Music Discovery Requirements

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Executive Summary

This document explores discovery needs specific to and especially important for music materials, particularly scores and recordings. Music materials pose unique demands that must be considered for successful discovery. For example, most books are published only once; for musical works, however, multiple versions (for example, score, parts, and recordings of different performances, arrangements, and transcriptions) are the norm. These different versions also often have different titles (different languages or grammatical formulations), making title transcribed from items much less useful for finding and identifying musical works. Music materials also possess unique attributes not found in books, such as instruments/voices used to perform the music. Some of the unique needs posed by music materials can be solved simply by ensuring that needed fields are appropriately displayed and indexed in discovery interfaces. Other problems are more difficult to solve. This document discusses the issues outlined in the table of contents and when possible gives concrete recommendations for display and indexing. Three appendixes compile technical details of the specific indexing recommendations in spreadsheets.

This document employs technical language, and the target audience is those creating or guiding the development of discovery interfaces that will include music materials. Developers of future recording and encoding standards will also benefit from reading this document and creating solutions to facilitate better discovery interfaces. The document identifies areas where deficient data creates particular problems for discovery. Those inputting or creating standards for data can use this document to identify areas where there is particular need for fuller, more consistent data. Given that most libraries will be dealing with large bodies of legacy data recorded according to AACR2 and encoded in MARC, particular attention is paid to MARC data and to AACR2, as well as issues related to RDA. The document also includes indexing recommendations for non-MARC metadata standards. As data recording and encoding changes, specific recommendations in this document will need revision in order to achieve and maintain this document's underlying principles in an evolving environment.

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I. Introduction

The discovery environment is changing rapidly today, both within libraries and externally. Within the library realm, FRBR, RDA,[1] discovery tools, and faceted browsing are key factors related to these changes in the way our users encounter library data. As libraries and vendors develop and implement these changes, the specialized discovery needs arising from music materials are often overlooked. This document serves as a guide to meeting these unique demands for vendors, librarians, and anyone developing or implementing discovery interfaces of all kinds.

This work was initiated by the Emerging Technologies and Services Committee of the Music Library Association (MLA) in February 2011, with official support of the MLA Board of Directors given in June 2011. Group membership was drawn from both that committee and the broader ranks of MLA members. The group includes a liaison to MLA's Bibliographic Control Committee, which provided many thoughtful comments and suggestions. A first draft was made available for public comment November 16-December 5, 2011. A second draft was made available for public comment February 9-March 16, 2012.

This document has roots in earlier work by Lenore Coral[2] and by the MLA Automation Subcommittee,[3] but is not a mere revision of either document but rather a wholly new document reflecting today's environment. Given the rapidly changing bibliographic landscape and the immediate need for a document to aid discovery interface implementations, this document is not a standard. Instead, it gives recommendations and possible best practices, in conjunction with discussion of the factors and discovery needs that precipitated the recommendations. As the bibliographic landscape changes, this document will need revision. The group also hopes this document's careful examination of limitations of the current landscape will inform the development and implementation of new standards for recording and encoding data.

Two elements define the scope of the present document: music and discovery. First, the document focuses on musical works (scores and recordings), rather than secondary literature about music (books and articles), because musical works present more unique discovery needs. Second, the focus on discovery mostly excludes back end functions such as circulation, cataloging, and acquisitions which, like secondary literature, present fewer music-specific requirements. However, powerful searching is important for staff work with music materials, and implementing recommendations from this document will benefit both users and library staff. The

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[1] FRBR: Functional Requirements for Bibliographic Records, http://www.ifla.org/publications/functional-requirements-for-bibliographic-records (accessed 4 April 2012) by IFLA Study Group on the Functional Requirements for Bibliographic Records. RDA: Resource Description and Access, new cataloging standard released in 2010 as the replacement for AACR2. Published in print as *RDA: Resource Description and Access*. ALA Editions/Canadian Library Association/Facet Publishing: 2010. Online as a continually updated, subscription resource at http://www.rdatoolkit.org/ (accessed 4 April 2012)

[2] Lenore Coral, "Automation Requirements for Music Information," *Notes* 43, no.1 (September 1986): 14-18.

[3] Music Library Association Automation Subcommittee, "Automation Requirements for Music Materials, Final Subcommittee Draft," 1997, http://library.music.indiana.edu/tech_s/mla/autoreq.txt (accessed 4 April 2012). Note that further minor revisions were made to the document as late as 2004, but these revisions were never made publicly available.

focus on discovery also means recommendations are focused on indexing and presentation of data for discovery, rather than rules and best practices for recording data (such as AACR2, RDA, and "Musical Attributes, Refinements, and Recommendations for their Use"[4]) or metadata formats and encoding standards (such as MARC, Dublin Core, METS, MODS, EAD, CDWA Lite, and VRA Core[5]). Within this focus on indexing and display, there is a particular need to address: legacy data created according to AACR or AACR2 and encoded in MARC, particularly the data in OCLC's WorldCat database; coming changes associated with RDA; and the particular relevance of FRBR concepts for music materials. This document, therefore, includes recommendations for dealing with the constraints presented by this large volume of legacy data. Historically, library data recording and encoding standards have been biased towards Western art music. Other musics are often not ideally served by these standards; however, insofar as these other musics have been cataloged following such biased standards, discovery interfaces will not vary much depending on the type of music. Interfaces facilitating discovery for large amounts of music beyond the Western art music tradition may benefit from further customizations, if data has been encoded to support such customizations.

The document contains recommendations in three sections, with the first two sections aligned with FRBR concepts: musical works; expressions and manifestations; and other aspects of music discovery. Within each section, this document:
- identifies and discusses each individual attribute or relationship
- gives a prose summary recommendation
- proposes best practices for the attribute/relationship regarding:
  - indexing (inclusion in the discovery tool's searchable indexes)
  - display (making the data viewable in patron interfaces); unless otherwise noted, codes should be converted to the vernacular for display
  - use in facets/limits (use of data to create pre- or post-search filters based on the data; traditional OPACs frequently emphasize pre-search limits, while faceted browsing discovery tools promote post-search facets for refining results)
- lists related MARC authority fields, if applicable

Following final conclusions, appendixes compile technical details of the recommendations in spreadsheet form, from two perspectives: beginning with the indexes and giving fields to include, and beginning with the field and giving indexing for each field. A third appendix details MARC bibliographic record mapping for content and carrier.

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[4] Music Library Association Bibliographic Control Committee Metadata Working Group, "Musical Attributes, Refinements, and Recommendations for Their Use," 2008, http://bcc.musiclibraryassoc.org/BCC-Historical/BCC2008/BCC2008MSWG2.html (accessed 4 April 2012).

[5] MARC: MAchine Readable Cataloging, http://www.loc.gov/marc/ (recommendations given are for MARC 21); Dublin Core: Metadata Initiative, http://dublincore.org/ METS: Metadata Encoding and Transmission Standard, http://www.loc.gov/standards/mets/; MODS: Metadata Object Description Schema, http://www.loc.gov/standards/mods/; EAD: Encoded Archival Description http://www.loc.gov/ead/ (recommendations given are for EAD 2002); CDWA Lite: Categories for the Description of Works of Art, http://www.getty.edu/research/publications/electronic_publications/cdwa/cdwalite.html; VRA Core: data standard from the Visual Resources Association, http://www.vraweb.org/projects/vracore4/. CDWA Lite and VRA Core are rarely ideal for music, but they are included in this document for the benefit of situations where they may be used. (all sites accessed 4 April 2012).

II. Musical Works

A. Introduction

Clear identification and display of information regarding the musical work[6] is important to users. The following section addresses attributes of musical works which are important to users, as well as the "created by" relationships which link persons and corporate bodies (most often persons) to works and the "has as subject" relationship linking various entities to works (under the heading "topical subjects"). The following attributes and relationships are addressed:

B. Titles
C. Identifying Numbers
D. Medium of Performance
E. Musical Key/Range
F. Dates
G. Persons and Corporate Bodies
H. Topical Subjects
I. Genre/Form
J. Geographic Area

B. Titles

Users' discovery and identification of musical works frequently draws on titles, often in conjunction with creator. Particular musical works are often referred to by many different titles in various languages, for example: Symphony no. 5, Fifth Symphony, Sinfonie C-Dur, Symphonie op. 67, etc. This reality spurred librarians' extensive development and application of standardized titles (AACR2's "uniform titles") for music materials. To facilitate identification of musical works, it is crucial to display the entire standardized title, including additions to distinguish similar works and to identify particular parts/sections of the work, as well as expression-related additions. It is also important to use authority records or other methods to lead users to the work they seek, even when they begin their search with an alternate title for the work. See discussion of authority records in IV.B.

The current environment focuses on creating a standardized text string (AACR2's "uniform title" and RDA's "authorized access point representing the work") to represent the work. Cataloging codes dictate the selection of the title language, manipulation of the title, and addition of elements such as medium of performance, work numbers and key to create this text string uniquely identifying the work. In the future, the entire authority record, or some other record, might serve as a surrogate for the work. For the present, best practice is to continue including all other elements (particularly medium of performance, work numbers, and key) in title indexes.

Musical works are nearly always associated with specific creators. For works with known composers, the composer's name is often essential to identify the work and distinguish it from works with the same or similar titles. Therefore, creator name must be displayed in conjunction

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[6] Here defined according to FRBR: a distinct intellectual or artistic creation.

with the standardized title. (Creator name should not, however, be included in title indexes.) One specific problem area with the indexing and display of standardized titles for MARC data is that some discovery interfaces create separate hyperlinks for the creator in 700 abcdej$q and the work title in 700 klmnoprs$t, and likewise fail to associate 100 and 240. (Standardized title combinations can also be created from 110 (corporate name) and 111 (meeting name) in combination with 240 and likewise in 710 and 711, but this is rare.) In the development of discovery systems it is important to create a robust system that will link the data from these fields together to enable users to find materials.[7] Some musical work titles are not associated with names and are contained in MARC 130 and 730.

When a manifestation contains expressions of multiple musical works (for example, song anthologies), standardized titles are not always assigned for every work expressed. Sometimes, titles are merely transcribed from the item in to contents notes. For most comprehensive coverage, these transcribed titles should also be included in title keyword indexes and displayed. See IV.C for further discussion of the challenges of compilations.

