



Module Six of Ten

Jacketing and Splicing Microfilm

TRAINING *in* PRESERVATION MICROFILMING

Module Six of Ten

Jacketing and Splicing Microfilm

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National Library of Australia

2003



Published by the National Library of Australia
Canberra ACT 2600

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Brown, Heather.

Training in preservation microfilming.

Bibliography.

Includes index.

ISBN 0 642 10782 3 (v. 6).

ISBN 0 642 10790 4 (set).

1. Preservation microfilming - Australia - Handbooks, manuals, etc. 2. Preservation microfilming - Australia - Problems, exercises, etc. 3. Preservation microfilming - Asia - Handbooks, manuals, etc. 4. Preservation microfilming - Asia - Problems, exercises, etc. 5. Preservation microfilming - Pacific Area - Handbooks, manuals, etc. 6. Preservation microfilming - Pacific Area - Problems, exercises, etc. I. Title.

025.84095

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Introduction

Welcome to Jacketing and Splicing Microfilm.

This module introduces you to splicing techniques. It also gives information about how to operate and look after microfilm jacketing equipment.

Prerequisites

This is the sixth module in a series of training materials about preservation microfilming. Before you start on this module you need to have satisfactorily completed the module, **Preservation Microfilming—Basics**.

It will also help if you have completed the modules:

- I **Preservation of Materials**
- I **Preparation for Microfilming**
- I **Maintaining Microfilming Equipment**
- I **Operating Microfilming Equipment—Cameras**.

These will give you useful background information which you will need before you start on this module.

Learning outcomes

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

- I operate a jacketing machine to create microfiche jackets
- I perform daily maintenance on a jacketing machine and arrange repairs
- I splice retakes as needed, using appropriate splicing technology
- I film retakes to correct problems.

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 the 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 jacketing (or reader-filler) machine
- I a splicing machine or splicing equipment—preferably an ultrasonic film splicer
- I relevant jacketing and splicing machine manuals
- I 1 roll of processed film with images—this will need to match the size of the jacketing machine e.g. 16mm or 35mm.

This module includes the following:

- I 1 roll of processed film with images for splicing
- I an empty fiche jacket
- I an acid-free envelope.

Check with your lecturer/assessor or mentor if there are any problems with access to the jacketing and splicing equipment and their manuals.

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 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 in the Log book simply by marking 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:

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/VII/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.

Manuals for jacketing and splicing 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.

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

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 Bibliotheque 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.

Topics 1 & 2

Operating jacketing equipment and routine maintenance

Performance criteria

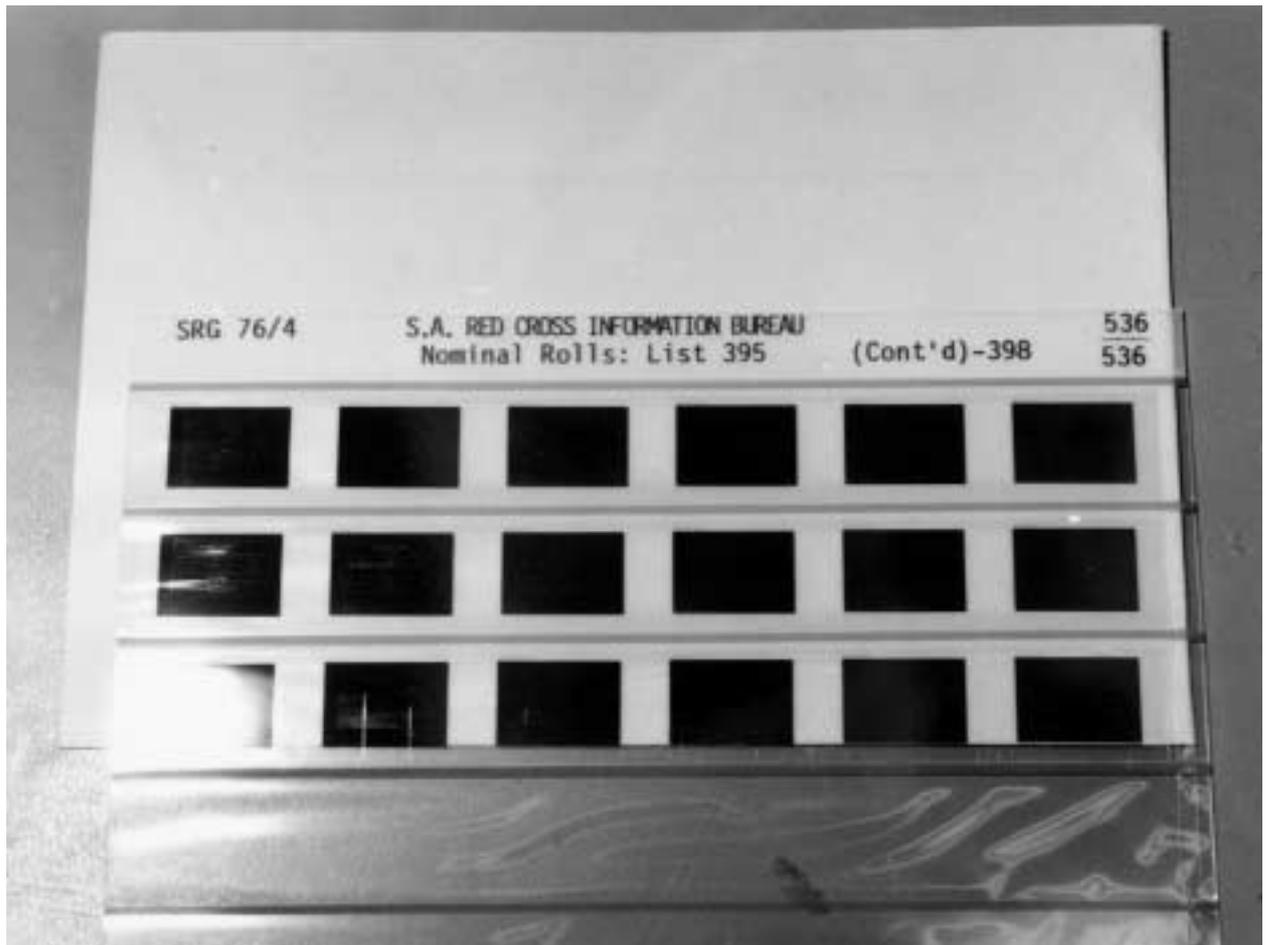
You will have achieved the performance criteria for these topics when you can:

- I produce microfiche jackets to an acceptable standard
- I identify and safely correct minor faults in jacketing equipment
- I implement a routine maintenance program for jacketing equipment.

Microfilm jackets

In the module, **Preservation Microfilming—Basics**, microfilm jackets are described as transparent holders containing channels into which strips of **16 or 35mm roll** film are inserted.

Jackets can be updated by adding or removing individual microfilm images, or rows of images.



