



Produce Traceability Initiative Guidance for Global Location Number (GLN) Assignment

(Revision 1.0)

About this Guidance Document

Guidelines are generally accepted, informally standardized techniques, methods or processes that have proven themselves over time to accomplish given tasks. The idea is that with proper processes, checks and testing, a desired outcome can be delivered more effectively with fewer problems and unforeseen complications. In addition, guidelines can evolve to become better as improvements are discovered. The Produce Traceability Initiative (PTI) is a voluntary U.S. produce initiative. The guidelines are the recommendations created and agreed to by all facets of the produce industry supply chain and PTI Leadership Council.

Consent between trading partners may replace specific recommendations as long as the minimum traceability information requirements are met in good faith.

Global Location Numbers (GLNs) are globally unique, GS1-standards based identification numbers for parties and locations. GLNs are not a mandatory PTI requirement, but are increasingly used in North America and globally by the fresh food sector including in the Global Data Synchronization Network™ (GDSN®).

While PTI continues to focus on traceability, the use of standardized product identification along with electronic data sharing create additional opportunities for supply chain visibility. These new best practices provide guidance for advanced uses of traceability information for those companies that are looking to take traceability to the next level.

Revision History

This section itemizes the changes from the last published Best Practice.

Revision No.	Date of Change	Changed By	Summary of Change
1.0	September 4, 2015	TWG/IWGC task force	Initial publication

Objectives

The goals of creating best practices for the assignment of GS1 Global Location Numbers (GLNs) are:

- to define a standardized approach for the creation of location identifiers used in internal and external traceability systems;
- to promote efficient use of the brand owner's GS1 Company Prefix; and
- to standardize location descriptions and geo-location assignment.

Introduction

The goal of the Produce Traceability Initiative (PTI) is supply chain-wide adoption of electronic traceability at the case level. The term “case” applies to the physical enclosure in which product is shipped and can be the form of a box, reusable plastic container (RPC), bin, bag, tote, etc. These cases are normally shipped on pallets and identified with a barcoded case label (see *Best Practices for Formatting Case Labels*). Traceability events are collected and shared based on the *Produce Traceability Best Practice for Sharing Trace-Back Data*. Traceability event data includes case identification (i.e., GS1 Global Trade Item Number[®] (GTIN[®]) and Batch/Lot), location identification (i.e., GLN), and event types (e.g., Transport, Transform, Deplete, etc.). This Best Practice document describes how to assign and define GLNs for a Company or Farm.

Common Questions about GLNs

Q. What is a Global Location Number (GLN)?

A. The GLN is a GS1 standards-based, globally unique identification number for supply chain parties and locations. When a user assigns a GLN, they define a prescribed set of data about the party/location to which that GLN relates (e.g., name, address, class of trade, etc.). These GLN attributes define master data about the party/location which help to ensure that each GLN is specific to one, very precise party/location within the world.

GLNs can be used to identify a *legal entity*, a *functional entity*, or a *physical entity*:

- **LEGAL ENTITY:** A *Legal Entity* is defined as any business, government body, department, charity, individual or institution that has a standing in the eyes of the law and has capacity to enter into agreements or contracts. Examples of *Legal Entities* include parent corporations, chain concept subsidiaries, specialty food divisions, etc.

- **FUNCTIONAL ENTITY:** *Functional Entities* can include a department within a legal entity. Examples of *Functional Entities* include purchasing departments, accounts receivable, accounts payable, etc.
- **PHYSICAL LOCATION:** A *Physical Location* is defined as a single point of access with a physical address. *Physical Locations* can include specific locations within a legal entity and/or a functional entity. Examples of *Physical Locations* include manufacturing plants, distribution centers and warehouses, warehouse gates and loading docks, etc.