Recommendation: Index and display all title fields, except do not display coded subfields not intended for user display. Ensure that standardized title strings are associated with their creators. Pursue methods for leading users to the work regardless of the version or element of the title they use to begin a search. For data using standardized vocabulary, make it possible for users to link from within the record display from standardized vocabulary terms to other materials associated with the same attribute/entity. This could be accomplished through use of bound texts strings for full authorized terms or via identifiers functioning behind the scenes. In linking and facet creation, and in relevance ranking, privilege standardized title fields over transcribed titles.

Index and display (Bibliographic/Descriptive Metadata):
MARC: 130 Uniform Title Main Entry
MARC: 240 Uniform Title (display all subfields; in particular, associate with names in 100, 110, 111)
MARC: 245 Title Statement
MARC: 382; 383; 384 Medium of Performance, Numeric Designation of Musical Work, [Musical] Key (keyword)
MARC: 505 $t Contents Note Title ($a could also be added to include titles found in unenhanced contents notes. However, this would also add many authors to the title index. Consider local data to make a decision balancing precision and recall.)
MARC: 700; 710; 711 Added Entry--Personal, Corporate, Meeting Name (only include title subfields, klmnoprs$t, in title keyword indexes but display all subfields intended for public display) (in particular, associate name and title subfields)
MARC: 730 Uniform Title Added Entry
MARC: 740 Added Entry--Uncontrolled Related/Analytical Title
MARC: 800, 810, 811, Series Added Entry--Personal Name, Corporate Name, Meeting Name (display all subfields intended for public display) (only include title subfields,

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[7] Stanford University's Blacklight implementation provides an example of a combined, clickable index. http://searchworks.stanford.edu/ The initial implementation chose to leave out subfields representing parts and expressions: 240/7xx os$p.

klmnoprs$t, in title keyword indexes but display all subfields intended for public display) (in particular, associate name and title subfields.)
MARC: 830 Series Added Entry--Uniform Title
Dublin Core: title
MODS: title
EAD: titleproper, unittitle
CDWA Lite for indexing: title
CDWA Lite for display: title
VRA Core: title

Facets/Limits (Bibliographic/Descriptive Metadata):
Musical work titles do not lend themselves to pre-search limits.
Post-search facets based on musical work title could be useful, but their long strings make them difficult to employ in the limited real estate usually available for facets. Any such facets should use standardized title fields, not transcribed titles. Facets by medium of performance (which are, currently, frequently included in uniform titles) could be useful; see II.D. and III.G for further discussion.

Related MARC Authority Fields:
MARC: 100; 110; 111; 130; 384

C. Identifying Numbers

Opus, thematic index, and serial numbers are frequently used in Western art music to identify musical works. Ideally, systems will exploit authority record data to easily lead users between different systems of numbering for composers (e.g. Vivaldi, D. Scarlatti) where multiple work number systems exist.

In many cases musical works lack a distinctive title and are titled only with a type of musical composition, such as "symphony." These works are often identified by the sequential number of works of that type by a given composer. These serial numbers depend on the association of the type with the number for meaning, and must display and function together.

Successful discovery of musical works identified by serial number (e.g., symphony no. 5) is dependent on phrase searching capabilities: search terms that otherwise function as Boolean operators must be searched as *terms* when enclosed in quotes or as part of phrases within quotes, rather than as operators. With this capability, a search on "no 5" returns works with recorded serial number "5" rather than excluding "5" as a search term.

Discovery systems do not often allow for searching, by opus, thematic index, or serial numbers alone, except in general keyword indexes where many false hits may be generated by numbers present in the record for other purposes. Ability to search opus, thematic index, and serial numbers in their own separate index would be very useful for music.

Other numbers are associated with expressions and manifestations, and are discussed in III.C.

Recommendation: Index and display opus, thematic index, and serial numbers. Utilize system algorithms to include in indexing all numbers in a consecutive range where only first and last numbers are recorded. Consider the interface and available screen real estate in the decision whether to include them in facets. Ensure that serial numbers are associated with the type of composition. Ensure that functionality exists for searching "no", the English abbreviation for "number", as a term, rather than exclusively as a Boolean operator.

Index and display (Bibliographic/Descriptive Metadata):
MARC: 130 $n; 240 $n; 700 $n; 730 $n Number of Part/Section of Work, including work numbers for music materials.
MARC: 383 abcd$e Numeric Designation of Musical Work
Dublin Core: identifier
MODS: identifier
EAD: unitid
CDWA Lite: possible use of descriptiveNote
VRA Core: possible use of the *refid* and *extent* attribute combination

Facets/Limits (Bibliographic/Descriptive Metadata):
Work numbers do not function well for pre-search limits. They could be used for post-search facets, but in situations where real estate is limited for post-search facets, they can be difficult to employ and may be best omitted as facets.
VRA Core: *refid*

Related MARC Authority Fields:
MARC: 100 $n; 130 $n; 383 abcd$e

D. Medium of Performance

Medium of performance is an attribute uniquely important to music. It is an identifying element for known musical works, and users also regularly seek works and expressions for a particular medium of performance, without a particular work/expression in mind at the beginning of their search. However, historically, data recording and encoding standards and practices have not made medium of performance cleanly and consistently separable from other attributes.

In MARC/AACR2 legacy data, the medium of performance may be stated or implied in fields for title (130, 240, 7xx) or subject/genre (650/655), encoded in 048 (medium of performance), or implied to a limited degree in certain codes in 008/18-19 and 047 (form of composition). Medium of performance may also be mentioned or implied in various descriptive fields (2xx, 5xx). As RDA records with related MARC elements are added, medium information may also be recorded in 382 (expanded to accommodate medium of performance data with MARC Proposal 2012-01, approved Jan. 21, 2012).[8] In the future, legacy data might be massaged so that medium of performance contained in 650/655 is moved to 382.

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[8] MARC Proposal No. 2012-01, "New Data Elements in the MARC 21 Bibliographic and Authority Formats for Medium of Performance," http://www.loc.gov/marc/marbi/2012/2012-01.html (accessed 6 April 2012).

Rules governing input of certain fields or elements within LCSH and AACR2 uniform titles add to the problem of limited or dispersed information. This is particularly problematic with vocal music, folk music, recorded popular music, and compilations. Indexing, displaying, and allowing limits/facets by multiple fields will maximize users' ability to search for and identify medium.

Going forward, recording medium in a way that permits machine actionable, granular description of expressions is essential. Current LCSH patterns have many shortcomings: combination of genre/form with medium of performance in a single term, difficulty in identifying soloists and number of performers, the semantic relationships between terms, and the syntax of the terms. Current MARC 048 is also problematic, particularly for recorded popular, jazz, and folk music when some, but not all, mediums can be identified. Since the proposed LCGFT thesaurus will not include medium of performance, the Library of Congress, in cooperation with the Music Library Association, is developing a new "Library of Congress Medium of Performance Thesaurus for Music (LCMPT)" to provide controlled vocabulary for medium of performance.[9]

Challenges relating to medium of performance are further complicated by the prevalence of manifestations with multiple expressions. (For additional discussion, see Compilations in IV.C.) Linking fields offer a potential solution in this area, but have historically not been employed.

Users may also seek an expression with a particular medium of performance (i.e. an arrangement). See III.G for further discussion.

Recommendation: Index and display fields relating to medium of performance, with codes converted to the vernacular. Explore alternative tools and interfaces to allow users to interact more easily with medium of performance. Revise interfaces as new standards for recording and encoding medium of performance are implemented.

Index and Display (Bibliographic/Descriptive Metadata):
MARC: 048 Number of Musical Instruments or Voices (display code in vernacular)
MARC: 130 $m; 240 $m; 7xx $m Medium of Performance
MARC: 382 Medium of Performance
MARC: 650 Subject Added Entry - Topical Term
MARC: 655 Index Term - Genre/Form
Dublin Core: type
MODS: genre
EAD: genreform
CDWA Lite: classification
VRA Core: description; subject

Facets/Limits (Bibliographic/Descriptive Metadata):
MARC: 048 Number of Musical Instruments or Voices (display code in vernacular)
MARC: 382 Medium of Performance (defined 2010; expanded 2012)
MARC: 650 Subject Added Entry - Topical Term
MARC: 655 Index Term - Genre/Form

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[9] See also "Medium of Performance for Music: Working List of Terminology," http://www.loc.gov/catdir/cpso/medprf.html (accessed 2 April 2012).

MODS: genreform
EAD: genre
VRA Core: subject

Information on medium of performance and number of instruments or performers may be too complex to use as limit/facet. There are a number of models that allow users to select music based on medium, but these are advanced interfaces that may be most effective as separate, complementary tools. Tools that leverage data in the MARC 048 field to search within a single 048 field (describing a single expression) include:
Kent State: http://www.library.kent.edu/kentlink_instrument_search.php
University of North Texas: http://iii.library.unt.edu/search~S7/X
Ball State: http://cms.bsu.edu/Academics/Libraries/ResearchTools/MediaFinders.aspx
Note: The Ball State search relies on detailed encoded information drawn from a non-MARC thesaurus. The addition of IAML medium of performance codes[10] to MARC codes provides a high level of specificity, but the IAML thesaurus is not widely used.

Related MARC Authority Fields:
MARC: 100 $m; 130 $m; 150; 155; 382; field for medium of performance (LCMPT) headings, when field is determined

E. Musical Key/Range

Original key can be useful for identifying tonal works of Western art music, particularly when the work has a generic title and the identifying number (such as an opus, work, or thematic catalog number) is unknown, absent from the cataloging data, or wholly non-existent.

Edition statements may contain information on the original key or range. The manifestation may not identify whether such statements refer to the original key/range or a transposition, so best practice is to simply include edition statements in indexing and display.

Successful discovery of musical works identified by musical key is dependent on phrase searching capabilities: terms that otherwise function as stopwords must be searched as *terms* when enclosed in quotes or as part of phrases within quotes. With this capability, a search on "a major" will return bibliographic records containing the string "a major" (a musical key) rather than "major" alone.

