

Guidelines for Tangible Preservation and Binding of PDF Scores

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Introduction

The sale of electronic scores is now common among both major publishers and small self-publishing operations (Szeto, 2018, p. 98). Libraries, however, are generally currently not well-equipped to purchase and circulate these types of scores (Carli, 2021, p. 14). While many libraries are purchasing electronic versions of scores because they are only available in this format, not all libraries have an effective way to host or circulate electronic scores (such as controlled digital lending) consistent with copyright or license agreements (Peters, 2019, p. 140). One popular solution to this problem is for libraries to print out the PDF scores and circulate them as a library would any other physical score. The printing of PDF scores eases some technical complications for both the purchasing library and the borrower, but can raise many other issues, both unexpected and expected, such as:

- Dealing with non-standard score sizes that may not match the printer or paper size available
- Choosing the correct software to manipulate the digital file at hand
- Choosing the optimal paper type for score preservation
- Deciding whether or not outsourcing printing may result in better outcomes
- Housing the printed score (such as binding) for a balance of use and preservation
- Managing the time that printing and binding might take, especially in the face of an urgent borrower request
- Storing the purchased digital files so that future library employees may find them, if needed
- Convincing stakeholders in your library that printing electronic scores is better than other options and worth the time and expense
- Managing extra time and effort to deal with all of the above

The Tangible Preservation and Binding Group's primary focus was to develop guidelines for libraries that must consider printing and binding for physical access as part of circulating collections. These guidelines can be shared with the composer/publisher community so that they can be more aware of needs around physical access to PDF scores.

This chapter attempts to address issues above, lays out additional considerations, and offers some guidelines for printing and binding of PDF scores.

Literature Review

While librarians have been aware of the problems posed by born-digital or electronic scores, Kent Underwood's article in 2016 first documents the scope of the problem. Underwood (2016) demonstrates that music libraries as a whole are doing a poor job adding self-published electronic scores to their

collections and invites them to improve. He also indicates that printing is the most popular method for those libraries that currently provide access (pp. 228–229).

Chuck Peters (2019) builds on Underwood’s findings and surveys 31 libraries about their policies for binding, printing, and storing PDF scores. Only 3 (9.7%) of the surveyed libraries have such a policy, even though 25 of them are purchasing electronic scores, and none circulates these scores in a digital format (pp. 136–137, 140). Peters also surveys how libraries produce the scores (allowing them to select multiple options) and finds a number of different approaches: 13 print and bind locally, 13 print locally and send to commercial bindery, 4 print locally but do not bind, 4 send files to a commercial bindery for printing and binding, and 1 says they do all of the above (p. 140). Some libraries indicate they asked commercial binderies to print out the scores because they were not happy with the quality produced in-house (p. 140). Peters notes that many libraries felt they needed to think through their processes more carefully (p. 140). He also finds that only 7 of the 31 libraries asked the vendor for permission to print out the scores for circulation (p. 143).

Alice Carli (2021) builds on PDF score circulation questions that Peters raises, especially with regard to licensing, printing, and file storage. Carli gives a list of 6 questions to ask electronic score vendors about how their purchases can be used, according to the license granted (p. 74). Carli also makes specific suggestions about printing and binding best practices for PDF scores (pp. 74–75, 243–251).

Research and scholarship by Underwood, Peters, and Carli make a strong case for a profession-wide recommendation for printing and binding PDF scores. The following subsections cover some considerations around formatting, in-house printing and binding, and printing and binding using a commercial bindery.

Formatting Print-ready File

These guidelines were developed with the assumption that almost all purchased electronic scores will be in the Portable Document Format (PDF) or converted into this format. The preparation of PDF scores for printing and binding requires consideration of the needs of each step in the post-acquisition process. The printer/binder needs the file to be compatible with their tools and materials, and the end user needs the score to be legible, free of impossible page turns, and have individual parts left unbound or bound separately.

File Management

Safe storage of unedited PDF score/s (“original file”) is a data management best practice. The original file should be moved into a dark archive for digital preservation purposes.

Make a copy of the original file and save as an “access copy”. Always format and make edits in the access copy file.

