Tools and techniques to advance music braille production, file-sharing and use (from the DAISY Music Braille Project)

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# Abstract

The DAISY Consortium is an international, non-profit membership organisation, working to improve worldwide access to reading for people with print disabilities, and has been leading standards and good practice in accessible publishing for over 20 years.

The DAISY Music Braille Project has a vision to “ensure that more music scores in braille are available more easily, and to more blind musicians world-wide, through global cross-sector collaboration.”

At the 2022 ICEB Mid-Term meeting, I gave a progress report on the strategic interventions being delivered by the DAISY Music Braille Project, which I introduced for the first time at the 7th ICEB General Assembly in 2020. Thank you to many of you for your active participation in our activities during this time.

These strategic interventions were designed to address the common and global concerns around the decline of music braille. A complementary set of activities was underway to secure the future of music braille production and use, through a range of technology developments in conversion and music notation tools, and international collaboration around music file formats, production and metadata standards, and online teaching and learning resources.

Our current ‘Implementation Phase’ 2023-2025 continues these efforts, to empower the sector to take up and embed resources into practice, through a range of further strategic activities. These include: developing a range of ‘getting started’ resources for the tools and materials available from the project; promoting a ‘born accessible’ agenda in the mainstream music publishing industry; promoting practical methodologies for the teaching and learning of music braille; and contributing to the preparation of an Addendum to the New International Manual of Music Braille.

We thank many of you for your contributions to this work so far, and welcome new connections.

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# 1. Introduction

This is a time of celebration for music braille! It is possible that there has never been so much concerted global and collaborative effort around music braille as there has been in recent years, driven primarily by the DAISY Consortium and its Music Braille Project [1], kindly funded by donations from DAISY Members and friends [see Appendix].

The DAISY Consortium is an international, non-profit membership organisation, working to improve worldwide access to reading for people with print disabilities (people for whom regular print materials are not accessible, including blind and low-vision people, and people with dyslexia).

DAISY has been leading standards and good practice in accessible digital publications for over 20 years, and it is widely respected in the publishing and accessibility industries. DAISY works closely with technology companies and standards agencies to ensure that the reading and publishing technology of tomorrow provide an accessible future for all.

This is a hugely exciting time of development and opportunity, giving braille-reading musicians increasing access to music braille resources than has ever been possible before.

Our strategic interventions were driven by the shared global concerns in 2017 around the decline of music braille production and use, which were increasingly negatively impacting on braille-reading musicians worldwide.

Having researched sector requirements in 2018 [2], we devised and delivered a range of complementary activities. These addressed a range of issues which would positively impact on the future quantity, quality and availability of music braille in both hard-copy and digital forms.

# 2. Successful interventions

## 2.1 Converter tools make it easier to produce music braille

### a) MakeBraille

We supported the development of an automated music braille conversion tool, MakeBraille, from the German Centre for Accessible Reading (dzb lesen) in Germany [3]. This is aimed at professional transcribers and end-users, and converts MusicXML files, or scanned print scores marked up in Capella, into music braille, according to user/worldwide country requirements. Various braille production agencies are already using MakeBraille, including dzb lesen themselves, Dedicon, ONCE, SBS and Vision Australia, and AVH has also recently begun to implement it. It is available free to end-users, and to organizations under a paid licence.

### b) Sao Mai Braille Converter (SMB)

We also supported the development of a much newer, and free, music braille converter from the Sao Mai Centre for the Blind, in Vietnam, Sao Mai Braille Converter [4]. This is a braille translation program which provides a unified solution for text, images, maths and music. The tool can be installed to run on Windows, and a simplified version can also be used on the web [5]. Many blind users and educators are using the tool alone for file conversions, and if they wish to read and write music, they are using SMB in conjunction with the free mainstream notation tool, MuseScore.

### c) MuseScore, with braille functionality powered by SMB

With our support, the free, mainstream music notation tool, MuseScore, from the Muse Group [6] has made accessibility improvements to its interface and to its MusicXML output, and has recently added a live braille window and 6-key braille input powered by Sao Mai Braille. This means that blind musicians can comfortably use MuseScore to read and create music scores just like any other musician, with the support of live braille output on their braille displays, and braille input from their computer keyboard. Because the two tools are designed to work together, the best braille conversion of MuseScore files into braille is achieved by exporting the MuseScore file as MusicXML and then importing it into Sao Mai Braille for translation into braille.

## 2.2 Improved file format standards give better conversion into braille

Music notation tools which are used to create music scores - such as MuseScore [6], Sibelius [7], Finale [8], and Dorico [9] - can export files as PDF and MusicXML in addition to their native music notation file formats. PDFs are typically very unhelpful for musicians with print-disabilities, since the content is not innately accessible, so we wanted to use MusicXML files to convert into accessible formats. In the past, these MusicXML files have not always been sufficiently complete for us to generate a useful braille file.

So, we worked with the W3C and the notation tool developers so that they now include more helpful tags in MusicXML for conversion into braille. When saving music notation files for conversion into music braille we recommend that you use the most up-to-date version, with the Dolet plug-in [10], to ensure you get the most complete MusicXML out of the tools.