Another consideration for searching for works with known key is the exclusive use of the symbols for music sharps and flats in uniform/preferred titles and the potential for symbols, rather than spelled out terms, to be used in descriptive fields. In some older data, the pound sign (#) is used as a replacement for the musical sharp, and the lowercase "b" is used as a substitute for the musical flat. A system that automatically associates search terms entered as "sharp" or "flat" with their respective symbols would not be appropriate, considering the common usage of these terms. However, this problem could be partially addressed by a feature that allows users to

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[10] See http://www.iaml.info/activities/cataloguing/unimarc/medium for further information on these codes, from the International Association of Music Libraries, Archives and Documentation Centres (IAML).

select from a set of frequently used symbols or diacritics. Regardless of search functionality, the system must allow entry and display of the symbols for musical sharps, flats, and naturals[11] in all fields of bibliographic and item records.

An additional field that contains musical key information is MARC 031 in bibliographic and authority records. Defined for recording musical incipit[12] in ordinary ASCII characters, it can be used for any material containing music. While $p contains the incipit itself, $r is used to record the key or mode. Therefore this field could potentially be used for searching by key; equally beneficial would be the capability to convert the coded incipit to musical notation for public display. However, like many other MARC fields, 031 has not been coded regularly in bibliographic or authority records.

Key and range can also be attributes at the expression level, as further discussed in .

Recommendation: Index and display musical key and range. Ensure that "a" (frequently a stopword), can be forced to be searched as a term. Ensure that the musical sharp, flat, and (if present in data) natural symbols can be entered, displayed, and searched. Evaluate data for feasibility of use as a facet. Explore the use of MARC 031 in bibliographic and/or authority records.

Index and Display (Bibliographic/Descriptive Metadata):
MARC: 130 $r; 240 $r; 7xx $r; 031 $r Musical Key
MARC: 250 Edition Statement
MARC: 384 [Musical] Key (generate display label based on first indicator)
Dublin Core: description; possible use of coverage
MODS: note type="key"[13]
EAD: note; odd
CDWA Lite: descriptiveNote
VRA Core: description.notes, possible use of the *refid* and *extent* attribute combination

Facets/Limits (Bibliographic/Descriptive Metadata):
In a music-specific interface, a facet or limit for musical key could be useful. However, in most legacy data, key is rarely recorded for distinctively-titled works, so such a facet would be far from comprehensive. In addition MARC 384 can be coded for either work (original) key or expression key, and key in MARC $r in MARC 130, 240, or 7xx may be misleading in cases of arrangements. Therefore, distinguishing between work key and expression key could be very problematic in facets/limits.
MODS: note type="key"

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[11] The use of the musical natural symbol is limited in cataloging (and not currently defined in the OCLC-MARC character set), because a letter name without a sharp or flat is taken to mean "natural" in standardized titles and Library of Congress classification. However, it may be encountered in certain cases, such as call numbers created under Dickinson classification.

[12] Musical incipit is the opening fragment (usually the melody) of a musical work. The incipit helps to identify the work.

[13] MODS does not currently include a prescribed method of coding musical keys; note type="key" is a permissible possibility.

VRA Core: *refid*

Related MARC Authority Fields:
MARC: 031; 100 $r; 130 $r; 384

F. Dates

Creation date is an important, though neglected, access point for musical works. Users may seek works composed in a particular date range, which might be a specific individual year or decade, or a more broad era of music history (such as "baroque era" or "medieval era," often indicative of style). Users may also use creation date to identify the work they are seeking, particularly to distinguish it from other works with similar titles and other attributes. With most books and articles (except classic literature) publication date is a fairly accurate approximation of creation date, but this is not true for musical works because a single musical work frequently exists in many expressions and manifestations. MARC 045 may be used to record period or date of composition, but this field has not been regularly used since the Library of Congress announced it would cease coding 045, in March 1989. Some approximation of creation era might be possible by exploiting composer birth/death date information. In future RDA implementations, creation date might be recorded in musical work records. MARC 046 kl are now defined in the MARC authority format for this purpose.

Creation date, and other temporal aspects associated with musical works, may also be reflected in chronological subdivisions from topical subject headings found in $y of MARC 650 fields. (Although $y is defined for 655 genre/form headings, the *Library of Congress Genre/Form Terms for Library and Archival Materials* (LCGFT) thesaurus currently has no provisions for subdivision of terms.[14]) Chronological subdivisions are not consistently present due to subject cataloging rules, and they may also represent other associated temporal aspects besides creation date. Nor do existing chronological subdivisions correspond to the broad stylistic eras users sometimes seek. Therefore while index and display of chronological subdivision is useful, it is problematic for use as a creation date or style facet.

Dates are also associated with expressions and manifestations. For information and discussion on these dates, see III.I.

Recommendation: Index and display creation date and include in facets/limits if present in data. However, this access point has been neglected in much legacy data, making it difficult to implement consistently and accurately as a part of discovery interfaces.

Index and Display (Bibliographic/Descriptive Metadata):
MARC: 045 Time Period of Content. (Was not used consistently after LC announced in March 1989 it would cease coding. Legacy data should be evaluated for consistent presence of this field before using as a facet.) (display code in vernacular)

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[14] "Frequently Asked Questions About *Library of Congress Genre/Form Terms for Library and Archival Materials (LCGFT),"* revised June 6, 2011, http://www.loc.gov/catdir/cpso/genre_form_faq.pdf (accessed 4 April 2012). See Q21, Q37 and Q38.

MARC: 046 kl Special Coded Dates. (Use codes in other subfields to generate vernacular display labels and to properly interpret dates coded in kl.)
MARC: 650 $y Chronological subdivision
Dublin Core: date.created
MODS: originInfo.dateCreated, subject.temporal
EAD: unitdate; subject (unitdate could be made more specific if the "creation" attribute is regularly employed in data; unit date + datechar="creation" if the "creation" attribute is regularly employed in data)
CDWA Lite: indexing: earliestDate; latestDate; style; subjectTerm
CDWA Lite: display: displayCreationDate
VRA Core: date.earliestDate; date.latestDate; style period; subject

Facets/Limits (Bibliographic/Descriptive Metadata):
MARC: 045 Time Period of Content. Was not used consistently after LC announced in March 1989 that it would cease coding. Legacy data should be evaluated for consistent presence of this field before using as a facet. (display code in vernacular)
MARC: 046 kl Special Coded Dates. Evaluate data for consistent presence before using as facet. (display code in vernacular)
MARC: 650 $y Chronological Subdivision. Problematic due to subject cataloging rules.
Dublin Core: date.created
MODS: orginInfo.dateCreated
EAD: unitdate; subject
CDWA Lite: indexingDateSet.earliestDate; indexingDateSet.latestDate; style; subjectTerm
VRA Core: date.earliestDate; date.latestDate; style period; subject

Related MARC Authority Fields:
MARC: 150 $y, 046 kl (authority format; implemented by OCLC May 2010) (display code in vernacular)

G. Persons and Corporate Bodies

The "created by" relationship is very important for users to find, identify, and select musical works by a particular composer. Usually, the composer is a single person; more rarely, corporate bodies can serve as creators. It is important to index and display all personal and corporate names, both transcribed forms and standardized vocabulary.

Once a user has identified a work created by a particular composer, the interface should link to more materials related to that person. When the data utilizes standardized vocabulary, the system should fully exploit the existing standardized vocabulary. For example, clicking on a link within a record for a work composed by John Adams the composer (Adams, John, 1947-) should locate only materials related to this person, not items related to either president or to other persons named John Adams. In many current systems, this will mean utilizing the bound text string for the full authorized form of name as the link. Alternately, a unique identifier could function behind the scenes, regardless of interface display. For further discussion of issues surrounding standardized vocabulary, see the discussion of authority records in IV.B.

Other names may be associated with a work as subjects (such as music about or in homage to a person) and these should be indexed and displayed, but as "subjects" rather than "authors."[15]

In addition to seeking specific known persons and corporate bodies, users may seek works associated with persons/corporate bodies possessing particular attributes, such as date, nationality, language, or field of activity. In existing AACR2/MARC data, the only one of these attributes recorded with any frequency is birth/death/activity dates of persons. In contrast, RDA allows for recording, for persons: date, gender, place of birth, place of death, associated country, place of residence, address, affiliation, language, field of activity, associated group, and profession/occupation of person; and for corporate bodies: associated place, associated date, associated institution, number of conference, other designation, language, address, and field of activity. MARC 046 and 370-377 have been defined in the authority format, and MARC 046 and 377 have been defined in the bibliographic format, to provide machine-actionable fields for this data. If these fields were regularly encoded, this data could be exploited to answer questions like "What music do you have by French women composers born before 1950?", through use of facets or limiters. However, MARC/ACCR2 legacy data does not contain this information; furthermore, these RDA elements, except birth and death dates for persons, and dates and locations of conferences, are not currently considered "core" RDA elements by the Library of Congress, except when needed to differentiate persons/corporate bodies. However, it might be possible to connect to other sources which have already mined this data such as WorldCat Identities (http://www.worldcat.org/identities/) or the Virtual International Authority File (http://viaf.org/).

Other persons besides the composer can be related to the musical work, such as librettists and lyricists. The relationship is sometimes collaborative (composer and lyricist work together on words and music) and sometimes involves an independent work (a literary text which the composer sets to music). AACR2 and MARC do not make the relationships clear in ways that could easily be machine-manipulated for discovery; future data recording and encoding might support more granularity in discovery. In addition, many more persons and corporate bodies contribute to musical expressions and manifestations; see discussion in III.J.

Recommendation: Index and display all personal and corporate names. Exploit data utilizing standardized vocabulary to allow users to differentiate between people/corporate bodies with similar names; make it possible for users to link from within the record display from standardized vocabulary terms to other materials associated with the same attribute/entity. This could be accomplished through use of bound texts strings for full authorized terms or via identifiers functioning behind the scenes. Explore methods of allowing users to seek works based on attributes of related persons/corporate bodies.

Index and Display (Bibliographic/Descriptive Metadata):

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[15] Mostly, subject headings for persons and corporate bodies reflect subject relationships. Authors of texts set to music are an exception. SHM H 1110 instructs addition of a subject heading for the name of the person whose writings or words are set to music, with the form subdivision "Musical settings" appended. In this case, the person has a creator, not a subject relationship to the work. However, AACR2 also instructs for added entries for the person whose words are set, making manipulating the subject headings to bring out the creator relationship less vital.