You can find more detailed information about Global Location Numbers and how to assign GLNs on the GS1 website at www.gs1.org/1/glnrules

Q. Why should I use GLNs?

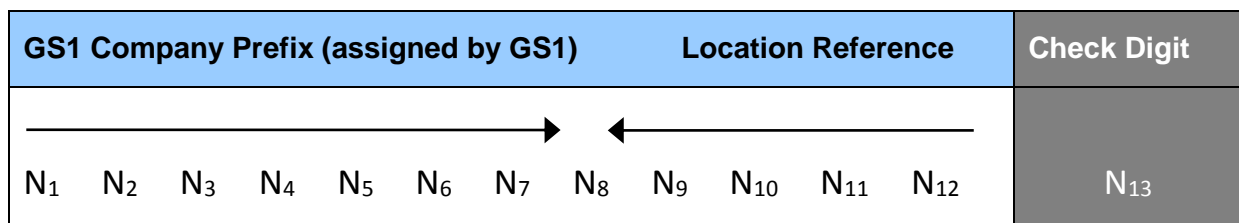
A. GLNs are unique globally, providing a universal way to talk about a specific physical location or party. It helps avoid duplicate identifiers for the same location, or worse yet, assigning the same location identifier to two different locations. The GLN is used globally, across many industry sectors including foodservice, grocery, retail, pharmaceutical, medical devices, automotive, consumer products, aerospace and defense.

Q. How is a GLN structured?

A. The GLN is a thirteen digit number composed of GS1 Company Prefix, Location Reference, and Check Digit:

- **GS1 Company Prefix:** assigned by a local GS1 Member Organization to a company (7-10 digits in length)
- **Location Reference:** allocated by the company to a location or party (2-5 digits in length)
- **Check Digit:** calculated according to GS1 algorithm (1 digit) (check digits can be calculated using the GS1 Check Digit Calculator found at www.gs1us.org/resources/tools/check-digit-calculator)

Figure 1: GLN Structure



Q. GS1 assigned a GLN to our company (using our GS1 Company Prefix). Do I still need to assign a GLN to our company headquarters?

A. The GLN assigned to the company is a legal entity GLN used to identify the company. Because corporations can move their headquarters, the recommended practice is to assign the headquarters building its own physical location GLN. Then, if the company does move, the company's legal entity GLN can remain the same, and the new headquarters building can be assigned a new GLN.

Q. What is a GLN Extension and an SGLN?

A. A GLN Extension provides a method for identifying physical locations within a location which is identified with a GLN. Produce examples of physical locations that might use GLN Extensions include:

- A specific packing line within a packing shed
- A specific slot within a warehouse
- A specific field within a farm
- A specific field and block within a farm
- A specific row/block/field within a farm

The GLN extension component may be communicated to trading partners by mutual agreement. (see *GS1 General Specifications* 2.4.3.1)

An SGLN is an EPC scheme (i.e., data format) for GLNs and GLN + Extension for EPC/RFID Tags and EPCIS pursuant to the GS1 Tag Data Standard.

Q. Why would I use GLN Extensions?

A. Within the context of the Produce Traceability Initiative, GLN Extensions may be used to provide a convenient mechanism for identifying fields in cases where it is impossible or impractical to assign discrete GLNs to those fields. It may also be used to identify internal locations within packing plants, warehouses and storage facilities.

Q. How is the GLN Extension Structured?

A. The GLN Extension is a variable length field with up to 20 characters. The GLN Extension may include letters, numbers and certain special characters. (See Appendix 4 for a complete list of permissible characters.)

