

# Deakin University Library and Archives – Preservation Plan

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## Introduction

Preservation is a central function of an archive and an important function for a research library. For Deakin Archives, the primary goal is to preserve the cultural heritage of Deakin and to ensure compliance with various statutory bodies including the Public Records Office of Victoria. For the University Library overall, there are a range of imperatives driving the preservation of special collection items and research outputs.

Within the Library, a diverse range of material is held across a variety of areas, collections and platforms. These include

- The Alfred Deakin Prime Ministerial Library (ADPML),
- Deakin Archives, part of Information & Records Services (IRS)
- Deakin Research Online – Deakin’s institutional repository
- The Fusion: Deakin Exhibits online digital exhibition platform
- Ad hoc research data sets

Across these collections, formats, include, but are not limited to:

- Rare and valuable books, pamphlets, posters, and manuscripts
- Paper documents and files
- Photographs and negatives
- Physical objects, e.g. the University Seals, graduation gowns, silver wear, awards, Deakinalia, such as his judicial wig, ornamental silver and a few rare books
- Audio-visual media, e.g. films and tapes in dozens of different AV formats, all requiring specialist equipment to access
- Optical media, such as on CDs and DVDs, requiring specialised software and hardware to access
- Digitised files, such as scanned documents, photographs or films
- “Born digital” files such as electronic documents, spreadsheets, digital photography images, digital films, and data of varying kinds, in a variety of formats

These differing formats have complex preservation needs that require specific handling, planning, expertise and consideration.

## The Preservation Challenge

This wide range of material presents a multi-faceted preservation challenge. Physical objects and files are best preserved by ensuring the physical conditions in which they are stored enables their longevity.

However, some objects will deteriorate over time regardless - though we can and do act to increase their longevity through appropriate housing and storage - especially non-paper formats, such as film and tape, or computer disks. The deterioration of carrier media threatens the accessibility of the content on that media.

Similarly, non-paper formats often require specialised equipment, hardware or software to access the content. As the equipment becomes dated, obsolete and breaks down, this too threatens our ability to access to the content on the carrier media.

Digitisation provides a way of preserving content that is otherwise threatened by deterioration over time or obsolescence in format or equipment. However, digitisation is expensive, resource-intensive

and time consuming, and so our digitisation efforts must focus on priority collections, those that are highly valuable, at risk of loss, or requiring increased levels of accessibility.

As the vast majority of newly created information in the twenty-first century is “born digital”, Deakin University Library and the University Archive is increasingly collecting and holding original digital content. Preservation of digital content, whether scanned from physical originals or born digital material, brings its own complications, from rapid format shifts, proprietary formats, and fast-move changes in common storage media (i.e. from floppy disks to cloud storage).

Digital Preservation – that is, the need to ensure long-term, error-free storage of digital information with means for retrieval and interpretation – is thus a priority focus of Deakin University Library and the Archives.

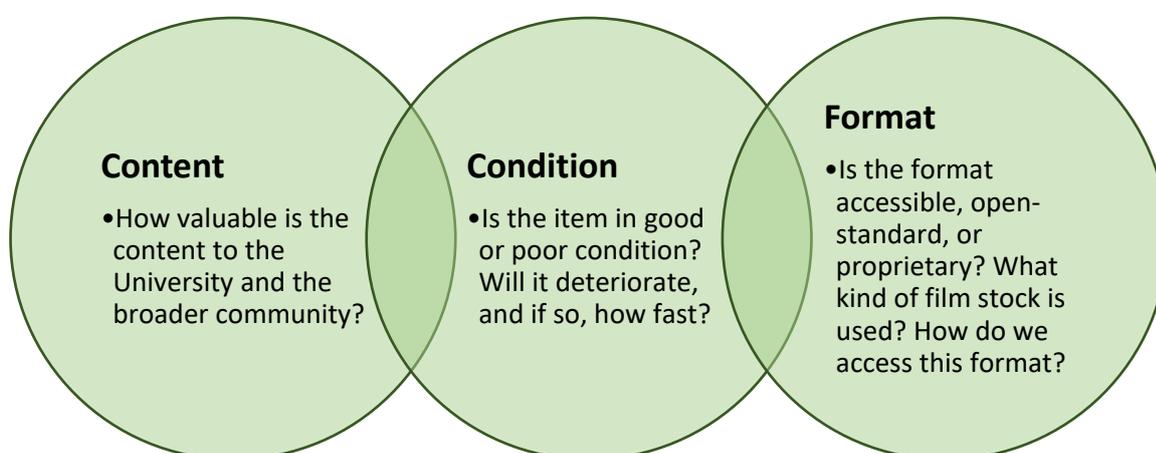
## Our Approach

The core preservation risks faced by the University Library, including Deakin Archives and IRS can be summarised into three broad areas:

- damage to the physical object through inappropriate physical storage
- deterioration of the content on the physical object over time
- inability to access the content due to format or equipment obsolescence

As our collections are large, digitisation expensive and digital preservation is resource intensive, decisions as to the Library and Archive’s preservation priorities must be efficiently made.

Preservation priority decisions – that is, where we need to focus our time, efforts and the resources available to us – are based on the following conditions:



With these conditions in mind, The University Library seeks to mitigate its preservation risks by implementing the following activities:

1. **Physical Storage** – maintaining high quality, compliant physical storage repositories in order to preserve permanent physical items
2. **Digitisation** – identifying collections most appropriate for digitisation, and developing plans that document the digitisation requirements, in order to preserve content on carrier media at threat from physical deterioration, or from format or equipment obsolescence

3. **Equipment Management** – tracking, monitoring, replacing, repairing and maintaining the specialised equipment needed to access the variety of formats in the collection
4. **Standards & Guidelines** – developing in-house standards, specifications and guidelines, based on national and international standards, and taking advice from key industry bodies, in order to advise the University and streamline our own workflows
5. **Digital Storage** – maintaining high quality, compliant digital storage repositories in which we manage permanent digital items, including investigating the feasibility of specialist digital preservation systems

## 1. Physical Storage

Two collection and organisation areas with a critical focus on physical storage of items requiring long term preservation and safeguarding from deterioration are Deakin Archives and the Alfred Deakin Prime Ministerial Library.

### Archives

Archives manages physical archival repositories at both the Waterfront and Burwood campuses. The Waterfront Archives and Records Repository in Building C holds all temporary records, and the permanent archives relating to Geelong and Warrnambool campuses, and their respective antecedent institutions.

The Burwood Archives repositories hold all permanent archives relating to the Melbourne-based campuses, and their antecedent institutions. The Burwood repositories include the purpose-built AV Repository (CP12) and a series of rooms elsewhere on the campus, primarily in buildings EC and ED.

Deakin is legally obliged to store its permanent archives in repositories which meet Public Record Office Victoria<sup>1</sup> standards. Alongside PROV standards, we also strive to follow recommended standards from expert industry bodies such as the National Archives of Australia<sup>2</sup>, and guidance from experts at the National Sound and Film Archives<sup>3</sup>.

See **Appendix One** for a list of relevant industry standards and guiding information.

In order to achieve these standards Archives, maintains a program of continuous improvement, monitoring and management of all our physical repositories. Some of our spaces are closer to achieving compliance than others – for example, the AV Archive in Burwood was purpose built to meet compliance standards. On the other hand, the Archives Rooms in Burwood ED and EC buildings are non-compliant in many and significant ways.

