ANSI/HIBC 1.2-2006

THE HEALTH INDUSTRY BAR CODE (HIBC) PROVIDER APPLICATIONS STANDARD

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THE HEALTH INDUSTRY BAR CODE (HIBC)
PROVIDER APPLICATIONS STANDARD

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Foreword

Automatic identification technology is continually evolving. As technological advances prove applicable to the health care industry, they will be incorporated into revisions of this standard, wherever possible. However, every attempt will be made to maintain the existing data structures, thereby allowing new technology to be introduced into systems in a non-disruptive manner.

Scope

This document describes the voluntary Health Industry Bar Code Provider Applications Standard. Providers of health care services are strongly encouraged to use bar code labeling incorporating bar code symbols in accordance with the standards described herein.

1.0 HIBC Provider Applications Standard Data Structures

A distinction is drawn in this document between data structures and the encodation of the data structure in a machine-readable form. This section defines only the data structures encoded in the HIBC symbologies.

The HIBC Provider Applications Data Structure Format uses the “+/” characters as the identifier for the HIBC Provider Applications Data Structure.

A set of application flag characters will identify the application and data by two criteria:

- Where the data structure is located (where it is or what it is on).
- The nature of the data structure (what it is).

Note:
In a health care setting, the simple identity of a data field is often insufficient. An example would be that of a patient identity for the taking of specimens or upon commencement of a surgical procedure. It is not only necessary to identify the patient, but further verification is required of "where" the patient identity was taken from. Patient identity might occur on the patient chart or other medical records, but in the cases enumerated above, should be taken from the patient wristband or other identity physically affixed to the patient. The "where" portion of the data structure would verify that the identity was, in fact, taken directly from the patient.

Single flag characters are selected from the set of letters A through Z (except Y). Three character flag-characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC. These three character flag-character definitions will be assigned by HIBCC as future needs are defined.

All non-defined flag characters are reserved for future expansion by HIBCC.

The letter "Z" is reserved for non-conforming data formats, for purely internal use (within a specific health care facility) or within a "closed system." A "closed system" is defined as one where the user of a data structure can always be defined and where a central authority in the user's institution has final authority over the encoding, decoding, and processing systems. Conversely, an "open system" is one typified by the absence of a central authority. Examples of "open systems" include:

- A specimen being sent to a private laboratory
- Transfer of patients between institutions
- Organs harvested from patients in one institution that are implanted in a patient at another institution.

In "open systems," a data structure encoded at one institution must be able to be decoded and referenced by the receiving institution.

It is recognized that data structures other than those identified in this standard may be in limited use in certain institutions. It is recommended that such non-conforming data structures be considered an interim method, with the HIBC Provider Applications Standard data structures as an ultimate uniform method. It is recommended that other data structures not be perpetuated except for some compelling pre-existing reasons.

No specific format is recommended for the individual data fields within the data structure with three exceptions:

- HIBCC assigned Labeler Identification Code (LIC); (see sec. 1.2.2 “A”)
- Date; (see sec. 1.2.2 “M”)
- Time; (see sec. 1.2.2 “M”)

Variable length fields will be limited to 15 characters maximum length.
The Character set for the HIBC Provider Applications Standard is the alphabetical characters A-Z, the numbers 0-9, and the three special characters. Three special characters have particular significance to the HIBC Provider Applications Standard:

- **"+"** - The plus sign is the reserved flag character to identify an HIBC Supplier Labeling Standard format

- **"*"** - The asterisk character must never be used (except in accordance with Section 2.2)
- **"/"** - The slash character is the reserved delimiter character to separate fields of data in an HIBC Provider Applications Standard Multiple Data Field "Concatenated" Format (see Section 1.1.3)

The check character employed in the HIBC Provider Applications Standard formats is a Modulus 43 Check Character. This character is generated as described in Appendix B and may assume any value in the character set of A-Z, 0-9, and the special characters -, ., $, /, +, %, and Space. The human-readable interpretation of the encoded data structure shall include all of the encoded data and will be shown directly below the encoded information except for compelling reasons in a "closed system" (see Section 3.1)

1.1 Standard Data Structures

Depending on the length of the data structure and the available space to represent the data structure any of three formats is recommended. These formats may combine two or more data fields or may split data fields.

