American National Standard

Transfer Data Syntax for High Capacity ADC Media

Approved: 9 August 2002

Abstract

This standard specifies a transfer structure, syntax, and coding of messages and data formats when using high capacity ADC media between trading partners, specifically between suppliers and recipients, and where applicable, in support of carrier applications, such as bills of lading and carrier sortation and tracking.

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Material Handling Industry

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Foreword   (This foreword is not part of American National Standard MH10.8.3-2002)

This standard was prepared by ANSI. MH10.8.3 was developed using ISO 15434 as a primary reference.

This standard defines the manner in which the data is transferred to the high capacity. Automatic Data Capture, ADC, media from a supplier's information system and the manner in which the data is transferred to the recipient's information system. This standard does not define the internal data storage format for specific high capacity ADC media. This standard does not specify the application of data structures provided by a specific data syntax format. The application of this data structure is specified by industry conventions.

Users of Automatic Data Capture technologies benefit by being able to receive data in a standard form and by being able to provide data in a standard form. Static ADC technologies such as bar code symbologies, magnetic stripe, optical character recognition, surface acoustical wave (SAW), and Weigand effect typically encode a single field of data. Most applications of these technologies involve the encoding of a single field of datum by the supplier of the medium and the subsequent decoding of the datum field by the recipient. Encoding single fields of data permit the supplier to perform the encodation from a single field within the supplier's information system. Decoding single fields of data permit the recipient to input this data into a single field into the recipients information system, in lieu of key entry.

High capacity ADC technologies, such as two-dimensional symbols, RFID transponders, contact memories, and smart cards encode multiple fields of data. These multiple fields usually are parsed by the recipient's information system and then mapped to specific fields of data in recipients information system. It is a purpose of this standard to define the syntax for high capacity ADC media, so as to enable ADC users to utilize a single mapping utility, regardless of which high capacity ADC media is employed.

Notes:

1.   Normative references will be replaced by the appropriate ISO/IEC JTC1/SC31 reference in the draft international standard (DIS).

2.   The following annex is provided:

        Annex A – subset of ASCII/ISO 646 (table of hexadecimal and decimal values) (informative).

At the date of approval of this standard, the MH10 Committee, Unit-Loads and Transport-Packages, consisted of the following members:

AIM, USA	International Cargo Handling Coordination Assoc.
American Trucking Associations	International Safe Transit Association
American Wood Packaging Association	Material Handling Industry
APA – The Engineered Wood Association	Material Handling Management Society
Association of American Railroads	National Wooden Pallet & Container Association
Assoc. of Professional Material Handling Consultants	Plastic Drum Institute
ASTM	QED Systems
Automotive Industry Action Group	Rack Manufacturers Institute
Comp TIA	Reusable Industrial Packaging Association
Containerization & Intermodal Institute	Steel Shipping Container Institute
Electronics Industries Association	Textile Bag Manufacturers Association
Fibre Box Association	The Soap & Detergent Association
Flexible Intermediate Bulk Containers Association	U.S. Dept. of Agriculture
Food Marketing Institute	U.S. Dept. of Defense Logistics
Glass Packaging Institute	U.S. Forest Products Laboratory
Graphic Communications Association	Uniform Code Council
IMC & WD, Product Section – Material Handing Industry	United Fresh Fruit & Vegetable Association
Institute of Packaging Professionals	United Parcel Service
Integrated Business Communications Alliance	

Suggestions for improvement, and questions regarding interpretation of this standard will be welcome. They should be sent to: MH 10 Committee (MHIA), Material Handling Industry of America, 8720 Red Oak Blvd., Suite 201, Charlotte, NC, 28217-3992 or mhstandards@mhia.org.

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TRANSFER DATA SYNTAX FOR HIGH CAPACITY ADC MEDIA

1 SCOPE

This standard specifies a transfer structure, syntax, and coding of messages and data formats when using high capacity ADC media between trading partners, specifically between suppliers and recipients, and where applicable, in support of carrier applications, such as bills of lading and carrier sortation and tracking;

The data encoded pursuant to this standard includes:

- That which may be used in the shipping, receiving, and inventory of transport units.
- That which may be contained within supporting documentation, in paper or electronic form, related to unit loads or transport packages.
- That which may be used in the sortation and tracking of transport units.

This standard describes the ASCII (ISO 646) data transfer syntax for automatic data capture. Where ASCII is not the transfer syntax of choice for transfer this standard does not apply. An example of this is in the case where ASN.1 (ISO 8824-1 through ISO 8825-1 and 8825-2) is applied for RFID purposes.[1]

This standard does not apply when there is a symbology, standardized by ISO, reserved for a given transfer syntax.

This standard does not supersede or replace any applicable safety or regulatory marking or labeling requirements. The standard is to be applied in addition to any other mandated labeling requirements.