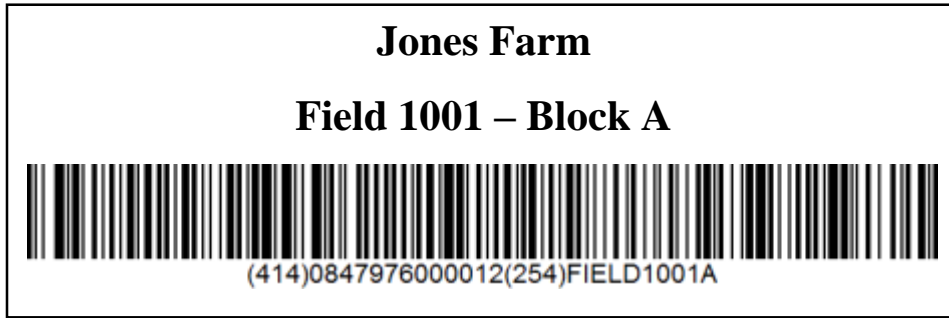


Figure 2: Example - Field & Block Sign with GLN + GLN Extension

Table 1: How to read this barcode

(414)	GLN Application Identifier (AI) – This application identifier or “AI” indicates the following 13 digits will be a physical location GLN.
0847976000012	GLN – This is the actual GLN number for the physical location.
(254)	GLN Extension Component AI – This application identifier or “AI” indicates the following 20 characters will be a Global Location Number Extension Component. GLN Extensions can only be used with physical GLNs.
FIELD1001A	GLN Extension Component – This is the actual GLN Extension Component. In this case, it represents the actual field (1001) and block (A).

Q. How does this work if field definitions change from year to year or season to season?

A. With master data, it is common to store an effective date for the location or product definition. It is really up to the grower to define the start/end date of a field. In the case of a field GLN+Extension, the effective date might be the date the field is contracted, tilled, planted or mapped for a particular growing period or season.

1. GLN Master Data

Master Data is the core data that is associated with the GLN. This data set does not change during transactions. The following is a list of the master data attributes that are recommended to be shared only once per GLN when sharing trace-back data.

Table 2: GLN Master Data

Master Data Common Name	Attribute Name	Description	Required / Optional
GLN	locationIdentification	13 digits	Required
Physical Location Extension	locationExtension	Up to 20 characters	Optional
Description	locationDescription	Free Text, 178 char	Required
Location Type	locationType	Multiple types allowed: Ship To, Bill To, Deliver To, Ship From, Paid By, Order From, Recall, Org Entity, Remit To, etc.	Required
Address Line 1	addressLine1		Required
Address Line 2	addressLine2		Optional
City	city		Required
State or Region	stateOrRegion	The state, province, or region using the standard two-letter abbreviation specified in ISO 3166-2:1998 country subdivision code [16].	Required
Postal Code	postalCode	The ZIP or other postal code.	Required
Country	country		Required
Latitude	latitude	(for Fields)	Required
Longitude	longitude	(for Fields)	Required
Contact Name	contactName		Required
Contact Email	contactEmail		Required
Contact Phone	contactPhone		Required
Create Date	createDate	Date this location becomes active	Required
Inactivation Date	inactivationDate	Date this location is no longer used by the information provider	Optional
Parent Location GLN	parentLocation	Used to describe a location hierarchy	Optional
Industry Sector	industrySector	Fresh Produce, Foodservice, Retail	Optional
Role	role	Pick best one for location: Manufacturer, Distributor, Operator, Grower, Packer, Shipper, Re- packer, Broker, 3PL, Brand Owner, Retailer, Restaurant Operator	Optional
Information Provider GLN	informationProviderGLN	The entity providing this information. Usually points to the primary business GLN listed in the spreadsheet or database.	Optional

2. GLN Assignment Best Practices

Assign a GLN to the Business's Headquarters

For a company, assign a GLN to the physical location of the primary headquarters. If the company moves its headquarters, a new GLN should be assigned to the new location per the GLN Allocation Rules found at www.gs1.org/1/glnrules/.