1.1.1 Single Data Structure Format

+/ F G D D D D D C

Table 1

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for HIBC Provider Applications Standard
F	1 (or 3) †	Flag character(s) indicating "where" the data structure is located. (See Section 1.2.1)
G	1 (or 3) †	Flag character(s) indicating "what" the encoded data is (See Section 1.2.2)
D	Variable 1-15 characters	Data defined by the application
C	1	Modulus 43 Check Character
†**Note:** Single flag characters are the set of letters A through Z (except Y). Three character flag characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC (see Section 1.0)		

The "F" field is used to define "where" the data structure is located. This is either a single alphabetic character from A to Z (see Section 1.2.1 for definition), or a 3-character sequence beginning with "Y". Three character flag characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC (see Section 1.0)[1]. If the field contains the letter "Z", this signifies that the data structure which follows does not conform to the HIBC Provider Applications Standard Data Structure Format.

[1] It should be noted that there are currently no three character flag data structures defined in this standard. The design of the standard to allow for three character flag data structures is to allow future expansion of this standard.

The "G" field is used to identify the nature of or "what" is being encoded in the data. This is either a single alphabetic character from A to Z (see Section 1.2.2 for definition), or a 3-character sequence beginning with "Y". Three character flag characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC (see Section 1.0)[2]. If the field contains the letter "Z", this signifies that the data structure which follows does not conform to the HIBC Provider Applications Standard Data Structure Format.

1.1.2 Split Data Field Format

If the length of the data field requires that a dual data structure ("split") format be used, encodation should be performed using the following format:

First Data Structure Format

+/ 1 F G D D D D C

Table 2

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for the HIBC Provider Application Standard
1	1	The digit “1” indicates that this is the first data structure
F	1 (or 3)	Flag Character(s) indicating “where” the data structure is located
G	1 (or 3)	Flag Character(s) indicating “what” the encoded data is. (see section 1.2.2)
D	Variable -1-15 Characters	First portion of the data defined by the application
C	1	Modulus 43 Check Character
†**Note**: Single flag characters are the set of letters A through Z. Three character flag characters begin with a “Y” and are followed by an additional two characters, as defined by HIBCC		

[2] See footnote 1 above.

Second Data Structure Format

+/ 2 D D D D L C

Table 3

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for the HIBC Provider Application Standard
2	1	The digit “2” indicating that this is the second data structure
D	Variable 1-15 characters	Remainder of application data
L	1	Link Character which is the check character for the first data structure
C	1	Modulus 43 Check Character for the data structure

A maximum of two data structures may be used in the split format.

The link character is designed to reduce the possibility of association from reading the first and second data structures from two unrelated places. The link character is the next to last character in the second data structure. It is the same as the check character from the first data structure. It is intended that software be provided to allow the two data structures to be read in either order.

1.1.3 Multiple Data Field (“Concatenated”) Format

The data structure may contain more than one type of data when they share the same “where” flag (see Section 1.2.1). If this is the case, the fields are separated by slash (/) characters, and the first character in each field is defined as in Section 1.2.2. (i.e., “what” the data is). The case of two data fields is illustrated in the following format: (see Table 4)

+/ F G_1 D_1 D_1 / G_2 D_2 D_2 D_2 C

Table 4

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for the HIBC Provider Application Standard
F	1 (or 3)	Flag Character(s) for Data. D_1 D_1 D_1, D_2 D_2 D_2 etc., through the number of fields concatenated in the data structure. This flag represents "where" the data is located. (see section 1.2.1)
G_1	1 (or 3) †	Flag character(s) for data D_1 D_1 D_1. This flag represents "what" the encoded data is. (See Section 1.2.2)
D_1	Variable 1-15 characters	First application data structure
/	1	Field delimiter
G_2	1 (or 3) †	Flag character(s) for data D2 D2 D2. This flag represents "what" the encoded data is. (See Section 1.2.2)
D_2	Variable 1-15 Characters	Second application data
C	1	Modulus 43 Check Character for the entire data structure
†**Note** Single flag characters are the set of letters A through Z (except Y). Three character flag characters begin with a "Y" and are followed by an additional two characters, as defined by HIBCC (see Section 1.0).		

1.2 Application Flag Character Definition

1.2.1 "Where" Flag Definitions

- **"A" Patient:** An identifying device affixed to the patient, e.g., identity imprinted and encased in a wrist-fastened bracelet.
- **"B" Patient Care Record:** Any document utilized as a unique patient record, including, but not limited to: medical abstract, patient chart, patient's laboratory cumulative summary, medication administration record, discharge plan, progress notes, ancillary service documents, etc. May also include patient charges, subject to individual institution's philosophy.
- **"C" Specimen Container:** An article (tube, jar, syringe, pan, etc.) used to hold and/or convey a non-reusable patient specimen from source of origin (patient) to another point (anatomical pathology, laboratories, etc.).

- **"D" Direct Patient Image Item:** Any image (film, recording, etc.) acquired in diagnostic testing, including, but not limited to: X-rays, ECG, EEG, Myelograms.