The Library maintains a constant dialogue with the University in order to maintain and improve our spaces. This includes:

- making recommendations relating to compliance needs of our physical spaces
- advising IPG on what is required to meet and maintain compliance

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<sup>1</sup> PROS 11/01 S2 Storing and Managing State Archives Specification: <https://prov.vic.gov.au/recordkeeping-government/document-library/pros-1101-s2-storing-and-managing-state-archives>

<sup>2</sup> National Archives of Australia Storage Conditions: <https://www.naa.gov.au/information-management/store-and-preserve-information/storing-information>

<sup>3</sup> National Sound and Film Archive – Technical Preservation Guide: <https://www.nfsa.gov.au/preservation/guide>

- developing requests for resourcing to ensure the IRS physical repositories are brought up to standard
- managing and implementing improvements as needed

In 2016-2017, external consultants VOTAR Partners were engaged to audit the compliance levels of the IRS physical repositories, and produced a report on the current compliance status at the time.<sup>4</sup>

In 2019, an updated report was prepared by Deakin's Information Manager, detailing the current status of our Archival Spaces and the necessary steps to continue to improve them.<sup>5</sup>

In 2020 and beyond, Deakin Archives will continue to monitor and report annually on the status of its physical repositories, to advise the University, make recommendations and manage continuous improvement efforts.

### Alfred Deakin Prime Ministerial Library

ADPML holds material primarily at Waterfront, with a subset of material held at Burwood, Waurn Ponds and Warrnambool. The ADPML space at Waterfront was purpose built to house the collection and includes a reading room where collection items can be consulted.

## 2. Digitisation

There is an active program of digitisation undertaken by both Deakin Library and Archives on an annual basis and which includes items from the Archives, ADPML, research collections and other special collection material deemed to be of significant value or risk.

Deakin Archives has undertaken a process of mapping and identification of digitisation priorities across its collections. As the Archives contains a vast range of formats and types of material, the specific processes, digitisation requirements and storage needs differ depending on the collection/sub-collection.

Commencing in 2012, the Special Collections Digitisation program has resulted in a digital Special Collection that, like all other Library collections of information resources, aims to support and enhance the teaching, learning and research activities and strategies of Deakin University. It draws on material across the campuses from special collections under the stewardship of ADPML including:

- Genealogy Collection
- Western Victoria Collections
- Rare Books
- Natural History
- Manuscripts
- Pamphlets
- Children's Literature Research Collections
- Australian Schools' Textbook Collections
- Australian Multicultural Literature Collection
- Louis Goldberg Collection

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<sup>4</sup> VOTAR Partners, *Record Storage Options Report*, TRIM Ref: D2018/11409. See also - *Record Storage Area Compliance Report, Deakin University April 2014*, TRIM Ref: D2016/16439  
*Record Storage Area Compliance Checklist Burwood Campus*, TRIM Ref: D2016/16435  
*Record Storage Area Compliance Checklist Waterfront Campus*, TRIM Ref: D2016/16436

<sup>5</sup> *IRS Physical Storage Report January 2019*, TRIM Ref: D2019/23546

- Deakin University Authors' Collection

## Digitisation Prioritisation

### Archives

Digitisation of permanent archival material is conducted for one of two purposes:

1. Access – where items are deemed to have a high interest or value, and there'd be benefit in making them openly accessible as possible
2. Preservation – where items are at risk of deterioration, or the equipment needed to access them is at risk of obsolescence, and digitisation is required to preserve content

### To Digitise for Access

The archival collections which have been assessed as having potential for digitisation based on value or accessibility grounds include:

- Deakin University Formation Historical Files
- Annual Reports
- Photographic Collections
- Max Charlesworth Collection
- Dr Lawrie Shears Collection

### To Digitise for Preservation

The archival collections which have been assessed as having potential for digitisation based on their preservation needs include:

- The Deakin AV Collection - a highly significant collection to the history of Deakin, which includes:
  - Recordings of opening ceremonies of buildings, schools, faculties and campuses
  - Student performances in theatre and dance
  - Geelong lectures featuring distinguished speakers
  - Interviews and presentations by significant Deakin staff
  - Promotional tapes of course offerings and student life at Deakin
  - Recordings of broader interest such as feature interviewed or presentations by significant public figures, including politicians and artists (e.g. Sir Zelman Cowan, Malcolm Turnbull, Bill Hayden, Max Charlesworth, Noel Counhihan, Jenny Watson)
- The Prahran Technical School Collection, containing a complete archive of a Victorian technical school spanning from its establishment in 1915 to its evolution as a college of Advanced Education in 1974, and separate school of TAFE in 1975. Some material is water damaged and deteriorating, and digitisation of the entire collection could be warranted
- The Deakin-Rusden AV Collection, which is a collection of film and video produced by the School of Communication and Creative Arts dating back to the first teaching of film and television at the Monash Teachers' Collection in 1966.

Each collection has very specific preservation needs and consequently, individual digitisation plans need to be developed for each collection deemed a digitisation priority, in order to identify the resource level required.

In 2019 work began on the AV Collection, identified as one of the core digitisation priorities for Deakin. The collection has been appropriately housed, listed and a preservation plan has been developed.

The AV Collection Preservation Project is detailed in **Appendices Two and Three**.

### *Special Collections*

Material may be selected for digitisation from special collections on all campuses, as part of a Digitisation Plan which will target specific materials in the collection to be digitised within a one to three-year period.

Material selected from the special collections should meet at least one of the above goals for digitisation and preferably be:

- Likely to support or stimulate research within the University or the wider community.
- Thematically relevant (e.g. research, enquiries, exhibitions, displays etc).
- Representative of strengths and scope of collection.
- Visually engaging if intended to support digital exhibitions

Factors likely to influence the selection of individual items include:

- relevance to the teaching or research areas of the University
- their scholarly or historical value;
- they have not previously been digitised by other bodies;
- they may be made available as open access (as copyright permits);
- exhibitions of related material
- notable acquisitions or gifts;
- they are fragile and digitisation will aid their preservation;
- they may be in an obsolete physical or digital format e.g. VHS, audio cassette, slides, floppy disks.

A targeted [Digitisation Priority Plan](#) is reviewed at the beginning of each year by the Collection Advisory Group and Library Executive. The aim is to identify and select sufficient material in the first half of each year to ensure digitisation is complete to satisfy the objectives of the Digitisation Plan by the end of that year.

Implementation of the plan is the responsibility of the Special Collections Librarian who may consult Liaison Librarians, Research Librarians, Campus Library managers, researchers or other University experts to identify or prioritise material as appropriate.

### Digitisation Processes

#### *Archives*

There are two approaches to the digitisation of archival materials:

#### *In-house digitisation undertaken by Deakin Archives staff*

- Outsourced digitisation undertaken by external specialists

Deakin Archives maintains digitisation equipment and has a series of workflows in place to manage basic digitisation of individual items where required. This allows us to respond to specific requests in a timely manner, and to handle individual items that are most at risk without delay.

This ad-hoc approach allows the Archives to be flexible, responsive and retain control over valuable items. Some formats are more economically handled in-house, such as audio tapes or digital video.

Other formats, however, require specialist handling and equipment which can only be sourced externally. Decisions regarding outsourcing of digitisation depend largely on the particular media, format and the quantity of material. Some AV formats, such as film, can be very expensive to digitise externally, however if digitising in large quantities, outsourcing remains more cost effective than handling specialist carrier media in-house.

To enable a larger scale of digitisation in order to protect and preserve at-risk archival material in a time sensitive fashion, or where there are complex digitisation needs requiring specialist equipment unavailable at Deakin, we need to investigate external providers and set up an internal workflow to manage such projects.

In contracting external digitisation providers, the Archives needs to consider:

- project and vendor management processes
- the metadata to be collected at the time of digitisation
- the specifications of the digitised output, formats, size and quality
- the media on which the digital files are transferred to the archives
- a migration plan for ensuring these files are captured into our Archival system(s)
- the appropriate physical handling of the original archival objects
- the needs of other university teams with relevant interests, such as for Research Collections published via in Deakin's Digital Research Online repository, and collaboration requirements across the University

As each collection within the Archives is considered for digitisation, the most appropriate approach of in-house digitisation versus external outsourcing for that collection needs to be determined.

#### *Special Collections*

The following principles are applied to digitisation initiatives undertaken as part of the stewardship and curation of special collection content.

