

CALINX-Related
HL7 Message Format High-level Implementation Guide
10/28/99
ATTACHMENT 3

Message Structure

An HL7 message consists of data fields that are of variable length and separated by a field separator character. Rules describe how the various data types are encoded within a field and when an individual field may be repeated. Data fields are combined into logical groupings called segments. Segments are separated by segment separator characters. Each segment begins with a three-character literal value that identifies it within a message. Segments may be defined as required or optional and may be permitted to repeat. Individual data fields are found in the message by their position within their associated segments. The hierarchy of the structure is as follows:

- Message
 - Segment (Some are Repeatable)
 - Fields (Some are Repeatable)
 - Components
 - Subcomponents

The segments used for the CALINX Laboratory Standard include:

MSH – Message Header – This is a required segment in all HL7 messages and defines how the message is being sent i.e. the version of HL7, the field separators and encoding characters, the message type, the sender and receiver, etc.

PID – Patient Identification – Identifies the individual patient demographics

FT1 – Financial Transaction – This segment is designed for billing and or payment transactions and identifies the patients billing and insurance information

OBR – Observation Reporting – This segment serves as the report header and identifies the observation set and relevant ordering information. When a set of observations is ordered, the order message contains an OBR segment. However, observations can be collected and reported without an antecedent order. When observations are reported, the report message also includes one or more OBR segments. So, the OBR segment is like a turn-around document. Some fields in the OBR segment apply only to the ordering message and some to the reporting message.

OBX – Observation Results – This segment is used to transmit a single observation or observation fragment. It represents the smallest indivisible unit of a report. It carries information about the observations in report messages. The OBX can also be part of an observation order.

Message Delimiters

The following delimiters are included in the HL7 format:

Delimiter	Suggested Value	Encoding Character Position	Usage
Segment Terminator	<cr> (hex 0D)	-	Terminates a segment record. This value cannot be changed by implementors.
Field Separator		-	Separates two adjacent data fields within a segment. It also separates the segment ID from the first data field in each segment.
Component Separator	^	1	Separates adjacent components of data fields where allowed.
Subcomponent Separator	&	4	Separates adjacent subcomponents of data fields where allowed. If there are no subcomponents, this character may be omitted.
Repetition Separator	~	2	Separates multiple occurrences of a field where allowed.
Escape Character	\	3	Escape character for use with any field represented by an ST, TX or FT data type, or for use with the data (fourth) component of the ED data type. If no escape characters are used in a message, this character may be omitted. However, it must be present if subcomponents are used in the message.

Fields

Maximum Field Length:

While the fields in HL7 are variable length, a maximum field length has been developed. The maximum length is calculated to include the component and subcomponent separators described above. Because the maximum length is that of a single occurrence, the repetition separator is not included in calculating the maximum length.

Repetition:

Some fields are designated as repeatable and can either be repeated indefinitely or a specified number of times, noted as follows:

Y = repeatable indefinitely

Y/x (where x is the number of times) = repeatable "x" times

Note: Some Segments are also repeatable (i.e. OBR & OBX)

Message Construction Rules

Step 1 -- Construct the segments in the order defined for the message. Each message is constructed as follows:

- a) the first three characters are the segment ID code
- b) each data field in sequence is inserted in the segment in the following manner:
 - 1) a field separator is placed in the segment
 - 2) if the value is not present, no further characters are required
 - 3) if the value is present, but null, the characters "" (two consecutive double quotation marks) are placed in the field
 - 4) otherwise, place the characters of the value in the segment. As many characters can be included as the maximum defined for the data field. It is not necessary, and is undesirable, to pad fields to fixed lengths. Padding to fixed lengths is permitted.
 - 5) if the field definition calls for a field to be broken into components, the following rules are used:
 - i. if more than one component is included they are separated by the component separator
 - ii. components that are present but null are represented by the characters ""
 - iii. components that are not present are treated by including no characters in the component
 - iv. components that are not present at the end of a field need not be represented by component separators. For example, the two data fields are equivalent:

|ABC^DEF^| and |ABC^DEF|.

- 6) if the component definition calls for a component to be broken into subcomponents, the following rules are used:
 - i. if more than one subcomponent is included they are separated by the subcomponent separator
 - ii. subcomponents that are present but null are represented by the characters ""
 - iii. subcomponents that are not present are treated by including no characters in the subcomponent
 - iv. subcomponents that are not present at the end of a component need not be represented by subcomponent separators. For example, the two data components are equivalent:

^XXX&YYY&&^ and ^XXX&YYY^.

