bibliotek-o Identifiers Pattern

NOTE: the following represents the direction taken by the LD4L Labs and LD4P Ontology Group in the development of bibliotek-o and may not be fully formed. This pattern document was used internally to define a direction and is shared with the intention of contextualizing a pattern found within the ontology; terms specified below may not fully align to the ontology as published. Further, discussion of BIBFRAME 2.0 may be out-of-date.

2016 December

Open Questions for LC

No remaining open questions.

Requests for Modifications to BF2

Open Requests

No remaining open requests.

Resolved requests

Approved

LC has agreed to the following requests:

- **Resource-to-identifier relationships**
  - Define object property bf:identifies as inverse of bf:identifiedBy.
  - Eliminate bf:barcode and use bf:identifiedBy with a bf:Barcode object.

- **Define the following new Identifier types with the definitions shown:**
  - bf:AudioTake: Identifier assigned to the smallest identifiable unit of a recording session, e.g., a specific recording of an individual song.
  - bf:Gtin14Number: 14-digit number assigned to identify trade items at various packaging levels.
  - bf:MusicAvDistributorIdentifier: Identifier appearing on a resource assigned by a distributor to a specific audio recording, publication of notated music, other music-related resource, or video recording.
  - bf:VideoGamePlatformIdentifier: Identifier assigned to a video game platform, e.g., CUSA 54321 (a PlayStation 4 number).

- **Modify the definitions of the following Identifier types as shown:**
bf:MusicPlate: Identifier assigned by a music publisher or printer to the printing plates for the notated portion of a notated music publication, or an identifier that emulates the printing plate tradition in contemporary publications.

bf:MusicPublisherNumber: Identifier assigned to a notated music publication other than an issue, matrix, or plate number.

bf:MatrixNumber: Matrix identifier assigned to the master from which a specific sound recording was pressed.

bf:IssueNumber: Identifier assigned by a publisher of an audio recording to identify the issue designation or serial identification.

- Name change:
  - Change bf:IssueNumber to bf:AudiobookIssueNumber.
  - Change bf:VideorecordingNumber to bf:VideoRecordingNumber.

Rejected

LC has not agreed to the following requests. LD4L will take the specified action.

- Identifier status
  - Define owl:NamedIndividuals (i.e., a controlled vocabulary) of type bf:Status within the id.loc.gov namespace.
    - Full set of individuals TBD, but should include:
      - current
      - deprecated
      - invalid
      - cancelled (02X $z)
  - LC has declined to define these individuals in the id.loc.gov namespace. BIBLIOTEK-O will define these NamedIndividuals in its namespace. This allows for the use of other individuals with an rdf:value rather than one of the NamedIndividuals.

- Identifier source
  - Remove the specified range of bf:source (bf:Source) so that any resource may serve as its object. (Also requested in the Titles recommendation).
  - LD4L will define bib:hasSource and bib:isSourceOf, domain and range unspecified.

- Resource-to-identifier relationships
  - Eliminate bf:ShelfMark and use bf:identifiedBy with a bf:ShelfMark (or subclass) object. (Request not yet made.)

Recommended for Review by Other Groups

The following identifiers are recommended for review by LD4P Ontology Extension groups.
- Performed Music Ontology Extension
  - bf:ismn
  - bf:issueNumber
  - bf:iswc
  - bf:matrixNumber
  - bf:musicPlate
  - bf:musicPublisherNumber
- RareMat Ontology Extension
  - bf:fingerprint
  - Canonical bibliographies
- MovingImage Extension
  - bf:videorecordingNumber

The following identifiers are recommended for review by the Serials community:
- bf:issn
- bf:issnL
- bf:sici

BF2 Identifier Model

See details in the [LC BF2 Identifiers Specification](#).

Diagram 1. Identifier in BF2 namespace

Diagram 2. Identifier in external namespace
BF2 Resource-to-Identifier Relationships

bf:barcode (object property)
- **Label**: Barcode
- **URI**: [http://id.loc.gov/ontologies/bibframe/barcode](http://id.loc.gov/ontologies/bibframe/barcode)
- **Definition**: Optical machine-readable representation of data relating to the item, to which it is attached.
- **Domain**: bf:Item
- **Range**: bf:Barcode (subclass of bf:Identifier)

bf:identifiedBy (object property)
- **Label**: Identifier
- **URI**: [http://id.loc.gov/ontologies/bibframe/identifiedBy](http://id.loc.gov/ontologies/bibframe/identifiedBy)
- **Definition**: Character string associated with a resource that serves to differentiate that resource from other resources, i.e., that uniquely identifies an entity.
- **Comment**: Used with Unspecified
- **Domain**: unspecified
- **Range**: bf:Identifier

bf:shelfMark (object property)
- **Label**: Shelf mark
URI: http://id.loc.gov/ontologies/bibframe/shelfMark
Definition: Piece identifier, such as a call or other type of number.
Domain: bf:Item
Range: bf:ShelfMark (subclass of bf:Identifier)