- **Quality**  
Collection material will be digitised to accepted national and international standards, with checks to maintain quality.
- **Formats**  
Archival formats will be selected for preservation of a copy as faithful to the original as possible, as well as a format for ease of presentation over the internet. Currently an archival quality TIFF and high-resolution JPEG are made of print items, including the carrier i.e. covers, end pages with text or inscriptions. A lower resolution PDF of the same (automatically OCR'ed) has been selected for presentation over the internet.
- **Copyright**  
The digitisation of material from special collections will take into consideration account the provisions in the Copyright Act 1968 and Intellectual Property Rights.
- **Partnerships**  
The Library may seek partners to support its digitisation initiatives, from within the University and the external community.

- **Presentation**

Digital objects may be presented and used in in multiple ways (e.g. interactive screens, [Fusion](#), Object Connected Experience), to encourage engagement with the collections.

- **Management**

Digital objects will be managed to ensure their ongoing preservation, including appropriate metadata and storage.

#### Special Collections – External Digitisation Workflow

Files are digitised in TIFF format, with JPGs and PDFs generated from the TIFFs

- On receipt from provider (such as dataComIT), all files are copied all to:
  - U: drive – for day-to-day use
  - DRO DEV & UAT file system (not DRO itself) – 2 spare copies retained
  - Research Data Store; these are considered our preservation copies, and are bagged with BagIt, checksummed, and checksum-checked at least every 2 months. The Research Data Store is this purpose as it was introduced at the same time that we were investigating preservation practices
- The portable drive received from dataComIT is stored in the ADPML’s controlled environment room
- Records are created in DRO and Fusion; original PDFs are loaded to DRO, and LQ PDFs to Fusion (i.e. access copies)
- Once record-creation is completed, TIFFs, JPGs and PDFs, along with any edits, are re-copied to the Research Data Store (in a separate folder to the originals);

files in this folder are also bagged and checksummed.

An example of the RDS file structure for SPC items:

spc201407datacomit-originals	19/08/2016 3:08 PM
spc201407datacomit-post-dro	20/08/2018 2:14 PM
spc201502datacomit-originals	26/09/2016 1:27 PM
spc201502datacomit-post-dro	11/10/2016 10:28 ...
spc201609datacomit-originals	22/09/2016 9:42 AM
spc201609dstacomit-post-dro	2/02/2018 2:02 PM
spc201609rbgv-originals	24/01/2018 3:03 PM
spc201609rbgv-post-dro	2/02/2018 9:11 AM

### *Research Data*

The digitisation and preservation of legacy research datasets is a relatively new area for the Library. While Information and Records Services and the University Archive have long stored physical copies of research datasets and publications on an ad hoc basis, the imperative around both managing and preserving research data both digitised and born digital has been more fully acknowledged over the last 3-5 years.

In 2019, a project was commenced to digitise a unique collection of research data known as the Marine Mapping Tapes. This required specialist, external digitisation, and as a research collection, it was also a collaborative project undertaken between Deakin Archives and Deakin's Digital Research Online team.

This project has led to collating a series of specifications and technical requirements, and a broader understanding of how the Archives and Library Research Systems Team in the Digital Libraries and Repositories directorate are able to work together on shared collections. More details of this foundational project can be found in **Appendix Four**.

### 3. Equipment Management

In order to facilitate access to the full range of formats and types of material held in the Archival collections, Deakin Archives maintains a significant number of machines, equipment and players. These include, but are not limited to, reel-to-reel projectors, VHS video, DAT and U-matic players, micro-cassette and audio cassette players, among many others.

The Archives also maintains digitisation equipment that enables us to implement our own in-house digitisation workflows. These include scanners, digital cameras, audio recorders and associated equipment needed to run them.

All equipment requires regular servicing and maintenance. This is increasingly problematic in regards to older, out-of-date machines which are required to access old formats. Not only are the machines fast becoming obsolete, but the parts needed and the expertise required to service this equipment is increasingly difficult to source.

In 2019, Deakin Archives created an Equipment Register listing the equipment we hold and use, and its current maintenance status. This enables us to keep track of what we have, what we own, what we borrow and from whom, and the working status and maintenance records of each piece of equipment.

It also enables us to identify “equipment gaps” – where we might need a piece of specialist equipment, but do not currently have access to it.

The full register of all equipment held and managed by Deakin Archives can be found in **Appendix Five**.<sup>6</sup>

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<sup>6</sup> The master copy of the Archives Equipment Register, which will be kept up to date, is held in TRIM, at TRIM Ref: D2019/23307

#### 4. Standards and Guidelines

The University is legally obliged to meet archival and records standards as set by the Public Record Office Victoria (PROV).<sup>7</sup>

We also follow standards and guidance provided by key industry bodies, including the National Film and Sound Archive, the National Archive of Australia and the National Library of Australia.

**Appendix One** has a list of detailed standards and specifications which inform the Archives AND University Library approach, including the PROV standards Deakin is legally obliged to meet.

The following links provide an overview of the Standards Frameworks, Guidance and Related Information from these key industry bodies:

- Public Record Office Victoria Standards Framework: <https://prov.vic.gov.au/recordkeeping-government/about-standards-framework-policies>
- National Archives of Australia – Managing Information and Records Guidance: <https://www.naa.gov.au/information-management>
- National Film and Sound Archive – Preservation Guidance: <https://www.nfsa.gov.au/preservation>
- National Library of Australia – Digital Preservation Policy: <https://www.nla.gov.au/policy-and-planning/digital-preservation-policy>

#### *Digitisation Specifications*

Deakin Archives has developed a set of minimum specifications for all digitisation undertaken within the Archives, or outsourced by the Archives, in particular relating to digitising the following:

- Documents
- Images
- Photographs
- Negatives
- Audio Media
- Video Media
- Motion Picture and Film

The specifications have been collated in the one Digitisation Specifications document<sup>8</sup>, and a copy is in **Appendix Six**.

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<sup>7</sup> PROV <https://prov.vic.gov.au/recordkeeping-government>

<sup>8</sup> *Digitisation Specifications – Deakin Archives Oct 2019*, TRIM Ref: D2019/23563

## 5. Digital Storage

### *Archives*

Deakin Archives' current archival management system is Microfocus Content Manager, (also known as TRIM). Our archival collections held in TRIM are made searchable to the public on our Archives website<sup>9</sup>, via a third-party "Archives on the Web" solution developed in 2018.

The combination of TRIM and Archives on the Web has enabled us to promote our existing collections, raise their accessibility and manage them more effectively.

However, TRIM was not designed as an archival management system and though we have adapted it to serve our current holdings, there are significant limitations as to what we can achieve with TRIM for our digital archival needs.

In order to achieve our preservation goals and to comprehensively preserve Deakin's Cultural Heritage for the future, Deakin Archives must be able to:

- Capture, ingest and manage permanent records currently produced in complex, hyperlinked and ephemeral media (e.g. websites, wiki sites, blogs)
- Capture, ingest and manage permanent records which come to us on a variety of different carrier media, including d:drives, hard-drives, USB sticks, and other disk and cloud storage
- Capture and make accessible digital film and other AV records via streaming, rather than download
- Migrate permanent digital records from unstable, short-term formats to long-term preservation formats, without damaging the original record
- Capture and manage detailed, standardised metadata which remains linked to the original digital object, even if that object is migrated to a new preservation format
- Implement preservation requirements at point of donation, to ensure all digital objects managed by the Archives are appropriately stored and managed
- Meet compliance standards as set by the Public Record Office Victoria, and national and international bodies

TRIM alone does not allow us to achieve all the above, however, it may in combination with other archival resources. Or there may be more appropriate resources available.

In 2020, Deakin Archives needs to undertake a review of its Archival system, and determine the best suite of systems for our purposes, not only for our current holdings, but for foreseeable future digital holdings.