- **"E" Business Record:** Generic item to be sub-classified as required within each institution to reflect internal organization. Examples: purchasing, wage and salary, utilities, requisitions, forms, maintenance agreements, contracts, etc.

- **"F" Medical Administration Record:** Any record required by an institution in documentation/quality assurance, registration through discharge, utilization, staffing, management, human resources, etc.

- **"G" Library Reference material:** Books, periodicals, reference materials, journal, standards, report series, etc.

- **"H" Devices and Materials:** Generic term to cover a broad spectrum of both direct and indirect patient care items. May be consumable or non-consumable (from pacemaker to housekeeping bucket). **Note:** Does not include assets.

- **"I" Identification Card:** Identification card used in any non-patient capacity within the hospital environment.

- **"J" Product Container:** Container for administrable product.

- **"K" Asset:** Term used to denote tangible real estate and capitalized equipment by item and/or location.

- **"L" through "X":** Reserved for future definition by HIBCC.

- **"Y" Expansion Flag Character:** This flag character will be used when further expansion is required by HIBCC. Two characters always follow this flag character.

- **"Z" User Defined:** This flag character signifies that the following data structure does not conform to the HIBC Provider Applications Standard.

1.2.2 "What" Flag Definitions

- **"A" Labeler Identification Code (LIC):** The LIC is used to define all health care locations, such as remote clinics, divisions of hospitals, ambulatory surgery sites, off-site warehouses, etc. The codes are assigned and maintained by HIBCC.

- **"B" Service Identification:** An internally assigned coding structure established by an institution to identify service areas, departments, or locations within a single institution or organization. Example of "service" may be nursing units, laboratories, operating rooms, patient rooms, etc.

- **"C" Patient Identification:** An internally assigned coding structure for differentiating a given patient from all other patients within the institution or organization. The patient identification should be a unique code assigned permanently to only one patient.

- **"D" Specimen Identification:** An internally assigned coding structure for differentiating a given sample of patient tissue, fluids, etc., from other samples. Examples of specimens include blood, serum, urine, and biopsy material. The specimen identification is usually a reusable code.

- **"E" Personnel Identification:** An internally assigned coding structure used to differentiate between individuals associated with that organization. Examples include employee code, visitor badge, security codes, and social security numbers.

- **"F" Administrable Product Identification:** An internally assigned coding structure used to identify or differentiate substances or products administered to a patient to achieve a desired therapeutic or diagnostic effect. Examples of administrable products include drugs, blood components, IV fluids, anaesthetic agents, oxygen, and diagnostic agents such as radionuclide. These identification codes are usually assigned on a permanent basis for the life of the product.

- **"G" Implantable Product Information:** An internally assigned coding structure used to identify or differentiate organs or devices that are intended for implantation or grafting in the patient. Examples of implantable or graft able products include pacemakers, artificial organs, prosthetic devices, and drug pumps. Examples of implantable or graft able organs include kidneys, hearts, cornea, liver, bone, bone marrow, skin, and blood vessels. These identification codes are usually assigned on a permanent basis for the life of the organ or device.

- **"H" Hospital Item Identification:** An internally assigned coding structure to identify medical/surgical materials used in the care of patients. Examples of products include tape, IV tubing, bandages, infusion pumps, surgical instruments, non-capital equipment, linens, and other patient supplies.

- **"I" Medical Procedure Identification:** An internally assigned coding structure used to identify the therapeutic or diagnostic processes, activities or interventions performed on the patient or patient specimen. An organization may choose to use a standard coding structure (such as the Hospitals-International Classification of Diseased Activity-9th Edition Examples of medical procedures include surgical procedures, laboratory procedures, nursing activities, therapeutic procedures (respiratory, physical, occupational therapies), and diagnostic procedures (ECG, EEG analyses).

- **"J" Reimbursement Category:** A coding structure, established by regulatory bodies or third party reimbursers, used to identify categories of health care services and the associated level of remuneration for goods and services provided to the patients. Information which may be encoded includes diagnosis, medical procedures, and discharge status. Examples of reimbursement categories include HMO, DRG, Blue Cross, Blue Shield, Medicare A and B, self-pay and commercial carriers.

- **"K" Blood Product Identification:** A blood type identification scheme, such as the two-digit numeric codes defined by the International Society of Blood Transfusion (ISBT) Standing Committee on Automation and Data Processing.