BF2 Identifier Class Hierarchy

bf:Identifier
Label: Identifier
URI: http://id.loc.gov/ontologies/bibframe/Identifier
Definition: "Token or name that is associated with a resource, such as a URI or an ISBN."
Subclass of: rdfs:Resource

Subclasses of bf:Identifier

bf:Ansi
Label: ANSI number
URI: http://id.loc.gov/ontologies/bibframe/Ansi
Definition: American National Standards Institute identifier.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

```turtle
:inst1 a bf:Instance ;
   bf:identifiedBy
      [ a bf:Ansi ;
         rdf:value "ANSI_ID" ] .
```

bf:Barcode
Label: Barcode
URI: http://id.loc.gov/ontologies/bibframe/Barcode
Definition: Optical machine-readable representation of data relating to the item to which it is attached.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

```turtle
:inst1 a bf:Instance ;
   bf:hasItem :item1 ;

:item1 a bf:Item ;
   # LC has agreed to remove bf:barcode and use bf:identifiedBy instead.
   bf:barcode
      [ a bf:Barcode ;
         rdf:value "0 360029145 2" .
```
bf:Coden
Label: CODEN
URI: http://id.loc.gov/ontologies/bibframe/Coden
Definition: "Identifier for scientific and technical periodical titles assigned by the International CODEN Section of Chemical Abstracts Service."
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier
Last Updated: 2016-04-21 (New)

```
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a  bf:Coden ;
      rdf:value  "NATUAS"] .
```

bf:CopyrightNumber
Label: Copyright-legal deposit number
URI: http://id.loc.gov/ontologies/bibframe/CopyrightNumber
Definition: "Identifier assigned to a copyright registration or legal deposit."
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier
Last Updated: 2016-04-21 (New)

```
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a  bf:CopyrightNumber ;
      rdf:value  "PA0000217251"] .
```

bf:DissertationIdentifier
Label: Dissertation Identifier
URI: http://id.loc.gov/ontologies/bibframe/DissertationIdentifier
Definition: "Identifier assigned to a thesis or dissertation for identification purposes."
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier
Used with: bf:Dissertation
Last Updated: 2016-04-21 (New)

```
:work1 a bf:Work ;
  bf:dissertation  _:dissertation1 ;
  owl:sameAs http://dx.doi.org/10.5860/lrts.60n3.140 .

_:dissertation1 a bf:Dissertation ;
  bf:identifiedBy
    [a bf:DissertationIdentifier ;
      ...] .
```
bf:Doi

Label: DOI
URI: http://id.loc.gov/ontologies/bibframe/Doi
Definition: Digital Object Identifier.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

:work1 a bf:Work ;
  bf:dissertation _:dissertation1 ;
  owl:sameAs http://dx.doi.org/10.5860/lrts.60n3.140 .

_:dissertation1 a bf:Dissertation ;
  bf:identifiedBy
    [a  bf:Doi ;
     rdf:value "dissID1"] .

bf:Ean

Label: EAN
URI: http://id.loc.gov/ontologies/bibframe/Ean
Definition: "International Article Identifier."
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

:inst1 a bf:Instance ;
  bf:identifiedBy
    [a  bf:Ean ;
     rdf:value "4006381333931"] .

bf:Fingerprint

Label: Fingerprint identifier
URI: http://id.loc.gov/ontologies/bibframe/Fingerprint
Definition: "Identifier that is used to assist in the identification of antiquarian books by recording information comprising groups of characters taken from specified positions on specified pages of the book."
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

bf:Hdl

Label: Handle
URI: http://id.loc.gov/ontologies/bibframe/Hdl
Definition: "Unique and persistent identifier for digital objects developed by the Corporation for National Research Initiatives."
**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

**Last Updated:** 2016-04-21 (New)

```turtle
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Hdl ;
      rdf:value http://hdl.handle.net/4263537/5041] ;
```

**bf:isan**

**Label:** ISAN

**URI:** [http://id.loc.gov/ontologies/bibframe/Isan](http://id.loc.gov/ontologies/bibframe/Isan)

**Definition:** International Standard Audiovisual Number.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

```turtle
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Isan ;
      rdf:value "0000-0000-3A8D-0000-Z-0000-0000-6"] .
```

**bf:isbn**

**Label:** ISBN

**URI:** [http://id.loc.gov/ontologies/bibframe/Isbn](http://id.loc.gov/ontologies/bibframe/Isbn)

**Definition:** International Standard Book Number.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

```turtle
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Isbn ;
      rdf:value "0912700513" ] ;
    [a bf:Isbn ;
      rdf:value "0912700947" ] .
```

**bf:ismn**

**Label:** ISMN

**URI:** [http://id.loc.gov/ontologies/bibframe/Ismn](http://id.loc.gov/ontologies/bibframe/Ismn)

**Definition:** International Standard Music Number.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Isrn ;
     rdf:value "0028-0836"] .