- 7) if the field definition permits repetition of a field, the following rules are used, the repetition separator is used only if more than one occurrence is transmitted and is placed between occurrences. (If three occurrences are transmitted, two repetition separators are used.) In the example below, two occurrences of telephone number are being sent:

|234-7120~599-1288B1234|

- c) repeat Step 1b while there are any fields present to be sent. If all the data fields remaining in the segment definition are not present there is no requirement to include any more delimiters.
- d) end each segment with an ASCII carriage return character

Step 2 -- Repeat Step 1 until all segments have been generated.

The following rules apply to receiving HL7 messages and converting their contents to data values:

- e) ignore segments, fields, components, subcomponents, and extra repetitions of a field that are present but were not expected
- f) treat segments that were expected but are not present as consisting entirely of fields that are not present
- g) treat fields and components that are expected but were not included in a segment as not present.

Data Types

The data types in this section are listed in alphabetical order.

Note: For data types which contain multiple components or subcomponents, the examples given in this section do not specify the optionality of the component or subcomponents. This must be specified in the field definitions that follow the formal segment attribute tables to a maximum length of 64K.
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Except for the TS data type and the maximum or minimum lengths for several other data types (CE, PN, TX, FT), the field length of HL7 attributes is specified in the segment attribute tables, and any specific length of the components or subcomponents of those attributes must be specified in the field definitions that follow the formal segment attribute tables. In general, HL7 does not specify the lengths of components and/or subcomponents.

(The data type examples in this Standard are given using the standard HL7 encoding rules, with the delimiter values from *Figure 2-1* of Section 2.7 "MESSAGE DELIMITERS." Although only one set of encoding rules is defined as a standard in HL7 Version 2.3, other encoding rules are possible (but since they are non-standard, they may only be used by a site-specific agreement).

In certain data type definitions, square brackets, "[and"]", are used to specify optional parts of a data type (or of a data type component or subcomponent). Additional details for each data type are included following this table. Refer to the column "HL7 Section Reference" for the applicable section.

Data Type Category/ Data type	Data Type Name	HL7 Section Reference	Notes/Format
Alphanumeric			
ST	String	2.8.40	
Numerical			
SI	Sequence ID	2.8.38	
Identifier			
HD	Hierarchic designator	2.8.20	<namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
ID	Coded values for HL7 tables	2.8.21	
IS	Coded value for user-defined tables	2.8.22	
EI	Entity identifier	2.8.17	<entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
PT	Processing type	2.8.31	<processing ID (ID)> ^ <processing mode (ID)>
Date/Time			
TS	Time stamp	2.8.44	YYYY[MM[DD[HHMM[SS[.S[S[S[S]]]]]]][+/-ZZZZ] ^ <degree of precision>
Code Values			
CE	Coded element	2.8.3	<identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^ <alternate text (ST)> ^ <name of alternate coding system (ST)>
CX	Extended composite ID with check digit	2.8.12	<ID (ST)> ^ <check digit (ST)> ^ <code identifying the check digit scheme employed (ID)> ^ < assigning authority (HD)> ^ <identifier type code (IS)> ^ < assigning facility (HD)>
XCN	Extended composite ID number and name	2.8.49	In Version 2.3, use instead of the CN data type. <ID number (ST)> ^ <family name (ST)> & <last name prefix (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (IS)> ^ <source table (IS)> ^ <assigning authority (HD)> ^ <name type code (ID)> ^ <identifier check digit (ST)> ^ <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)> ^ <name representation code (ID)>
Demographics			
XPN	Extended person name	2.8.51	In Version 2.3, replaces the PN data type. <family name (ST)> & <last name prefix (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (IS)> ^ <name type code (ID)> ^ <name representation code (ID)>

Additional Data Type Descriptions:

2.8.3 CE - coded element

Components: <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^ <alternate text (ST)> ^ <name of alternate coding system (ST)>

This data type transmits codes and the text associated with the code. To allow all six components of a CE data type to be valued, the maximum length of this data type must be at least 60. Example:

```
|F-11380^CREATININE^I9^2148-5^CREATININE^LN|
```

2.8.3.1 Identifier (ST)

Sequence of characters (the code) that uniquely identifies the item being referenced by the <text>. Different coding schemes will have different elements here.

2.8.3.2 Text (ST)

Name or description of the item in question. E.g., myocardial infarction or X-ray impression. Its data type is string (ST).

