

7.4 Name Data Frame

name [Name Data Frame]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	B1		Name Distribution Header		a
2	O1	B2		A Sequence of Name Data Lists		c
3	O2	B3		Extended Data (Name Data Frame)	(1)	c

(1) Individual Expansion (Name Data Frame)

If the value of size described in the basic data frame management record of the main map data frame is larger than specification-defined size, the increased area is used as expansion fields. Follow the expansion method that is defined separately.

7.4.1 Name Distribution Header

name [Name Distribution Header]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	SWS	Size of Name Data Distribution Header		a
2	2	B1		A Sequence of Name Data Management Information	(1)	b
3	O1	B2		Extended Data (Name Distribution Header)	(2)	c

(1) A Sequence of Name Data Management Information

As name data management information, a set of name data grouped by display class is managed. There are no limitations for the number and sequence of items of name data management information.

If a display class has no name data, set the name data management information for the class as follows: "Offset to name data" = 0xFFFF, and "Number of name data records" = 0.

name [Name Data Management Information]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	D	Offset to the Name Data List	(1-1)	a
2	2	2	N	Number of Name Data Records	(1-2)	a

(1-1) Offset to the Name Data List

This field describes the displacement of the beginning of the particular name data list from the beginning of the name data frame.

(1-2) Number of Name Data Records

This field describes the total number of name data records that constitute the name data list. If there is no entity, number 0 shall be set.

(2) Extended Data (name Distribution Header)

Expansion fields shall be able to be used.

Follow the expansion method that is defined separately.

7.4.2 Name Data List

name [Name Data List]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	B1		A Sequence of Name Data Records		

7.4.2.1 Name Data Record

name [Name Data Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	6		Name Attribute Header		a
2	6	B1		String Data Record	(1)	a
3	O1	2	N	Auxiliary Data	(2)	c
4	O2	B2	D	Additional Background Information Pointer		c
5	O3	8		Temporal Information	(4)	
6	O4	B3		Extended Data (Name Data Record)	(3)	c

(1) String Data Record

The format of a string data record differs depends on the string type recorded in the attribute field of the name attribute header.

(2) Auxiliary Data

The auxiliary data flag exists if there is auxiliary data.

Set a 3-D symbol code.

(3) Extended Data (Name Data Record)

When the extended data (name data record) flag in name attribute header of string data record is "1: Extended data," expansion fields shall be able to be used.

Follow the expansion method that is defined separately.

(4) Temporal Information

This is similar to the description of Subsection 7.2.2.1.1.7, "Spatial temporal information."

7.4.2.1.1 Name Attribute Header

name [Name Attribute Header]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	B:B:B::SWS	Name Data Header	(0)	
2	0	2	B:B:B:B:B:B: B:B:N	Attribute 1	(1)	a
3	2	2	N	Attribute 2	(6)	a

(0) Name Data Header

No.	bit	Description
1	15	Deletion Flag (Delete: 1/Do not delete: 0) (0-1)
2	14	Temporal Information Flag (0: No setting, 1: Setting) (0-2)
3	13	Extended Data (Name Data Record) Flag (0: No extended data, 1: Extended data)
4	12	(RESERVED)
5	11 to 0	Size of Minimum Graphics Data Record

(0-1) Deletion Flag

This flag indicates whether the data is valid(0) or invalid(1). Normally, this flag is used in memory after being read from a medium.

(0-2) Temporal Information Flag

This flag indicates whether the name data record has "Spatial temporal information."

(1) Attribute 1

No.	bit	Description				
1	15	Display Scale Flag 1 (Permitted: 1/Not permitted: 0) (2)				
2	14	Display Scale Flag 2 (Permitted: 1/Not permitted: 0) (2)				
3	13	Display Scale Flag 3 (Permitted: 1/Not permitted: 0) (2)				
4	12	Display Scale Flag 4 (Permitted: 1/Not permitted: 0) (2)				
5	11	Display Scale Flag 5 (Permitted: 1/Not permitted: 0) (2)				
6	10 to 8	String Type	bit10	bit 9	bit 8	Meaning
			0	0	0	(RESERVED)
			0	0	1	Barycentric string
			0	1	0	Point-indicating string
			0	1	1	Linear-placed string Type A
			1	0	0	Linear-placed string Type B
			1	0	1	Linear-placed string Type C
			1	1	0	Symbol + String
			1	1	1	(Undefined for 111(2) and later)
7	7	Height Information Flag (3) (Per Name Data Record)	bit 7	Meaning		
			0	There is no height information.		
			1	There is height information.		
8	6	String Orientation (4)	bit 6	Meaning		
			0	Horizontal		
			1	Vertical		
9	5 to 0	Character Priority Information (5)				

(2) Display Scale Flag

These fields contain display scale flag setting. Flag usage is the same as for background data.

When all display scale flags 1 to 4 are 0 (not permitted), no display shall be made.

(3) Height Information Flag

This flag indicates whether the particular name record retains height information.

When the string type is "linear-placed string Type B," this flag is ignored.

(4) String Orientation

This flag indicates string drawing orientation. The position of the string plotted on the coordinates depends on the string type.

When the string type is "linear-placed string Type A" or "linear-placed string Type B," this flag is ignored.

(5) Character Priority Information

This field describes a value from -31 to 31, corresponding to the priority of the name data record.

The field value represents the priority that cannot exactly be expressed by a name type code and a display scale flag. -32 invalidates the character priority.

(6) Attribute 2

This field contains a type code. For the information about type codes, see Chapter 32.

The type code field contains a code corresponding to the type of an object to be recorded.

The correspondence between type codes and objects is defined by META [country of application and region identification].

7.4.2.1.2 String Data Record (When String Type is Barycentric String)

name [String Data Record (When String Type is Barycentric String)]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	6		Barycentric Coordinates Information		a
2	4	B1		Character Information Data List		a
3	01	2	:l	Altitude Information	(1)	c

(1) Altitude Information

No.	bit	Description
1	15 to 14	(RESERVED)
2	13 to 0	Altitude Value (2)

(2) Altitude Value

This field describes an altitude from -4095 to +12287 with the offset of 4096. The units are meters. Thus, the field contains the sum of an actual altitude value and 4096 meters.

When string type = barycentric string, a string data record is created on the supposition that a character string is positioned on the display, based on the barycentric coordinates information, depending on the string orientation specified by attribute 1, as will be described below.

a) Horizontal Characters

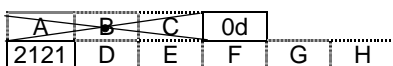
The coordinates (X, Y) for displaying a horizontal character string shall correspond to the coordinates of the center point of string on the first line from top. For line feed, set a line feed code in feed position. In addition, use a space character to set the start position of string on the next line. Appropriate code setting is shown below.

- For simple horizontal characters



The coordinates of the center point of string "AB" are given.