Use a naming convention that is intuitive, hierarchical, and self-explanatory. One possible example is:

Composer_Title_[type].pdf

(Ex: Price_MississippiRiverSuite_score.pdf; Price_MississippiRiverSuite_clarinet.pdf)

If the composer/publisher has added a statement identifying the original legal owner of the file but included the name of the individual who placed the order, request that the composer/publisher remove the person's name from the statement and reissue the file.

Ex: "These digital files were purchased by Jane Miller at Music University Libraries (Order #2482 - 2020-02-04 09:37:00)" would become "These digital files were purchased by Music University Libraries (Order #2482 - 2020-02-04 09:37:00)"

Similarly, if the composer/publisher has added a watermark, ask that they reissue the file without it. Licensing agreements render watermarks added to prevent breach of copyright unnecessary.

Software

PDF scores may come with sub-optimal formatting for library use, such as poor pagination, large margins, or small print. Additionally, the composer/publisher may not remove the buyer's name. Free-to-use Adobe Reader will not permit editing, so libraries may want to use more sophisticated software if they want to improve the formatting.

Any version of Adobe Acrobat can be used for the full range of formatting PDF scores for printing, including obliterating unwanted marks, adding blank pages as needed for correct pagination or improved page turns, and cropping images to avoid unnecessarily wide margins and small print. Some composers may employ copy-protection mechanisms to prevent this type of manipulation. These will need to be dealt with on a case by case basis.

Other cheaper PDF manipulation programs may also work. A Google search for "PDF manipulation software" should bring up a list of currently recommended offerings, some of which will likely be one-time purchases while others will be subscriptions. Either purchase format can work depending on library needs and preferences. Features to look for are cropping, text editing, and the ability to insert blank pages. There may also be free options that offer (probably browser-based) cropping and editing of individual pages. These are more likely to be affected by copy protection and will probably be cumbersome to use, but might be tried if PDFs are purchased very infrequently.

Editing Scores

Be aware of the following considerations when preparing your PDF files for in-house printing or sending to a commercial bindery for print and bind.

Sometimes identifying information can only be found in the file name and does not appear in the document itself.

- Does the title of the piece and name of the composer appear on the score or parts?
 - If not, create a title page, or at a minimum a header, with the title and composer information. For parts, a small header or footer may be sufficient.
- Do parts indicate which instrument they are for?
 - If not, add the instrument name at the top of the first page. (Ex: "VIOLIN 1")

It may be necessary to add a blank page after the title page to keep odd page numbers on right-hand pages. Some binderies require this.

Keep performance considerations in mind. Take care to look over where the page turns are and consider adding blank pages where it would help avoid a problem. Specific suggestions for dealing with poor page turns are included in the section on [Workflows](#) below.

Odd formats, such as scores in non-standard sizes or that would be unperformable if bound, can create challenges. In some cases, standard binding practices just won't work for the way that some scores are used in performances. Be prepared to be creative and recognize that sometimes putting sheets in a pocket may be your best compromise.

In-house Printing

This section covers processes and workflows for in-house printing, and binding of PDF scores in pamphlet format in a library unit or using a local/institutional bindery.

Printers and Toner

Inkjet printers should not be used to print music for library circulation. Color ink is highly soluble in water, while the black ink is very prone to scrape or rub off the paper. Laser toner has developed a good track record for longevity, and any laser printer less than thirty years old should work fine to print music for circulation. This specifically includes staff photocopiers that also serve as networked printers. The one caveat regarding laser-printed scores is that they should not be stored in plastic envelopes, especially in damp climates. The plasticizers have been seen to cause the toner to delaminate and become sticky, so that pages stick together and ink transfers to the facing page. The clear covers offered with pamphlet binders probably will not be a significant cause of this problem, because of higher quality plastic and greater air circulation, but resist the temptation to use plastic envelopes.

The ideal printer for PDF scores is one that will print two-sided, onto Tabloid (aka Double Letter, 11"x17") and A3 (the European equivalent of Double Letter) sized paper. Access to this printer will allow easy in-house printing and pamphlet binding of scores up to 80 pages, as well as printing of scores up to 11"x17" in size. On a machine that only prints one-sided, printing a second side manually will require some additional manipulation. Once the workflow is developed and written out, it will add only a little more time and opportunity for error to the process.

