ASTM Style Implementation Guide for Transferring Information Between Dade Behring Instruments and Information Systems

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Scope

This document covers the two-way digital transmission of remote requests and results between clinical instruments/devices and computer systems. It is intended to document the common conventions required for the interchange of clinical results and patient data between Dade Behring clinical instruments and computer systems (LIS). This standard specifies the message content for transferring information between a clinical instrument/devices and a computer system. It enables any two such systems to establish a logical link for communicating text to send result, request, or demographic information in a standard and interpretable form. This document along with the Dade Behring Test, Error, and Instrument Codes should contain the required information for the interface.

This standard specification is intended to apply to the structure of messages exchanged between clinical instruments/devices and computer systems by means of defined communications protocols. A separate specification is available from CLSI detailing a standard for low-level data transfer communications (see Specification LIS 1A).

This standard specifies the conventions for structuring the content of the message and for representing the data elements contained within those structures. It is applicable to all text oriented clinical instrumentation/devices. This document is patterned after the CLSI LIS 2 formerly ASTM E1394-97 protocol and the numbers used are included in this document for the purpose of reference to the existing standard.

Terminology

Definitions of Terms Specific to this standard:

Component field - a single data element or data elements which express a finer aggregate or extension of data elements which precede it. For example, parts of a field or repeat field entry. As an example, the patient's name is recorded as last name, first name, and middle initial, each of which is separated by a component delimiter. Components cannot contain repeat fields.

Download - data transmitted from a computer system to a clinical instrument

Field - one specific attribute of a record, which may contain aggregates of data elements further refining the basic attribute.

Message - a textual body of information consisting of a header (H) record through a message terminator (L) record.

Record - an aggregate of fields describing one aspect of the complete message.

Repeat field - a single data element which expresses a duplication of the field definition it is repeating. Used for demographics, requests, orders and the like, where each element of a repeat field is to be treated as having equal priority or standing to associated repeat fields.

Test - a determination of a single analyte or a combination of values from other determinations or observations, which constitute a measure of a single system attribute.

Upload - data transmitted from a clinical device to a computer system.

Significance and Use

General Information:

This standard provides for two-way transmission allowing for data-flow in either direction. It provides for sending demographic and test information to or from clinical device.

This standard uses positional convention to define the structure of messages that exchange information about clinical test requests and results. The set of conventions specifies a hierarchical set of records in which the records higher in the hierarchy contain information that is common to all records lower in the hierarchy and thus avoids redundancy in linking data together. The positional convention is simple and direct to implement, requiring only a sequence of strings each having variable length delimited fields which are positionally specified.

Information Requirements in Clinical Testing

General Approach:

Messages may contain one or more requests/results for one or more patients.

Messages consist of a hierarchy of records of various types. Records at level zero contain information pertaining to the sender identification and completion of transmission. Records at level one of the hierarchy contain information about individual patients. Records at level two contain information about test order requests and specimens. Records at level three contain information about test results

Comment records may be inserted at any level in the hierarchy. A comment record always relates to the immediately preceding patient, order, result, scientific or manufacturer information record. Therefore, if a comment record were to follow a patient record (level one), then that comment record would be treated as a level two record. A comment record may not follow the message terminator record.

Additional record types are the request-information record and the terminator record. The request-information record provides for the request of demographics or test results to or from the clinical instrument for specified patients, specimens, tests, and dates, and the like. The message terminator record must be the very last record of the message.

The smallest element of information in any record is a field, containing a single item of information, such as a patient name, or a numeric test result.

The test order record contains information about ordering a single test, or a series of tests.

Most of the record types are related to each other in a definite hierarchy. At level zero is the message header and message terminator. At level one is the patient record, the request-information record. At level two is the test order record. At level three is the result record. The comment and manufacturer information records do not have an assigned level.

A sequence of patient records, order records, or result records at one level is terminated by the appearance of a record type of the same or higher level. Thus, a sequence of results for tests is terminated by the next test order, patient, manufacturer information, request information, or message terminator record.

An order record may never appear without a preceding patient record and a result record may never appear without a preceding order record.

When an order is transmitted, it must be preceded by a patient record. All orders that follow apply to the patient in the preceding patient record. When a result is transmitted, it must be preceded by an order record and a patient record to maintain the prescribed hierarchy.

```
Level 0)    HEADER
Level 1)        MANUFACTURER INFORMATION 1
Level 1)        PATIENT 1(general information about patient)
Level 2)            COMMENT Record (relates to previous patient record)
Level 2)            ORDER I (information about the first battery requested)
Level 3)                COMMENT I Record (Relates to ORDER 1)
Level 3)                RESULT I (information about the first result of battery 1)
Level 3)                RESULT 2 (information about the second result of battery 1)
Level 4)                    COMMENT 1 Record (Relates to RESULT 2)
Level 4)                    COMMENT 2 Record (Relates to RESULT 2)
                            .
                            .
                        RESULT n (information about the last result of battery 1)
Level 2)                ORDER 2 (information about battery 2)
                        RESULT 1 (information about the first result of battery 2)
                        RESULT 2 (information about the second result of battery 2)
                        .
                        .
                        RESULT n (information about the last result of battery 2)
                        .
                        .
Level 2)                ORDER n (information about the last battery for the first patient)
Level 3)                    RESULT 1 (First result of the last order)
                            .
                            .
                            .
Level 1)        Patient 2 (all of the structure repeats )
                .
                .
Level 1)         Patient  N
                   .
                   .
Level 0     Message Terminator
```

Example of Information Flow

Logical Information Storage Requirements - In order to determine buffering requirements, both transmitter and receiver must use common rules for storing transmitted data in order to ensure proper error logging and error recovery procedures. Since data content is structured in a hierarchical fashion, any decremental change in the hierarchical level shall trigger storage of all data transmitted prior to said level change. This rule may be considered as the minimal implementation. Data may be saved at more frequent intervals at the receiver's option. See Error recovery

Line Failure Occurs At:	Requires Retransmission of:
A	A
B	A, B
C	A, B, C
D	A, B C, D
E	A, B, C, D, E
F	A, B, E, F
G	A, B, E, F, G
H	A, G, H
I	A, G, H
J	A, G, F,I J
K	A, G, H, I, J, K
L	A, G, H, I, J, K, L
M	A, G, H, L, M
N	A. G, M, N
0	A, N, 0
P	A, N, 0, P
Q	A, N, 0, P, Q

