Artlab Australia, <<http://www.artlab.sa.gov.au/>>, accessed 3 May 2003. (Artlab provides a range of conservation and preservation information and services.) Address: Artlab Australia, 70 Kintore Avenue, Adelaide South Australia 5000, Australia.

BSI Group (British Standards Institution), <<http://www.bsi-global.com>>, accessed 13 May 2003. The source of information and supply of British microfilming standards. BSI Group 389 Chiswick High Road, London, W4 4AL, UK.

CLIR (Council on Library and Information Resources), <<http://www.clir.org/>>, accessed 3 May 2003. Address: 1755 Massachusetts Avenue, NW, Suite 500 Washington DC 20036, USA

COOL (Conservation Online), <<http://palimpsest.stanford.edu/>>, accessed 14 May 2003. Hosted by Stanford University, USA, this is a comprehensive source for online information for preservation in libraries and archives.

ECPA (European Commission on Preservation and Access), <<http://www.knaw.nl/ecpa/expo.htm>>, accessed 3 May 2003. Hosts GRIP – which is a Gateway for Resources and Information on Preservation. Address: Royal Netherlands Academy of Arts and Sciences, Kloveniersburgwal 29, P.O. Box 19121 NL-1000 GC Amsterdam, The Netherlands.

G.G. Baker and Associates, <<http://www.ggbaker.com/>>, accessed 15 May 2003.

This organisation provides detailed advice about micrographic systems. The web site includes links to suppliers and also provides background information about areas of microfilming from jacketing to linking with electronic document management systems.

Address: Saffron Hill, Chedworth, Glos. GL54 4AL UK.

IFLA (International Federation of Library Associations and Institutions) Preservation and Conservation (PAC) Core Programme, <<http://www.ifla.org/VI/4/admin/general.htm#1>>, accessed 15 May 2003.

IFLA-PAC Bibliothèque Nationale de France, Address: 2, rue Vivienne, 75084 Paris Cedex 02, France.

- See also *Principles for the care and handling of library material*, <<http://www.ifla.org/VI/4/news/pchlm.pdf>>, accessed 15 May 2003.

- A number of back issues of *International Preservation News* are available direct from the IFLA website, <<http://www.ifla.org/VI/4/pac.htm#4>>, accessed 15 May 2003.

- The IFLA-PAC Centre at the National Library of Australia maintains a *Documentary Heritage Preservation Register*. This provides information about preservation projects in the Southeast Asian and Pacific regions such as microfilming, training, basic conservation and collection surveys, <<http://www.nla.gov.au/dhpr/>> accessed 15 May 2003.

IPI (Image Permanence Institute) <<http://www.rit.edu/~661www1/>>, accessed 15 May 2003. The IPI is a university-based research laboratory devoted to image preservation. Address: Rochester Institute of Technology, 70 Lomb Memorial Drive Rochester NY 14623-5064, USA.

ISO (International Organisation for Standardisation), <<http://www.iso.ch/>>, accessed 15 May 2003. Address: ISO Central Secretariat PO Box 56 CH-1211 GENÈVE Switzerland.

Library Preservation and Conservation Tutorial – Southeast Asia. Designed for librarians and conservators in Southeast Asia, it has a range of information on preservation, including microfilming, <<http://www.librarypreservation.org/>>, accessed 15 May 2003.

The Microfilm Shop, <<http://www.microfilm.com/>>, accessed 15 May 2003. Provides product information, news and views with a focus on business applications.

MICROLINK-L is an email discussion list on preservation microfilming jointly owned by the National Library of Australia and the State Library of South Australia, <http://www.nla.gov.au/nla/listserv/microlink_l.html>, accessed 15 May 2003.

Museums Australia, <<http://amol.org.au/>>, accessed 15 May 2003.

Address: PO Box K36 Haymarket NSW 1238.
(The resource *ReCollections* is also available online from the Museums Australia website, <<http://amol.org.au/reollections/>>, accessed 15 May 2003.)

National Library of Australia <<http://www.nla.gov.au/>>, accessed 15 May 2003.

Address: Canberra, ACT 2600, Australia
National Library of Australia. *Policy on Preservation Copying of Collection Materials*, <<http://www.nla.gov.au/policy/micro.html>>, accessed 15 May 2003.

National Library of Australia. Anica – Australian Network for Information on Cellulose Acetate, <<http://www.nla.gov.au/anica/index.html>>, accessed 15 May 2003. See also MICROLINK-L <http://www.nla.gov.au/nla/listserv/microlink_l.html>, accessed 15 May 2003, and IFLA-PAC *Documentary Heritage Preservation Register* <<http://www.nla.gov.au/dhpr/>> accessed 15 May 2003.

The National Preservation Office (UK).
Address: British Library, 96 Euston Road London, NW1 2DB, UK <<http://www.bl.uk/services/preservation/>>, accessed 15 May 2003.

NSSN: a National Resource for Global Standards, <<http://www.nssn.org>>, accessed 15 May 2003. Provides a fee-based information service which includes international standards and technical data. Address: Customer Service, American National Standards Institute, 25 West 43rd Street, New York, NY 10036.