Printers limited to Letter size (8.5"x11") paper can also be used, but scores printed on Letter paper will require additional effort and expense to bind. Again, two-sided printing is nice, but a workflow written down and posted by the printer will allow for two-sided printing with minimal additional time and error. Printing scores one-sided is not recommended for library circulation. This doubles the effort and expense of binding, and is much less usable for performance due to the added page turns. Consider this document to be a call to organizational administration to prioritize the purchase of a Tabloid laser printer if the library plans to purchase PDF scores.

Paper

Library scores should be printed on heavy, acid-free paper. PDF scores with page size 8.5"x11" can be printed either as 8.5"x11" pamphlets (usually referred to as "booklets" in printer software) on Tabloid

(11"x17") paper, or as double-sided single sheets. Scores may also be received in larger formats, but only in very rare cases will a composer expect a purchaser to print their music on paper larger than 11"x 17".

Specific paper stocks recommended for printing circulating library scores are as follows:

- 70 lb. Letter sized (8.5"x11") white or cream colored paper (cream is easy on the eye, and looks well when reprinting scans of older scores, since the cream color imitates the pleasant effect of acid discoloration), with grain running long (which is the normal grain direction for Letter paper). Use if there is no access to a Tabloid laser printer, and for scores too thick to bind as pamphlets (over 80 images).¹
- 70 lb. Tabloid sized (11"x17") white or cream colored paper with grain running short (this will need a special order, see footnote below), for printing standard pamphlets up to 80 images. This covers most standard sheet music available in PDF format.
- 70 lb. Tabloid sized paper with grain running long (this is the normal grain direction for Tabloid paper) for printing oversize scores.

If you are lucky enough to have a local paper shop still in business your best procedure will be to bring them your list of requirements and ask for their recommendation. However, the retail paper industry has been much affected by the consolidation seen across the market landscape, so you will likely be ordering online from a distributor, where you will quickly find a bewildering range of options. Also, paper manufacturers come and go and a paper type that works for many years may suddenly go out of production. In this situation, the distributor will be your only friend.²

At one time, specifying paper that satisfies the ANSI/NISO Z39.48-1992 requirement for paper permanence would have been recommended. However, changes in paper production methods since that standard was promulgated have meant that most "acid free" office paper is likely to satisfy the standard. Meanwhile certain paper additives and procedures will cause paper not to meet the standard because they are not specifically included in the standard (having been introduced more recently), though they will not in fact decrease longevity. For this reason, paper producers go to the trouble and expense of certifying compliance with the standard for only a few products used for special archival applications, and they charge for these papers accordingly. So for circulating library use, requiring that paper meet the ANSI standard is no longer considered to be necessary.

The simplest way to use a shared staff printer to print on special paper (i.e., the 70 lb. short grain Tabloid paper for pamphlets, or the regular/long grain—but still 70 lb.—paper used for single sheets) is to tell the printer that you are using colored paper, so that it waits for you to load the correct paper before completing the print job. The difference between 60 lb. (standard weight, which is expressed as 28 lb. in the ream size used for office paper) and 70 lb. paper is not sufficient for the "heavy paper" designation

¹ The image number in a file seldom correlates with the page number of that image in the printed document.

² Lindenmeyr-Munro has proved a helpful and reliable distributor, and offered the following specific recommendations in 2019 for the purchase of the special order Tabloid paper with the grain running short. They are currently still usable as given: For cream colored paper: 17.5x22.5 58M 70# Cream Springhill Opaque to be cut to 17x11 - Grain 11; For white paper: 17.5x22.5 58M 70# White Accent Opaque to be cut to 17x11 - Grain 11; The same makes of paper (Springhill for cream, Accent for white) are also cut to Letter and Tabloid sizes with the grain running long, and can be ordered right in those sizes.

in the printer options. “Heavy paper” designation causes changes in how the paper is fed and the toner applied. Therefore designating it as colored paper is a better option.

Workflows

Tabloid Pamphlet Printing

If you have access to a printer that prints double-sided onto Tabloid paper you need only work out how to use the printer driver to choose “Tabloid paper, Booklet printing” and either “Fit” or “Shrink oversized pages,” and then fold the individual printed sheets in half. The resulting printout will be similar to standard printed sheet music, only without the staples.