## 2.3 Improved music engraving (music setting) practice for accessibility

Another problem previously faced by transcribers has been that engraved music hasn’t always been done very accurately. It might look beautifully correct on screen and in print, but if the musical elements or lyrics are not properly engraved, the resulting file isn’t semantically accurate (e.g. lyrics are not properly attached to the individual voice parts, or a dynamic marking isn’t attached to start and end notes). This means that automated converter tools can’t identify the elements correctly and the resulting braille file might be meaningless.

However, we developed good practice guidelines for engravers and music-setters [11], which, when followed, generate scores suitable for automated conversion into music braille (or other accessible formats, such as Modified Stave Notation). These guidelines are starting to be used by mainstream engravers, and in the mainstream music publishing industry. This ensures that new scores are ‘born accessible’ and are suitable for immediate conversion into accessible formats. We are now also trying to find efficient solutions for updating legacy music files into quality MusicXML files.

## 2.4 Promotion of online teaching and learning resources

There was a shortage of shared knowledge and resources in this niche sector and consequently braille-reading children and adults were not getting the tuition they required. To help promote existing resources and avoid duplication of effort, we collated as many online resources as we could and signposted these on the DAISY Music Braille project web page [12]. The resources are grouped by end-user type and presented in a suitable order to progress through the content. The resources are suitable for blind and sighted musicians and teachers at various stages of their music braille journey.

## 2.5 ‘Music Braille Production Network’ connects the sector

Music braille transcribers were feeling isolated and disconnected from each other, and agencies were often duplicating efforts unnecessarily. We now have a global group of music braille producers in a ‘Music Braille Production Network’ [13] who can efficiently source existing scores and procure music braille productions from each other, and we have agreed guidance for producing scores for international readership [14]. These guidelines, developed by producers in the Network harmonize some elements of transcription formatting to make it easier to share files and easier for end-users to be able to read scores produced in other countries.

## 2.6 Harmonized music braille metadata improves file-sharing

In addition to guidelines for transcription for international file-sharing, the sector has also agreed to harmonize metadata for music braille files [15]. The use of consistent and helpful metadata makes it easier to find and retrieve suitable scores from online collections, and for files to be ingested into those online collections. These metadata guidelines were prepared with NLS [16], ABC Global Book Service [17], and BookShare [18] and braille libraries and online collections are currently working towards implementation of the proposed ‘Core’ and ‘Desirable’ fields.

# 3. Current interventions

Our primary focus in the remaining year of the project is on implementation of the resources previously developed in the project, with a particular emphasis on the promotion of a ‘born accessible’ agenda for music publishing. We would welcome further contributions to these activities if you have relevant expertise.

## 3.1 ‘Getting Started’ resources

We are devising a range of ‘Getting Started’ resources so that people have the right support materials to find out about, and learn to use, the available tools and guidelines. These resources will initially be aimed at educators and end-users, but resources will also be created for agencies wishing to incorporate tools into their music braille production workflow. Resources will include videos and guides to the conversion tools, testing and recommendations of suitable Optical Music Recognition software, and recommendations for how to find and check files which are suitable for conversion into music braille.

## 3.2 ‘Born Accessible’ agenda for music publishing

We are very excited to have initiated an international ‘Accessible Music Publishing’ agenda in the mainstream music publishing industry, highlighting the need for born-accessible scores for musicians who are blind, low vision or with other print-disabilities. There are parallels with the book publishing sector where we can collaborate, but some issues are specific to music publishing, and need dedicated attention.

If publishers make well-structured scores available in MusicXML format to agencies or directly to end-users, these can be very quickly and accurately converted into accessible formats, such as braille and Modified Stave Notation, and can be read on braille displays and in music notation programs. The MusicXML score could be available at the same time as the printed version.

This would revolutionize the speed and the way in which musicians with print-disabilities are able to access music scores, and gives users great flexibility and control for reading scores.

We have had a very positive response already from music publishers, composers, exam boards, engravers, transcribers and end-users, and have run two Round Table events, and established an Accessible Music Publishing Action Group.

We are now working more closely with publishers and engravers to help them integrate our engraving guidelines into their workflows. We are also beginning to establish processes for promoting and making their resources available on request, and/or through online collections. We will continue to make/maintain links with publishers, engravers, and relevant associations to spread the message as widely as possible.

## 3.3 Practical methodologies for teaching and learning music braille

We will also be trying to bring together music braille teaching practitioners in working groups. We would like to collate and signpost to practical methodologies for teaching and learning music braille, to add to the existing directory of online resources. By increasing the amount of quality resources available to teachers in particular, we should quickly see an increasing availability of braille music support in schools and beyond.

## 3.4 Music braille production standards

Finally, to further improve music braille production standards, we are offering some assistance to ICEB during the preparation of an Addendum to the New International Manual of Music Braille [19], by helping to identify gaps and offering suggestions for content. Some of these proposals have already been submitted by the UK Association for Accessible Formats (UKAAF) [20] and the DAISY Music Braille Project [1], and we also now have access to the minutes of the 2002-04 international committee which had begun this work, which will help with these latest efforts.

