

# Workflow Documentation

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## Workflows

(Should everything from accessioning to access and re-shelving of game/equipment)

## Stages

1. Appraisal
  - Determining the value of materials; can occur prior to or after acquisition
2. Acquisition
  - Acquiring materials, physical transfer of materials from creator/owner to archive
3. Accessioning
  - Process of creating a permanent record of materials from one source at one time for which the archive has custody, right, or title; includes assigning a unique control number to said object, assembly, or lot.
4. Processing
  - Surveying, arranging, describing materials; performing basic preservation actions
5. [Preservation](#) (Digital)

- Safeguarding the materials from damage to extend the life of their life
  - Creating a digital copy or surrogate from materials that can be used without original media/hardware
6. Access
- Providing access to materials and/or digital object

## LGIRA Workflow

This workflow was documented on 2019-07-16 by Fernando with Ken and Judd. The existing LGIRA workflow, as documented, has been organized according to the above stages. The workflow does not include digital preservation. **NOTE:** Areas that appear to touch on an aspect of preservation through use are tagged with **PTU**.

*Preservation-through-use refers to the understanding that the act of preservation extends beyond the physical preservation of objects and further towards human capacity for memory-making. Memory-making prioritizes and leverages persistence of sensory-based, affective representations of the artifact and its uses through human interaction.*

Given the staffing limitations of the Archive, the overarching theme of the workflow is “light touch”, meaning that the minimum amount of work needed to make items available to users is all that is done.

## Acquisition & Appraisal

Material comes into the Archive via various routes, including but not limited to

- Donations
- Thrift store purchases
- Online purchases

The acquisition strategy is to collect any kind of “interesting-looking” material (not just games and systems but other material like promotional flyers, magazines, etc). If a specific request for an item, or class of items has been made by a researcher, those take priority.

After acquiring, depending on how the items were acquired, the material is appraised after it arrives at the archive and potentially rare items, or items that have been specifically requested by a researcher, are prioritized for the rest of the workflow.

At this stage, all items are placed into one of several “To Be Processed” cabinets.



## Workflow Instructions

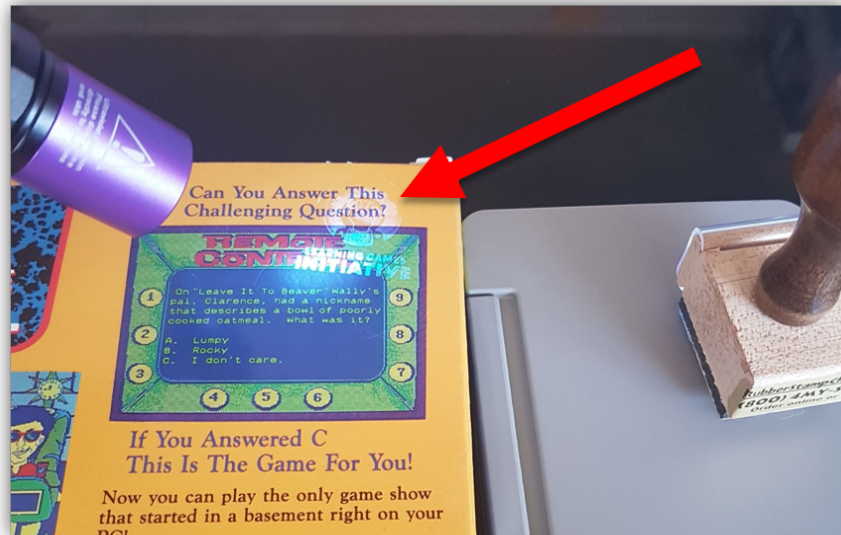
None (see Policies section for more info)

## Accessioning

Items are taken out of the cabinets in no particular order (apart from prioritized materials). Often, the processing individual may search the cabinets for similar items to process as it's easier to process like materials together (hardware systems, textiles, print, etc.) The processor then follows the [LGIRA Data Entry Procedures](#) to enter basic information about the item into an Omeka-based catalog.

Note: currently the process does not include avoiding duplicate entries for items that have multiple copies. E.g., if there are multiple copies of a game in the Archive, they should be labeled Copy 1, Copy 2, etc. However, copies may come in at different times which means that the first catalogued copy will not be labeled as Copy 1. Therefore, adding another copy without searching the catalog first will result in duplicates. Searching was formerly part of the Data Entry Procedures but it was dropped to increase the speed at which items can be accessioned. Duplicates are then fixed later on an as-needed basis.