If your Tabloid printer prints only one-sided, do whatever experimentation is needed to produce the first usable copy: images printed on opposite sides of the paper with the paper flipped on the short side, so the opposing images are both right side up. Then, carefully document what specific moves and commands created that result. Refine the document as needed while producing the next several copies, then post it by the printer. Your staff/students will then print scores correctly, and your colleagues and performers will thank you.

Single Sheet Printing

If your printer only handles Letter sized paper, or you are printing a score too thick to form into a pamphlet (i.e., over 80 pages), or you are printing an oversized score larger than Letter format, then you will need to print to single pages, not booklets. If your printer prints two-sided then the process is at least straightforward; if it prints one-sided, then you must experiment as needed to develop the most efficient workflow for printing the alternate sides, and post the resulting document on or near the printer.

Handling Poor Page Turns in Parts

Ideally, the engraver who prepared the PDF will have taken care that every odd-numbered page of each part will end with a section break or a rest of sufficient length to allow the performer to turn the page.

However, this is not always the case. There are four approaches to handling cases with poor page turns:

- It may work to add a blank page before the affected page, so that it becomes an even-numbered page (and therefore a left-hand page that will continue over the fold of the pamphlet). Since the page numbering will not adjust automatically in a PDF, and it is likely that editing will be prohibited, this option will alter the pagination. Note that an engraver who did not include a blank page after the title page might have provided good page turns on even-numbered pages. In this case, leaving the part as is will result in a nonstandard pagination but with better page turns for performance, and would be the correct option.

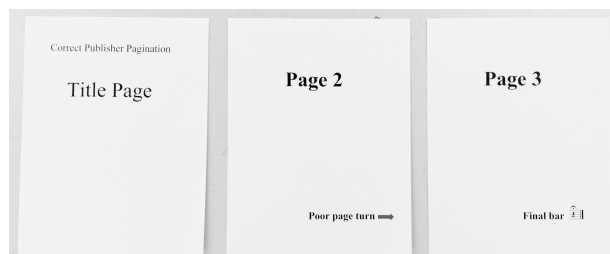


Figure 1: Music begins on the page after the title page in order to accommodate a poor page turn on the first page of the score, and is paginated correctly: no alteration needed.

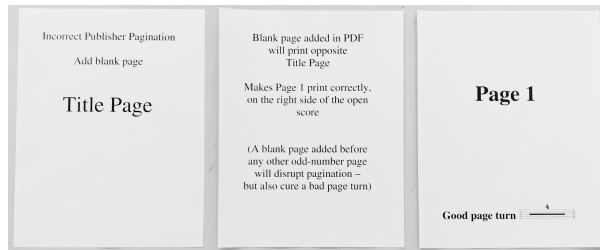


Figure 2: Music begins on the page after the title page, is labeled Page 1 and does not need accommodation for a poor page turn. A blank page should be added to produce correct pagination in the printout.

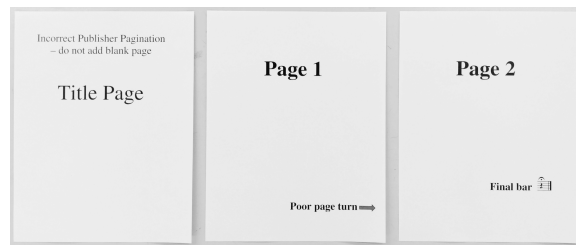


Figure 3: Music begins on the page after the title page, is labeled Page 1, and accommodates a poor page turn. This should be left as is, since correcting the pagination by adding a blank back to the title page would mess up the page turn.

- One or more poor page turns can be accommodated by printing the part in single sheets and then guarding them all edge to edge and folding them accordion style, sewing through one of the central folds or not sewing into a cover at all. This works well for up to four pages of music, which will be adequately supported by a stand.