A microfiche jacket

© Photograph courtesy of State Library of South Australia

With microfilm jackets, the sequence of frames is from left to right in each row, beginning at the top left hand corner and ending at the bottom right hand corner. (See the diagram in Topics 4 and 5 of the module, **Preservation Microfilming—Basics.**)

Microfilm jackets are often used in situations where information needs to be updated. For example, one Australian government department currently uses microfilm jackets for updating files of prisoner records which need to be kept long-term. The updated jackets are duplicated to create a current copy of the microfiche.

An alternative

Some 16mm cameras have two heads (dual heads). These cameras allow *two* master negative copies of the same image to be created simultaneously. One master negative copy is kept in reel form. The other copy is made into jackets and becomes the second generation printing master. Service copies are made directly from the jacket copy.



A dual head camera

© Photograph courtesy of State Library of South Australia

Operating a typical microfilm jacketer

Jackets are made using special jacket or reader-filler machines that transfer the film from reels into strips that are inserted into the jacket channels. A typical jacket machine (**jacketer**) looks like this.



A jacket machine

Copyright: Reproduced by permission from The Microfilm Shop, <http://www.microfilm.com/>

The following are some general steps for loading and operating a typical microfilm jacketer. Compare these steps with the steps needed to operate other jacketers that you have seen or used.



Loading a jacketer

© Photograph courtesy of State Library of South Australia

Loading the jacketer

First carry out jacketer cleaning and maintenance steps.
(Check the manual for instructions.)

Attach film to supply spindle.

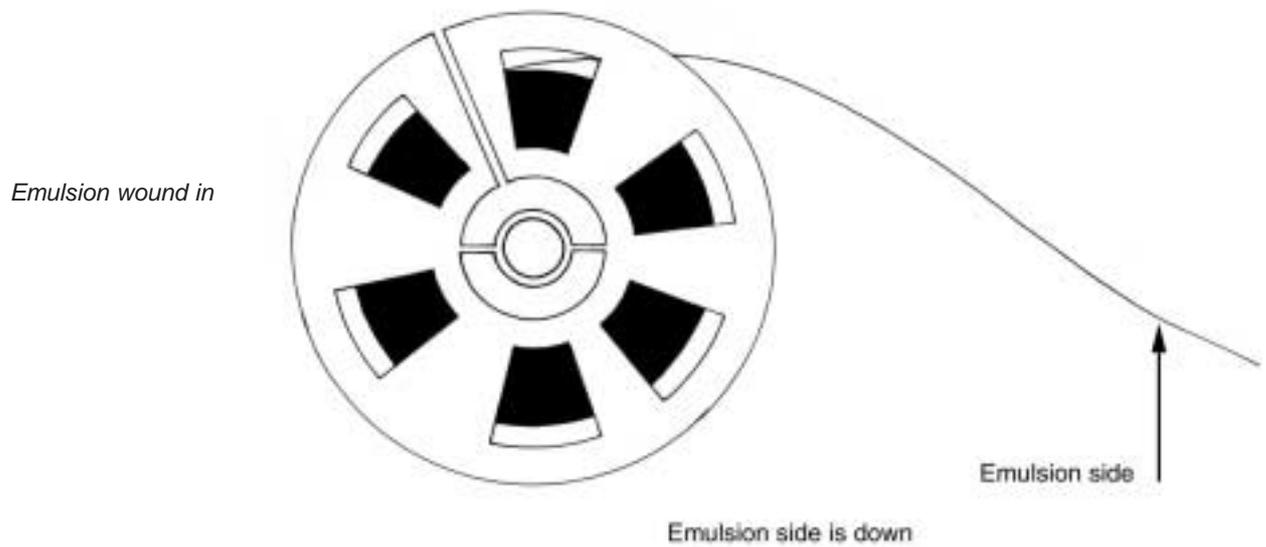


Film on supply spindle

© Photograph courtesy of State Library of South Australia

Topics 1 & 2

Check that emulsion side of film is wound in (down).



Thread the film until the feed knob engages the film.

Rotate the feed knob clockwise until the first image appears on the screen.

Adjust focus control if necessary.

Align the left edge of the first frame with the left-hand edge of the blade image.

The image on the screen is not in the jacket.

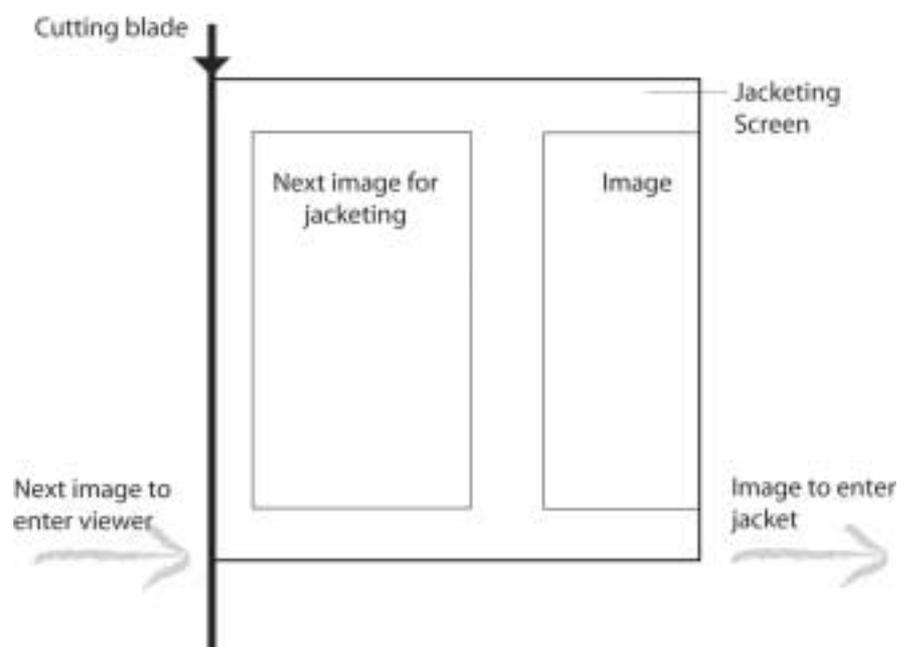
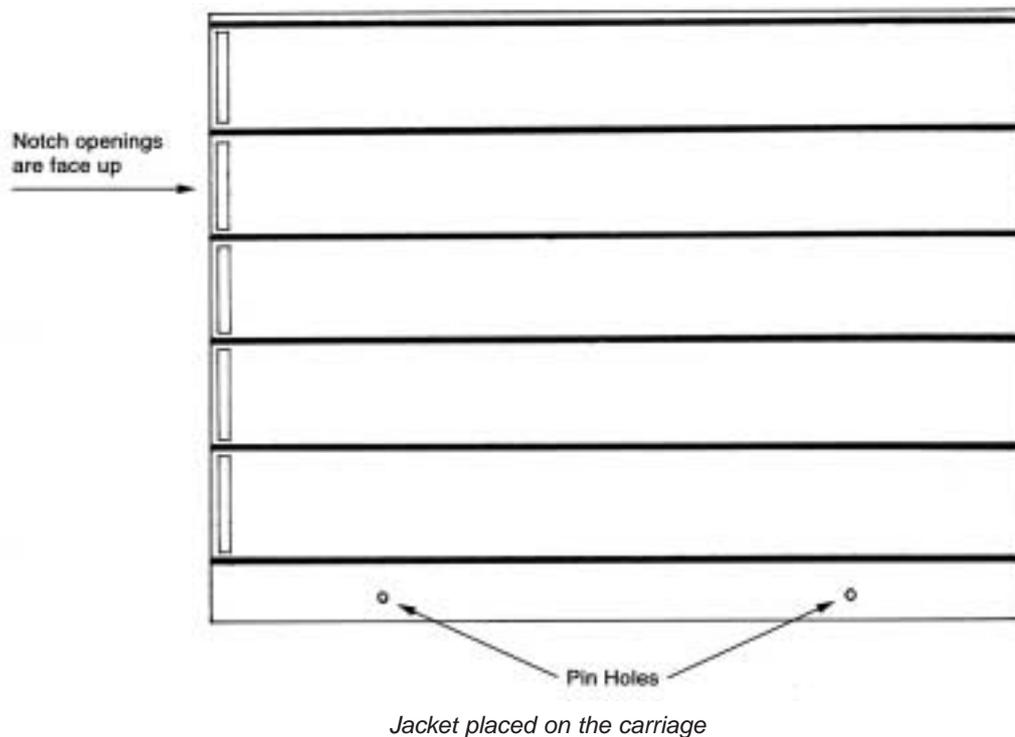


