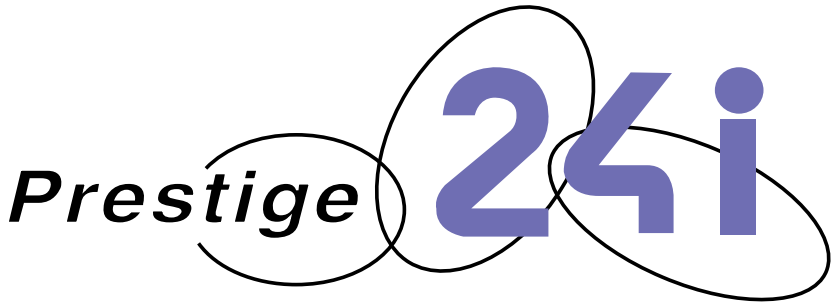
Automated Clinical Analyzer



Bi-directional Communication Specifications

Version 1.09

TOKYO BOEKI LTD.

TOKYO BOEKI MEDICAL SYSTEM LTD.

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1. Preface

Bi-directional communication between Prestige 24i (Prestige) and the host computer (Host) is specified here.

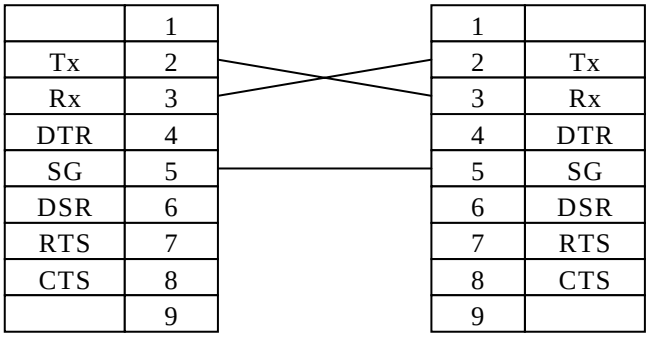
Bi-directional communication is based on ASTM1381-91 and ASTM1394-91.

The specifications may change without notice.

2. Connection Condition

Prestige uses the cross cable of RS-232C for connection to Host.
The connector of Prestige side is D-SUB (9 pins).

Assignment of pins



	1	1	
Tx	2	2	Tx
Rx	3	3	Rx
DTR	4	4	DTR
SG	5	5	SG
DSR	6	6	DSR
RTS	7	7	RTS
CTS	8	8	CTS
	9	9	

No.	Setting items	Available setting value
1	Transmission speed	1200 bps 2400 bps 9600 bps (default) 14400 bps 19200 bps
2	Parity	None (default) Odd Even
3	Data bits	7 8 (default)
4	Stop bits	1 (default) 2

3. Protocol of Data Link Layer

The protocol of data link layer is defined by ASTM 1381-91.

The protocol of data link layer uses the following transmission control codes.

No.	Transmission control code name	Transmission control code	Explanation
1	<STX>	2(02h)	Code to show the beginning of text.
2	<ETB>	23(17h)	Code to show the interruption of text. When the text to be transmitted is too large, the text is split into multiple frames, using <ETB>.
3	<ETX>	3(03h)	Code to show the end of text.
4	<CR>	13(0Dh)	Carriage return
5	<LF>	10(0Ah)	Line feed code
6	<ENQ>	5(05h)	Enquiry
7	<ACK>	6(06h)	Acknowledge
8	<NAK>	21(15h)	Not acknowledge
9	<EOT>	4(04h)	End of transmission
10	[FN]	-	Frame number ASCII numbers from 0 to 7. The first frame begins with 1.
11	[C1][C2]	-	Checksum

3.1. Frame

```
<STX>[FN][TEXT]<ETB>[C1][C2]<CR><LF>      Intermediate frame
<STX>[FN][TEXT]<ETX>[C1][C2]<CR><LF>      Termination frame
```