As "authors":
Standardized vocabulary:
MARC: 100; 110; 111 Main Entry--Personal, Corporate, Meeting Name
MARC: 700; 710; 711 Added Entry--Personal, Corporate, Meeting Name
MARC: 800, 810; 811 Series Added Entry--Personal, Corporate, Meeting Name
MARC: $4; $e Relator Code and Relator Term (assess data for presence) (display codes in vernacular)

Non-standardized vocabulary:
MARC: 511, 508, 505 $r Notes for Participant or Performer, Creation/Production Credits, and Statement of Responsibility in Contents
Persons and corporate bodies referred to in notes will often, but not always, be included in controlled vocabulary fields. Including these notes in the "author" keyword index will give fullest coverage of persons and corporate bodies. 245 $c might also be included, but this subfield may also contain title and other non-author data. 505 $a could also be included to include authors found in unenhanced contents notes. However, this would also add many titles to the author index. 505 $a could also be included to include authors found in unenhanced contents notes. However, this would also add many titles to the author index. Consider local data to make a decision balancing precision and recall.

Analyze data for standardized/non-standardized vocabulary (best practices call for adopting an authority source, but this may not always be done)
Dublin Core: creator ; contributor
MODS: name / namePart + *type*
EAD: origination.persname, origination.corpname
CDWA Lite Indexing: nameCreator, roleCreator
CDWA Lite Display: displayCreator
VRA Core: agent name + *type*, role

As "subjects":
Standardized vocabulary:
MARC: 600; 610; 611 Subject Added Entry--Personal, Corporate, Meeting Name
Dublin Core: subject, relation
MODS: relatedItem
EAD: subject; persname, corpname + role = "subject" (may contain both standardized and non-standardized vocabulary)
CDWA Lite: relatedWork
VRA Core: relation

Facets/Limits (Bibliographic/Descriptive Metadata):
Include persons and corporate bodies contained in standardized vocabulary "author" fields in an "author/creator" facet.
If roles are regularly and uniformly encoded, consider incorporating this information into faceting. (For example, to allow easy filtering of Leonard Bernstein as composer vs. as conductor.)

Related MARC Authority Fields:
MARC: 100; 110; 111

H. Topical Subjects

True topical headings for music materials are confined to describing what music is *about*, but many musical works are not objectively *about* anything. Therefore, true topical headings are both less important and less common for music materials than for books. In FRBR terminology, true topical headings express a "has as subject" relationship. Subjects of musical works may include associated concepts, names of persons or bodies, and geographic areas (i.e. music about a geographic area, as distinguished from music emanating from a geographic area). In LCSH, topical headings for music materials are usually created by adding the form subdivisions "Songs and music" or (for dramatic musical works such as opera) "Drama" to non-musical headings. These subdivisions hold little meaning when separated from the rest of the heading, so it is important that the entire heading string be displayed as a unit and be able to function as a unit.

Currently, topically coded subject headings are also assigned to identify non-topical aspects including: music of national, religious, and ethnic groups (see also II.J and III.K,) often by adding the form subdivision "Music" to an otherwise topical heading; the source of text set, by employing the title of a liturgical text or adding the subdivision "Musical settings"; temporal coverage, often via date subdivisions (addressed II.F and III.I); medium of performance (addressed in II.D and III.G); and genre/form (addressed in II.I).

Given the large number of attributes of music materials that have been historically coded as subjects and the changes underway (particularly with genre/form and medium of performance), discovery services need to allow maximum flexibility and be able to accommodate the full range of subject-related fields. Additionally, subject search algorithms should be customizable by individual libraries so they may leverage the data contained in their information systems.

Books about particular musical works are assigned subject headings which consist of the standardized title (including composer, if applicable for the work.) It could be useful to provide functionality for moving from the actual work to materials about the work, and vice versa. The same controlled vocabulary is currently recorded in both cases, but the distinction between the work and materials about it should be made clear by the display.

Recommendation: Index and display subject fields. For data using standardized vocabulary, make it possible for users to link from within the record display from standardized vocabulary terms to other materials associated with the same attribute/entity. This could be accomplished through use of bound texts strings for full authorized terms or via identifiers functioning behind the scenes. Subdivisions are important to music materials, so make it possible for users to view and interact with the entire subject string as a unit. Because current music subject headings frequently include non-topical aspects, many interfaces will choose to combine all these aspects into one index or facet area for the near future. However, this area should be watched closely for updates as data encoding and recording standards change.

Index and Display (Bibliographic/Descriptive Metadata):

Also note: II.F, III.I (dates); II.D, III.G (medium of performance); II.I (genre/form); II.G. (persons/corporate bodies); II.J, III.K (geographic area)
MARC: 043 Geographic Area Code (display code in vernacular)
MARC: 6xx Subject Access
Dublin Core: subject
MODS: subject
EAD: subject ; geogname + *role* = "subject"
CDWA Lite: subjectTerm
VRA Core: subject + *extent*

Facets/Limits (Bibliographic/Descriptive Metadata):
MARC: 043 Geographic Area Code (display code in vernacular)
MARC: 6xx Subject Access
Dublin Core: subject
MODS: subject
EAD: subject
CDWA Lite: subjectTerm
VRA Core: subject + extent

Related MARC Authority Fields:
MARC: 100; 110; 111; 130; 150; 151; 180

I. Genre/Form

Users regularly seek works and expressions with particular forms, genres, types, styles, etc. Up until now, these headings, which describe what musical works *are*, have been incorporated into the Library of Congress' cataloging manuals for topical subjects, and coded the same as topical subjects, using MARC 650 (bibliographic) and 150 (authority.) The Library of Congress is currently working with interested groups, including MLA's Music Genre/Form Task Force, to develop the thesaurus *Library of Congress Genre/Form Terms for Library and Archival Materials* (*LCGFT*), which will separate form and genre headings from topical subjects and code musical genre/form headings separately from topical headings, using MARC 655 (bibliographic) and 155 (authority.) Discovery services should be able to distinguish between genre/form headings and topical subjects for purposes of searching and faceting or limiting.

While the current practice of coding genre and medium in MARC 650 topical fields will soon change as part of the LC genre projects, this does not address the issue of legacy data. Some libraries may lack the resources required for creating a genre/form index in their local systems or for updating topical 650 headings to genre 655 headings. Moreover, even libraries that do create genre/form indexes may still wish to retain 655 headings in their subject index for patrons who might not make the distinction between "is" and "about."

Furthermore, while libraries will no doubt rely heavily on *LCGFT* to provide genre/form access, it remains to be seen whether this resource will adequately describe popular, ethnic, and non-Western art music. To allow maximum flexibility, discovery services should accommodate whatever genre-related thesauri are desired, including those that are locally developed.

Recommendation: Index and display genre/form terms, including displaying codes in the vernacular. Data recording and encoding standards are undergoing major change. Discovery systems need to allow maximum flexibility and decisions must be regularly reviewed and revised to accommodate changes as they occur. For data using standardized vocabulary, make it possible for users to link from within the record display from standardized vocabulary terms to other materials associated with the same attribute/entity. This could be accomplished through use of bound texts strings for full authorized terms or via identifiers functioning behind the scenes.

Index and Display (Bibliographic/Descriptive Metadata):
MARC: 006/01-02 (display code in vernacular)
MARC: 008/18-19 (display code in vernacular)
MARC: 047 Form of Musical Composition Code (display code in vernacular)
MARC: 380 Form of Work
MARC: 650 Topical Term (until such time as genre/form terms are moved to 655, including those in legacy data)
MARC: 655 Index Term—Genre/Form
Dublin Core: subject, format, description
MODS: genre, subject, note
EAD: genreform
CDWA Lite: style; classification; subjectTerm with appropriate *type* attribute
VRA Core: style period; subject with appropriate *type* attribute

Facets/Limits (Bibliographic/Descriptive Metadata):
MARC: 006/01-02 Form of Composition (display code in vernacular)
MARC: 008/18-19 Form of Composition (display code in vernacular)
MARC: 047 Form of Musical Composition Code (display code in vernacular)
MARC: 655 Index Term - Genre/Form
Dublin Core: subject, format
MODS: genre, subject
EAD: genreform
CDWA Lite: style, subjectTerm
VRA Core: style period, subject

Related MARC Authority Fields:
MARC: 150; 155; 380

J. Geographic Area

Geographic area of musical works (the geographic area from which they emanate, as distinguished from geographic areas they are about) is a problematic and under-coded attribute.

Geographic area is particularly important for music other than Western art music, and these musics have historically received the most geographic access, primarily through assignment of

Library of Congress Subject Headings.[16] However, these subject headings are problematic for facets and limits because they combine information on geographic locale and ethnic/national group, and often make use of subdivisions to create meaning. For example, the heading "Folk music -- Germany" is applied to folk music of Germans in Germany, of other national groups in Germany, and of Germans in other locales. In addition, the same subject headings used for music emanating from a geographic area are also assigned to works about the music of ethnic and national groups, with appropriate subdivisions but the same MARC field tags. For example, the heading "Music -- Uganda" is used for actual music recordings/scores. The same heading is used for a book about Ugandan music, by simply appending the subdivision "History and criticism." Furthermore, it is important that the entire subject heading be displayed and actionable as a string.

Geographic access has been considered less important for Western art music, and geographic subject headings are only assigned if geographic area is a particular focus of the manifestation. If, in the future, geographic area associated with the composer was regularly recorded (for example, in authority records, as currently allowed for in RDA; MARC 370 has been defined for this purpose), that data could be harnessed for geographic limits and facets.

A final complication of geographic access to musical works is the intellectual task of determining and prioritizing associated geographic areas, since multiple geographic areas may be associated with a piece of music including: birth, death, and residence of the composer ("art" music) or performer ("folk" music), area(s) it was intended for, area(s) it was popular, and area(s) "folk" music is associated with.

See III.K for discussion of geographic area as an expression and manifestation level attribute.

Recommendation: Geographic access to musical works is problematic. Index appropriate fields, and be careful to distinguish between work, expression, and manifestation-level attributes. For data using standardized vocabulary, make it possible for users to link from within the record display from standardized vocabulary terms to other materials associated with the same attribute/entity. This could be accomplished through use of bound texts strings for full authorized terms or via identifiers functioning behind the scenes.