PAMBU (Pacific Manuscripts Bureau), <<http://rspas.anu.edu.au/pambu/>>, accessed 15 May 2003. Based in the Research School of Pacific and Asian Studies, Australian National University, the aim of the Pacific Manuscripts Bureau is to locate and preserve archives, manuscripts and other unpublished or semi-published material through microfilm. Address: PAMBU, Research School of Pacific and Asian Studies, Australian National University, Canberra, ACT, 0200, Australia.

Preservation Resources is a division of OCLC. (Online Computer Library Center Inc.), <<http://www.oclc.org/oclc/presres/microfilm.htm>>, accessed 15 May 2003.

It offers services such as preservation microfilming to libraries, including duplicating, scanning and polysulfide treatment.

RLG DigiNews is a newsletter conceived by the members of the Research Libraries Group's PRESERV community. Funded in part by the Council on Library and Information Resources (CLIR) from 1998–2000, it is available internationally via the RLG PRESERV web site, <<http://www.rlg.org/preserv/>>, accessed 15 May 2003. Address: Research Libraries Group 1200 Villa Street Mountain View, CA 94041-1100 USA.

SEACAP (Southeast Asian Consortium for Access and Preservation), <<http://www.seacap.chiangmai.ac.th>>, accessed 14 May 2003.

The aim of SEACAP is to encourage and support collaboration amongst libraries, archives and other institutions and interested individuals in order to preserve and provide access to the published and documentary heritage of the region.

Spring Singapore, <<http://www.psb.gov.sg>>, accessed 15 May 2003.

The source for information and supply of Singapore Codes of Practice relating to microfilming. PSB Building, 2 Bukit Merah Central, Singapore 159835.

Standards Australia, <<http://www.standards.com.au>>, accessed 14 May 2003. Address: GPO Box 5420 Sydney NSW 2001, Australia.

UNESCO *Memory of the World Programme*, <<http://whc.unesco.org/nwhc/pages/home/pages/homepage.htm>>, accessed 15 May 2003.

Topic 1

Monitoring equipment use and maintenance requirements

Performance criteria

You will have achieved the performance criteria for this topic when you can:

- I describe the information needed to monitor microfilm equipment use, maintenance and service history
- I collect and review information on equipment use and maintenance requirements
- I operate a booking/reservation system for the use of equipment.

Microfilming equipment

How many times have you heard someone say: 'I'm only as good as my tools'?

Microfilming equipment is no exception. The quality of the final microfilm product depends just as much on how well the equipment works as on the skills of the operators. And with preservation quality microfilm, the need for investment in quality equipment that works reliably is even more crucial.

There is a wide range of specialised major and minor equipment used in microfilming.

The review exercise below explores this range. While this module focuses on major and more expensive equipment, the same principles can be applied to minor equipment.

■ Activity 4.1

Microfilming equipment

The table below is a revision of a number of the terms covered in **Preservation Microfilming-Basics**. It is a summary of a range of microfilming equipment, both major and minor, and where it is used.

Complete the blank details where the * is shown.

You may wish to add other equipment in the blank spaces at the end of the table.

Equipment	Stage(s) of microfilming in which it is used
camera	*
iron	*
*	processing
film winder	*
densitometer	*
*	splicing
*	duplicating
eye loupe	*
microscope	*
light meter	*
film/fiche reader or reader printer	*
light box	*
*	jacketing of microfiche

Other equipment

Equipment use, maintenance and service history

In order to monitor equipment use and ensure proper maintenance it is important to keep accurate records of how frequently equipment is being used, and of any problems.

Tracking individual equipment use

Where there is more than one camera or processor operating, individual records are required to track how each piece of equipment is performing.

Tracking can be done very simply, by asking operators to record certain details each time the equipment is used. These details can be recorded manually, or as part of an computerised job tracking system. The data can then be summarised in the form of an **equipment daily use sheet** to provide a picture of use level over a specified period.

Records are essential in tracking problems which may potentially affect all the films which were produced on a specific piece of equipment on a certain date.

Note that the details can be both *quantitative* e.g. how many frames, and also *qualitative* (e.g. comments.) Qualitative details such as comments are helpful for operators to build on previous experience of what worked well and what did not, for example, typical camera exposure levels, or reduction ratios used for certain types of original materials.

Camera use

Typical quantitative and qualitative details which can help monitor camera use include the following:

- I camera details
- I date
- I number of frames
- I what was filmed (e.g. title)
- I name of the operator
- I other comments (e.g. exposure levels).

Here is an example of a camera daily use sheet.

Camera daily use sheet

Date	A archival P published	Refilms rolls frames	Name/title/date	Film length	Voltage	Reductn.	Frames 16mm	Frames 35mm	Comment	Sign
5/2/01	P		Maitland Watch 1956-1957	40m	85/92	1:16		1139		IM
5/2/01	P		Sunday Mail January 2001	30.5m	85/92	1:16		788		LB
6/2/01	P		Chinese Weekly 1998	40m	85/100	1:17		1236		DM
	P		Northern Sun 1996-1997	40m	85/90/95	1:14		1403		LH
	P		Northern Sun 1998-1999	40m	85/90	1:14		1410		NS
	A		P. Smith Diary of field trip to Guam 1953	30.5m	85/92	1:13		854		BK
	P		Plains Producer 1998	30.5m	85/92	1:16		1102		SL

Example of a camera daily use sheet.