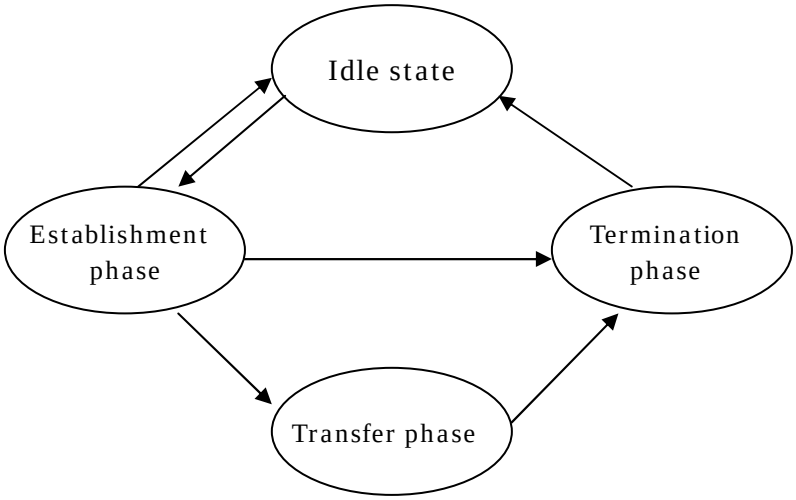
```
[STX]3O|1|010402180001||^^^1^T-BIL^0・・・¥^^^18^CPK^0¥^^^19[ETB]2F[CR][LF]
[STX]4^AMY^0|R||||||||||Serum||||||||||F[CR][ETX]35[CR][LF]
```

[TEXT] is the text data to be transmitted.
In Prestige, [TEXT] corresponds to the record (ASTM 1394-91).
240 characters are the maximum in [TEXT]. (240 octets)
The text, which exceeds 240 octets, uses multiple frames, using <ETB>.

Checksum is the least 8 bits of the value, that is gotten when the sum of character codes from [FN] to <ETB>, <ETX>. (Modulo 256).
[C1] and [C2] are ASCII alphanumeric hexadecimal notations of the upper 4 bits and the lower 4 bits of checksum, respectively.

3.2. Transition of States

There are the following four states in data link layer.



3.2.1. Idle State

The idle state is the state that transmission is not performed between Prestige and Host.

3.2.2. Establishment Phase

The establishment phase determines the direction of information flow.

The system with information to send transmits the <ENQ>, after transforming the state into the establishment phase.

1) A reply of <ACK>

The system that received <ENQ> transmits <ACK>, if it is ready to receive information.

The state is transformed from the establishment phase to the transfer phase.

Sender	Direction of information flow	Receiver
<ENQ>	→	
	←	<ACK>

2) A replay of <NAK>

The system that received <ENQ> transmits <NAK>, if it cannot immediately receive information.

The system, which received a reply of <NAK> to its transmitted <ENQ>, transmits <ENQ> again after 10 seconds.

In case that the system received a reply of <NAK> six times successively, the state is transformed into the termination phase.

Sender	Direction of information flow	Receiver	
<ENQ>	→		The first transmission
	←	<NAK>	
WAIT for 10 sec.			
<ENQ>	→		
	←	<NAK>	
:		:	
<ENQ>	→		The sixth transmission
	←	<NAK>	
<EOT>	→		

3) No response/response delay

In case that there is no response within 15 seconds after transmitting of <ENQ>, the state is transformed into the termination phase.

Sender	Direction of information flow	Receiver
<ENQ>	→	
		No response for 15 sec.
<EOT>	→	

4) Contention of <ENQ>

When both systems simultaneously transmit <ENQ>, Prestige has priority.

In case that Prestige received a reply of <ENQ> to its transmitted <ENQ>, it interprets that the data link is in contention, and transmits <ENQ> again after waiting for one second.

Upon receiving a reply of <ENQ> to its transmitted <ENQ>, Host waits for a replay of <ENQ> from Prestige.

Sender	Direction of information flow	Receiver
<ENQ>	→←	<ENQ>
WAIT for one sec.		
<ENQ>	→	
	←	<ACK>

5) Defective response

Upon receiving a code except <ACK>, <NAK>, <EOT> and <ENQ>, the state is transformed into the termination phase.

Sender	Direction of information flow	Receiver
<ENQ>	→	
	←	Data
<EOT>	→	

3.2.3 Transfer Phase

The transfer phase transmits the data from the sender to the receiver.
The data are transmitted in frames.