- For horizontal characters and line feed

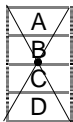


The coordinates of the center point of string "ABC" are given.

b) Vertical Characters

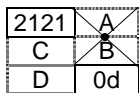
The coordinates (X, Y) for displaying a vertical character string shall correspond to the coordinates of the center point of string on the rightmost row.

- For simple vertical characters



The coordinates of the center point of string “ABCD” are given.

- For vertical characters and line feed



The coordinates of the center point of string “AB” are given.

7.4.2.1.2.1 Barycentric Coordinates Information

name [Barycentric Coordinates Information]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	B:B::B:	Additional Background Information Type + Additional Background Information Flag	(1)	a
2	2	2	N:NZ	X Coordinate (Longitude)	(2)	a
3	4	2	N:NZ	Y Coordinate (Latitude)	(3)	a

When both X and Y coordinates are 0xFFFF, normally, no display shall be made.

(1) Additional Background Information Type + Additional Background Information Flag

No.	bit	Description		
1	15 to 14	Additional Background Information Type	bit15	bit14
			Meaning	
			0	0
			0	1
			1	0
2	13	Additional Background Information Flag	bit13	Meaning
			0	There is no additional background information.
			1	There is additional background information.
3	12	(RESERVED)		
4	11	Auxiliary Data Flag	bit11	Meaning
			0	There is no auxiliary data.
			1	There is auxiliary data.
5	10 to 0	(RESERVED)		

(2) X Coordinate (Normalized Longitude)

No.	bit	Description
1	15 to 13	Relative Position within an Integrated Parcel
2	12 to 0	X Coordinate

When the current parcel is formed by integrating multiple parcels, relative positions within the integrated parcel are expressed by taking the sub-parcel at left bottom of the integrated parcel as being 0.

X-coordinate values are on the longitudinal coordinate within a parcel.

(3) Coordinate (Normalized Latitude)

No.	bit	Description
1	15 to 13	Relative Position within an Integrated Parcel
2	12 to 0	Y Coordinate

When the current parcel is formed by integrating multiple parcels, relative positions within the integrated parcel are expressed by taking the sub-parcel at left bottom of the integrated parcel as being 0.

Y-coordinate values are on the latitudinal coordinate within a parcel.

7.4.2.1.2.2 Character Information Data List

name [Character Information Data List]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	SWS	Character Information Data Size	(1)	c
2	2	B1	M	Language-specific Offset Pointer Table	(2)	c
3		B2		Language-specific Character Information List	(3)	a

(1) Character Information Data Size

This field describes the size of the whole list of character information data. The character information data size is omitted if the language-specific character information is only one type.

(2) Language-specific Offset Pointer Table

name [Language-specific Offset Pointer Table]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	D	Language-specific Offset Pointer Table (Language 1)		C
2	2	2	D	Language-specific Offset Pointer Table (Language 2)		C
3		2	D *		C
4		2	D	Language-specific Offset Pointer Table (Language n)		C

This table describes the displacement of the beginning of every particular language-specific character information from the beginning of the character information data list.

The number of languages stored, type, and sequence in which they are stored are described in a META file.

Notes 1. If only one type of language (for example, only Japanese) is stored, the language-specific offset pointer table is deleted.

2. Different language-specific offset pointers may indicate same language data information.

(3) Language-specific Character Information List

name [Language-specific Character Information List]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0			Language-specific Character Information (Language 1)	(4)	c
2				Language-specific Character Information (Language 2)		c
3			 *		c
4				Language-specific Character Information (Language n)		c

(4) Language-specific Character Information

name [Language-specific Character Information]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	SWS	String Size (words)	(5)	a
2	2		CC	String	(6)	c

(5) String Size

This field describes the size of string in units of words.

(6) String

If the string ends with an odd byte, the field contains 00(16) as dummy data at the tail of the string.

7.4.2.1.3 String Data Record (When String Type is Point-indicating String)

name [String Data Record (when String Type is Point-indicating String)]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	6		Indicated Point Information	(1)	a
2	6	2	I	Offset of String representative Point from Indicated Point	(2)	a
3	8	B1		Character Information Data List	(3)	a
4	01	2	I	Altitude Information	(4)	c

(1) Indicated Point Information

Indicated point normalized latitude and longitude represent the position of an object to which the string points, corresponding to the center of rotation of the string.

(2) Offset of string representative Point from Indicated Point

Corresponds to the distance from the indicated point to the string representative point in normalized latitude and longitude.

These indicated point information and offset of string representative point shall be based on the maximum scale factor of display level.

(3) Character information data list is similar to that applies when string type = barycentric string.

(4) Altitude information is similar to that applies when String Type = barycentric string.

When string type = point-indicating string, a string data record is created on the supposition that a character string is positioned on the display, based on the indicated point information, depending on the string orientation specified by attribute 1, as will be described below.

a) Horizontal Characters

The coordinates (X, Y) of a string representative point shall correspond to the coordinates (X, Y) of the point at left bottom of the string on the first line from top (at left bottom of the foremost character). Line feed and space setting are the same as for a barycentric string.

- For simple horizontal characters

A	B
---	---

The coordinates of the point at left bottom of character "A" are given.

- For horizontal characters and line feed

A	B	C	000d			
2121	D	D	F	G	H	

The coordinates of the point at left bottom of character "A" are given.

b) Vertical Characters

The coordinates of a string representative point shall correspond to the coordinates (X, Y) of the point at right top of the string on the rightmost row (right top of the foremost character).

- For simple vertical characters

A
B
C
D

The coordinates of the point at right top of character "A" are given.

- For vertical characters and line feed

2121	A
C	B
D	000d

The coordinates of the point at right top of character "A" are given.

7.4.2.1.3.1 Indicated Point Information

name [Indicated Point Information]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	B:B::B::N	Additional Background Information Type + Additional Background Information Flag + Multiplication Constant	(1)	a
2	2	2	N:NZ	X Coordinate of Indicated Point	(3)	a
3	4	2	N:NZ	Y Coordinate of Indicated Point	(4)	a

(1) Additional Background Information Type + Additional Background Information Flag

No.	bit	Description			
1	15 to 14	Additional Background Information Type	bit15	bit14	Meaning
			0	0	To be contained in additional data frame A
			0	1	To be contained in additional data frame B
			1	0	SS (to be contained in the currently used medium)
			1	1	SS (to be contained in an external medium)
2	13	Additional Background Information Flag	bit13	Meaning	
			0	There is no additional background information.	
			1	There is additional background information.	
3	12	(RESERVED)			
4	11	Auxiliary Data Flag	bit11	Meaning	
			0	There is no auxiliary data.	
			1	There is auxiliary data.	
5	10 to 3	(RESERVED)			
6	2 to 0	Multiplication Constant (2)			

(2) Multiplication Constant

The offsets of a string representative point from indicated point (X-coordinate offset and Y-coordinate offset) are used by multiplying each offset by two to the nth power, where n is a multiplication constant, provided (0 ≤ n ≤ 3: n is an integer).