bf:lsrn

Label: ISRN
URI: http://id.loc.gov/ontologies/bibframe/Isrn
Definition: International Standard Recording Number.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Rsmsn ;
     rdf:value "0028-0836"] .
URI: http://id.loc.gov/ontologies/bibframe/issnL
Definition: International Standard Serial Number that links together various media versions of a continuing resource.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

```web-ontology
:inst1 a bf:Instance ;
  bf:identifiedBy
    [ a bf:IssnL ;
      rdf:value "ISSNLXXXXX"] .
```

bf:IssueNumber
Label: Audio issue number
URI: http://id.loc.gov/ontologies/bibframe/IssueNumber
Definition: Number used to identify the issue designation, or serial identification, assigned by a publisher to a sound recording.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

```web-ontology
:inst1 a bf:Instance ;
  bf:identifiedBy
    [ a bf:IssueNumber ;
      rdf:value "No. 1"] .
```

bf:Istc
Label: ISTC
URI: http://id.loc.gov/ontologies/bibframe/Istc
Definition: International Standard Text Code, a numbering system developed to enable the unique identification of textual works.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

```web-ontology
:inst1 a bf:Instance ;
  bf:identifiedBy
    [ a bf:Istc ;
      rdf:value "A02-2009-000004BE-A"] .
```

bf:Iswc
Label: ISWC
URI: http://id.loc.gov/ontologies/bibframe/Iswc
Definition: International Standard Musical Work Code, a unique, persistent reference number for the identification of musical works.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier
bf:Lccn

**Label:** LCCN  
**URI:** http://id.loc.gov/ontologies/bibframe/Lccn  
**Definition:** Library of Congress Control Number that identifies a resource description.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier

bf:LcOverseasAcq

**Label:** LC acquisition program  
**URI:** http://id.loc.gov/ontologies/bibframe/LcOverseasAcq  
**Definition:** Identification number assigned by the Library of Congress to works acquired through one of its collaborative overseas acquisition programs.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier

bf:Local

**Label:** Local identifier  
**URI:** http://id.loc.gov/ontologies/bibframe/Local  
**Definition:** Identifier established locally and not a standard number.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier
bf:MatrixNumber

**Label:** Audio matrix number  
**URI:** http://id.loc.gov/ontologies/bibframe/MatrixNumber  
**Definition:** Matrix number from the master from which a specific sound recording was pressed.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier

```plaintext
:inst1 a bf:Instance ;
   bf:identifiedBy
      [a bf:MatrixNumber ;
       rdf:value "ABC123XYZ890"].
```

bf:MusicPlate

**Label:** Music plate number  
**URI:** http://id.loc.gov/ontologies/bibframe/MusicPlate  
**Definition:** Number assigned by a music publisher to a specific music publication.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier

```plaintext
:inst1 a bf:Instance ;
   bf:identifiedBy
      [a bf:MusicPlate ;
```

bf:MusicPublisherNumber

**Label:** Music publisher number  
**URI:** http://id.loc.gov/ontologies/bibframe/MusicPublisherNumber  
**Definition:** Number assigned to a notated music publication other than a matrix or plate number.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier

```plaintext
:inst1 a bf:Instance ;
   bf:identifiedBy
      [a bf:MusicPublisherNumber ;
       rdf:value "2012564395"] .
```

bf:Nbn

**Label:** NBD  
**URI:** http://id.loc.gov/ontologies/bibframe/Nbd  
**Definition:** National Bibliography Number that identifies a resource description.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier
bf:PostalRegistration

Label: Postal registration number
URI: http://id.loc.gov/ontologies/bibframe/PostalRegistration
Definition: Number assigned to a publication for which the specified postal service permits the use of a special mailing class privilege.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

bf:PublisherNumber

Label: Other publisher number
URI: http://id.loc.gov/ontologies/bibframe/PublisherNumber
Definition: Number assigned by a publisher that is not one of the specific defined types.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

bf:ReportNumber

Label: Technical report number
URI: http://id.loc.gov/ontologies/bibframe/ReportNumber
Definition: Identification number of a technical report that is not a Standard Technical Report Number.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier
bf:ShelfMark