Line #	Record Type	(Level) Increment Action
A	Header	(Level 0)+0
B	Patient 1	(Level 1)+1
C	Order 1	(Level 2)+1
D	Result 1	(Level 3)+1
E	Order 2	(Level 2)-1 {Save A-D}
F	Order 3	(Level 2)+0
G	Patient 2	(Level 1)-1 {Save E-F}
H	Order 1	(Level 2)+1
I	Comment 1	(Level 3)+1
J	Result 1	(Level 3)+0
K	Comment	(Level 4)+1
L	Result 2	(Level 3)-1 {Save G-K}
M	Order 2	(Level 2)-1 {Save L}
N	Patient 3	(Level 1)-1 {Save M}
0	Order 1	(Level 2)+1
P	Result 1	(Level 3)+1
Q	Message Terminator	(Level 0)-3 {Save N-P}

Given the following example, permanent storage of data, by the receiver, should occur at points: E,G,L,M,N.Q

Error Recovery

Transmission Error Recovery Requirements - Transmission line failure, determined at the transmission protocol level requires a mechanism for restarting the incomplete message. If a transmission failure occurs, transmission shall restart at the List logical record not presumed saved as outlined in Error Recovery. Procedures for determining time before retransmission or. maximum number of retransmissions are not within the scope of this document. In order to fulfill hierarchical record level requirements, all logical records necessary to reach the restart record point must be repeated prior to transmitting the record where line failure originally occurred. Using the transmission example as given in Error Recovery, the above record recovery would be valid. All orders that follow apply to the patient in the preceding patient record. When a result is transmitted, it must be preceded by an order record and a patient record to maintain the prescribed hierarchy.

Message Content General Considerations

Delimiters Definition

All data shall be represented as eight-bit, single-byte, coded graphic character values as defined in ISO 88591: 1987. The eight-bit values, within the range from 0 to 127 of ISO 88591:1987 correspond to the ASCII standard character set. Values from 0 to 31 are disallowed, with the exception of 7 (BEL), 9 (Horizontal tab), 11 (Vertical tab), and 13 (CR), where 13 is reserved as a record terminator. Values from 32 to 126 and from 128 to 254 are allowed. Values 127 and 255 are also not allowed. It is the responsibility of the instrument vendor and computer system vendor to understand the representation of any extended or alternate character set being used. As an example, the numeric value 13.5 would be sent as four-byte value characters 13.5 or Latin -1 (49), Latin -1 (51), Latin -1(46), and Latin -1(53).

Within text data fields, only the Latin -1 characters 32-126 and the undefined characters 128 -254 are permitted as usable characters (excluding those used as delimiter characters in a particular transmission). Furthermore, all characters used as delimiters in a particular transmission are excluded from the permitted range. The sender is responsible for screening all text data fields to ensure that the text does not contain those delimiters. Unless otherwise stated, contents of data fields shall be case sensitive.

Maximum Field Lengths- No storage is allocated (except for the delimiter) for a null field. When, for example, ten characters of data are entered within a field, only ten characters will be used. This specification defines a maximum length for fields and relies upon the receiver's

buffering capabilities, and the logical layer's transport facilities, to parse information into workable lengths for transmission and processing purposes

Maximum Record Length-See individual items

Use of Delimiters

Alphanumeric characters should not be used as delimiters; because they are likely to appear within field content

For the purpose of providing examples, the following delimiters are used.

Field delimiter	= vertical bar	(|)	Latin-1 (124)
Record delimiter	= backslash	(\)	Latin-1 (96)
Component delimiter	= caret	(^)	Latin-1 (94)
Escape delimiter	= ampersand	(&)	Latin-1 (38)

Record Delimiter-Carriage return Latin -1 (13) shall be the delimiter for the end of any of the defined record types-

Field Delimiter-A single allowable character as defined in Delimiters Definition excluding Latin-1 (13) (carriage return), shall separate adjacent fields. The field delimiter is variable and defined in the message header. The same delimiter must be used in all records following a header and preceding a message terminator record.

Repeat Delimiter-A single allowable character as defined in Delimiters Definition excluding Latin-1 (13) and the value for the field delimiter defined in Field Delimiter. The repeat delimiter must be defined in the message header and is used to separate variable numbers of descriptors for fields containing parts of equal members of the same set

Component Delimiter-A single allowable character as defined in Delimiters Definition excluding Latin-1 (13) and the field and repeat delimiter values. The component delimiter is used to separate data elements of fields of a hierarchical or qualifier nature. For example the street, city, state, zip, etc. of an address field would be separated by component delimiters.

Escape Delimiter - A single allowable character, as defined in Delimiters Definition above, excluding Latin-1 (13) and the field, repeat and component delimiter values. The escape delimiter is used within text fields to signify special case operations. Applications of the escape delimiter are optional and may be used or ignored at the discretion of either transmitter or receiver. However, all applications are required to accept the escape delimiter and use it to correctly parse fields within the record.

Use of Escape Delimiter-The escape delimiter may be used to signal certain special characteristics of portions of a text field (for example, imbedded delimiter line feed, carriage return, etc). An escape sequence consists of the escape delimiter character followed by a single escape code ID (listed below), followed by zero or more data characters followed by another (closing) occurrence of escape delimiter character. No escape sequence may contain a nested escape sequence. The following escape sequences are pre-defined.

&H&	start highlighting text
&N&	normal test (end highlighting)
&F&	imbedded field delimiter character
&S&	imbedded component field delimiter character
&R&	imbedded repeat field delimiter character
&E&	imbedded escape delimiter character
&Xhhhh&	hexadecimal character

Note 1 – Any number of hexadecimal digits (0-9,A-F) may follow (that is, &XA& could equal line feed).
Note 2 – Any number of legal characters may follow

Use of *Escape Delimiter*-

Specification of Delimiters - The actual delimiters to be employed in a given transmission shall be specified in the header message. It is the responsibility of the sender to avoid the inclusion of any delimiter characters within the field contents.

Delimiters for Null Values - Fields shall be identified by their position, obtained by counting field delimiters from the front of the record. This position-sensitive identification procedure requires that when the contents of the field are null, its corresponding field delimiter must be included in the record to ensure that the nth field can be found by counting (n-1) delimiters. Delimiters are not included for trailing null fields; that is, if the tenth field was the last field containing data, the record could terminate after the tenth field, and therefore would contain only nine delimiters.

Fields of No Concern to the Receiving System - Transmitted records may include more fields than are required by a receiving system. When processing a message, the receiving system may ignore any field it does not require. Fields must always be transmitted, however, in the positional order specified.