Processor use

Typical quantitative and qualitative details which can help monitor processor use include the following:

- I processor details
- I date
- I what was processed (e.g. title)
- I the generation of film being processed (e.g. first generation master, duplicate negative, or service copy)
- I number of reels/fiche
- I name of operator
- I other comments (e.g. settings, chemical levels)
- I equipment cleaning details.

Maintenance contracts

In some countries good maintenance service is available from equipment suppliers or specialist technical firms. In these countries it is common for microfilming organisations with a large amount of equipment to take out service agreements or **maintenance contracts**.

These agreements or contracts cover a specified payment in return for services such as:

- I labour
- I parts
- I number of services on equipment during the year
- I an agreed response time of technicians.

An example of a maintenance agreement is shown on the next page. **Micromenders Maintenance Agreement** is only a **sample**, and is not to be used as a model.

Servicing of equipment

The services on microfilm equipment are just like the servicing that is carried out on an aircraft.

During servicing, parts are cleaned and lubricated, minor adjustments are made and any parts that are worn or damaged are identified.

An alternative to the maintenance contract is paying the full 'call out' price for the services of a technician or full market prices for replacement parts.

As a general rule, maintenance contracts are more likely to be taken out on equipment which is regularly heavily used, or has a number of problems.

Each organisation will need to calculate for itself the cost benefits of having a maintenance contract as opposed to a standard 'call out' arrangement.

The information below, under **Equipment problem log sheets and service history**, will help in this decision.

MicroMenders Maintenance Agreement Terms and Conditions

The customer named in the Maintenance Agreement agrees to pay the amount listed within 20 days of the commencement of the term of the Agreement. MicroMenders agrees to provide a repair service and two general services per annum for the period of the Maintenance Agreement.

Repair service

Repairs will be provided during the normal working hours of MicroMenders. If the customer requests a repair service at other times then charges will be according to 'out of hours' rates.

General services

Two general services per annum, at a six monthly interval, will be provided during the normal working hours of MicroMenders.

General services consist of performance check of equipment and any technical adjustments consistent with the previous use, condition and age of the equipment.

Customer's warranty

The customer warrants that:

- I the customer is the owner of the equipment
- I the customer is responsible for compliance of the workplace and work environment with occupational health and safety legislation
- I the customer is responsible for the security of the building including insurance against damage, theft, fire, and flood
- I the customer will provide a responsible person in attendance on site.

Exclusions

This Agreement excludes:

- I general cleaning and daily maintenance
- I any major reconditioning or overhaul of equipment
- I damage caused by abuse, accident, use for which the equipment was not designed, relocation of equipment, failure to follow manufacturer's instructions
- I damage caused by power failures or surges, flood, explosion, water damage.

Moving equipment

The customer will notify MicroMenders at the time equipment is relocated to a different site within the customer's premises or to a different address. MicroMenders may make an additional travelling charge to the changed address if this Agreement will continue.

Notices

Any notices from the customer and MicroMenders shall be in writing.

Cancellation

This Agreement may be cancelled by either party giving the other 30 days notice in writing.

The customer shall be entitled to a refund of the proportion of the amount paid, based on the outstanding period of the Agreement, provided the customer is not then in default.

Signed on behalf of Banyan Library Date

Signed on behalf of MicroMenders Date

Other alternatives

In a number of countries, just finding someone to fix microfilm equipment can be difficult. In this case, maintenance contracts are not an option.

If you need help in finding someone who can fix a problem with your equipment, check with the equipment manufacturer, your mentor or lecturer, or colleagues for suggestions.

You will also need to follow some of the trouble-shooting suggestions in **Topic 2** to identify what the problem really is.

In **Activity 4.8** you will start to build up a list of contacts who may be able to help you.

Equipment problem log sheets and service history

Keeping **equipment problem log sheets** will assist in monitoring:

- frequency of problems
- repeating patterns of problems which will need major repairs or replacement
- techniques for solving similar problems for the future
- whether problems have been satisfactorily solved by technicians (technician performance)
- whether terms of the maintenance contract are being met (e.g. by recording response times, whether specified levels of routine maintenance servicing is being carried out).

An example of an **equipment problem log sheet** for a camera follows.

Camera Details: Camera no. 1, Model ABC Serial no. 123456				
Date	Details of problems	Action (include details of person and time contacted)	Details of work done	Init/Date completed
19/2/2000	Voltage meter needle flickering	Called technician on 20/2/2000	Technician came pm 20/2/2000 and fitted spare 'variac'. Problem fixed.	20/2/2000 LH
2/4/2000	Leaving black line along edge of film —fogging also.	Called technician on 2/4/2000 11 am	Technician called—but found to be operator error—loading problem. Technician adjusted tension of springs.	3/4/2000 NS
13/7/2000	Lights fluctuating	No need to call technician	Changed all globes. Rebalanced lights.	13/7/2000 SL
12/12/2000	Deep scratches along bottom of film.	Films from other cameras not affected, so not a processor problem. Tested and no further problems.	Called technician 12/12 Technician cleaned and also carried out a preventative maintenance service.	13/12/2000 DM

Example of an equipment problem log sheet for a camera

■ Activity 4.2

Camera daily use sheet

Design a daily use sheet for a microfilming camera.

