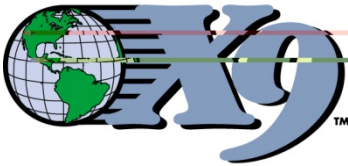


ASC X9 TR 40–2011

**Bridging ANSI X9.100-187
to ANSI X9.100-182-2-1:
Transferring Data from an Image Cash
Letter File to an XML Check Delivery
Document**



A Technical Report prepared by:
Accredited Standards Committee X9, Incorporated
Financial Industry Standards

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Foreword

The ANSI X9.100-182 Bulk Data and Image Delivery Schema addresses the formatting of check image payment items in a comprehensive XML structure. The ANSI X9.100-182 standard is not intended to compete with or to replace the more traditional standard for image payment exchange, the ANSI X9.100-187-2008 and its predecessor the withdrawn DSTU X9.37-2003. Rather, ANSI X9.100-182 is intended to complement the cash letter image delivery standard by extending a supported data structure to the transfer and storage of image cash letter originated payments. For example, image payments data can be formatted in a standardized structure on a delivery medium such as DVD, or a storage medium such as an archive. Image payments information can also be transferred in a standardized structure from one application to another within an organization's internal upstream or downstream service.

The XML format that is embodied in the ANSI X9.100-182 Bulk Data and Image Delivery Schema actually reflects a structure that is similar in context to the ANSI X9.100-187-2008 cash letter file. However, the data is in a format that is more readily accessible to modern XML-sensitive applications. Furthermore, the XML structure actually lends itself to storing payments, with or without embedded images, as individual independent entities, while still retaining the envelopment concept of a traditional cash letter file format (i.e. a transaction within bundle, a bundle within cash letter, and a cash letter within file).

When an organization receives payments data originating from standard image cash letter files, the payments data is likely to be retained for some period of time as individual transactions within a receiver's applications. Furthermore, transaction level data originating from the image cash letter file is likely to be transferred from one application to another for payments processing enrichment.

Many organizations, including payments processors, exchange channels, banks and check truncation product vendors, are very familiar with the industry-wide standard content of the image cash letter format. However, few such organizations are likely to be familiar with the format of the XML equivalent as embodied in the ANSI X9.100-182 Bulk Data and Image Delivery Schema. The challenge is that, without a simple guideline to assist an organization to relate the image cash letter data structure to the XML-based standard equivalent, it can be relatively difficult to see how the XML standard can be of benefit to the organization. Without an awareness of the potential benefit of the XML standard as applied to internal systems, the organization may embark on developing a separate proprietary application interface standard or a separate data storage structure, whereas an industry supported standard could more readily have provided a consistent solution.

The effective use of the XML standard emphasizes commonality and predictability for data transfer and storage. The standard can be a common point of agreement among adopting parties, whether these are intra-organizational systems or inter-organizational arrangements. This in turn can help reduce the time to market for new application services, help contain the risk associated with proprietary one-off implementations, and can promote greater longevity of developed solutions that are more broadly supportable.

This Technical Report provides a guideline to co-relate the two data structures, the image cash letter file and the XML document. The content of this document originated from a technical reference guideline that was authored by Brian Salway, Symcor Inc., for internal company use to assist with early adoption of the ANSI X9.100-182 standard. The content was then further developed to comply with standards conventions and general industry use. It was then offered by Symcor Inc. to Accredited Standards Committee X9 as a prospective ANS Technical Report.

Publication of this Technical Report that has been registered with ANSI has been approved by the Accredited Standards Committee X9, Incorporated, 1212 West Street, Suite 200, Annapolis, MD 21401. This document is registered as a Technical Report according to the "Procedures for the Registration of Technical Reports with

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Introduction

This Technical Report contains no requirements for the specific use of patented materials.

Suggestions for the improvement or revision of this Technical Report are welcome. They should be sent to the X9 Committee Secretariat, Accredited Standards Committee X9, Inc., Financial Industry Standards, 1212 West Street, Suite 200, Annapolis, MD 21401 USA.

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This document does not cancel or replace any other ANSI published standards or Technical Reports, in whole or in part.

This Technical Report provides information related to the bridging of data between the ANSI X9.100-187 and the ANSI X9.100-182 standards. To understand the concepts discussed in this document, the reader must be knowledgeable of the purpose and the content of these two standards.

Bridging the ANSI X9.100-187 to the ANSI X9.100-182-2-1: Transferring Data from an Image Cash Letter File to an XML Check Delivery Document

1 Introduction

This Technical Report contains considerations for the transfer of data from an ANSI X9.100-187 Electronic Exchange of Check and Image Data – Domestic cash letter file to an ANSI X9.100-182 Part 2-1 Bulk Data and Image Delivery – General Check Delivery XML document. It describes a technique for the mapping of data elements contained within these source image cash letter (ICL) files ¹ to a programmatically addressable storage structure, embodied in an XML document.

The ICL files arrive into the payments process from a variety of sources. These include inclearings image exchange, upstream truncated deposits in a depository bank process (for example, branch capture), regional distributed proof-of-deposit truncated capture within a bank network, third party depository sources (for example, merchant capture), and post-presentment payments processing services (for example, outbound and inbound image returns).

1.1 Scope

The Technical Report provides some background material and a relevant synopsis of the ANSI X9.100-182 standard. It explains the structure principle behind the mapping approach. And finally, it provides field-by-field data content mapping from the image cash letter file records to the respective XML element layers.

The Technical Report focuses on, and restricts itself to, those ANSI X9.100-182 Part 2-1 defined elements and element layers in the XML structure that have equivalence in the ANSI X9.100-187 file record fields. The Technical Report does not provide content detail on ANSI X9.100-182 Part 2-1 XML elements that do not have a direct equivalence in ANSI X9.100-187 file record fields.

The guidelines and suggestions in the Technical Report apply to the technical specifications as documented in the ANSI X9.100.187 image cash letter standard, and the technical functionality implemented in the XML schema files that are a component of the ANSI X9.100-182 Part 2-1 standard. A proprietary adoption of the ANSI X9.100-187 standard, or the use of a proprietary rendering of the ANSI X9.100-182 schema files, may render some or all of the guidelines in this Technical Report to be incompatible with the programming processes of the adopter.

Although it is possible and even desirable in certain situations to transfer data from the ANSI X9.100-182 XML element structure to equivalent data placement in an ANSI X9.100-187 cash letter file, this Technical Report does not provide specific information to assist with that directional transition. The Technical Report focuses on the transfer from ANSI X9.100-187 to ANSI X9.100-182 Part 2-1 only. However, the information provided in this Technical Report is sufficient for the reader to conclude how to affect a transfer of data from ANSI X9.100-182 Part 2-1 to ANSI X9.100-187.

¹ The term ICL is used throughout this document to refer generically to any ANSI X9.100-187 formatted check and image data file. These can include, but are not necessarily restricted to, clearings exchange files, depository source files and proprietary internal application-to-application files.

1.2 Consideration

While this Technical Report specifically compares the ANSI X9.100-182 standard for XML with the ANSI X9.100-187 standard for image cash letter files, it is recognized that, at the time of publication, the predominant 'standard' in use in the financial industry is the DSTU X9.37-2003 image cash letter file specification. The concepts in this document can generally be applied to the DSTU X9.37-2003 in place of the ANSI X9.100-187. However, the reader is advised that there are certain differences between the ANSI X9.100-187 and the DSTU X9.37-2003 which may need to be considered when using this Technical Report as a guideline.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the specific edition cited applies. For undated references, the most recent edition of the referenced document (including any amendments) applies.

ANSI X9.100-160-1, *Magnetic Ink Printing (MICR), Part 1: Placement and Location*

ANSI X9.100-160-2, *Magnetic Ink Printing (MICR), Part 2: EPC Field Use*

ANSI X9.100-182-1, *Bulk Data and Image Delivery, Part 1: Overview and Structure*

ANSI X9.100-182-2-1, *Bulk Data and Image Delivery, Part 2-1: Check General Delivery*⁽²⁾

ANSI X9.100-187, *Specifications for Electronic Exchange of Check and Image Data – Domestic*

DSTU X9.37-2003 (Withdrawn), *Specifications for Electronic Exchange of Check and Image Data*⁽³⁾

3 Terms and Definitions

The defining standard is listed in parentheses after each term. The first listing is the current defining standard and the second listing, if present, is the past or future defining standard. If a definition starts with the words, "As used in this standard,...", it indicates the definition is altered to meet the needs of this standard and differs from the definition in the referenced defining standard.

3.1 Image Cash Letter (ICL) (ASC X9 TR 40)

An Image Cash Letter is a generic reference to any file that complies in format and content to the standard ANSI X9.100-187-2008 Specifications for Electronic Exchange of Check and Image Data – Domestic. An ICL is also a generic reference to any file that complies in format and content to the withdrawn DSTU X9.37-2003. The ICL by definition can contain either forward presented (check) or return items with the respective associated records.

3.2 XML (ASC X9 TR 40)

XML or 'eXtensible Markup Language, is a general purpose specification for creating custom markup elements within a structured file. Each instance of markup text, or tag, generally has a name that reflects the meaning and content of those data elements it represents. In addition, the placement of a markup element or tag within the hierarchical structure of the file reflects the relationship of that data component to other components within the file.

² The XML XSD schema files that are a component of the Part 2-1 of the ANSI X9.100-182 standard also form a critical part of the documentation within this Technical Report.

³ Although the DSTU X9.37-2003 has been withdrawn from circulation, image cash letter files in this format remain an industry-wide de facto pseudo-standard among early and even recent adopters of image cash letter exchange.

4 Background on ANSI X9.100-182 Part 2-1

The ANSI X9.100-182 Part 2-1 standard was designed to be a full feature-rich payment exchange standard that is capable of recording a significant amount of detail related to the processing of a payment item. The scope of the information content of the standard goes beyond what is presently used in the image cash letter exchange process. As a very broad standard, the ANSI X9.100-182 Part 2-1 structure encompasses the content of the ANSI X9.100-187. It also supports the now retired DSTU X9.37-2003.

The ANSI X9.100-182 Part 2-1 standard is not intended to replace the image cash letter file. The ANSI X9.100-187-2008 file, and its predecessor the DSTU X9.37-2003 file, will continue to be used for payments exchanges that are most suited to that transport medium. Rather, the ANSI X9.100-182 Part 2-1 is meant to provide an alternative mechanism for the exchange of payment information, if, for example, the information being transferred exceeds the scope of the image cash letter standard, or if this is a more agreeable mechanism for information exchange to address the specific needs of a community of adopting parties.

5 Synopsis of ANSI X9.100-182 Part 2-1 for Cash Letter File Mapping

In general, the ANSI X9.100-182 Part 2-1 standard provides a well-structured and accurate XML representation of the data content in the ANSI X9.100-187 image cash letter file standard, and the predecessor DSTU X9.37-2003. It can accommodate storage of the most significant data fields that are pertinent to conventional use of the cash letter file standards.

There are some exceptions and differences with the ANSI X9.100-182 Part 2-1 standard as it exists today that result in it being less than a perfect match to the contemporary ICL standard. However, the differences are not significant, and should not interfere with use of the ANSI X9.100-182 Part 2-1 standard to represent pertinent data in traditional ICL files.

The differences, and considerations for ANSI X9.100-182 Part 2-1 adoption, are as noted.

5.1 Unmatched Data Elements

Some fields in various ANSI X9.100-187 records do not have a direct data map into any XML element. For the most part, the fields are optional, and their value is inconsequential to the image exchange process.

Most of the missing XML elements are for ANSI X9.100-187 data field content that is not passed downstream to subsequent ANSI X9.100-187 image files. There are, however, some exceptions. Certain minor data fields on the Check Detail Addendum A Record (Type 26) and its mirror Return Addendum A Record (Type 32), and on the Check Detail Addendum C Record (Type 28) and its mirror Return Addendum D Record (Type 35) do not have a designated XML element. Technically, all these fields are expected to be passed on. The consequences of not doing so through the interbank exchange channels may vary.

An alternative approach to retaining each unrepresented addendum data field within the XML structure is included in Annex B in this proposal.

Certain data elements from X9.100-187 records other than Addendum records, if significant to the immediate business need, may also be transferred to the XML document using the convention described in Annex B.

5.2 Single Image Pair

The XML structure assumes that there is only one primary single full image view pair of segments for an item on the ANSI X9.100-187 cash letter file. That is, there is only one front full image and one back full image of a check.

Under normal circumstances, a single image pair is all that will appear on an image exchange file or on a file from a depository source. This is also what practically appears in files produced by software vendor products.

Furthermore, the data stored in the XML representation of the Image View Detail Record (Type 50) and the Image View Data Record (Type 52) pair would be of limited importance, assuming the actual images are separately archived after extraction from the X9.100-187 file.

If there is a specific need to retain data elements from more than one set of front-bank image pairs on an ANSI X9.100-187 cash letter file, then this can be accommodated by the use of a designated 'other' image data XML element pair within the ANSI X9.100-182 Part 2-1 XML structure.

5.3 No Direct Record Map (Record Type Number) to XML Element

While not really a technical problem, it is important to understand that there is no XML element that directly relates to Record Type (Field 1) in each record type on the ANSI X9.100-187 image cash letter file. There is no direct File Header Record (Type 01) or File Control Record (Type 99), Cash Letter Header Record (Type 10) or Cash Letter Control Record (Type 90), Bundle Header Record (Type 20) or Bundle Control Record (Type 70), Check Detail Record (Type 25) or Return Record (Type 31), Check Detail Addendum A Record (Type 26) or Return Addendum A Record (Type 32), Check Detail Addendum C Record (Type 28) or Return Addendum D Record (Type 35), with simple straight-forward XML element path definitions. Rather, the XML structure is designed with an intuitive mapping of ICL record types to equivalent XML element paths.

5.4 Multiple Record Maps to Shared XML Path

Certain XML element values or element names indicate the specific type of data that is represented in the XML path, which reflects similar nomenclature as in image exchange files. For example, the enumeration of element <checkItemType> identifies the item as a 'Check' or a 'Qualified Return', which then applies to all downstream XML element paths associated with that item.

Another example is the element <frontCheckImage> versus <backCheckImage>, which determines whether the data in the downstream XML element path applies to the front or the back image segment from the ANSI X9.100-187 image cash letter file.

6 How the Mapping Analysis is Approached

The content of the ANSI X9.100-187 file was reviewed to identify the information that should be mapped to the XML structure, and to determine how it should be represented within that structure. Particular attention was paid to the relative importance of records and data within the traditional ICL.