(3) X Coordinate (Normalized Longitude) of Indicated Point

No.	bit	Description
1	15 to 13	Relative Point within an integrated parcel
2	12 to 0	X Coordinate of Indicated Point

When the current parcel is formed by integrating multiple parcels, relative positions within the integrated parcel are expressed by taking the sub-parcel at left bottom of the integrated parcel as being 0.

X-coordinate values of indicated point are on the longitudinal coordinate within a parcel.

(4) Y Coordinate (Normalized Latitude) of Indicated Point

No.	bit	Description
1	15 to 13	Relative position within an integrated parcel
2	12 to 0	Y Coordinate of Indicated Point

When the current parcel is formed by integrating multiple parcels, relative positions within the integrated parcel are expressed by taking the sub-parcel at left bottom of the integrated parcel as being 0.

Y-coordinate values of indicated point are on the latitudinal coordinate within a parcel.

7.4.2.1.3.2 Offset to Character String Representative Point from Indicated Point

name [Offset to Character String Representative Point from Indicated Point]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	1	I	Offset of Character String Representative Point from Indicated Point (X-coordinate direction)	(1)	a
2	1	1	I	Offset of String representative Point from Indicated Point (Y-coordinate direction)	(1)	a

(1) X-coordinate-direction and Y-coordinate-direction Offsets

X-coordinate-direction and Y-coordinate-direction offsets are obtained by dividing each offset value on the corresponding coordinate within a parcel by two to the nth power (n is a multiplication constant). The range of the obtained value is from -128 to 127.

7.4.2.1.4 Character String Data Record (When String Type is Linear-placed String Type A)

name [Character String Data Record (When String Type is Linear-placed String Type A)]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	6		Indicated Point Information	(1)	a
2	6	B1		Linear-placed String Type A Character Information Data List	(2)	a
3	01	2	I	Altitude Information	(3)	c

(1) Indicated Point Information

Indicated point information is similar to that applies when string type is point-indicating string.

(2) Linear-placed String Type A Character Information Data List

This character information data list contains offset coordinates records and offset height information records.

(3) Altitude Information

Altitude information is similar to that applies when string type is barycentric string.

7.4.2.1.4.1 Character Information Data List of Linear-placed String Type A

name [Linear-placed String Type A Character Information Data List]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	SWS	Character Information Data Size of Linear-placed String Type A	(1)	c
2	2	B1		Language-specific Offset Pointer Table	(2)	c
3		B2		Language-specific Character Information List	(3)	a

(1) Character Information Data Size of Linear-placed String Type A

This field describes the size of the whole data list of linear-placed string Type A character information. The data size of linear-placed string Type A character information is language-specific. If there is only one type of character information, the data size is omitted.

(2) Language-specific Offset Pointer Table

name [Language-specific Offset Pointer Table]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	D	Language-specific Offset Pointer (Language 1)		c
2	2	2	D	Language-specific Offset Pointer (Language 2)		c
3		2	D*		c
4		2	D	Language-specific Offset Pointer (Language n)		c

This field describes the displacement of the beginning of every particular language-specific character information from the beginning of the character information data list.

The number of languages stored, type, and sequence in which they are stored are described in a META file.

Notes 1. If only one type of language (for example, only Japanese) is stored, the language-specific offset pointer table is deleted.)

2. Different language-specific offset pointers may indicate same language data information.

(3) Language-specific Character Information List

name [Language-specific Character Information List]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0			Language-specific Character Information (Language 1)	(4)	c
2				Language-specific Character Information (Language 2)		c
3			*		c
4				Language-specific Character Information (Language m)		c

(4) Language-specific Character Information

name [Language-specific Character Information]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	SWS	String Size (words)	(5)	a
2	2	B1	CC	String	(6)	c
3	01	B2		A Sequence of Offset Coordinates Management Records		c
4	02	B3		A Sequence of Offset Coordinates Records		c
5	03	B4		A Sequence of Offset Height Information Records		c

(5) String Size

This field describes the size of string in units of words.

(6) String

If the string ends with an odd byte, the field contains 00(16) as dummy data at the tail of the string.

7.4.2.1.4.1.1 Offset Coordinates Management Record

name [Offset Coordinates Management Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	1	B:	Offset Coordinates Management Information	(1)	a

(1) Offset Coordinates Management Information

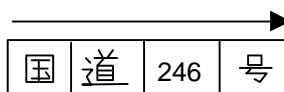
The offset coordinates management records as many as the number of name characters are created. If the number of name characters (number of offset coordinates management records) is odd, the record contains dummy data 00(16) at its tail.

No.	bit	Description		
1	7	Grouping Flag	bit7	Meaning
			0	Single character
			1	Grouping characters (2)
2	6 to 0	(RESERVED)		

(2) Grouping Flag

Successive characters to be grouped, following a single character, are stored into one offset coordinates record.

- If the numerical characters of national road route number "246" are grouped,



the number of name characters will be 6, as " 国道", "2": single, "4": groped, "6": grouped,

" 号" single. The " 国 ", "道46," and " " are stored into respective offset coordinates records.

7.4.2.1.4.1.2 Offset Coordinates Record

Offset coordinates records are created as many as enough to accommodate the number of name characters depending on the grouping flag setting.

name [Offset Coordinates Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	1	I	X-coordinate Offset	(1)	a
2	1	1	I	Y-coordinate Offset	(2)	a

(1) X-coordinate Offset

This field describes the offset of the X coordinate of the particular character from the X coordinate of its just preceding character. For the foremost character, the offset is from the indicated point to its X coordinate.

(2) Y-coordinate Offset

This field describes the offset of the Y coordinate of the particular character from the Y coordinate of its just preceding character. For the foremost character, the offset is from the indicated point to its Y coordinate.

X-coordinate and Y-coordinate offsets are obtained by dividing each offset value on the corresponding coordinate within a parcel by two to the nth power (n is a multiplication constant). The range of the obtained value is from -128 to 127.

The indicated point information and offset coordinates records shall designate string positions, based on the maximum scale factor of display level.

7.4.2.1.4.1.3 Offset Height Information Record

name [Offset Height Information Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	N:I	Number of Consecutive Characters + Altitude Offset	(1)	a

(1) Number of consecutive Characters + Altitude Offset

No.	bit	Description
1	15 to 11	Number of Consecutive Characters (2)
2	10 to 0	Altitude Offset (3)

(2) Number of consecutive Characters

This field describes the number of characters with same altitude information, sequenced from the foremost character. A total of the consecutive characters equals the number of characters that constitute one name data record. The value range is from 1 to 31.