Include records of both *quantitative and qualitative* use.

If your organisation already has a camera daily use sheet, take this opportunity to revise it. Discuss its use with other camera operators who may have additional suggestions for you to include.

■ Activity 4.3

Checking an equipment problem log sheet

Below is a hypothetical study from an equipment problem log sheet of a microfilm camera.

There is a maintenance contract with the firm **MicroMenders**.

This agreement includes:

- two services per year (March and September)
- an agreed technician response time of 24 hours (operating within the time period of 8.30 am to 6 pm Monday to Friday).

Examine the log sheet carefully, then answer the 4 questions that follow.

Equipment problem log sheet for ABC camera

Date	Details of problem	Date/time technician contacted	Date/time technician responded	Total time to complete work	Details of work done	Did technician solve problem (yes/no). If no give details of what needs to be done to solve it	Comments e.g. Training
25/09/2000	full service of camera			2 hrs	clean and service		OK
8/11/2000	film images are blurred	8/11/2000 3pm	9/1/2001	1 hour	took camera apart and cleaned it. Lens was dirty had finger marks on it	yes	operator error clean inside camera with soft brush & lens with soft cloth each time camera is used
10/11/2000	small scratches throughout film	10/11/2000 9am	11/11/2000 11am	0.25 hrs	checked rollers, tension etc.	yes	
21/11/2000	density varies greatly from image to image and within each image	21/11/2000 9am	25/11/2000	1 hr	tightened loose lamps in their sockets also checked illumination levels with light meter	yes	long response time
6/12/2000	small scratches throughout film	6/12/2000 9am	6/12/2000 11am	0.25 hrs	checked rollers, tension etc.	yes	good response time
15/12/2000	alarm buzzer sounds while documents are being filmed	15/12/2000 10am	17/12/2000 2pm	0.5 hrs	vacuum hose loose reconnected it	yes	long response time manager followed up with maintenance firm
21/12/2000	small scratches throughout film	21/12/2000 11 am	21/12/2000	0.25 hrs	checked rollers, tension etc.	yes—for present	
8/01/2001	small scratches throughout film	8/01/2001 9:30 am	8/01/2001	0.5 hrs	checked rollers, tension etc.	yes—for present	parts are wearing ordered new rollers
20/03/2001	deep scratch along whole film	20/02/2001 3.pm	16/01/2001 21/02/2001 9 am	1 hr 0.25 hrs	new rollers fitted checked scratch operator error film incorrectly loaded also film not tracking correctly due to loading problems	yes	operator error film incorrectly loaded followed up with operator
30/03/2001	full service of camera			2 hrs	clean and service	OK	

Questions on equipment problem log sheet

a) Which problem(s) were caused by operator errors?

b) Which problem has repeating patterns that show a need for major repairs or replacement?

c) Can you identify any points for training, or techniques for solving similar problems for the future?

training

techniques for solving similar problems

d) Are the terms of the maintenance contract being met in relation to:

response times

number of services per year

Booking equipment

Where there are several microfilm operators who are responsible for a range of tasks, it is sometimes necessary to set up a reservation or booking system. This provides operators with access to equipment such as cameras and readers which can be in heavy demand.

The booking system may be part of an overall roster, or it can stand alone. The activity below gives an example of a booking system.

■ Activity 4.4

Operating a booking system

Operate the following weekly equipment booking system by completing the following table.

There are 5 operators (A, B, C, D, E) and 4 cameras.

During the week each operator needs to have equal access to the cameras for 3 full days and 2 half days.

Weekly Camera Bookings																					
Mon	Mon				Tues				Wed				Thurs				Fri				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Camera																					
AM	A	B	D	E	B	C	D	A	D	E											
PM	A	C	D	E	B	C	D	E	D	E											

Summary

- I The quality of the final microfilm products depends just as much on how well the equipment works as on the skills of the operators.
- I In order to monitor equipment use and ensure proper maintenance, it is important to keep accurate records of how frequently equipment is being used and of any problems.
- I Daily equipment use sheets can help in monitoring use and tracking problems. Details can be both *quantitative* and *qualitative*.
- I Equipment problem logs also help in monitoring problems and in checking whether maintenance services are being carried out.
- I In countries where maintenance services are available, it can be worthwhile taking out a maintenance contract. This is a payment in return for labour, parts, servicing etc.
- I Booking systems help to provide operators with systematic access to equipment.

Checklist

In order to test your understanding of this material, work through the checklist below.

If you can answer 'yes' to each question, and you have completed the activities for this topic, you are now ready for your lecturer or assessor to verify that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities**.