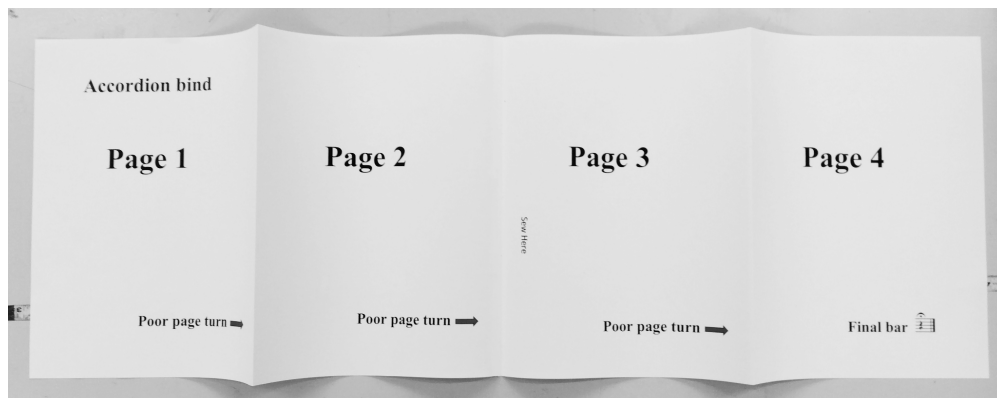


Figure 4: All pages are printed on one side only and guarded together in a row. Sew through the central fold.

- Careful arrangement of printing order also makes it possible to design fold-outs. For example, for a part with a poor page turn on page 3 but a good one on page 4, a binding order could be: Title,

blank/1, 2/3-foldout4 (good page turn), foldout5-6/7. Here “;” represents a page turn, “/” represents a guard sewn through the middle, and “-” represents a guard to the foldout. The print instructions to get this result from a printer would be to Booklet print images “1-5, 8-9”³ onto Tabloid paper and separately print images 6-7 (i.e. pages 4-5) on the 2 sides of a single sheet. This would be better than an accordion bind for a 7-page part, and would require good page turns only on pages 1 and 4. This foldout method can be adapted to other page turn situations as needed.

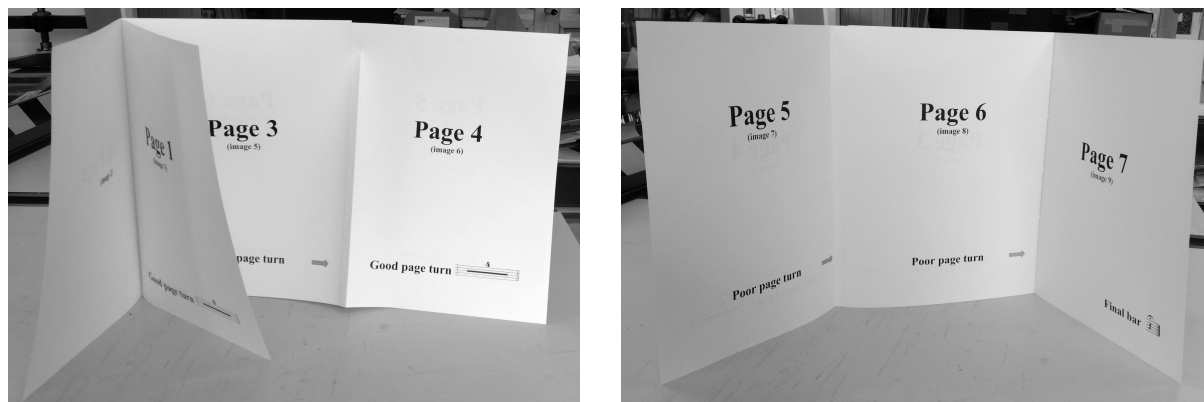


Figure 5-6: The image on the left shows the first six sides (first four pages) of a part where one sheet (pp. 4-5) has been printed separately and added as a foldout. The part should be sewn through the fold between pages 2 and 3. The image on the right shows the last three pages of the same part.

- If it is clear that no accommodation was made for page turns and the part is too long for accordion binding to be practical for performance, the remaining options are: (for a single part) to print the leaves one-sided and place them in the pocket unbound, with instructions for the circulation desk to “check for 7 unbound leaves,” or (for multiple parts) to print and bind the parts normally, in folios sewn through the middle. This will require the performers either to memorize their parts, to illegally adapt them (e.g. by taping in extra copied sheets), or to have page turners, but may be better than placing many unbound sheets in the pocket and risking loss.

Binding Printouts

Printed Pamphlets

When scores can be printed as Tabloid pamphlets, the resulting printout can be sewn or stapled through the fold in whatever way the library normally binds sheet music pamphlets.