2.8.3.3 Name of coding system (ST)

Each coding system is assigned a unique identifier. This component will serve to identify the coding scheme being used in the identifier component. The combination of the **identifier** and **name of coding system** components will be a unique code for a data item. Each system has a unique identifier. ASTM E1238-94, Diagnostic, procedure, observation, drug ID, and health outcomes coding systems are identified in the tables in Section 7.1.4, "Coding schemes." Others may be added as needed. When an HL7 table is used for a CE data type, the *name of coding system* component is defined as **HL7nnnn** where *nnnn* is the HL7 table number.

2.8.3.4 Alternate components

These three components are defined analogously to the above for the alternate or local coding system. If the Alternate Text component is absent, and the Alternate Identifier is present, the Alternate Text will be taken to be the same as the Text component. If the Alternate Coding System component is absent, it will be taken to mean the locally-defined system.

Note: The presence of two sets of equivalent codes in this data type is semantically different from a repetition of a CE-type field. With repetition, several distinct codes (with distinct meanings) may be transmitted.

For HL7-defined tables which have not been adopted from some existing standard, the third component, "name of coding system," is constructed by appending the table number to the string "HL7." Thus, the field RXR-2-site, is a CE data type which refers to HL7 table number 0163. Its "name of coding system" component is "HL70163".

2.8.12 CX - extended composite ID with check digit

Components: <ID (ST)> ^ <check digit (ST)> ^ <code identifying the check digit scheme employed (ID)> ^ <assigning authority (HD)> ^ <identifier type code (IS)> ^ <assigning facility (HD)>

Example:

```
|1234567^4^M11^ADT01^MR^University Hospital|
```

2.8.12.1 ID (ST)

Defined as in the CK data type except that a ST data type is allowed instead of a NM data type.

2.8.12.2 Check digit (ST)

Defined as in the CK data type except that an ST data type is allowed instead of an NM data type. The check digit in this data type is **not** an add-on produced by the message processor. It is the check digit that is part of the identifying number used in the sending application. If the sending application does not include a self-generated check digit in the identifying number, this component should be valued null.

2.8.12.3 Code identifying the check digit scheme employed (ID)

Defined as in the CK data. Refer to *HL7 table 0061- Check digit scheme* for valid values.

Note: The check digit and code identifying check digit scheme are null if ID is alphanumeric.

2.8.12.4 Assigning authority (HD)

The assigning authority is a unique name of the system (or organization or agency or department) that creates the data. It is a HD data type. *User-defined table 0363 – Assigning authority* is used as the HL7 identifier for the user-defined table of values for the first sub-component of the HD component, <namespace ID>.

Note: When the HD data type is used in a given segment as a component of a field of another data type, *user-defined table 0300 - Namespace ID* (referenced by the first sub-component of the HD component) may be re-defined (given a different user-defined table number and name) by the technical committee responsible for that segment.

By site agreement, implementors may continue to use *user-defined table 0300 – Namespace ID* for the first sub-component.

2.8.12.5 Identifier type code (IS)

A code corresponding to the type of identifier. In some cases, this code may be used as a qualifier to the “Assigning authority” component. Refer to *user-defined table 0203 - Identifier type* for suggested values.

User-defined table 0203 - Identifier type

Value	Description
AM	American Express
AN	Account number
BR	Birth registry number
DI	Diner's Club card
DL	Driver's license number
DN	Doctor number
DS	Discover Card
EI	Employee number
EN	Employer number
FI	Facility ID
GI	Guarantor internal identifier

Value	Description
GN	Guarantor external identifier
LN	License number
LR	Local Registry ID
MS	MasterCard
MA	Medicaid number
MC	Medicare number
MR	Medical record number
NE	National employer identifier
NI	National unique individual identifier
NH	National Health Plan Identifier
NNxxx	National Person Identifier where the xxx is the ISO table 3166 3-character (alphabetic) country code
NPI	National provider identifier
PI	Patient internal identifier
PN	Person number
PRN	Provider number
PT	Patient external identifier
RRI	Regional registry ID
RR	Railroad Retirement number
SL	State license
SR	State registry ID
SS	Social Security number
U	Unspecified
UPIN	Medicare/HCFA's Universal Physician Identification numbers
VS	VISA
VN	Visit number
WC	WIC identifier
XX	Organization identifier

2.8.12.6 Assigning facility (HD)

Subcomponents: <namespace ID (IS)> & < universal ID (ST)> & <universal ID type (ID)>

Definition: The place or location identifier where the identifier was first assigned to the patient. This component is not an inherent part of the identifier but rather part of the history of the identifier: as part of this data type, its existence is a convenience for certain intercommunicating systems.

Note: When the HD data type is used in a given segment as a component of a field of another data type, user-defined table 0300 - Namespace ID (referenced by the first sub-component of the HD component), may be re-defined (given a different user-defined table number and name) by the technical committee responsible for that segment.