Index and display (Bibliographic/Descriptive Metadata):
(note that MARC 651 is not included; this field is for topical use)
MARC: 043 Geographic Area Code (display code in vernacular) (problematic because MARC fields codes do not distinguish between "is" and "about")
MARC: 650 Subject Added Entry - Topical Term (problematic both "is" and "about" are contained in MARC 650; distinction could be made based on presence of other subdivisions)
MARC: 650 $z Subject Added Entry - Topical Term, Geographic Subdivision (problematic because MARC field tags do not distinguish between "is" and "about"; distinction could be made based on presence of other subdivisions)
Dublin Core: coverage
MODS: geographic

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[16] See in particular SHM H 1917.

EAD: geogname
CDWA Lite: locationName; subjectTerm type="geographicTerm"; culture
VRA Core: location.name

Facets/Limits (Bibliographic/Descriptive Metadata):
MARC: 043 Geographic Area Code (display code in vernacular) (problematic because MARC fields codes do not distinguish between "is" and "about")
MARC: 650 Subject Added Entry - Topical Term (problematic both "is" and "about" are contained in MARC 650; distinction could be made based on presence of other subdivisions) (also problematic because not always recorded due to subject cataloging rules)
MODS: geographic
EAD: geogname
CDWA Lite: locationName; subjectTerm type="geographicTerm"; culture
VRA Core: location.name

Related Authority Fields:
MARC: 150; 151; 370 (150 is problematic because it does not distinguish between "is" and "about")

III. Expressions and Manifestations

A. Introduction

Musical works frequently exist in many expressions and manifestations,[17] and users seek particular versions of works at the expression and manifestation levels. Users also seek versions with attributes which do not neatly align with FRBR expression or manifestation levels. For example: any vocal score, any arrangement for string quartet, any CD, or any recorded performance by soprano and piano.

A discovery interface allowing navigation through a FRBR Work-Expression-Manifestation-Item (WEMI) tree would be very helpful to music users. However, because the attributes music users seek do not always align neatly with the WEMI levels, further faceting or limiting is necessary in addition to WEMI levels, and, in the absence of a WEMI-formatted discovery interface, can serve many of music users' needs. To date, practical implementation of full FRBR concepts in discovery interfaces has been limited. One model is Indiana University's Variations/FRBR project, a testbed, including prototype catalog, for the FRBR conceptual model for music.[18]

This section will explore indexing, display, and facets/limits for important attributes of and relationships to musical expressions and manifestations. The following attributes and relationships are addressed:

B. Format: Content and Carriers

Music as a discipline depends on the use of information in different formats, including scores, sound recordings, videos, and texts. In FRBR terminology, content type (score, audio, video) is usually an expression-level attribute, while carrier type is a manifestation-level attribute. These content types, particularly recordings, exist in many different carriers, including compact disc, LP, audiocassette, videocassette, videodisc, mp3, and other formats. Users need to be able to

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[17] Here defined according to FRBR: expression: the intellectual or artistic realization of a *work*; manifestation: the physical embodiment of an *expression* of a *work*.

[18] Variations/FRBR: Variations as a Testbed for the FRBR Conceptual Model, http://www.dlib.indiana.edu/projects/vfrbr/ (accessed 4 April 2012).

find, identify, and select the form of information they need. They need facets and limits that enable selection of content types, such as sound recording or video recording, as well as selection of a specific carrier, such as audiocassette, compact disc, LP, streaming sound, DVD, etc. Therefore, systems must allow a single record to be assigned multiple content types/carriers, or for content types/carriers to be grouped together for patron interfaces. For example, an item must be able to be both a "sound recording" and a "CD." Allowing multiple content types/carriers also is important for packages with accompanying material, such as score/CD combinations. The display should facilitate easy identification of an item's content type/carrier. Icons are frequently useful for this task.

RDA content type/media type/carrier type fields could be used to create displays and search data. However, RDA carrier type "audio disc" will still be insufficient for distinguishing CDs from LPs.[19] For MARC data, Leader/06, 006/00, and 007 will generally be a better source of this information; use these codes to power searching, displays, and limits/facets for formats and subformats.

RDA's instructions for creating an authorized access point for an expression (RDA 6.27.3) indicate addition of a term indicating content type (notated music/performed music). Implementation is uncertain, but if implemented, this data might be useful for keyword searching or to create a clickable sublink of the access point string. It would be important, however, not to lose the ability to collocate all expressions of the work, regardless of content type. In addition, other coded fields and MARC 33x already provide the ability to distinguish the content type.

Recommendation: Distinguishing format is crucial for music materials. Users need to be able to distinguish both content type (score vs. audio recording vs. video recording) and particular carriers (CD, LP, cassette, etc.). Carefully evaluate the available data and the discovery system's capabilities in order to choose the best method(s) for distinguishing both content type and carrier. For MARC data, see Appendix C for detailed content and carrier mapping.

Index and Display (Bibliographic/Descriptive Metadata):
MARC: Leader/06; 006/00; 007. Use this coded data to create icons or labels indicating material type. See Appendix C for detailed content and carrier MARC mapping.
MARC: 130 $h; 240 $h; 7xx $h Medium might be used in keyword searching or as a clickable sublink of the musical work title string. Assess data for presence before implementing.
Dublin Core: format
MODS: typeOfResource, typeOfResource + form or internetMediaType
EAD: physdesc
CDWA Lite Indexing: termMaterialsTech
CDWA Lite Display: displayMaterialsTech
VRA Core: materials + measurements

Facets/Limits (Bibliographic/Descriptive Metadata):

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[19] The music library community will be developing best practices which will likely address the issue of providing an eye-readable indication of compact disc in RDA records. One proposed MARC location is 300$b. This area should be monitored for needed edits to indexes and display as best practices are implemented.

MARC: Leader/06, 006/00, 007 (Use this coded data to create facets/limits in the vernacular.) (Allow selection of both a general content type (printed music, audio recording, video recording) as well as more specific carriers (CD, LP, audio cassette, streaming audio, DVD, VHS, etc.)) (See Appendix C for detailed content and carrier MARC mapping.)
Dublin Core: format
MODS: typeOfResource; typeOfResource+form; internetMediaType
EAD: physdesc
CDWA Lite: termMaterialsTech
VRA Core: materials + measurements

Related MARC Authority Fields:
MARC: 100 $h; 130 $h (assess data for presence before implementing)

C. Identifying Numbers

Opus, thematic index, and serial numbers are associated with musical works and are discussed in II.C.

Whereas the ISBN and ISSN serve as fairly uniform standard numbers for books and serials, music materials have a wide variety of numbers associated with expressions and especially with manifestations. These numbers include ISMN, ISBN, ISRC, UPC, EAN, sound and video recording issue numbers, matrix numbers, and plate and publisher numbers.[20] Discovery systems should index and display all these associated numbers.

Plate numbers and publisher numbers are often the key to a successful search for a specific publication of a printed score. Users may seek an exact match of a score for an accompanist, teacher, conductor, or other ensemble members; users may seek a particular error or revision in a score that was printed by a specific publisher from a specific time period; catalogers may want to seek additional clues when the date of publication is not found. Much legacy data contains variations in recording plate numbers and publisher numbers.

Discovery systems often allow searches by indexed plate and publisher numbers. Systems will ideally algorithmically process letter strings, punctuation, and ranges of consecutive numbers so that these numbers can be searched, filtered, and browsed in a meaningful way.

Recommendation: Index and display all associated numbers. Utilize system algorithms to include in indexing all numbers in a consecutive range where only first and last numbers are recorded.

Index and Display (Bibliographic/Descriptive Metadata):
MARC: 020 az ISBN ($z is a canceled/invalid standard number or code; make local decision on inclusion)

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[20] ISMN: International Standard Music Number; ISRC: International Standard Recording Code; EAN: International Article Number; matrix number: used to indicate sound recording masters, often used to identify 78s.

MARC: 024 az Other Standard Identifier ($z is a canceled/invalid standard number or code; make local decision on inclusion) (use first indicator to generate display label)
MARC: 028 Publisher Number (use first indicator to general display label)
Dublin Core: identifier
MODS: identifier
EAD: unitid
CDWA Lite: possible use of inscriptions/marks
VRA Core: possible use of inscription and *refid*

Facets/Limits (Bibliographic/Descriptive Metadata):
Facets/limits by identifying number are rarely useful for expressions and manifestations; such facets/limits would only occasionally yield more than one result.

Related Authority Fields:
MARC: 020; 024 (024 is defined, but rarely used)

D. Musical Presentation

Users need to distinguish between various formats of notated music, such as full score, parts, vocal score, etc. This attribute does not apply to recorded performances of music.

Commonly used cataloging standards and metadata formats and the legacy data encoded via these standards and formats do not provide a clear and concise way to support searching and limiting/faceting by musical presentation. The information recorded under AACR2 and RDA is sufficient to allow informed users to identify the musical presentation when viewing a bibliographic record, but does not lend itself to machine manipulation for facets or limits. MARC coding for Format of Music (008/20, 006/03) is problematic, and mapping musical presentation to other metadata formats is also difficult. The most promising possibility for musical presentation facets/limits comes from free-floating subdivisions in subject headings, as discussed further below.

Under AACR2, musical presentation information is scattered throughout the descriptive areas of a bibliographic record. It may be found in: physical description (1 vocal score, 1 miniature score, 1 score + 2 parts, and so forth); musical presentation statement (however, this is a transcribed statement and as such its presence, language, and formulation is dependent on the whims of publishers); and possibly in notes, title, and statement of responsibility.

RDA eliminates the distinction between musical presentation and edition statements. Musical presentation information transcribed in MARC 254 under AACR2 will be transcribed in MARC 250 under RDA.

MARC provides the opportunity to code Format of Music in 008/20 and 006/03. On the surface, this might be used to create a facet, but it is problematic for several reasons:

- Code z (Music in other than score form) is an amalgamation of formats: works for solo instrument, popular music on two staves for piano with words printed between the staves, with or without guitar chords, and materials consisting solely of parts.
- Parts are ignored when issued with a score. The codes in MARC 008/21, 006/04 are for information regarding whether the entity in hand contains parts. However, OCLC and MLA's MARC Formats Subcommittee have recommended simply accepting the "blank" default so this data is not often coded, at least in WorldCat.
- Code m (Several types of scores are issued together). Although the codes for any one type of score allow granularity for a single score, there is no way to encode any one score included in a manifestation with multiple types of scores issued together.
- Codes h (chorus score), i (condensed score), and j (performer-conductor part) were only approved in 2009 for MARC21 and only implemented by OCLC in May 2010; definition of code d "Voice score" was also changed at this time.