2 NORMATIVE REFERENCES

This Standard incorporates, by dated or undated references, provisions from other publications. These normative references are listed as follows. For dated references, subsequent amendments to or revisions of any of these publications apply to this American National Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO/IEC JTC1 (SC31 N0102)	Terms, Definitions, and Letter Symbols for Machine-Readable Symbols
ISO/IEC 15418	Automatic Identification and Data Capture Techniques International Specification – Data Application Identifiers
ISO/IEC 8824-1	Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation

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[1] This statement does not imply that ASN.1 is the required syntax for RFID.

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ISO/IEC 8824-2	Information technology – Abstract Syntax Notation One (ASN.1): Information Object specification
ISO/IEC 8824-3	Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification
ISO/IEC 8824-4	Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ANS.1 specifications
ISO/IEC 8825-1	Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)
ISO/IEC 8825-2	Information technology – ASN.1 encoding rules: Specification of packed Encoding Rules (PER)
ISO 646	Information technology – ISO 7-bit Coded Character Set for Information Interchange
ISO 9735	Electronic Data Interchange for Administration, Commerce, and Transportation (EDIFACT)
IATA Resolution 606	Cargo Label
ANSI X12	Electronic Data Interchange – United States
CII Syntax Rules (Vers. 1.11 and 1.51)	CII Syntax Rule Specifications 1.11 and 1.51 (Electronic Data Interchange – Japan)
ANSI MH10.8.2	Data Application Identifiers
ASNI UCC 4	Application Identifiers

3 DEFINITIONS

For the purpose of this American National Standard, the definitions in ISO/IEC JTC1/SC 1 2382-xxx (currently in ISO/IEC JTC1/SC 31 document N0102) shall apply.

Document Notation Conventions:

This standard uses the following typographical conventions in message examples:
- **BOLD, ALL CAPITALS**   Text that must be entered exactly as it appears (In this standard, F_S, G_S, U_S, R_S, E_{OT} are used to represent non-printable special characters. The ASCII representation of special characters used in this standard are in Annex A).

- *italic, lower case*   Variable Parameters. The user must supply an appropriate value. In some cases default values are recommended in this standard.

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4 MESSAGE FORMAT

This clause defines how data shall be transferred from a High Capacity ADC Media reading device to the user's application software.

To allow multiple data Formats to be contained within a data stream, a two level structure of enveloping is employed. The outermost layer of the message is a Message Envelope that defines the beginning and end of the message. Within the Message Envelope are one or more Format Envelopes that contain the data (See Figure 1). Multiple formats in a single message should only be employed with bi-lateral agreements of the trading partner.
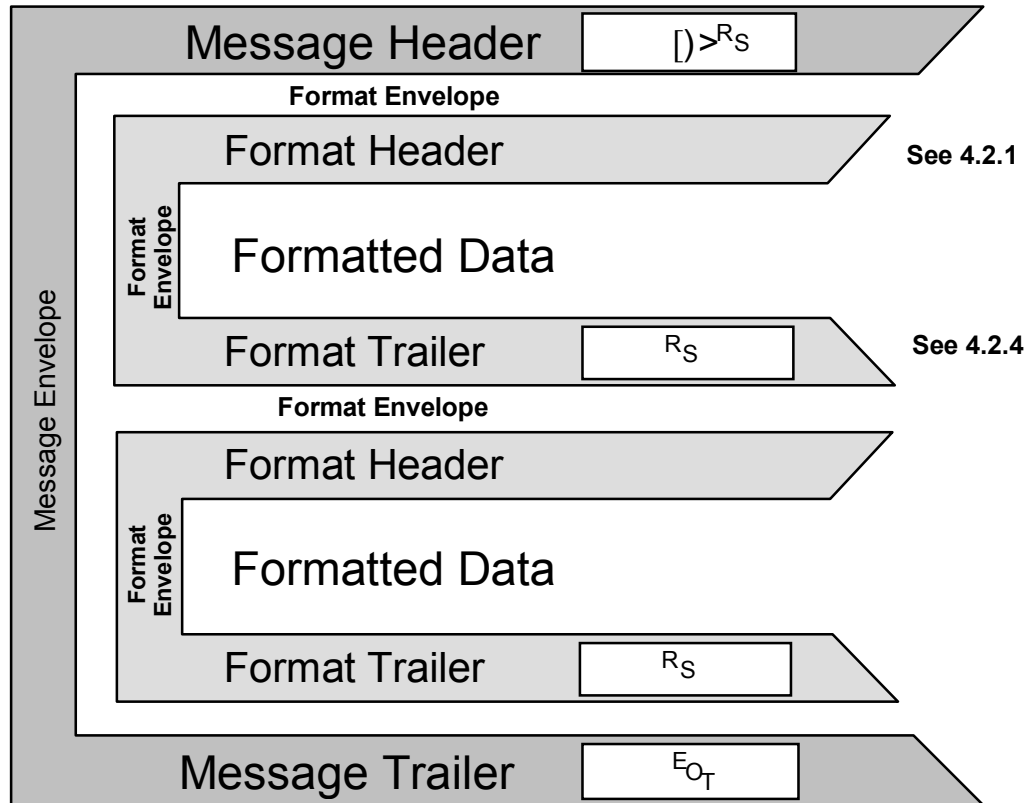
Figure 1 – Enveloping Structure
(Annex A shows the Decimal and Hexadecimal values of ASCII characters)

The Message Envelope shall consist of

- A Message Header,
- One or more Format Envelope(s), and
- A Message Trailer (when required).