Fields with Null Values:

A system may transmit a null value for a field because (1) it does not know the value, (2) it knows the value is irrelevant to the receiving system, or (3) the value has not changed since the last transmission, or any combination thereof. To exemplify case (3), a lab within a tightly linked hospital network may never transmit the patient's birth date, sex, or race in the patient record when transmitting the order and result records to the requesting system, because it knows that the hospital registry system always broadcasts new or changed patient data to the receiving system.

Data Record Usage Overview-Data shall be exchanged in records of different types. Each record is introduced by field (number one) identifying the record type, and terminated by a carriage return. The following record types are defined. The following table will define letters referenced in the usage section of the record types.

Format	**Data Type**
A xx	alphanumeric to xx characters
N xx	Numeric to xx digits
TD	Table driven
D	Date YYYYMMDD
DT	Date Time YYYYMMDDHHMMSS
S	Sequence Number
-	Format currently not defined
Usage	**Usage Overview**
D	Download
U	Upload
I	Ignore
R	Reguired
F	Future Implementation
O	Optional

The record type ID field shall be case insensitive.

Message Header Record (H)-This record shall contain information about the sender and the receiver, that is, it shall identify the instrument(s) and the computer systems whose records are being exchanged. It also defines the field, repeat field, and component field delimiter characters.

Patient Identifying Record (P) -This record type contains information about an individual patient

Test Order Record (0) - When sent from the computer system to the instrument, this record shall represent a test order. When sent by the instrument to the computer system, it shall provide information about the specimen/test request, and may be followed by result records (at least one record for each test).

Result Record (R)-Each result record shall contain the results of a single analytic determination.

Comment Record (C) - Comment records shall apply to any other record except the message trailer record. They may be free standing messages sent to or from the instrument, unrelated to a particular patient or test procedure.

Request Information Record (Q)-This record requests information for new tests. A single request information record may request individual specimens, groups of specimens, etc.

Manufacturer Information Record (M)-This record, which is similar to the comment record, may be used to send complex structures where use of the existing record types would not be appropriate.

Common Field Types.

Universal Test ID - This field is defined as a four part field with provisions to further define the test identification via use of component fields. The test ID field is used to identify a test.name. The four parts which are defined below are the universal test identifier, the test name, the test identifier type and the manufacturer defined test code. All test ID parts must be separated by a component delimiter and are position dependent

Universal Test ID (Part I) - Not Supported

Universal Test ID Name (Part 2) - Not Supported

Universal Test ID Type (Part 3) - Not Currently implemented

Manufacturer's or Local Code (Part 4) - Supported This field will consist of three parts, each separated by a component delimiter. They will always appear in the following order. (1) [A4] Dade Behring Test Code {See Dade Behring Test Codes and Analyate Names}

(2) Instrument Code [A4]{See Dade Behring Instruments Table} (3) Analyate Name [A50] {See Dade Behring Test Codes and Analyate Names}

Dates and Times-In all cases, dates shall be recorded in the YYYYMMDD format as required by ANSI X3.30. March 10,2000 would be represented as 20000310. When times are transmitted, they shall be represented as HHMMSS, shall be linked to dates as specified by ANSI X3.43. Date and time together shall be specified as up to a fourteen-character string: YYYYMMDDHHMMSS.

Time Zone - Not Supported

Telephone Numbers - Not Supported

Fixed Measurements and Units - Not currently supported

Provider and User ID's - Not Supported

Record Sequence Number-This is a required field used in record types that may occur multiple times within a single message. The number used defines the first occurrence of the

associated record type at a particular hierarchical level and is reset to one whenever a record of a greater hierarchical significance (lower number) is transmitted or if the same record is used at a different hierarchical level (for example, comment records).

Examples of Basic Record Types-The following examples are given for a set of transmitted results for a given patient. These will show how the employment of the conventions defined lead to a valid message. In these examples the first two fields of each line (record) of the message body contain the record type and the integer record sequence number (excepting the header record). Carriage return is indicated by <CR>. To simplify the example, all the components of each record have not been included. Ellipses (...) are used to indicate fields that are left out and comments are enclosed in square brackets. Record hierarchical levels are shown by indentation.

Message Header Record

Usage: Both the sender and receiver are identified in the record. This message is a level zero type and must be followed by additional records followed by a message terminator record. This must be the first record in the transmission.

The record type ID is immediately followed by the delimiter definitions and is not separated by a field delimiter.

Field and Component Definitions:

#	Format	Usage	ASTM Section	Description	Notes
1	"H"	R	7.1.1	Record Type ID	Instrument transmit upper case characters, receive upper case
2	-		7.1.2	Delimiter Definition	
2.1	A1	R	7.1.2.1	Field Delimiter	| (ASCII 124)
2.2	A1	R	7.1.2.2	Repeat Delimiter	\ (ASCII 92)
2.3	A1	R	7.1.2.3	Component Delimiter	^ (ASCII 94)
2.4	A1	R	7.1.2.4	Escape Delimiter	& (ASCII 38) (Escape delimiter is not supported for within records)
3		I	7.1.3	Message Control ID	
4		I	7.1.4	Access Password	
5	A40	O	7.1.5	Sender Name/ID	
6	-	I	7.1.6	Sender Street Address	
7	-	F	7.1.7	Reserved Field	
8	-	I	7.1.8	Sender Telephone Number	
9	-	I	7.1.9	Characteristics of Sender	
10	A40	O	7.1.10	Receiver ID	
11	-	I	7.1.11	Comment	
12	A1	O	7.1.12	Processing ID	Nil P(Production (data stored)) D (Debugging (data not stored)) Q (Quality Control /Regulatory)
13	A20	O	7.1.13	Version Number	DB 100102

#	Format	Usage	ASTM Section	Description	Notes
14	DT	I	7.1.14	Date and Time of Message	YYYYMMDDHHMMSS

Format	Data Type
A xx	alphanumeric to xx characters
N xx	Numeric to xx digits
TD	Table driven
D	Date YYYYMMDD
DT	Date Time YYYYMMDDHHMMSS
S	Sequence Number
-	Format currently not defined

Usage	Usage Overview
D	Download
U	Upload
I	Ignore
R	Required
F	Future Implementation
O	Optional

Message Header Record

General -The header shall contain identifiers of both sender and the receiver. The message header is a level zero record and must be followed at some point by a message terminator record before ending the session. This record type must always be the first record in a transmission.

Record Type ID -The character H identifies the word as a message header record.