6.1 Unused Records

Certain records within the ANSI X9.100-187 file are conditional, and in practice are never involved in formal image file creation or transfer, unless there is some very specific agreement between the sending and receiving parties. Such records are either never included in the files, or if they are, they mean little to, and are ignored by, the receiver.

The little-used or unused records in the X9.100-187-2008 that have been excluded from the mapping are:

- ⇒ Check Detail Addendum B Record (Type 27)
- ⇒ Return Addendum C Record (Type 34)
- ⇒ Account Totals Detail Record (Type 40)
- ⇒ Non-Hit Totals Detail Record (Type 41)
- ⇒ Image View Analysis Record (Type 54)

- ⇒ Box Summary Record (Type 75)
- ⇒ Routing Number Summary Record (Type 85)

6.2 Non-Transferable Information

Certain information within traditionally used mandatory and conditional ANSI X9.100-187 records, including both mandatory and conditional data types, is never intended to be passed further downstream to any receiving process by representation on a subsequently created ANSI X9.100-187 file. Upon arrival, such data may, however, have some importance to the receiver of a cash letter file for its internal processes.

Examples of such data elements include, but are not limited to, the entire contents of the File Control Record (Type 01), the Cash Letter Control Record (Type 10), and the Image View Detail Record (Type 50) and the Image View Data Record (Type 52). Certain data elements from these X9.100-187 records, however, may have some immediate business importance. These data elements may then be treated as Transferable Information, as discussed in the next section.

6.3 Transferable Information

Certain information within traditionally used mandatory and conditional ANSI X9.100-187 records, including both mandatory and conditional data, may be expected to be passed further downstream to a receiving process by representation on a subsequently created ANSI X9.100-187 file.

The receiver of an ICL file containing these elements can expect to know the respective values of these data elements as they existed on a prior file.

Classic examples of such data elements include:

- ⇒ Payments Fields on the Check Detail Addendum A Record (Type 26), which can be transferred to Return Addendum A Record (Type 32), and visa versa;
- ⇒ Fields on the Check Detail Addendum C Record (Type 28), which can be transferred to Return Addendum D Record (Type 35), and visa versa;

Certain individual data elements can be transferred from one record type to a different record type. Examples include:

- ⇒ Check Detail Record (Type 25) ECE Institution Item Sequence Number (Field 8) is transferred unchanged to Return Record (Type 31) ECE Institution Item Sequence Number (Field 10);
- ⇒ Bundle Header Record (Type 20) Bundle Business Date (Field 5) from a forward presentment is transferred unchanged to Return Record (Type 31) Forward Bundle Date (Field 9).

7 The Approach for the Mapping

Following identification of the data elements in the ICL structure, the XML structure of the ANS X9-100-182 file was then examined to determine how and where information could be stored from the original ANSI X9.100.187 content.

7.1 Data From Unused Records

No provision was made to determine an XML path and XML element structure for any data within certain unused or little used ICL records.

7.2 Non-Transferable Information

If a data element, whether mandatory or conditional in the ANSI X9.100-187 ICL file, could be readily accommodated by a specific XML path and element structure within the ANSI X9.100-182 schema, then that XML path and XML element structure was identified.

If a data element, whether mandatory or conditional in the ANSI X9.100-187 ICL file, did not have a specific XML path and element representation within the ANSI X9.100-182 schema, or if the representation was very complicated with little or no perceived value ⁽⁴⁾, no attempt was made to identify an equivalent XML path and element structure for that file element.

7.3 Transferable Information

If a data element, whether mandatory or conditional in the ANSI X9.100-187 ICL file, could be readily accommodated by a specific XML path and element structure within the ANSI X9.100-182 schema, then that path and element structure was identified.

If a data element, whether mandatory or conditional in the ANSI X9.100-187 ICL file, did not have a specific XML path and element representation within the ANSI X9.100-182 schema, a suitable alternate XML path and element structure is proposed.

Annex B presents a convention for the preservation of data elements originating from an ANSI X9.100-187 cash letter file that do not have a direct representation in the ANSI X9.100-182 XML structure, but it is likely that the data elements will be needed for later transfer from an ANSI X9.100-182 XML structure to another ANSI X9.100-187 cash letter file. Annex B focuses on the preservation of the data content of addendum records following either a Check Detail Record (Type 25) or a Return Record (Type 31). Annex B can also be followed to preserve important business elements from records other than Addendum records, at the discretion of the adopter.

7.4 Image Binary Data

The Technical Report assumes that the actual image binary data for each image segment belonging to an item on the source ANSI X9.100-187 image cash letter file is extracted from each respective Image View Data Record (Type 52) Image Data (Field 19), and is then stored and managed in a separate image repository. As such, this Technical Report makes no provision for the transfer of the ANSI X9.100-187 source file image binary data to the associated ANSI X9.100-182 Part 2-1 XML <imageDataEmbedded> Base 64 Binary element within the respective XML <imageInfo> element structure. Furthermore, this Technical Report does not propose any particular method to associate the item data in the ANSI X9.100-182 Part 2-1 XML element structure to the image binary representation that is stored external to the ANSI X9.100-182 Part 2-1 XML document.

⁴ Examples of available but complex XML paths that accommodate fields in the ANSI X9.100-187 ICL file, but are never used, include the coordinates for image clippings and the information pertaining to image digital signatures.

8 High Level Composite View

For illustrative purposes, the ANS X12 EDI schematic convention is used in Figure 1 to depict the high level structure of the composite data layout associated with an item. This convention lends itself easily to portraying the entire structure, including the item and the envelope, in a single diagram. It renders a common view that is equally applicable to the generic data arrangement in either the ANSI X9.100-187 image cash letter file or the ANSI X9.100-182 XML document.

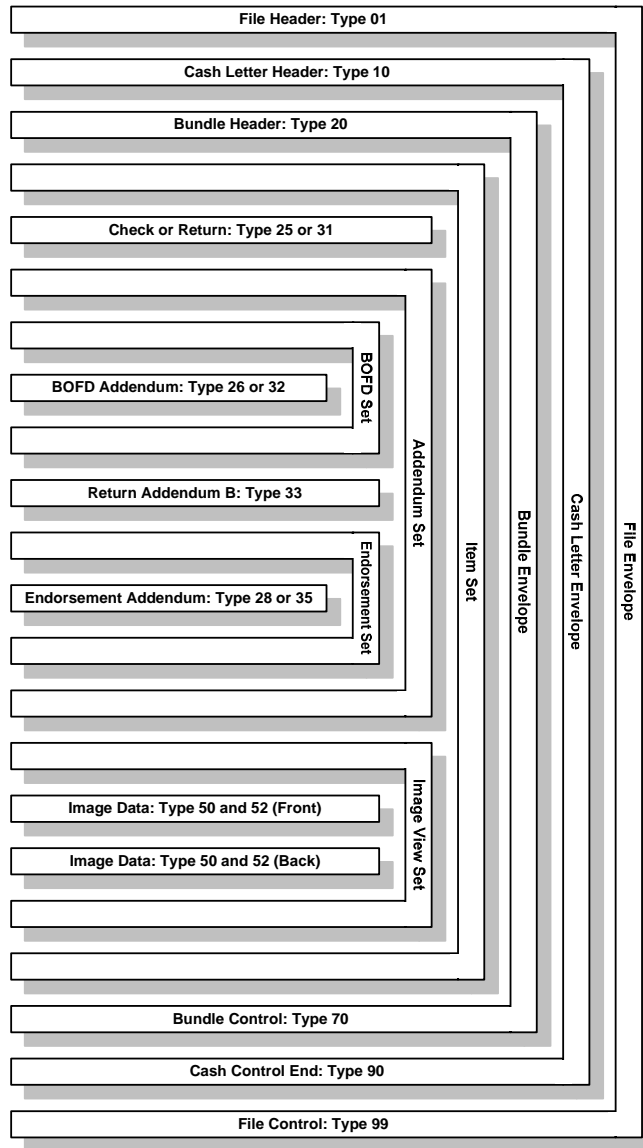


Figure 1. Item Structure Including Surrounding Envelope

Item data can be transferred from an ANSI X9.100-187 file to an ANSI X9.100-182 XML document according to different models of XML packaging. Refer to Annex A for further information and examples.

9 Detailed Schematic Views of ANSI X9.100-182 Part 2-1 Structure

9.1 View: Primary ANSI X9.100-182 Part 2-1 XML Document Path for ANSI X9.100-187 File

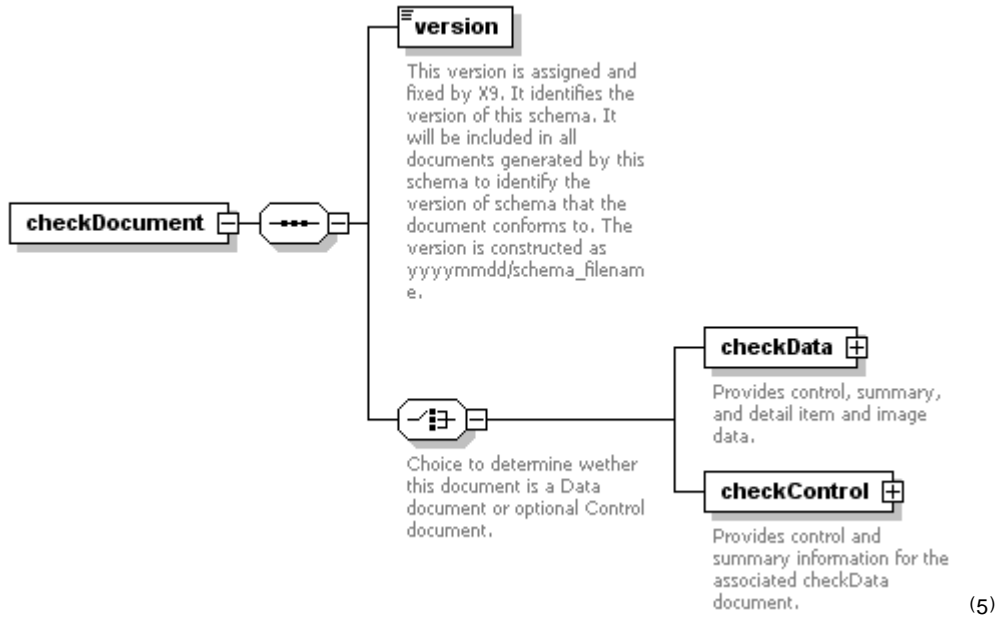


Figure V1. XML path for ANSI X9.100-187 Version Number

9.1.1 Summary

- Actual data content begins at the `<checkData>` level

⁵ The XML schema diagrams in this Section were generated with the XMLSPY Schema Editor <http://www.altova.com/xmlspy>

9.2 View : ANSI X9.100-182 XML Part 2-1 File Envelope from ANSI X9.100-187 File

Path to File Header Record (Type 01) with File Control Record (Type 99)

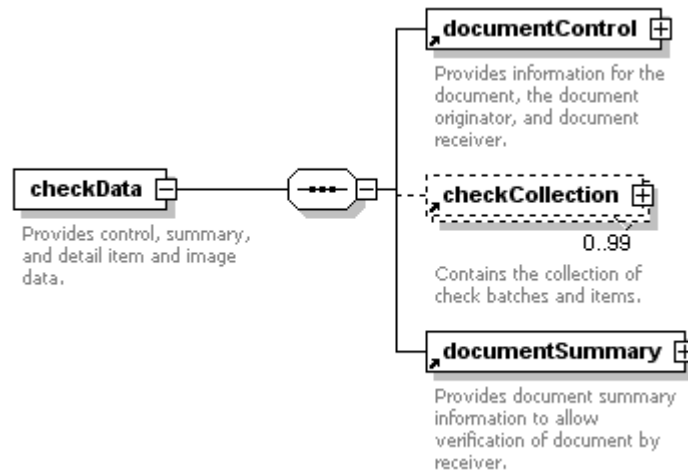


Figure V2. XML envelope for ANSI X9.100-187 File Header and Control

9.2.1 Summary

- File Header Record (Type 01) begins at the XML <documentControl> level
- File Control Record (Type 99) begins at the XML <documentSummary> level
- Cash letter information begins at the XML <checkCollection> level

9.3 View: ANSI X9.100-182 Part 2-1 XML Cash Letter Envelope from ANSI X9.100-187 File

XML Path to Cash Letter Header Record (Type 10) with Cash Letter Control Record (Type 90)

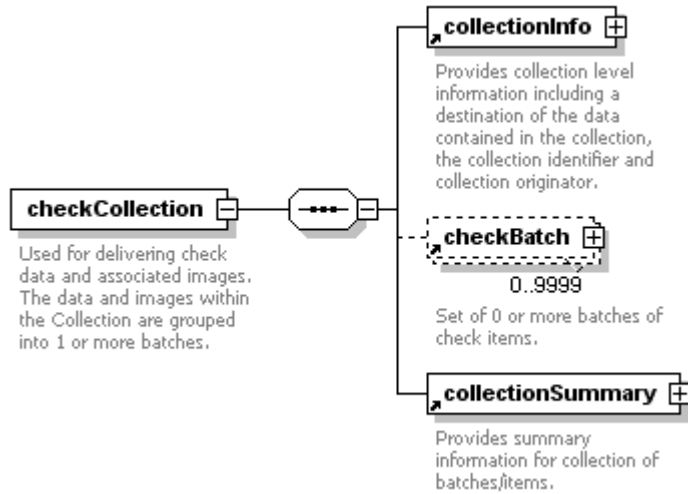


Figure V3. XML envelope for ANSI X9.100-187 Cash Letter Header and Control

9.3.1 Summary

- Cash Letter Header Record (Type 10) begins at the XML <collectionInfo> level
- Cash Letter Control Record (Type 90) begins at the XML <collectionSummary> level
- Bundle information begins at the XML <checkBatch> level

9.4 View: ANSI X9.100-182 Part 2-1 XML Bundle Envelope from ANSI X9.100-187 File

XML Path to Bundle Header Record (Type 20) with Bundle Control Record (Type 70)

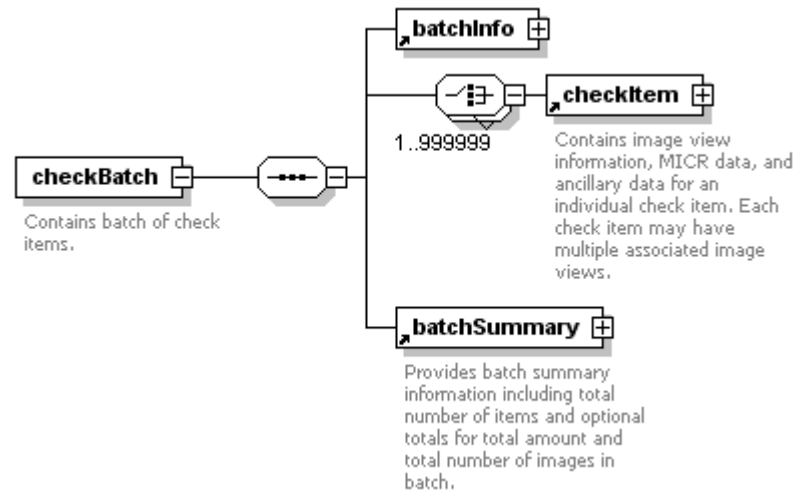


Figure V4. XML envelope for ANSI X9.100-187 Bundle Header and Control

9.4.1 Summary

- Bundle Header Record (Type 20) begins at the XML `<batchInfo>` level
- Bundle Control Record (Type 70) begins at the XML `<batchSummary>` level
- Check (or Return) Item information begins at the XML `<checkItem>` level
- Check Detail Record (Type 25) versus Return Record (Type 31) is differentiated by an element enumeration setting within XML `<checkItem>`

9.5 View: ANSI X9.100-182 Part 2-1 XML ‘Check’ or ‘Return’ Information Set from ANSI X9.100-187 File

XML Path to Check Detail Record (Type 25), with Check Detail Addendum A Record (Type 26), Check Detail Addendum C Record (Type 28), Image View Detail Record (Type 50), and Image View Data Record (Type 52).