If you are in any doubt about any of the content, you should read through the material again, consult some of the references mentioned in the section entitled **Resources**, talk to your work colleagues or contact your lecturer or mentor.

I can:

- I describe the information needed to monitor microfilm equipment use, maintenance and service history
- I collect and review information on equipment use and maintenance requirements
- I operate a booking/reservation system for the use of equipment.

▲ Submit

You are now ready to record in your **Log book** that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities** for this topic.

You can record these by marking off the boxes in the shaded columns with a ✓ **yes** or ✗ **no**.

You can then ask your lecturer or assessor to verify this information.

Topic 2

Trouble-shooting to identify equipment problems

Performance criteria

You will have achieved the performance criteria for this topic when you can:

- I identify and safely correct minor operating equipment faults
- I carry out routine maintenance for equipment, including arranging of repairs.

Inevitably, there will be problems with microfilming equipment—in the same way as there are problems with equipment all over the world. Usually these problems occur at the worst possible times, in the middle of a peak period.

While the following information will never solve all of these problems, it will help to approach them in a systematic way. It should help you to quickly pinpoint the most likely causes, and the best options for solving the problems.

Occupational health and safety issues

Before discussing trouble-shooting it is important to reflect on a range of occupational health and safety issues that relate to the microfilming area.

These issues include manual handling, protecting hearing, eyes and feet, handling chemicals and solvents and making sure that equipment is in good working condition.

To avoid injury and accident make sure that you and other operators know how to use the equipment properly.

Do not allow a person to undertake any task unless they have the skills, experience and understanding to do it safely. Operators should be provided with training where necessary.

- I All equipment should be in good working condition. Regular safety checks should be undertaken of cords, plugs and switches.
- I In many countries voltage stabilisers are used to maintain a predictable voltage level.
- I It is also worthwhile considering having an earth leakage circuit breaker or other safety switches installed.
- I In processing areas it is important that electrical cords and switches are kept out of the way of water and the possibility of water and chemical leakages.
- I Always switch off and unplug equipment before attempting any adjustments.
- I A qualified electrician should be able to advise on your requirements.
- I Wear protective clothing, footwear, gloves etc. as required.

When a problem strikes—what can you do?



Identifying a problem

Identify the *real* problem

The first stage in solving a problem is identifying the *real* problem. For example, what may *appear* a problem with the machine not functioning may turn out to be a problem with the power supply.

Identify the cause

The next stage is identifying the *cause*. For example, what at first glance may appear to be caused by the processor scratching the film may turn out to be caused by dirt in a camera head. Most of the equipment manuals provide a trouble-shooting list of the cause of problems and as well as suggestions for correcting them.

Make the adjustments

The third stage is making the suggested adjustments based on the trouble-shooting lists.

Activity 4.5 gives you the opportunity to identify the probable causes of some common faults and then make suggestions for correcting them.

Activity 4.6 then gives you the opportunity to practise two adjustments according to established procedures.

In all cases the problem and its solution should be logged to provide information for operators and technicians in the future.

■ Activity 4.5

Identifying causes and corrections of common problems



For this activity you will need access to trouble-shooting charts from the manuals of a **microfilming camera** and a **processor**.

Your organisation may also have its own trouble-shooting charts or lists.

Task

Identify causes and corrections for the following common problems.

Use your trouble-shooting charts as a guide. (Note there can be several causes for the one problem.)

Add your own list of problems, probable causes and corrections at the end.

Camera

Problem	Probable causes	Corrections/adjustments
Film images are fogged		
Density varies greatly from image to image, and also within each image		
Blurred, fuzzy image		
Film is not advancing		
Film is broken		
Camera will not operate		
Lamps are flickering		

Additional list

Problem	Probable causes	Corrections/adjustments

Processor

Problem	Probable causes	Corrections/adjustments
Solutions do not reach correct operating temperature		
Dryer temperature is too low		
Spot pattern on film from processor rollers		
Processor is operating but not all rollers are turning		
Leaking chemicals are noticed near processor		
Film is jammed		

Additional list

Problem	Probable causes	Corrections/adjustments

Adjusting equipment according to recognised procedures

The activity below will give you an opportunity to practise some adjustments to a camera according to established procedures.

■ Activity 4.6★

★ *These are major activities which require the lecturer/assessor to observe and/or sign off performance details.*

Adjusting two common camera problems

Your task is to:

- a) **list the steps for adjusting the camera** in the table below (as listed in manual/trouble-shooting list)
- b) **carry out the adjustment** task competently in the presence of your lecturer or assessor.



Each step needs to be performed correctly and signed off on the **Activity 4.6** sheet before you are competent.

For this activity you will need access to:

- a microfilming camera
- the camera manual and trouble-shooting lists.

You will first need make advance arrangements with your lecturer or assessor. Your lecturer or assessor will need to be present to observe you making the adjustments according to the steps outlined.

Use the following table to record the steps required to correct the following two problems:

Carry out routine maintenance for equipment

The old proverb says that 'a stitch in time saves nine'.

Routine maintenance by operators can be like 'a stitch in time' because equipment that is well-maintained will last longer and produce higher quality microfilm.