Some of the proposals for this Addendum already include for example: clarifications on existing guidance; individual musical elements or situations taken from real life experiences of transcribers not currently included in NIM; examples from mainstream notation reference books which do not currently have a braille equivalent; Gregorian chant; microtonal notation; conductor’s symbols; and hand-signs for complex keyboard music.

Getting the right international music braille experts together to review and contribute to this Addendum and seeing it through to agreement and publication is a major undertaking, and discussions are underway between relevant associations to establish the best way to do this.

# 4. Our vision

In closing, here’s a reminder of DAISY’s vision for this area: “To ensure that more music scores in braille are available more easily, and to more blind musicians world-wide, through global cross-sector collaboration.”

We feel that our work so far has taken us a long way to securing the future of music braille production and use.

Our dedicated (and funded) focus on music braille continues until Spring 2025, when we anticipate that the sector will be taking responsibility for the majority of ongoing activity without the dedicated driving force of the DAISY Music Braille Project.

By this time we expect to see:

* mainstream music publishers providing (or beginning to provide) ‘born-accessible’ files to agencies and musicians who need alternative access to print scores, with sector-wide collaboration;
* agencies continuing to network effectively to share expertise and develop knowledge around music braille production and use;
* various conversion tools being widely used, with active user-groups, and feedback being given to developers who make continuous improvements;
* increasing use by Authorized Entities of the ABC Global Book Service as the primary source for sharing and obtaining accessible materials, including music braille files, and possibly also the MusicXML intermediary files;
* increasing numbers of teachers able to support musicians of all ages with music braille, with new materials being developed collaboratively and shared widely;
* production houses witnessing increased demand for, and fulfilment of, accessible scores for musicians who are blind, low vision, or with other print-disabilities.

# 5. Join us

There are various ways to engage with the DAISY Music Braille Project and our activities, building resources in our community, and helping us to celebrate even more music braille successes!

1. Visit our web pages at [www.daisy.org/MusicBraille](http://www.daisy.org/MusicBraille)
2. Sign up to one or more of our mailing lists using the form at: <https://forms.office.com/e/MRS7DpmWUr>
3. Email us at MusicBraille@daisy.org

We would be delighted to welcome more music braille producers, teachers and other specialists to the network, and we look forward to hearing from you.

# 6. References

Links all working on 27/02/2024.

[1] DAISY Consortium, Music Braille Project: <https://daisy.org/MusicBraille>

[2] “Music Braille Production in 2018, a Phase 2 Research Report from the DAISY Music Braille Project” (2018) at: <https://dl.daisy.org/projects/DAISY_Music_Braille_Research_Report_Phase2-FINAL.docx>

[3] MakeBraille: <https://makebraille.dzblesen.de/MakeBraille>

[4] Sao Mai Braille Converter: <https://saomaicenter.org/en/smsoft/smb>

[5] Sai Mai Braille web translator:
<https://saomaicenter.org/en/smsoft/sm-music-braille/translate>

[6] MuseScore: <https://musescore.org/en>

[7] Sibelius: <https://www.avid.com/sibelius>

[8] Finale: <https://www.finalemusic.com/>

[9] Dorico: <https://www.steinberg.net/dorico/>

[10] Dolet Plug-in: <https://www.musicxml.com/dolet-plugin/>

[11] Guidance for Engravers using Notation tools to create accessible master scores, latest version available at: <https://daisy.org/AccessibleMusicPublishing>

[12] “Teaching and Learning Resources for Music Braille” (2023): [https://dl.daisy.org/projects/musicbraille/Music\_Braille\_Teaching\_&\_Learning\_Resources\_DAISY\_24.03.2023.docx](https://dl.daisy.org/projects/musicbraille/Music_Braille_Teaching_%26_Learning_Resources_DAISY_24.03.2023.docx)

[13] Music Braille Production Network page: [www.daisy.org/MBPN](http://www.daisy.org/MBPN)

[14] “Guidance for producing scores for international use (04.07.2023)”:

<https://dl.daisy.org/projects/musicbraille/MBPN_Guidance_for_producing_scores_for_international_use_04.07.2023.docx>

[15] “Metadata for Music Braille Files – Guidelines for Cataloguers (2023)”: <https://dl.daisy.org/projects/musicbraille/Music_Braille_Metadata_Guidelines_DAISY_FINAL_Feb-19-2023.docx>

[16] National Library Service for the Blind and Print Disabled, Library of Congress: <https://www.loc.gov/nls>

[17] ABC Global Book Service: <https://www.accessiblebooksconsortium.org/globalbooks>

[18] BookShare: <https://www.bookshare.org/>

[19] New International Manual of Music Braille, Bettye Krolick (1996):

<https://www.rnib.org.uk/documents/1799/New_International_Manual_6BS0GLM.doc>

[20] UK Association for Accessible Formats (UKAAF): [www.ukaaf.org](http://www.ukaaf.org)

# Appendix: Funders

We are grateful to the following agencies for supporting the project with financial contributions towards the DAISY Music Braille Project:

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* Vision Australia, Australia