(3) Altitude Offset

This field describes the offset of the altitude value of the particular character from the altitude value of its just preceding character. For the foremost character, the offset is from the altitude data of the indicated point to its altitude value. The altitude offset is expressed in the range is from -1024 to +1023. The units are meters.

7.4.2.1.5 String Data Record (When String Type is Linear-placed String Type B)

Linear-placed string type B is effective only in the following cases where:

- a) Comment is made to a minimum graphics data record (background data), providing:
 - The relevant name record is allocated and located by name offset within the minimum graphics data record.
 - The minimum graphics data record can be located by its displacement.
- b) Comment is made to a MultiLink data record (road data), providing:
 - The relevant name record is allocated and located by street name data offset assigned to each element point within the MultiLink data record.
 - The MultiLink data record can be located by the displacement to the node record within it.

name [String Data Record (When String Type is Linear-placed String Type B)]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	B:B::B:B:B:B::N	String Placement Information		a
2	2	2	D	Offset to the Data to be drawn	(1)	b
3	4	B1		A Sequence of String Placement Point Records		a
4	O1	B2		String Information Data List	(2)	a

(1) Offset to the Data to be drawn

The offset (meaning) differs, according to the data to which comment is made, the data being either background or road data, as explained below:

- a) If the data to which comment is made is a minimum graphics data record (background data)

The offset is the displacement of the relevant minimum graphics data record (to which name is assigned) from the beginning of the background data frame.
- b) If the data to which comment is made is a MultiLink data record (road data)

The offset is the displacement of the relevant MultiLink data record (to which name is assigned) from the beginning of the road data frame.

(2) Character information data list is similar to that applies when string type is barycentric string.

7.4.2.1.5.1 String Placement Information

	bit	Description				
1	15 to 14	Additional Background Information Type	bit15	bit14	Meaning	
			0	0	To be contained in additional data frame A	
			0	1	To be contained in additional data frame B	
			1	0	SS (to be contained in the currently used medium)	
			1	1	SS (to be contained in an external medium)	
2	13	Additional Background Information Flag	bit13	Meaning		
			0	There is no additional background information.		
			1	There is additional background information.		
3	12	(RESERVED)				
4	11	Auxiliary Data Flag (7)	bit11	Meaning		
			0	There is no auxiliary data.		
			1	There is auxiliary data.		
5	10 to 8	String Placement Type	bit10	bit9	bit8	Meaning
			0	0	0	(RESERVED)
			0	0	1	Point data
			0	1	0	Line data (Character sequence is aligned with line.)
			0	1	1	Area data
			1	0	0	(Undefined for (100(2)) and later)
6	7 to 6	Identification Flag of Target Data to be drawn	bit7	bit6	Meaning	
			0	0	Road data (MultiLink data record)	
			0	1	Background data (minimum graphics data record)	
			1	0	(RESERVED)	
			1	1	(RESERVED)	
7	5	Height Information Flag (1) (Target Data to be drawn)	bit5	Meaning		
			0	There is no height information		
			1	There is height information		
8	4	(RESERVED)				
9	3 to 0	Number of Character Placement Points (2)				

(1) Height Information Flag (data to be drawn)

This flag indicates whether the appropriate data to which comment is made (MultiLink data record or minimum graphics data record) retains height information.

(2) Number of Character Placement Points

This field describes the number of character placement point records. The value range is 1 to 15. Up to 15 strings that are identical can be placed on one data to which comment is made.

7.4.2.1.5.2 Character Placement Point Record

Records as many as the number of character placement points are created.

name [Character Placement Point Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	B:N	Display Orientation + Normalized Distance from Reference Point	(1)	a

(1) Display Orientation + Normalized Distance from Reference Point

No.	bit	Description			
1	15 to 14	Display Orientation	bit15	bit14	Meaning
			0	0	On the object to which comment is made
			0	1	Left when viewed from the direction of element points contained (forward direction)
			1	0	Right when viewed from the direction of element points contained (forward direction)
			1	1	Either side when viewed from the direction of element points contained (forward direction)
2	13 to 0	Normalized Distance from Reference Point (2)			

(2) Normalized Distance from Reference Point

This field represents the normalized distance of the character placement point from the reference point. When a vertical line is drawn from the center point of the string to the data object to which comment is made (for area data, the vertical line to a line from the foremost element to the next element), the distance from the reference point of that data object to the point at which the vertical line intersects data object is the normalized distance (along a line if the data object is line data). The following table lists different reference points for different data to which comment is made.

Data to which comment is made	Reference point
Minimum Graphics Data Record (line or area data)	Foremost Element Point (start Point of polyline)
Minimum Graphics Data Record (Point data)	(RESERVED)
MultiLink Data Record (road data)	Element Point within the MultiLink Data Record (start or intermediate Point of polyline)

The normalized distance is calculated by applying a multiplier given in the relevant minimum graphics record or MultiLink data record.

The reference point and the normalized distance from the reference point are based on the maximum scale factor of display level.

7.4.2.1.6 String Data Record (When String Type is Linear-placed String Type C)

name [String Data Record (When String Type is Linear-placed String Type C)]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	6		Barycentric Coordinates Information	(1)	a
2	6	2		Display Angle Information		a
3	8	B1		Character Information Data List	(2)	a
4	O1	2	:l	Altitude Information	(3)	c

(1) Barycentric coordinates information is similar to that applies when string type is barycentric string.

(2) Character information data list is similar to that applies when String Type is barycentric string.

(3) Altitude Information

No.	bit	Description
1	15 to 14	(RESERVED)
2	13 to 0	Altitude Value (4)

(4) Altitude Value

This field describes an altitude from -4095 to +12287 with the offset of 4096. The units are meters. Thus, the field contains the sum of an actual altitude value and 4096 meters.