- **"L" Demographic Data:** All descriptive data pertaining to patients such as: name, age, sex, etc

- **"M" Date/Time:** The standard for the date is established as a six-digit Julian date where the first three digits represent the year and the last three present the day. Time is expressed with four digits in military time, representing local time in hours and minutes with the optional character "G" representing Greenwich Mean Time (GMT), i.e.:

Y Y Y D D D H H M M G

Note - This date format was established for several reasons. Three digits are used to encode the "year" to distinguish between the ages of a one-year-old patient and a 101-year-old patient. The "month, day, year" formats are avoided because they vary around the world (for example the ISO Standard is "day, month, year") and because three digits are still required for the year. The use of Julian dates is not a problem because this HIBC coding structure is designed for computer interpretation only. The date in "month, day, year" form may still be printed on the item in another place, distinct from the HIBC Format. The time format is standardized as:
H H M M G – Hours, Minutes, GMT Option
Seconds will not be encoded and no ":" will be embedded in the machine-readable data structure, though a human-readable interpretation embedding the ":" in a data structure placed elsewhere than the actual human-readable of the machine-readable data structure might be desirable. The time will be local in military 24-hour clock format. A leading zero is used, when necessary, to keep

both the hours and minutes in sub-fields at exactly two-digits. The letter "G" is used when the time is encoded as GMT. This is important in some applications where the data is passed through different time zones. For example, an organ for transplant purposes needs to be encoded in a GMT format since it could be shipped to a recipient in a different time zone. Time is an important element to be captured in machine-readable form in areas such as drug administration schedules, items that have an extremely limited shelf-life, organ/tissue harvesting as described above, etc. A Julian Dating Calendar is included as Appendix A to this Standard.

- **"N" Asset Identification:** A code representing any capitalized asset such as equipment, furniture, buildings, and physical locations.
- **"O" Purchase Order Number:** A code associated with a source document utilized to purchase a product or service.
- **"P" Dietary Item Identification:** A code associated with human consumable internal products given for their nutritional value, i.e., patient menus, cafeteria items, infant formulae, and patient therapeutic diets.
- **"Q" Manufacturer Serial Number:** A code assigned by the manufacturer to differentiate identical products.
- **"R" Library Materials Identification:** A code utilized to catalog books, periodicals, journals, report series, newspapers, subscriptions, references, etc.
- **"S" Business Control Number:** Identification codes associated with forms, records, and materials in support of the health care facility's business, e.g., requisition codes, personnel records, maintenance records, bills, patient invoices, etc.
- **"T" Episode of Care Identification:** An internally-assigned coding structure for differentiating a specific episode of care form all other such episodes for a patient. See also, "C" Patient Identification. Examples of care episodes may be an outpatient visit, a series of outpatient visits, an emergency room visit, an in-patient admission, a clinic visit or a referral/specimen episode.
- **"U" Health Industry Number (HIN):** The Health Industry Number (HIN) is nine character alphanumeric unique identifier that is assigned to every facility, delivery location and business activity in the healthcare supply chain. The first seven positions of the HIN comprise the "base HIN" which identifies a healthcare entity at a particular location. The seventh position is a check digit to verify the first six positions. The last two positions of the HIN comprise the suffix that uniquely identifies a specific ship-to location, alternative location or a functional affiliation with the entity..
- **"V" and "W":** Reserved for future definition by HIBCC.
- **"X" XML Document:** This flag character will be used when the data is formatted as an Extensible Markup Language (XML) Document.
- **"Y" Expansion Flag Character:** This flag character will be use when further expansion is required by HIBCC. Two characters always follow this flag character to provide further definition.
- **"Z" User Defined:** This flag character signifies this data structure does not conform to the HIBC Provider Applications Standard Data Structure Formats.

1.3 Examples of HIBC Provider Applications Standard Data Structures

Purchase Order Example:

A purchase order is generated that is transmitted to a vendor. It contains several fields of information, which are:

- The HIN of the ordering hospital
- The purchase order number
- The purchase order data and time

The basic structure format could be as follows:

+/ E U 9 C 8 3 4 1 6 F 2

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure.

"E" is the "where is it located" flag character, indicating that the data structure is on a business record.

"U" is the "what kind of data" flag character, indicating that what follows is a HIN.

"9C8341 is the HIBCC assigned Base HIN for the ordering hospital. (Note: the complete Base HIN for the hospital includes the Check Character and Suffix 00, i.e. the complete Base HIN is 9C8341600)

“6” is the Modulus 43 Check Character of the data structure for the Base HIN.

F2 is the HIN Suffix, which indicates the specific hospital department or location (eg Purchasing Department)

If the Hospital wanted to include further information, such as a department code indicating which internal department initiated the purchase order and the LIC of the vendor, the data structure format may then be:

+/ E U 9 C 8 3 4 1 6 F 2 / Z 3 4 H 1 5 9 $

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure

"EU9C83416F2" would be the same as identified in the above example.

slash (/) indicates more data follows with the first character after the slash identifying the "what kind of data" flag character.