XML Path to Return Detail Record (Type 31), with Return Addendum A Record (Type 32), Return Addendum D Record (Type 35), Image View Detail Record (Type 50), and Image View Data Record (Type 52).

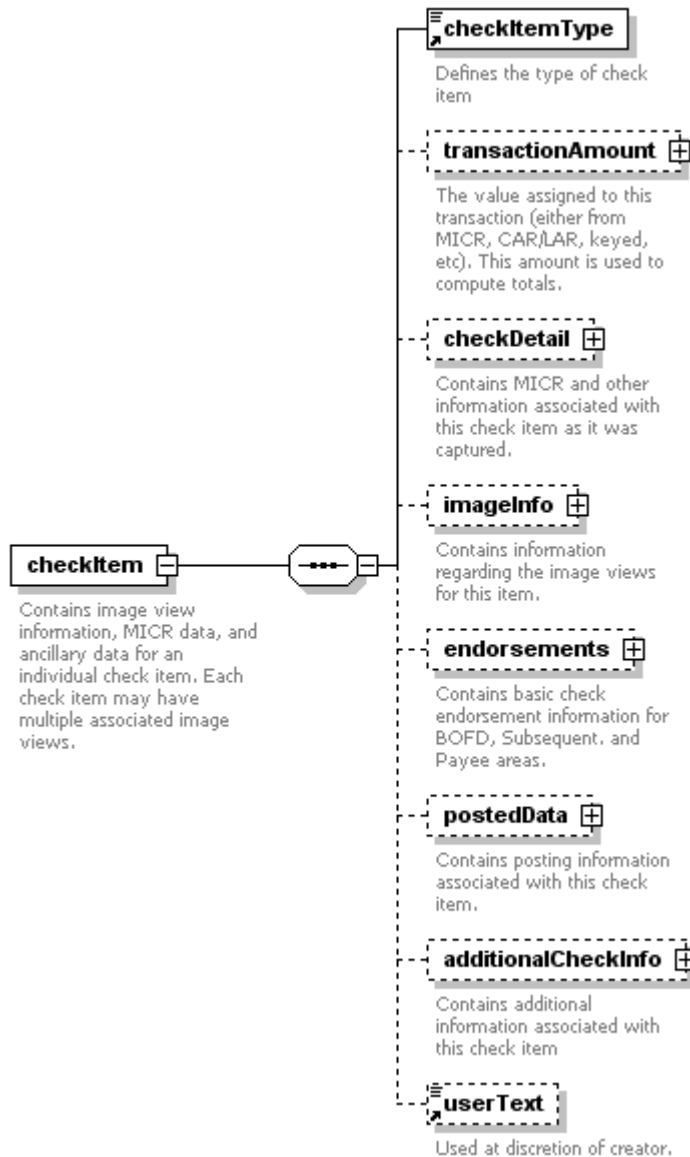


Figure V5. XML Path for ANSI X9.100-187 Check Detail Record (Type 25) or Return Record (Type 31)

9.5.1 Summary

- Enumeration value for XML <checkItemType> differentiates a 'Check' item from a 'Return' item
- Check Detail Record (Type 25) or Return Record (Type 31) data begins at the XML <transactionAmount>, <checkDetail> and <additionalCheckDetail> levels
- Addendum record information for all addenda types begins at the XML <endorsements> level
- All image information begins at the XML <imageInfo> level
- XML <userText> element provides a common storage area for any addendum record data fields that are not specifically represented by corresponding elements below the XML <endorsements> level

9.6 View: ANSI X9.100-182 Part 2-1 XML ‘Check’ or ‘Return’ Addenda Information Set from ANSI X9.100-187 File

XML Path to Check Detail Addendum A Record (Type 26) and Check Detail Addendum C Record (Type 28)

XML Path to Return Addendum A Record (Type 32) and Return Detail Addendum D Record (Type 35)

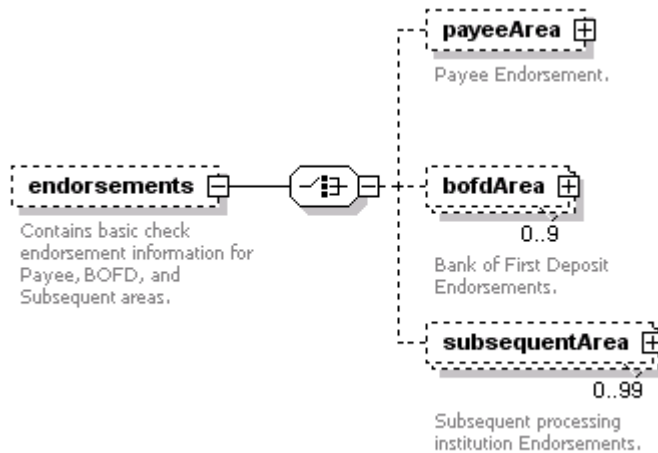


Figure V6. XML envelope for ANSI X9.100-187 Check Detail Record (Type 25) or Return Record (Type 31) Addenda

9.6.1 Summary

- Applies to Check Detail Addendum A Record (Type 26) with Check Detail Addendum C Record (Type 28) set, or to Return Addendum A Record (Type 32) with Return Addendum D Record (Type 35) set
- Data for each Check Detail Addendum A Record (Type 26) or each Return Addendum A Record (Type 32) is below the XML <bofdArea> and XML <payeeArea> levels
- XML <bofdArea> level for a single Check Detail Addendum A Record (Type 26) data or a single Return Addendum A Record (Type 32) data is repeatable up to a maximum of 9
- XML <payeeArea> level applies only to one Check Detail Addendum A Record (Type 26) or one Return Addendum A Record (Type 32)
- Data for each Check Detail Addendum C Record (Type 28) or each Return Addendum D Record (Type 35) is below the XML <subsequentArea> level
- XML <subsequentArea> level for a single Check Detail Addendum C Record (Type 28) or for a single Return Addendum D Record (Type 35) is repeatable up to a maximum of 99

9.7 View: ANSI X9.100-182 Part 2-1 XML Path for ANSI X9.100-187 Return Addendum B Record (Type 33)

XML Path to Return Addendum B Record (Type 33)

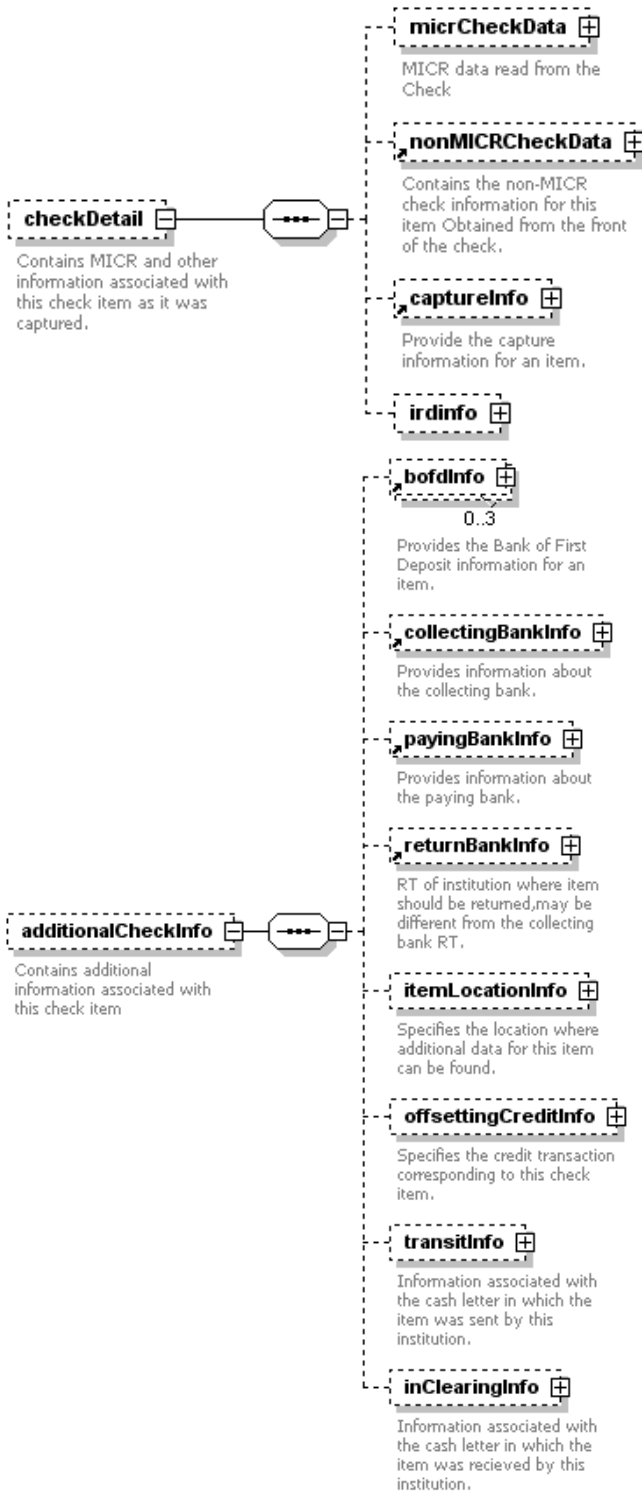


Figure V7. XML Path for ANSI X9.100-187 Return Addendum B Record (Type 33)

9.7.1 Summary

- ANSI X9.100-187 Return Addendum B Record (Type 33) primarily contains the optional MICR Serial Number of a returned item.
- Return Addendum B Record (Type 33) has no equivalent XML path.
- Return Addendum B Record (Type 33) data is held at the XML <checkDetail> level and the XML <additionalCheckInfo> level within the XML <checkItem> level, as opposed to being held in the XML <endorsements> level within the XML <checkItem> level

9.8 View: ANSI X9.100-182 Part 2-1 XML Image Data from ANSI X9.100-187 File

XML Path to Image View Detail Record (Type 50) and Image View Data Record (Type 52)

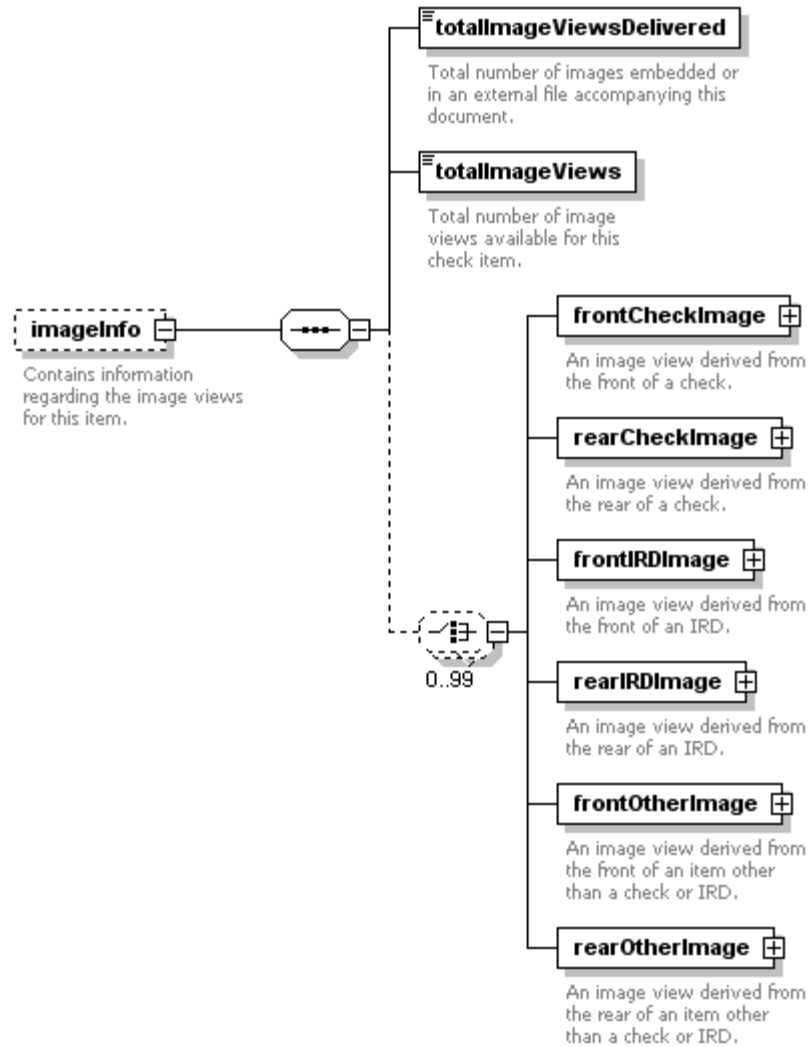


Figure V8. XML Path Image Information set for ANSI X9.100-187 File

9.8.1 Summary

- Image View Detail Record (Type 50) with Image View Data Record (Type 52) are both represented together as a set below the XML <imageInfo> level
- Data associated with the Front Image is held below the XML <frontCheckImage> level
- Data associated with the Back Image is held below the XML <backCheckImage> level
- Data below the XML <frontCheckImage> level with XML <backCheckImage> level represent one set of image segment pairs (e.g. front black-and-white with back black-and-white)
- If needed, data for an additional image segment set (e.g. front greyscale with back greyscale) can be represented below the XML <frontOtherImage> level with the XML <backOtherImage> level.
- If preferred, data for an imaged IRD can be represented below the XML <frontIRImage> level with the XML <backIRImage> level.