7.4.2.1.6.1 Display Angle Information

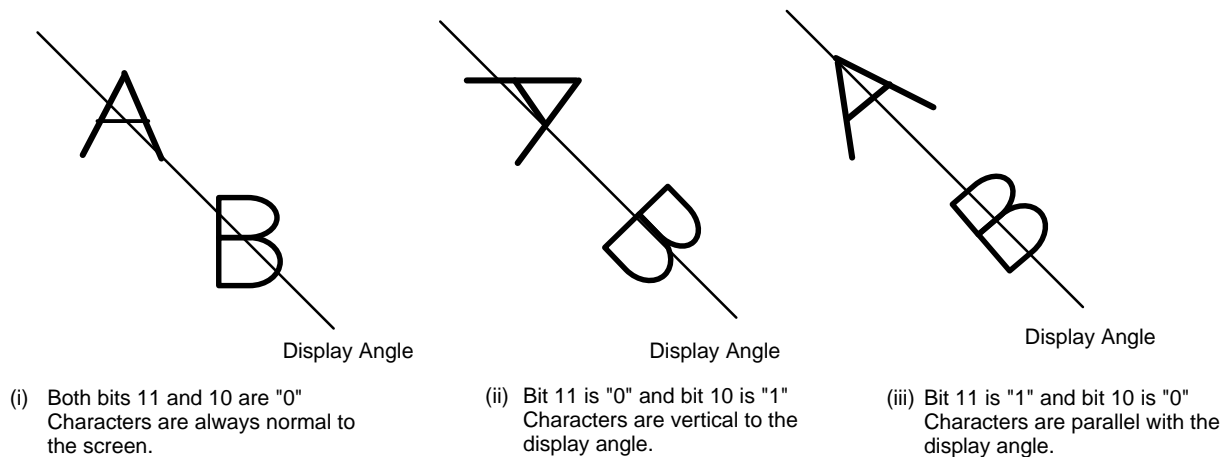
No.	bit	Description			
1	15 to 13	(RESERVED)			
2	12	Rotation Angle(1)	bit12	Meaning	
			0	Represents a fixed angle for display on the screen.	
			1	Represents a relative angle to map on the screen.	
3	11 to 10	Character Display Orientation (2)	bit11	bit10	Meaning
			0	0	Characters are always displayed, normal to the screen.
			0	1	Characters are displayed, vertical to the display angle.
			1	0	Characters are display, parallel with the display angle.
4	9	String Rotation Mode (3)	Bit9	Meaning	
			0	Rotation on a sting-by-string basis is not performed.	
			1	Rotation on a sting-by-string basis is performed.	
5	8 to 0	Display Angle (4)			

(1) Rotation Angle

In the case of map rotation, for example, heading-up, specify whether to wish to change the character display angle, according to its rotation. When "0" is specified, characters are displayed at a fixed angle relative to the north top of the map. When "1" is specified, characters rotate, according to the angle of rotation of the map.

(2) Character Display Orientation

This field represents how characters are displayed in orientation to the specified display angle. When both bit 11 and bit 10 are "0," characters are displayed, normal to the screen. When bit 11 is "0" and bit 10 is "0," characters are displayed so that they are oriented vertically to the specified display angle. When bit 11 is "1" and bit 10 is "0," characters are displayed so that they are oriented in parallel with the specified displayed angle.

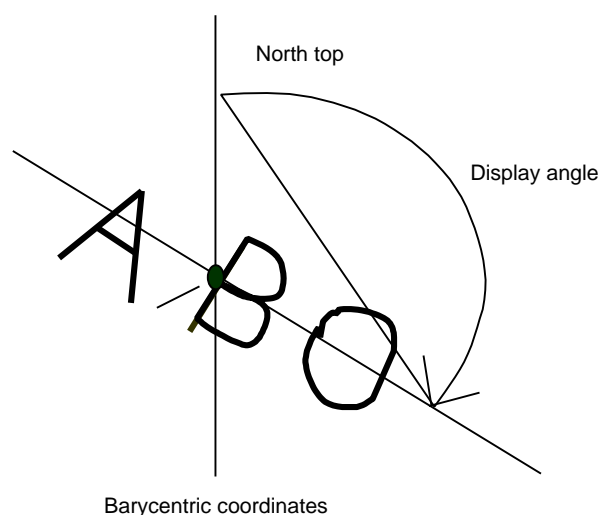


(3) Character Rotation Mode

This field describes whether to rotate characters on a string-by-string basis, according to the display angle. When "1" is specified, the rotation on a string-by-string basis is performed. When "0" is specified, the rotation on a string-by-string basis is not performed. If the rotation on a string-by-string basis is specified, a string is displayed after rotating, according to the setting of the above character display orientation. Otherwise, the string is displayed after its constituent characters rotate, according to the string orientation specified in attribute 1 and the setting of the above character display orientation.

(4) Display Angle

With the north top being 0 degree, an angle of string displayed to the north top is expressed clockwise between 0 and 359 degrees in steps of 1 degree.



For example, if a simple horizontal string is written upright from bottom to top, the angle will be 0 degree. If the string is written upright from top to bottom, the angle will be 180 degrees. If a simple vertical string is written upright from top to bottom, the angle will be 0. If the vertical string is written upright from bottom to top, the angle will be 180 degrees.

7.4.2.1.7 String Data Record (When String Type is Symbol + String)

name [String Data Record (When String Type is Symbol + String)]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	6		Barycentric Coordinates Information	(1)	a
2	6	2		String Placement	(2)	a
3	8	B1		Character Information Data List	(3)	a
4	O1	2	:l	Altitude Information	(4)	c

- (1) Barycentric coordinates information is similar to that applies when string type = barycentric string. The coordinates represent the center of symbol.

(2) String Placement

No.	bit	Description			
1	15 to 14	String Alignment Position	bit15	bit14	Meaning
			0	0	Align the right end of string with symbol.
			0	1	Align the left end of string with symbol.
			1	0	Align the center of string with symbol.
			1	1	(RESERVED)
2	13 to 12	String Placement Position	bit13	bit12	Meaning
			0	0	Above symbol
			0	1	Under symbol
			1	0	On the left of symbol
			1	1	On the right of symbol
3	11 to 0	(RESERVED)			

(3) Character information data list is similar to that applies when string type = barycentric string.

(4) Altitude information is similar to that applies when string type = barycentric string.

7.4.2.1.8 String Data Record (When String Type is Linear-placed String Type D)

name [String Data Record (when String Type is Linear-placed String Type D)]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	6		Indicated Point Information	(1)	a
2	6	B1		Character Information Data List of Linear-placed String Type D	(2)	a
3	O1	2	I	Altitude Information	(3)	c

(1) Indicated Point Information

Indicated point information is similar to that applies when string type is point-indicating string.

(2) Linear-placed String Type D Character Information Data List

This character information data list contains offset coordinates records and offset height information records.

(3) Altitude Information

Altitude information is similar to that applies when string type is barycentric string.

7.4.2.1.8.1 Character Information Data List of Linear-placed String Type D

name [Character Information Data List of Linear-placed String Type D]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	SWS	Linear-placed String Type D Character Information Data Size	(1)	c
2	2	B1		Language-specific Offset Pointer Table	(2)	c
3		B2		Language-specific Character Information List	(3)	a

(1) Character Information Data Size of Linear-placed String Type D

This field describes the size of the whole data list of linear-placed string Type D character information. The data size of linear-placed string Type D character information is language-specific. If there is only one type of character information, the data size is omitted.

(2) Language-specific Offset Pointer Table

name [Language-specific Offset Pointer Table]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	D	Language-specific Offset Pointer (Language 1)		c
2	2	2	D	Language-specific Offset Pointer (Language 2)		c
3		2	D*		c
4		2	D	Language-specific Offset Pointer (Language n)		c

This table represents the displacement of the beginning of every particular language-specific character information from the beginning of the character information data list.

The number of languages stored, type and sequence in which they are stored are described in a META file.