In this case, the "Z" signifies what follows does not conform to the HIBC Provider Applications Standard Data Formats. In this example, external systems would ignore all the data following the "Z." Internal systems, however, would process the common data according to an internally defined procedure. For example, the procedure could be that the two-character field following the "Z" ("34") defines the Materials Management Department of the ordering institution and the next four characters are the LIC of the vendor ("H159").

“$” is the Modulus 43 Check Character of the data structure.

Another data structure on the purchase order could be the following format:

+/ E O 5 2 3 2 0 1 3

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure

"E" is the "where is it located" flag character, indicating that the data structure is on a business record.

"O" is the "what kind of data" flag character, indicating that what follows is a purchase order number.

"523201" is the purchase order number.

“3” is the Modulus 43 Check Character of the data structure.

A fourth data structure on the purchase order could be the following format:

+/ E M 9 8 4 2 4 3 1 3 4 0 Q

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure

"E" is the "where is it located" flag character, indicating the data structure is on a business record.

"M" is the "what kind of data" flag character, indicating that what follows is a date and possibly time.

"9842431340" indicates the year is 1984 ("984"), the 243rd day of the year ("243") and the time is 1:40 p.m. ("1340") local time (since the "G" does not appear). (See Section 1.2.2)

“Q” is the Modulus 43 Check Character of the data structure.

As another option, all of the data could appear as one data structure in a concatenated format utilizing the slash (/) character. The data structure format would be:

+/ E A H 7 8 3 / Z 3 4 H 1 5 9/ 0 5 2 3 2 0 1 / M 9 8 4 2 4 3 1 3 4 0 K

The last character of the data structure “K” is the Modulus 43 Check Character of the entire data structure.

Asset Tag Example

+/ K N 1 2 3 4 5 A

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure.

"K" is the "where is it located" flag character, indicating that the data structure is on the asset itself, as opposed to being on a document that refers to an asset (such as a packing slip).

The "N" is the "what kind of data" flag character, indicating that what follows is an asset identification code.

"12345" is the internally defined asset identification code.

The “A” is the Modulus 43 Check Character of the data structure.

If this same data structure was on the packing slip for this item, then the format would have a one data character change, plus the change of the Check Character:

+/ E N 1 2 3 4 5 9

The change from "K" to "E" identifies that the asset identification code was obtained from a business record and not from the asset itself. This is an important distinction for such applications as equipment maintenance recording.

Direct Patient Image (Split) Record Example

An example of using the "split" data structure format for a direct patient image record is as follows:

Certain information is to be recorded on a direct patient image record (e.g., an x-ray). If the physical constraints of the record and the length of the data require two data structures, the data structure format could be:

+/1 D I 9 8 7 6 E

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure.

"1" indicates this is the first data structure and that a second data structure is to follow.

"D" is the "where is it located" flag character, indicating that the data structure is on a direct patient image record.

"I" is the "what kind of data" flag character, indicating that what follows is a medical procedure identification code.

"9876" is the first portion of the data.

“E” is the Modulus 43 Check character of the first data structure.

The second data component in the split data structure is:

+/2 9 3 1 A 1 E Z

Where,

"+/" is the industry standard identifier indicating a HIBC Provider Applications Standard data structure.

"2" indicates this is a continuation of data from the first data structure.

"931A1" is the continuation of data. The data field "9876931A1" (which is the two compents joined together) is the medical procedure identification in this example.

“E” is the Modulus 43 Check Character of the first data structure and is used as a link character.

“Z” is the Modulus 43 Check Character of the second data structure.

2.0 HIBC Data Carriers

2.1 General

In Section 1.0, the Standard defined the data structures for provider applications. This section now defines the specific machine-readable encodation recommended for health care providers. The preferred symbologies for use with the HIBC Provider Applications Standard Data Structure Formats are Code 39 or Code 128. In those instances, and only then, where there is insufficient label area to allow the use of Code 128 or Code 39, it is permissible to encode the HIBC Provider Applications Standard Data Structure using the PDF417, MicroPDF417 and Data Matrix.

2.2 Symbologies for use with the HIBC Provider Applications Standard Data Structures

When the HIBC Provider Applications Standard data structures are printed in Code 39 symbology, one asterisk "*" immediately precedes the first character of the format (Start Code) and another asterisk "*" immediately follows the last character of the format (Stop Code). An asterisk is never embedded within a message format. Examples of formats and printed symbols are shown below.