**Label:** Shelf location  
**URI:** http://id.loc.gov/ontologies/bibframe/ShelfMark  
**Definition:** Piece/item identifier, such as a call or other type of number.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier  
**Subclassed as:**
- http://id.loc.gov/ontologies/bibframe/ShelfMarkDdc  
- http://id.loc.gov/ontologies/bibframe/ShelfMarkLcc  
- http://id.loc.gov/ontologies/bibframe/ShelfMarkUdc  
- http://id.loc.gov/ontologies/bibframe/ShelfMarkNlm

```ruby
:inst1 a bf:Instance ;
  bf:hasItem :item1 ;

:item1 a bf:Item ;
  bf:shelfMark [  
    a bf:ShelfMark ;
    rdf:value "B48"
  ] .
```

bf:ShelfMarkDdc

**Label:** Shelf location  
**URI:** http://id.loc.gov/ontologies/bibframe/ShelfMarkDdc  
**Definition:** Shelf mark based on Dewey Decimal Classification  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/ShelfMark

bf:ShelfMarkLcc

**Label:** Shelf location  
**URI:** http://id.loc.gov/ontologies/bibframe/ShelfMarkLcc  
**Definition:** Shelf mark based on Library of Congress Classification  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/ShelfMark

bf:ShelfMarkNlm

**Label:** Shelf location  
**URI:** http://id.loc.gov/ontologies/bibframe/ShelfMarkNlm  
**Definition:** Shelf mark based on Universal Decimal Classification  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/ShelfMark

bf:ShelfMarkUdc

**Label:** Shelf location  
**URI:** http://id.loc.gov/ontologies/bibframe/ShelfMarkUdc  
**Definition:** Piece/item identifier, such as a call or other type of number.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/ShelfMark
**bf:Sici**

**Label**: SICI

**URI**: http://id.loc.gov/ontologies/bibframe/Sici

**Definition**: Serial Item and Contribution Identifier.

**Subclass of**: http://id.loc.gov/ontologies/bibframe/Identifier

```reason
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Sici ;
      rdf:value   "0002-8231(199412)45:10<737:TIODIM>2.3.TX;2-M"] .
```

**bf:StockNumber**

**Label**: Stock number

**URI**: http://id.loc.gov/ontologies/bibframe/StockNumber

**Definition**: Identification number used for stock purposes and assigned by agencies such as distributors, publishers, or vendors.

**Subclass of**: http://id.loc.gov/ontologies/bibframe/Identifier

```reason
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:StockNumber ;
      rdf:value   "Stock Number 12345"] .
```

**bf:Strn**

**Label**: STRN

**URI**: http://id.loc.gov/ontologies/bibframe/Strn

**Definition**: Standard Technical Report Number.

**Subclass of**: http://id.loc.gov/ontologies/bibframe/Identifier

```reason
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Strn ;
      rdf:value   "MPC-386" ;
      bf:status   "Canceled"
    ] .
```

**bf:StudyNumber**

**Label**: Study number
**URI**: http://id.loc.gov/ontologies/bibframe/StudyNumber  
**Definition**: Identification number for a computer data file.  
**Subclass of**: http://id.loc.gov/ontologies/bibframe/Identifier

```sparql
:inst1 a bf:Instance ;
  bf:identifiedBy
    [ a bf:StudyNumber ;
      rdf:value   "CNRS 84115"
      bf:source http://www.cnrs.com
    ] .
```

**bf:Upc**  
**Label**: UPC  
**URI**: http://id.loc.gov/ontologies/bibframe/Upc  
**Definition**: Universal Product Code.  
**Subclass of**: http://id.loc.gov/ontologies/bibframe/Identifier

```sparql
:inst1 a bf:Instance ;
  bf:identifiedBy
    [ a bf:Upc ;
      rdf:value   "042100005264"
    ] .
```

**bf:Urn**  
**Label**: URN  
**URI**: http://id.loc.gov/ontologies/bibframe/Urn  
**Definition**: Uniform Resource Number.  
**Subclass of**: http://id.loc.gov/ontologies/bibframe/Identifier

```sparql
:inst1 a bf:Instance ;
  bf:identifiedBy
    [ a bf:Urn;
      rdf:value   "urn:isbn:0451450523"
    ] .
```

**bf:VideorecordingNumber**  
**Label**: Videorecording number  
**URI**: http://id.loc.gov/ontologies/bibframe/VideorecordingNumber  
**Definition**: Number assigned by a publisher to a videorecording.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

```
:inst1 a bf:Instance;
   bf:identifiedBy
     [ a bf:VideorecordingNumber;
       rdf:value "aVM5108"
     ].
```

BF2 Identifier Source

bf:source (object property)

Label: Source
URI: http://id.loc.gov/ontologies/bibframe/source
Definition: Resource from which value or label came or was derived, such as the formal source/scheme from which a classification number is taken or derived, list from which an agent name is taken or derived, source within which an identifier is unique.
Comment: Used with Unspecified. The expected value is bf:Source.
Domain: unspecified
Range: unspecified

bf:Source

Label: Source
URI: http://id.loc.gov/ontologies/bibframe/Source
Definition: Resource from which value or label came or was derived.

BF2 Identifier Value

rdf:value (property)

Label: value
URI: http://www.w3.org/1999/02/22-rdf-syntax-ns#
Definition: Idiomatic property used for structured values

bibliotek-o Identifier Model

NOTE: The bibliotek-o is presented with the recommended BF2 terms, according to the modifications requested above. Those terms that are not adopted by BF2 will be defined in the BIBLIOTEK-O namespace, with corresponding revisions made to this document.
The following diagram provides an overview of the model. It does not differ from the BF2 representation of the same data, but is provided to illustrate the overall model and the use of owl:sameAs vs. bf:identifiedBy.