Delimiter Definition - The five Latin-1 characters that immediately follow the H (the header ID) define the delimiters to be used throughout the subsequent records of the message. The second character in the header record is the field delimiter, the third character is the repeat delimiter, the fourth character is the component delimiter, and the fifth is the escape character. A field delimiter follows these characters to separate them from subsequent fields. Another way to view this is that the first field contains H and the second field contains the repeat, component and escape delimiters. Using the example delimiters, the first six characters in the header record would appear as follows: H |\^&.

Message Control ID -This is a unique number or other ID that uniquely identifies the transmission for use in network systems that have defined acknowledgment protocols that are outside of the scope of this specification. Note that this is the third field.

Access Password - Not Supported

Sender Name or ID - This text value includes the name or other ID of the sender. Its purpose is verification that the transmission is indeed for the receiver. [A40]

Sender Street Address - Not Supported

Reserved Field - This field is currently unused but "reserved for future use".

Sender Telephone Number - Not Supported

Characteristics of Sender - Not Supported

Receiver ID - This text value includes the name or other ID of the receiver. Its purpose is verification that the transmission is indeed for the sender. [A40]

Comment or Special Instructions - Not Supported

Processing ID [A1] - Indicates how this message is to be processed:
P (Production): Treat message as an active message to be completed according to standard processing
D (Debugging): Message is initiated for the purpose of a debugging program.
Q (Quality Control): Message is initiated for the purpose of transmitting quality control or quality assurance or regulatory data.

Version No. - This value identifies the version level of the specification. This value is currently DB 000102. [A20]

Date and Time of Message - This field contains the date and time that the message was generated using the format YYYYMMDDHHMMSS

Patient Information Record

Usage: To transmit information about a individual patient. This is a level one message. Each line of the patient record begins with a record type and ends with a carriage return.

Field and Component Definitions:

#	Format	Usage	ASTM Section	Description	Notes
1	"P"	R	8.1.1	Record Type	
2	S	R	8.1.2	Sequence Number	
3	A20	O	8.1.3	Practice Assigned ID	Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument.
4	A20	O	8.1.4	Lab Assigned Patient ID	Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument.
5	A20	O	8.1.5	Patient ID No. 3	Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument.
6			8.1.6	Patient Name	Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument in the following order, last name, space, first name, space, initial, space, and suffix. The patient name field will consist of : Last Name [20],First Name [20], Initial [1], Suffix [5]
6.1	A20	O	8.1.6.1	Last Name	
6.2	A20	O	8.1.6.2	First Name	
6.3	A1	O	8.1.6.3	Initial	
6.4	A5	O	8.1.6.4	Suffix	
7	-	I	8.1.7	Mother's Maiden Name	
8	D	O	8.1.8	Birth date [8]	YYYYMMDD
9	A1	O	8.1.9	Patient Sex	M (Male),F (Female), U (Unknown)
10			8.1.10	Patient Race/Ethnic Origin	W = white B = black O = asian/pacific islander AN = american/alaskan native H = hispanic
10.1	A10	O	8.1.10.1	Code	
10.2	A40	O	8.1.10.2	Description	
11	-	F	8.1.11	Patient Address	
12	-	F	8.1.12	Reserved Field	
13	_	F	8.1.13	Patient Telephone Number	

#	Format	Usage	ASTM Section	Description	Notes
14			8.1.14	Attending Physician	The field will be as follows; Attending Physician code [10], Last Name [20], First Name [20], Middle Initial [1], and Suffix [5]
14.1	A10	O	8.1.14.1	Attending Physician Code	User Defined
14.2	A20	O	8.1.14.2	Attending Physician Last Name	User Defined
14.3	A20	O	8.1.14.3	Attending Physician First Name	User Defined
14.4	A1	O	8.1.14.4	Attending Physician Middle Initial	User Defined
14.5	A5	O	8.1.14.5	Attending Physician Suffix	User Defined
15	-	F	8.1.15	Special Field 1	
16	-	F	8.1.16	Special Field 2	
17	-	F	8.1.17	Patient Height	.
18	-	F	8.1.18	Patient Weight	.
19			8.1.19	Patient Diagnosis	
19.1	A10	F		Code	
19.2	A40	F		Description	
20	-	F	8.1.20	Patient Active Medications	
21	-	I	8.1.21	Patient's Diet	
22	-	F	8.1.22	Practice Field No. 1	
23	-	F	8.1.23	Practice Field No. 2	
24	D	O	8.1.24	Admission Date, Discharge Date (Separated by Repeat delimiter)	The format is the admission date followed by the discharge date using the repeat delimiter. Each is eight digits in length.
25	-	IF	8.1.25	Admission Status	
26			8.1.26	Location	User Defined Each instrument type will have limits on the length of data stored, data will be saved from left most to the maximum.
26.1	A10	O	8.1.26.1	Location Code	User Defined
26.2	A40	O	8.1.26.2	Location Text	User Defined
27	-	I	8.1.27	Nature of Alternative Diagnostic Code	
28	-	I	8.1.28	Alternative Diagnosis	
29	-	I	8.1.29	Patient Religion	
30	-	I	8.1.30	Marital Status	
31	-		8.1.31	Isolation Status	
31.1	A10	IF	8.1.31.1	Isolation Code	
31.2	A40	IF	8.1.31.2	Isolation Text	
32	-	I	8.1.32	Language	

#	Format	Usage	ASTM Section	Description	Notes
33	-	F	8.1.33	Hospital Service	
34	-	F	8.1.34	Hospital Institution	
35	-	F	8.1.35	Dosage Cat.	

Format	**Data Type**
A xx	Alphanumeric to xx characters
N xx	Numeric to xx digits
TD	Table driven
D	Date YYYYMMDD
DT	Date Time YYYYMMDDHHMMSS
S	Sequence Number
-	Format currently not defined
Usage	**Usage Overview**
D	Download
U	Upload
I	Ignore
R	Required
F	Future Implementation
O	Optional

Patient Information Record

General - Each line of the patient record shall begin with a record type and end with a carriage return.

Record Type - The character P identifies the record as a patient record.

Sequence Number - For the first patient transmitted, I shall be entered, for the second, 2.... until the last . (Record Sequence Number - This is a required field used in record types that may occur multiple times within a single message. The number used defines the first occurrence of the associated record type at a particular hierarchical level and is reset to one whenever a record of a greater hierarchical significance (lower number) is transmitted or if the same record is used at a different hierarchical level (for example, comment records).