10 Detailed Data Content of ANSI X9.100-182 XML Structure

10.1 Data Mapping: ANSI X9.100-187 File Header Record (Type 01)

Table R01. ANSI X9.100-187 File Header Record (Type 01) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 01) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	XML tag <docDescription> is mandatory. Suggested Value= "File Header (Type 01)"	<checkDocument> <checkData> <documentControl> <documentInfo> <docDescription> <destinationInfo> <sourceInfo>
01	Record Type	Assumed by XML path ...	<checkDocument> <checkData> <documentControl> <documentInfo>
	[XML Path]		<documentInfo>
02	Standard Level	Reassignment of this XML element for alternative use. ⁽⁶⁾ Shared with Field 14 in a common element. Recommended Value= "0102=[NN] 0114=[N]" Refer to Annex B for explanation of the XML shared field data format.	<standardNameAndVersion>
	[XML Path]		<documentInfo>
03	Test File Indicator		<testIndicator>

⁶ The proposed usage of XML element <standardNameAndVersion> to preserve ANSI X9.100-187 File Header Record (Type 01) Standard Level (Field 4) with Companion Document Indicator (Field 14) conflicts with the intended use of this element in ANSI X9.100-182. It is intended to contain the ANSI X9.100-182 schema version indicator for maintenance purposes. If the conflicting reuse is not acceptable for a particular adoption of the ANSI X9.100-182, then XML element <userText> within XML element <documentInfo> in the ANSI X9.100-182 schema can be used.

Field Nbr	Record (Type 01) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path]		<destinationInfo> <destinationID> <idRT>
04	Immediate Destination Routing Number		<fullRT>
	[XML Path]		<sourceInfo> <sourceID> <idRT>
05	Immediate Origin Routing Number		<fullRT>
	[XML Path]		<documentInfo>
06	File Creation Date	Represents the calendar or system date as recorded into the source file in the time zone of the file creating application. Preferred format is "YYYY-MM-DD". ⁽⁷⁾	<docCreateDate>
	[XML Path]		<documentInfo>
07	File Creation Time	Represents the local wall clock or system time as recorded into the source file in the time zone of the file creating application. Preferred format is "HH:MM:SS". ⁽⁸⁾	<docCreateTime>
	[XML Path]		<documentInfo>
08	Resend Indicator		<resendIndicator>
	[XML Path]		<destinationInfo>

⁷ Caution is advised when populating the XML date and time elements. Depending on the programming conventions used within the application creating the X9.100-182 XML document, the native 'date' and 'time' datatypes of the respective XML elements, as defined in the X9.100-182 XSD schema, can result in the output XML element containing a date or time format that is different from the preferred format. The variations may include, but are not limited to, the addition of an extraneous time zone indicator or a Universal Time Zone offset appended to the preferred format, or the value of the date or time in the preferred format being readjusted to reflect an offset to a universal time value. This in turn may affect a downstream application that later parses the XML document, which could result in something other than the desired original X9.100-187 field value being delivered to the parsing application. This caution applies to the transfer of any 'date' and 'time' fields that appear in various X9.100-187 records to X9.100-182 XML date and time elements.

⁸ Refer to previous footnote.

Field Nbr	Record (Type 01) Field Name	Comment	ANSI X9.100-182 XML Path
09	Immediate Destination Name	XML tag <bankName> is mandatory but may be empty	<bankName> or <bankName/>
	[XML Path]		<sourceInfo>
10	Immediate Origin Name	XML tag <bankName> is mandatory but may be empty	<bankName> or <bankName/>
	[XML Path]		<documentInfo> <docID>
11	File ID Modifier		<ID> <IDModifier>
12	Country Code	No XML tag element.	
	[XML Path]		<documentInfo>
13	User Field		<userText>
	[XML Path]		<documentInfo>
14	Companion Document Indicator ⁽⁹⁾	Reassignment of this element for alternative use. Refer to Field 2. Shared with Field 2 in a common element. Recommended Value= "0102=[NN] 0114=[N]" Refer to Annex B for explanation of the XML shared field data format.	<standardNameAndVersion>

⁹ File Header Record (Type 01) Companion Document Indicator (Field 14) was introduced with ANSI X9.100-187-2008, superseding File Header Record (Type 01) Reserved (Field 14) in the predecessor DSTU X9.37-2003.

10.2 Data Mapping: ANSI X9.100-187 File Cash Letter Header Record (Type 10)

Table R10. ANSI X9.100-187 Cash Letter Header Record (Type 10) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 10) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	XML tag <description> is mandatory. Suggested Value="Cash Letter Header (Type 10)"	<checkDocument> <checkData> <checkCollection> <collectionInfo> <description>
01	Record Type	Assumed by XML path ...	<checkDocument> <checkData> <checkCollection> <collectionInfo>
	[XML Path]		<collectionInfo>
02	Collection Type Indicator		<classification>
	[XML Path]	XML tag <bankName> is mandatory but may be empty.	<collectionInfo> <destinationInfo> <bankName/> <destinationID> <idRT>
03	Destination Routing Number		<fullIRT>
	[XML Path]	XML tag <bankName> is mandatory but may be empty.	<collectionInfo> <sourceInfo> <bankName/> <sourceID> <idRT>
04	ECE Institution Routing Number		<fullIRT>
	[XML Path]		<collectionInfo>
05	Cash Letter Business Date	Represents the local business date as recorded into the source cash letter in the time zone of the file creating application. Preferred format is "YYYY-MM-DD".	<businessDate>

Field Nbr	Record (Type 10) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path]		<collectionInfo>
06	Cash Letter Creation Date	Represents the local calendar or system date as recorded into the source cash letter in the time zone of the file creating application. Preferred format is “YYYY-MM-DD”.	<createDate>
	[XML Path]		<collectionInfo>
07	Cash Letter Creation Time	Represents the local wall clock or system time as recorded into the source cash letter in the time zone of the file creating application. Preferred format is “HH:MM:SS”.	<createTime>
	[XML Path]		<collectionInfo>
08	Cash Letter Record Type Indicator	No XML tag element. If needed, can be shared with Field 09 in a common element. Recommended Value= “1008=[X] 1009=[X]” Refer to Annex B for explanation of the XML shared field data format	<classificationQualifier>
	[XML Path]		<collectionInfo>
09	Cash Letter Documentation Type Indicator	No XML tag element. If needed, can be shared with Field 08 in a common element. Recommended Value= “1008=[X] 1009=[X]” Refer to Annex B for explanation of the XML shared field data format	<classificationQualifier>
	[XML Path]		<collectionInfo> <id>
10	Cash Letter ID		<ID>
	[XML Path]		<collectionInfo> <sourceInfo> <contactInfo>
11	Originator Contact Name		<contactName>

Field Nbr	Record (Type 10) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path]		<collectionInfo> <sourceInfo> <contactInfo>
12	Originator Contact Phone Number		<phone>
13	Fed Work Type	Refer to Field 15. If needed, can be shared with Field 15 in a common data element.	
14	Returns Indicator	Refer to Field 15. If needed, can be shared with Field 15 in a common data element.	
	[XML Path]		<collectionInfo>
15	User Field	Can be shared with Fields 13 and 14 in a common element. Recommended Value= "1013=[X] 1014=[X] 1015=[X]" Refer to Annex B for explanation of the XML shared field data format	<userText>
16	Reserved	No XML tag element.	

10.3 Data Mapping: ANSI X9.100-187 File Bundle Header Record (Type 20)

Table R20. ANSI X9.100-187 Bundle Header Record (Type 20) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 20) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	XML tag <description> is mandatory. Preferred Value= "Bundle Header (Type 20)"	<checkDocument> <checkData> <checkCollection> <checkBatch> <batchInfo> <description> <checkItem>
01	Record Type	Assumed by XML path ...	<checkDocument> <checkData> <checkCollection> <checkBatch> <batchInfo>
	[XML Path]		<batchInfo>
02	Collection Type Indicator		<classification>
	[XML Path]	XML tag <bankName> is mandatory but may be empty.	<batchInfo> <destinationInfo> <bankName/> <destinationID> <idRT>
03	Destination Routing Number		<fullIRT>
	[XML Path]	XML tag <bankName> is mandatory but may be empty.	<batchInfo> <sourceInfo> <bankName/> <sourceID> <idRT>
04	ECE Institution Routing Number		<fullIRT>
	[XML Path]		<batchInfo>

Field Nbr	Record (Type 20) Field Name	Comment	ANSI X9.100-182 XML Path
05	Bundle Business Date	Represents the local business date as recorded into the source bundle in the time zone of the file creating application. Preferred format is "YYYY-MM-DD".	<businessDate>
	[XML Path]		<batchInfo>
06	Bundle Creation Date	Represents the local calendar or system date as recorded into the source bundle in the time zone of the file creating application. Preferred format is "YYYY-MM-DD".	<createDate>
	[XML Path]		<batchInfo> <id>
07	Bundle ID		<ID>
	[XML Path]		<batchInfo> <id>
08	Bundle Sequence Number		<IDModifier>
	[XML Path]		<checkItem> <checkDetail> <captureInfo>
09	Cycle Number		<captureCycle>
10	Reserved	No XML tag element.	
	[XML Path]		<batchInfo>
11	User Field		<userText>
12	Reserved	No XML tag element.	

10.4 Data Mapping: ANSI X9.100-187 Check Detail Record (Type 25)

The mapping in the Check Detail Record (Type 25) table is based on the transfer of each MICR codeline content field, including Field 02, 03, 04, 05 and 06, to respective separate XML elements in the ANSI X9.100-182 XML document structure. No assumption is made as to the level of qualification of each field in the original X9.100-187 file Check Detail Record (Type 25).

Depending on the source of the ICL file, any field can be fully qualified, meaning that it contains only the normally applicable characters, for example, numerics, dash and possibly field delimiters. Alternatively, any field may contain optional characters, for example, read errors (*) or even complete blanks. As an example, files received from the inclearings exchange will contain at least a properly formatted Field 04 Payor Bank Routing Number and Field 05 Payor Bank Routing Number Check Digit. The Contents of Field 02 Auxiliary On-Ups, Field 03 External Processing Code and Field 06 On-Ups are also likely to be qualified, but this is not guaranteed. On the other hand, the content of any of Fields 02, 03, 04, 05 and 06 can never be guaranteed for ANSI X9.100-187 files delivered from any BOFD depository source such as merchant capture, branch capture, etc. These fields, including Field 04 Payor Bank Routing Number and Field 05 Payor Bank Routing Number Check Digit, may contain read errors (*) and may possibly be fully blank.

An optional approach is to retrofit a representation of raw check MICR codeline into an XML element, by using unqualified MICR content fields from the Check Detail Record (Type 25). For further information, refer to Annex C.

Table R25. ANSI X9.100-187 Check Detail Record (Type 25) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 25) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]		<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> </pre>
01	Record Type	Assumed by XML path, and by <checkItemType> enumeration value "Check"	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <checkItemType> <checkDetail> </pre>
	[XML Path]		<pre> <checkItem> <checkDetail> <micrCheckData> <sourceMICRInfo> <semiParsedMICR> </pre>

Field Nbr	Record (Type 25) Field Name	Comment	ANSI X9.100-182 XML Path
02	Auxiliary On-Ups		<checkAuxOnUs>
	[XML Path]		<checkItem> <checkDetail> <micrCheckData> <sourceMICRInfo> <semiParsedMICR>
03	External Processing Code		<checkEPC>
	[XML Path]		<checkItem> <checkDetail> <micrCheckData> <sourceMICRInfo> <semiParsedMICR>
04	Payor Bank Routing Number	Includes Field 05 Element tag <checkRT> is fixed 9 characters, and can contain any of the following in each position: numerics, dash, space [blank], read error (*)	<checkRT>
05	Payor Bank Routing Number Check Digit	Included in XML tag <checkRT>	
	[XML Path]		<checkItem> <checkDetail> <micrCheckData> <sourceMICRInfo> <semiParsedMICR>
06	On-Ups	XML tag <checkOnUs> contains all characters between the closing Amount symbol or document edge and the opening Routing Transit symbol (right to left), and includes data content plus all intervening OnUs symbols.	<checkOnUs>
	[XML Path]		<checkItem> <transactionAmount>
07	Item Amount		<amount>

Field Nbr	Record (Type 25) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path]		<checkItem> <checkDetail> <captureInfo>
08	ECE Institution Item Sequence Number		<captureSeqNum>
09	Documentation Type Indicator	No XML tag element. If needed, refer to Annex B.	
10	Return Acceptance Indicator	No XML tag element. If needed, refer to Annex B.	
11	MICR Valid Indicator	No XML tag element. If needed, refer to Annex B.	
12	BOFD Indicator	No XML tag element. If needed, refer to Annex B.	
13	Check Detail Record Addendum Count	No XML tag element. Equivalent to summation of <endorsements> tag occurrences.	
14	Correction Indicator	No XML tag element. If needed, refer to Annex B.	
15	Archive Type Indicator	No XML tag element. If needed, refer to Annex B.	

10.5 Data Mapping: ANSI X9.100-187 Check Detail Addendum A Record (Type 26)

Table R26. ANSI X9.100-187 Check Detail Addendum A Record (Type 26) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 26) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]		<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <endorsements> <payeeArea> <bofdArea> </pre>
01	Record Type	<p>Assumed by XML path ... All Check Detail Addendum A Record (Type 26) data is stored at these path levels.</p> <p>The maximum occurrences of <bofdArea> is 9, meaning a maximum of 9 Check Detail Addendum A Records (Type 26).</p>	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <endorsements> <payeeArea> <bofdArea> </pre>
	[XML Path]		<bofdArea>
02	Check Detail Addendum A Record Number	<p>Begins with value '1' for first Check Detail Addendum A Record (Type 26).</p> <p>Increments by +1 for each additional, up to a maximum of 9.</p>	<endorsementNumber>
	[XML Path]		<pre> <bofdArea> <endorsementRT> </pre>
03	Return Location Routing Number	<p>Options:</p> <p>1) fullRT, if 9 digits</p> <p>2) baseRT, if >0 & <9 digits</p>	<pre> <fullRT> ... or ... <baseRT> </pre>
	[XML Path]		<bofdArea>

Field Nbr	Record (Type 26) Field Name	Comment	ANSI X9.100-182 XML Path
04	BOFD / Endorsement Business Date	Represents the local business date as recorded into the source addendum record in the time zone of the addendum creating application. Recommended format is "YYYY-MM-DD".	<endorsementDate>
	[XML Path]		<bofdArea>
05	BOFD Item Sequence Number		<endorsementSequenceNumber>
	[XML Path]		<payeeArea>
06	Deposit Account Number at BOFD	Refers to one Check Detail Addendum A Record (Type 26) only. For other Check Detail Addendum A Records (Type 26), refer to Annex B. XML tag <bankRoutingNumber> is mandatory. Refer to Field 03 for value.	<bankRoutingNumber> <fullRT> ... or ... <baseRT> <bankAccountNumber>
07	BOFD Deposit Branch	Refer to Annex B	
	[XML Path]		<payeeArea>
08	Payee Name	Refers to one Check Detail Addendum A Record (Type 26) only. For other Check Detail Addendum A Records (Type 26), refer to Annex B.	<payeeName>
	[XML Path]		<bofdArea>
09	Truncation Indicator	XML tag Boolean Value 'Y' maps to 'True' Value 'N' maps to 'false' Both XML tags are mandatory and can be set to the same value.	<bofdIndicator> <truncationIndicator>
	[XML Path]		<bofdArea>
10	BOFD Conversion Indicator	XML tag Boolean Values '1','3','5' map to 'True' Values '0','2','4','6','7','8' map to 'False'. If actual values are needed, refer to Annex B.	<irdCreationIndicator>

Field Nbr	Record (Type 26) Field Name	Comment	ANSI X9.100-182 XML Path
11	BOFD Correction Indicator	Refer to Annex B	
12	User Field	Refer to Annex B	
13	Reserved	No XML tag element.	