2.8.17 EI - entity identifier

Components: <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>

The entity identifier defines a given entity within a specified series of identifiers.

The specified series, the *assigning authority*, is defined by components 2 through 4. The assigning authority is of the hierarchic designator (HD) data type, but it is defined as three separate components in the EI data type, rather than as a single component as would normally be the case. This is in order to maintain backward compatibility with the EI's use as a component in several existing data fields. Otherwise, the components 2 through 4 are as defined in Section 0, "HD - hierarchic designator." Hierarchic designators (HD) are unique across a given HL7 implementation.

2.8.17.1 Entity identifier (ST)

The first component, <entity identifier>, is usually defined to be unique within the series of identifiers created by the <assigning authority>, defined by a hierarchic designator, represented by components 2 through 4. (See Section 0, "HD - hierarchic designator".)

2.8.17.2 Namespace ID (IS)

See Section 0, "2.8.20.1 Namespace ID (IS)" for definition.

The assigning authority is a unique identifier of the system (or organization or agency or department) that creates the data. *User-defined table 0363 – Assigning authority* is used as the HL7 identifier for the user-defined table of values for this component.

Note: When the HD is used as a part of another data type, in this case as part of the EI data type, this table may be re-defined (given a different user-defined table number and name) by the technical committee responsible for that segment.

By site agreement, implementors may continue to use *user-defined table 0300 – Namespace ID* for the first component

2.8.17.3 Universal ID (ST)

See Section 0, "2.8.20.2 Universal ID (ST)" for definition..

2.8.17.4 Universal ID type (ID)

Refer to *HL7 table 0301 - Universal ID type* for valid values. See Section 0 "2.8.20.2 Universal ID (ST)," for definition.

2.8.20 HD - hierarchic designator

Components: <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>

The HD is designed to be more powerful and more general replacement for the application identifier of HL7 versions 2.1 and 2.2. It adds two additional components, the <universal ID> and the <universal ID type> to the former *application ID* (which is renamed more generically to be the *namespace ID*)

The basic definition of the HD is that it identifies an (administrative or system or application or other) entity that has responsibility for managing or assigning a defined set of instance identifiers (such as placer or filler number, patient identifiers, provider identifiers, etc.). This entity could be a particular health care application such as a registration system that assigns patient identifiers, a governmental entity such as a

licensing authority that assigns professional identifiers or drivers' license numbers, or a facility where such identifiers are assigned.

In the case where a HD identifies an entity that assigns/creates instance identifiers such as a particular patient registration system, it defines an "assigning authority." In the case where a HD identifies a location where instance identifiers are given out (although they may be created by another entity at another location) such as a particular "department of motor vehicles office location," it defines an "assigning facility." These two different uses of the HD appear in many of the extended data types.

The "assigning authority" defined by the HD is similar in its role to the coding system (and version) part of the coded element data types: both identify a set of more discrete instance identifiers. The difference is that the set of HD-defined discrete instances contain identifiers of "real-world" things such as patient or clinical orders, while the coded element-defined set of discrete instances contains concept identifiers (codes).

The HD is designed to be used either as a local identifier (with only the <namespace ID> valued) or a publicly-assigned identifier, a UID (<universal ID> and <universal ID type> both valued). Syntactically, the HD is a group of two identifiers: a local identifier defined by the first component, and a universal identifier defined by the second and third components. HDs that have defined third components (defined UID types) must have a second component that is unique within the series of IDs defined by that component.

Note: The HD is used in fields that in earlier versions of HL7 used the IS data type. Thus, a single component HD (only the first component valued) will look like a simple IS data type for older systems expecting a single component in the place of the HD data type.

If the first component for the HD data type is present, the second and third components are optional. If the third component is present, then the second must also be present (although in this case the first is optional). The second and third components must either both be valued (both non-null), or both be not valued (both null).

This means that if all three components of the HD are valued, the entity identified by the first component is the same as the entity identified by components two and three taken together. However, implementors may choose, by site agreement, to specify that if all three components of the HD are valued, the first component defines a member in the set defined by the second and third components.

2.8.20.1 Namespace ID (IS)

User-defined table 0300 - Namespace ID is used as the HL7 identifier for the user-defined table of values for this component.

Note: When the HD is used in a given segment (either as a field or as a component of another data type) this table may be re-defined (given a different user-defined table number and name) by the technical committee responsible for that segment.