Diagram 4. Instance with Identifier and sameAs.

Identifiers and owl:sameAs

There is a relationship between bf:identifiedBy and owl:sameAs assertions. The following example shows the relationship of a Work to both a URI and non-URI identifier of the Work (from Rob Sanderson’s Analysis of BF1). Because generally catalogs will require a local URI for bf:Works and other local resources in order to make local assertions, the local URI is not simply replaced with http://dx.doi.org/10.1007/study-1345b.

```
:work1 a bf:Work ;
  bf:identifiedBy [ a bf:Doi ;
    rdf:value "1345b" ] ;
  owl:sameAs <http://dx.doi.org/10.1007/study-1345b> .
```
bibliotek-o Resource-to-Identifier Relationships

**bf:identifiedBy** *(object property)*

- **Label:** Identifier
- **URI:** [http://id.loc.gov/ontologies/bibframe/identifiedBy](http://id.loc.gov/ontologies/bibframe/identifiedBy)
- **Definition:** Character string associated with a resource that serves to differentiate that resource from other resources, i.e., that uniquely identifies an entity.
- **Comment:** Used with Unspecified
- **Domain:** unspecified
- **Range:** bf:Identifier
- **Inverse:** [http://id.loc.gov/ontologies/bibframe/identifies](http://id.loc.gov/ontologies/bibframe/identifies)

**bf:identifies** *(object property)*

- **Label:** identifies
- **URI:** [http://id.loc.gov/ontologies/bibframe/identifies](http://id.loc.gov/ontologies/bibframe/identifies)
- **Definition:** Resource that this character string serves to differentiate that resource from other resources, i.e., that uniquely identifies an entity.
- **Domain:** bf:Identifier
- **Range:** unspecified
- **Inverse:** [http://id.loc.gov/ontologies/bibframe/identifiedBy](http://id.loc.gov/ontologies/bibframe/identifiedBy)

bibliotek-o Identifier Class Hierarchy

**bf:Identifier**

- **Label:** Identifier
- **URI:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)
- **Definition:** Token or name that is associated with a resource, such as a URI or an ISBN.
- **Comment:** Used with Unspecified

**Subclasses of bf:Identifier**

The vast majority of these are the same as BF2. They are included here to clarify points of departure in bibliotek-o, including the RDF samples. **Differences are highlighted in yellow.**

**bf:Ansi**

- **Label:** ANSI number
- **URI:** [http://id.loc.gov/ontologies/bibframe/Ansi](http://id.loc.gov/ontologies/bibframe/Ansi)
- **Definition:** American National Standards Institute identifier.
- **Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)
bf:Barcode

Label: Barcode

URI: http://id.loc.gov/ontologies/bibframe/Barcode

Definition: Optical machine-readable representation of data relating to the item to which it is attached.

Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

bf:Coden

Label: CODEN

URI: http://id.loc.gov/ontologies/bibframe/Coden

Definition: "Identifier for scientific and technical periodical titles assigned by the International CODEN Section of Chemical Abstracts Service."

Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Last Updated: 2016-04-21 (New)

bf:CopyrightNumber

Label: Copyright-legal deposit number

URI: http://id.loc.gov/ontologies/bibframe/CopyrightNumber

Definition: "Identifier assigned to a copyright registration or legal deposit."

Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Last Updated: 2016-04-21 (New)
bf:DissertationIdentifier

Label: Dissertation Identifier
URI: http://id.loc.gov/ontologies/bibframe/DissertationIdentifier
Definition: "Identifier assigned to a thesis or dissertation for identification purposes .".
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier
Used with: bf:Dissertation

Using BF2 model for now; will revisit as part of Degrees recommendation (not yet ready for review).

bf:Doi

Label: DOI
URI: http://id.loc.gov/ontologies/bibframe/Doi
Definition: Digital Object Identifier.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Using BF2 model for now; will revisit as part of Degrees recommendation (not yet ready for review).
bf:Ean

**Label:** EAN  
**URI:** [http://id.loc.gov/ontologies/bibframe/Ean](http://id.loc.gov/ontologies/bibframe/Ean)  
**Definition:** "International Article Identifier."  
**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

```plaintext
:inst1 a bf:Instance ;
  bf:identifiedBy
   [a  bf:Ean ;
    rdf:value  "4006381333931"] .
```

bf:Fingerprint

**Label:** Fingerprint identifier  
**URI:** [http://id.loc.gov/ontologies/bibframe/Fingerprint](http://id.loc.gov/ontologies/bibframe/Fingerprint)  
**Definition:** "Identifier that is used to assist in the identification of antiquarian books by recording information comprising groups of characters taken from specified positions on specified pages of the book."  
**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