Each Format within the Message Envelope shall consist of

- A Format Header,
- Data, formatted according to the rules defined for that Format, and
- A Format Trailer (when required).

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4.1 MESSAGE ENVELOPE

The Message Envelope defines the start and the end of the data contained within the data stream, and provides the following functions:

- Indication that the message contained within this media is formatted in compliance with the rules of this standard.
- Indicates the character which has been defined to separate Formats within this Message.
- Provide a unique character to indicate the end of the Message.

The structure within a data stream is as follows:

- A Message, containing one or more Formats.
- A Format, containing one or more Segments.
- A Segment, containing one or more Data Elements.
- A Data Element (Field), potentially containing one or more Sub-elements (Sub-fields).

4.1.1 MESSAGE HEADER

The Message Header consists of two parts:

- the three character Compliance Indicator, and
- the Format Trailer Character

The complete Message Header is: [ )>^R_S

4.2 COMPLIANCE INDICATOR

The Compliance Indicator shall be the first three characters in the Message Header. The Compliance Indicator shall be [)> (left bracket, right parenthesis, and greater than). See Annex A for a table of ASCII decimal and hexadecimal values.

4.2.1 FORMAT TRAILER CHARACTER

The Format Trailer Character shall be the fourth character in the Message Header. The Format Trailer Character shall be the non-printable ASCII character " ^R_S " (See Annex A). The Format Trailer Character is used throughout the message to indicate the end of a data Format Envelope (See 4.2.15).

4.2.1.1 MESSAGE TRAILER

The Message Trailer identifies the end of the message within the data stream. The Message Trailer shall be the End Of Transaction character "$^E_{OT}$" (see Annex A). The Message Trailer Character shall not be used elsewhere in the message except in Format "09" (binary data) and Format "11" (ASN.1 value) where the "$^E_{OT}$" character may appear.

The Message Trailer shall <u>not</u> be used with Formats "02" (Complete EDI message/transaction) and "08" (Structured data using CII Syntax Rules).

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4.2.1.2 FORMAT ENVELOPE

The Format Envelope defines the start and end of data in a given Format and provides the following functions:

- Identifies the data Format used within the envelope,
- Defines the character(s) used to separate the Segments, Data Elements (Fields), and Sub-elements (Sub-fields) within this data Format, and
- Indicates any applicable date, release, or control information.

4.2.1.3 FORMAT HEADER

A Format Header shall consist of two parts (Table 1 lists Format Indicators and variable data):

- A Format Indicator (a two-digit numeric identifier which identifies the rules governing the Format), and
- Variable data (if any) which defines the separators used and version and release, date, or control information of the applicable standards.

Format Indicator	Variable Header Data	Format Trailer	Format Description
00			Reserved for future use
01	G_S *vv*	R_S	Transportation
02			Complete EDI message / transaction
03	*vvvrr* F_S G_S U_S	R_S	Structured data using ANSI ASC X12 Segments
04	*vvvrrr* F_S G_S U_S	R_S	Structured data using UN/EDIFACT Segments
05	G_S	R_S	Data using EAN/UCC Application Identifiers
06	G_S	R_S	Data using FACT Data Identifiers
07		R_S	Free form text
08	Vvvvrrnn		Structured data using CII Syntax Rules
09	G_S ttt...t G_S ccc...c G_S nnn...n G_S	R_S	Binary data (file type) (compression technique) (number of bytes)
10			Reserved for future use
11	bbb...b G_S		Structured data using ASN.1
12-99			Reserved for future use

Table 1. Format Header Table Showing Recommended Separators

vv	represents the two-digit version of Format '01' being used
R$_S$	represents the Format Trailer character (See 4.2.15).
F$_S$	represents the Segment Terminator (See 4.2.1.1.1).
G$_S$	represents the Data Element Separator (See 4.2.1.1.2).
U$_S$	represents the Sub-Element Separator (See 4.2.1.1.3).
vvvrrr	represents the three-digit Version (vvv) followed by the three digit Release (rrr) (See 4.2.5).
vvvvrrnn	represents the four digit Version (vvvv) followed by the two digit Release (rr) followed by the two digit Edition indicator (nn) (See 4.2.10).
ttt...t	represents the file type name (See 4.2.11).
ccc...c	represents the compression technique name (See 4.2.11)
nnn...n	represents the number of bytes (See 4.2.11)
bbb...b	represents the number of bytes (See 4.2.13)

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4.2.1.4 SEPARATORS AND TERMINATORS

The Separators and Terminators are an integral part of the data stream. The Separator and Terminator characters shall not be used in non-binary data elsewhere in the message. For binary data strings (Formats "09") and ASN.1 values (Format "11"), special considerations apply (see 4.2.11 and 4.2.13, respectively).