Musical presentation is not easily mapped to DC, MODS, or EAD. LC's crosswalk to MODS doesn't seem to support MARC 254. Rethinking of data recording may be necessary; perhaps musical presentation could fit in physicalDescription or typeOfResource.

The most promising source of musical presentation information comes from subject, rather than descriptive cataloging, via the list of free-floating subdivisions for Written or Performed Music; Performed Version (*Subject Headings Manual* (SHM) H 1160), which provides terms such as "Parts", "Scores", "Scores and Parts", and "Vocal scores with piano" that could be exploited to provide users with facets/limits for commonly sought formats. However, these subdivisions have historically not been comprehensively applied because of restrictions in SHM H 1160 #6, so facets based on musical presentation would exclude particular kinds of music. These subdivisions and RDA extent terms are being revised for the musical works portion of the Genre/Form Thesaurus Project.[21] Preliminary recommendations call for clearly separating format terms from medium of performance. For example, the current subdivision "Vocal scores with piano" would be replaced with "Vocal scores" and the accompanying instruments listed separately in a medium facet. Such changes could make the vocabulary even more promising for musical presentation facets/limits.

Recommendation: Based on the existing situation for musical presentation, best practice is to ensure that necessary fields for identification are indexed and displayed, and to explore ways to exploit legacy data as well as to improve future data capture.

Index and display (Bibliographic/Descriptive Metadata):
MARC: 250 Edition Statement (for records created according to RDA rules)
MARC: 254 Musical Presentation Statement
MARC: 300 $a $e Physical Description; Accompanying material
MARC: 650 $v Subject Added Entry Form Subdivision
Dublin Core: type
MODS: typeOfResource, physicalDescription
EAD: function

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[21] Genre/Form Headings for Musical Works, http://www.loc.gov/catdir/cpso/genremusic.html (accessed 4 April 2012).

CDWA Lite: n/a; possible use of inscriptions or stateEdition
VRA Core: n/a; possible use of inscription + *extent* or stateEdition + *type*

Facets/Limits (Bibliographic/Descriptive Metadata):
(problematic; see discussion above)
MARC: 008/20, 006/03 Format of Music
MARC: 008/21, 006/04 Music Parts
MARC: 650 $v Free-floating subdivisions for Written or Performed Music; Performed Version
DC, MODS, EAD: musical presentation is not easily mapped to these formats.

Related MARC Authority Fields:
MARC: 150 $v; 185 $v

E. Edition

Users seek specific "editions" of notated music, meaning usually a search for a specific editor, publisher, or type of edition (critical edition, facsimile edition, Urtext edition, etc.), not (as is common with books), a search for a numbered edition statement ("2nd edition") or merely the most recent publication. Users may also scrutinize the editor, publisher, and other edition information to select a particular expression/manifestation even if they do not begin their search with a particular edition in mind. Editors frequently make substantial intellectual contributions to notated music, making the editor an important factor to users in selecting an expression. See III.J for recommendations regarding editors and other associated people and corporate bodies.

Recommendation: Many aspects of what music users mean when they talk about "edition" are addressed under other sections, including Medium of Performance (II.D, III.G), Persons/Corporate Bodies (II.G, III.J), Dates (II.F, III.I), Language (III.F), and Musical Key/Range (II.E, III.H). In addition to following recommendations in those sections, index and display fields identified below in order to provide publisher information and edition statements transcribed from the item itself.

Index and display (Bibliographic/Descriptive Metadata):
MARC: 250 Edition Statement (in RDA records, 250 will also contain Musical Presentation information)
MARC: 260 bf Publisher Information
MARC: 264 $b Name of producer, publisher, distributor, manufacturer (field newly defined Sept. 2011; implementation anticipated sometime in 2012.)
MARC: 5xx Notes (may include information about the editor and the edition, such as being a critical edition, etc.)
Dublin Core: description
MODS: edition under originInfo
EAD: revisiondesc, publisher + publicationstmt
CDWA Lite: displayEdition, possible use of sourceStateEdition
VRA Core: possible use of stateEdition with attribute *type*

Facets/Limits (Bibliographic/Descriptive Metadata):

Edition information does not readily lend itself to facets/limits. While users often seek "authoritative", "Urtext" or "scholarly" editions, this data has, historically, been neither recorded nor encoded in any standardized way. The subjective nature of these designations would make it difficult to record and encode them in the future as well.

F. Language

Three factors contribute to a heightened need to find, identify, and select music materials based on language attributes: the variety of languages used in the study and performance of music, the fact that a single manifestation often incorporates many languages, and the challenges of purely instrumental music.

First, while general users frequently focus on one or perhaps a handful of languages (i.e. languages they read/speak), seekers of musical works regularly desire a variety of languages. This is particularly true for vocal music, where users seek both original languages and specific translations.

Second, individual music materials regularly incorporate a number of languages in various distinct capacities, including program notes, critical commentaries, libretti, dubbing and subtitles. Consider which of these capacities are most valuable, particularly for facets and limits. Including all capacities will be the most comprehensive route, but can also be confusing, particularly if the function of each language is not clearly identified. In all cases, the function of the language should be clearly identified, if this information is present in the data (as it is in MARC 041).

Finally, purely instrumental music has no language information associated with the work's primary content, yet manifestations feature an array of languages in the secondary content, making indexing and display of language problematic for instrumental music. It is unclear what users think of when considering the "language" of instrumental music. They might associate it with the composer's language, the language used in the accompanying material, or the language used by the publisher of a particular manifestation. Or, knowing instrumental music does not have a "language" they may just ignore a language facet/limit. In the *MARC Code List for Languages*,[22][23] the code zxx is used to indicate "no linguistic content."[23] Code zxx could be used as a limit/facet; if so, possible display text is "no language content." Or, it could be ignored; but it should not be replaced with language of the secondary material Finally, zxx should not be confused or combined with code und ("undetermined") which is used both when the language cannot be identified and when sung or spoken text is "vocalises, humming and other texts that are wordless or consist of nonsense syllables."

Recommendation: Index and display language codes and terms, converted to vernacular when necessary. Display and allow possibility for additional limits/facets for secondary languages and indicate function of the language (e.g., subtitles, librettos/lyrics, performance instructions,

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[22] MARC Code List For Languages, http://www.loc.gov/marc/languages/ (accessed 4 April 2012).

[23] Both N/A and three blanks have previously been used to designate "No linguistic content." Although OCLC converted all instances to zxx in 2006, N/A and three blanks may still exist in other data sources. There was also no reliable way to convert incorrect codes for instrumental music coded for language of imprint.

original language). At local level, determine desired use and label of MARC language code zxx (no language content).

Index and Display (Bibliographic/Descriptive Metadata):
MARC: 041, 008/35-37 Language Code (may be better suited to facets) (If used, ideally make clear the function of the language within the item, if this info is coded in the data.[24] Consider carefully subfields of 041 to include. All subfields contain language codes except: $2 (Source of code), $6 (Linkage), and $8 (Field link and sequence number).)
MARC: 130 $l; 240 $l; 7xx $l Language information in standardized titles
MARC: 377 Associated Language (assess data for presence before implementing; defined for MARC Bibliographic Format September 2011)
MARC: 546 $a Language Notes (older data may contain language notes in 500, where it was recorded before 546 was defined)
Dublin Core: language
MODS: languageTerm
EAD: langmaterial + language
CDWA Lite: n/a
VRA Core: attribute *xml:lang*

Facets/Limits (Bibliographic/Descriptive Metadata):
Allow facets/limits by all languages, not just those in MARC 008/35-37. Ideally, allow the possibility to facet/limit by the function of the language.
Dublin Core: language
MODS: languageTerm
EAD: langmaterial + language
VRA Core: attribute *xml:lang*

Related MARC Authority Fields:
MARC: 100 $l; 130 $l; 377

G. Medium of Performance

Users may seek expressions of works with a particular medium of performance other than the original medium, i.e. arrangements. Users may also seek music for a particular medium of performance regardless of whether it is the original medium. Both AACR2 and RDA dictate use of the original medium of performance when included in standardized titles. Medium of the expression is given in both coded and textual fields; see II.D for further detail.

Recommendation: Follow indexing and display recommendations given for Medium of Performance in II.D.

H. Musical Key/Range

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[24] The facets in the video view of University of Virginia's Blacklight implementation provide an example of clearly labelled facets for different language functions. http://search.lib.virginia.edu/catalog?portal=video

Musical key and range (complete span of pitches used in the piece of music) are particularly important for vocal music, where works frequently exist in a variety of keys and ranges, but instrumental music can also exist in expressions distinguished by the key or range. Users would also benefit from the ability to search by more specific ranges, such as the exact pitches included, to match their ability and available resources. For example, some instruments like carillon or handbell choir do not have standard ranges, and vocalists' ranges are a combination of physiology and training. However, key and range information is not currently or historically recorded under AACR2 nor encoded in MARC data on any regular basis. It may be included in a note or edition statement, particularly if a statement about key or range is present on the manifestation itself.

The key in which a musical work was originally composed and its original range are work-level attributes and addressed in II.E.

Recommendation: Musical key and range are important, but because of historic data recording and encoding practices, discovery systems will not be able to do much more than provide general keyword indexing and display of the appropriate fields. More dynamic searching capabilities should be explored in the future.

Index and display (Bibliographic/Descriptive Metadata):
MARC: 250 Edition Statement
MARC: Edition information may also appear in other areas including Title (245) and various Notes (5xx)
Dublin Core: description; creative use of coverage
MODS: note type="key"
EAD: note; odd
CDWA Lite: descriptiveNote
VRA Core: description.notes; possible use of the *refid* and *extent* attribute combination

Facets/Limits (Bibliographic/Descriptive Metadata):
Coded data for range could lend itself to some sort of coded search capability, though this data has historically not been coded in MARC.
MODS: note type="key"
VRA Core: *refid*

Related MARC Authority Fields:
MARC: 031; 384

I. Dates

Like musical works, musical expressions and manifestations have many associated dates. Discovery interfaces commonly allow searching, limiting, and faceting by date, most frequently exploiting publication date, which is regularly recorded in bibliographic data in an easily machine-actionable form. However, other dates often hold equal or greater importance for music materials. Unfortunately, these dates may be buried in notes or completely absent from bibliographic data. One particular limitation for MARC is the fact that MARC 008/07-14 only

has space to record two years. Ideally, date indexing, faceting, and limiting should take into account the full spectrum of dates associated with music materials. When this is not feasible, "date" searches/limits/facets should at a minimum clearly identify the type of dates being exploited; for example, using the label "Publication Date" rather than just "Date," if only publication dates are included.