Scores printed in single sheets, however, will need some form of page attachment.

³ The numbered "images" in the PDF will not match the numbering of the "pages" in the resulting printout, since the title page and the blank page after it are usually not included in the page numbering, but are included in the image numbering. A PDF with a title page and 7 numbered pages will therefore have 9 images.

Guarded Pamphlets

Scores and parts that consist of fewer than 30 single sheets are most effectively bound by gluing or taping sheets together to form pamphlets which can then be sewn through the fold. Commercial binders will accept thinner scores for adhesive binding, but this binding is harder to apply to thin scores, they are less openable than sewn pamphlets, and there is a greater likelihood that they will crack along the spine or pop out of a binder or paper cover. Some commercial binders have in the past offered to guard single sheets into pamphlets and may be willing to do so in future, though there will be a significant additional charge for this service. Full directions for guarding pamphlets are found in Carli's (2021) *MLA Basic Manual Binding and Care of Printed Music, Revised Edition* (pp. 57–68).

In general, however:

- Pages with more than 5/8" of inner margin can be glued together down the middle. Half of the pages will need to have 1/4" trimmed from the inner margin first, so that the fold will not interfere with the glued overlap.
- Pages with more than 3/8" of inner margin can be taped together down the middle. It is important to use water-activated tape (or paper or Tyvek strips applied with white glue) rather than pressure-sensitive tape, which will interfere with sewing.
- It is advisable to sew, rather than staple, guarded pamphlets.

Thick Scores

Scores with more than 30 sheets should receive double-fan adhesive binding. This is best done by a commercial binder, which will be familiar with the process since it is a standard binding style. They will require an inner margin of at least 3/4" (1" is better). The best approach for libraries without a contract with a commercial binder is to use the print-and-bind on-demand option described below, which may allow them to sidestep minimum volume requirements (though paying more per volume), rather than printing thick scores in house. This approach is also likely to be more cost-effective than printing thick scores in-house and sending them out for binding, due to the cost savings in shipping and because commercial binders often pass on some of the savings they realize from high volume printing.

Printing and Binding using a Commercial Binder

In the previous section, we provided a possible workflow for in-house printing and binding of PDF scores as pamphlets. The following workflow can be modified for binding-only if you are able to print in-house and send printed sheets to a commercial binder for binding. We recommend consulting the [In-house Printing](#) section above for printing the file.

If you are using a commercial binder for printing and binding, it is important to know whether they can print in signatures or only offer single-sheet printing with adhesive binding.

A commercial binder that can provide both printing and binding of PDF scores is an option to consider if you have limited staff for processing and in-house preservation work. However, you may still end up spending a considerable amount of time formatting the PDF file to meet their printing setup. We have provided a [Formatting Print-ready File](#) section in this chapter for your consideration.

Possible workflow:

Make a copy of the original PDF file using guidelines in the [File Management](#) section above. Edit the file, as needed, using guidelines in the [Editing Scores](#) section.

Send print-ready PDF files via FTP or other electronic file sharing system to the commercial binder.

- The bindery may have existing instructions for uploading files into their file sharing system. Consult those directions during this stage.
- Some vendors may require a print-ready file be submitted, and others may be able to provide formatting as part of costs.

Create a record in the bindery software program so that each print job can be traced at the bindery end.

- Include the filename in the bindery instructions section for connecting back to the print order.
- Provide specific instructions for binding. (Ex: Bind parts separately and place in a pocket.)

Once the file is submitted via FTP site and the bindery record is created, communicate that information to the bindery representative.

- Since the information is submitted through separate channels, this step ensures there's awareness and administrative linking at commercial bindery end.
- Sample email text:

File name:

Bindery record information: [date, order number, etc.]

Page size for printing: [in inches]

Printing instructions for score (and parts, if applicable): [double sided, single sided, etc.]

Page numbers (in PDF file) for each individually-bound item:

Ex: Score: pages 1–20. Violin part: pages 21–23. Cello part: pages 25-27.

Works cited:

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Preferred citation: Music Library Association Electronic Scores Working Group's Tangible Preservation and Binding Subgroup. *Guidelines for Tangible Preservation and Binding of PDF Scores*. September 2022.