1) Data delay/no response to the transfer phase

In case that the first data are not transferred within 20 seconds after transformed into the transfer phase, the state is transformed into the termination phase.

Sender	Direction of information flow	Receiver
<ENQ>	→	
	←	<ACK>
		WAIT for 20 sec.
	←	<EOT>

2) A replay of <ACK>

Upon receiving the data adequately, the system replies with <ACK>.

Sender	Direction of information flow	Receiver
<ENQ>	→	
	←	<ACK>
Data	→	
	←	<ACK>

3) A replay of <NAK>

Upon not receiving the data adequately, the system replies with <NAK>.
In case of receiving a reply of <NAK> to its transmitted data, the system re-transmits the same data (frames).

The sender transmits the same frame six times.
In case of receiving a reply of <NAK> to its sixth transmitted data, the sender transforms the state into the termination phase.

Sender	Direction of information flow	Receiver	
<ENQ>	→		
	←	<ACK>	
Data	→		The first transmission
	←	<NAK>	
WAIT for 10 sec.		:	
Data	→		The sixth transmission
	←	<NAK>	
<EOT>	→		

The conditions that Prestige replies with <NAK> are as follows.

No.	Condition of a reply of <NAK>	Explanation
1	Error signal	Parity error, frame error, port overrun, etc.
2	Checksum discord	In case that the values of frame checksums, [C1] and [C2], are in discord.
3	Defective frame number	The frame except 0 – 7, the smaller frame number than the number received before, and so on.
4	Frame length over	The frame exceeds the maximum length.

4) No response/ response delay

In case of receiving no response within 15 seconds after the sender transmitted the data, the state is transformed into the termination phase.

Sender	Direction of information flow	Receiver
<ENQ>	→	
	←	<ACK>
Data	→	
		No response for 15 sec.
<EOT>	→	

5) Defective response

Upon receiving a replay except <ACK>, <NAK> and <EOT> to the transmitted data, the system re-transmits the same frame.

The system transmits the same frame six times, and then transforms the state into the termination phase.

Sender	Direction of information flow	Receiver	
<ENQ>	→		
	←	<ACK>	
Data	→		The first transmission
	←	Defective response	
:		:	
Data	→		The sixth transmission
	←	Defective response	
<EOT>	→		

3.2.4 Termination Phase

Transmitting <EOT>, the system transforms the state into the idle state.

4. Record

The records are defined by ASTM1394-91.
The records supported by Prestige are as follows.

No.	Record ID	Record
1	H	Message Header Record
2	P	Patient Information Record
3	O	Measurement Order Record
4	Q	Enquiry Record
5	C	Comment Record
6	R	Measurement Result Record
7	L	Message Terminator Record

Any record except the above is ignored.

To clear the extensive data, a hierarchical structure is adopted for the message.

The relationship between the hierarchical level supported by Prestige and the hierarchical level of record is as follows.

	level 0	level 1	level 2	level 3	level 4
Message Header Record (H)	*	--	--	--	--
Patient Information Record (P)	--	*	--	--	--
Measurement Order Record (O)	--	--	*	--	--
Enquiry Record (Q)	--	*	--	--	--
Comment Record (C)	--	*	*	*	*
Measurement Result Record (R)	--	--	--	*	--
Message Terminator Record (L)	*	--	--	--	--

* Level supported
-- Level not supported

4.1. Delimiter

The setting of the delimiter used by the record that is transmitted from Prestige can be changed.

The delimiters at initialization are as follows.

No.	Delimiter	Explanation
1	|	**Field Delimiter** Used to partition a field from a field.
2	¥	**Repeat Delimiter** Used to repeat to define a particular field. For Prestige, it cannot be used without any notice.
3	^	**Component Delimiter** Used to partition a component in the field.
4	&	**Escape Delimiter** Used within text fields to signify certain special characteristics of portions. For Prestige, the following escape characters can be used. "&F&" : The same character as the field delimiter "&S&" : The same character as the component delimiter "&R&" : The same character as the repeat delimiter "&E&" : The same character as the escape delimiter The escape characters except the above are deleted.

To terminate the record, <CR> (13(ODh) in ASCII code) is used.