10.6 Data Mapping: ANSI X9.100-187 File Check detail Addendum C Record (Type 28)

Table R28. ANSI X9.100-187 Check Detail Addendum C Record (Type 28) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 28) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]		<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <endorsements> <subsequentArea> </pre>
01	Record Type	Assumed by XML path ... All Check Detail Addendum C Record (Type 28) data is stored at this path level. Equivalent to the maximum occurrences of <subsequentArea> is 99, meaning a maximum of 99 Check Detail Addendum C Records (Type 28).	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <endorsements> <subsequentArea> </pre>
	[XML Path]		<subsequentArea>
02	Check Detail Addendum C Record Number	Begins with value '1' for first Check Detail Addendum C Record (Type 28). Increments by +1 for each additional, up to a maximum of 99.	<endorsementNumber>
	[XML Path]		<pre> <subsequentArea> <endorsementRT> </pre>
03	Endorsing Bank Routing Number	Options: 1) fullRT, if 9 digits 2) baseRT, if >0 & <9 digits	<pre> <fullRT> ... or ... <baseRT> </pre>
	[XML Path]		<subsequentArea>

Field Nbr	Record (Type 28) Field Name	Comment	ANSI X9.100-182 XML Path
04	BOFD / Endorsement Date	Represents the local business date as recorded into the source addendum record in the time zone of the addendum creating application. Recommended format is "YYYY-MM-DD".	<endorsementDate>
	[XML Path]		<subsequentArea>
05	Endorsing Bank Item Sequence Number		<endorsementSequenceNumber>
	[XML Path]		<subsequentArea>
06	Truncation Indicator	XML tag Boolean Value 'Y' is 'true' Value 'N' is 'false'	<truncationIndicator>
	[XML Path]		<subsequentArea>
07	Endorsing Bank Conversion Indicator	XML tag Boolean Values '1','3','5' map to 'True' Values '0','2','4','6','7','8' map to 'False'. If actual values must be retained, refer to Annex B.	<irdCreationIndicator>
08	Endorsing Bank Correction Indicator	Refer to Annex B.	
09	Return Reason	Refer to Annex B.	
10	User Field	Refer to Annex B.	
11	Endorsing Bank Identifier	Refer to Annex B.	
12	Reserved	No XML tag element.	

10.7 Data Mapping: ANSI X9.100-187 Return Record (Type 31)

Table R31. ANSI X9.100-187 Return Record (Type 31) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 31) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]		<checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem>
01	Record Type	Assumed by XML path, and by <checkItemType> enumeration value "QualifiedReturn"	<checkDocument> <checkData> <checkCollection> <checkBatch> <checkItemType> <checkItem>
	[XML Path]		<checkItem> <checkDetail> <micrCheckData> <sourceMICRInfo> <semiParsedMICR>
02	Payor Bank Routing Number	Includes Field 03	<checkRT>
03	Payor Bank Routing Number Check Digit	Included in XML tag <checkRT>	
	[XML Path]		<checkItem> <checkDetail> <micrCheckData> <sourceMICRInfo> <semiParsedMICR>
04	On-Us		<checkOnUs>
	[XML Path]		<checkItem> <transactionAmount>
05	Item Amount		<amount>

Field Nbr	Record (Type 31) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path]		<pre> <checkItem> <additionalCheckInfo> <payingBankInfo> <returnReasonInfo> </pre>
06	Return Reason		<pre> <returnReasonCode> </pre>
07	Return Record Addendum Count	No XML tag element. Equivalent to the summation of occurrences of the <bofdArea> elements plus <subsequentArea> elements within the <endorsements> element, plus allowance for a possible Return Addendum B Record (Type 33).	
08	Return Documentation Type Indicator	No XML tag element. If needed, refer to Annex B.	
	[XML Path]		<pre> <checkItem> <additionalCheckInfo> <inclearingInfo> </pre>
09	Forward Bundle Date		<pre> <bundleBusinessDate> </pre>
	[XML Path]		<pre> <checkItem> <checkDetail> <captureInfo> </pre>
10	ECE Institution Item Sequence Number		<pre> <captureSeqNum> </pre>
	[XML Path]		<pre> <checkItem> <checkDetail> <micrCheckData> <sourceMICRInfo> <semiParsedMICR> </pre>
11	External Processing Code		<pre> <checkEPC> </pre>
12	Return Notification Indicator	No XML tag element. If needed, refer to Annex B.	
13	Return Archive Type Indicator	No XML tag element. If needed, refer to Annex B.	

Field Nbr	Record (Type 31) Field Name	Comment	ANSI X9.100-182 XML Path
14	Number of Times Returned	No XML tag element. If needed, refer to Annex B.	
15	Reserved	No XML tag element.	

10.8 Data Mapping: ANSI X9.100-187 Return Addendum A Record (Type 32)

Table R32. ANSI X9.100-187 Return Addendum A Record (Type 32) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 32) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]		<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <endorsements> <payeearea> <bofdArea> </pre>
01	Record Type	<p>Assumed by XML path ... All Return Addendum A Record (Type 32) data is stored at these path levels.</p> <p>The maximum occurrences of <bofdArea> is 9, meaning a maximum of 9 Return Addendum A Records (Type 32).</p>	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <endorsements> <payeeArea> <bofdArea> </pre>
	[XML Path]		<bofdArea>
02	Return Addendum A Record Number	<p>Begins with value '1' for first Return Addendum A Record (Type 32). Increments by +1 for each additional, up to a maximum of 9.</p>	<endorsementNumber>
	[XML Path]		<pre> <bofdArea> <endorsementRT> <fullRT> ... or ... <baseRT> </pre>
03	Return Location Routing Number	<p>Options:</p> <ol style="list-style-type: none"> 1) fullRT, if 9 digits 2) baseRT, if >0 & <9 digits 	<pre> <fullRT> ... or ... <baseRT> </pre>
	[XML Path]		<bofdArea>

Field Nbr	Record (Type 32) Field Name	Comment	ANSI X9.100-182 XML Path
04	BOFD / Endorsement Business Date	Represents the local business date as recorded into the source addendum record in the time zone of the addendum creating application. Recommended format is "YYYY-MM-DD".	<endorsementDate>
	[XML Path]		<bofdArea>
05	BOFD Item Sequence Number		<endorsementSequenceNumber>
	[XML Path]		<payeeArea>
06	Deposit Account Number at BOFD	Refers to one Return Addendum A record (Type 32) only. For other Return Addendum A Records (Type 32), refer to Annex B. XML tag <bankRoutingNumber> is mandatory. Refer to Field 03 for value.	<bankRoutingNumber> <fullRT> ... or ... <baseRT> <bankAccountNumber>
07	BOFD Deposit Branch	Refer to Annex B	
	[XML Path]		<payeeArea>
08	Payee Name	Refers to one Return Addendum A Record (Type 32) only. For other Return Addendum A Records (Type 32), refer to Annex B.	<payeeName>
	[XML Path]		<bofdArea>
09	Truncation Indicator	XML tag Boolean Value 'Y' maps to 'True' Value 'N' maps to 'false' Both XML tags are mandatory and can be set to the same value.	<bofdIndicator> <truncationIndicator>
	[XML Path]		<bofdArea>
10	BOFD Conversion Indicator	XML tag Boolean Values '1','3','5' map to 'True' Values '0','2','4','6','7','8' map to 'False'. If actual values are needed, refer to Annex B.	<irdCreationIndicator>

Field Nbr	Record (Type 32) Field Name	Comment	ANSI X9.100-182 XML Path
11	BOFD Correction Indicator	Refer to Annex B	
12	User Field	Refer to Annex B	
13	Reserved	No XML tag element.	

10.9 Data Mapping: ANSI X9.100-187 Return Addendum B Record (Type 33)

Table R33. ANSI X9.100-187 Return Addendum B Record (Type 33) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 33) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	All Return Addendum B Record (Type 33) data is stored at three path levels ...	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <checkDetail> <micrCheckData> <nonMICRCheckData> <additionalCheckInfo> </pre>
01	Record Type	Not explicitly represented by any XML path. Data is stored at various XML path levels.	
	[XML Path]		<pre> <checkItem> <checkDetail> <nonMICRCheckData> <payingBank> </pre>
02	Payor Bank Name	XML tag <bankName> and XML tag <bankAddress> with sub-elements <street>, <city>, <stateProvince> and <postalCode> are mandatory but may be empty.	<pre> <bankName/> <bankAddress/> <street/> <city/> <stateProvince/> <postalCode/> </pre>
	[XML Path]		<pre> <checkItem> <checkDetail> <micrCheckData> <sourceMICRInfo> <semiParsedMICRData> <checkAuxOnUs> </pre>
03	Auxiliary On-U's		
	[XML Path]		<pre> <checkItem> <additionalCheckInfo> <payingBankInfo> </pre>

Field Nbr	Record (Type 33) Field Name	Comment	ANSI X9.100-182 XML Path
04	Payor Bank Item Sequence Number		<itemSeqNum>
	[XML Path]		<checkItem> <additionalCheckInfo> <payingBankInfo>
05	Payor Bank Business Date	Represents the local business date as recorded into the source addendum record in the time zone of the addendum creating application. Recommended format is "YYYY-MM-DD".	<bankBusinessDate>
	[XML Path]		<checkItem> <checkDetail> <nonMICRCheckData> <payorInfo>
06	Payor Account Name		<payorName>

10.10 Data Mapping: ANSI X9.100-187 Return Addendum D Record (Type 35)

Table R35. ANSI X9.100-187 Return Addendum D Record (Type 35) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 35) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]		<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <endorsements> <subsequentArea> </pre>
01	Record Type	Assumed by XML path ... All Return Addendum D Record (Type 35) data is stored at this path level. The maximum occurrences of <subsequentArea> is 99, meaning a maximum of 99 Return Addendum D Records (Type 35)	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <endorsements> <subsequentArea> </pre>
	[XML Path]		<subsequentArea>
02	Check Detail Addendum C Record Number	Begins with value '1' for first Return Addendum D Record (Type 35). Increments by +1 for each additional, up to a maximum of 99.	<endorsementNumber>
	[XML Path]		<pre> <subsequentArea> <endorsementRT> <fullRT> ... or ... <baseRT> </pre>
03	Endorsing Bank Routing Number	Options: 1) fullRT, if 9 digits 2) baseRT, if >0 & <9 digits	<pre> <subsequentArea> <endorsementRT> <fullRT> ... or ... <baseRT> </pre>
	[XML Path]		<subsequentArea>
04	Endorsing Bank Endorsement Date	Represents the local business date as recorded into the source addendum record in the time zone of the addendum creating application. Recommended format is "YYYY-MM-DD".	<endorsementDate>
	[XML Path]		<subsequentArea>

Field Nbr	Record (Type 35) Field Name	Comment	ANSI X9.100-182 XML Path
05	Endorsing Bank Item Sequence Number		<endorsementSequenceNumber>
	[XML Path]		<subsequentArea>
06	Truncation Indicator	XML tag Boolean Value 'Y' is 'true' Value 'N' is 'false'	<truncationIndicator>
	[XML Path]		<subsequentArea>
07	Endorsing Bank Conversion Indicator	XML tag Boolean Values '1','3','5' map to 'True' Values '0','2','4','6','7','8' map to 'False'. If actual values must be retained, refer to Annex B.	<irdCreationIndicator>
08	Endorsing Bank Correction Indicator	Refer to Annex B.	
09	Return Reason	Refer to Annex B.	
10	User Field	Refer to Annex B.	
11	Endorsing Bank Identifier	Refer to Annex B.	
12	Reserved	No XML tag element.	