*Referred to RareMat Ontology Extension group.*

bf:Hdl

**Label:** Handle  
**URI:** [http://id.loc.gov/ontologies/bibframe/Hdl](http://id.loc.gov/ontologies/bibframe/Hdl)  
**Definition:** "Unique and persistent identifier for digital objects developed by the Corporation for National Research Initiatives."  
**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)  
**Last Updated:** 2016-04-21 (New)

```plaintext
:inst1 a bf:Instance ;
  bf:identifiedBy
   [a  bf:Hdl ;
```

bf:Isan

**Label:** ISAN  
**URI:** [http://id.loc.gov/ontologies/bibframe/Isan](http://id.loc.gov/ontologies/bibframe/Isan)  
**Definition:** International Standard Audiovisual Number.  
**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)
[a bf:isan ;
  rdf:value "0000-0000-3A8D-0000-Z-0000-0000-6"] .

bf:isbn

Label: ISBN
URI: http://id.loc.gov/ontologies/bibframe/isbn
Definition: International Standard Book Number.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:isbn ;
      rdf:value "0912700513" ] ;

    [a bf:isbn ;
      rdf:value "0912700947" ] .

bf:ismn

Label: ISMN
URI: http://id.loc.gov/ontologies/bibframe/ismn
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Referred to Performed Music Ontology Extension group.

:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:ismn ;
      rdf:value "979-0-9016791-7-7"] .

bf:iso

Label: ISO number
URI: http://id.loc.gov/ontologies/bibframe/iso
Definition: International Organization for Standardization standard number.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:iso ;
bf:lsrc

Label: ISRC
URI: http://id.loc.gov/ontologies/bibframe/lsrc
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:lsrc ;
      rdf:value "US-S1Z-99-00001"] .

bf:issn

Label: ISSN
URI: http://id.loc.gov/ontologies/bibframe/issn
Definition: International Standard Serial Number.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Referred to Serials and Other Multipart Works Recommendation.

:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:issn ;
      rdf:value "0028-0836"] .

bf:issnL

Label: ISSN-L
URI: http://id.loc.gov/ontologies/bibframe/issnL
Definition: International Standard Serial Number that links together various media versions of a continuing resource.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Referred to Serials and Other Multipart Works Recommendation.

:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:issnL ;
      rdf:value "ISSNLXXXXX"] .

bf:IssueNumber

Label: Audio issue number
URI: http://id.loc.gov/ontologies/bibframe/IssueNumber
**Definition:** Number used to identify the issue designation, or serial identification, assigned by a publisher to a sound recording.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

```sparql
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:IssueNumber ;
     rdf:value "No. 1"] .
```

**bf:lstc**

**Label:** ISTC

**URI:** [http://id.loc.gov/ontologies/bibframe/Istc](http://id.loc.gov/ontologies/bibframe/Istc)

**Definition:** International Standard Text Code, a numbering system developed to enable the unique identification of textual works.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

```sparql
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Istc ;
     rdf:value "A02-2009-000004BE-A"] .
```

**bf:Iswc**

**Label:** ISWC

**URI:** [http://id.loc.gov/ontologies/bibframe/Iswc](http://id.loc.gov/ontologies/bibframe/Iswc)

**Definition:** International Standard Musical Work Code, a unique, persistent reference number for the identification of musical works.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

**Referred to Performed Music Ontology Extension group.**

```sparql
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Iswc ;
     rdf:value "T-000.000.001-0"] .
```

**bf:Lccn**

**Label:** LCCN

**URI:** [http://id.loc.gov/ontologies/bibframe/Lccn](http://id.loc.gov/ontologies/bibframe/Lccn)

**Definition:** Library of Congress Control Number that identifies a resource description.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)
bf:LcOverseasAcq

Label: LC acquisition program
URI: http://id.loc.gov/ontologies/bibframe/LcOverseasAcq
Definition: Identification number assigned by the Library of Congress to works acquired through one of its collaborative overseas acquisition programs.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

bf:Local

Label: Local identifier
URI: http://id.loc.gov/ontologies/bibframe/Local
Definition: Identifier established locally and not a standard number.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

bf:MatrixNumber

Label: Audio matrix number
URI: http://id.loc.gov/ontologies/bibframe/MatrixNumber
Definition: Matrix number from the master from which a specific sound recording was pressed.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Refered to Performed Music Ontology Extension group.
bf:MusicPlate

**Label:** Music plate number  
**URI:** http://id.loc.gov/ontologies/bibframe/MusicPlate  
**Definition:** Number assigned by a music publisher to a specific music publication.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier

**Referred to Performed Music Ontology Extension group.**

```ruby
:inst1 a bf:Instance ;
   bf:identifiedBy
   [a bf:MusicPlate ;
```

bf:MusicPublisherNumber

**Label:** Music publisher number  
**URI:** http://id.loc.gov/ontologies/bibframe/MusicPublisherNumber  
**Definition:** Number assigned to a notated music publication other than a matrix or plate number.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier

**Referred to Performed Music Ontology Extension group.**

```ruby
:inst1 a bf:Instance ;
   bf:identifiedBy
   [a bf:MusicPublisherNumber ;
    rdf:value "2012564395"] .
```

bf:Nbn

**Label:** NBD  
**URI:** http://id.loc.gov/ontologies/bibframe/Nbd  
**Definition:** National Bibliography Number that identifies a resource description.  
**Subclass of:** http://id.loc.gov/ontologies/bibframe/Identifier

```ruby
:inst1 a bf:Instance ;
   bf:identifiedBy
   [a bf:Nbn ;
    rdf:value "urn:nbn:de:bvb:19-146642"] .
```

bib:OclcIdentifier

**Label:** A number assigned to a bibliographic MARC record from OCLC  
**URI:** http://bibliotek-o.org/ontology/OclcIdentifier  
**Definition:** OCLC Worldcat identifier.
**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

**bf:PostalRegistration**

**Label:** Postal registration number  
**URI:** [http://id.loc.gov/ontologies/bibframe/PostalRegistration](http://id.loc.gov/ontologies/bibframe/PostalRegistration)  
**Definition:** Number assigned to a publication for which the specified postal service permits the use of a special mailing class privilege.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

```reasonml
:inst1 a bf:Instance ;
  bf:identifiedBy
  [ a bf:PostalRegistration ;
    rdf:value   "003752" ;
```

**bf:PublisherNumber**

**Label:** Other publisher number  
**URI:** [http://id.loc.gov/ontologies/bibframe/PublisherNumber](http://id.loc.gov/ontologies/bibframe/PublisherNumber)  
**Definition:** Number assigned by a publisher that is not one of the specific defined types.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

```reasonml
:inst1 a bf:Instance ;
  bf:identifiedBy
  [ a bf:PublisherNumber ;
    rdf:value   "440 073 033-9" ;
```

**bf:ReportNumber**

**Label:** Technical report number  
**URI:** [http://id.loc.gov/ontologies/bibframe/ReportNumber](http://id.loc.gov/ontologies/bibframe/ReportNumber)  
**Definition:** Identification number of a technical report that is not a Standard Technical Report Number.

**Subclass of:** [http://id.loc.gov/ontologies/bibframe/Identifier](http://id.loc.gov/ontologies/bibframe/Identifier)

```reasonml
:inst1 a bf:Instance ;
  bf:identifiedBy
  [ a bf:ReportNumber;
    rdf:value   "Report Number XX"] .
```
bf:ShelfMark

Label: Shelf location
URI: http://id.loc.gov/ontologies/bibframe/ShelfMark
Definition: Piece/item identifier, such as a call or other type of number.
Subclass of: bf:Identifier
Subclassed as:
  - http://id.loc.gov/ontologies/bibframe/ShelfMarkDdc
  - http://id.loc.gov/ontologies/bibframe/ShelfMarkLcc
  - http://id.loc.gov/ontologies/bibframe/ShelfMarkUdc
  - http://id.loc.gov/ontologies/bibframe/ShelfMarkNlm

:inst1 a bf:Instance ;
  bf:hasItem :item1 ;

:item1 a bf:Item ;
  bf:identifiedBy [ 
    a bf:ShelfMark ; 
    rdf:value "B48"
  ] .

See proposal to model shelf marks as locations as an area for future research.

bf:ShelfMarkDdc

Label: Shelf location
URI: http://id.loc.gov/ontologies/bibframe/ShelfMarkDdc
Definition: Shelf mark based on Dewey Decimal Classification
Subclass of: http://id.loc.gov/ontologies/bibframe/ShelfMark

bf:ShelfMarkLcc

Label: Shelf location
URI: http://id.loc.gov/ontologies/bibframe/ShelfMarkLcc
Definition: Shelf mark based on Library of Congress Classification
Subclass of: http://id.loc.gov/ontologies/bibframe/ShelfMark

bf:ShelfMarkNlm

Label: Shelf location
URI: http://id.loc.gov/ontologies/bibframe/ShelfMarkNlm
Definition: Shelf mark based on Universal Decimal Classification
Subclass of: http://id.loc.gov/ontologies/bibframe/ShelfMark
bf:ShelfMarkUdc
Label: Shelf location
URI: http://id.loc.gov/ontologies/bibframe/ShelfMarkUdc
Definition: Piece/item identifier, such as a call or other type of number.
Subclass of: http://id.loc.gov/ontologies/bibframe/ShelfMark

bf:Sici
Label: SICI
URI: http://id.loc.gov/ontologies/bibframe/Sici
Definition: Serial Item and Contribution Identifier.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Referred to Serials and Other Multipart Works Recommendation.

```
:inst1 a bf:Instance ;
   bf:identifiedBy [a bf:Sici ;
                   rdf:value "0002-8231(199412)45:10<737:TI0DIM>2.3.TX;2-M"] .
```