4.2. Usable Character Code

The character codes, 20h – 7Eh and 80h – FFh, can be used in the records.

When the records includ the character codes that cannot be shown, they are likely to disturb the screen of Prestige

In case that the records includ the same codes as the codes defined for the delimiters, use the escape characters.

For Prestige, the fields in which the escape characters can be used are settled.
The fields in which the escape characters can be used are as follows.

No.	Field name	Notes
1	Patient name (Family name, First name)	Patient Information Record
2	Doctor in charge	Patient Information Record
3	Patient ID	Patient Information Record
4	Sample ID	Measurement Order Record
5	Comment Text	Comment Record

4.3. The Maximum Length of Record

The maximum length of record is a record that includes 1024 characters (1024 octets).

The escape characters are counted for the characters after escape.
(For example, “&F&” is counted as three characters.)

4.4. The Record to be transmitted from Prestige to Host

In this chapter, the definition for each record to be transmitted from Prestige to Host is explained.
In the field of each record, the necessity of transmission means as follows.

No.	Necessity of transmission	Explanation
1	Indispensable	It is always needed to set. It is dealt as an invalid record, if this setting is omitted.
2	Optional	Set when needed. Refer to the explanation of each message.
3	Not supported	Set blank. When the value is set, Prestige ignores it.

Refer to Appendix B of the specifications for the maximum length of each field.

4.4.1. Message Header Record (From Prestige to Host)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	“H”	Indispensable
2	Delimiter definition	Prestige initial values are as follows. Field delimiter | Repeat delimiter ¥ Component delimiter ^ Escape delimiter &	Indispensable （Setting is possible.）
5	Sender ID		Indispensable
	Sender’s name	Prestige 24i	Indispensable
	System ID	The fixed system ID is set.	Indispensable （Setting is possible.）
10	Receiver ID		Indispensable
	Receiver’s name	The fixed system name is set.	Indispensable （Setting is possible.）
	System ID	The fixed system ID is set.	Indispensable （Setting is possible.）
12	Process ID	“P” : Production	Indispensable
13	Version No.	“1”	Indispensable
14	Date & time of message	The date when this record is generated is set.	Indispensable

Example of transmission

```
H|¥^&|||Prestige24i^System1|||||Host^PC1||P|1|20000530192631<CR>
```

4.4.2. Patient Information Record (From Prestige to Host)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	The character to discriminate this record “P”	Indispensable
2	Sequence No.	Sequence No. of patient information record	Indispensable
3	Patient ID	ID that doctor in charge put to identify the patient	Optional
6	Patient’s name	Patient’s name	Optional
	Family name	Patient’s family name	Optional
	First name	Patient’s first name	Optional
8	Date of birth	Date of birth In the form of “YYYYMMDD”	Optional
9	Sex	“M” : Male “F” : Female “U” : Unknown	Optional
14	Doctor in charge	It is impossible to partition the name by component.	Optional

When the patient information is in Prestige, the optional items of patient information record are set.

Example of transmission in case there is no patient information in Prestige

```
P|1<CR>
```

Example of transmission in case there is any patient information in Prestige

```
P|1|1234|||Yamada^Hanako||19710322|M|||||Junichiro Koizumi<CR>
```

4.4.3. Measurement Order Record (From Prestige to Host)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	"O"	Indispensable
2	Sequence No.	Sequence number of measurement order record	Indispensable
3	Sample ID	Barcode value or sample ID transmitted from Host is set.	Indispensable
4	System sample ID		Indispensable
	Sample tag	Blank is set.	Not supported
	Sample round No.	Sample round number is set.	Indispensable
	Sample position	Sample positions are set. In case of STAT sample positions, "E1" – "E50" are set. In case of control sample positions,"C1" – "C66" are set.	Indispensable
5	Test item ID	When there are multiple test items, the repeat delimiters are used.	Indispensable
	Test ID	Blank is set.	Not supported
	Test name	Blank is set.	Not supported
	Test type		Not supported
	Test item No.	Test item number	Indispensable
	Test item name	Test item name	Indispensable
	Dilution rate	"0" : No dilution (default) "1" : 1 : 6 "7 " : 1 : 60 "2" : 1 : 10 "8" : 1 : 70 "3" : 1 : 20 "9" : 1 : 80 "4" : 1 : 30 "10" : 1 : 90 "5" : 1 : 40 "11" : 1 : 100 "6" : 1 : 50 Prestige always sets one of the above mentioned dilution rates.	Optional
6	Priority	"S" : STAT "R" : Routine Prestige always sets either of the above.	Optional
12	Action code	"Q" : A sample which is used for QC. In case of patient or STAT sample test results transfer, Blank is set.	Optional
16	Sample information (Sample kind)	"Serum" : Serum "Urine" :Urine "Plasma" :Plasma "CSF" : Marrow fluid "Dialysis" : Dialysis fluid "Other" :Other	Indispensable
26	Report form	"F" : Final result In case of transmission of measurement result. In case an error occurred during measurement. "X" : No result obtained, or order cancelled In case of rejecting of measurement order message from Host.	Indispensable