Purchase Order Example

Shown below are the Code 39 and Code 128 symbols for the purchase order example

Code 39

***+/EAH783B ***

Code 128

***+/EAH783B ***

Second Purchase Order Example

Shown below are the Code 39 and Code 128 symbols for the LIC of the order hospital, ordering department and LIC of the vendor

Code 39

+/EAH783/Z34H159$

Code 128

+/EAH783/Z34H159$

Third Purchase Order Example

Shown below are the Code 39 and Code 128 symbols for the LIC of the ordering hospital; ordering department; LIC of the vendor; purchase order number, and date/time field example

Code 39

***+/EAH783/Z34H159/0523201/M9842431340K ***

Code 128

+/EAH783/Z34H159/0523201/M9842431340K

Asset Tag Example

Shown below are the Code 39 and Code 128 symbols for the asset tag example defined in Section 1.3:

Code 39

+/KN12345A

Code 128

+/KN12345A

Director Patient Image (Split) Record Example

Shown below are Code 39 and Code 128 symbols for the direct patient image example as defined in Section 1.3:

Code 39

+/1DI9876E

***+/2931A1EZ ***

Code 128

+/1DI9876E

+/2931A1EZ

2.3 RFID Tags to carry the HIBC Provider Applications Standard Data Structures

HIBCC recognizes the potential use of RFID in healthcare applications such as Patient Identification, and Implant Identification and Tracking. Any RFID tags used in healthcare applications must be able to carry the HIBC Provider Applications Standard data structure without modification.

Conformance with ANSI/HIBC 1 is necessary to support existing and future applications that receive and unpack HIBC data messages.

3.0 Amplifications and References

3.1 Human-Readable Interpretation

Except for compelling reasons in a "closed system," the human-readable interpretation (HRI) of the encoded data structure shall include all of the encoded data with exactly the same characters as the encoded data itself and will be shown directly below the encoded information. The HRI is intended to be used for human recognition only, and not as a method of machine readability addressed in this standard.

It is the recommendation of HIBCC that the HRI interpretation of zero be represented as "Ø". The check character in the symbol will sometimes be a space character. In this case, the HRI should use an "underscore" to represent the space character. If Code 39 is used, the HRI will include "*"s for the start and stop codes.

Note: A compelling reason for the HRI not including all encoded data would be if the human-readable data is to be used for manual back-up procedures relating to patient care when equipment failure occurs. In such cases, HRI should only include the data normally used by the practitioner.

There are several important reasons for the requirements to print exactly the encoded data, and except for compelling reasons, to position the same directly below the encoded data:

- In the event of a failure of a reading device, the data could still be keyed into the appropriate computer system by reading the human interpretation.
- The asterisks, in the case of Code 39 symbology, indicate which data should be keyed since there may be other information printed on the item.
- The presence of asterisks, in the case of Code 39 symbology, indicates the symbol is complete and has not been torn or otherwise damaged.
- Enclosing the data elements between asterisks eliminates the possibility of each labeler, in the case of Code 39 symbology, expanding the human-readable interpretation according to individual preferences, and thus compromising the validity of the HIBC Provider Applications Standard.
- While the human-readable interpretation shall be represented as stipulated in Section 3.1, this does not preclude the human-readable information from being repeated in another form elsewhere on the coded item, e.g., time, date, lot code, product code, etc.

3.2 References for the HIBC Provider Applications Standard

Specifics relating to implementing the HIBC Provider Applications Standard are contained within the Application Specifications for the HIBC Provider Applications Standard.

Copies of the HIBC Guidelines can be obtained from:

Health Industry Business
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APPENDIX A

JULIAN DATING CALENDAR

Table A1

DAY OF MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	001	032	060	091	121	152	182	213	244	274	305	335
2	002	033	061	092	122	153	183	214	245	275	306	336
3	003	034	062	093	123	154	184	215	246	276	307	337
4	004	035	063	094	124	155	185	216	247	277	308	338
5	005	036	064	095	125	156	186	217	248	278	309	339
6	006	037	065	096	126	157	187	218	249	279	310	340
7	007	038	066	097	127	158	188	219	250	280	311	341
8	008	039	067	098	128	159	189	220	251	281	312	342
9	009	040	068	099	129	160	190	221	252	282	313	343
10	010	041	069	100	130	161	191	222	253	283	314	344
11	011	042	070	101	131	162	192	223	254	284	315	345
12	012	043	071	102	132	163	193	224	255	285	316	346
13	013	044	072	103	133	164	194	225	256	286	317	347
14	014	045	073	104	134	165	195	226	257	287	318	348
15	015	046	074	105	135	166	196	227	258	288	319	349
16	016	047	075	106	136	167	197	228	259	289	320	350
17	017	048	076	107	137	168	198	229	260	290	321	351
18	018	049	077	108	138	169	199	230	261	291	322	352
19	019	050	078	109	139	170	200	231	262	292	323	353
20	020	051	079	110	140	171	201	232	263	293	324	354
21	021	052	080	111	141	172	202	233	264	294	325	355
22	022	053	081	112	142	173	203	234	265	295	326	356
23	023	054	082	113	143	174	204	235	266	296	327	357
24	024	055	083	114	144	175	205	236	267	297	328	358
25	025	056	084	115	145	176	206	237	268	298	329	359
26	026	057	085	116	146	177	207	238	269	299	330	360
27	027	058	086	117	147	178	208	239	270	300	331	361
28	028	059	087	118	148	179	209	240	271	301	332	362
29	029	*	088	119	149	180	210	241	272	302	333	363
30	030		089	120	150	181	211	242	273	303	334	364
31	031		090		151		212	243		304		365