10.11 Data Mapping: ANSI X9.100-187 Image View Detail Record (Type 50)

Table R50. ANSI X9.100-187 Image View Detail Record (Type 50) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 50) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	<p>XML tag <frontCheckImage> or <backCheckImage> identifies the respective front or back image of a check.</p> <p>If the image originated from an IRD, XML tags <frontIRDImage> and <backIRDImage> can be alternately used.</p> <p>A second check image set (e.g. one greyscale front with one greyscale back) could be accommodated by the respective XML tags <frontOtherImage> and <backOtherImage>.</p>	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <imageInfo> <frontCheckImage> <imageView> <backCheckImage> <imageView> </imageInfo> <frontIRDImage> <imageView> <backIRDImage> <imageView> </imageInfo> <frontOtherImage> <imageView> <backOtherImage> <imageView> </checkItem> </checkBatch> </checkCollection> </checkData> </checkDocument> </pre>
01	Record Type	Image View Detail Record (Type 50) and Image View Data record (Type 52) combined are assumed by this XML path ...	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <imageInfo> </pre>
	[XML Path]		<imageView>

Field Nbr	Record (Type 50) Field Name	Comment	ANSI X9.100-182 XML Path
02	Image Indicator	XML enumerations: “Actual Item Image” “Not Actual Item Image” “Unable to determine”. Value=“Actual Item Image” is assumed	<imageIndicator>
	[XML Path]		<imageView> <imageCreatorInfo> <imageCreatorRT>
03	Image Creator Routing Number	Options: 1) fullRT, if 9 digits 2) baseRT, if >0 & <9 digits	<fullRT> ... or ... <baseRT>
	[XML Path]		<imageView> <imageCreatorInfo>
04	Image Creator Date	Represents the local business date as recorded into the source image detail record in the time zone of the image record creating application. Recommended format is “YYYY-MM-DD”.	<imageCreatorDate>
	[XML Path]		<imageView> <imageViewInfo> <imageformat>
05	Image View Format Indicator	XML enumerations: “TIFF” “JPEG” In most cases, Value=“TIFF” (black-and-white image) is assumed	<Baseline>
	[XML Path]		<imageView> <imageViewInfo> <imagecompression>
06	Image View Compression Algorithm Identifier	XML enumerations: “CCITTG4” “JPEGBaseline” In most cases, Value=“CCITTG4” (black-and-white image) is assumed	<Baseline>

Field Nbr	Record (Type 50) Field Name	Comment	ANSI X9.100-182 XML Path
07	Image View Data Size	No XML tag element. Non-transferable data.	
	[XML Path]		<imageInfo>
08	View Side Indicator	Indicated via the specific XML path for 'Front' or 'Back'	<frontCheckImage> <backCheckImage>
	[XML Path]		<imageView>
09	View Descriptor	Assume only full image in current ANSI X9.100-187 file usage. For full image, XML enumeration is "Actual Image Item"	<imageIndicator>
10	Digital Signature Indicator	No XML tag element. Assume not present in current ANSI X9.100-187 file usage. Indicated by absence of path ...	<imageView> <imageViewInfo> <imageSecurity>
11	Digital Signature Method	Assume not present in current ANSI X9.100-187 file usage	
12	Security Key Size	Assume not present in current ANSI X9.100-187 file usage	
13	Start of Protected Data	Assume not present in current ANSI X9.100-187 file usage	
14	Length of Protected Data	Assume not present in current ANSI X9.100-187 file usage	
15	Image Recreate Indicator	No XML tag element. If needed, refer to Annex B.	
16	User Field	No XML tag element. If needed, refer to Annex B.	
17	Image TIFF Variance Indicator	No XML tag element. If needed, refer to Annex B.	
18	Override Indicator	No XML tag element. If needed, refer to Annex B.	
19	Reserved	No XML tag element.	

10.12 Data Mapping: ANSI X9.100-187 Image View Data Record (Type 52)

Table R52. ANSI X9.100-187 Image View Data Record (Type 52) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 52) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	<p>XML tag <frontCheckImage> or <backCheckImage> identifies the respective front or back image of a check.</p> <p>If the image originated from an IRD, XML tags <frontIRDImage> and <backIRDImage> can be alternately used.</p> <p>A second check image set (e.g. one greyscale front with one greyacale back) could be accommodated by the respective XML tags <frontOtherImage> and <backOtherImage>.</p>	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <imageInfo> <frontCheckImage> <imageView> <backCheckImage> <imageView> <imageInfo> <frontIRDImage> <imageView> <backIRDImage> <imageView> <imageInfo> <frontOtherImage> <imageView> <backOtherImage> <imageView> </pre>
01	Record Type	Image View Detail Record (Type 50) and Image View Data record (Type 52) combined are assumed by this XML path ...	<pre> <checkDocument> <checkData> <checkCollection> <checkBatch> <checkItem> <imageInfo> </pre>
02	ECE Institution Routing Number	Refer to Bundle Header Record (Type 20) Field 04. Stored in respective XML path.	

Field Nbr	Record (Type 52) Field Name	Comment	ANSI X9.100-182 XML Path
03	Bundle Business Date	Refer to Bundle Header Record (Type 20) Field 05. Stored in respective XML path.	
04	Cycle Number	Refer to Bundle Header Record (Type 20) Field 09. Stored in respective XML path.	
05	ECE Institution Item Sequence Number	Refer to Check Detail Record (Type 25) Field 08. Stored in respective XML path.	
06	Security Originator Name	Assume not present in current ANSI X9.100-187 file usage. Refer to Image View Detail Record (Type 50) Field 10	
07	Security Authenticator Name	Assume not present in current ANSI X9.100-187 file usage. Refer to Image View Detail Record (Type 50) Field 10	
08	Security Key Name	Assume not present in current ANSI X9.100-187 file usage. Refer to Image View Detail Record (Type 50) Field 10	
09	Clipping Origin	Assume not present in current ANSI X9.100-187 file usage. Refer to Image View Detail Record (Type 50) Field 09	
10	Clipping Coordinate h1	Assume not present in current ANSI X9.100-187 file usage. Refer to Field 09.	
11	Clipping Coordinate h2	Assume not present in current ANSI X9.100-187 file usage. Refer to Field 09.	
12	Clipping Coordinate v1	Assume not present in current ANSI X9.100-187 file usage. Refer to Field 09.	
13	Clipping Coordinate v2	Assume not present in current ANSI X9.100-187 file usage. Refer to Field 09.	

Field Nbr	Record (Type 52) Field Name	Comment	ANSI X9.100-182 XML Path
14	Length of Image Reference Key	Assume not present in current ANSI X9.100-187 file usage.	
15	Image Reference Key	Assume not present in current ANSI X9.100-187 file usage.	
16	Length of Digital Signature	Assume not present in current ANSI X9.100-187 file usage.	
17	Digital Signature	Assume not present in current ANSI X9.100-187 file usage.	
18	Length of Image Data	Not needed. Refer to Field 19.	
19	Image Data	Separate image binary store. Refer to Section 7.4. Image Binary Data.	

10.13 Data Mapping: ANSI X9.100-187 File Bundle Control Record (Type 70)

Table R70. ANSI X9.100-187 Bundle Control Record (Type 70) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 70) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	XML tag <totalItemCount> is mandatory. Equivalent to a count of debit items within an ANSI X9.100-187 bundle.	<checkDocument> <checkData> <checkCollection> <checkBatch> <batchSummary> <totalItemCount>
01	Record Type	Assumed by XML path ...	<checkDocument> <checkData> <checkCollection> <checkBatch> <batchSummary>
			<batchSummary>
02	Items Within Bundle Count	Assumes all bundle items are considered debits, 'Check' or 'Return'. The value of the element may represent one single item or it may represent multiple items. Refer to Annex A.	<totalDebitItemCount>
	[XML Path]		<batchSummary>
03	Bundle Total Amount	Assumes all bundle items are considered debits, 'Check' or 'Return'. The value of the element may represent one single item or it may represent multiple items. Refer to Annex A.	<totalDebitAmount>
04	MICR Valid Total Amount	Refer to Field 06. If needed, can be shared with Field 06 in a common data element.	
	[XML Path]		<batchSummary>
05	Images Within Bundle Count		<totalBatchmageViews>
	[XML Path]		<batchSummary>

Field Nbr	Record (Type 70) Field Name	Comment	ANSI X9.100-182 XML Path
06	User Field	Can be shared with Field 04 in a common data element. Recommended Value= "7004=[X] 7006=[X]" Refer to Annex B for explanation of the XML shared field data format.	<userText>
07	Reserved	No XML tag element. Non-transferable data.	

10.14 Data Mapping: ANSI X9.100-187 File Cash Letter Control Record (Type 90)

Table R90. ANSI X9.100-187 Cash Letter Control Record (Type 90) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 90) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	XML tag <totalItemCount> is mandatory. Equivalent to a count of debit items within an ANSI X9.100-187 cash letter.	<checkDocument> <checkData> <checkCollection> <collectionSummary> <totalItemCount>
01	Record Type	Assumed by XML path ...	<checkDocument> <checkData> <checkCollection> <collectionSummary>
	[XML Path]		<collectionSummary>
02	Bundle Count		<totalBatchCount>
			<collectionSummary>
03	Items Within Cash Letter Count	Assumes all cash letter items are considered debits, 'Check' or 'Return'. The value of the element may represent one single item or it may represent multiple items. Refer to Annex A.	<totalDebitItemCount>
	[XML Path]		<collectionSummary>
04	Cash Letter Total Amount	Assumes all cash letter items are considered debits, 'Check' or 'Return'. The value of the element may represent one single item or it may represent multiple items. Refer to Annex A.	<totalDebitAmount>
	[XML Path]		<collectionSummary>
05	Images Within Cash Letter Count		<totalCollectionImageViews>
	[XML Path]		<collectionSummary>

Field Nbr	Record (Type 90) Field Name	Comment	ANSI X9.100-182 XML Path
06	ECE Institution Name	No XML data element. If needed, can be shared with Field 07 in a common data element. Recommended Value= "9006=[X] 9007=[X]" Refer to Annex B for explanation of the XML shared field data format.	<userText>
	[XML Path]		<collectionSummary>
07	Settlement Date	No XML data element. If needed, can be shared with Field 06 in a common data element. Recommended Value= "9006=[X] 9007=[X]" Refer to Annex B for explanation of the XML shared field data format.	<userText>
08	Reserved	No XML tag element.	

10.15 Data Mapping: ANSI X9.100-187 File File Control Record (Type 99)

Table R99. ANSI X9.100-187 File Control Record (Type 99) to ANSI X9.100-182 Part 2-1

Field Nbr	Record (Type 99) Field Name	Comment	ANSI X9.100-182 XML Path
	[XML Path for record]	XML tag <totalItemCount> is mandatory. Equivalent to a count of debit items within an ANSI X9.100-187 file. XML tag <totalBatchCount> is mandatory, and can be derived from summation of XML <checkItemBatch> occurrences.	<checkDocument> <checkData> <documentSummary> <totalBatchCount> <totalItemCount>
01	Record Type	Assumed by XML path ...	<checkDocument> <checkData> <documentSummary>
	[XML Path]		<documentSummary>
02	Cash Letter Count		<totalCollectionCount>
03	Total Record Count	No XML tag element. Not needed for reconciliation as other data is available.	
	[XML Path]		<documentSummary>
04	Total Item Count	Assumes all file items are considered debits, 'Check' or 'Return'. The value of the element may represent one single item or it may represent multiple items. Refer to Annex A.	<totalDebitItemCount>
	[XML Path]		<documentSummary>
05	File Total Amount	Assumes all file items are considered debits, 'Check' or 'Return'. The value of the element may represent one single item or it may represent multiple items. Refer to Annex A.	<totalDebitAmount>
	[XML Path]		<documentSummary>

Field Nbr	Record (Type 99) Field Name	Comment	ANSI X9.100-182 XML Path
06	Immediate Origin Contact Name	No XML data element. If needed, can be shared with Field 07 in a common data element. Recommended Value= "9906=[X] 9907=[X]" Refer to Annex B for explanation of the XML shared field data format.	<userText>
	[XML Path]		<documentSummary>
07	Immediate Origin Contact Phone Number	No XML data element. If needed, can be shared with Field 67 in a common data element. Recommended Value= "9906=[X] 9907=[X]" Refer to Annex B for explanation of the XML shared field data format.	<userText>
08	Reserved	No XML tag element.	

Annex A (informative)

Transforming and Carrying Item Data – ANSI X9.100-187 File to ANSI X9.100-182 Part 2-1 XML Document

A.1 Transforming and Carrying Data within an Organization

In a software application model for financial image exchange, the ANSI X9.100-187 formatted image and data file is typically the beginning or the end object in the intra-organization steps of the processing and storage of images and data. However, in a fixed file format, the image segments and the data associated with items on the file are inaccessible to applications that must process the individual payment items.

In a typical image file receive operation, the first step in the process is to parse the file with a software application, breaking it down into individual items of associated data and image segments. From that point on, the individual items remain separate and individually accessible by processing applications, although the items may still retain some loose level of association with one another, as they originated from a common file.

The same principle applies to the delivery of an image file. Software applications typically collect together various items, including their data and images, according to a pre-determined relationship of the items with one another. The items are then relegated to a common image file, which can then be delivered to a receiving entity as a unit block of inseparable payments.

The ANSI X9.100-182 XML document format presents a solution for a standardized way to disassociate items from an ANSI X9.100-187 image file in favour of a looser and more programmatically accessible form of the individual items. The items can then optionally move about the organization from application to application in this format, if desired. In a similar fashion, a group of related items could be assembled together by applications, using the ANSI X9.100-182 standard XML format, from where they can be transformed to the final output medium in the form of a fixed ANSI X9.100-187 image file.

Figure A1 depicts how such a procedure for the transformation and carriage of items could be used within an organization to receive image files on inbound delivery, to process the payments among various applications, and finally to assemble an image file for outbound delivery.

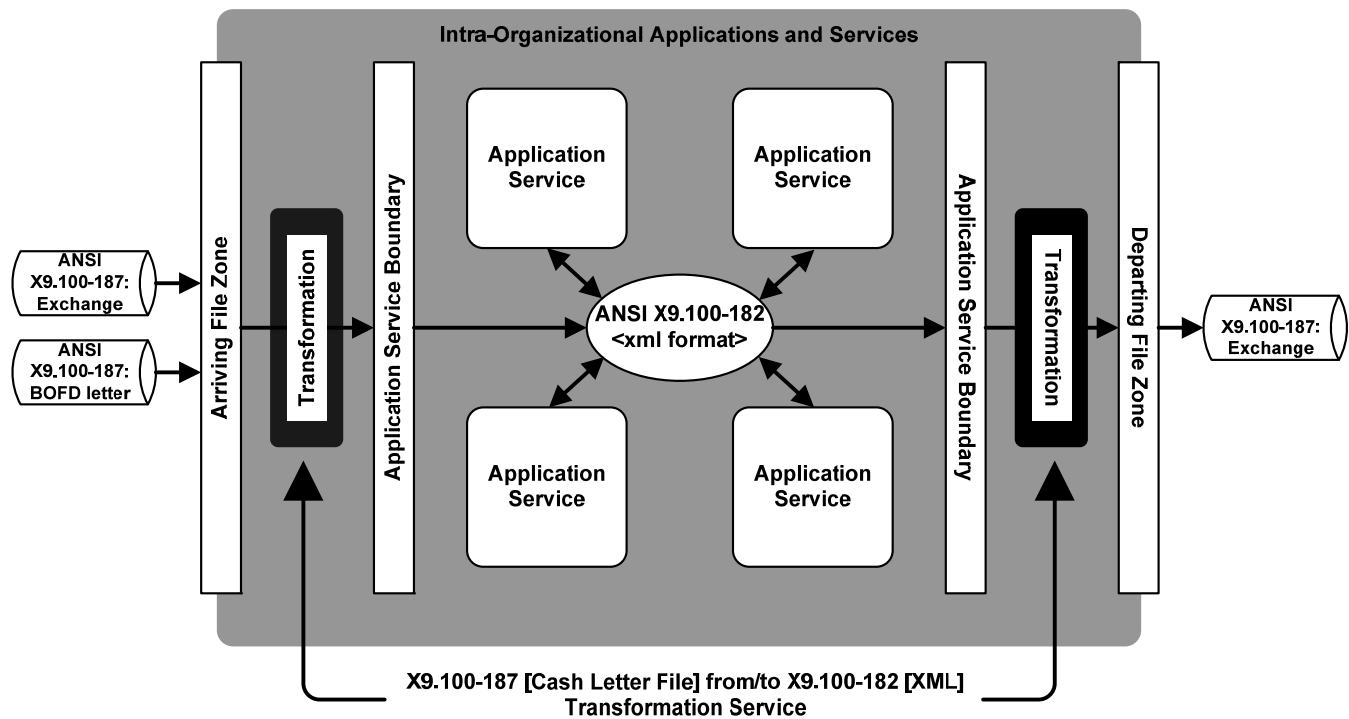


Figure A1. Intra-Organizational Use of ANSI X9.100-182 XML Formatted Items

A.2 Transfer Models for Item Data

This Technical Report provides a basic guideline for ANSI X9.100-187 to ANSI X9.100-182 Part 2-1 mapping procedures that can be applied to different data transfer models. Each data transfer model begins with an ANSI X9.100-187 image cash letter file that is assumed to contain multiple items embedded within multiple bundles, which in turn are embedded within multiple cash letters. Different transfer models, however, can result in different output ANSI X9.100-182 XML structures.