Diagram of screen, blade and frame

Cut off film leader by pressing the cycle button.

Pull out the carriage, using carriage lever.

Place jacket on carriage.



Clamp the jacket in position.

Press down on carriage lever and position carriage to the first jacket channel.

Note the limit lines.



Limit lines on jacketer

© Photograph courtesy of State Library of South Australia

The following hints and tips give more details about loading the jacketer.

Steps	Comments
attaching film to supply spindle	<ul style="list-style-type: none"> the leading edge of the film usually comes from the top of the reel into the feed slot
positioning the emulsion side of film	<ul style="list-style-type: none"> the <i>emulsion side</i> (dull side) of the film should be <i>down</i> and wound toward the centre of the spool on the inside this means that the emulsion side should face the <i>thinnest</i> side of the jacket the two layers of transparent material that form the jacket channels are of different thickness this means that duplicate copies can be made with minimum loss of resolution
pulling out the carriage using carriage lever	<ul style="list-style-type: none"> press down and pull out the <i>carriage lever</i>, bringing the carriage all the way forward then move the <i>clamp</i> lever up for easy placement of the jacket
placing jacket on carriage	<ul style="list-style-type: none"> place the jacket on the carriage with the notch openings up, and at the film track side align the jacket with the two pins
clamping jacket	<ul style="list-style-type: none"> clamp the empty jacket carefully in position by moving the clamp lever down
using the carriage lever	<ul style="list-style-type: none"> press down on the carriage lever so that the first channel or row lines up with the film track always use the carriage lever to move the carriage to the relevant row
limit lines	<ul style="list-style-type: none"> note the <i>limit lines</i> on the carriage these lines show the furthest point that film should be put into each jacket channel before cutting

Operating the jacketer

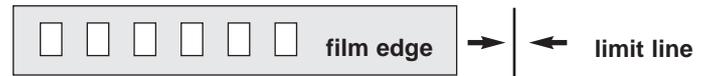
Rotate feed knob and slide film into first jacket channel.

Sliding film into channel

© Photograph courtesy of State Library of South Australia

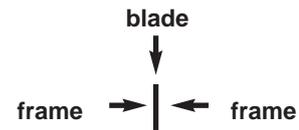


Check for when leading edge
of the first image touches the limit line.



Check the screen to make sure that the left hand
edge of the blade is centred between the image
on the screen and the last image in the jacket.

Adjust the film until the left hand edge of the blade
is evenly spaced between the image frames.



Press cycle button and cut off film with
the blade when first channel is filled.



First channel of jacket being filled

© Photograph courtesy of State Library of South Australia

Set carriage advance/return control
to the ADVANCE position.



Carriage return positions

© Photograph courtesy of State Library of South Australia

The machine will:

- cut the film
- push the cut film into the channel
- move the carriage to the next jacket channel.

Repeat this process.

The following hints and tips give more details about loading the jacketer.

Steps	Comments
rotating feed knob and slide film into first jacket channel	<ul style="list-style-type: none">• rotate the feed knob slowly and gently• the film will slide into the first jacket channel• you may need to cut off some leader first• the first image will shortly appear on the screen
checking the screen	<ul style="list-style-type: none">• remember that the image on the screen is <i>not</i> in the jacket
cutting the film	<ul style="list-style-type: none">• with 16mm film, this is typically after 12 single frames or 6 double frames
repeating	<ul style="list-style-type: none">• repeat this process until all the rows on the jacket have been filled, or the sequence is logically complete• with 16mm film, there are 5 rows

Do **not** move the carriage when you have inserted film into the jacket without cutting it. This will damage the film and jacket.

Do **not** keep moving the film left to right, in and out of the channels. This will scratch it.

Removing the jacket

press carriage lever

move clamp handle

place jacket in enclosure



Transferring jacket to envelope

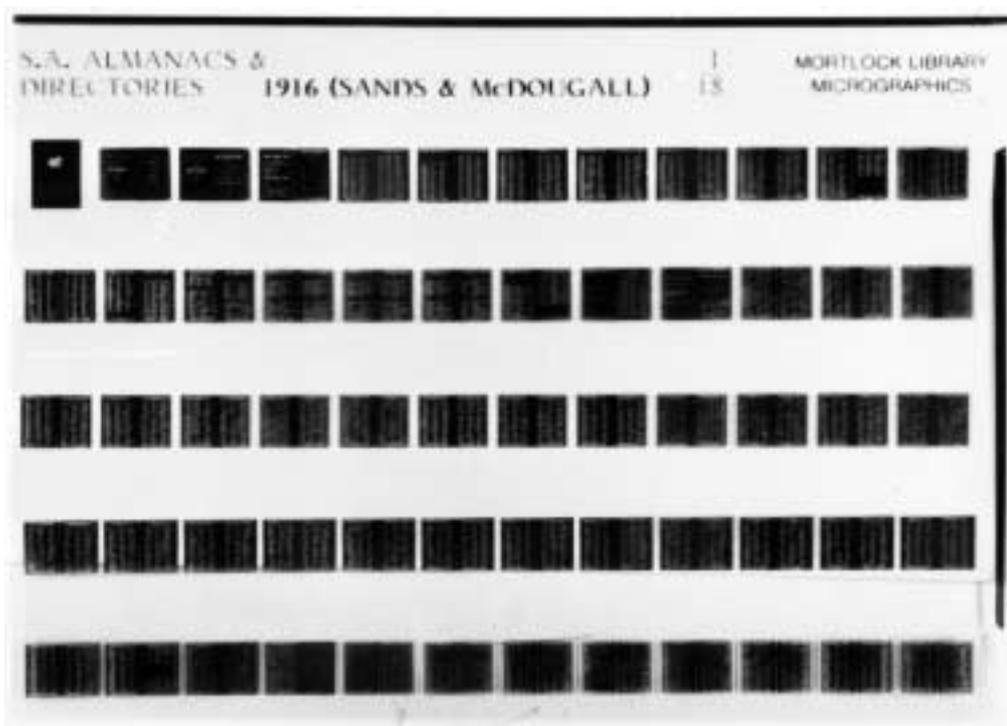
© Photograph courtesy of State Library of South Australia