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<sup>9</sup> <https://www.deakin.edu.au/library/aotw>

### Special Collections

Metadata describing ADPML Special Collection items are generally fed into DRO, the University's institutional repository, via the Library catalogue. Attached objects – the files that have been digitised – are stored in a variety of places:

- High quality PDFs, JPGs and TIFFs are bagged and loaded into the Research Data Store (RDS)
- Low quality files are generated from these high-quality files and loaded into Omeka
- High quality PDFs are also generated and loaded into DRO

A visual diagram outlining this workflow is available on the Library wiki:

<https://wiki.deakin.edu.au/display/fusion/Catalogue+%3E+DRO+%3E+Omeka+relationship+model>

Digitised SPC content is stored in several locations:

- The original portable drive as received from the supplier, such as DataComIT/RBGV is stored in ADPML's controlled environment room.
- Preservation copies of all original files (TIFFs, JPGs, PDFs) are checksummed and bagged, and stored in the Research Data Store. Checksums are re-checked at 2-monthly intervals.
- Additional copies of all the original files are stored in the DRO DEV and UAT file system as an extra safeguard.
- Working copies of all originals are stored in the U: drive. These files may be edited to correct issues. Additional files may also be generated and stored here e.g. LQ PDFs for Fusion, HTML files. Due to space issues, TIFF files may be deleted, but only after a batch is considered complete.
- PDFs received from DataComIT, as well as any HTML files in-house are stored in DRO
- LQ PDFs are stored in Fusion
- Once a batch is considered complete (i.e. no more edits are expected), the edited (or original, if not edited) versions of the TIFFs, JPGs and PDFs are stored in another folder of the Research Data Store. These files are also checksummed and bagged, and have their checksums re-checked each 2 months.

### Research Outputs

- Published outputs  
Published research outputs are stored in DRO according to international benchmark standards and practices. The Library has adopted the most widely accepted standard, the Trustworthy Repositories Audit and Certification: Criteria and Checklist (TRAC), ISO 16363-2012, to ensure DRO meets the criteria required for be considered a Trusted Digital Repository. The Library has implemented a program of continuous improvement to ensure that policies, guidelines and practices meet the standard.

DRO is able to accommodate a wide variety of file formats, including but not limited to text, audio, image, video, matlab, and spreadsheet types (see Appendix C). An array of extension types (MP4, .doc, .pdf, etc.) is also accommodated. New file formats and file attachments are reviewed frequently by the Digital Preservation Librarian.

- Research data  
Although metadata records describing research data are fed into DRO via Footprints, research data generally is not stored in DRO. The University recommends a number of methodologies to ensure research data is stored safely and securely. Storage options include:
  - Faculty, Institute or School shared networked drives
  - The Research Data Store via networked drives
  - Syncplicity as well as CloudStorPlus, software that supports collaboration with researchers external to Deakin
  - Deakin desktop computers and laptops
  - Personal network drives

Only a small proportion of Deakin's research outputs come under the Library's purview. These include:

- Occasional datasets that may be attached to DRO records
- Footprints records, which get uploaded to DRO. There may or may not be datasets linked to from Footprints. These links should display in the DRO record.
- Projects such as the Melbourne Workers Theatre, Scholarships & Connections and the Marine Mapping tapes, where the Library co-operates with researchers to store and/or showcase the project's content. In such cases, the Library loads the relevant metadata and research outputs to DRO, and possibly also Fusion. The Library also stores the original files in the Research Data Store.

## Digital Preservation

Digital Preservation is the need to ensure long-term, error-free storage of digital information, with means for retrieval and interpretation. Most digital preservation approaches are based on:

- Sustainable file formats
- Detailed, standardised metadata

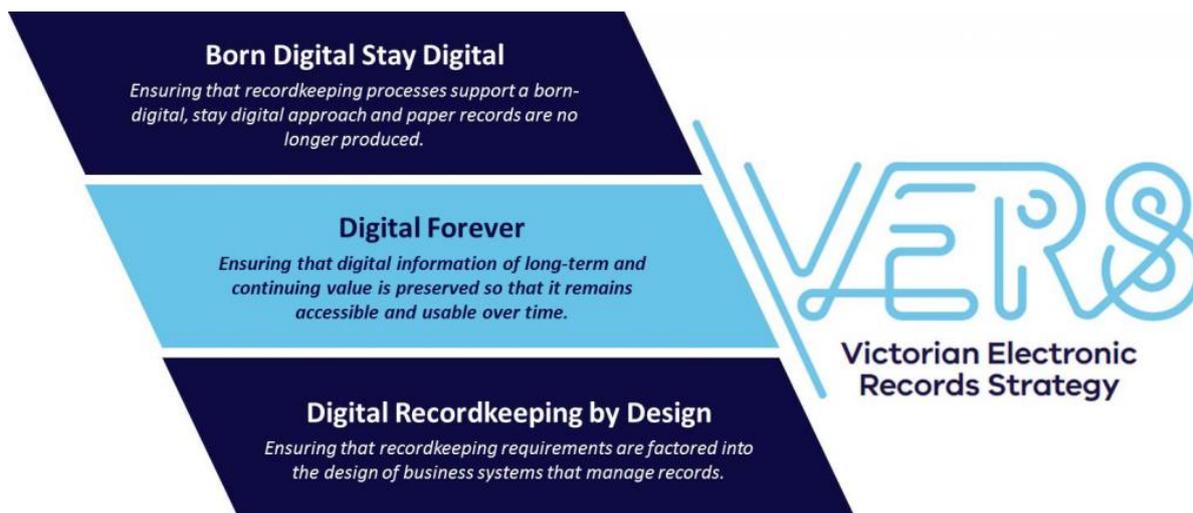
## File formats

Long-term file formats suitable for preservation have been documented by several industry bodies. For example, NSW State Archives and Records publish a useful list<sup>10</sup> which Deakin Archives often uses as a reference guide.

The standards we are legally obliged to comply with are those set by the Public Record Office Victoria, and these can be found as part of PROV's Victorian Electronic Recordkeeping Strategy, VERS.

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<sup>10</sup> NSW State Archives and Records – Sustainable File Formats:  
<https://www.records.nsw.gov.au/recordkeeping/sustainable-file-formats>



VERS applies to all long-term temporary and permanent archival records in Victoria. As part of VERS, PROV have published a list of their accepted Long Term Preservation Formats<sup>11</sup>.

Deakin Archives adheres to these PROV guidelines and aims to ingest archival material in the formats listed, or to migrate permanent digital records to the accepted long-term formats at the point of donation or transfer.

## Standardised Metadata

### *Special Collections*

Metadata describing Special Collections items is ingested into DRO as part of a regular standardised workflow<sup>12</sup>. This metadata is received in MARC format, and converted into MODs when ingested into DRO. An 856 link to the DRO record is placed in the catalogue record to link catalogue end users to digitised content. Records in DRO are output in Dublin Core format and regularly harvested by sites such as Trove, and indexed by various search engines including Google Scholar

### *Research Outputs*

Metadata describing research outputs is regularly ingested into DRO from the Elements harvesting system.

- Generally, metadata describing traditional research outputs including articles, conference papers, book chapters, etc., is collected by Elements from various data sources including Scopus, Web of Science, PubMed, etc.
- Non Traditional Research Outputs, including performances, exhibitions, poetry and other creative writing, etc. is manually created in Elements and also ingested into DRO.

<sup>11</sup> PROS 15/03 S3: <https://prov.vic.gov.au/recordkeeping-government/document-library/pros-1905-s3-long-term-sustainable-formats-specification>

<sup>12</sup> See the Digitisation Workflow on the wiki:

<https://wiki.deakin.edu.au/display/specialcollectionsandADPML/Digitisation+lifecycle>

## Archives

Digital records can be transferred to the Archives in any format, sometimes very short-term or unstable formats, and on a variety of stable or unstable carrier media. Regardless of the format or the carrier media, the Archives needs to be able to ingest and manage the records, and ensure their preservation.

The archives also needs to manage complex media that includes dynamic content and links. Some archival records we previously captured as physical publications or single-file documents, such as University handbooks or staff newsletters like 'Network', are now being published as websites or wiki pages, or as blogs, or other dynamic, linked-based online media.

Currently, we are not able to capture or manage this kind of complex media with our existing archival systems. Nor are we able to shift digital objects from short-term or unstable formats to long-term preservation formats without irreversibly changing the object itself (which is contrary to Archival principles.)