The examples in this Annex are not all inclusive. Rather, they are indicative of possible scenarios for each resultant XML document that is output from a data transfer process. Figures A1, A2 and A3 depict the specific transfer model scenarios discussed in this Annex. The high level and detailed specifications for the XML structures referenced in the diagrams can be found in Sections 9 and 10 respectively.

A.2.1 Model #1: Multi-Item XML Document

In this model, there is a single resultant ANSI X9.100-182 Part 2-1 XML document that contains all the items from the original ANSI X9.100-187 file. The structure of the original bundles and original cash letters from the file are preserved with regards to item content and value within the output bundles, cash letters and the overall XML document file.

This data transfer model is useful if the application that will receive and process the ANSI X9.100-182 Part 2-1 XML document expects to all process the original items contained within the XML document as a cohesive set. An example of such an application may be a downstream second-stage transaction processing system that requires all original items to be presented within an integrated unit of work.

A.2.2 Model #2: Independent Single-Item XML Documents

In this model, there are multiple resultant ANSI X9.100-182 Part 2-1 XML documents, one for each of the items on the original ANSI X9.100-187 cash letter file. Each separate item-level XML document is fully complete and correctly formed as an XML document object. The single item that is represented in the XML document is alone within its own bundle, which is alone within its own cash letter, which is alone within the XML document file. Furthermore, the <totalDebitItemCount> and <totalDebitAmount> XML elements within the ANSI X9.100-182 Part 2-1 XML document, at the bundle control level, at the cash letter control, and at the file control level, reflect the fact that there is only this single item in the XML document file. This renders the XML document to be fully self-contained, with self-checking financial integrity (i.e. the single item balances to the totalling elements).

This data transfer model is useful if the application that will receive and process the multiple ANSI X9.100-182 Part 2-1 XML documents expects to process each item from the original ANSI X9.100-187 file individually and completely independent of one another. An example of such an application may be a downstream system that loads the additional check image data from the ANSI X9.100-187 addendum records associated with an item into a check image data archive.

A.2.3 Model #3: Dependent Single-Item XML Documents

This model is similar to the Independent Single-Item XML Document model, with one exception.

The <totalDebitItemCount> and <totalDebitAmount> XML elements within the ANSI X9.100-182 Part 2-1 XML document, at the bundle control level, at the cash letter control, and at the file control level, each reflect the values as extracted from the original respective bundle control, cash letter control and file control records on the ANSI X9.100-187 file that contained the original item. The XML Document will be self contained, but it does not have traditional self-checking financial integrity. Whereas the XML document contains only one item of a particular value, the totalling elements contain values that represent an aggregate number of items and an aggregate dollar value for multiple items.

This data transfer model is useful if the application that will receive and process the ANSI X9.100-182 Part 2-1 XML documents expects to process each item from the original ANSI X9.100-187 file individually and independent of one another, but it still expects to maintain a loose relative association of each item to the original ANSI X9.100-187 file from which they were individually extracted. An example of such an application may be a downstream system that loads data from ANSI X9.100-187 control, item and addendum records into a data store for each item, from where is intended to be used for item level tracing and research.

A.3 Data Transfer Models – Diagrams

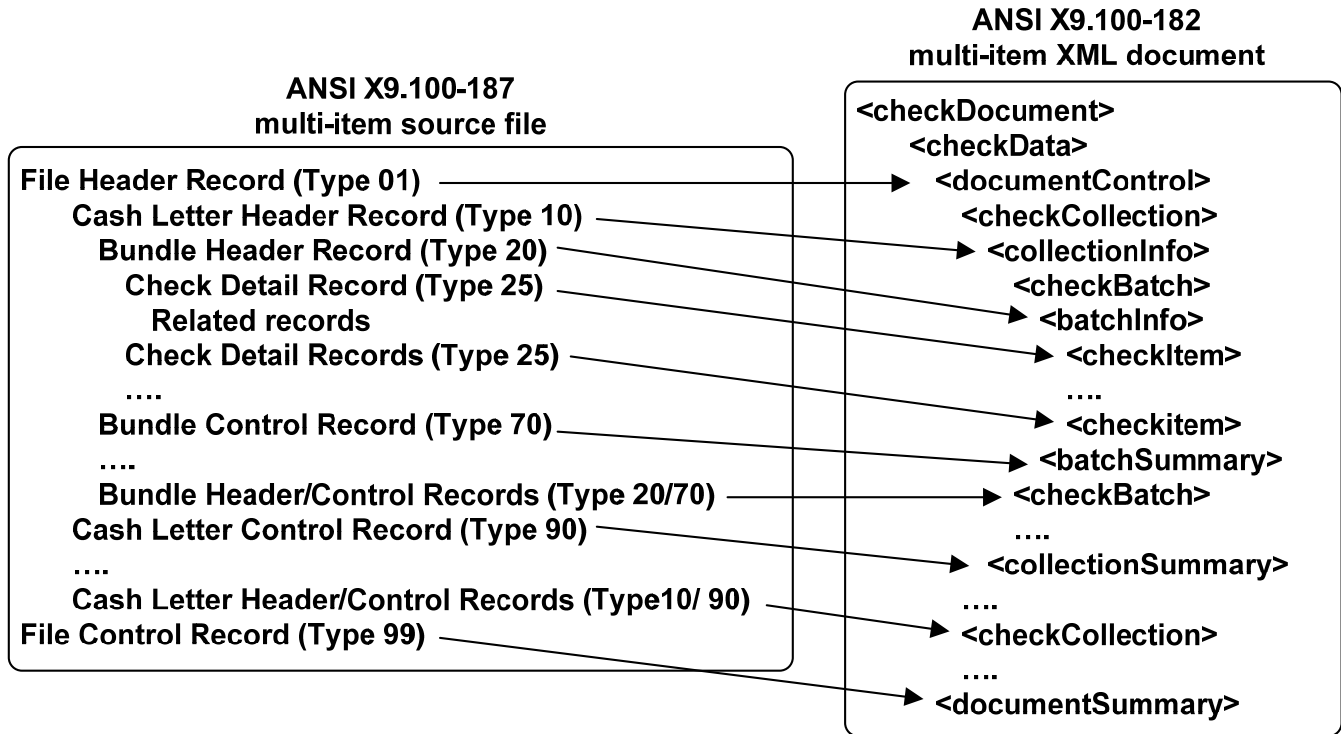


Figure A2. Transfer Model: Multi-Item XML Document

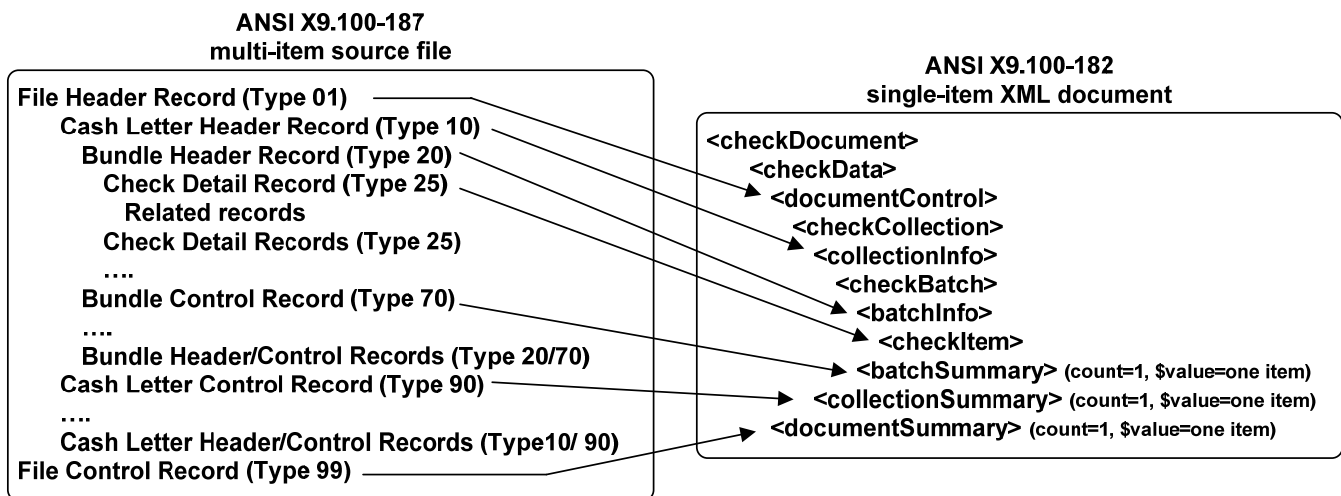


Figure A3. Transfer Model: Independent Single-Item XML Documents

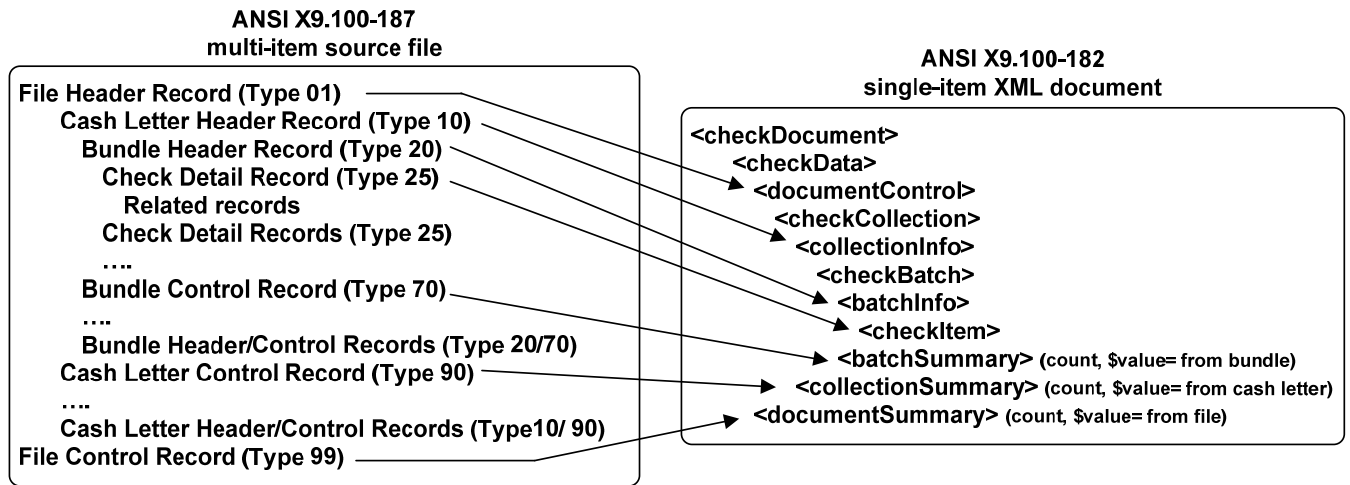


Figure A4. Transfer Model: Dependent Single-Item XML Documents

Annex B (normative)

Preservation of ANSI X9.100-187 Record Fields Not Represented in ANSI X9.100-182 Part 2-1 XML Structure

B.1 Preservation of ‘Transferable’ Addendum Record Information

Information arriving on an ANSI X9.100-187 image cash letter file may have to be preserved in its original state, for subsequent transfer to another ANSI X9.100-187 file. The specific business need is to deliver back to the presenter of a forward image check item, all the content of addendum records, should the item later be returned via image exchange.

The use of the ANSI X9.100-187 image cash letter file structure for payment exchange principally involves Bank of First Deposit addendum information and subsequent processing Endorsement addendum information, which are manifested in the Check Detail Addendum A Record (Type 26) / Return Addendum A Record (Type 32) pair, and the Check Detail Addendum C Record (Type 28) / Return Addendum D Record (Type 35) pair respectively. Other addendum records are not pertinent to this discussion.

B.2 ANSI X9.100-187 Addendum Structure

The ANSI X9.100-187 standard supports the following basic structure:

- Check Detail Record (Type 25)
 - ⇒ Accommodates up to a theoretical aggregation of 99 total addendum records that follow
- Check Detail Addendum A Record (Type 26)
 - ⇒ For BOFD and depositor information – up to a theoretical maximum of 9 records
- Check Detail Addendum C Record (Type 28)
 - ⇒ For endorsement information – up to a theoretical maximum of 99 records
- Return Record (Type 31)
 - ⇒ Accommodates up to a theoretical aggregation of 99 total addendum records that follow
- Return Addendum A Record (Type 32)
 - ⇒ For BOFD and depositor information – up to a theoretical maximum of 9 records
- Return Addendum D Record (Type 35)
 - ⇒ For endorsement information – up to a theoretical maximum of 99 records

B.3 ANSI X9.100-182 Part 2-1 Addendum Structure

The ANSI X9.100-182 Part 2-1 standard supports the following basic structure:

<checkItem> represents the equivalent of a Check Detail Record (Type 25)

<endorsements>

Represents the start of data for the equivalent of all Check Detail Addendum A Records (Type 26), plus all Check Detail Addendum C Records (Type 28)

<payeeArea>

Represents certain additional data content for the equivalent of one Addendum A record – this is not repeatable for holding similar data content from other Addendum A records

<bofdArea>

Represents BOFD data for the equivalent of one Check Detail Addendum A Record (Type 26), repeatable to a maximum of 9

<subsequentArea>

Represents Endorsement data for the equivalent of one Check Detail Addendum C Record (Type 28), repeatable to a maximum of 99

<checkItem> represents the equivalent of a Return Record (Type 31)

<endorsements>

Represents the start of data for the equivalent of all Return Addendum A Records (Type 32), plus all Return Addendum D Records (Type 35)

<payeeArea>

Represents certain additional data content for the equivalent of one Addendum A record – this is not repeatable for holding similar data content from other Addendum A records

<bofdArea>

Represents BOFD data for the equivalent of one Return Addendum A Record (Type 32), repeatable to a maximum of 9

<subsequentArea>

Represents Endorsement data for the equivalent of one Return Addendum D Record (Type 35), repeatable to a maximum of 99

B.4 ANSI X9.100-182 Part 2-1 Data Structure for Unrepresented ANSI X9.100-187 Record Data Fields

Retention of ANSI X9.100-187 record data fields that do not have equivalent XML elements in the ANSI X9.100-182 XML structure is managed through the use of structured data content in the XML element <userText> that is beneath each XML element <checkItem>.