2.8.20.2 Universal ID (ST)

The HD's second component, <universal ID (UID), is a string formatted according to the scheme defined by the third component, <universal ID type> (UID type). The UID is intended to be unique over time within the UID type. It is rigorously defined. Each UID must belong to one of the specifically enumerated schemes for constructing UID's (defined by the UID type). The UID (second component) must follow the syntactic rules of the particular universal identifier scheme (defined by the third component). Note that these syntactic rules are not defined within HL7 but are defined by the rules of the particular universal identifier scheme (defined by the third component).

2.8.20.3 Universal ID type (ID)

The third component governs the interpretation of the second component of the HD. If the third component is a known UID refer to *HL7 table 0301 - Universal ID type* for valid values, then the second component is a universal ID of that type.

Table 0301 - Universal ID type

Value	Description
DNS	An Internet dotted name. Either in ASCII or as integers
GUID	Same as UUID.
HCD	The CEN Healthcare Coding Scheme Designator. (Identifiers used in DICOM follow this assignment scheme.)
HL7	Reserved for future HL7 registration schemes
ISO	An International Standards Organization Object Identifier
L,M,N	These are reserved for locally defined coding schemes.
Random	Usually a base64 encoded string of random bits. The uniqueness depends on the length of the bits. Mail systems often generate ASCII string "unique names," from a combination of random bits and system names. Obviously, such identifiers will not be constrained to the base64 character set.
UUID	The DCE Universal Unique Identifier
x400	An X.400 MHS format identifier
x500	An X.500 directory name

Note: X400, X500, and DNS are not technically universally valid for all time. Names can be de-registered from an existing user and registered to a new user.

Examples:

Universal ID examples with only the 2nd and 3rd components valued:

`^1.2.344.24.1.1.3^ISO`

A HD consisting only of an ISO UID.

`^1.2.34.4.1.5.1.5.1,1.13143143.131.3131.1^ISO`

The syntax of the second component is defined by the ISO standard for object identifiers, not by HL7 (for which the second component is of the ST data type). Thus the periods (“.”) and comma (“;”) in the second component are part of the ISO syntax, but are legal by the definition of the HL7 ST data type.

`^14344.14144321.4122344.14434.654^GUID`

`^falcon.iupui.edu^DNS`

An internet example

`^40C983F09183B0295822009258A3290582^RANDOM`

An example of a RANDOM UID

Local examples:

`LAB1`

Local use only: a HD that looks like an IS data type

`PathLab^PL.UCF.UC^L`

The ‘PathLab’ application is identified by the namespace component but it is also identified by the 2nd and 3rd components, (i.e., by the locally-defined UID system “L”). The two identifiers are equivalent.

This is a more complex HD in which the middle component, which is locally defined, is itself structured. As with the ISO example above, the middle component’s structure is not defined by HL7 but by the site

according to its own needs: the only requirement is that the middle component's structure is allowed by the HL7 string (ST) data type.

```
RX.PIMS.SystemB.KP.CA.SCA
```

Local use only: a HD that looks like an IS data type. Again, note that the syntax of the first component is not defined by HL7 but by the site according to its own needs: the only requirement is that the first component's structure is allowed by the HL7 string (ST) data type, which is used for values by the IS data type.

```
^RX.PIMS.SystemB.CA.SCA^M
```

An alternate way to encode the previous example, illustrating the use of the third component value of "M" (see above table 0301) to identify a locally-defined identifier set. The second component has the same value as the previous example but is now defined to be a member of a set of allowable values defined by a site for the identifier set "M".

Examples containing both local and universal ID types:

```
LAB1^1.2.3.3.4.6.7^ISO
```

A HD with an ISO "object Identifier" as a UID and a locally defined system name. Both the first component and the second and third (taken together) refer to the same entity. This example shows that the local value and the universal ID value may be transmitted with a single HD field.

2.8.21 ID - coded value for HL7 defined tables

The value of such a field follows the formatting rules for an ST field except that it is drawn from a table of legal values. There shall be an HL7 table number associated with ID data types. Examples of ID fields include *MSH-12-version ID* and *OBR-25-result status*. This data type should be used only for HL7 tables. The reverse is not true, since in some circumstances it is more appropriate to use the CE data type for HL7 tables.

2.8.22 IS - coded value for user-defined tables

The value of such a field follows the formatting rules for a ST field except that it is drawn from a site-defined (or user-defined) table of legal values. There shall be an HL7 table number associated with IS data types. An example of an IS field is the *Event reason code* defined in Section 3.3.1.4, "Event reason code." This data type should be used only for user-defined. The reverse is not true, since in some circumstances, it is more appropriate to use the CE data type for user-defined tables.

2.8.31 PT - processing type

Components: <processing ID (ID)> ^ <processing mode (ID)>

This data type indicates whether to process a message as defined in HL7 Application (level 7) Processing rules.