Specialised digital preservation systems, such as Archivematica<sup>13</sup>, enable archivists to capture, manage and preserve digital objects in their original state, while also creating long-term preservation formats, maintaining the detailed metadata in a 'preservation package' embedded with the object.

Deakin Archives currently cannot do this. Subsequently, we need to investigate the most appropriate digital preservation system to achieve it.

In 2020, the University Library, including Archives will be undertaking a review of our archival systems, to determine the suite or combination of systems to meet our needs now and into the future.

This review will investigate:

- Specialist digital preservation systems such as Archivematica, which provide the capability to process digital objects from ingest to access, while maintaining a system-independent preservation metadata package for digital storage
- Adjacent archival systems such as AtoM<sup>14</sup>, or other alternatives, which may allow us to capture and manage AV files, such as digital film, and make them accessible to end-users via streaming rather than download<sup>15</sup>
- If a combination of systems is appropriate – e.g. TRIM as the primary management system, AtoM as the film and streaming system, Archivematica as the preservation system

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<sup>13</sup> <https://www.archivematica.org/en/>

<sup>14</sup> <https://www.accesstomemory.org/en/>

<sup>15</sup> Our current web publishing system – Archives on the Web – allows end users access to our digitised AV media via download only. It is far preferable, especially for reasons of copyright and privacy, to allow digital access via streaming instead.

## Non-Archival Long-Term Records

As well as Deakin's archival collections, there are long-term preservation needs for some records held for reasons other than historical or cultural significance. These records are required to be managed long-term for evidential or compliance purposes, or to fulfil the University's legislative requirements, and include:

- Personnel files
- Student records
- Legal files
- Research data
- Research ethics applications

Some of these records need to be retained for 50-100 years, while others, such as significant research data, are required to be kept permanently.

Information & Records Services (IRS), of which Deakin Archives is a part, currently stores long-term temporary records in a hybrid state, with paper records stored in the physical repository at Waterfront, and related digital data held in our central digital repository (Deakin TRIM).

Routine assessments of Deakin's faculties and business units regularly reveal that high risk and high value records requiring long-term preservation, are also being stored across the university in non-appropriate, non-compliant conditions. This includes on shared drives, in Outlook/email inboxes, on computer desktops or USB sticks, or in cupboards and filing cabinets.

Ongoing preservation goals for this kind of information can differ to archival records, and includes:

- Digitisation where appropriate of paper-based records deemed high-risk/high-value, especially where information is not otherwise stored electronically
- Identification of ongoing digital preservation requirements for long-term records, including storage in appropriate, compliant digital repositories
- Migration of digital records requiring long-term retention which are currently held in non-compliant, or digital systems inappropriate for long-term preservation
- Development of policies and procedures to guide digital storage solutions for information and data (e.g. using cloud storage or storing onsite) with a view to preservation needs, security, access and disaster management

## Recommendations

In 2020, in order to comprehensively manage preservation, following initiatives will be undertaken:

### *Information and Records Services*

Conduct an annual review and report on the Archives physical storage spaces, with associated compliance recommendations

- Develop digitisation plans for key at-risk and high-value archival collections, and high-risk/high-value records collections, including identifying necessary resource investment
- Maintain a full equipment register, including identifying equipment gaps and maintenance requirements
- Undertake a review of high-risk/high-value information and records currently stored in non-compliant, inappropriate digital storage systems elsewhere in the University

### *Library Research Systems*

- Establish a pilot instance of Archivematica and work collaboratively with Archives and other key Library stakeholders to interrogate functionality and outputs
- Continue to work with researchers in the Faculty of Science, Engineering and Built Environment specifically in the area of marine science to develop mechanisms and opportunities to preserve valuable datasets and use this experience to document a case study

### *Combined initiatives*

- Document standards, specifications and guidelines in relation to digitisation, digital preservation, digital storage, and capture of 'born digital' material
- Undertake a review of Archival systems to determine if we have the best suite of systems for our current and future needs
- Review and map the roles and responsibilities of staff across the two areas to ensure staff activities complement each other and there is a clear understanding of expectations and 'who does what' across the two work areas.

## APPENDICES

### Appendix One – Industry Standards

#### *Public Record Office Victoria (PROV)*

- PROV Standards Framework: <https://prov.vic.gov.au/recordkeeping-government/about-standards-framework-policies>
  - Storage Standard PROS 11/01 <https://prov.vic.gov.au/recordkeeping-government/document-library/pros-1101-storage-standard>
  - Storing and Management State Archives Specification PROS 11/02 S2 <https://prov.vic.gov.au/recordkeeping-government/document-library/pros-1101-s2-storing-and-managing-state-archives>
  - Digitisation Standards and Requirements: <https://prov.vic.gov.au/about-us/our-blog/digitisation-standards-and-requirements>
  - Digitisation Specification PROS 19/05 S1: <https://prov.vic.gov.au/recordkeeping-government/document-library/pros-1905-s1-digitisation-specification>
  - Long Term Sustainable Formats Specification PROS 10/05 S3: <https://prov.vic.gov.au/recordkeeping-government/document-library/pros-1905-s3-long-term-sustainable-formats-specification>
  - Minimum Metadata Requirements Specification PROS 10/05 S2: <https://prov.vic.gov.au/recordkeeping-government/document-library/pros-1905-s2-minimum-metadata-requirements-specification>

#### *National Archives of Australia (NAA)*

- Storing Information – Digital and Physical: <https://www.naa.gov.au/information-management/store-and-preserve-information/storing-information>
  - Storing Physical Information: <https://www.naa.gov.au/information-management/store-and-preserve-information/storing-information>
  - Preserving Physical Records: <https://www.naa.gov.au/information-management/storing-and-preserving-information/preserving-information>
  - Standard for the Physical Storage of Commonwealth Records: [https://www.naa.gov.au/sites/default/files/2019-09/standard-for-the-physical-storage-of-commonwealth-records\\_1.pdf](https://www.naa.gov.au/sites/default/files/2019-09/standard-for-the-physical-storage-of-commonwealth-records_1.pdf)
  - Storing Digital Information <https://www.naa.gov.au/information-management/store-and-preserve-information/storing-information>
  - Preservation Digitisation Standards: <https://www.naa.gov.au/about-us/our-organisation/accountability-and-reporting/archival-policy-and-planning/preservation-digitisation-standards>

#### *National Library of Australia (NLA)*

- Image Capture Standards <https://www.nla.gov.au/standards/image-capture>

#### *National Sound and Film Archive (NSFA)*

- NSFA Preservation: <https://www.nfsa.gov.au/preservation>
- Technical Guide: <https://www.nfsa.gov.au/preservation/guide>

*NSW State Archives and Records*

- Sustainable File Formats: <https://www.records.nsw.gov.au/recordkeeping/sustainable-file-formats>

## Appendix Two – The Audio Visual Collections

Deakin's AV Collections have been identified as a high priority for digitisation, due to their being:

- Extensive, including several dozen different AV formats
- Valuable, documenting Deakin's focus on early distance-education and commitment to equality in education
- At risk due to deterioration of the carrier media and obsolescence of the equipment needed for access

In 2019, work began on the Deakin AV and the Deakin-Rusden AV collections, focusing on listing and cataloguing the collections in order to understand exactly what we hold, what condition the individual items are in, and to make them searchable via publication of that listing on our Archives web search.

The items went through an initial triage, identifying those which were instantly recognised as valuable, those considered possibly valuable, and those which could be assessed later. Identification where possible of film or tape stock was part of the process, as some stocks last longer than others and this is a factor in deterioration risk.

It was recognised that capture of items on tape can be undertaken in a straight-forward manner in-house at Deakin. Film based items, however, such as reel-to-reel or U-matic formats, often need "baking" first (which the Archives only has the capacity to do for small items and on a small scale) and require specialist handling. Digitisation for such formats is often best to outsource, but is likewise also expensive.