B.4.1 Basic <userText> XML Path Mapping

```

<checkDocument>
  <checkData>
    <checkCollection>
      <checkBatch>
        <checkItem>
          <userText>
  
```

B.4.2 XML Element <userText> Sub-Field Structure

“field-identifier = [content] field-identifier = [content]” etc.

B.4.3 <userText> “field-identifier” Keyword Structure

B.4.3.1 RRFN (for Addendum Records Type 26, 28, 32, 35)

- ⇒ RR is the two-digit ANSI X9.100-187 record type from Record Type (Field 1) in the respective source addendum record (Type 26, 28, 32 or 35)
- ⇒ FF is the two-digit field number within the respective ANSI X9.100-187 source record (01, 02, etc)
- ⇒ NN is the two-digit Record Number of the respective source addendum record (01, 02, etc.). This is located in:
 - Check Detail Addendum A Record (Type 26) Check Detail Addendum A Record Number (Field 2)
 - Check Detail Addendum C Record (Type 28) Check Detail Addendum C Record Number (Field 2)
 - Return Addendum A Record (Type 32) Return Addendum A Record Number (Field 2)
 - Return Addendum D Record (Type 35) Return Addendum D Record Number (Field 2)

B.4.3.2 RRFN (for non-repeating non-Addendum records eg. Type 31)

- ⇒ RR is the two-digit ANSI X9.100-187 record type from Record Type (Field 1) in the respective source addendum record (eg Type 31)
- ⇒ FF is the two-digit field number within the respective ANSI X9.100-187 source record (01, 02, etc)
- ⇒ NN is set to ‘01’

B.4.4 <userText> “[content]” Value Structure

- “content” is the actual data content as extracted from the field in the respective ANSI X9.100-187 record.
 - ⇒ Blanks that lead, trail, or are contained within the source field can be preserved as needed in the overall character representation, or can be removed if appropriate.

- ⇒ A completely blank field in the source record can be represented by a single blank or by the total absence of characters in the “content”.
- “[” and “]” (left and right square brackets) are fixed characters acting as delimiters. They are present even if there is no character content between them from the original record.

B.5 Examples of Addendum Data Preservation

Table B1. Examples of ANSI X9.100-187 Record Data in ANSI X9.100-182 <userText> Element

Field Value	Interpretation	Transaction Flow and ANSI X9.100-182 Representation
261001=[2]	<ul style="list-style-type: none"> • Check Detail Addendum A Record (Type 26). • BOFD Conversion Indicator (Field 10). • Value means “Original Paper Converted to Image”. • First Check Detail Addendum A Record (Type 26). 	<ul style="list-style-type: none"> • A Check Detail Record (Type 25) arrives from the exchange. <ul style="list-style-type: none"> ○ A Check Detail Addendum A Record (Type 26) with BOFD information record is attached. • The ANSI X9.100-182 schema does not have an element in the <endorsements><bofdArea> path to explicitly store the value from Check Detail Addendum A Record (Type 26) BOFD Conversion Indicator (Field 10).
280903=[A]	<ul style="list-style-type: none"> • Check Detail Addendum C Record (Type 28). • Return Reason (Field 9). • Value means “NSF Not Sufficient Funds”. • Third Check Detail Addendum C Record (Type 28). 	<ul style="list-style-type: none"> • A Check Detail Record (Type 25) previously arrived from the exchange. <ul style="list-style-type: none"> ○ A Check Detail Addendum C Record (Type 28) with endorsement information was attached. • The item was returned via a Return Record (Type 31). <ul style="list-style-type: none"> ○ The original Check Detail Addendum C Record (Type 28) was reversed to a Return Addendum D Record (Type 35). ○ An additional new Return Addendum D Record (Type 35) was attached. • The Check Record (Type 25) again arrives from the exchange as an image representment following a redeposit. • Three Check Detail Addendum C Records (Type 28) are attached. <ul style="list-style-type: none"> ○ The first and second are the reversal of the original Return Addendum D Records (Type 35) attached to the Return Record (Type 31). ○ The third is an additional new Check Detail Addendum C Record (Type 28) that was attached. • By convention, the new Check Detail Addendum C Record (Type 28) contains Return Reason (Field 09), as transferred from Return Record (Type 31) Return Reason (Field 6). • The ANSI X9.100-182 schema does not have an element in the <endorsements><subsequentArea> path to explicitly store the value from Check Detail Addendum C Record (Type 28) Return Reason (Field 09).

Field Value	Interpretation	Transaction Flow and ANSI X9.100-182 Representation
<p>260602= [7778889]</p>	<ul style="list-style-type: none"> • Check Detail Addendum A Record (Type 26). • Field 06 'Deposit Account Number at BOFD'. • Value '7778889' is Depositing Customer Account Number. • Type 26 record # 2. 	<ul style="list-style-type: none"> • A Check Detail Record (Type 25) previously arrived from the exchange. <ul style="list-style-type: none"> ○ A Check Detail Addendum A Record (Type 26) containing BOFD information was attached. The record also contained the original depositor's account number. • The item was returned via a Return Record (Type 31). <ul style="list-style-type: none"> ○ The original Check Detail Addendum A Record (Type 26) was reversed to a Return Addendum A Record (Type 32). • The Check Detail Record (Type 25) again arrives from the exchange as an image representation following a redeposit. <ul style="list-style-type: none"> ○ Two Check Detail Addendum A records (Type 26) are attached. ○ The first (#1) is the reversal of the original Return Addendum A Record (Type 32) attached to the Return Record (Type 31). ○ The second (#2) is an additional new Check Detail Addendum A Record (Type 26) that was attached. • The new Check Detail Addendum A Record (Type 26) contains a different depositor account number in Field 06, as the depositor chose to transact the re-deposit against a different account. • The ANSI X9.100-182 schema does not have an element in the <endorsements><bofdArea> path to explicitly store the value from Check Detail Addendum A Record (Type 26) Field 06 for any other than the first Check Detail Addendum A Record (Type 26).

Annex C (normative)

Unparsed MICR Codeline Representation from Parsed MICR Fields

C.1 Including Unparsed MICR Codeline Field Content in an EML Element

The fields within the ANSI X9.100-187 source file Check Detail Record (Type 25) that represent the MICR codeline fields from the original truncated check can be placed together into a common ANSI X9.100-182 Part 2-1 XML element <unparsedMICR>, to reflect the original MICR codeline content as it would have been extracted from the truncated check. XML element <unparsedMICR> can be placed in the ANSI X9.100-182 business document in place of the XML element <semiParsedMICR>, or it can coexist with the XML element <semiParsedMICR>.

The XML path to the elements <semiParsedMICR> and <unparsedMICR> is as follows:

```

<checkDocument>
  <checkData>
    <checkCollection>
      <checkBatch>
        <checkItem>
          <checkDetail>
            <micrCheckData>
              <sourceMICRInfo>
                <semiParsedMICR> <! -- optional -->
                <unparsedMICR> <! -- optional -->

```

C.2 Constructing the XML Element <unparsedMICR>

Because the XML element <unparsedMICR> is the common receptacle for data that originates from up to six separate fields in the Check Detail Record (Type 25), certain rules must be applied to the formation of the composite data in the XML element. This will ensure that the content can be later decomposed into its original component parts by any downstream application program that has a need to separate the field content back to the original MICR codeline field representations

The format of the <unparsedMICR> field conveys a logical view of the representation of the original MICR codeline from the check, as it passed through a transport MICR read head, to be subsequently stored as 'raw MICR data' in a transport buffer. The format includes all MICR characters as encountered by the read head, from right to left off the MICR codeline band. However, the data is placed in a left-to-right orientation in the XML element <unparsedMICR>, which is more intuitive. The characters representing the original MICR line content are:

- Numerical digits 0 to 9
- Dash '-'
- Asterisk '*' (representing a read error)
- Blank (representing white space)
- Dollar '\$' (representing opening and closing amount symbols)
- Pound sign '#' (representing opening and closing routing transit symbols)
- Forward slash '/' (representing opening and closing OnUs symbols)

Table C1 presents the format and content of the MICR codeline as it would appear on the original check codeline band. The ANSI X9.100-160-1 and ANSI X9.100-160-2 standards provide details on the actual placement of MICR codeline fields on a physical check.

Table C2 is a representation of the content from the original MICR codeline as it would appear in a properly formatted <unparsedMICR> XML element. The representation is intended to cover all possible allowable variations of MICR codeline band information, which can also include no content whatsoever.

Table C3 presents simple rules that can be used to transfer the content of the various MICR codeline fields from the Check Detail Record (Type 25) to the <unparsedMICR> XML element, resulting in the proper format.

Table C1. Standard MICR Line Format (left-to-right: visual appearance on the printed check)

Check Item MICR Field Content	Check Item MICR Field Values	Cross Reference to Table C2
MICR Auxiliary OnUs (with close/open symbols)	/ SerialNumber-value /	Field Ref 13 - 15
MICR EPC	EPC-value	Field Ref 12
MICR RoutingTransit (with close/open symbols)	# RoutingTransit-value #	Field Ref 9 - 11
MICR OnUs (with close/open symbols)	other-value / AccountNumber-value / ProcessControl-value	Field Ref 4 - 8
MICR Amount (with close/open symbols) [if MICR amount encoding is represented on the check]	\$ Amount-value \$	Field Ref 1 - 3

Table C2. Generic Unparsed MICR Codeline Data Character Content (right-to-left: transport capture)

Field Ref	Expected Content	Optional Content	Standard Check Status	Appearance Rules
1	'\$'	blank	Optional	Expected, if Field Ref 2 is present.
2	N	blank	Optional	<u>Amount:</u> Included, if a MICR-encoded amount is represented
3	'\$'	blank	Optional	Expected, if Field Ref 2 is present.
4	N	'**', blank	Optional	<u>Process Control:</u> 1) Frequently expected; 2) May be absent.
5	'/'	N/A	Optional	Expected if Field Ref 6 is present.
6	N, '-'	'**', blank	Optional	<u>Account:</u> 1) Normally expected; 2) May be missing.
7	'/'	N/A	Optional	1) Sometimes expected, if Field Ref 6 is present; 2) Expected, if Field Ref 6 and 8 are both present; 3) May be missing if Field Ref 8 is absent.
8	N	'**', blank	Optional	<u>Other OnUs:</u> Normally not expected.
9	'#'	N/A	Mandatory	Expected, if Field Ref 10 is present.
10	N	'**', '- ', blank	Mandatory	<u>Routing Transit:</u> 1) Normally expected; 2) May be missing, if MICR codeline is completely blank.
11	'#'	N/A	Mandatory	Expected, if Field Ref 10 is present.
12	N	'**', blank	Optional	<u>EPC:</u> Sometimes expected, eg. for IRD.
13	'/'	N/A	Optional	Expected, if Field Ref 14 is present.
14	N	'**', blank	Optional	<u>Serial:</u> Frequently expected.
15	'/'	N/A	Optional	1) Expected, if Field Ref 14 is present; 2) May be missing, depending on physical check size

Table C3. Transfer Rules (right-to-left: Check Detail Record (Type 25) to XML Element <unparsedMICR>)

Check Detail Record (Type 25) Field	Steps to Populate <unparsedMICR>
Field 02 Auxiliary OnUs	If Field 02 is blank (empty): <ul style="list-style-type: none"> • Take no action. If Field 02 is non-blank: <ul style="list-style-type: none"> • Bypass leading blanks in Field 02; • Transfer remaining Field 02 content to <unparsedMICR>, up to end of Field 02; • If last non-blank character in Field 02 is not '/', insert '/' after rightmost character in <unparsedMICR>.
Field 03 External Processing Code	If Field 03 is blank (empty): <ul style="list-style-type: none"> • Take no action. If Field 03 is non-blank: <ul style="list-style-type: none"> • Transfer content of Field 03 to <unparsedMICR>.
Field 04 Payor Bank Routing Number + Field 05 Payor Bank Routing Number Check Digit	If composite (Field 04+Field 05) is blank (empty): <ul style="list-style-type: none"> • Take no action. If composite (Field 04+Field 05) is non-blank: <ul style="list-style-type: none"> • Insert '#' after rightmost character in <unparsedMICR>; • <u>Field 04</u>: • If Field 04 is blank: <ul style="list-style-type: none"> ○ Proceed to <u>Field 05</u>; • If Field 04 is non-blank: <ul style="list-style-type: none"> ○ Bypass leading blanks in Field 04; ○ Transfer remaining Field 04 content to <unparsedMICR>, up to end of Field 04. • <u>Field 05</u>: • If Field 05 is blank: <ul style="list-style-type: none"> ○ Proceed to <u>End</u>. • If Field 05 is non-blank: <ul style="list-style-type: none"> ○ Transfer Field 05 content to <unparsedMICR>. • <u>End</u>: • Insert '#' after rightmost character in <unparsedMICR>.
Field 06 On-Us	If Field 06 is blank (empty): <ul style="list-style-type: none"> • Take no action. If Field 06 is non-blank: <ul style="list-style-type: none"> • Bypass leading blanks in Field 06; • Transfer remaining Field 06 content to <unparsedMICR>, up to end of Field 06. <u>Note</u> : Refer to ANSI X9.100-187-2008 Annex A for information on the expected format of Field 06.
Field 07 Item Amount (included only if a MICR- encoded amount is represented)	If Amount is not to be included, proceed to <u>End</u> ; <ul style="list-style-type: none"> • Insert '\$' after rightmost character in <unparsedMICR>; • Transfer Field 07 content to <unparsedMICR>; • Insert '\$' after rightmost character in <unparsedMICR>; • <u>End</u>: • Procedure is complete.