Notes 1. If only one type of language (for example, only Japanese) is stored, the language-specific offset pointer table is deleted.)

2. Different language-specific offset pointers may indicate same language data information.

(3) Language-specific Character Information List

name [Language-specific Character Information List]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0			Language-specific Character Information (Language 1)	(4)	c
2				Language-specific Character Information (Language 2)		c
3			*		c
4				Language-specific Character Information (Language m)		c

(4) Language-specific Character Information

name [Language-specific Character Information]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	SWS	String Size (words)	(5)	a
2	2	B1	CC	String	(6)	c
3	01	B2		A Sequence of Offset Coordinates Management Records		c
4	02	B3		A Sequence of Offset Coordinates Records		c
5	03	B4		A Sequence of Offset Height Information Records		c

(5) String Size

This field describes the size of string in units of words.

(6) String

If the string ends with an odd byte, the field contains 00(16) as dummy data at the tail of the string.

7.4.2.1.8.1.1 Offset Coordinates Management Record

name [Offset Coordinates Management Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	1	B:	Offset Coordinates Management Information	(1)	a

(1) Offset Coordinates Management Information

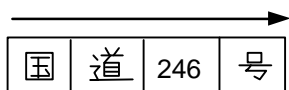
The offset coordinates management records as many as the number of name characters are created. If the number of name characters (number of offset coordinates management records) is odd, the record contains dummy data 00(16) at its tail.

No.	bit	Description	
1	7	Grouping Flag	bit7
			Meaning
			0 Single character
			1 Grouping characters (2)
2	6 to 0	(RESERVED)	

(2) Grouping Flag

Successive characters to be grouped, following a single character, are stored into one offset coordinates record.

- If the numerical characters of national road route number "246" are grouped,



the number of name characters will be 6, as " 国 " single, "2": single, "4": groped, "6": grouped,

"号" single. The " 国 " , "道46," and " " are stored into respective offset coordinates records.

7.4.2.1.8.1.2 Offset Coordinates Record

Offset coordinates records are created as many as enough to accommodate the number of name characters depending on the grouping flag setting.

name [Offset Coordinates Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	1	I	X-coordinate Offset	(1)	a
2	1	1	I	Y-coordinate Offset	(2)	a

(1) X-coordinate Offset

This field describes the offset of the X coordinate of the particular character from the X coordinate of its just preceding character. For the foremost character, the offset is from the indicated point to its X coordinate.

(2) Y-coordinate Offset

This field describes the offset of the Y coordinate of the particular character from the Y coordinate of its just preceding character. For the foremost character, the offset is from the indicated point to its Y coordinate.

X-coordinate and Y-coordinate offsets are obtained by dividing each offset value on the corresponding coordinate within a parcel by two to the nth power (n is a multiplication constant). The range of the obtained value is from -128 to 127.

The indicated point information and offset coordinates records shall designate string positions, based on the maximum scale factor of display level.

7.4.2.1.8.1.3 Offset Rotation Information Record

The number of the offset rotation information records are the same as the number of the offset coordinate records specified by the group specification flag.

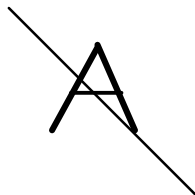
No.	bit	Description			
1	15 to 13	(RESERVED)			
2	12	Rotation Reference (1)	bit12	Meaning	
			0	Represents a fixed angle for display on the screen.	
			1	Represents a relative angle to map on the screen.	
3	11 to 10	Character Display Orientation (2)	bit11	bit10	Meaning
			0	0	Characters are always displayed, normal to the screen.
			0	1	Characters are displayed, vertical to the display angle.
			1	0	Characters are display, parallel with the display angle.
4	9	Group String Rotation Mode (3)	Bit9	Meaning	
			0	Rotation on a group string basis is not performed.	
			1	Rotation on a group string basis is performed.	
5	8 to 0	Display Angle (4)			

(1) Rotation Angle

In the case of map rotation, for example, heading-up, specify whether to wish to change the character display angle, according to its rotation. When "0" is specified, characters are displayed at a fixed angle relative to the north top of the map. When "1" is specified, characters rotate, according to the angle of rotation of the map.

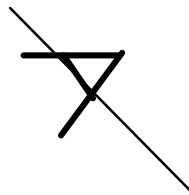
(2) Character Display Orientation

Specify how characters are displayed in orientation to the specified display angle. When both bit 11 and bit 10 are "0," characters are displayed, normal to the screen. When bit 11 is "0" and bit 10 is "0," characters are displayed so that they are oriented vertically to the specified display angle. When bit 11 is "1" and bit 10 is "0," characters are displayed so that they are oriented in parallel with the specified displayed angle.



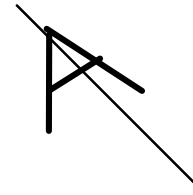
Display angle

- (i) Both bits 11 and 10 are "0"
Characters are always normal to the screen.



Display angle

- (ii) Bit 11 is "0" and bit 10 is "1"
Characters are vertical to the display angle.



Display angle

- (iii) Bit 11 is "1" and bit 10 is "0"
Characters are parallel with the display angle.

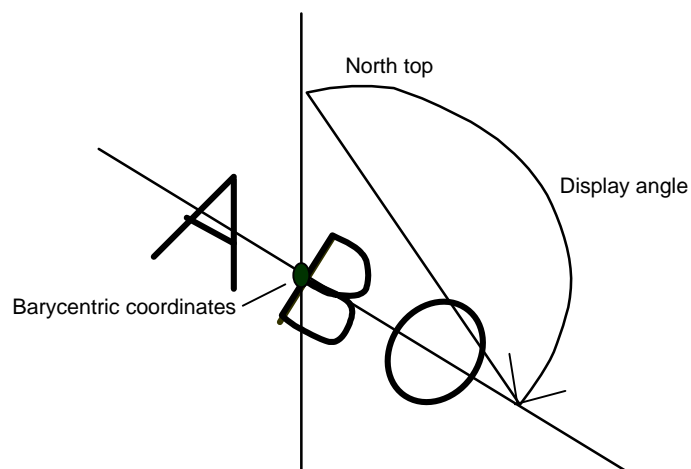
(3) Group String Rotation Mode

Specify whether to rotate characters on a group string basis, according to the display angle. When "1" is specified, the rotation on a group string basis is performed. When "0" is specified, the rotation on a group string basis is not performed. If the rotation on a group string basis is specified, a group string is displayed after rotating, according to the setting of the above character display orientation. Otherwise, the group string is displayed after its constituent characters rotate, according to the string orientation specified in attribute 1 and the setting of the above character display orientation.

When the specified character does not belong to a group string (i.e., a single character), set 1 (bit 9) for the group string rotation mode.

(4) Display Angle

With the north top being 0 degree, an angle of string displayed to the north top is expressed clockwise between 0 and 359 degrees in steps of 1 degree.