Table 3: Example of a GLN for Business Headquarters

GLN = 1234560 00001 2	
Attribute	Value
Description	Sample Farm Co., Fresh Produce, HQ
Address Line 1	101 Main St
Address Line 2	
City	Salina
State or Region	CA
Postal Code	99999-9999
Country	USA
Contact Name	Name of Contact
Contact Email	name@sfc.com
Contact Phone	1.999.999.9999

Assign GLNs to Physical Locations Where Product is Transformed, Transported or Depleted

Assign GLNs to each physical location within an organization’s scope of responsibility where Critical Tracking Events occur in order to identify where Critical Tracking Events occur. This includes the following types of locations:

- Packing Sheds
- Warehouses
- Distribution Centers
- Farms
- Fields (if possible)

Table 4: Example of a GLN for a Critical Tracking Event Physical Location

GLN = 1234560 00201 6	
Attribute	Value
Description	Cooler 201, Fresh Produce, Cooler
Address Line 1	902 Highway 100
Address Line 2	
City	Salina
State or Region	CA
Postal Code	88888.8888
Country	USA
Contact Name	Name of Contact
Contact Email	Name2@sfc.com
Contact Phone	1.888.888.8888

Document GLN Extension Scheme for Internal Operations Locations If Necessary

For packing operations that would prefer to use their internal location identification scheme, verify that only valid GLN Extension characters are used (see Appendix 4) and that the twenty-character limitation for GLN Extension is observed. Once verified, create a listing of internal locations associated with a Physical Location GLN.

Table 5: Example of GLN Extensions for Internal Operations Locations

Location GLN	GLN Extension	Description
1234560 00201 6	LINE1	Packing Line 1
1234560 00201 6	LINE2	Packing Line 2
1234560 00201 6	RECEIVING	Receiving Dock
1234560 00201 6	SHIPPING	Shipping Dock
1234560 00201 6	COOLER1	Cooler 1

Document GLN Extension Scheme for Field Locations If Necessary

For farming operations that would prefer to use their existing field and harvest location identification scheme, verify that only valid GLN Extension characters are used (see Appendix 4) and that the twenty-character limitation for GLN Extension is observed. Once verified, create a listing of Farm GLN and corresponding field GLN Extensions with latitude and longitude of the field center or entry point.

Table 6: Example of a GLN Extensions for Field Locations

Farm (GLN)	Field (GLN Extension)	Latitude	Longitude
1234560 00001 2	FIELD101A	36.655777	-121.647380

Example 1 – Basic GLN Assignment to Farm, Fields and Cooler



Sample Farm Company has a one location growing operation. GS1 US has assigned them a GS1 Company Prefix of “1234560” and an Entity GLN of “1234560 00000 5.” All fields are assigned sequential reference numbers beginning with “101.” Coolers and other facilities are assigned sequential reference numbers beginning with “201.”

The internal naming scheme easily lends itself to assigning GLNs directly by using the internal number as the location reference padded with zeros, GLN Prefix (“1234560”) + “00” + “101” + Check Digit for a resulting GLN for field “101” of “1234560 00 101 9” for example.

The Headquarters is allocated a physical GLN of “1234560 00001 2” and is the parent GLN of the field GLNs and cooler GLN.

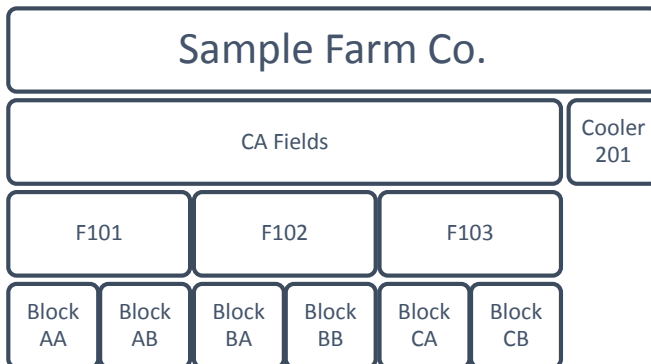
Table 7: Allocation Example of Sample Farm Co. with Fields Identified with GLNs

GLN	GLN Extension	Description
1234560 00001 2	{blank}	Sample Farm Company HQ
1234560 00101 9	{blank}	Field 101
1234560 00102 6	{blank}	Field 102
1234560 00103 3	{blank}	Field 103
1234560 00201 6	{blank}	Cooler 201