*Every leap year has 366 days with February having 29. Julian dating in leap years is the same through February 28 (059) with February 29 as 060. All dating from March 1 through December 31 is incremented by one during leap years.

The HIBC Provider Applications Standard Format for use of Julian dating includes the last three digits of the year followed by a three digit “day of the year” code. For example, November 7, 2003 2011 is represented as”011311” (the 311th day of 2011).

APPENDIX B

MODULUS 43 CHECK CHARACTER GENERATION

Each of the HIBC Standards' data structures employs a Modulus 43 Check Character for additional data security. The Check Character is the Modulus 43 sum of all the character values in a given message, and is printed as the last character value in a given message. Check Character generation is illustrated by the following example with the table below:

Provider Applications Data Structure: +/EAH783
Sum of values: 41+40+14+10+17+7+8+3 = 130
Divide 130 by 43. The quotient is 3 with a remainder of 11. The Check Character is the character responding to the value of the remainder (see table below), which in this example is 11, or B. The complete Provider Applications data structure, including Check Character, would therefore be: +/EAH783B
Table of Numerical Value Assignments for Computing the HIBC Standards' Data Format Check Character

Table B1

0 = 0	F = 15	U = 30
1 = 1	G = 16	V = 31
2 = 2	H = 17	W = 32
3 = 3	I = 18	X = 33
4 = 4	J = 19	Y = 34
5 = 5	K = 20	Z = 35
6 = 6	L = 21	- = 36
7 = 7	M = 22	. = 37
8 = 8	N = 23	Sp = 38
9 = 9	O = 24	$ = 39
A = 10	P = 25	/ = 40
B = 11	Q = 26	+ = 41
C = 12	R = 27	% = 42
D = 13	S = 28	
E = 14	T = 29	
Note: See paragraph 3.1 in regard to the representation of a space		

APPENDIX C

BACKWARD COMPATIBILITY

Every effort has been made to insure this standard is backwardly compatible. Some infrequently used aspects of the previous standard were dropped or replaced and will be acceptable until August 1, 2004 (three years from the date of publication of this version of this document). Among these are the use of stacked symbologies Code 16K and Code 49, and the absence of the HIBC PAS Identifier '+/' characters.

Information about the previous version of this standard is available from HIBCC.
The recommended human-readable format should always begin and end with an asterisk ('* ') and should be phased in. Previously designed labels are acceptable.

APPENDIX D

Patient identification data frame and data carriers

ANSI/HIBC 1, The Health Industry Bar Code (HIBC) Provider Applications Standard describes how to encapsulate a wide spectrum of healthcare information into machine-readable codes (e.g., linear/1D bar codes, 2D matrix symbols, RFID). This includes information such as patient identification. Patient Identifiers are typically assigned by the healthcare provider. However, patients may travel from one care giving entity to another within a provider network, increasing the need for a standardized patient identifier.

The HIBC Provider Applications Standard specifies a machine-readable data frame and data carriers in which patient identification can be reliably encoded and captured using automatic identification technology.

The machine-readable patient identification, printed as a bar code or carried in another form of automatic identification, could be found on a patient wristband, on medical record jackets, specimen containers, etc
.
On the following pages are the specifications for construction of the data frame, and the HIBC-compatible machine-readable data carriers for encoding the patient identification data.
Given the large amount of data to be encoded relative to the limited space available, particularly on patient wristbands and specimen containers, the use of high-capacity AIDC media, i.e., 2D matrix symbologies and RFID technology, is specified.

Encoding Patient Identification according to ANSI/HIBC 1, the HIBC Provider Applications Standard
Data frame to contain Patient Identifier.