Example of transmission

```
O|1|12345|^2^12|^^^1^GOT^0|R|||||||||Serum|||||||||F<CR>
```

Example of transmission in case there are multiple measurement items

```
O|1|12345|^2^12|^^^1^GOT^0¥^^^2^GPT^1¥^^^3^ALP^0|R|||||||||Serum||||||||
|F<CR>
```

4.4.4. Enquiry Record (From Prestige to Host)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	"Q"	Indispensable
2	Sequence No.	Sequence number of enquiry record	Indispensable
3	Start range ID	"ALL"	Indispensable
5	Test item ID	"ALL"	Indispensable
13	Condition code	"O": Order of measurement and of patient information only	Indispensable

Example of transmission

```
Q|1|ALL||ALL|||||||O<CR>
```

4.4.5. Comment Record (From Prestige to Host)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	"C"	Indispensable
2	Sequence No.	Sequence number of comment record	Indispensable
3	Comment source	"I" : Clinical inspection system	Indispensable
4	Comment text	Measurement result comment by operator and error codes by system errors are set. In case that there are multiple error causes, error codes are set in the form of separated by ", ". Refer to the error code list in Appendix A.	Indispensable
5	Comment type	"G" : General test comment Comment of operator for measurement result "I" : System flag comment Error code for no result because of system error	Indispensable

Example of transmission

```
C|1|I|R1,S|I<CR>
```

4.4.6. Measurement Result Record (From Prestige to Host)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	"R"	Indispensable
2	Sequence No.	Sequence number of measurement result record	Indispensable
3	Test item ID		Indispensable
	Test ID		Not supported
	Test name		Not supported
	Test type		Not supported
	Test item No.	Test item number	Indispensable
	Test item name	Test item name	Indispensable
	Dilution rate	"0" : No dilution (default) "1" : 1 : 6 "7 " : 1 : 60 "2" : 1 : 10 "8" : 1 : 70 "3" : 1 : 20 "9" : 1 : 80 "4" : 1 : 30 "10" : 1 : 90 "5" : 1 : 40 "11" : 1 : 100 "6" : 1 : 50	Indispensable
4	Measurement value	Measurement value is written by ASCII text. In case the condition of result is "X" or "I", blank is set.	Indispensable
5	Unit	In case unit is registered in Prestige, it is set.	Optional
6	Reference range	In the form of "the lower limit to the higher limit" In case that sex is "U" (unknown) or is omitted in patient information record, reference range for man is set. This is set when normal range is registered in Prestige.	Optional
7	Abnormal result flag	"L" : lower than the lower limit. "H" : higher than the higher limit. "N" : normal In case of measurement failure, "N"is set, too.	Indispensable
9	Condition of result	"F" : final result Measurement result is transmitted. "I" : in instrument, result pending This test item is for automatic re-measurement and in the waiting state for measurement, or is in the measurement waiting state when STAT is cutting in. （No measurement value） As measurement is completed, this is retransmitted as the final result of "F". "P" : preliminary result When measurement ended in failure, it is set. （With a measurement value.） "X" : No result When measurement ended in failure, it is set. （No measurement value） The cause of failure (error code) is set to the comment record, following to this record.	Indispensable
13	Date & time of ending of test	Date and time when measurement was over. （In the form of YYYYMMDDHHMMSS）	Indispensable