Table 8: Data Sharing Example of Sample Farm Co. with Fields Identified with GLNs

Master Data Common Name	Example: Company	Example: Field Location	Example: Cooler Location
GLN	123456000012	1234560001012	1234560002016
GLN Extension			
Description	Sample Farm Company	Field 101	Cooler 201
Type	Org Entity	Physical	Physical
Address Line 1	101 Main Street		902 Highway 100
Address Line 2			
City	Salinas		Salinas
State or Region	CA		CA
Postal Code	99999-9999		88888.8888
Country	USA		USA
Latitude		36.655777	
Longitude		-121.647380	
Contact Name	John Smith		Joe Cooler
Contact Email	js@sfc.com		jc@sfc.com
Contact Phone	+1.999.999.9999		+1.888.888.8888
Parent Location			123456000012
Industry Sector	Fresh Produce	Fresh Produce	Fresh Produce
Role	Seller	Grower	Packer
Create Date	20141107:13:05:01	20141107:13:05:01	20141107:13:05:01
Inactivation Date			
Information Provider GLN	1234560000005	1234560000005	1234560000005

Example 2 – Field Grouping with GLN Extensions



Sample Farm Company has a growing operation in California and would like to use their existing field and block identification scheme. GS1 US has assigned them a GS1 Company Prefix of “1234560” and an entity GLN of “1234560 00000 5.” Each field is identified with “F” followed by a sequential number, “101”, “102”, etc. Blocks are identified with letters. Each field gets a dedicated letter, followed by a sequence of letters for each block, “AA”, “AB”, “AC”, “AD”, etc. At Sample Farm, they refer to a field as “F” plus the field number (“F101”) and Block as the field name followed by a hyphen and the block letters, “F101-AA”, “F101-AB.”

The Company also has fields in Arizona and Mexico. To group the California fields together, Sample Farm Co. creates a GLN for CA Fields, “1234560001019” which is the parent GLN to the fields and blocks. California Fields and Blocks are assigned a GLN Extension based on their internal naming scheme and attached to the CA Fields GLN to form a GLN Extension, “1234560001019” (GLN) + “F101-AA” (Extension) for example.

Warehouses, coolers and other structures are assigned sequential location reference numbers beginning with “201.” The cooler shown above has a GLN of “1234560 00**201** 6.”

The Headquarters is allocated a physical GLN of “1234560 00001 2” and is the parent GLN of the field grouping GLN and the cooler GLN.

Table 9: Allocation Example for Sample Farm Co. with Fields Identified with GLN + Extension

GLN	GLN Extension	Description
1234560 00001 2	{blank}	Sample Farm Company HQ
1234560 00101 9	{blank}	CA Fields
1234560 00101 9	F101	Field 101
1234560 00101 9	F101-AA	Field 101 – Block AA
1234560 00101 9	F101-AB	Field 101 – Block AB
1234560 00101 9	F102	Field 102
1234560 00101 9	F102-BA	Field 102 – Block BA
1234560 00101 9	F102-BB	Field 102 – Block BB
1234560 00101 9	F103	Field 103
1234560 00101 9	F103-CA	Field 103 – Block CA
1234560 00101 9	F103-CB	Field 103 – Block CB
1234560 00201 6	{blank}	Cooler 201

Table 10: Data Sharing Example for Sample Farm Co. with Fields Identified with GLN + Extension

Master Data Common Name	Example: Company HQ	Example: Field Group	Example: Field + Block
GLN	1234560000012	1234560001019	1234560001019
GLN Extension			F101-AA
Description	Sample Farm Company HQ	CA Fields	Block F101-AA
Type	Physical	Physical	Physical
Address Line 1	101 Main Street		
Address Line 2			
City	Salinas	Salinas	
State or Region	CA	CA	
Postal Code	99999-9999		
Country	USA	USA	
Latitude			36.655777
Longitude			-121.647380
Contact Name	John Smith	Joe Field Man	
Contact Email	js@sfc.com	jfm@sfc.com	
Contact Phone	+1.999.999.9999	+1.888.888.8888	
Parent Location		1234560000012	1234560001019
Industry Sector	Fresh Produce	Fresh Produce	Fresh Produce
Role	Seller	Grower	Grower
Create Date	20141107:13:05:01	20141107:13:05:01	20141107:13:05:01
Inactivation Date			
Information Provider GLN	1234560000005	1234560000005	1234560000005