## Processing



Once the item is in the system, it is marked, when possible, with invisible ink (visible under ultraviolet light) and placed in a "To Be Cataloged" cabinet. If an item requires repair, a designated and trained staff member may choose to repair the item at this time. Another point where items may be repaired is in the [Access](#) stage.

Repairs are primarily done to non-video game items such as packaging/boxes, magazines, manuals, etc. Because the Archive takes in more material than there is available labor to process it, at this stage, video games and systems are not tested to see if they function properly. It is at this stage that the process could fork into a digital preservation workflow. It is also at this stage that other preservation tasks would be undertaken, including the purchase or 3D printing of broken parts, capturing items as 3D interactive objects, storing materials in acid-free containers, and so on.

Items in the "To Be Cataloged" cabinet are then shelved at a later time by a designated staff member and are grouped according to the kind of item (games, systems, textiles, print, etc), the associated platform (Commodore64, Sega Genesis, etc.), and sometimes down to the individual game.

## Preservation

Due to the large amount of material and small amount of available staff, preservation, beyond what has already been described, is not part of the Archive's workflow. Expanding on the preservation described in the previous section, training for preservation tasks such as book repair using acid-free tape or soldering skills, has been received from the LGIRA community. There is even a current offer from a LGIRA user to help repair a multi-ton hydraulic arcade

machine. In a way, the community that uses the materials is also contributing to their preservation. **PTU**

In ensuring preservation through use, the Borrower's agreement generally prohibits modifications. However, the prohibition does not explicitly define "modification". While this adds flexibility in how the items can be experienced **PTU**, it could be problematic as someone may not consider something like peeling off a price sticker or thoroughly cleaning the system and returning it in a "better" condition than received, a modification (even though they actually are modifications). Sometimes, special instructions are sent to the borrower to aid in preservation. For example, some console systems have user interfaces which have been updated over time. The instruction could state not to connect the system to an active internet connection to avoid having the system auto-update, thereby destroying the preserved interface. **PTU**

To ensure the material remains in an as-received condition (until a determination can be made if the condition warrants repair), the **Processing** stage of the workflow includes explicit instructions (especially for interns) to not attempt to repair object or remove stickers, packaging, etc. The only exception is the removal of cellophane wrapping which can damage certain kinds of media over time.

Workflow Instructions

[Borrower Form](#)

## Born-Digital Media Preservation

In order to increase access, games can be preserved digitally in order to separate the data object from the original media so that the game can be played without use of the original gaming equipment such as the console, joystick, drive, etc.. **PTU** For the purpose of our work, the games used in the grant project are born-digital, meaning they originated in a digital form as opposed to originating in a paper-based form and being reformatted (digitized). In order to preserve born-digital games, specialized equipment—such as floppy controllers, hardware and software write-blockers, imaging software, floppy disk drives—are often used in order to capture the digital object safely and completely. Many of these preservation methods have been borrowed and modified from digital forensics work, a branch of forensic science related to the investigation and discovery of data on digital devices.

Due to the nature of the Arizona grant project, digital preservation activities occur primarily in the Libraries, where the necessary computers, equipment, and software reside to capture games from their original rendering equipment and media.

Workflow Instructions

❏ [Commodore 64/128 Imaging Workflow](#)

- ❑ [Disk Image Format Primer](#)
- ❑ [Floppy Disk \(3.5", 5.25"\) Imaging Workflow](#)
- ❑ [Guidelines for Storing and Handling Removable Media](#)
- ❑ [Born-Digital Media Request Workflow](#)

## Access

The overall goal of the Access workflow (from the point of view of LGIRA staff) is simplicity. Once a bonafide research purpose for allowing the use material is established, material from the Archive can be accessed by users primarily in two ways

1. Material is sent to a borrower or otherwise leaves the Archive (e.g., on loan to an exhibition)
2. A user physically comes to the archive to examine and use the material. This has the advantage of having staff present to provide additional information. This is the most common method of access for LGIRA items.