For example, if a simple horizontal string is written upright from bottom to top, the angle will be 0 degree. If the string is written upright from top to bottom, the angle will be 180 degrees. If a simple vertical string is written upright from top to bottom, the angle will be 0. If the vertical string is written upright from bottom to top, the angle will be 180 degrees.

7.4.2.1.8.1.4 Offset Height Information Record

name [Offset Height Information Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	N:I	Number of Consecutive Characters + Altitude Offset	(1)	a

(1) Number of Consecutive Characters + Altitude Offset

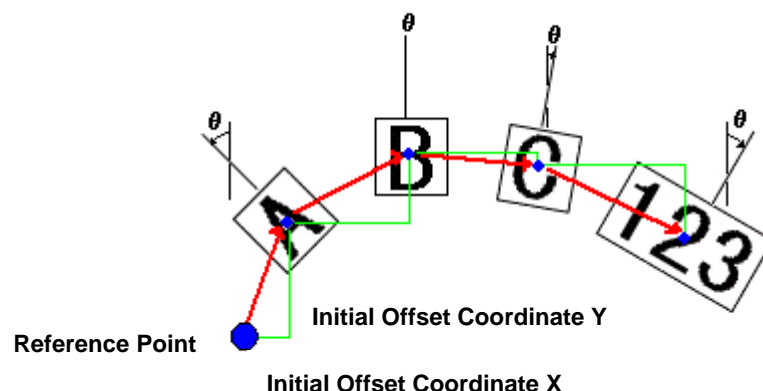
No.	bit	Description
1	15 to 11	Number of Consecutive Characters (2)
2	10 to 0	Altitude Offset (3)

(2) Number of Consecutive Characters

This field describes the number of characters with same altitude information, sequenced from the foremost character. A total of the consecutive characters equals the number of characters that constitute one name data record. The value range is from 1 to 31.

(3) Altitude Offset

This field describes the offset of the altitude value of the particular character from the altitude value of its just preceding character. For the foremost character, the offset is from the altitude data of the indicated point to its altitude value. The altitude offset is expressed in the range is from -1024 to +1023. The units are meters.



7.4.2.1.9 Additional Background Information Pointer

This pointer exists only when the additional background information flag indicates the presence of such information.

This pointer does not exist if there is no additional background information.

7.4.2.1.9.1 Additional Background Information Offset (When the Additional Background Information Type is to be Contained in Additional Data Frame A or B)

The additional background information offset points to the storage position of additional data associated with the name data record.

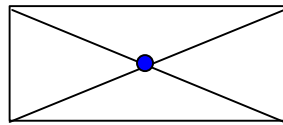
This field represents the displacement of the beginning of the appropriate particular data management record from the beginning of additional data frame A or B.

name [Additional Background Information Offset]

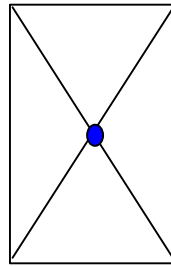
No.	offset	Data length	Data format	Item name	Remarks	Classification
1	0	4	D	Additional Background Information Offset		a

7.4.3 Explanation of Name Data

7.4.3.1 When String Type is Barycentric String



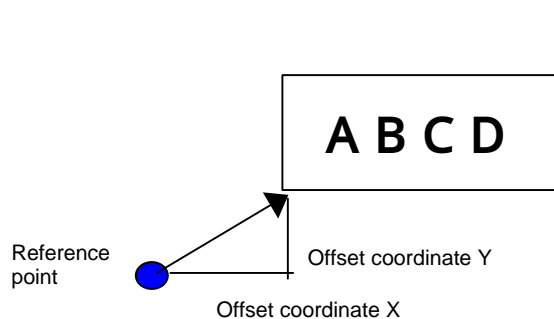
(i) Simple horizontal string



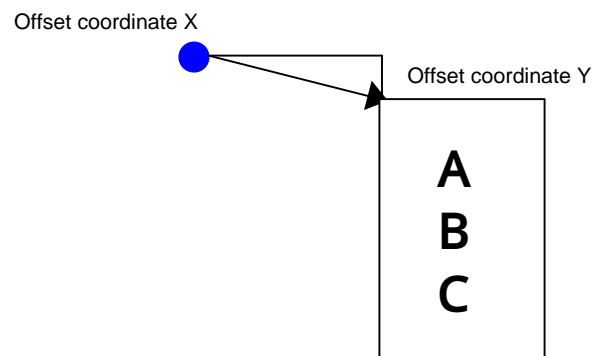
(ii) Simple vertical string

String is displayed by specifying the barycentric coordinates.

7.4.3.2 When String Type is Point-indicating String



(i) Simple horizontal string

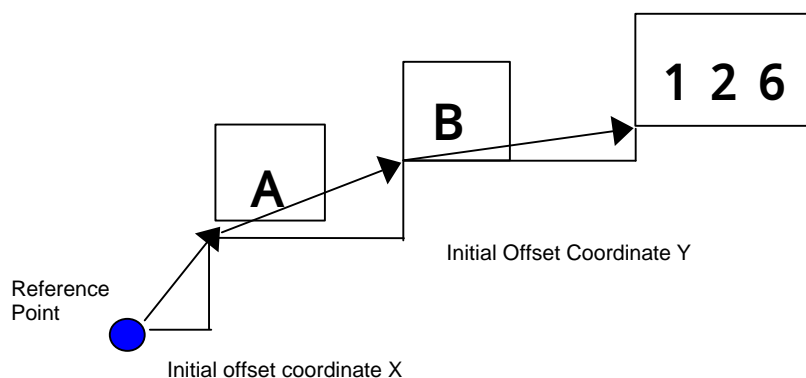


(ii) Simple vertical string

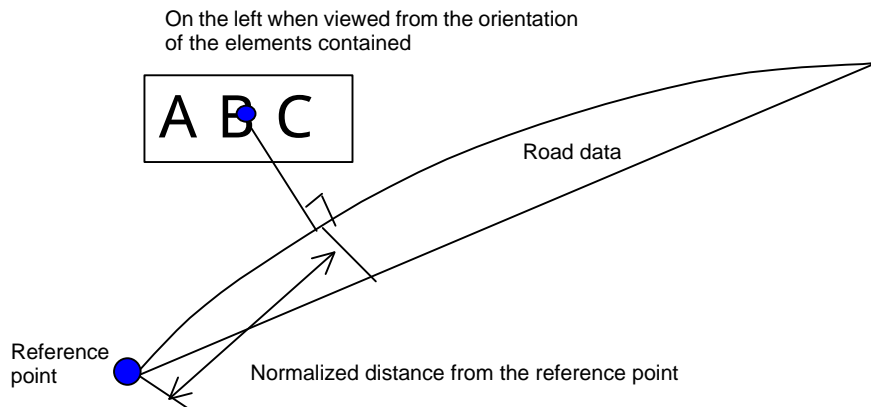
String is displayed at a point determined by the offset coordinates, apart from the reference point.