Appendix 1 – Cross-Referenced Terms/Definitions

Listed below are terms used by the produce industry and the cross-reference with the GS1 Glossary of Terms:

Sector Term	GS1 Glossary Term	Definition
	Batch/Lot Number	The batch or lot number associates an item with information the manufacturer considers relevant for traceability of the trade item. The data may refer to the trade item itself or to items contained in it.
Block		A block is an area of a land within a field, used to further segment a field.
	Check Digit	A final digit calculated from the other digits of some GS1 identification keys. This digit is used to check that the data has been correctly composed.
Critical Tracking Event (CTE)		Any occurrence involving an item within the supply chain at a specific location and time that is associated with collection and storage of data useful for associating an item or related items to the specific occurrence at a later time and is determined to be necessary for identifying the actual path of an item through the supply chain.
Depletion		A Critical Tracking Event that involves the transfer of custody of a product to the final point in the supply chain. [This could be the sale of an item at retail, the consumption of an item for a finished plate in food service, the move of samples to the final party, or the donation of goods.]
Disposal		A Critical Tracking Event to denote the destruction of an item and removal from the supply chain in a manner making it unfit for consumption.
Farm		A farm is an area of land that is devoted primarily to agricultural processes or an area of water that is devoted primarily to aquaculture processes, in order to produce and manage such commodities as produce, fibers, grains, livestock, or fuel. It is the basic production facility in food production. Farms may be owned and operated by a single individual, family, community, corporation or a company. A farm can be a holding of any size from a fraction of an acre to several thousand acres.
Field		A field is an area of land, enclosed or otherwise, used for agricultural purposes such as: <ul style="list-style-type: none"> • Cultivating crops • Usage as a paddock or, generally, an enclosure of livestock • Land left to lie fallow or as arable land.
	GLN Extension	The GLN extension component is used to identify internal physical locations within a location which is identified with a GLN (stores, factories, buildings, etc.).

Sector Term	GS1 Glossary Term	Definition
	Global Location Number (GLN)	The globally unique GS1 System identification number for legal entities, functional entities, and physical locations. The Global Location Number is 13 digits, which comprise a GS1 Company Prefix, Location Reference, and Check Digit. Supply side trading partner locations generally include corporate headquarters, regional offices, warehouses, plants, and distribution centers. Demand side trading partner locations generally include corporate headquarters, divisional offices, stores, and distribution centers.
	Global Trade Item Number (GTIN)	The globally unique GS1 System identification number for products and services. A Global Trade Item Number may be 8, 12, 13, or 14 digits in length, represented as GTIN-8, GTIN-12, GTIN-13, and GTIN-14 respectively. The GTIN-14 has been selected for use in the PTI.
	GS1	The not-for-profit, neutral organization dedicated to facilitating the adoption and implementation of global standards for the improvement of supply and demand chains. GS1, based in Brussels, Belgium, is comprised of global GS1 Member Organizations and manages the GS1 System and Global Standards Management Process.
	GS1 Company Prefix	A unique string of four to twelve digits used to construct GS1 identification keys. The GS1 Company Prefix is issued by a GS1 member organization.
	Location Reference	A component of a Global Location Number (GLN) assigned by the brand owner to create a unique GLN.
Key Data Element (KDE)		The essential data values captured for a CTE to identify and maintain a chain of custody for an item as it is transformed through the supply chain.
Party		Business entity or specific shipping/receiving location at the discretion of the reporting business entity
Receiving		The act of accepting a shipment of a trading good from another trading partner.
Role		Main responsibility of the location or entity in the supply chain.
	SGLN	SGLN is an EPC scheme used to assign a unique identity to a physical location, such as a specific building or a specific unit of shelving within a warehouse. The term SGLN merely distinguishes the EPC form, which can be used either for a GLN by itself or GLN with extension, from the term GLN which always refers to the unextended GLN identifier. The letter "S" does not stand for anything.
Ship from Location		Identification of the party from whom goods will be or have been shipped.