2.8.31.1 Processing ID (ID)

A value that defines whether the message is part of a production, training, or debugging system. Refer to *HL7 table 0103 - Processing ID* for valid values.

2.8.31.2 Processing mode (ID)

A value that defines whether the message is part of an archival process or an initial load. Refer to *HL7 table 0207 - Processing mode* for valid values.

2.8.38 SI - sequence ID

A non-negative integer in the form of a NM field. The uses of this data type are defined in the chapters defining the segments and messages in which it appears.

2.8.40 ST - string data

String data is left justified with trailing blanks optional. Any displayable (printable) ACSII characters (hexadecimal values between 20 and 7E, inclusive, or ASCII decimal values between 32 and 126), except the defined delimiter characters. Example:

```
|almost any data at all|
```

To include any HL7 delimiter character (except the segment terminator) within a string data field, use the appropriate HL7 escape

Usage note: The ST data type is intended for short strings (e.g., less than 200 characters). For longer strings the TX or FT data types should be used.

2.8.44 TS - time stamp

Format: YYYY[MM[DD[HHMM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ]^<degree of precision>

Contains the exact time of an event, including the date and time. The date portion of a time stamp follows the rules of a date field and the time portion follows the rules of a time field. The time zone (+/-ZZZZ) is represented as +/-HHMM offset from UCT (formerly Greenwich Mean Time (GMT)), where +0000 or -0000 both represent UCT (without offset). The specific data representations used in the HL7 encoding rules are compatible with ISO 8824-1987(E).

In prior versions of HL7, an optional second component indicates the degree of precision of the time stamp (Y = year, L = month, D = day, H = hour, M = minute, S = second). This optional second component is retained only for purposes of backward compatibility.

By site-specific agreement, YYYYMMDD[HHMM[SS[.S[S[S]]]]][+/-ZZZZ]^<degree of precision> may be used where backward compatibility must be maintained.

In the current and future versions of HL7, the precision is indicated by limiting the number of digits used, unless the optional second component is present. Thus, YYYY is used to specify a precision of "year," YYYYMM specifies a precision of "month," YYYYMMDD specifies a precision of "day," YYYYMMDDHH is used to specify a precision of "hour," YYYYMMDDHHMM is used to specify a precision of "minute," YYYYMMDDHHMMSS is used to specify a precision of seconds, and YYYYMMDDHHMMSS.SSSS is used to specify a precision of ten thousandths of a second. In each of these cases, the time zone is an optional component. Note that if the time zone is not included, the time zone defaults to that of the local time zone of the sender. Also note that a TS valued field with the HHMM part set to "0000" represents midnight of the night extending from the previous day to the day given by the YYYYMMDD part (see example below). Maximum length of the time stamp is 26. Examples:

```
|19760704010159-0500|
```

1:01:59 on July 4, 1976 in the Eastern Standard Time zone (USA).

```
|19760704010159-0400|
```

1:01:59 on July 4, 1976 in the Eastern Daylight Saving Time zone (USA).

```
|198807050000|
```

Midnight of the night extending from July 4 to July 5, 1988 in the local time zone of the sender.

|19880705|

Same as prior example, but precision extends only to the day. Could be used for a birthdate, if the time of birth is unknown.

|19981004010159+0100|

1:01:59 on October 4, 1998 in Amsterdam, NL. (Time zone=+0100).

The HL7 Standard strongly recommends that all systems routinely send the time zone offset but does not require it. All HL7 systems are required to accept the time zone offset, but its implementation is application specific. For many applications the time of interest is the local time of the sender. For example, an application in the Eastern Standard Time zone receiving notification of an admission that takes place at 11:00 PM in San Francisco on December 11 would prefer to treat the admission as having occurred on December 11 rather than advancing the date to December 12.

Note: The time zone [+/-ZZZZ], when used, is restricted to legally-defined time zones and is represented in HHMM format.

One exception to this rule would be a clinical system that processed patient data collected in a clinic and a nearby hospital that happens to be in a different time zone. Such applications may choose to convert the data to a common representation. Similar concerns apply to the transitions to and from daylight saving time. HL7 supports such requirements by requiring that the time zone information be present when the information is sent. It does not, however, specify which of the treatments discussed here will be applied by the receiving system.