Example of transmission when measurement succeeded

```
R|1|^^^1^GOT^0|54.5143|IU/L|8 TO 38|H||F||||20010618145805<CR>
```

Example of transmission when measurement failed

```
R|1|^^^1^GOT^0||IU/L|8 TO 38|N||X||||20010618145805<CR>
```

4.4.7. Message Terminator Record (From Prestige to Host)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	The character to discriminate this record "L"	Indispensable
2	Sequence No.	Sequence number of message terminator record	Indispensable
3	Termination code	"N" : normal termination	Indispensable

Example of transmission

```
L|1|N<CR>
```

NOTE: Transmission at Automatic Remeasurement

The result data will be transmitted twice: at the time when all the results of the ordinary measurement are assembled and at the time when all the results of the automatic remeasurement are assembled.

Transmission at STAT

STAT sample will cut in between the items of the sample measurement.
The result data will be transmited twice: at the time when all the item measurement results are assembled before STAT sample cuts in and at the time when all the measurement results are assembled after STAT sample has cut in.

4.5. The Record to be transmitted from Host to Prestige

4.5.1. Message Header Record (From Host to Prestige)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	The character to discriminate this record “H”: The field with only one character, H	Indispensable
2	Delimiter definition	Prestige initial values are as follows. Field delimiter | Repeat delimiter ¥ Component delimiter ^ Escape delimiter &	Indispensable
5	Sender ID		Indispensable
	Sender’s name	The name of Host is set.	Indispensable
	System ID	System ID of Host is set.	Indispensable
10	Receiver ID		Indispensable
	Receiver’s name	Prestige24i	Indispensable
	System ID	System ID of Prestige is set.	Indispensable
12	Process ID	“P” : Production	Indispensable
13	Version number	“1”	Indispensable
14	Date & time of message	The date and time that the message was generated. In the form of YYYYMMDDHHMMSS. （year/month/day/hour/min./sec.）	Indispensable

There is no discrimination between capital letters and small letters in Sender ID and Receiver ID.

Example of transmission

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
```

4.5.2. Patient Information Record (From Host to Prestige)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	The character to discriminate this record “P”	Indispensable
2	Sequence No.	Sequence number of patient information record	Indispensable
3	Patient ID	ID that doctor in charge put to identify the patient.	Optional
6	Patient’s name	Patient’s name	Optional
	Family name	Patient’s family name	Optional
	First name	Patient’s first name	Optional
8	Date of birth	Date of birth In the form of “YYYYMMDD”	Optional
9	Sex	“M” : Male “F” : Female “U” : Unknown	Optional
14	Doctor in charge	It is impossible to partition the name with component. In case it is partitioned with component, the first component is used.	Optional

In case there is no patient information to transmit, leave the optional item blank.

In case the patient ID is blank, other optional items are ignored.

In case there is no patient information to transmit