Cleaning

Dust and dirt severely limit the performance of equipment such as cameras, processors, duplicators and readers.



Cleaning a camera head with a brush

© Photograph courtesy of State Library of South Australia

Lubrication

Lubrication of parts helps to reduce wear and tear. Lubrication should always be applied according to the specifications. In some equipment, lubrication can be easily carried out by a trained operator. In other types of equipment, lubrication can be more complex and should ideally be done by a technician, if one is available.



Lubrication – oiling the pads of the duplicator

© Photograph courtesy of State Library of South Australia

General guide to routine maintenance

The following are some general guidelines for routine maintenance for some common types of equipment.

The guidelines are a general indication only of the types of tasks needed to maintain equipment.

In each case you should always follow the specifications in your organisation's equipment manuals.

Equipment	Maintenance details	Suggested frequency
Cameras	<ul style="list-style-type: none"> • wipe lenses gently with a lens cleaning cloth. gently remove dust from the inside of camera heads e.g. with a fine camel's-hair brush 	<ul style="list-style-type: none"> • each time the camera is used
	<ul style="list-style-type: none"> • wipe copyboards clean with a soft cloth to remove paper, dust and debris • general cleaning of work area to reduce dust 	<ul style="list-style-type: none"> • each time the camera is used
	<ul style="list-style-type: none"> • change water filters regularly to make sure water is clean. • wipe splashes of developer during daily cleaning routine • wipe all surfaces with lint-free cloth to remove all spilled or dripped solutions 	<ul style="list-style-type: none"> • ask the plumber for advice on frequency • daily • daily
Processors	<ul style="list-style-type: none"> • clean rollers in water to remove dirt etc. 	<ul style="list-style-type: none"> • daily as used
	<ul style="list-style-type: none"> • clean tanks and rollers with a systems cleaner 	<ul style="list-style-type: none"> • weekly depending on use, or as recommended by manufacturer
	<ul style="list-style-type: none"> • thoroughly clean tanks and rollers with systems cleaner to remove build up on rollers 	<ul style="list-style-type: none"> • as recommended by manufacturer, depending on use and level of build up
Duplicators	<ul style="list-style-type: none"> • check tension on take-up and supply spools by making sure that they are at recommended levels 	<ul style="list-style-type: none"> • daily as used or as recommended by manufacturer
	<ul style="list-style-type: none"> • clean rollers with a damp cloth to remove lint, dust and build up of residue 	<ul style="list-style-type: none"> • daily as used or as recommended by manufacturer
	<ul style="list-style-type: none"> • check brake and clutch pads and oil if necessary 	<ul style="list-style-type: none"> • weekly as used or as recommended by manufacturer
Readers	<ul style="list-style-type: none"> • wipe lenses gently with a soft clean cloth or lens cleaning cloth 	<ul style="list-style-type: none"> • daily or more frequently as required
	<ul style="list-style-type: none"> • wipe screen gently with a soft cloth 	<ul style="list-style-type: none"> • as needed
	<ul style="list-style-type: none"> • use dust covers to prevent dust build up 	<ul style="list-style-type: none"> • when not in use

Equipment	Maintenance details	Suggested frequency

Arranging repairs

At next stage you:

- I have identified a particular problem and its cause
- I have tried some simple adjustments—which did not work
- I will need more help.

You now have two main options:

- I call a technician, if one is available
- I ask your contacts for suggestions.

Call a technician

You should have already logged the problem in the **equipment problem log sheet**, together with details of any actions taken.

Most organisations will have procedures in place for handling repairs/maintenance. This will include who is authorised to place such calls.

There may already be a list of firms or technicians who will repair various types of equipment. If not, start a list now and include it in **Activity 4.8**.

Before placing a call for a technician it is always a good idea to:

- I **check with a colleague** to make sure that the problem and its cause has been correctly identified
- I **let your colleagues know** what is happening
- I **let your supervisor know**
- I **check whether** there is a maintenance contract on the equipment
- I **have details ready**, including models of equipment, serial numbers and the name of a contact person.

Once the technician arrives and the repairs have been completed, an authorised person will sign that the repairs have been satisfactorily completed. Again, the details should be recorded in the equipment problem log sheet.

If replacement parts need to be ordered from overseas, there may be significant delays. In such cases it can be worthwhile having back-up arrangements, such as negotiating with another microfilming organisation to provide a filming or processing service during the repair period.

Ask your contacts

In a number of countries in the region, finding someone to fix microfilm equipment is difficult. If you need help in finding someone who can fix a problem with your equipment, check first with the equipment manufacturer, your mentor or lecturer, or a colleague for suggestions.



If you have access to the internet you can check out some of the web pages listed under **Resources** in this module.

You will also need to:

- re-check some of the trouble-shooting suggestions to identify what the problem really is
- have all details ready, including models of equipment and serial numbers.

Start building up your list of contacts. **Activity 4.8** will start you off on this.