Creation date is associated with musical works and is discussed in II.F.

Performance date is an important expression-level attribute for recorded music. Users may seek particular performances, or they may use performance date to select an expression that meets their needs. Performance date is often included in bibliographic data for recordings, though it is usually buried in notes. For popular musics, chronological subdivisions are frequently added to genre headings indicating the decade of the expression.

Publication date is primarily important as an access point for manifestations of notated music. For notated music, creation date for the expression will often have to be approximated by the date of publication of the first manifestation of that expression.

Expression date is occasionally included in standardized titles. In addition, past practice was to add the manifestation date routinely to standardized titles, and this use may still be present in some legacy data.

Recommendation: Many dates are important to music materials, and because of this variety, it is easy for discovery interfaces to be misleading regarding dates. For the present, best practice is to index and display all dates, consider the dates included in the index(es), and give an appropriate label. Also creatively explore ways to tease out the different kinds of dates and present them to the user in a useful way.

Index and display (Bibliographic/Descriptive Metadata):
MARC: 008/07-10 (Date1); 008/11-14 (Date2) (consider using code in 008/06 to generate vernacular display label)
MARC: 033 Date/Time and Place of Event (display code in vernacular) (has not been regularly coded for music)
MARC: 046 kl Special Coded Dates (use codes in other subfields to generate vernacular display labels and to properly interpret dates coded in kl)
MARC: 111; 711; 811 $d Date of Meeting
MARC: 100, 110, 111; 130; 240; 700; 710; 711; 730; 800; 810; 811 $f Date of a Work (100, 110, and 111 are defined but in reality rarely used because AACR2 title main entry information is placed in 240.)
MARC: 260 $c Date of Publication/Distribution
MARC: 264 $c Date of Production, Publication, Distribution, Manufacture, or Copyright Notice (field newly defined Sept. 2011; implementation anticipated sometime in 2012)
MARC: 502 $d Dissertation Note, Year degree granted
MARC: 518 $a $d Date of Event
MARC: 534 $c Original Edition, including dates
MARC: 650 $y Chronological Subdivision

Dublin Core: date
MODS: dateCreated, dateModified and copyrightDate in dateIssued, and possibly dateOther
EAD: unitdate, date
CDWA Lite Indexing: earliestDate and latestDate + dateQualifier
CDWA Lite Display: displayCreationDate
VRA Core: date.earliestDate and date.latestDate + *type* and *extent*

Facets/Limits (Bibliographic/Descriptive Metadata):
MARC: 008/07-10; 008/11-14; 046 kl; or dates in 260 $c and 264 $c could be used to create date limits, but care should be exercised as discussed above.
Dublin Core: date
MODS: dateCreated; dateModified; copyrightDate; dateOther
EAD: unitdate
CDWA Lite: earliestDate + dateQualifier; latestDate + dateQualifier
VRA Core: date.earliestDate; date.latestDate; earliestDate + type and extent; latestDate + type and extent

Related MARC Authority Fields:
MARC: 046; 111 $d; 150 $y

J. Persons and Corporate Bodies

In addition to the composer and librettists/lyricists, who are related to musical works, many additional persons and corporate bodies contribute to music materials and hold responsibility at the expression and manifestation levels, especially the expression level. The recommendations in this section build on those in II.G. and focus on the unique requirements posed by the many different people related to expressions and manifestations. These related persons and corporate bodies include: editor, arranger, performer (both individuals and groups), producer, and director.

These persons and corporate bodies are important access points for music users for finding, identifying, and selecting their desired entity. Therefore, it is important to index and display all personal and corporate names, both transcribed forms and controlled vocabulary. If codes or terms are present in the data which designate the person/corporate body's function, these should be indexed and displayed, with codes converted to the vernacular.

Western art music generally makes a clear distinction between composer (related at the work level) and performers (related at the expression level). Many other musics do not make this sharp distinction. For discovery purposes, following the recommendations in this document will make persons and corporate names related to the work, expression, or manifestation useful for finding, identifying, and selecting music, regardless of the exact nature of the relationship.

Recommendation: Follow recommendations in II.G. Of particular importance to expressions and manifestations, if codes or terms are present designating function, these should be indexed and displayed, with codes converted into the vernacular.

Index and Display:

See recommendations in [II.G](#).

K. Geographic Area

While potentially useful, geographic area is arguably a less important attribute for expressions and manifestations than it is for musical works.

For recordings, geographic area of the expression is often included in a note; however, this is a free-text field not designed for machine manipulation. This note (which may contain other information about the recording, particularly the date) should be indexed in general keyword indexes and displayed. For scores, geographic area of the expression is a more abstract concept and infrequently contained in bibliographic data. MARC 033 is defined to record date/time and place of event, but is not regularly coded.

Geographic area of the manifestation is regularly recorded in the publication statement and, in MARC, coded in 008/15-17, providing an easily machine-actionable field for creation of facets or limits. For books published in their original language, geographic area of manifestation may be a somewhat successful approximation of geographic area of the work. For musical scores and recordings, this is not true. Care should be taken that any facets, limits, or displays created from geographic area of manifestation area clearly labeled as referring to place of publication.

Recommendation: Display notes relating to geographic area of expressions and manifestations, and include them in general keyword indexes. If place of publication is used to create facets, limits, or displays, ensure that it is clearly labeled as such.

Index and display (Bibliographic/Descriptive Metadata):
MARC: 008/15-17 Place of Publication, Production, or Execution (display code in vernacular)
MARC: 033 Date/Time and Place of an Event
MARC: 260 ae Publication, Distribution, etc. (Imprint)- Place of publication, distribution, etc.; Place of manufacture
MARC: 264 $a Production, Publication, Distribution, Manufacture, and Copyright Notice - Place of production, publication, distribution, manufacture
MARC: 518 Date/Time and Place of an Event Note
Dublin Core: coverage
MODS: geographic; originInfo.place
EAD: imprint.geogname; geogname
CDWA Lite: locationName; subjectTerm type="geographicTerm"
VRA Core: culturalContext; location.name; subject type="geographicPlace"

Facets/Limits (Bibliographic/Descriptive Metadata):
MARC: 008/15-17 Place of Publication, Production, or Execution (display code in vernacular)
Dublin Core: coverage
MODS: geographic
EAD: geogname
CDWA Lite: locationName; subjectTerm type="geographicTerm"
VRA Core: culturalContext; location.name; subject type="geographicPlace"

IV. Other Aspects of Music Discovery

A. Introduction

Several issues related to music discovery do not focus on particular attributes or relationships. The following areas are discussed in this section. For the topics in this section, indexing recommendations are not relevant and therefore are omitted.

B. Authority Records

For music materials, authority records are essential to back end functions like cataloging. In addition, they are also extremely important for public interfaces in that they provide valuable cross-references and other information to users.

Creators—whether composers, lyricists, librettists, or even corporate bodies—are important access points for music. So too are associated contributors such as performers, arrangers, and editors. Because a single creator or contributor might be known by more than one name, a method should be provided to lead users from alternate names to the forms they seek.

Musical works also present a challenge. For instance, a work might be associated with more than one creator (as in the case of works previously attributed to another), or it might be known by different titles (possibly in different languages) or multiple work numbers. Outside of cataloging codes the choice of a title's language, elements, and grammatical construction is far from consistent. Therefore, users may begin a search with any one of many possible titles for a known musical work, and discovery interfaces should provide a method to find the musical work even if the user starts with one of these alternate titles. The same is true for expressions and manifestations, which might be issued with new titles or differ from the original work in medium of performance or key, as is often the case with arrangements. Similarly, topical subjects or musical genres can also be represented by varying terminology.

Historically, leading the user from alternate terms to the preferred one was accomplished by "see" and "see also" references (MARC 4xx and 5xx authority record fields) in author, title or subject browse lists. Unfortunately, keyword searching has mostly ignored "see" and "see also" data. Mere spell check features will not solve this problem, though they are potentially helpful. Auto-complete or "did you mean" features are useful, particularly when based on database contents or rich, authoritative sources of alternate name and title data such as the Library of Congress/NACO Authority File (LC/NAF) or the Virtual International Authority File (VIAF).[25]

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[25] See, for example: Demian Katz, Ralph LeVan, and Ya'aqov Ziso, "Using Authority Data in VuFind," *Code4Lib Journal* 14 (July 25, 2011), http://journal.code4lib.org/articles/5354 (accessed 4 April 2012).

More recently, the MARC authority format has expanded to include 7xx fields for equivalent access points found in different thesauri or authority files. The use of linked data, which relies on an identifier rather than a text string, has made possible initiatives like the VIAF; when employed in a search interface, linked data could provide a seamless experience where patrons enter search terms in their preferred language, script, or form and retrieve the desired results automatically.[26] Future systems could allow the library to choose which heading string to display to its patrons, even if it is a "see" reference. For example, a library might choose to display all titles in the local language rather than the composer's original language. Future systems might also allow the library to manipulate various elements which identify the work in other ways to help the user identify or select the desired work, such as producing a list of a composer's oeuvre organized by opus number.

Finally, authority records contain a wealth of other information that potentially could be used for display, pre-search limiting, or post-search facets. Such information includes the MARC 680 public "scope" note, the MARC 043-046 fields for geographic and temporal information, the MARC 336 and 37x notes for content type, associated place, occupation, gender, language, etc., and, specifically for music, the MARC 380, 382, 383, and 384 fields for form of work, medium of performance, numeric designation, and key. Current authority records are very similar to work records in a FRBRized environment; in the future, many important attributes (see the entirety of Section II. Musical Works) will ideally be placed in work records rather than bibliographic records, making indexing and display of work or "authority" data absolutely crucial to music information retrieval.