For the first manner of access, a borrower signs a [Borrower's Agreement](#) (modeled on Yale's Medical Library agreement). Once an item is checked out, a note is made in the Omeka database of that fact. Although, there have been several systems to track the status of items, including by hand, a more comprehensive system has not been implemented for simplicity. To address potential preservation issues, a note may be included in the packaging or verbally communicated. See the [Preservation](#) section for more details **PTU**. For the second manner of access, the equipment requested will be set up by a staff member. In both cases, prior to making the items available, they are tested to ensure they function. Testing is done at the Access stage and not the Processing stage due to the volume of material processed by the Archive. If the item does not function, a repair may be attempted by a staff member at this time.

In all cases, after an item is returned, the note is removed from Omeka and the item is checked for damage with the expectation that normal wear and tear occurs. This wear and tear is one of the downsides of preservation through use. **PTU** The item is then re-shelved.

A possible third manner of access (for video game material only) is via emulation. This way of accessing games could be implemented in the Archive in isolation or in conjunction with the other two access approaches. Due to the technical and legal complexity of the issues related to emulation, user procedures for accessing emulated resources are still to be determined.

## Workflow Instructions

### [LGIRA Data Entry Procedure](#)

## Emulation

When data is captured from the original media, technologies like virtualization and emulation can aid in providing access to that data. These technologies mimic the original hardware and operating system requirements so that the game—now a file or series of files—can be accessed

and played in a similar fashion to its original use. Through the FCoP grant project, we can provide access to games we preserve through the Emulation-as-a-Service-Infrastructure sandbox. This web-based tool allows us to upload games and play them in their original computing environments.

Workflow Instructions

[EaaS Sandbox Workflow](#)

[Selection for Emulation Criteria](#)

## Outreach

**PTU** Although not currently implemented, a potentially useful and impactful way to leverage the notion of preservation through use is to crowdsource from borrowers additional descriptive information on items they have borrowed. For example, a form could be created to collect information such as

- Detailed descriptive info (descriptive text, screenshots, copyright or creator information available only by loading a game, documenting additional characteristics like stickers or user notes in a manual, etc.)
- Physical condition
- Photographs of the material
- Any non-working components of a system that were not identified during testing
- If the game has been placed into an emulated preservation system, note any aspects that did not function as expected. If the borrower has the physical game, they could compare the physical and emulated versions and note any differences.

## Policies

### Acquisitions

Material comes into the Archive via various routes, including but not limited to

- Donations
- Thrift store purchases
- Online purchases

The acquisition strategy is to collect any kind of “interesting-looking” material (not just games and systems but other material like promotional flyers, magazines, etc). If a specific request for an item, or class of items has been made by a researcher, those take priority.

### Selection for Emulation

The LGIRA has many thousands of software titles that are effectively stranded because the hardware environments they depend on are difficult to source. Within the LGIRA, of course, this is not the case; we have prioritized over the years the acquisition of all necessary hardware needed to make any software (i.e., games) in the collection usable. There are a growing number of instances, however, in which it is insufficient—from a research standpoint—to accept such a limited frame of access for LGIRA’s materials. It is entirely likely, for instance, that researchers in the future will want to be able to run games designed for the Dendy system, which was a massively popular hardware clone of Nintendo’s Famicom sold in the Soviet Union and Russia during the 1990s. In order to understand the history of Soviet-era game culture, game scholars in the future will need a way to easily play the titles made popular on the Dendy, some of which are simply bootlegged versions of Nintendo titles, while others are original and emerged out of homebrew clubs located throughout Eastern Europe.

Because the process of emulating games can be quite time-consuming—even if an emulator already exists, it can still require considerable effort to identify the settings necessary for the game to run correctly—LGIRA uses the following prompts to help leadership determine its emulation priorities:

### **Due Diligence Check**

1. Has the software been emulated already?

### **Risks**

2. Will the creation of the emulation generate IP/legal issues that LGIRA will have to address?

### **Scope of Work**

3. Does an emulator already exist?
4. How soon is the emulation needed?
5. How many titles need emulating?

### **Impact**

6. How likely do we think an emulated title will be repeatedly requested?
7. Are there ongoing research projects concerned with the prospective title that might benefit from emulation?

### **Capacity**



8. Does LGIRA currently have the resources needed to develop, store, and (if legal) distribute the emulation?

The answers to these prompts help LGIRA's leadership team make informed decisions about when and how to pursue an emulation project. In general, LGIRA would like to emulate all software that becomes part of the collection. Practically speaking, however, the organization's limited resources—and its desire to steer clear of legal and/or bureaucratic impediments—determines, to a great degree, which emulation projects we are reasonably able to pursue.