7.4.3.3 When String Type is Linear-placed String Type A

This is an extended type of the point-indicating string. For each character group (may consist of one character), its position can be designated by offset coordinates.

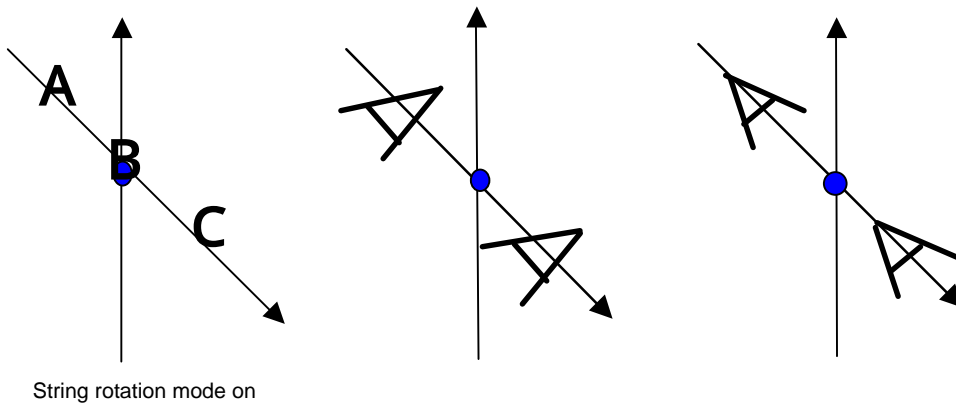


7.4.3.4 When Character Type is Linear-placed String Type B



The linear-placed string **Type B** indicates position and orientation in which string should be displayed to the object such as linked road data or background data (on the right or left of the object or across the object).

7.4.3.5 When String Type is Linear-placed String Type C



(1) Upright characters

(2) Vertical characters

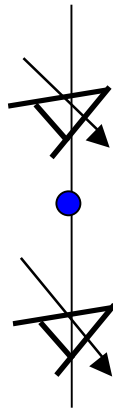
(3) Horizontal characters



String rotation mode off, simple horizontal string specified

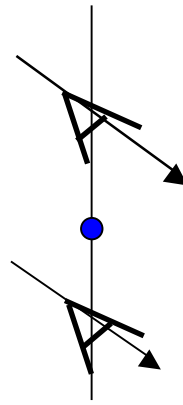
(4) Vertical characters

(5) Horizontal characters



String rotation mode off, simple vertical characters specified

(6) Vertical characters

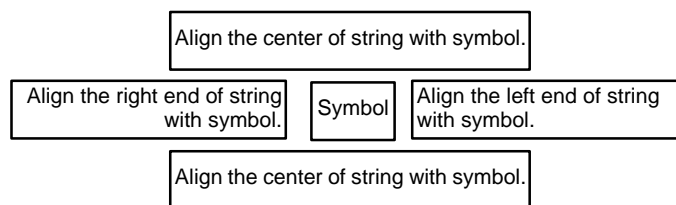


(7) Horizontal characters

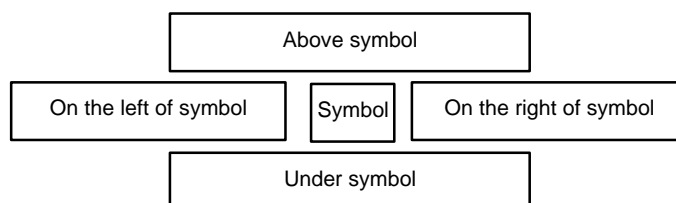
Around the barycentric coordinates, a display angle can be specified on a string-by-string or character-by-character basis or in combination of character and string.

7.4.3.6 When String Type is Symbol + String

(1) String Alignment Position

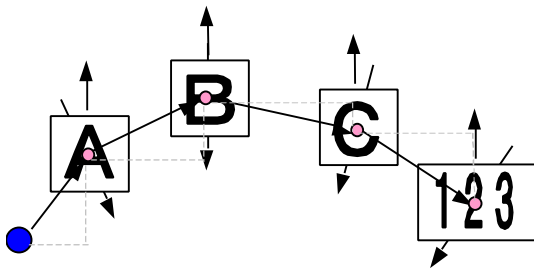


(2) String Placement Position

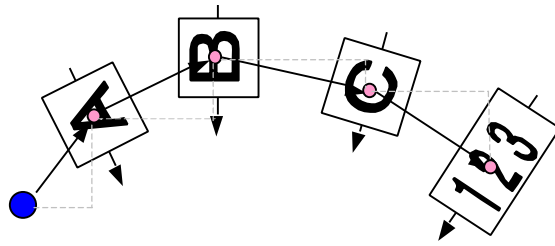


7.4.3.7 String Data Record (When String Type is Linear-placed String Type D)

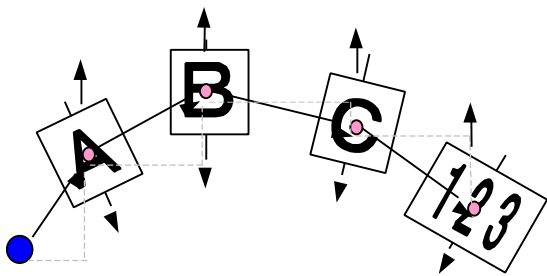
String Rotation Mode ON



(1) Upright Characters

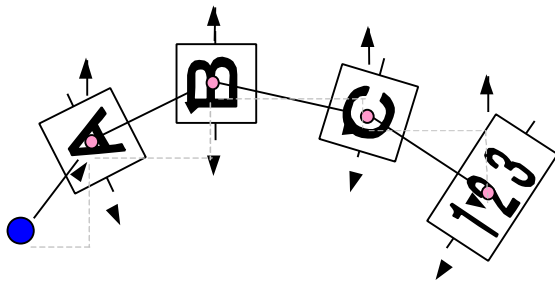


(2) Vertical Characters

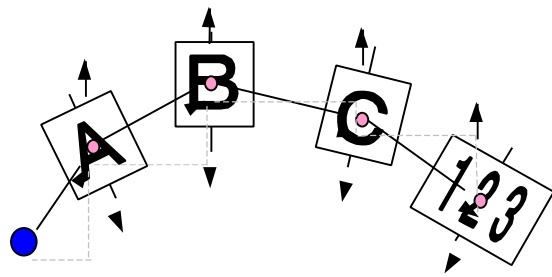


(3) Horizontal Characters

String rotation mode OFF, simple horizontal string specified



(4) Vertical Characters



(5) Horizontal Characters

The position of a character group (or a single character) can be specified by the offset coordinates referring to the previous character group. Also, around the barycentric coordinates, a display angle can be specified on a character group basis.