Practice Assigned Patient ID - This identifier shall be the unique assigned and used by the practice to identify the patient and his/her results upon return of the results of testing. **Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument. [A20]**

Laboratory Assigned Patient ID - This identifier shall be the unique assigned and used by the facility to identify the patient and his/her results upon return of the results of testing. **Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument. [A20]**

Patient ID No. 3 - This identifier shall be the unique assigned and used by some instruments to identify the patient results upon return from testing. **Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument. [A20]**

Patient Name - The patient's name shall be presented in the following format: last name, first name, middle name or initial, suffix, and title, and each of these components shall be separated by a component delimiter. **Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument in the following order, last name, space, first name, space, initial, space, and suffix. The patient name field will consist of: Last Name [20], First Name [20], Initial [1], Suffix [5]**

Mother's Maiden Name - Not Supported

Birth date - The birth date shall be presented in the standard format. Dates shall be recorded in the YYYYMMDD format as required by ANSI X3.30. March 10,1943 would be represented as 19430310.

Patient Sex [A1] - Sex shall be represented by the following: M (Male), F (Female), U (Unknown)

Patient Race-Ethnic Origin - This field shall be as two components; ethnic code [10], the description [40] and each of these components shall be separated by a component delimiter. As an example:

Code	Ethnic Description
W	white
B	black
O	asian/pacific islander
AN	american/alaskan native
H	hispanic

Patient Address - Not Supported

Reserved Field - This field is reserved for expansion.

Patient Telephone Number - This field is currently unused but “reserved for future use”.

Attending Physician ID - This field contains the name of the attending physician This field shall be Physician code [10], Last Name [20], First Name [20], Middle Initial [1],and Suffix [5] and each of these components shall be separated by a component delimiter

Special Field 1 - This field is currently unused but “reserved for future use”.

Special Field 2 - This field is currently unused but “reserved for future use”.

Patient Height - Not Currently Supported.

Patient Weight - This field is currently unused but “reserved for future use”.

Patient's Known or Suspected Diagnosis - This field is currently unused but “reserved for future use”.

Patient Active Medications - This field is currently unused but “reserved for future use”.

Patient's Diet - Not Supported

Practice Field No 1 - This field is currently unused but “reserved for future use”.

Practice Field No. 2 - This field is currently unused but “reserved for future use”.

Admission and Discharge Dates - The discharge date, when included, follows the admission date and is separated from it by a repeat delimiter.

Admission Status - Not Supported

Location - This text value reflects the general clinic location or nursing unit, or ward or bed or both of the patient in terms agreed upon by the sender and receiver Each instrument type will have limits on the length of data stored, data will be saved from left most to the maximum. Length Field is defined as Location Code [10] Location Text [40]

Nature of Alternative Diagnostic Code and Classifiers - Not Supported

Alternative Diagnostic Code and Classification - Not Supported

Patient Religion - Not Supported

Marital Status - Not Supported

Isolation Status - Isolation codes indicate precautions that must be applied to protect the patient or staff against infection. The following are suggested Codes [10] for common precaution. Multiple precautions can be listed when separated by repeat delimiters. Full text [40] precautions Not currently implemented.

Language - Not Supported

Hospital Service - This field is currently unused but “reserved for future use””

Hospital Institution - This field is currently unused but “reserved for future use”.

Dosage Category - This field is currently unused but “reserved for future use”.

Test Order Record

Usage: This record identifies a request to perform a test request. Either the instrument or the computer system may generate this order. This is a level two record. It will contain sufficient information for either system to be able create a test order. Single test request are supported, the use of profiles or batteries is not supported. No test order may be sent without a patient order.

Notes

Field and Component Definitions:

#	Format	Usage	ASTM Section	Description	Notes
1	"O"	R	9.4.1	Record Type	
2	S	R	9.4.2	Sequence Number	
3	A30	R	9.4.3	Specimen ID	Some instruments have a maximum limit on the data, data will be displayed/stored up to the maximum for the instrument.
4	-	I	9.4.4	Instrument Specimen ID	
5	-		9.4.5	Universal Test ID	This field will have six (6) components. The first three (3) components are not supported. The fourth component will contain the Manufacturers Test Code. The fifth component will contain the Instrument Type. The sixth component contains the Analyate Name. See appendix for Test Codes, Instrument Types and Analyate Names.
5.1	-	I	9.4.5.1	Universal Test ID	
5.2	-	I	9.4.5.2	Universal Test ID Name	
5.3		I	9.4.5.3	Universal Test ID type	
5.4			9.4.5.4	Manufacturer Codes	See Dade Behring Test Codes Document D00979
5.4.1	A4	R	9.4.5.4.1	Dade Behring Test Code	
5.4.2	A4	O	9.4.5.4.2	Instrument Code	If Instrument code is not specified, any instrument acceptable
5.4.3	A50	O	9.4.5.4.3	Analyate Name	
6	A1	R	9.4.6	Priority	S (Stat),A (as soon as possible), R (routine), P (preoperative)
7	-	IF	9.4.7	Requested/Ordered Date and Time	
8	DT	O	9.4.8	Specimen Collection Date and Time	YYYYMMDDHHMMSS
9	-	IF	9.4.9	Collection end time	
10	-	IF	9.4.10	Collection Volume	

#	Format	Usage	ASTM Section	Description	Notes
11	-	I	9.4.11	Collector ID	
12	A1	R	9.4.12	Action Code	N (New request),Q (treat as QC), A (add requesting tests), C (cancel), S (Calibration material)
13	-	I	9.4.13	Danger Code	
14	-	I	9.4.14	Relevant Clinical Information	
15	-	F	9.4.15	Date/Time Specimen Received	
16			9.4.16	Specimen Descriptor	
16.1	A1	R	9.4.16.1	Sample Type	S (Serum), C (CSF), P (plasma). U (Urine), W (Whole Blood), A (Amniotic Fluid),O (other)
16.2	A5	O	9.4.16.2	Sample Source	QC1 (1St Level QC) QC2 (2nd Level QC) QC3 (3rd Level QC) QC4 (4th Level QC) QC5 (5th Level QC) CAL1 (1st Level Calibrator) CAL2 (2nd Level Calibrator) CAL3 (3rd Level Calibrator) CAL4 (4th Level Calibrator) CAL5 (5th Level Calibrator)
17			9.4.17	Ordering Physician	The field will be as follows; Physician code [10], Last Name [20], First Name [20], Middle Initial [1], and Suffix [5] each separated by the component delimiter
17.1	A10	F	9.4.17.1	Physician Code	
17.2	A20	F	9.4.17.2	Physician last Name	
17.3	A20	F	9.4.17.3	Physician first Name	
17.4	A1	F	9.4.17.4	Physician Middle Initial Name	
17.5	A5	F	9.4.17.5	Physician Suffix	
18	-	F	9.4.18	Physician Telephone Number	
19	N6	R	9.4.19	Sample Dilution	Default is 1
20	N3	O	9.4.20	Total Number of Tests	Total number of tests ordered for this sample (Includes all tests for all Instrument Types)
21	-	I	9.4.21	Laboratory Field No. 1	
22	-	I	9.4.22	Laboratory Field No. 2	
23	DT	O	9.4.23	Date/Time Results Reported	YYYYMMDDHHMMSS
24	-	I	9.4.24	Instrument Charge to Computer System	