4.2.1.5 SEGMENT TERMINATOR

Each segment in Format "03" shall be terminated by the Segment Terminator character, the non-printable character "F_S" (see Annex A.).

4.2.1.6 DATA ELEMENT SEPARATOR

Data elements in Formats "01", "03", "05", and "06" shall be separated by the Data Element Separator, the non-printable character "G_S" (see Annex A).

4.2.1.7 SUB-ELEMENT SEPARATOR

Sub-elements in Format "03" shall be terminated by the Sub-element Separator character, the non-printable character "U_S" (see Annex A).

4.3   FORMAT HEADER "00" – RESERVED FORMAT

Format header "00" is reserved for future assignment by the maintenance body for this standard.

4.3.1   FORMAT HEADER "01" – TRANSPORTATION

The Format Header shall be represented as: **01$^{G}{}_{S}vv$**

where:

- G_S is the Data Element Separator to be used between Data Elements.

- *vv* represents the two-digit version assigned by the maintenance body for this standard.

4.3.2   FORMAT HEADER "02" – COMPLETE EDI MESSAGE/TRANSACTION

The Format Header shall be represented as: **02**

There is no variable header data for this data Format (see 4.3.3).

4.3.3   FORMAT HEADER "03" – STRUCTURED DATA USING ASC X12 SEGMENTS

The Format Header shall be represented as: **03$vvvrrr^{F}{}_{S}{}^{G}{}_{S}{}^{U}{}_{S}$**

where:

- *vvvrrr* represents the three-digit Version (*vvv*) and three-digit Release (*rrr*) indicator for the drafts of ASC X12 used,

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- $^F S$ is the Segment Terminator to be used to indicate the end of an EDI segment,

- $^G S$ is the Data Element Separator to be used between EDI Data Elements,

- $^U S$ is the Sub-Element Separator to be used between EDI Sub-elements in a Composite Data Element.

Format Header "03" employs ANSI ASC X12 segments, used in North America. For international trade Format Header "04" should be used. Format "03" is intended for use within North America only.

4.3.4   FORMAT HEADER "04" – STRUCTURED DATA USING UN/EDIFACT SEGEMENTS

The Format Header shall be represented as: $04vvvrrr^F{}_S{}^G{}_S{}^U{}_S$

where:

- *vvvrrr* represents the three-digit Version (*vvv*) and three-digit Release (*rrr*) indicator for the UN/EDIFACT level used,

- $^F S$ is the Segment Terminator to be used to indicate the end of an EDI segment,

- $^G S$ is the Data Element Separator to be used between EDI Data Elements,

- $^U S$ is the Sub-element Separator to be used between EDI Sub-elements in a Composite Data Element.

4.3.5   FORMAT HEADER "05" – DATA USING EAN/UCC APPLICATION IDENTIFIERS

The Format Header shall be represented as: $05^G{}_S$

where:

- $^G S$ is the Data Element Separator to be used between data Fields.

4.3.6   FORMAT HEADER "06" – DATA USING FACT DATA IDENTIFIERS

The Format Header shall be represented as: $06^G{}_S$

where:

- $^G S$ is the Data Element Separator to be used between data Fields.

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4.3.7   FORMAT HEADER "07" – FREE FORM TEXT DATA

The Format Header shall be represented as: **07**

There is no variable header data for this data Format (see 4.3.8).

4.3.8   FORMAT HEADER "08" – STRUCTURED DATA USING CII SYNTAX RULES

The Format Header shall be represented as: **08vvvvrrnn**

where:

- **vvvvrrnn** represents the four-digit Version (*vvvv*), two-digit Release (*rr*), and two-digit edition (*nn*) indicator for the CII level used. This equates to the BPID in CII Syntax Rules (see 4.3.9).

Format Header "08" employs CII syntax rules used in Japan. For international trade, Format Header "04" should be used. Format "08" is intended for use within Japan only.

4.3.9   FORMAT HEADER "09" – BINARY DATA

The Format Header shall be represented as: **09$^{G}_{S}$ttt...t $^{G}_{S}$ccc...c $^{G}_{S}$nnn...n $^{G}_{S}$**

where:

- $^{G}_{S}$ is the Data Element Separator to be used between Fields in this header and at that end of the last data field.

- **ttt...t** represents the identification of the binary file type, e.g., JPEG, TIFF, PCX, BMP, CSV, CGM, GIF. This field is a variable length of 1-30 characters (including version if applicable). This field shall be terminated by the "$^{G}_{S}$" character. The binary file type and the means by which to represent the binary file type should be mutually agreed upon between the trading partners.

- **ccc...c** represents the compression technique employed. This field is a variable length of 0-30 characters. If no compression is used, this field shall be left blank. In any case this field shall be terminated by the "$^{G}_{S}$" character. The compression technique and the means by which to represent the compression technique should be mutually agreed upon between the trading partners.