Headings

The headings for the jackets should be clear and able to be read without the aid of a reader (eye legible). They can be added at convenient times during the jacketing process. A common method is to type the headings on the top of the fiche using an electric typewriter. Handwritten headings should be avoided as they are difficult to read.

The correct form of the headings should be determined at the preparation stage.

Make sure that the jacket is facing the correct way when typing the heading.



Fiche with heading

© Photograph courtesy of State Library of South Australia

The module, **Preparation for Microfilming**, gives guidelines for producing fiche or jacket headings to preservation quality standards. They include the following:

Headings should be	Headings should include
eye legible	short title
consistent throughout the series	date
	numbering e.g. 1/20 = fiche number 1 of 20 fiche
	author/editor (for books)
	volume/issue number
	pagination—the page range e.g. pp.1–50
	section or chapter

Some organisations include **header-stripes** on the back of the heading area in microfiche third generation use copies. Colour-coded header-stripes help users to identify microfiche within a series.

Accepted standards for jacketed film

The film itself

The microfilm *contained within the jacket* should be produced according to the established preservation quality standards. The essential features of these microfilm standards are described in, **Preservation Microfilming—Basics**, Topics 4 and 5.

They include features such as the following:

- I how originals and microforms are to be handled
- I the environment in which items are to be filmed, processed and stored (e.g. levels of temperature, humidity, exposure to dust)
- I the film base and type to be used
- I whether the filming arrangements and image quality will have to support later digitisation
- I image orientation and placement and the acceptable degree of skew
- I reduction ratio
- I resolution
- I density levels
- I scratching and marking
- I the need for multiple exposures
- I sequence and type of targets
- I indexes and guides
- I leaders and trailers
- I splices
- I chemical processing and levels of residual chemicals on master films
- I quality control requirements
- I processes for correcting defects
- I how the film is to be wound
- I housing of films—type of reels, boxes, envelopes, labels.

The jacketed film

In addition to the features of the film itself, the jacketed fiche should comply with the following features:

- I have a consistent number of images per channel (e.g. 12 single images) except at the end of a sequence
- I be free from scratches, tears, curling, fingerprints or any other damage
- I be clearly labeled with headings as described above
- I follow logical programming as described in the module, **Preparation for Microfilming**—for example:
 - books should be filmed on consecutive fiche
 - serials should start a new fiche for each logical break e.g. month, year, volume
- I be housed within a preservation-standard enclosure e.g. an acid-free envelope
- I be stored and handled carefully as a master (unless a second master copy has been created with a dual head camera).

Further information

 Further information about jacketers is available from the website of G.G. Baker under *jacketing* and the *links to suppliers*.

Activity 6.1

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

Producing microfilm jackets to accepted standards



For this activity you will need access to:

- a jacketing (or reader-filler) machine
- a relevant jacketing machine manual
- a roll of processed film with images for jacketing (this will need to match the size of the jacketing machine e.g. 16mm or 35mm).

An empty fiche jacket and an acid-free envelope are supplied.

You will need to make advance arrangements so that your assessor or lecturer can be present to observe you doing the test.

Your task is to jacket one complete fiche using a jacketing machine and following the steps outlined above.

This task has to be done in the presence of your assessor or lecturer who will check that each stage is performed correctly according to the checklist below.

Your completed jacket should conform to the acceptable standards for quality fiche above, except for the heading.

For the lecturer/assessor

Check that the operator completes these tasks in Activity 6.1	Lecturer/assessor to verify that each step has been performed correctly		
	Correct ✓ yes X no	Assessor signature	Date
• operator is using white gloves to handle film	<input type="checkbox"/>		
• operator places reel on supply spindle correctly, with emulsion side correct	<input type="checkbox"/>		
• operator threads film	<input type="checkbox"/>		
• operator places and secures empty jacket correctly on the carriage	<input type="checkbox"/>		
• operator rotates feed knob so that the film slowly slides into the first jacket channel	<input type="checkbox"/>		
• operator cuts off leader	<input type="checkbox"/>		
• operator continues moving film in the channel until the leading edge reaches limit line	<input type="checkbox"/>		
• operator checks screen	<input type="checkbox"/>		
• operator cuts off film when first row of the channel is filled	<input type="checkbox"/>		

For the lecturer/assessor (continued)

Check that the operator completes these tasks in Activity 6.1	Lecturer/assessor to verify that each step has been performed correctly		
	Correct ✓ yes ✗ no	Assessor signature	Date
• operator repeats process until all the rows on the jacket have been filled	<input type="checkbox"/>		
• operator pulls carriage forward to remove jacket	<input type="checkbox"/>		
• jacket has a consistent number of images per channel	<input type="checkbox"/>		
• jacket is free from scratches, tears, curling, fingerprints or any other damage	<input type="checkbox"/>		

Maintaining jacketing equipment

The principles of routine maintenance of equipment were discussed in Topic 1 of the module, **Maintaining Microfilming Equipment**.

Two key parts of maintenance are:

- I regular cleaning
- I lubrication.

Regular cleaning removes the dust and dirt that causes scratching.

Lubrication prevents wear and tear. Generally, lubrication should be applied according to specifications. Ideally, lubrication should be done by a technician, if one is available.

The following are some general guidelines for routine maintenance on jacketing equipment. The guidelines serve as a general indication only of the types of tasks needed to maintain jacketers. In each case you should follow the specifications in your organisation's equipment manuals.

Always *disconnect the power cord* before cleaning equipment.