```
P|1<CR>
```

In case there is any patient information to transmit

```
P|1|1234|||Yamada^Taro||19710322|U|||||Junichiro Koizumi<CR>
```

4.5.3. Measurement Order Record (From Host to Prestige)

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	"O"	Indispensable
2	Sequence No.	Sequence number of measurement order record	Indispensable
3	Sample ID	Sample ID managed by barcode value or Host	Indispensable
4	System sample ID	In case that sample application mode is position mode, be sure to set it. In case that sample application mode is ID mode, set blank.（Even if value is set, it is ignored.）	Indispensable
	Sample tag		Not supported
	Sample round No.	Set sample round number. You can ignore zero "0" and "space" to put close.	Indispensable
	Sample position	Set sample positions. STAT sample positions, "E1" – "E50" and control sample positions, "C1" - "C66" can be set. You can ignore zero "O" and "space" to put close.	Indispensable
5	Test item ID	Either test item number or test item name can be used to designate. If both are used, they have to designate the same test item. In case that there are multiple test items, designate items as one order record using repeat delimiter.	Indispensable
	Test ID		Not supported
	Test name		Not supported
	Test type		Not supported
	Test item No.	Set test item number. (Note 2)	Indispensable
	Test item name	Set test item name. (Note 2)	Indispensable
	Dilution rate	"0" : No dilution (default) "1" : 1 : 6 "7 " : 1 : 60 "2" : 1 : 10 "8" : 1 : 70 "3" : 1 : 20 "9" : 1 : 80 "4" : 1 : 30 "10" : 1 : 90 "5" : 1 : 40 "11" : 1 : 100 "6" : 1 : 50	Optional
6	Priority	"R" : routine (default) "S" : STAT	Optional
12	Action code	"C" : Measurement order is cancelled. Measurement order that was transmitted to Prestige before is cancelled. Test order of patient, STAT and control samples can be cancelled. But measurement order that can be cancelled is only for samples before measurement. "N" : New measurement order (default) Set this code when test orders of patient and STAT samples are transmitted. (Note 1) "A" : Additional test item Add test items to the test order, which is already registered. (Note 1) "Q" : Quality Control sample Transferring control sample test order, set this code.	Optional
16	Sample information (sample kinds)	"Serum" :Serum "Urine" :Urine "Plasma" :Plasma "CSF" : Marrow fluid "Dialysis" : Dialysis fluid "Other" :Other In this item, there is no discrimination between capital letters and small letters. Also, space cannot be used to fill digit.	Indispensable
26	Report form	"O" : Measurement order	Indispensable

Note 1: The difference between “N” and “A” action codes.
For the new test order, both “N” and “A” can be registered as action code.
But for the registered test order, the difference is the following.

A) Action code “N”
Test order is over written by the transferred test order from host.
If designated sample is under testing or already tested, Prestige returns test order refusal response to host.
Please use action code “N” for the host system, which transfers test orders of already transferred, as the response of Prestige inquiry message.

B) Action code “A”
If the test item transferred from host is the new test item, the test item is additionally registered.
If the test item is already registered, the test item is overwritten.
If designated sample is under testing, test refusal response is transffered to host.
If already tested, it is registered as a rerun test item.

Note 2: Test item number and test item name.
Either item number or item name can be omitted. If both number and name are registered, these should be consistent.

As test item number and item name are set or modified by each laboratory, they are not defined in the specifications. Host system should have compatible item number and item name list registered in Prestige. Please get the list from the person in the laboratory.

Example of transmission in case that sample application mode is “Sample ID mode”

```
O|1|12345||^^^78^Na^0|R|||||||||Serum|||||||||O<CR>
```

Example of transmission in case that sample application mode is “Position mode”

```
O|1|12345|^1^10|^^^78^Na^0|R|||||||||Serum|||||||||O<CR>
```

Example of discrimination of test item
(The following three records mean the same meaning.)

```
O|1|12345||^^^22^^0|R|||||||||Serum|||||||||O<CR>
O|1|12345||^^^^PTT^0|R|||||||||Serum|||||||||O<CR>
O|1|12345||^^^22^PTT^0|R|||||||||Serum|||||||||O<CR>
```

The following record is null in case that the test item name of test item No. 78 is “Na”.

```
O|1|12345||^^^40^Na^0|R|||||||||Serum|||||||||O<CR>
```

4.5.4. Enquiry Record (From Host to Prestige)

In case that Host rejects an enquiry from Prestige, this record is transmitted.
If the condition code of the enquiry record is not “X”, this record is ignored.

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	“Q”	Indispensable
2	Sequence No.	Sequence number of enquiry record	Indispensable
3	Start range ID	“ALL”	Indispensable
5	Test item ID	“ALL”	Indispensable
13	Condition code	“X” : Can get no result. The order is cancelled.	Indispensable

Example of transmission in case of rejecting an enquiry from Prestige

Q|1|ALL||ALL||||||||X<CR>

4.5.5. Comment Record (From Host to Prestige)

Prestige ignores the comment record from Host.

Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	"C"	Indispensable
2	Sequence No.	Sequence number of the comment record	Indispensable
3	Comment source	"L" : computer system	Indispensable
4	Comment text	No limit is given. But do not exceed the maximum length.	Indispensable
5	Comment type	Select the most suitable one out of the followings. "G" : General test comment "T" : Text name comment "P" : Positive test comment "N" : Negative test comment "I" : System flag comment	Indispensable

Example of transmission