A Preservation Project Plan for the AV Collections, from ingest through to preservation, was drafted by the University Archivist in early 2019 and can be seen in **Appendix Three**.

## Appendix Three – AV Preservation Project 2019

**Antony Catrice, University Archivist**

**April 2019**

This document<sup>16</sup> outlines a plan for the preservation and digitisation of Deakin's AV collections as currently maintained by the University Archives. It outlines ingest of items and collections into the new CP12 Archive, a purpose built facility for storage of fragile or at risk archival items, and the most appropriate space for the storage, preservation and digitisation of Deakin's AV collections.

Deakin Archive's Audio Visual collections consist of two major collections:

- Deakin University Audio Visual Archive Collection
- Deakin-Rusden Film, Television and Animation Archive

Other AV collections the Archives hold include material created by various individuals, schools and departments of or associated with the university or its antecedents for promotional or teaching purposes.

### *Deakin University Audio Visual Archive Collection*

The Deakin University Audio Visual Archive Collection includes over 300 boxes of audio visual material. Many of the items were created to document significant events and promote the university, its courses and programs.

There also exists a large and significant collection of course material created for off-campus or distance education, often from the 1970s when this was a developing strength of Deakin University and reflected the university ethos of open education.

Material was produced by various technical and media departments from Deakin and its antecedents including the:

- Audio Visual Unit
- Curriculum Development Centre
- Deakin Video Production
- Educational Media Services
- Knowledge Media Division
- Learning Futures
- Media Unit
- Open Campus Program
- Teaching Services Unit.

Many items are highly significant to Deakin University, as well as of state or national importance. This has been recognised by the ADI who in 2018 undertook a project archiving some of the curriculum development work done in the 1980s-1990s by Deakin scholars such as David Turnbull, Helen Verran, David Wade Chambers and Max Charlesworth.<sup>17</sup>

Beyond Deakin, the collection is largely unknown, but it could and should be of greater national significance.

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<sup>16</sup> The master copy of this project paper is held in TRIM, ref: D2019/23564

<sup>17</sup> <http://stsinfrastructures.org/content/sts-deakin-university>

Some records identified as of significant interest include:

- Original coverage of Deakin University official and cultural events from the 1970s
- Audio and video Interviews with, or speeches by, politicians, artists and other significant persons, including prominent Deakin academics
- Distance learning materials from early off-campus audio cassette tapes through to CD-ROMs heralding the dawn of online course delivery
- Promotional audio and videotapes about the University or its component parts
- Potentially significant off-air recordings from the ABC and elsewhere

#### *The Deakin-Rusden, Film, Television and Animation Archive*

The Deakin-Rusden Archive includes a physical collection of celluloid film (mainly 16mm), video and audio tapes, as well as a collection of digital media files. Most items are films made by students, with some film made by staff or individuals and groups associated with Deakin and its antecedents.

The material dates back to the 1960s and includes work from Monash Teacher's College, Rusden College, Victoria College and Deakin University. Production became fully digital in the 2000s, so most physical items date from the 1970s to 2000s.

Items include the only known copies of films that have been screened internationally, and projects produced with federal and state grants and/or sponsored by government, non-government organisations and the private sector. Many of the student films are works by filmmakers who have gone on to become industry leaders.

This collection is managed by Deakin Archives in conjunction with SCCA Project Coordinator and content expert, John Cumming.

#### HISTORY

- 2019 (February) Physical transfer of collection to CP12
- 2018 Building of CP12 storage facility at Elgar Rd
- 2017 Researching & planning collection establishment and storage
- 2016 Initial discussions between FTA (John Cumming) and IRS (Antony Catrice & David Tredinnick)
- 2016 Temporary relocation of the collection
- 2016 WIFT IWD Waterfront and Channel 31
- 2015-16 checking and labelling of all boxed items, some re boxing
- 2015 WIFT/Deakin screening/seminar at Deakin Edge
- 2015 Preliminary catalogue of nearly 400 student works by women
- 2013 Lodgement of David King's 1975 Deakin Waurun Ponds film with Deakin Archives
- 2003 (?) Collection moved from Deakin Rusden Campus to Building P, Burwood.

#### *Stages*

The AV Preservation Project can be broken down into 4 stages:

1. Ingest
2. metadata creation
3. preservation
4. digitisation

## Ingest

Ingest of all AV items into the new, purpose-built Archives Repository at the Burwood Campus ("CP12") was completed in February 2019.

This included the ~300 boxes of Deakin AV material already held by Deakin Archives, and then the additional Deakin-Rusden, Film, Television and Animation Archive, which was delivered mid-February.

All items were organised and shelved immediately upon ingest, including removing items from boxes and placing them on shelves.

## Metadata Creation and Management

Some small collections at Burwood are already fully described, however most have only limited description or are not listed at all.

In 2019, the largest collection (~300 boxes), was listed and described, and organised on the shelves by media type. There was no order to the material that needed to be maintained from the boxes they were delivered and previous stored in.

Organising by media type allows the Archive to separate the VHS from the U-matic from the Reel-to-Reel, enabling efficiency in space utilisation and preservation activities. It allows for isolating at risk media types (some film stocks deteriorate much faster than others), in order to be prioritised for digitisation.

Metadata from the physical items (i.e. labels on boxes, what is written on the items themselves) was captured, created and listed in their 2019 AV Listing Project.

The Deakin-Rusden, Film, Television and Animation Archive is mostly unlisted and will require full listing on a spreadsheet, with metadata captured where possible at the time of listing. This will be a focus of Archives project work in late 2019 and into 2020.

It is proposed:

- All items from both major collections are listed on spreadsheets, capturing all appropriate metadata
- Series are created in TRIM (our archival management system) as required
- Where appropriate, sub-collections should be identified and broken down further into smaller series, based on provenance and purpose (this can only be determined once the material is completely identified)
- The spreadsheets are attached to the Series Records in TRIM, establishing a broad level of management and control of the collections
- Individual item records should then be created in TRIM, with a form populated for each item, creating a 'stub' attached to the Series record
- As digitisation occurs, the digitised copies of each item can then be attached to the 'stub' item records, making it available via Archives on the Web
- The Archives team should work with the Systems team to automate as much TRIM work as possible

### Physical Preservation

Nearly all the AV material is contained in its original housing. This is suitable for preservation. By preference, items should also be housed on open shelves rather than placing them in boxes on shelves. However, some items without suitable housing will need to be re-boxed.

Ventilation holes should be cut into the metal and plastic film cans where required to prevent mould, and build-up of gases. Humidity levels in the repository should be kept to 30% to further minimise the problem of mould.

A process of testing priority celluloid items for film-based deterioration needs to be undertaken, using appropriate materials, such as “A-D Strips”.<sup>18</sup>

This process would include the following steps:

- Data to be captured in a spreadsheet in the first instance
- A-D strips put into film cans, with a spreadsheet entry on the initial condition
- An A-D strip reading of 1.5 deterioration is acceptable
- Any cans which return a reading of 2 and 3 need to be isolated immediately
- All at risk “A” items need immediate refrigeration
- The worst condition items should be frozen
- Silica gel should be put into each can to reduce moisture and lower deterioration risk

### Digitisation

In-house digitisation can occur where the Archives has the equipment and expertise, and it is more cost-effective to do in-house than to outsource. Workflows have been established, which include formal technical process, format specifications, copyright checks and quality checking (checksums).

The Archives has a series of old player and equipment, often of now-redundant technology, which is difficult to source and repair. These include VHS, U-Matic and reel to reel audio players. The SCCA also has a collection of similar players, including players for Mini-DV tapes. Both the archives and SCCA have digital converters to digitise analogue into correct preservation files.

The Archives also has a dehydrator oven to ‘bake’ films – a process which enables the loosening of emulsion on the tapes prior to digitisation.

If larger-scale digitisation is required (i.e. in bulk) or for specialist items the Archives does not have the equipment or expertise to handle, outsourcing of digitisation should be considered. External digitisation organisations we have contacts within include:

- DamSmart
- ACMI

Specifications for digitisation should be established and where possible this should be in keeping with preservation standards based on National Archives of Australia and Public Records Office of Victoria guidelines.