Summary

- To avoid accidents, make sure that you and other operators know how to use the equipment properly. Do not allow anyone to do a task unless they have the skills and experience necessary to do it safely.
- When equipment problems occur, the first stage in solving them is identifying the real problem.
The next stage is identifying the cause.
The third stage is making adjustments, based on the information in trouble-shooting lists.
- Routine maintenance by operators can help equipment to last longer and to produce higher quality microfilm. Key maintenance tasks are cleaning and lubrication.
- In arranging repairs, follow set procedures to contact a technician if one is available. If a technician is not available you will need to check with your contacts for suggestions.

Checklist

In order to test your understanding of this material, work through the checklist below.

If you can answer 'yes' to each question, and you have completed the activities for this topic, you are now ready for your lecturer or assessor to verify that you:

- can meet the **performance criteria**
- have satisfactorily completed the **activities**.

If you are in any doubt about any of the content, you should read through the material again, consult some of the references mentioned in the section entitled **Resources**, talk to your work colleagues or contact your lecturer or mentor.

I can:

- I identify and safely correct minor operating equipment faults
- I carry out routine maintenance for equipment, including arranging of repairs.

▲ Submit

You are now ready to record in your **Log book** that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities** for this topic.

You can record these by marking off the boxes in the shaded columns with a ✓ **yes** or ✗ **no**.

You can then ask your lecturer or assessor to verify this information.

Topic 3

Equipment suppliers and criteria for evaluating equipment

Performance criteria

You will have achieved the performance criteria for this topic when you can:


- I maintain a file listing suppliers of new and replacement microfilm equipment
- I develop and apply criteria for the evaluation of microfilm equipment for selected tasks.

Equipment suppliers

There is an international network of specialist organisations and their agents that supply microfilming equipment.

It is worthwhile maintaining a list of suppliers of new and replacement equipment to keep up to date with the latest developments and with the various sources of supply.

Sources of information about equipment suppliers include:

- I colleagues
 - I other microfilming organisations
 - I national or state libraries or archives, or IFLA regional centres—check the list of *Libraries and Organisations from the Asian-Pacific Region* in the **Learning Guide**
 - I professional associations e.g. library and preservation associations
 - I journals such as *Microform Review*
 - I MICROLINK-L - post a query on the international email discussion list <http://www.nla.gov.au/nla/listserv/microlink_1.html>
 - I film manufacturers such as Kodak, Agfa-Gevaert, Fuji and their regional representatives—check out their web pages on the internet
 - I equipment manufacturers e.g. Elke, GKL, Hermann and Kraemer, Zeuschel, and Canon—check out their web pages on the internet.
-  the website of G.G. Baker provides an excellent start with the section *links to suppliers* <<http://www.ggbaker.com/>>, as do the websites of individual suppliers such as The Microfilm Shop, <<http://www.microfilm.com/>>. The Film-based Imaging Association, <<http://www.fbi.aiim.wegov2.com>>, has a buyers guide of U.S. manufacturers and distributors of micrographic equipment and supplies.

■ Activity 4.8

Contacts file

- a) Start a file (or develop an existing file) of microfilming equipment and contacts who can help or fix the equipment.

The file can consist of examples such as:

- I information sheets or brochures from the manufacturer
- I a print out of a page from the internet

- l a copy of an advertisement in a magazine
 - l information provided by colleagues or professional contacts.
- b) All information sheets should be dated and the source given (e.g. title and issue number of magazine).
- c) Your file should include at least one item in each of the following categories:
- l cameras
 - l processors
 - l duplicators
 - l microfilm readers OR microfiche readers OR reader printers
 - l minor equipment—winders, splicers, densitometers etc.
 - l a person or organisation who can help to fix your equipment.

(Do NOT include jacketing equipment at this stage. Jacketing equipment will be covered separately in the module, **Jacketing and Splicing Microfilm.**)

Criteria for evaluating equipment

The task of evaluating equipment is a complex one. It is best if all the relevant people are involved in the process, especially the people who will be operating the equipment.

The following is a general introduction to the kind of criteria which can be developed and applied to specific requirements. Similar principles can be applied to developing criteria for other types of microfilming equipment.

Developing the criteria

Sources

Sources which can assist in developing the criteria include:

- l standards and specifications
- l brochures from equipment manufacturers, or similar information sourced from the internet
- l equipment reviews in journals (e.g. *Microform and Imaging Review*)
- l information from other organisations and colleagues
- l the experience of the staff in your organisation
- l equipment log books.

In combination, these sources can provide information on what is available, what the equipment is required to produce, its general features and performance issues.

The purpose

The most important point is being clear about the purpose. What do you need the equipment for? For example, if you need to microfilm thick heavy archival volumes then a camera with a book lift and book cradle will be highly desirable.

Example of criteria

The criteria below were recently developed by one microfilming organisation for evaluating the most useful features of a camera.

The purpose

In this case the camera was needed to film thickly-bound archival documents, as well as newspapers. A book cradle was therefore a high priority. A flexible adjustable frame size was also a requirement. This was needed to adapt to changing page sizes for newspaper fold outs and double page spreads.

Criteria

In developing and applying the criteria, the microfilming organisation decided to give each of the criteria a number weighting of 5. Each of the cameras was given a score for its performance.