Recommendation: At a *minimum*, in back end functions discovery systems should be able to index MARC 1xx, 4xx, 5xx, and other desired fields and also to display all fields in the authority record. For public interfaces, browse indexes should display 4xx and 5xx cross-references and public notes such as the 680. Associated name and title strings must be kept together for both indexing and display.

Ideally, as discovery systems evolve, they should be able to index and display cross-references in keyword indexes and allow linking or display of alternate data. They should leverage authority information to provide autosuggestions, context-sensitive recommendations, or other functionality. Additionally, they should be able to make use of extended authority fields for display or faceting. All options should be customizable by individual libraries.

As authority records morph into work records, indexing and displaying the data they contain will become even more crucial.

For data using standardized vocabulary, make it possible for users to link from within the record display from standardized vocabulary terms to other materials associated with the same attribute/entity. This could be accomplished through use of bound texts strings for full authorized terms or via identifiers functioning behind the scenes.

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[26] The Library of Congress has made available as linked data many of its thesauri—including LCSH and the Genre/Form Terms—on its Authorities and Vocabularies web site, http://id.loc.gov/ (accessed 4 April 2012).

C. Compilations

Multiple expressions are frequently issued together in a single manifestation, sometimes called an aggregate.[27] This is particularly common for recordings, which often contain expressions of more than one musical work, each of which might be by a different composer, for a different medium, of a different genre, performed by different performers, or based on different works. It also occurs with notated music, e.g. song anthologies or collections of all or some works by a single composer. Under most past and current descriptive and encoding standards, the relationships in multi-expression manifestations a) between works; and b) between works/expressions and their performers, medium of performance, or format of notated music are often recorded in notes designed for human interpretation but are not linked together in a manner friendly to machine processing.

In future data creation, this problem could be solved by creating WEMI record trees and/or by utilizing linking fields (such as MARC $8, which could solve this problem but has not in reality been implemented for this purpose). However, because of the lack of linking information, this problem cannot easily be solved by discovery interfaces utilizing legacy data from MARC and AACR2. The Variations/FRBR project opted in favor of recall over precision and mapped data elements in a bibliographic record to all works/expressions on a manifestation, given the absence of machine-readable information regarding which work/expression the data element applied to.[28] The result is that, for example, all performers and subject headings are associated with all works/expressions contained on a recording.

Recommendation: Be aware of and explore solutions to the special challenges posed by the frequency with which compilations occur for music materials, particularly that legacy data rarely links together all the attributes of the various expressions contained in a compilation in a manner friendly to machine processing.

D. Searching: Alphabetical and Keyword

Historically, alphabetically filed "browse" listings have been indispensable in library information retrieval, beginning with the card catalog, and continuing in "traditional" OPACs. OPACs introduced the additional functionality of keyword searching. "Next-generation" catalogs added faceted browsing, but many simultaneously ceased to provide alphabetical browse searching.

Alphabetical listings have been particularly important to music librarianship. "Known-item" queries are more common in music searching than in general searching; this is true of both "classical" and "popular" music.[29] However, users do not always "know" a lot about the entity

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[27] "Aggregate" may be defined as "a manifestation embodying multiple distinct expressions" and may represent a collection based on genres or performers, or may be an apparently "random collection of expressions." Working Group on Aggregates, "Final Report of the Working Group on Aggregates" (2011), 3. http://www.ifla.org/files/cataloguing/frbrrg/AggregatesFinalReport.pdf (accessed 4 April 2012).

[28] Jenn Riley, "Leveraging the FRBR Data Model for Music Discovery and Data Sharing: Autobiographical Note," *OCLC Systems and Services* 27, no. 3 (2011): 186.

[29] Beth Christensen, Mary Dumont, and Alan Green, "Taking Note: Assessing the Performance of Reference Service in Academic Music Libraries: A Progress Report," *Notes* 58, no. 1 (September 2001): 52. Jin Ha Lee,

they are seeking. Title is a notoriously unreliable access point, especially for Western art music. "Subject" is a problematic concept; music subject headings often reflect non-subject attributes such as form, genre, and instrumentation. Perhaps because of these difficulties, personal names are frequently used as an access point in music searching.[30] However, many composers are very prolific, and their works exist in many versions, making personal name alone an insufficiently precise access point.

Author, title, and subject, are, alone, insufficient access points for music. This deficiency led to extensive development of uniform titles (especially generic uniform titles) and subject headings (which in reality reflected true "aboutness" only occasionally) to provide access to music materials based on attributes beyond author, title, and subject. When organized into alphabetical lists, they made it possible for informed users to reliably find and browse musical works. Alphabetical lists facilitated browsing in this complex system because users were not required to determine and input keywords to begin a search. A significant weakness of most current keyword searching is that it does not take advantage of alternate forms found in LC/NAF authority records. These alternate forms are indispensable in music searching, given the vagueness of even "known-item" queries. It is extremely difficult for untrained users to predict the vocabulary that will be used in uniform titles and subject headings, and current systems rarely provide much guidance. See IV.B for further discussion of authority records and keyword searching.

Recommendation: Consider carefully the options for alphabetical and keyword searching. Current keyword searching has significant deficiencies for music. However, the needs which have historically been met through alphabetical listings might be met through other means, particularly faceted browsing based on attributes important to music. Recommendations have been given throughout the document. Alphabetical searching has particular value for librarians and staff, and should be retained in back-end interfaces even if it is eliminated from public interfaces.

E. Enhancements: Third-Party Content

The ability to incorporate third-party content is an important enhancement to discovery systems. Existing data from vendors, publishers, and other content providers can be leveraged to increase the information available in and through a discovery system.

Content from outside a bibliographic database can be either linked or incorporated. Links to external content have been included in traditional MARC bibliographic records for some time: URLs pointing to digitized versions of tangible resources, movie reviews, tables of contents, program notes, or finding aids.

"Analysis of User Needs and Information Features in Natural Language Queries Seeking Music Information," *Journal of the American Society for Information Science and Technology*, 61, no. 5 (2010): 1037.

[30] David M. King, "Catalog User Search Strategies in Finding Music Materials," *Music Reference Services Quarterly* 9, no.4 (2007): 17.

Incorporated content may come from any number of sources and can include cover art, reviews, summaries, previews of initial/selected pages, or other content. In some cases content may be purchased from a vendor such as Syndetic Solutions. External content can also be incorporated from sources that gather content, provide content directly, or sell products, such as LibraryThing, Open Library, AllMusic.com, Amazon.com, iTunes, Wikipedia, IMDb, or Google Books; additional enhancements may be in the form of user-contributed tags or reviews. Looking to the future, it may be possible to incorporate audio or video clips, and systems that are able to take advantage of such a service provide music users with a greatly increased capability to determine if the item in question suits their needs.

For music formats, particularly scores, it may be difficult to incorporate content for a number of reasons: information may not be available online; in some cases the only available information may be a short description from a publisher or vendor, with no cover image available; reviews may only be published in subscription-only journals; and there may not be a way to make a reliable match to third-party content. For scores, initial pages of music will be much more useful than the cover to help users identify the work and evaluate whether it meets their needs as to style, difficulty level, and similar considerations. Even when content is available, a service that uses only ISBNs to extract content will not function for items that do not have an ISBN, as is often the case with scores and sound recordings. Creating match points on standard numbers in addition to ISBNs, such as publisher numbers, recording issue numbers, or ISRCs would allow for enrichment of records for music formats in cases where data is available.

Most importantly, third-party content must enhance, not replace, existing data. This is a risk when categories are duplicated across data sources but the data is different. Sound recordings are particularly at risk with the various versions of genres and "contents" that may exist across data sources. For a given item, cataloger-supplied contents notes and CD track listings are very different (tracks may simply be identified as "Allegro"), titles and track listings may vary in clarity greatly depending on source of the data, and specific functions of composers, performers, or other contributors with different functions may not be reliably identified (for example, there may be a single column labeled "performer/composer" containing only a single name without explanation). This information should not necessarily be blocked from catalog records--in some cases third-party data may be the only source of contents, or provide additional information of interest to users--but it must not replace cataloger-supplied notes. Furthermore, identifying the sources of data may reduce confusion where fields are duplicated.

Recommendation: Display and maintain links within bibliographic records, with ability to suppress links to inaccessible material such as subscription-only access an institution does not hold. Allow local customization and interoperability with providers of third-party content to incorporate elements not present in or linked from bibliographic records. Ensure that match points are reliable. Identify third-party content with its source, either by category (Source A genre; Source B genre) or by source (Source A: genre, contents, etc.). Do not hide or replace content in bibliographic records.

F. Music-Specific Interface/View

As discussed throughout this document, music materials posses many attributes that are unique or uniquely important. In addition, while in the bibliographic universe as a whole, the norm is for each work to be realized by only one expression realized by one manifestation, for musical works, multiple expressions and manifestations are the norm. Because of these factors, it is worth considering whether a discovery tool should have a music-specific view that highlights these particular attributes and relationships, employing facets, limits, and displays that aid in the finding, identification, and selection of music materials. A separate music interface could be particularly beneficial for tools designed to discover collections containing large amounts of music. However, other factors should be considered, particularly the time and effort needed to maintain a separate interface/view. In addition, if an alternate interface/view is created, the general interface should be designed to lead users seeking music materials intuitively to the alternate interface/view. Recommendations given throughout this document can be implemented in both general and music-specific interfaces/views.

Recommendation: Consider the pros and cons of a music specific interface or view in any discovery tool implementation.

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Appendixes

The first two spreadsheets compile the indexing, display, and facet/limit recommendations in the document. The third spreadsheet details recommended MARC bibliographic mapping and display terms for content and carrier for printed music, audio, and video.

The spreadsheets should be used in conjunction with the full document, particularly because in some cases multiple options are given for addressing discovery needs, and the extended discussion is contained in the document proper. The spreadsheets are not exhaustive mapping documents; their scope is the same as the document: areas which are music-specific or particularly important for music.

A. Compiled Details of Indexing and Display Requirements (Bibliographic/Descriptive): Index Focused (spreadsheet)
B. Compiled Details of Indexing and Display Requirements (Bibliographic/Descriptive): Tag Focused version (spreadsheet)
C. MARC Bibliographic Record Mapping for Content and Carrier (spreadsheet)