*Digitisation Standards have been documented in **Appendix Six**.*

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<sup>18</sup> <https://store.imagepermanenceinstitute.org/media-preservation/d-strips>

## Appendix Four – The Marine Mapping Tapes

In 2019, a project to digitise a collection of Marine Mapping tapes was commenced and has provided a 'test case' for the digitisation outsourcing of a complex, shared collection of research data that both needs to be published via Deakin's Research Platforms, and preserved in the Archives. The digitisation was outsourced to a specialist provider, DamSmart.

The Marine Tapes are a unique research collection of marine data/ocean bed mapping in a video format that cannot be replicated. Deakin Archives holds the original carrier media, which are a series of tapes in a proprietary format which can only be played on obsolete, proprietary equipment that is no longer available. As valuable research data with a potentially broad interest, it is a shared collection that needs to be published and promoted via Deakin's research systems, such as Digital Research Online.

The project was a collaboration between Deakin Archives and the Library Research Systems team. It involved careful consideration of metadata capture, digitisation specifications, handling of original objects, migration of digital files and the management of a collaborative process, with the learnings informing much of this Preservation Plan.

An example of the developed for workflow for the Marine Tapes

Marine tapes:

- Files digitised in AVI and HQ MP4 formats by damSmart
- Original physical items returned to Deakin Archives and stored in the Burwood AV Repository
- A full-sized digital preservation copy in .AVI format delivered to Deakin Archives, to be stored in our digital archives
- A full-sized digital preservation copy in .AVI format copied to Research Data Store (no bagging or check summing)
- LQ MP4 copies generated in LRS; these will be loaded to DRO record

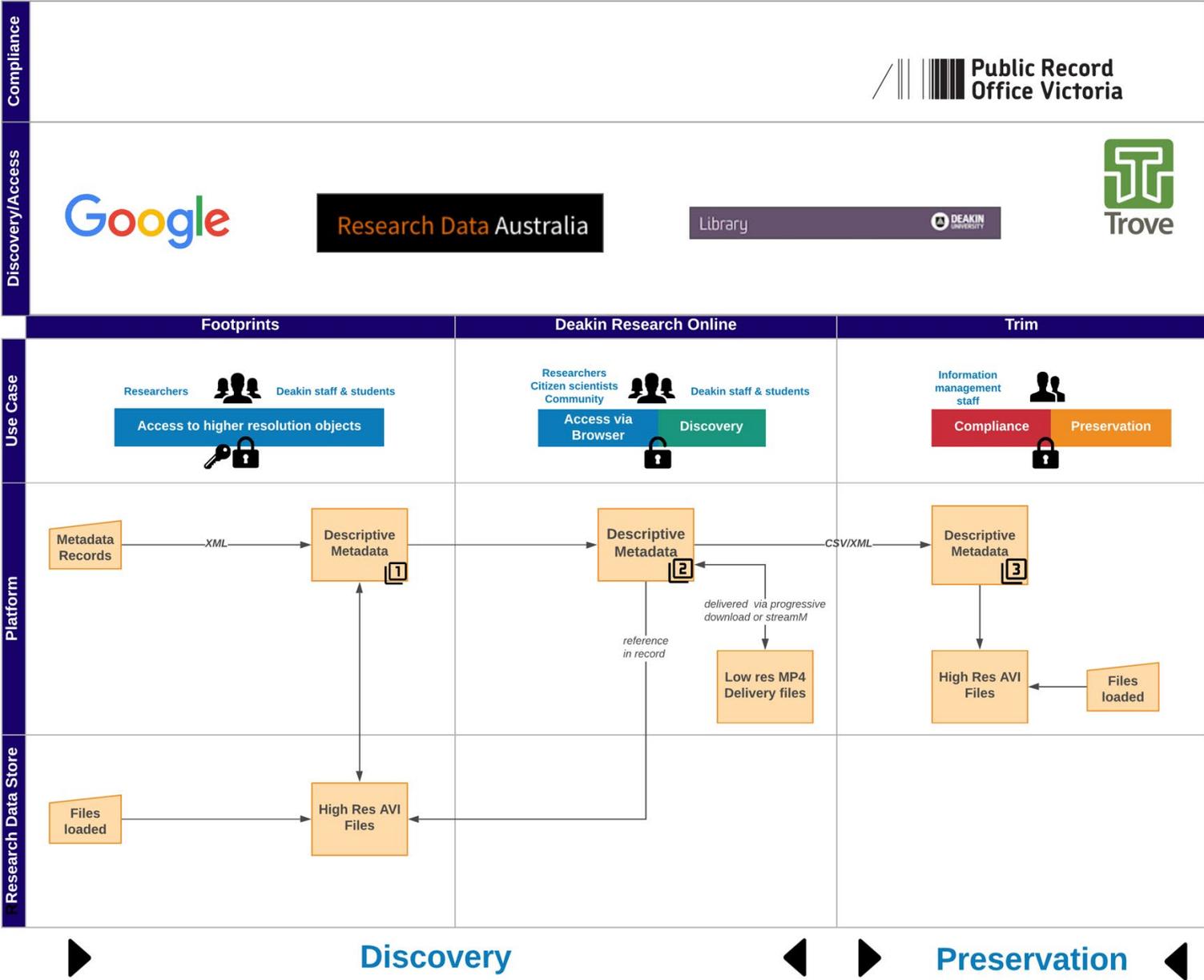
Marine DVDs:

- Files copied as ISOs (i.e. an exact replica of the files on the DVD)
- MP4s to be generated for dissemination purposes (not yet done, awaiting finalisation of privacy issue)

There have been a number of challenges in retrospectively digitising and describing this content including lack of available metadata. This has meant that much of the workload associated with the project has been about reviewing the content in its digital format and using a combination of field and metadata expertise to facilitate accurate description.

# Marine Tapes Project

File location and access



## Appendix Five – Equipment Register

The master copy of the below register, which will be kept updated, is stored in TRIM, at: D2019/23307

Equipment	How many?	Category	Detail	Maintenance Notes	Location
U-matic player	1	Players	U-matic tapes, AV Collection	Needs servicing F&TV have two U-matic players they've offered to lend the Archives. Plan to identify best player of all three, and get that one serviced	Burwood
VHS players	7	Players	VHS Tapes, AV Collection	All working, but with varying quality. General maintenance required, e.g. head cleaning. Can be done in-house	Burwood & Waterfront
Betamax players	2	Players	Betamax tape, AV Collection	Believed to work, but currently untested	Burwood
Sony Videocorder	1	Players	Player/Recorder	Working, but of limited use	Burwood
Reel to Reel audio player	1	Players	TEAC A-3440 Multitrack, 4 track, 1/4 inch tape format with DBX noise reduction unit and mixing console	Working, requires leader spools.	Burwood
Reel to Reel audio player	1	Players	TASCAM 38 Multitrack. 8-track, Half inch tape format	Working, but requires belt replacement, replacement belt purchased.	Burwood
Phillips 4 track reel to reel player	1	Players		Untested	Burwood
Micro Cassette Recorder	1	Players		Working	Burwood
DAT Player	2	Players	TASCAM Digital Audio Player	Working and recently serviced. F&TV have offered another should we need it	Burwood