Part	General maintenance details	General comments On steps	Suggested frequency D= daily W= weekly An = as needed
film track glass	<ul style="list-style-type: none"> • clean film track glass • wipe it with a soft cloth moistened with water • dry it 	<ul style="list-style-type: none"> • follow steps in manual 	D or An
screen	<ul style="list-style-type: none"> • clean screen by wiping it with a soft cloth moistened with water • dry it 	<ul style="list-style-type: none"> • do not use ammonia-based cleaning solutions and other solvents, as these will damage screen 	An
rear mirror	<ul style="list-style-type: none"> • caution—handle mirror carefully • wipe mirror with a soft cloth moistened with water • dry it 	<ul style="list-style-type: none"> • do not touch mirror surface • mirror will scratch easily 	An

Part	General maintenance details	General comments On steps	Suggested frequency D= daily W= weekly An = as needed
front mirror	<ul style="list-style-type: none"> • caution—handle mirror carefully • wipe mirror with a soft cloth moistened with water • dry it 	<ul style="list-style-type: none"> • do not touch mirror surface • mirror will scratch easily 	An
lens cleaning	<ul style="list-style-type: none"> • caution—handle lens carefully, as it will scratch easily • wipe lens with a soft cloth moistened with water • dry it 	<ul style="list-style-type: none"> • do not touch mirror surface 	An

In **Activity 4.7** in the module, **Maintaining Microfilming Equipment**, you drew up a table for routine equipment maintenance in your own organisation.

You can now add jacketing equipment to this list by completing **Activity 6.2** below.

■ Activity 6.2

Routine maintenance of jacketing equipment

Draw up a table for routine maintenance of your organisation's *own* jacketing equipment.

You can adapt the information in this module, but your table should reflect the particular needs of your own organisation. This table will add to the list that you have made for routine maintenance of equipment in **Activity 4.7** of the module, **Maintaining Microfilming Equipment**.

Equipment	Maintenance details	Suggested frequency D= daily W= weekly An = as needed O = other (specify)

Identifying and correcting minor faults in jacketing machines

The module, **Maintaining Microfilming Equipment**, identified three stages in solving an equipment problem:

- I identifying the *real* problem
- I identifying the cause
- I making the suggested adjustments based on trouble-shooting lists in the manuals.

Trouble-shooting is the first stage of making adjustments before calling out a technician.

■ Activity 6.3

Identifying and correcting problems in jacketing equipment



For this activity you will need access to a trouble-shooting chart from the manual of a jacketing machine. Your organisation may also have its own trouble-shooting chart or list.

- I Identify the probable causes and corrections for the following types of problems in jacketing machines.
- I Use your trouble-shooting chart as a guide to help
(Note that there can be several causes for the one problem).

Problem	Probable causes	Corrections/adjustments
film will not enter jacket		
lamp will not light		
film jams in unit		

Problem	Probable causes	Corrections/adjustments
machine does not operate		
Images on screen are not centred horizontally or vertically		

Arranging repairs

Sometimes you will reach the stage when you:

- have identified a particular problem and its cause
- have tried some trouble-shooting adjustments
- need more help.

The module, **Maintaining Microfilming Equipment**, describes your options of:

- calling out a maintenance technician—if one is available
- checking your *contacts list* that you developed in **Activity 4.8** of the module, **Maintaining Microfilming Equipment**.

Remember that sources of information about equipment suppliers and repairers can include:

- colleagues
- other microfilming organisations
- 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**
- professional associations e.g. library and preservation associations
- journals such as *Microform and Imaging Review*
- MICROLINK-L—post a query on the international email discussion list <http://www.nla.gov.au/nla/listserv/microlink_l.html>.
- film manufacturers such as Kodak, Agfa-Gevaert, Fuji and their regional representatives—check out their web pages on the internet
- equipment manufacturers, such as Elke, GKL, Hermann and Kraemer, Zeuschel, Canon, Allen—check out their web pages on the internet

- I 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.

You can also check with the equipment manufacturer, your assessor or lecturer, or colleagues for suggestions.

Revise the checklist for:

- I things to remember when calling out a technician
- I details that need to be recorded.

These are listed in the section, **Arranging repairs** in the module, **Maintaining Microfilming Equipment**.

■ Activity 6.4

Add to your contacts

Add information on jacketing machines to your file of contacts, which was developed in **Activity 4.8** of the module, **Maintaining Microfilming Equipment**.

The information in the file can consist of examples such as:

- I information sheets or brochures from the manufacturer
- I a print out of pages from the internet e.g. from the website of G.G. Baker under jacketing and the *links to suppliers* <<http://www.ggbaker.com/>>
- I a copy of an advertisement in a magazine
- I information provided by colleagues or professional contacts
- I an organisation or person who can help to fix the jacketing equipment.

Summary

- I Microfiche jackets are created using jacketing machines. These transfer the film from rolls into strips that are inserted into jackets.
- I In addition to the preservation standards of the film itself, the jackets should be free of scratches, tears, curling, fingerprints or any other damage.
- I Jacketing equipment should be cleaned and maintained regularly.

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 produce microfiche jackets to an acceptable standard
- I identify and safely correct minor faults in jacketing equipment
- I implement a routine maintenance program for jacketing 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.

Topics 3 & 4

Splicing and filming retakes

Performance criteria

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

- I demonstrate splicing techniques which avoid possible problems
- I identify an appropriate span of frames for retakes to:
 - eliminate problems
 - achieve a minimum number of splices
 - achieve an economical product
- I identify situations where retakes/splices are needed and where they are unacceptable
- I calculate frame breaks to allow re-jacketing of whole rows.

Splicing

The module, **Preservation Microfilming—Basics** described a splice as a join made by attaching two pieces of film together so they will function as a single piece. This usually happens when there are errors in the camera master, leading to the need for some sections to be refilmed and spliced into the camera master. When sections are refilmed these are known as *retakes*.

An error that requires splicing can be discovered at two distinct stages:

- I during filming
- I during the quality checking stage.

Problems at both stages are discussed under **Splicing options** below.

(There is another type of temporary splice that is made to join films together for processing. This is discussed under **Temporary splicing for processing** below).



Splicing with an ultrasonic film splicer

© Photograph courtesy of State Library of South Australia

Guidelines for splicing

It is not good policy to depend on splicing to correct mistakes in preparation or poor filming practices. Every splice weakens the film, making it more vulnerable to breaking or tearing.

The *RLG Preservation Microfilming Handbook* (Elkington 1992), the *RLG Archives Microfilming Manual* (Elkington 1994) and the *Guidelines for Preservation Microfilming in Australia and New Zealand* (National Library of Australia 1998) provide clear guidelines as to the types and number of splices. These are summarised below.