Sector Term	GS1 Glossary Term	Definition
Ship to Location		Identification of the party to whom goods will be or have been shipped.
Shipping		The act of releasing a shipment from one trade partner to go to another.
Trace-back		The act of monitoring the elements of CTEs to follow the chain of custody of a product from harvest to depletion.
	Trade Item	Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain.
	Trading Partner	A Party to transactions in the supply chain, such as a supplier (seller) or a customer (buyer).
Transformation		The act or result of changing the item such as combining ingredients to make a finished product or repackaging a product such as producing a tray-packed product for consumer sale from cased ingredients. Transformation can be production, aggregation, grouping, splitting, mixing, packing and repacking traceable items.

Appendix 2 – GS1 AI Encodable Character Set 82

Graphic Symbol	Name	Coded Representation	Graphic Symbol	Name	Coded Representation
!	Exclamation mark	2/1	M	Capital letter M	4/13
"	Quotation mark	2/2	N	Capital letter N	4/14
%	Percent sign	2/5	O	Capital letter O	4/15
&	Ampersand	2/6	P	Capital letter P	5/0
'	Apostrophe	2/7	Q	Capital letter Q	5/1
(Left parenthesis	2/8	R	Capital letter R	5/2
)	Right parenthesis	2/9	S	Capital letter S	5/3
*	Asterisk	2/10	T	Capital letter T	5/4
+	Plus sign	2/11	U	Capital letter U	5/5
,	Comma	2/12	V	Capital letter V	5/6
-	Hyphen/Minus	2/13	W	Capital letter W	5/7
.	Full stop	2/14	X	Capital letter X	5/8
/	Solidus	2/15	Y	Capital letter Y	5/9
0	Digit zero	3/0	Z	Capital letter Z	5/10
1	Digit one	3/1	_	Low line	5/15
2	Digit two	3/2	a	Small letter a	6/1
3	Digit three	3/3	b	Small letter b	6/2
4	Digit four	3/4	c	Small letter c	6/3
5	Digit five	3/5	d	Small letter d	6/4
6	Digit six	3/6	e	Small letter e	6/5
7	Digit seven	3/7	f	Small letter f	6/6
8	Digit eight	3/8	g	Small letter g	6/7
9	Digit nine	3/9	h	Small letter h	6/8
:	Colon	3/10	i	Small letter i	6/9
;	Semicolon	3/11	j	Small letter j	6/10
<	Less-than sign	3/12	k	Small letter k	6/11
=	Equals sign	3/13	l	Small letter l	6/12
>	Greater-than sign	3/14	m	Small letter m	6/13
?	Question mark	3/15	n	Small letter n	6/14
A	Capital letter A	4/1	o	Small letter o	6/15
B	Capital letter B	4/2	p	Small letter p	7/0
C	Capital letter C	4/3	q	Small letter q	7/1
D	Capital letter D	4/4	r	Small letter r	7/2
E	Capital letter E	4/5	s	Small letter s	7/3
F	Capital letter F	4/6	t	Small letter t	7/4

Graphic Symbol	Name	Coded Representation	Graphic Symbol	Name	Coded Representation
G	Capital letter G	4/7	u	Small letter u	7/5
H	Capital letter H	4/8	v	Small letter v	7/6
I	Capital letter I	4/9	w	Small letter w	7/7
J	Capital letter J	4/10	x	Small letter x	7/8
K	Capital letter K	4/11	y	Small letter y	7/9
L	Capital letter L	4/12	z	Small letter z	7/10