- **nnn...n** represents the number of bytes in the binary message. This field is a variable length field of 1-15 digits. The count does not include the length of the data format header or the data format trailer. This field shall be terminated by the "$^{G}_{S}$" character, which is not part of the byte count.

4.3.10   FORMAT HEADER ("10") – RESERVED FORMAT

Format Header "10" is reserved for future assignment by the maintenance body for this standard.

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4.3.11 FORMAT HEADER ("11") – STRUCTURED DATA USING ASN.1

Format Header shall be represented as: **11bbb...b $^{G}_{S}$**

where:

- **bbb...b** represents the number of bytes in the structured data. This field is a variable length ASCII number whose value ranges between 5 and 4294967295. This count does not include the length of the data format header. This field shall be terminated by the "$^{G}_{S}$" character, which is not part of the byte count.

- $^{G}_{S}$ is the Data Element Separator to be used to signify the end of the length.

The formatted data that follows the Format Header shall be the PER Aligned encoding of the following ASN.1 type:

```
Identifier ::= SEQUENCE {
        type            OBJECT IDENTIFIER,
        encoding        OBJECT IDENTIFIER DEFAULT
                        {joint-iso-itu-t(2) asn1(1) packed-encoding(3) basic(0) aligned(0)}
        }
```

followed immediately by the encoding of the value of the ASN.1 type using the encoding rules identified by "encoding".

When the value of the ASN.1 type is encoded according to the PER Aligned encoding rules it will in practice consist of:

00 A single byte of binary zeros indicating that the value is encoded according to the PER Aligned encoding rules.

TT   A single byte in binary indicating the length of the "type" value.

tt…t   The OBJECT IDENTIFIER value for "type" encoded according to BER, excluding the tag and length.

When value of the ASN.1 type is not encoded according to the PER Aligned encoding rules it will, in practice, consist of:

80   A single byte with the high order bit set to 1 and the rest to 0, indicating that the value is not encoded according to the PER Aligned encoding rules.

TT   A single byte in binary indicating the length of the "type" value.

ttt…t   The OBJECT IDENTIFIER value for "type" encoded according to BER, excluding the tag and length.

EE   A single byte in binary indicating the length of the "encoding" value.

eee…e   The OBJECT IDENTIFIER value for "encoding" encoded according to BER, excluding the tag and length.

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It is recommended that PER Aligned be used for all Format 11 values unless there is compelling reason to use another set of encoding rules. The Basic Encoding Rules are defined in ITU-T Rec. X.690 / ISO/IEC 8825-1, and the Packed Encoding Rules in ITU-T Rec. X.691 / ISO/IEC 8825-2.

4.3.12 FORMAT HEADER ("12"-"99") – RESERVED FORMATS

Format headers "12" – "99" are reserved for future assignment by the maintenance body for this standard.

4.3.13 FORMAT TRAILER

The Format Trailer identifies the end of a Format Envelope. The Format Trailer shall consist of the Format Trailer Character, the non-printable ASCII character **"R_S"** (see Annex A). The Format Trailer Character shall not be used in non-binary data elsewhere in the Message.

The Format Trailer shall <u>not</u> be used in Formats "02" (Complete EDI message/transaction) and "08" (CII – Complete Message).

4.4 DATA FORMAT

Within a given Format Envelope, the data shall be formatted using one and only one of the following methods:

- Transportation
- Complete EDI Message/Transaction (ASC X12, UN/EDIFACT or CII standard)
- Structured Text (ASC X12 or UN/EDIFACT subset)
- Data structured using the rules of EAN/UCC Application Identifiers
- Data structured using the rules of FACT Data Identifiers
- Free form text
- CII Message Record without Message-group header and trailer
- Binary Data
- Data structured using one of the encoding rules of ASN.1

4.4.1 FORMAT "00" (RESERVED)

This Format type is reserved for future assignment and should not be used prior to the issuance of a revision or draft standard for trial use of this document.

4.4.2 FORMAT "01" CARRIER SORTATION AND TRACKING (TRANSPORTATION)

Format "01" consists of two areas: the first is mandatory data which is common to all carrier sortation and tracking applications, the second area is optional data which may be useful to specific applications between trading partners.

If more than one Format is included in a Message, Format "01", if used, shall be the first Format in the Message.

The organization controlling the data structure within this format is identified through the version indicator in the Format Header. At the time that this standard was published, the following versions had been identified:

- Version "02" – Formatted according to the rules of ANSI MH10/SC 8 (using measurement qualifiers of pounds ["LB"] and kilograms ["KG"]

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- Version "06" – Formatted according to the rules of the International Air Transport Association (IATA)

- Version "56" – Formatted according to the rules of International Federation of Freight Forwarders Association (FIATA)

- Version "96" – Formatted according to the rules of ANSI MH10/SC 8 (using measurement qualifier of pounds only)

4.4.3 FORMAT "01" CARRIER SORTATION AND TRACKING (TRANSPORTATION)[2]

Format "01" consists of two areas: the first is mandatory data which is common to all carrier sortation and tracking applications, the second area is optional data which may be useful to specific applications between trading partners.