Feature	Comment
limits on numbers of splices	<ul style="list-style-type: none"> usually limited to 6 per reel (3 retakes)
type of splicing	<ul style="list-style-type: none"> only <i>ultrasonic splices</i> are recommended for preservation microfilming microfilm intended for preservation should not be spliced with tapes, rubber cement, glues or other adhesives
generations of film	<ul style="list-style-type: none"> splices should only be made on the masters and <i>not</i> the printing masters or service copies new error-free copies of the printing masters and service copies should be produced
types of film and thickness	<ul style="list-style-type: none"> it is important that only <i>the same type of film</i> is used for the retakes and is spliced together for example, retakes of images originally filmed on a 40 metre (131 foot) length of film should be done on a 40 metre film this makes sure that film of the same thickness is spliced together (40 metre film is thinner than 30.5 metre film).
removing defective frames	<ul style="list-style-type: none"> defective frame images should be removed from the first generation camera negative
location of splices	<ul style="list-style-type: none"> there should <i>never</i> be splices between the technical target and the first ten frames of the text
include 2 frames before and after splice in retake	<ul style="list-style-type: none"> splicing must not obscure the frames immediately before and after the splice for this reason the guidelines require that <i>at least two pages before and after the page being refilmed</i> should be included in the retake this is discussed further under, Splicing options below splicing should not be too close to an image as it may cause blurring of the images on the duplicate copy
minimum distances if several titles on same reel	<ul style="list-style-type: none"> if several titles are spliced together to form a reel, there must be a minimum of 5cm or 2 inches between the splice and the last target of one title and the splice and the first target of the next title the total distance between titles should be <i>at least</i> 10cm or 4 inches.



Different lengths of film

© Photograph courtesy of State Library of South Australia

Ultrasonic splices

Ultrasonic splices are extremely durable and flexible. High frequency sound waves cause the molecules of the film base to vibrate rapidly. This generates enough heat to melt the two pieces of film base together.

Economics

Where a significant number of problems occur close together, it is often more economical to retake a whole sequence than to spend time on splicing small sections together, as in the following example.

Problem	Frames	Suggested action
deep scratching	23–24, 30–32, 50–55, 63–64	Retake from beginning up to frame 77 and splice
blurred image	70	
missing pages	11, 75	

When splicing is unacceptable

Where microfilm is expected to be used in evidence (e.g. legal) any splicing is unacceptable. A special target should be filmed in the normal target sequence at the start indicating that any retakes will be found on a supplementary reel.

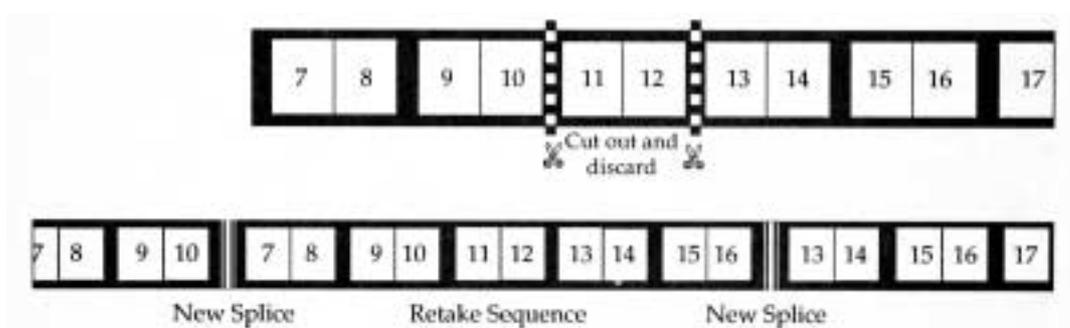
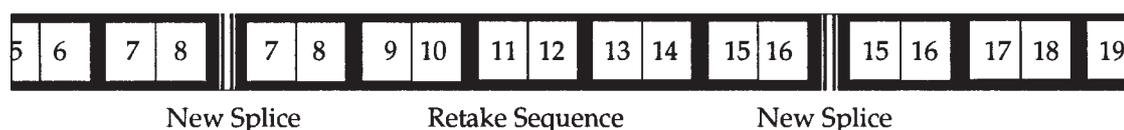
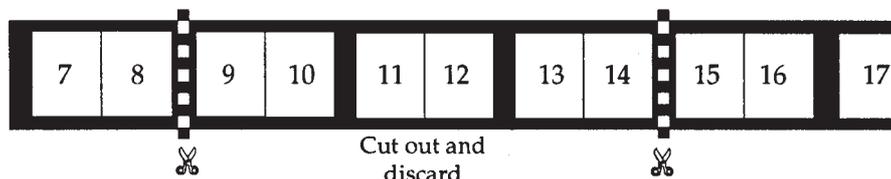
Splicing options

The RLG guidelines that *at least two pages before and after the page being refilmed* should be included in the retake can be interpreted in two main ways, both of which are correct. Two examples are examined below.

The following discussion of the two options is drawn from the *RLG Archives Microfilming Manual* (Elkington 1994 pp. 119–123). The section is called **Splicing: Art or Science**.

Problem A

The single frame containing pages 11/12 (11 to 12) of a bound volume is out of focus and must be replaced.



Problem A—options 1 and 2

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The two options for splicing are summarised in the table below. The major difference is the location of the two splices.