#	Format	Usage	ASTM Section	Description	Notes
25	-	I	9.4.25	Instrument Section ID	
26	A1	R	9.4.26	Report Type	O (order), F (final), P(preliminary), Q (Response to Query)
27	-	F	9.4.27	Reserved Field	
28	-	IF	9.4.28	Location or Ward	
29	-	I	9.4.29	Nosocomial Infection Flag	
30	-	I	9.4.30	Specimen Service	
31	-	IF	9.4.31	Specimen Institution	

Format	Data Type
A xx	Alphanumeric to xx characters
N xx	Numeric to xx digits
TD	Table driven
D	Date YYYYMMDD
DT	Date Time YYYYMMDDHHMMSS
S	Sequence Number
-	Format currently not defined
Usage	**Usage Overview**
D	Download
U	Upload
I	Ignore
R	Required
F	Future Implementation
O	Optional

Test Order Record

General - The test order record defines the attributes of a particular request for a clinical instrument's services and contains all specimen information. An order record will be generated by the computer system to request a given test, or set of tests. The information in an order record will usually apply to a single specimen. However, there is not necessarily a one-to-one relationship between specimen and tests ordered.

Multiple Orders - More than one test may be ordered on a single order record by using repeat delimiters between the individual tests ordered in that record. However, in such cases, all other attributes stored within the order record must be the same for all the tests ordered within that record. Thus, if one wishes to order one test as a STAT and another as a routine test, two separate order records would be required.

When test analyses are successfully performed, the message returned to the computer system will include the order record followed by result records for each separate observation requested by that order.

General Applications - The order record is sent by the computer system to request a particular set of instrument tests.

Field Definitions - The order record is comprised of the following fields:

Record Type ID - The character assigned to the order record is 0.

Sequence Number - This field represents as described in Record Sequence Number. (Record Sequence Number-This is a required field used in record types that may occur multiple times within a single message. The number used defines the first occurrence of the associated record type at a particular hierarchical level and is reset to one whenever a record of a greater hierarchical significance (lower number) is transmitted or if the same record is used at a different hierarchical level (for example, comment records).

Specimen ID - This text field shall represent a unique identifier for the specimen assigned by the computer system and returned by the instrument.

Instrument Specimen ID - Not supported

Universal Test ID - This field shall use universal test ID as described Below:

Universal Test ID (Part I) - Not Supported

Universal Test ID Name (Part 2) - Not Supported

Universal Test ID Type (Part 3) - Not Supported

Manufacturer's or Local Code (Part 4) - This field will consist of three parts, each separated by a component delimiter. They will always appear in the following order. (1) Dade Behring Test Code [4] (2) Instrument Code [4] (3) Analyte name [50]. See Dade Behring Analyate Names D00979

Priority [A1] - Test priority codes are: S (Stat), A (as soon as possible), R (Routine), P (preoperative)

Requested/Ordered Date and Time - Not supported

Specimen Collection Date and Time - This field shall represent the actual time the specimen was collected or obtained. In all cases, dates shall be recorded in the YYYYMMDD format as required

by ANSI X3.30. March 10,2000 would be represented as 20000310. When times are transmitted, they shall be represented as HHMMSS, shall be linked to dates as specified by ANSI X3.43. Date and time [14] together shall be specified as up to a fourteen-character string: YYYYMMDDHHMMSS.

Collection End Time - Not supported

Collection Volume - Not supported

Collector ID - Not supported

Action Code [A1] - This field shall indicate the action to be taken with respect to the specimens that accompany or precede this request. The following codes shall be used: N (New request), Q (Treat specimen as QC specimen), A (Add requesting tests), C (Cancel test), S (Calibration Material)

Danger Code - Not supported

Relevant Clinical Information - Not Supported

Date/Time Specimen Received - This field is currently unused but “reserved for future use.

Specimen Descriptor - This field may contain two separate elements, specimen type and specimen source. Component delimiters must separate the components.

> Specimen Type [A1] are: S (Serum), P (Plasma), C (CSF), U (Urine), W (whole Blood), A (Amniotic Fluid), O (Other)
>
> Specimen Source [A5] are: nil (Not a Quality Control or Calibrator material), QC1 (1st Level QC), QC2 (2nd Level QC), QC3 (3rd Level QC), QC4 (4th Level QC), QC5 (5th Level QC), CAL1 (1st Calibrator Level),CAL2 (2nd Calibrator Level), CAL3 (3rd Calibrator Level), CAL4 (4th Calibrator Level), CAL5 (5th Calibrator Level)

Ordering Physician - This field shall contain the name of the ordering physician This field shall be Physician code [10], Last Name [20], First Name [20], Middle Initial [1], and Suffix [5] ,and each of these components shall be separated by a component delimiter

Physician's Telephone Number - This field is currently unused but “reserved for future use.

Sample Dilution (formerly User Field No. 1) - This field will contain the sample dilution. [N6]

Total Number of Tests (formerly Users Field No. 2) - This field will contain the total number of tests ordered on this sample. This will be used to determine if the specimen is needed elsewhere for testing. [N3]

Laboratory Field No. 1 - This field is currently unused but “reserved for future use”.

Laboratory Field No. 2 - This field is currently unused but “reserved for future use”.

Date/Time Results Reported or Last Modified This field is used to indicate the date and time the results for the order are composed into a report YYYYMMDDHHMMSS

Instrument Charge to Computer System - Not Supported

Instrument Section ID - Not Supported

Report Types - The following codes shall be used: O (order record; user asking that analysis be performed), F (final results), P (preliminary result), Q (Response to query)

Reserved Field - This field is currently unused but “reserved for future use”.

Location or Ward of Specimen Collection - Not Supported

Nosocomial Infection Flag - Not Supported

Specimen Service - Not Supported

Specimen Institution - Not Supported.