Audio Cassette Players	2	Players		BORROWED. Property of the Archivist, not of Deakin Working	Burwood
Super8 film projector	1	Players		BORROWED. Property of the Archivist, not Deakin Working	Burwood
Hanimax Eyki film projector	1	Player		Works but requires belt replacement	Burwood
DVD Players	4	Player		Working	Burwood & Waterfront
Record Player with USB	1	Player	Has USB Compatability	BORROWED. Property of the Archivist, not Deakin Working	Burwood
Zoom digital recording players	3	Digitisation		One is very aged One is BORROWED. Property of Archives Casual, not Deakin	Burwood
Stand alone digitisation computer	1	Digitisation	Powerful stand alone computer to allow for much faster processing of large film files	BORROWED. Property of Archives Casual, not Deakin	Burwood
Terranex converter	1	Digitisation		Working, but complex to work	Burwood
BlackMagic Intensity Converter	1	Digitisation		Working	Burwood
SAMMA Solo	1	Digitisation	<a href="https://backporch.tv/wp-content/uploads/2017/07/SAMMASolo_HDW.pdf">https://backporch.tv/wp-content/uploads/2017/07/SAMMASolo_HDW.pdf</a>	Given to Archives by F&TV No-one can work it properly	Burwood
Canon EOSX80D digital camera	2	Digitisation	<a href="https://www.canon.com.au/cameras/eos-80d">https://www.canon.com.au/cameras/eos-80d</a>		Burwood
Manfrotto Camera Tripods	2	Digitisation	<a href="https://www.camera-warehouse.com.au/manfrotto-mk190xpro4-3w-tripod">https://www.camera-warehouse.com.au/manfrotto-mk190xpro4-3w-tripod</a>		Burwood
Falcon Eyes Lighting Kit	1	Digitisation	<a href="https://www.camera-warehouse.com.au/falcon-eyes-continuous-led-820-panel-lighting-kit">https://www.camera-warehouse.com.au/falcon-eyes-continuous-led-820-panel-lighting-kit</a>		Burwood

Photograph Scanners	2	Digitisation	<a href="https://hot.com.au/price/epson-perfection-v800-photo-scanner?gclid=EAlaIqobChMIpZSIOMm53QIVSZN-Ch17ygLcEAQYASABEgI0DfD_BwE">https://hot.com.au/price/epson-perfection-v800-photo-scanner?gclid=EAlaIqobChMIpZSIOMm53QIVSZN-Ch17ygLcEAQYASABEgI0DfD_BwE</a>		Burwood
Dehydrator Oven	1	Digitisation	To dry moisture from VHS tapes		Burwood
Cassette deck – Sony	1	Player	Sony TC-WE305		Waterfront
Standalone PC	1	Digitisation	Standalone PC to run digitisation software that cannot be loaded onto DeakinShield computers		Waterfront

## Appendix Six – Digitisation Specifications

Deakin Archives' Digitisation Specifications are stored in TRIM, ref: D2019/23563.

### Document and Image Specifications

The minimum specifications for digitising documents and images as set by PROV can be summarised as the following:

	Text & Image		Photographs		Negatives	
	Black & White/ Colour Unimportant	Colour Important	Black & White	Colour	Black & White	Colour
<b>Description</b>	Where colour is either not present, or not considered meaningful to understanding the content. Any images are line art only.	Where colour is present and also considered important to understanding the content. Also documents with low contrast (faded text, coloured background).  This can include highlighting or coloured markings; colour floor plans or images crucial to the context of the material.	Material is <i>only</i> Black & White photographic material.	Material is <i>only</i> colour photographic material.	Material is <i>only</i> Black & White negative material.	Material is <i>only</i> colour negative material.
<b>Type of Image</b>	Bi-tonal	Colour	Greyscale	Colour	Greyscale	Colour
<b>Resolution (dpi)</b>	300 dpi	200 dpi	600 dpi	600 dpi	2400 dpi	2400 dpi
<b>Bit-depth (bit)</b>	1 bit	24 bit	8 bit	24 bit	8 bit	24 bit
<b>Colour Mgmt</b>	Not Applicable	Embedded ICC Colour Profile	Embedded ICC Colour Profile	Embedded ICC Colour Profile	Embedded ICC Colour Profile	Embedded ICC Colour Profile
<b>Compression</b>	Lossless compression.	Lossless compression	Lossless compression	Lossless compression	Lossless compression	Lossless compression
<b>Output formats</b>	JPG, PDF, PDF/A, TIFF, JPG2000 are all acceptable	JPG, PDF, PDF/A, TIFF, JPG2000 are all acceptable	JPG, PDF, PDF/A, TIFF, JPG2000 are all acceptable	JPG, PDF, PDF/A, TIFF, JPG2000 are all acceptable	JPG, PDF, PDF/A, TIFF, JPG2000 are all acceptable	JPG, PDF, PDF/A, TIFF, JPG2000 are all acceptable

All documents with text should be undergo OCR wherever possible to enable a high level of searchability.

It is NOT recommended to use Multi-Page TIFF formats to store multi-page records. This is because multi-page TIFF images are not widely supported in viewing software. Multi-page records should be stored in PDF/A wherever possible.

### Audio Visual Digitisation Specifications

The National Archives of Australia details the following minimum digitisation standards for Audio-Visual formats:

#### Audio

Type	File format	Audio stream
<ul style="list-style-type: none"> <li>gramophone disc</li> <li>music on ¼ inch tape or compact cassette</li> <li>speech on ¼ inch tape 7.5ips or higher</li> <li>magnetic or optical film sound</li> </ul>	wav	<ul style="list-style-type: none"> <li>96 kHz sampling</li> <li>24 bit</li> </ul>
<ul style="list-style-type: none"> <li>speech on ¼ inch 3.75ips or less</li> <li>speech on compact cassette</li> <li>micro cassette</li> </ul>	wav	<ul style="list-style-type: none"> <li>48 kHz sampling</li> <li>24 bit</li> </ul>
<ul style="list-style-type: none"> <li>digital formats (e.g. DAT)</li> </ul>		

All copies made from analogue sources should be stored in uncompressed file based formats at a sample rate no lower than 44.1kHz and a bit rate of 16 bits. (NAA) File format should be wav.

#### VIDEO

Type	File wrapper(s)	Video stream	Audio stream
Standard definition	mov, avi, mxf	50 Mb/s 10-bit uncompressed or lossless compression encoding <ul style="list-style-type: none"> <li>PAL - 4:3 720 x 576 pixels 25fps</li> <li>NTSC - 4:3 720 x 486 pixels 29.97 fps</li> </ul>	BWF 48 kHz, 16 bit PCM encoding
High definition	mov, avi, mxf	100Mb/s 10bit uncompressed or lossless compression encoding <ul style="list-style-type: none"> <li>1280 x 720 or 1920 x 1080 as per the recorded format</li> <li>23.98 PsF, 24P, 25P, 50i, 29.97P, 59.94i as per the recorded format</li> </ul>	BWF 48kHz, 24 bit PCM encoding

## Motion Picture / Film

Digitised preservation files should be produced to the following specifications or higher:

Type	Resolution	Video stream	Audio stream
16 mm positive material	SD or HD telecine transfer	uncompressed AVI; or uncompressed Quicktime; or lossless MJPEG2000	BWF 48 kHz, 24 bit PCM encoding
16 mm and Super 16 mm negative	scanned at 2K resolution (2048x1080)	minimum 10bit log or linear DPX ( SMPTE-268 2003)	BWF 48 kHz, 24 bit PCM encoding
3 5mm positive and negative	scanned at 4K resolution (4096 x 2160)	minimum 10bit log or linear DPX ( SMPTE-268 2003)	BWF 48 kHz, 24 bit PCM encoding

For internal access or reference purposes, the following formats could also be considered:

Original content	Format
Video or motion picture film	<ul style="list-style-type: none"> <li>• mov (Quicktime) – H.264 or DV codec</li> <li>• wmv – Playback compatibility with QuicktimePlayer depends on the availability of the wmv player component.</li> <li>• DVD</li> </ul>
Audio – easily intelligible speech	<ul style="list-style-type: none"> <li>• CD</li> <li>• MP3 at 128 kbps</li> </ul>
Audio – music or poorly recorded speech	<ul style="list-style-type: none"> <li>• CD</li> <li>• MP3 at 256 kbps</li> </ul>

Relevant documents

Information and Records Management Policy: <https://policy.deakin.edu.au/document/view-current.php?id=55>

Information and Records Management Procedure <https://policy.deakin.edu.au/document/view-current.php?id=3&version=3#major6>