The assessment of camera performance was based on:

- testing by the operators
- comments from the manufacturers
- comments from other users.

A score of 5 was excellent, 4 was very good, 3 was good and below 3 was poor.

Examine the following evaluation example carefully, then complete **Activity 4.9**.

Evaluating three cameras

Criteria	Camera A Score	Comments	Camera B Score	Comments	Camera C Score	Comments
resolution (sharpness of image)	5	150 lines pairs per mm	5	150 lines pairs per mm	5	150 lines pairs per mm
lamp or indicator to help with placing original correctly on copyboard	5		5		2	just a diagram in manual
alarm or device to indicate whether camera is loaded correctly	5	alarm	2	no alarm - difficult to load incorrectly but still possible to make errors	5	alarm
alarm or device to indicate whether film is running out	5	film indicator	5	film indicator	0	no film indicator
adjustable mask or frame size	5	possible to adjust frame size easily over a full range of options	0	only 2 sizes available	5	possible to adjust frame size easily over a full range of options
maximum size or original item which can be filmed	5	A1 size (594mm X 841mm)	5	A1 size (594mm X 841mm)	3	A2 size (420mm X 594mm)
range of reduction ratios possible	5	1: 30 to 1:7	5	1: 30 to 1:7	3	1: 27 to 1:10
ease of loading (tested by operator)	5	very easy	5	very easy	5	very easy
ease of change between 16 and 35mm	4	OK but a little complicated	5	very easy	4	OK but a little complicated

Evaluating three cameras						
Criteria	Camera A Score	Comments	Camera B Score	Comments	Camera C Score	Comments
ergonomics (ease and comfort for operator to use)	5	comfortable to use	3	comfortable to use but switches could be located lower for easier operation	5	comfortable to use
smoothly operating book cradle	5	yes	5	yes	5	yes
level of service agreements/maintenance possible	5	local service available	2	would need to call technician from another state	3	available. basic local service (For complex problems, would need to call technician from another state)
reliability reports (from users)	5	users report very reliable	5	users report very reliable	4	users report mostly reliable
cost	2	\$W 65,000	4	\$W 45,000	5	\$W 40,000
Total	66 out of 70		56 out of 70		54 out of 70	
Other comments		all users report they are very satisfied		some users report they are very satisfied		some users report they are very satisfied

Score: 5= excellent, 4= very good, 3 = good, below 3 = poor.

■ Activity 4.9

Evaluating cameras

a) Using the evaluation example, identify one or more limitations of each camera.

Limitations of camera A

Limitations of camera B

Limitations of camera C

b) Now rank the three cameras in your order of preference.

1. Camera letter _____

2. Camera letter _____

3. Camera letter _____

● Reflect 4A

First steps to evaluating equipment

- | Think about examples of microfilming equipment that you have used.
- | Choose ONE example—it could be a reader, a winder, a splicer, a densitometer, a processor, or a camera—the choice is up to you.
- | What features work well?
- | What are the problems?
- | What could be improved?
- | Discuss these with your colleagues as preparation for **Activity 4.10**.

■ Activity 4.10

Criteria for evaluating microfilming equipment

Develop your own criteria which could be used for evaluating your chosen piece of microfilm equipment.

Name of equipment (e.g. winder, processor, fiche reader)

a) What will you use the equipment for?

b) Briefly list your criteria below. (Remember to include **ergonomics**—how easy and comfortable the equipment is to operate).

Name of equipment:

Criteria

1.

2.

3.

4.

5.

6.

Summary

- It is worthwhile keeping a list of suppliers of new and replacement equipment to keep up-to-date with the latest developments.
- The task of evaluating equipment is complex one. It is best if all the relevant people are involved in the process, especially the people who will be operating the equipment.
- In developing criteria for evaluating equipment the most important point is being clear about the purpose. What do you need it for?

Checklist

In order to test your understanding of this material, work through the checklist below.

If you can answer 'yes' to each question, and you have completed the activities for this topic, you are now ready for your lecturer or assessor to verify that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities**.

If you are in any doubt about any of the content, you should read through the material again, consult some of the references mentioned in the section entitled **Resources**, talk to your work colleagues or contact your lecturer or mentor.

I can:

- I maintain a file listing suppliers of new and replacement microfilm equipment
- I develop and apply criteria for the evaluation of microfilm equipment for selected tasks.

▲ Submit

You are now ready to record in your **Log book** that you:

- I can meet the **performance criteria**
- I have satisfactorily completed the **activities** for this topic.

You can record these by marking off the boxes in the shaded columns with a ✓ **yes** or ✗ **no**.

You can then ask your lecturer or assessor to verify this information.

Background

The training materials have been developed by the National Library of Australia, in collaboration with the State Library of South Australia and under the auspices of IFLA PAC, and will be provided to people within the Asia and Pacific regions as a training resource. The materials will also be used within Australia as part of an accredited TAFE training course.

The training materials consist of 10 modules, 6 wall charts, a Log Book, a Learning Guide and a Glossary/Index. We expect that users will both read a printed version of the materials and download them as PDF files from the National Library of Australia's website – www.nla.gov.au