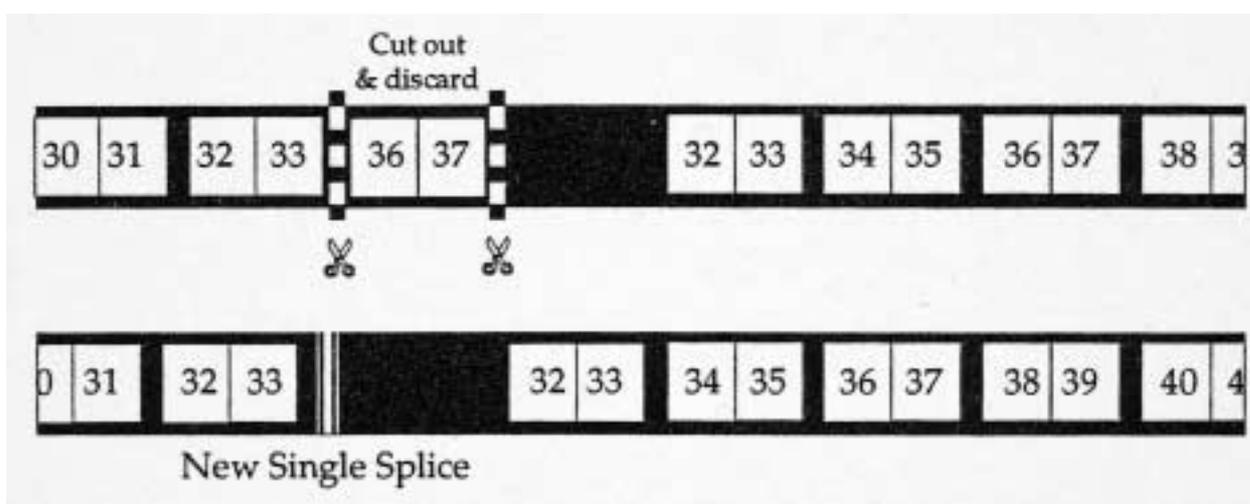
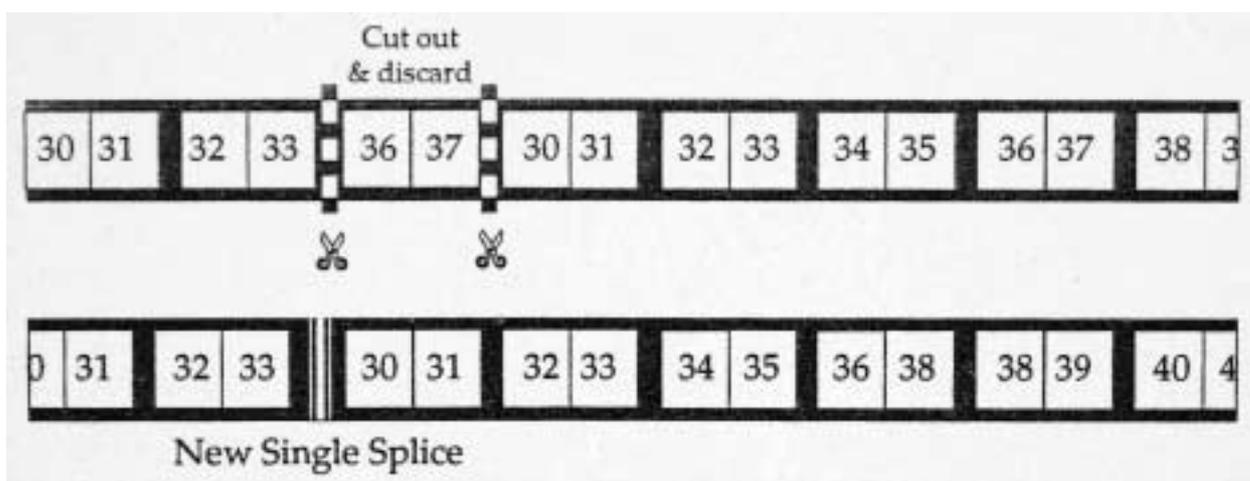
Splicing & retakes	Option 1	Option 2
splice out	frame containing pages 11/12	frame containing pages 11/12, plus good frames on either side (9/10 and 13/14)
retakes	pp 7/8 and 9/10—the 2 frames before 11/12 pp 13/14, 15/16—the 2 frames after	pp 7/8 and 9/10—the 2 frames before 11/12 pp 13/14, 15/16—the 2 frames after
new frame sequence	1/2, 3/4, 5/6, 7/8, 9/10 splice 13/14, 15/16, 17/18, etc. splice 7/8, 9/10, 11/12, 13/14, 15/16	7/8, 9/10, 11/12, 13/14, 15/16 splice 1/2, 3/4, 5/6, 7/8 splice 15/16, 17/18, etc.
no. of frames removed	1 (bad)	3 (1 bad + 2 good)
no. of new frames shot	5	5
no. of frames appearing twice	4	2
no. of splices	2	2
splices separated by...	5 frames	5 frames

Advantages and disadvantages

- I Option 1 repeats more of the frames. Therefore if any problems develop in the area of the splices, there is less likelihood of losing information.
- I Option 2 limits the number of repeats and makes it less confusing to the user.

Problem B

The camera operator discovers an error while filming—almost immediately after making it. The operator has filmed p 36/37 and then realises that p 34/35 has been missed.



Problem B—Options 1 and 2

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The two options for splicing are summarised in the table below. Again, the major difference is the location of the two splices.

Splicing & retakes	Option 1	Option 2
retake	30/31, 32/33, 34/35, 36/37 until end of volume	take one blank frame then retake 32/33, 34/35, 36/37 until end of volume
cut	after first appearance of frame 32/33	after first appearance of frame 32/33
remove	first instance of 36/37 and discard it	first instance of 36/37 and discard it
new frame sequence	30/31, 32/33, splice	30/31, 32/33, 34/35, 36/37, 38/39, etc. 30/31, 32/33, splice blank space 32/33, 34/35, 36/37, 38/39, etc.
no. of frames removed	1 (bad)	1 (bad)
no. of frames appearing twice	2	1 (but separated by blank film between splice and second appearance)
no. of splices	1	1

Advantages and disadvantages

- I These are the same as for Problem A.

● Reflect 6B

Splicing options

- I Which splicing option do you prefer? Why?
- I Discuss the two options with experienced colleagues and your supervisor or mentor.
- I Which option is preferred by your organisation?

■ Activity 6.5

Splicing guidelines

The table below contains 5 problems. Complete the table by identifying an appropriate span of frames for retakes to:

- I eliminate the problem
- I achieve the minimum number of splices
- I achieve an economical product.

Remember to apply the splicing guidelines above.

You will need to show where the splice appears by adding the word *splice*.

Problem 1 has already been completed as an example.

Problem	Splicing & retake features	Details	Reason/comment
(1) frame 23 is badly scratched (single frames)	splice out	23	at least two pages before and after the page being refilmed should be included in the retake
	retakes	21, 22, 23, 24, 25	
	new frame sequence (with splice details)	20, 21, 22, splice 21, 22, 23, 24, 25 splice 24, 25	
(2) frames 53–94, 96–99, 203–205, 306–309 are far too light	splice out		
	retakes		
	new frame sequence (with splice details)		
(3) 5 target frames are blurred including title, and copyright statement (single frames)	splice out		

Topics 3 & 4

Problem	Splicing & retake features	Details	Reason/comment
	retakes		
	new frame sequence (with splice details)		
(4) frame 53/54 is far too dark (double frames)	splice out		
	retakes		
	new frame sequence (with splice details)		
(5) blurring in frames 11, 15, 21, 22, 32, 33, 44, 47.	splice out		
	retakes		
	new frame sequence (with splices)		

■ Activity 6.6

Splicing quiz

In this activity you will identify situations where retakes/splices are required by marking the boxes **Yes** or **No** in the following statements:

- | | |
|--|--|
| 1. Should splices be made on the service copies? | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| 2. Is it OK to splice within the target sequence, provided that two frames before and after the problem target are included in the retake? | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| 3. Is it OK to leave defective frames in if a retake is spliced in later? | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| 4. When splicing retakes, should all duplicated pages be eliminated? | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| 5. Splicing is acceptable in microfilm to be used for legal evidence if it is done with an ultrasonic splicer. | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| 6. The number of splices allowed per reel is proportional to the size of the reel. | Yes <input type="checkbox"/> No <input type="checkbox"/> |

Calculating frame breaks for jacketing

When an error is found during jacketing, splicing is not necessary. This is because it is easy to retake a whole row.

If the error is noticed during filming, the retakes can be made on the spot. For example:

- a jacket contains a standard 5 rows with 12 images per row
- it will be necessary to retake from the frame *following* the nearest multiple of 12 frames (12, 24, 36, 48 etc).

If the operator makes error on frame 41, it will be necessary to retake the row following frame 36 i.e. frames 37 to 48.

■ Activity 6.7

Calculating retakes so that whole row can be replaced

An operator has made a number of filming errors. The film is to be jacketed in a standard jacket of 12 images and 5 rows.