Result Record

Usage To transmit patient results. Each record shall contain the values of a single determination. This is a level three record. A comment record may follow it.

Field and Component Definitions:

#	Format	Usage	ASTM Section	Description	Notes
1	"R"	R	10.1.1	Record Type	
2	S	R	10.1.2	Sequence Number	
3	-	I	10.1.3	Universal Test ID	
3.1	-	I	10.1.3.1	Universal Test ID	
3.2	-	I	10.1.3.2	Universal Test ID Name	
3.3	-	I	10.1.3.3	Universal Test ID type	
3.4			10.1.3.4	Manufacture Codes	See Dade Behring Test Codes and Names Document D00979
3.4.1	A4	R	10.1.3.4.1	Dade Behring Test Code	
3.4.2	A4	O	10.1.3.4.2	Instrument Code	
3.4.3	A50	O	10.1.3.4.3	Analyate Name	
4	A20	O	10.1.4	Data Measurement	Under certain condition the data measurement may not always be present. For example a error that would cause no data measurement.
5	A10	O	10.1.5	Units	
6	A30	O	10.1.6	Reference Ranges	This field contains the ranges defined for the specific device, some devices may not have reference ranges. The field can contain 30 characters with the lower reference range followed by a – (dash) then the upper range. Multiple ranges are not supported.
7	-	I	10.1.7	Results Abnormal Flag	
8	-	I	10.1.8	Nature Of Abnormal Testing	
9	A1	R	10.1.9	Result Status	F (final result), S (partial result), U (unsolicited order), P (preliminary),R (previously transmitted)
10	-	I	10.1.10	Date of Change in Instrument Normative Values	
11	A20	O	10.1.11	Operator Identification	this field contains the twenty-character field for the identification of the operator of the instrument. Not all instruments may support this field.
12	-	IF	10.1.12	Date/time Test Started	

#	Format	Usage	ASTM Section	Description	Notes
13	DT	O	10.1.13	Date/Time Completed	YYYYMMDDHHMMSS
14	A20	O	10.1.14	Instrument Identification	Identifies the instrument ID, not all instruments support this field.

Format	Data Type
A xx	Alphanumeric to xx characters
N xx	Numeric to xx digits
TD	Table driven
D	Date YYYYMMDD
DT	Date Time YYYYMMDDHHMMSS
S	Sequence Number
-	Format currently not defined
Usage	**Usage Overview**
D	Download
U	Upload
I	Ignore
R	Required
F	Future Implementation
O	Optional

Result Record

General - The result record shall include the following fields:

Record Type ID - Coded as R.

Sequence Number -This is a required field used in record types that may occur multiple times within a single message. The number used defines the first occurrence of the associated record type at a particular hierarchical level and is reset to one whenever a record of a greater hierarchical significance (lower number) is transmitted or if the same record is used at a different hierarchical level (for example, comment records).

Universal Test ID - This field shall the use universal test ID as described Below:

Universal Test ID (Part I) - Not Currently Supported

Universal Test ID Name (Part 2) - Not Currently Supported

Universal Test ID Type (Part 3) - Not Currently Supported

Manufacturer's or Local Code (Part 4) - This field will consist of three parts, each separated by a component delimiter. They will always appear in the following order. (1) Dade Behring Test Code [A4] (2) Instrument Code [A4] (3) Common name [A50]. See Dade Behring Test Names Document D00979

Data or Measurement Value - Whether numeric, text, scientific, or coded values.

Units - The abbreviation of units for numeric results shall appear here. ISO standard abbreviations in accordance with ISO 2955 should be employed when available, for example, use mg rather than milligrams. Units can be reported in upper or lower case.

Reference Ranges - This field contains the ranges defined for the specific device, some devices may not have reference ranges. The field can contain 30 characters with the lower reference range followed by a – (dash) then the upper range. Multiple ranges are not supported.

Result Abnormal Flags - Not Supported

Nature of Abnormal Testing - Not Supported

Result Status - The following codes shall be used: F (final results), S (partial results), P (preliminary results), R (previously transmitted), U (unsolicited order) Note: This is to notify the computer system that additional analyate(s) have been performed on the original test order).

Date of Change in Instrument Normative Values or Units - Not Supported

Operator Identification - The first component identifies the instrument operator [20] who performed the test. The second component identifies the verifier [20] for the test. Certain instruments may not support this function.

Date/Time Test Started – Not Supported

Date/Time Test Completed - Date [8] and time [6] the instrument completed the test results being reported. In all cases, dates shall be recorded in the YYYYMMDD format as required by ANSI X3.30. March 10,2000 would be represented as 20000310. When times are transmitted, they shall be represented as HHMMSS, and shall be linked to dates as specified by ANSI X3.43. Date and time [14] together shall be specified as up to a fourteen-character string: YYYYMMDDHHMMSS.

Instrument identification
Instrument ID- Identifies the instrument or device type and the specific instrument or device that performed this particular measurement. Note that some instruments may not contain an Instrument ID field.

Comment Record

Usage General - Comment records may be inserted anywhere except after the message terminator record. Each Comment record shall apply to the first non-comment record preceding it. See Dade Behring Comment codes.

Notes: When the Comment Record follows the Patient Record, Result Record or Order Record, its information content should be associated with those records. If the Comment Record does not follow one of the previously mentioned records, its information content is not associated with any other record and is complete and stand-alone.

Field and Component Definitions:

#	Format	Usage	ASTM Section	Description	Notes
1	"C"	R	11.1.1	Record Type ID	
2	S	R	11.1.2	Sequence Number	
3	A1	R	11.1.3	Comment Source	I = Instrument/device
4			11.1.4	Comment	This field will have two (2) components. The Comment Code [A6] followed by Comment Text [A35] (i.e. E121^Never Calibrated). This record is used to transmit the following: E001 to E999 - Instrument Errors (text matching error code in Comment Text) L001 (Sample Receipt Notification) i.e. L001^SampleID L001 (Sample Dispatch Notification) i.e. L001^SampleID^RackLocation) S001 - Sample Storage Location (in Comment Text) R001 – (Reagent Lot Number) R002 (Reagent Expiration Date(MMDDYY)) R003(Reagent Sequence Number (in Comment Text) i.e. R001^AA1365 C001 (Calibrator Name) C002 (Calibrator Lot Number) C003 (Calibrator Expiration Date(MMDDYY)) i.e. C001^Elavated Enzyme Verifier Q004 (QC Product Name) i.e. Q004^Normal Chemistry Control See Table for comment codes and text.
4.1	A6	R	11.14.1	Comment Code	See Table for comment codes and text
4.2	A35	R	11.14.2	Comment Text	See Table for comment codes and text
5	A1	U/R	11.1.5	Comment Type	I (Instrument Flags), G (General Text), E (Error Comments),T (Test Name Comment), A (Auxiliary Information), R (Reagent Lot Information), S (Sample Storage Information),C (Calibrator Information),Q (Quality Control Information)