2.8.49 XCN - extended composite ID number and name for persons

Components: <ID number (ST)> ^ <family name (ST) > & < last_name_prefix (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (IS)> ^ <source table (IS)> ^ <assigning authority (HD)> ^ <name type code(ID)> ^ <identifier check digit (ST)> ^ <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^ <assigning facility (HD)> ^ < name representation code(ID)>

Subcomponents of assigning authority: <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>

Subcomponents of assigning facility: <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>

This data type is used extensively appearing in the PV1, ORC, RXO, RXE, OBR and SCH segments , as well as others, where there is a need to specify the ID number and name of a person.

Example without assigning authority and assigning facility:

|1234567^Smith^John^J^III^DR^PHD^ADT01^^L^4^M11^MR|

Examples with assigning authority and assigning facility:

Dr. Samuel Semmelweiss's provider ID was assigned by the Provider Master and was first issued at Fairview Hospital within the University Hospitals System. Since IS table values (first component of the HD) were not used for assigning authority and assigning facility, components 2 and 3 of the HD data type are populated and demoted to sub-components as follows:

12188^Semmelweiss^Samuel^S^IV^Dr^MD^^&Provider Master.University Hospitals&L^L^9^M10^DN^&Fairview Hospital.University Hospitals&L^A

Ludwig van Beethoven's medical record number was assigned by the Master Patient Index and was first issued at Fairview Hospital within the University Hospitals System.

2.8.49.1 ID number (ST)

This string refers to the coded ID according to a user-defined table, defined by the 9th component. If the first component is present, either the source table or the assigning authority must be valued.

2.8.49.2 Family name (ST) & last name prefix (ST)

2.8.49.2.1 Family name (ST)

Surname/last name.

2.8.49.2.2 Last name prefix (ST)

Internationalization usage for Germanic languages. An example of a <last name prefix> is the “van” in “Ludwig van Beethoven.” Since the <last name prefix> doesn’t sort completely alphabetically, it is reasonable to specify it as a separate sub-component of the PN and extended PN data types (XPN and XCN).

Note: If the <last name prefix> is not null, the <last name prefix> should also be present as part of the <family name> subcomponent e.g. “van Beethoven&van.”

2.8.49.3 Given name (ST)

2.8.49.4 Middle initial or name (ST)

2.8.49.5 Suffix (ST)

Used to specify a name suffix (e.g., Jr. or III).

2.8.49.6 Prefix (ST)

Used to specify a name prefix (e.g., Dr.).

2.8.49.7 Degree (IS)

Used to specify an educational degree (e.g., MD). Refer to *user-defined table 0360 – Degree* for suggested values.

2.8.49.8 Source table (IS)

User-defined table 0297 - CN ID source is used as the HL7 identifier for the user-defined table of values for this component. Used to delineate the first component.

2.8.49.9 Assigning authority (HD)

The assigning authority is a unique identifier of the system (or organization or agency or department) that creates the data. It is a HD data type. Assigning authorities are unique across a given HL7 implementation. *User-defined table 0363 – Assigning authority* is used as the HL7 identifier for the user-defined table of values for the first sub-component of the HD component, <namespace ID>.

Note: When the HD data type is used in a given segment as a component of a field of another data type, user-defined table 0300 - Namespace ID (referenced by the first sub-component of the HD component) may be re-defined (given a different user-defined table number and name) by the technical committee responsible for that segment.
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By site agreement, implementors may continue to use user-defined table 0300 – Namespace ID for the first sub-component.

2.8.49.10 Name type code (ID)

A code that represents the type of name. Refer to *HL7 table 0200 - Name type* for valid values (see Section 0, “XPN - extended person name”).

2.8.49.11 Identifier check digit (ST)

The check digit in this data type is not an add-on produced by the message processor. It is the check digit that is part of the identifying number used in the sending application. If the sending application does not include a self-generated check digit in the identifying number, this component should be valued null.

2.8.49.12 Code identifying the check digit scheme employed (ID)

Refer to HL7 table 0061 - Check digit scheme for valid values.

2.8.49.13 Identifier type code (IS)

A code corresponding to the type of identifier. In some cases, this code may be used as a qualifier to the <assigning authority> component. Refer to *user-defined table 0203 - Identifier type* for suggested values.

2.8.49.14 Assigning facility (HD)

The place or location identifier where the identifier was first assigned to the person. This component is not an inherent part of the identifier but rather part of the history of the identifier: as part of this data type, its existence is a convenience for certain intercommunicating systems.

Note: When the HD data type is used in a given segment as a component of a field of another data type, user-defined table 0300 - Namespace ID (referenced by the first sub-component of the HD component) may be re-defined (given a different user-defined table number and name) by the technical committee responsible for that segment.

2.8.49.15 Name representation code (ID)

Different <name/address types> and representations of the same <name/address> should be described by repeating of this field, with different values of the <name/address type> and/or <name/address representation> component.