If more than one Format is included in a Message, Format "01", if used, shall be the first Format in the Message.

4.4.3.1 MANDATORY DATA

This data is required within the "01" Format. The following Data Elements shall be ordered as listed below, immediately following the Format Header. Each Data Element is defined as either fixed or variable length. Where Fields are variable in length the minimum Field length and the maximum Field length (min…max) are shown below. All Fields are separated by the Data Element Separator Character "$^G{}_S$" (see Annex A) defined in the Format Header.

Ship to Postal Code	(an 00…11)
Ship to Country Code (ISO 3166)	(n 03)
Class of Service (Assigned by carrier)	(an 01…03)[3]
Tracking Number (controlled by carrier)	(an 01…20)
Origin Carrier SCAC	(an 02…04)
(Standard Carrier Alpha Code (SCAC) of the carrier intended to transport the package)	

4.4.3.2 OPTIONAL DATA

There are nine optional Data Elements. Optional Data Elements, if used, shall immediately follow Mandatory Data, in the order specified below. Each Data Element is defined as either fixed or variable length. Where Fields are variable in length the minimum Field length and the maximum Field length (min…max) are shown below. All optional Fields, including blank ones, shall be separated by the Data Element Separator "$^G{}_S$" (see Annex A). Trailing Data Element Separators shall be suppressed.

Data that has been identified as Optional Data may not be needed in all applications. The Optional Data fields and associated lengths are shown below:

Carrier Assigned Shipper ID (pick-up location)	(an 01…10)
Julian Day of Pickup	(n 03)
Shipment ID Number	(an 01…30)
n/x (container n of x total containers)	(n 01…04 / n 01…04)
Weight ("LB" or "KG") (decimal is a character if used)	(r 01…08, a02)[4]
Cross match (value is Y or N)	(a 01)
Ship to Street Address	(an 01…35)
Ship to City	(an 01…35)
Ship to State/Province	(an 02)

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Ship to Name   (an 01…35)

4.5   FORMAT "01" VERSION "96"

4.5.1 MANDATORY DATA

This data is required within the "01" Format. The following Data Elements shall be ordered as listed below, immediately following the Format Header. Each Data Element is defined as either fixed or variable length. Where Fields are variable in length the minimum Field length and the maximum Field length (min…max) are shown below. All Fields are separated by the Data Element Separator character "$^{G}_{S}$" (see Annex A) defined in the Format Header.

Ship to Postal Code	(an 03…11)
Ship to Country Code (ISO 3166)	(n 03)
Class of Service (Assigned by carrier)	(an 01…03)[5]
Tracking Number (controlled by carrier)	(an 01…20)
Origin Carrier SCAC	(an 02…04)
(Standard Carrier Alpha Code (SCAC) of the carrier intended to transport the package)	

4.5.2 OPTIONAL DATA

The re are nine optional Data Elements. Optional Data Elements, if used, shall immediately follow Mandatory Data, in the order specified below. Each Data Element is defined as either fixed or variable length. Where Fields are variable in length the minimum Field length and the maximum Field length (min…max) are shown below. All optional Fields, including blank ones, shall be separated by the Data Element Separator character "$^{G}_{S}$" (see Annex A). Trailing Data Element Separators shall be suppressed.

Data that has been identified as Optional Data may not be needed in all applications. The Optional Data fields and associated lengths are shown below:

Carrier Assigned Shipper ID (pick-up location)	(an 01…10)
Julian Day of Pickup	(n 03)
Shipment ID Number	(an 01…30)
n/x (container n of x total containers)	(n 01…04 / n 01…04)
Weight (lb)(decimal is a character if used)	(r 01…10)
Cross match (value is Y or N)	(a 01)
Ship to Street Address	(an 01…35)
Ship to City	(an 01…35)
Ship to State/Province	(an 02)

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[2]   an   indicates Alpha/Numeric data; Value is a sequence of any printable characters
       a   indicates Alphabetic data
       n   indicates Numeric data; Value is a sequence of any digits
       r   indicates Radix data; Value is a sequence of any digits and a decimal point (ASCII Hex '2E', Dec '46') (decimal point is not used for whole numbers) (Note the decimal, when used, is counted as a character).

[3]   It is recommended that the Class of Service be 3 digits of numeric data.

[4]   The weight qualifier is appended directly to the value without an intervening space and is in uppercase letters. An example of this format would be if shipment weight is 117.6 kilograms, this data stream would appear as 117.6KG.

[5]   It is recommended that the Class of Service be 3 digits of numeric data.

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4.5.3 FORMAT "02" (COMPLETE EDI MESSAGE/TRANSACTION)

This Format is used to encode an entire EDI transaction/message with the intent of passing it directly to an EDI translator. The Format shall be either ASC X12, UN/EDIFACT or CII-Standard. Enveloping structures as defined by the applicable standard shall be included, e.g., ISA, GS, ST, SE, GE, and IEA segments (for ASC X12) or UNA, UNB, UNH, UNT, and UNZ segments (for UN/EDIFACT), or Message-group-header, Message and Message-group-trailer Record (for CII Standard).