Format	Data Type
A xx	alphanumeric to xx characters
N xx	Numeric to xx digits

TD	Table driven
D	Date YYYYMMDD
DT	Date Time YYYYMMDDHHMMSS
S	Sequence Number
-	Format currently not defined
Usage	**Usage Overview**
D	Download
U	Upload
I	Ignore
R	Required
F	Future Implementation
O	Optional

Comment Record

General - Comment records may be inserted anywhere except after the message terminator record. Each Comment record shall apply to the first non-comment record preceding it and may appear in any Comment Type order. The comment record includes the following fields:

Record Type ID - This record type is denoted by C.

Sequence Number - As defined in Record Sequence Number. (Record Sequence Number-This is a required field used in record types that may occur multiple times within a single message. The number used defines the first occurrence of the associated record type at a particular hierarchical level and is reset to one whenever a record of a greater hierarchical significance (lower number) is transmitted or if the same record is used at a different hierarchical level (for example, comment records).

Comment Text - Where comment codes/mnemonics are used, the code should be sent first, followed, if desired, by the comment text and separated by a component delimiter

Comment Type [A1]- The following codes may be used to qualify comment record types are: I (instrument flags), E (Errors), G (General Text), L (Sample Receipt / Dispatch Notification), T (Test Name Comments), R (Reagent Lot Information), S (Sample Storage Information), Q (Quality Control Information), C (Calibrator information)

Request Information Record

Usage To request Patient Records and tests for a specific sample ID.

Field and Component Definitions:

#	Format	Usage	ASTM Section	Description	Notes
1	"Q"	R	12.1.1	Record Type ID	
2	S	R	12.1.2	Record Sequence Number.	
3			12.1.3	Sample ID Number	Support for Single Requests
3.1	-	I	12.1.3.1	Patient ID	
3.2	A30	R	12.1.3.2	Sample ID	Must be specific sample ID
4	-	I	12.1.4	Ending Range ID Number	
5	-	I	12.1.5	Universal Test ID	
6	-	I	12.1.6	Nature of Request Time Limits	
7	-	I	12.1.7	Beginning Request Results Date and Time	
8	-	I	12.1.8	Ending Request Results Date and Time	
9	-	I	12.1.9	Requesting Physicians Name	
10	-	I	12.1.10	Requesting Physicians Telephone Number	
11	-	I	12.1.11	User Field 1	
12	-	I	12.1.12	User Field 2	
13	A1	U/R	12.1.13	Request Information Status Code	Only Requests for Orders and Demographics are supported by instrument type ‘O’. If the LIS has no orders for this sample it will return a ‘X’.

Format	Data Type
A xx	Alphanumeric to xx characters
N xx	Numeric to xx digits
TD	Table driven
D	Date YYYYMMDD
DT	Date Time YYYYMMDDHHMMSS
S	Sequence Number
-	Format currently not defined
Usage	**Usage Overview**
D	Download
U	Upload
I	Ignore
R	Required
F	Future Implementation

O	Optional

Request Information Record

General - Each line of the request record begins with a record type and ends with a carriage return. The request record includes the following fields:

Record Type ID - This record type is denoted by Q.

Sequence Number - As defined in Record Sequence Number. (Record Sequence Number-This is a required field used in record types that may occur multiple times within a single message. The number used defines the first occurrence of the associated record type at a particular hierarchical level and is reset to one whenever a record of a greater hierarchical significance (lower number) is transmitted or if the same record is used at a different hierarchical level (for example, comment records).

Sample ID Number - This field contains the following two sub-fields:

Patient ID - Not Supported.

Sample ID – For single sample queries, this text sub-field shall contain the unique identifier for the specimen. The host response is to transmit the order and demographics information matching the Sample ID.

Ending Range ID Number - Not Supported.

Universal Test ID - Not Supported.

Nature of Request Time Limits - Not Supported.

Beginning Request Results Date and Time - Not Supported.

Ending Request Results Date and Time - Not Supported.

Requesting Physicians Name - Not Supported.

Requesting Physicians Telephone Number - Not Supported.

User Field 1 - Not Supported.

User Field 2 - Not Supported.

Request Information Status Code – This field contains “O” to indicate the request is for orders and demographics from the instrument to LIS. If the LIS has not sample information for the sample ID a ‘X’ is returned to the instrument..

Message Terminator Record

Usage: This is the last record in a transmission. It terminates the transmission. This is a level zero record.

Field and Component Definitions:

#	Format	Usage	ASTM Section	Description	Notes
1	"L"	R	13.1.1	Record Type ID	
2	S	R	13.1.2	Record Sequence Number: Will always be "1".	
3	A1	D/O	13.1.3	Termination Code	Nil, N (normal termination) T (sender aborted) R (receiver requested abort) E (unknown system error) T, R and E will be reported as the cause for termination in the log file. Q (Error in last request for information) * I (No information available from last request) * F (Last request for information processed) * * Will terminate a request and allow processing of a new request

Format	Data Type
A xx	Alphanumeric to xx characters
N xx	Numeric to xx digits
TD	Table driven
D	Date YYYYMMDD
DT	Date Time YYYYMMDDHHMMSS
S	Sequence Number
-	Format currently not defined
Usage	**Usage Overview**
D	Download
U	Upload
I	Ignore
R	Required
F	Future Implementation
O	Optional

Message Terminator Record

General - This is the last record in the message. A header record may be transmitted after this record signifying the start of a second message.

Record Type ID - Coded as L.

Sequence Number - As described in Record Sequence. (For this record type, the value of this field should always be 1.) Record Sequence Number-This is a required field used in record types that may occur multiple times within a single message. The number used defines the first occurrence of the associated record type at a particular hierarchical level and is reset to one whenever a record of a greater hierarchical significance (lower number) is transmitted or if the same record is used at a different hierarchical level (for example, comment records).

Termination Code [A1] - Provides explanation of end of session. The following are the termination codes: Nil (Normal Termination), N (Normal Termination), R (Receiver requested aborted), E (Unknown system error), Q (Error in last request for information *), I (No information available from last request *), F (Last request for information processed *)

* Will terminate a request and allow processing of a new request