bf:StockNumber
Label: Stock number
URI: http://id.loc.gov/ontologies/bibframe/StockNumber
Definition: Identification number used for stock purposes and assigned by agencies such as distributors, publishers, or vendors.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

```
:inst1 a bf:Instance ;
   bf:identifiedBy [a bf:StockNumber ;
                   rdf:value "Stock Number 12345"] .
```

bf:Strn
Label: STRN
URI: http://id.loc.gov/ontologies/bibframe/Strn
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier
bf:StudyNumber
Label: Study number
URI: http://id.loc.gov/ontologies/bibframe/StudyNumber
Definition: Identification number for a computer data file.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

bf:Upc
Label: UPC
URI: http://id.loc.gov/ontologies/bibframe/Upc
Definition: Universal Product Code.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

bf:Urn
Label: URN
URI: http://id.loc.gov/ontologies/bibframe/Urn
Definition: Uniform Resource Number.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier
bf:VideorecordingNumber

Label: Videorecording number
URI: http://id.loc.gov/ontologies/bibframe/VideorecordingNumber
Definition: Number assigned by a publisher to a videorecording.
Subclass of: http://id.loc.gov/ontologies/bibframe/Identifier

Referred to Moving Image Ontology Extension group.

:b:inst1 a :bf:Instance ;
:bf:identifiedBy
  [ a :bf:VideorecordingNumber ;
    rdf:value "aVM5108"
  ] .

bibliotek-o Identifier Status

Diagram 5. Identifier status
bf:status (object property)

**Label:** status

**URI:** [http://id.loc.gov/ontologies/bibframe/status](http://id.loc.gov/ontologies/bibframe/status)

**Definition:** The status of a resource

**Domain:** unspecified

**Range:** bf:Status

bibliotek-o Status Named Individuals

Namespace TBD.

cancelled

**Label:** cancelled

**Type:** owl:NamedIndividual, bf:Status

current

**Label:** current

**Type:** owl:NamedIndividual, bf:Status

deprecated

**Label:** deprecated

**Type:** owl:NamedIndividual, bf:Status

invalid

**Label:** invalid

**Type:** owl:NamedIndividual, bf:Status

bibliotek-o Identifier Date

Diagram 6. Identifier Date
dcterms:date (property)

**Label:** Date

**URI:** [http://purl.org/dc/terms/date](http://purl.org/dc/terms/date)

**Definition:** A point or period of time associated with an event in the lifecycle of the resource.

**Comment:** Date may be used to express temporal information at any level of granularity. Recommended best practice is to use an encoding scheme, such as the W3CDTF profile of ISO 8601.

**Range:** rdfs:Literal
bibliotek-o Identifier Source

Diagram 7. Identifier source

bf:source (object property)

Label: Source
URI: http://id.loc.gov/ontologies/bibframe/source
Definition: Resource from which value or label came or was derived, such as the formal source/scheme from which a classification number is taken or derived, list from which an agent name is taken or derived, source within which an identifier is unique.
Domain: unspecified
Range: unspecified
Inverse: http://id.loc.gov/ontologies/bibframe/sourceOf

The object of bf:source is expected to be a URI for the assigner of the identifier.

bf:sourceOf (object property)

Label: is source of
URI: http://id.loc.gov/ontologies/bibframe/sourceOf
Definition: This resource is the source of the object.
Domain: unspecified
Range: unspecified
Inverse: http://id.loc.gov/ontologies/bibframe/source

The subject of bf:source is expected to be a URI for the assigner of the identifier.
bibliotek-o Identifier Value

rdf:value (property)

Label: value
URI: http://www.w3.org/1999/02/22-rdf-syntax-ns#
Definition: Idiomatic property used for structured values
Domain: rdfs:Resource
Range: rdfs:Resource

Open Questions and Areas for Future Work

- What to do when stable identifiers become URIs?
  - ISBNs, ESTC numbers, etc.
- What to do with canonical bibliographies whose identifiers are essential to rare book cataloging? (510s)
  - Referred to RareMat extension group
- Attach DissertationIdentifier to Work rather than the Dissertation object.
- Modeling shelf marks as locations has been discussed but not finalized as a recommendation.
  - bibliotek-o has adopted the following model for locations:
    - Replaces bf:Place with prov:Location.
    - Defines subclasses of prov:Location:
      - bib:GeographicLocation
      - bib:PhysicalLocation
      - bib:ElectronicLocation
    - Defines predicates bib:atLocation (range prov:Location) and inverse bib:locationOf (domain prov:Location).
  - Future integration of shelf marks into this model would involve making the ShelfMark class a subclass of prov:Location, and using bib:locationOf rather than bf:identifiedBy to link the resource to the ShelfMark. This would be recommended for BF, but if not adopted then BIBLIOTEK-O would define bib:ShelfMark as subclass of prov:Location. Current subclasses of ShelfMark would remain.