The Message Trailer character **"E_T"** and the Format Trailer character **"R_S"** shall <u>not</u> be used with Format "02".

There shall be no more than one "02" Format in a Message Envelope. Format "02" shall <u>not</u> be combined with any other data format within a Message Envelope.

4.5.4 FORMAT "03" (STRUCTURED DATA USING ASC X12 SEGMENTS)

This Format is used to represent data, such as Ship To and Ship From, etc., structured according to ASC X12 rules. This format allows the encodation of data represented by either individual ASC X12 segments without enveloping, i.e., ISA/IEA, GS/GE, and ST/SE; or a single ASC X12 transaction set with enveloping, i.e., ST/SE. this data is not intended to be passed directly to an EDI translator.

For Format "03", the version of ASC X12 format is contained in the Format Header. The character **"F_S"** shall be used as the ASC X12 Segment Terminator. The character **"G_S"** shall be used as the ASC X12 Data Element Separator. The character **"U_S"** shall be used as the ASC X12 Sub-element Separator (See Annex A for hexadecimal and decimal values of Terminators and Separators).

EDI segments such as BIN that encode binary data shall not be used in Format "03". Binary data should be encoded only in Format "09" and Format "11" (see 4.3.10 and 4.3.12, respectively).

Format Header "03" employs ANSI ASC X12 segments, used in North America. For international trade Format Header "04" should be used. Format "03" is intended for use within North America only.

4.5.5 FORMAT "04" (STRUCTURED DATA USING UN/EDIFACT SEGMENTS)

This Format is used to represent data, such as Ship To and Ship From, etc., structured according to UN/EDIFACT rules.

This format allows the encodation of data represented by either individual UN/EDIFACT segments without enveloping, i.e., UNB/UNA/UNZ and UNH/UNT; or a single UN/EDIFACT message with enveloping, i.e., UNH/UNT. This data is not intended to be passed directly to an EDI translator.

4.5.6 FORMAT "05" (USING EAN/UCC APPLICATION IDENTIFIERS)

Each Data Element in this Format shall be preceded by the appropriate EAN/UCC Application Identifier (AI) code and followed by the Data Element Separator character **"G_S"** unless the Data Element is the last field in the data Format, i.e., the last Format "05" data element is followed by

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the Format Trailer Character **"R$_S$"** (see Annex A for hexadecimal and decimal values of Terminators and Separators).

4.5.7 FORMAT "06" (USING FACT DATA IDENTIFIERS)

Each Data Element in this Format shall be preceded by the appropriate FACT Data Identifier (DI) code and followed by the Data Element Separator character **"G$_S$"** unless the data element is the last field in the data Format, i.e., the last Format "06" data element is followed by the Format Trailer Character **"R$_S$"** (see Annex A for hexadecimal and decimal values of Terminators and Separators).

4.5.8 FORMAT "07" (FREE FORM TEXT FORMAT)

This Format permits free-form text information. There is no variable header data for this data Format. Complete sentences will be followed by a period and, if the sentence is not the last sentence in a paragraph, two spaces. Two line feeds will be used between paragraphs.

4.5.9 FORMAT "08" (STRUCTURED DATA USING CII SYNTAX RULES)

This Format is structured data according to CII standards, as defined by the Center for Informatization of Industry – Japan. Format "08" contains only one CII-Message-Record. Format-end and Message-end in Format "08" shall be indicated by the CII-Message-Trailer.

The Message Trailer character **"E$_O$$_T$"** and the Format Trailer character **"R$_S$"** shall <u>not</u> be used in Format "08".

Format "08" shall <u>not</u> be combined with any other data Format within a Message Envelope. Format Header "08" employs CII Syntax Rules, used in Japan. For international trade Format Header "04" should be used. Format "08" is intended for use within Japan only.

4.5.10 FORMAT "09" (BINARY DATA)

This Format is for binary data in any format. The length and format of the data shall be identified in the format header. Binary files must be defined as to the type, compression technique, and number of bytes used in the data stream.

Binary data strings, such as those that represent digital image data, may be included in messages exchanged by and agreed upon between trading partners. CAD/CAM drawings, picture files, various raster and vector graphic images, as well as 2D and 3D images are examples of the kinds of data which could be compressed and encoded for exchange. Typically such binary data files will be encoded and formatted according to an image file representation standard such as JPEG, TIFF, PCX, BMP, CSV, DGM, GIF, and CCITT Group 4, that will include header data followed by image data. The contents of the binary file data groupings, in order to be intelligible, need to be encapsulated within the identifying envelope that separates the binary image data from the other types of message information normally represented as ASCII characters.

By definition, binary data may include any eight-bit character, even those that have special meaning elsewhere in this standard. Care should be taken not to misinterpret binary values as characters having special meaning elsewhere in this standard.