Your task is to calculate which frames the operator will need to retake so that the whole row can be replaced.

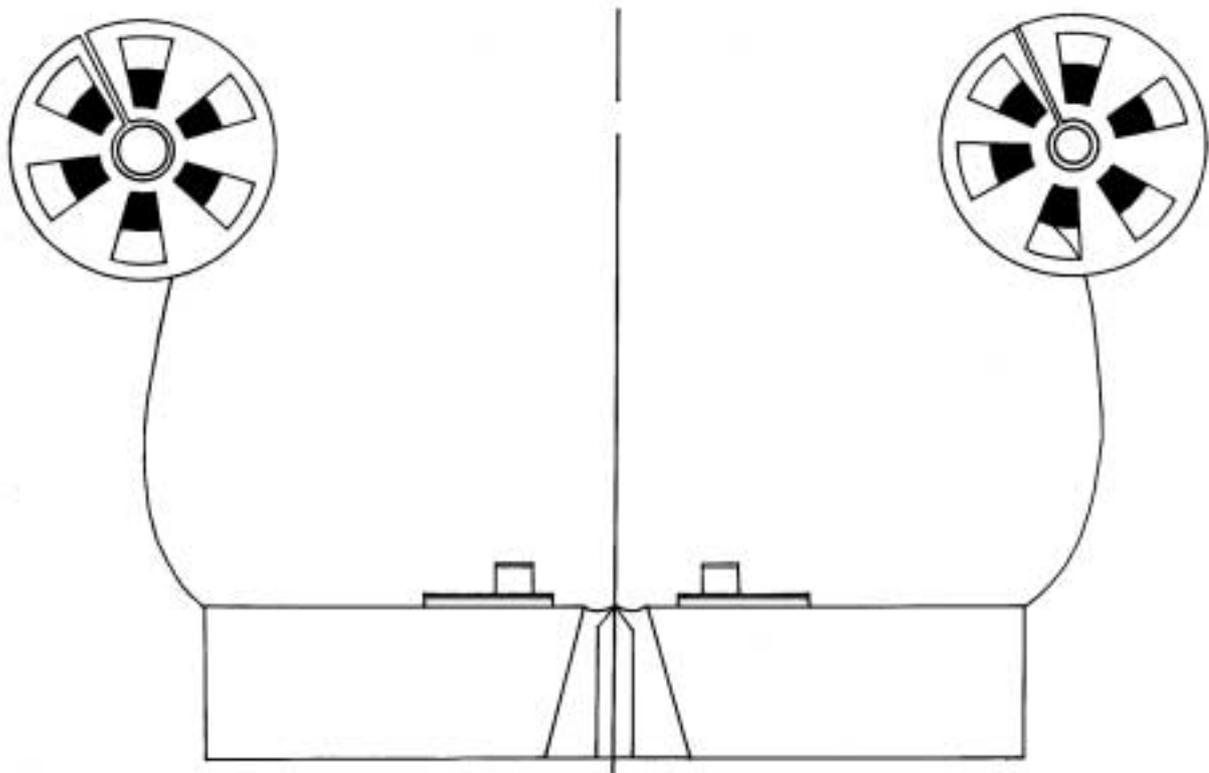
Record your answer in the spaces below in the right-hand column. The first line has been completed as an example.

Operator makes error on frame	Operator will need to retake frames
41	37 to 48
83to....
123to....
145to....
214to....

Splicing techniques

The following are some general steps for operating a typical film splicer. Compare these steps with the steps needed to operate other splicers that you have seen or used.

Step	Comments
splice like with like	<ul style="list-style-type: none"> • always make sure that you are splicing similar types of film, thickness and polarity (e.g.40 metre film is thinner than 30.5 metre film)
handle master carefully	<ul style="list-style-type: none"> • handle the master film carefully with cotton gloves to avoid scratching
clamp first section	<ul style="list-style-type: none"> • clamp first section of film onto splicer
trim film	<ul style="list-style-type: none"> • use cutter blade to trim film at point of splice • avoid splicing too close to an image frame
repeat	<ul style="list-style-type: none"> • repeat with second section of film
overlap edges of both sections of film	<ul style="list-style-type: none"> • both sections of film should be placed so that their trimmed edges overlap over the centre line of the ultrasonic horn
film is welded	<ul style="list-style-type: none"> • a roller will move forward and then weld the film
rest then test	<ul style="list-style-type: none"> • leave the film for approximately 5 minutes before testing the strength of the splice



Cross section of an ultrasonic film splicer

■ Activity 6.8★

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

Splicing techniques



For this activity you will need access to:

- a splicing machine or splicing equipment—preferably an ultrasonic film splicer
- a splicing machine manual.

One roll of processed film with images for splicing is supplied.

You will need to make advance arrangements so that your lecturer or assessor can be present to observe you doing the test.

Splicing task

- In the film supplied there is a section out of sequence. The operator has then refilmed some frames.
- Your task is to correct the mistake in the film supplied by cutting, removing frames and then splicing the film.
- The detailed instructions about the frames to cut, remove and splice are at the beginning of the roll of film supplied.
- This task has to be done in the presence of your mentor or supervisor who will check that each stage is performed correctly according to the checklist below.

For the lecturer/assessor

Check that the operator completes these tasks in Activity 6.8	Lecturer/assessor to verify that each step has been performed correctly		
	Correct ✓ yes or ✗ no	Assessor signature	Date
• operator uses white gloves to handle film	<input type="checkbox"/>		
• operator clamps first section of film onto splicer	<input type="checkbox"/>		
• operator trims film at point of splice and repeats action with second section of film	<input type="checkbox"/>		
• operator places both sections of film so that their trimmed edges overlap (e.g. over the ultrasonic horn)	<input type="checkbox"/>		
• operator splices film (e.g. by welding)	<input type="checkbox"/>		
• operator tests strength of splice after 5 minutes	<input type="checkbox"/>		
• splice holds when tested and is free from major scratches	<input type="checkbox"/>		

Temporary splicing for processing

A temporary type of splicing is used in larger microfilming operations with large processors. The single reel films are spliced temporarily into a longer roll, normally up to 330 metres or 1000 feet long, *before* they are processed. Almost any temporary splicing method can be used for this purpose.

At the end of this processing, the splices are cut off and the rolls are returned to their original lengths for quality control inspection.

Summary

- I Splices attach two parts of a film together.
- I The need for splicing can be determined at two stages: during filming or quality checking
- I Splicing guidelines cover the location of splices, taking out defective frames and types of film.
- I Splices weaken the film. It is not good policy to depend on splicing to correct mistakes in preparation and poor filming.

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 demonstrate splicing techniques which avoid possible problems
- I identify an appropriate span of frames for retakes to:
 - eliminate problems
 - achieve a minimum number of splices
 - achieve an economical product
- I identify situations where retakes/splices are needed and where they are unacceptable
- I calculate frame breaks to allow re-jacketing of whole rows

▲ 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.

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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