Note: This new component remains in “alphabetic” representation with each repetition of the field using these data types. I.e. even though the name may be represented in an ideographic character set, this component will remain represented in an alphabetic character set.

Table 4000 - Name/address representation

Value	Description
I	Ideographic (i.e., Kanji)
A	Alphabetic (i.e., Default or some single-byte)
P	Phonetic (i.e., ASCII, Katakana, Hiragana, etc.)

In general this component provides an indication of the representation provided by the data item. It does not necessarily specify the character sets used. Thus, even though the representation might provide an indication of what to expect, the sender is still free to encode the contents using whatever character set is desired. This component provides only hints for the receiver, so it can make choices regarding what it has been sent and what it is capable of displaying.

2.8.51 XPN - extended person name

Components: <family name (ST)> & <last_name_prefix (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (IS)> ^ <name type code (ID)> ^ <name representation code (ID)>

Example:

|Smith^John^J^III^DR^PHD^L|

2.8.51.1 Family name (ST) & last name prefix (ST)

2.8.51.1.1 Family name (ST)

Surname/last name.

2.8.51.1.2 Last name prefix (ST)

Internationalization usage for Germanic languages. An example of a <last name prefix> is the “van” in “Ludwig van Beethoven.” Since the <last name prefix> doesn't sort completely alphabetically, it is reasonable to specify it as a separate sub-component of the PN and extended PN data types (XPN and XCN).

Note: If the <last name prefix> is not null, the <last name prefix> should also be present as part of the <family name> subcomponent e.g. “van Beethoven&van.”

2.8.51.2 Given name (ST)

2.8.51.3 Middle initial or name (ST)

2.8.51.4 Suffix (ST)

Used to specify a name suffix (e.g., Jr. or III).

2.8.51.5 Prefix (ST)

Used to specify a name prefix (e.g., Dr.).

2.8.51.6 Degree (IS)

Used to specify an educational degree (e.g., MD). Refer to *user-defined table 0360 – Degree* for suggested values.

User-defined table 0360 - Degree

Value	Description
AAS	Associate of Applied Science
AA	Associate of Arts
ABA	Associate of Business Administration
AE	Associate of Engineering
AS	Associate of Science
BA	Bachelor of Arts
BBA	Bachelor of Business Administration
BE	Bachelor or Engineering
BFA	Bachelor of Fine Arts

Value	Description
BN	Bachelor of Nursing
BS	Bachelor of Science
BSL	Bachelor of Science – Law
BT	Bachelor of Theology
CER	Certificate
DIP	Diploma
DBA	Doctor of Business Administration
DED	Doctor of Education
PHE	Doctor of Engineering
PHD	Doctor of Philosophy
PHS	Doctor of Science
MD	Doctor of Medicine
DO	Doctor of Osteopathy
HS	High School Graduate
JD	Juris Doctor
MA	Master of Arts
MBA	Master of Business Administration
MCE	Master of Civil Engineering
MDI	Master of Divinity
MED	Master of Education
MEE	Master of Electrical Engineering
ME	Master of Engineering
MFA	Master of Fine Arts
MME	Master of Mechanical Engineering
MS	Master of Science
MSL	Master of Science – Law
MT	Master of Theology
NG	Non-Graduate
SEC	Secretarial Certificate
TS	Trade School Graduate

2.8.51.7 Name type code (ID)

A code that represents the type of name. Refer to *HL7 table 0200 - Name type* for valid values.

Table 0200 - Name type

Value	Description
A	Alias Name
L	Legal Name
D	Display Name
M	Maiden Name
C	Adopted Name
B	Name at Birth
P	Name of Partner/Spouse
S	Coded Pseudo-Name to ensure anonymity
T	Tribal/Community Name
U	Unspecified

Note: The content of Legal Name is country specific. In the US the legal name is the same as the current married name.

2.8.51.8 Name representation code (ID)

Different <name/address types> and representations of the same <name/address> should be described by repeating of this field, with different values of the <name/address type> and/or <name/address representation> component.

Note: This new component remains in "alphabetic" representation with each repetition of the field using these data types. I.e. even though the name may be represented in an ideographic character set, this component will remain represented in an alphabetic character set.

Table 4000 - Name/address representation

Value	Description
I	Ideographic (i.e., Kanji)
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In general this component provides an indication of the representation provided by the data item. It does not necessarily specify the character sets used. Thus, even though the representation might provide an indication of what to expect, the sender is still free to encode the contents using whatever character set is desired. This component provides only hints for the receiver, so it can make choices regarding what it has been sent and what it is capable of displaying.