The Data Element Separator character **"G$_S$"** <u>shall</u> be used in the header of Format "09" to separate <u>both</u> the data elements <u>and</u> to terminate the header because all fields in the header are

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variable in length. Though the number of bytes is given in the header, the Format Trailer Character shall follow the binary data to complete the format envelope.

4.5.11   FORMAT "10" (RESERVED)

This Format type is reserved for future assignment and should not be used prior to the issuance of a revision or draft standard for trial use of this document.

4.5.12   FORMAT "11" (DATA STRUCTURED USING ASN.1)

This Format is for data defined using ASN.1 and encoded according to encoding rules that fully support ASN.1 (e.g., PER, BER). The Format Header conveys the length of the entire encoded value and includes the prefixing identifier information (the object identifiers).

Values of any ASN.1 type encoded using ASN.1-related encoding rules (e.g., PER, BER) may be included in messages exchanged between trading partners. PER <u>encoding rules should</u> be used.

PER and BER encoded data may include any eight-bit character, even those that have special meaning elsewhere in this standard. Care should be taken not to misinterpret binary values as characters having special meaning elsewhere in this standard.

The Data Element Separator character **"^G_S"** <u>shall</u> be used to terminate the header because the length information in the header is variable length.

4.5.13   FORMAT "12" – "99" (RESERVED)

These Format types are reserved for future assignment and should not be used prior to the issuance of a revision or draft standard for trial use of this document.

5   MAINTENANCE

The Syntax Maintenance Committee of ISO/IEC JTC 1/SC 31 is responsible for the maintenance of this document. Maintenance includes the assignments of new formats and new versions within formats whose versions are controlled by this standard. Requests for new formats and requests for new versions of formats controlled by this standard should be submitted to the ISO 15434 Maintenance Committee who can be reached as follows:

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Requests for new Formats or new versions of Formats whose version control rests with the Maintenance Committee of this standard will be evaluated on the following criteria:

a) Requests shall be submitted by a National Body having membership or technical liaison status to ISO/IEC JTC 1/SC 31;

b) Requestors shall demonstrate that the requested Format or version will be used by multi-sectoral interests, preferably on a multi-national basis;

c) Requestors shall demonstrate the support of the requested Formats by multiple economic entities, specifically, more than one company;

d) Requestors shall demonstrate that the requested Format is to be used in an open interchange environment; and

e) Requestors shall within a reasonable timeframe, preferably within 12 months of the date of assignment of the Format or version, provide proof of the implementation of the new Format or version to the Maintenance Committee.

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ANNEX A - Subset of ASCII/ISO 646
(Table of Hexadecimal and Decimal Values) (informative)

HEX	DEC	ASCII / ISO 646	HEX	DEC	ASCII / ISO 646	HEX	DEC	ASCII / ISO 646
00	00	NUL	30	48	0	60	96	'
01	01	SOH	31	49	1	61	97	a
02	02	STX	32	50	2	62	98	b
03	03	ETX	33	51	3	63	99	c
04	04	EOT	34	52	4	64	100	d
05	05	ENQ	35	53	5	65	101	e
06	06	ACK	36	54	6	66	102	f
07	07	BEL	37	55	7	67	103	g
08	08	BS	38	56	8	68	104	h
09	09	HT	39	57	9	69	105	i
0A	10	LF	3A	58	:	6A	106	j
0B	11	VT	3B	59	;	6B	107	k
0C	12	FF	3C	60	<	6C	108	l
0D	13	CR	3D	61	=	6D	109	m
0E	14	SO	3E	62	>	6E	110	n
0F	15	SI	3F	63	?	6F	111	o
10	16	DLE	40	64	@	70	112	p
11	17	DC1	41	65	A	71	113	q
12	18	DC2	42	66	B	72	114	r
13	19	DC3	43	67	C	73	115	s
14	20	DC4	44	68	D	74	116	t
15	21	NAK	45	69	E	75	117	u
16	22	SYN	46	70	F	76	118	v
17	23	ETB	47	71	G	77	119	w
18	24	CAN	48	72	H	78	120	x
19	25	EM	49	73	I	79	121	y
1A	26	SUB	4A	74	J	7A	122	z
1B	27	ESC	4B	75	K	7B	123	{
1C	28	FS	4C	76	L	7C	124		
1D	29	GS	4D	77	M	7D	125	}
1E	30	RS	4E	78	N	7E	126	~
1F	31	US	4F	79	O	7F	127	DEL
20	32	SP	50	80	P			
21	33	!	51	81	Q			
22	34	"	52	82	R			
23	35	#	53	83	S			
24	36	$	54	84	T			
25	37	%	55	85	U			
26	38	&	56	86	V			
27	39	'	57	87	W			
28	40	(	58	88	X			
29	41	)	59	89	Y			
2A	42	*	5A	90	Z			
2B	43	+	5B	91	[			
2C	44	,	5C	92	\			
2D	45	-	5D	93	]			
2E	46	.	5E	94	^			
2F	47	/	5F	95	_			