A set of application flag characters identify the application and data by two criteria:

- Where the data structure is located (where it is or what it is on), and
- The nature of the data structure (what it is).

Note In a health care setting, the simple identity of a data field is often insufficient. An example would be that of a patient identity for the taking of specimens or upon commencement of a surgical procedure. It is not only necessary to identify the patient, but further verification is required of "where" the patient identity was taken from. Patient identity might occur on the patient chart or other medical records, but in the cases enumerated above, should be taken from the patient wristband or other identifier physically affixed to the patient. The "where" portion of the data structure would verify that the patient's identity was, in fact, taken directly from the patient wristband.

Specification 1a: Scope – Regional / Global to the care giving institution.

This is the preferred option for encoding the patient identifier on the patient's wristband or other identifying device affixed to the patient.
Format: +/ $AUD_1D_1D_1D_1D_1D_1D_1D_1D_1/CD_2D_2D_2$ . . . Z

Table D1

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for

		HIBC Provider Application Standard
A	1	Flag Character for “where” the data structure is located, as in an identifying device affixed to the patient
U	1	Flag Character indicating “what” the encoded data is, (Health Industry Number (HIN) issued by HIBCC to define all health care locations, such as remote clinics, divisions of hospitals, ambulatory surgical sites, etc)
$D_1D_1D_1D_1D_1D_1D_1D_1D_1$	9	First application data “what”, e.g. healthcare provider’s HIN
/	1	Field Delimiter
C	1	Flag Character indicating “what” the encoded data is, (an assigned coding structure for differentiating a given patient from all other patients)
$D_2D_2D_2$ . . .	Variable	Second application data “what”, e.g. Patient ID.
Z	1	Modulus 43 Check Character

Other “Where” flags that might carry this standardized patient identification include:
B Patient Care Record
C Specimen Container
H Devices and Materials
I Identification Card
J Product Container

See Specification 2a for an example of other “where” encoding.

Specification 1b: Scope – Local to the care giving institution.*
Format: +/**ACD . . . Z**

Table D2

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for HIBC Provider Applications Standard
A	1	Flag character indicating "where" the data structure is located (an identifying device affixed to the patient)
C	1	Flag character indicating "what" the encoded data is (an assigned coding structure for differentiating a given patient from all other patients)
D . . .	Variable	Data defined by the application. e.g. Patient ID
Z	1	Modulus 43 Check Character
* Note The scope of this application is local. This data frame and the identifier it contains will not be useful outside of the local provider's scope. Specification 1a includes the use of the Health Industry Number (HIN) and it is strongly suggested that it be used.		

Other "Where" flags include:
B Patient Care Record
C Specimen Container
H Devices and Materials
I Identification Card
J Product Container

Specification 2a: Scope – Regional / Global to the care giving institution.
This is the preferred option for encoding the patient identifier on patient care record.
Format: +/ **BUD$_1$D$_1$D$_1$D$_1$**D$_1$D$_1$D$_1$D$_1$D$_1$**/CD$_2$D$_2$D$_2$ . . . Z**

Table D3

Field Descriptor	Field Length	Field Description
+/	2	Industry Standard Identifier for HIBC Provider Applications Standard
B	1	Flag character indicating "where" the data structure is located, (patient care record)
U	1	Flag character indicating "what" the encoded data is, (Health Industry Number (HIN) issued by HIBCC to define all health care locations, such as remote clinics, divisions of hospitals, ambulatory surgical sites, etc.)
D$_1$D$_1$D$_1$D$_1$D$_1$D$_1$D$_1$D$_1$D$_1$	9	First application data “what”, e.g. healthcare provider’s HIN
/	1	Field Delimiter
C	1	Flag character indicating "what" the encoded data is, (an assigned coding structure for differentiating a given patient from all other patients)
D$_2$D$_2$D$_2$ . . .	Variable	Second application data “what”, e.g. Patient ID
Z	1	Modulus 43 Check Character

Encoding Patient Identification according to ANSI-HIBC1, the HIBC Provider Applications Standard
HIBC compatible machine-readable data carriers to encode the data frame.
Given the large amount of data to be encoded relative to the limited space available, particularly on patient wristbands and specimen containers, the use of high-capacity AIDC media, i.e., 2D matrix symbologies and RFID technology, is specified.

The following machine-readable 2D matrix symbologies may be used to carry the data frame. The minimum symbol cell size should be 0.015 in (15 mils) and the minimum bar code print quality grade as per ISO/IEC 15415 should be 1.5/10/660.

1 Data Matrix ECC 200

Aztec Code

RFID can be used in place of 2D matrix symbologies according to the needs of the institution. Detailed specifications for use of this technology in this application will be published at a future date.