```
C|1|L|Not in Service|G<CR>
```

4.5.6. Measurement Result Record (From Host to Prestige)

The measurement result record is not transmitted from Host.
Prestige ignores the measurement result record from Host.

4.5.7. Message Terminator Record (From Host to Prestige)

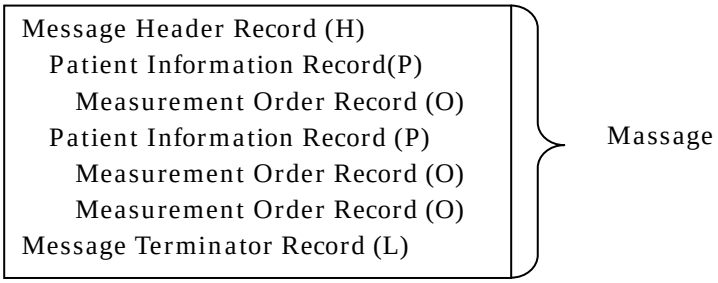
Field No.	Field name	Explanation	Necessity of transmission
1	Record ID	"L"	Indispensable
2	Sequence No.	Sequence number of the message terminator record	Indispensable
3	Termination code	"N"：Normal termination	Indispensable

Example of transmission

```
L|1|N<CR>
```

5. Message

Message is a gathering of records from the message header record to the message terminator record.



5.1. Enquiry Message (From Prestige to Host)

The enquiry message is the message that Prestige inquires of Host about the measurement order.

5.1.1. Transmission Timing

Prestige can send inquiry message by the following 2 cases.

1) Upon pressing the measurement start button of Prestige
   Prestige transmits an inquiry message to host, when measurement button is pressed.

2) When Prestige inquiry button is pressed.
   When an operator presses inquiry button, Prestige sends an inquiry message to host.

NOTE

Do not transmit all the measurement orders every time Prestige inquires.
Except the case of changing the contents of measurement order, you do not have to transmit the measurement order which has been once transmitted.

5.1.2. Record Configuration

Message record configuration

Level	Message record
0	Message Header Record (H)
1	Enquiry Record (Q)
0	Message Terminator Record (L)

Example of transmittion No. 1: Enquiry Message from Prestige (ALL)

```
H|¥^&|||Prestige24i^System1|||||Host^PC1||P|1|20000530192631<CR>
Q|1|ALL||ALL||||||||O<CR>
L|1|N<CR>
```

Example of response No. 1 : in case of designating multiple measurement items with repeat delimiters

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1<CR>
O|1|123456|^1^20|^^^1^GOT^0¥^^^11^LDH^0¥^^^42^Ca^0|R|||||||||Serum|||||||
||O<CR>
L|1|N<CR>
```

Example of response No. 2 : in case of designating measurement items using multiple measurement order records

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1<CR>
O|1|123456|^1^20|^^^1^GOT^0|R|||||||||Serum|||||||||O<CR>
O|2|123456|^1^20|^^^11^LDH^0|R|||||||||Serum|||||||||O<CR>
O|3|123456|^1^20|^^^42^Ca^0|R|||||||||Serum|||||||||O<CR>
L|1|N<CR>
```

NOTE

In this example of transmission, only the first measurement order record is effective. The measurement item of sample ID 123456 is only 1 (GOT).
When requesting measurement items 1 (GOT), 11 (LDH) and 42 (Ca), request them by a single measurement order record using repeat delimiters.

Example of response No. 3 : in case of no measurement order

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
L|1|N<CR>
```

Example of response No. 4 : in case of refusing the enquiry from Prestige

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
Q|1|ALL||ALL||||||||X<CR>
C|1|L|some reason|I<CR>
L|1|N<CR>
```

In case that there is no measurement order to be transmitted to the enquiry from Prestige, transmit either the example of response No. 3 or No. 4.

5.2. Measurement Order Message (From Host to Prestige)

The measurement order message is a message to inform Prestige of measurement items for samples from Host.
In the measurement message, you can register the measurement request and cancel the measurement request.

In case that the sample application mode is “Sample ID mode” (the barcode application mode), you cannot designate a sample round number.
The measurement request that can be used in “Sample ID mode” is only for samples with the present sample round numbers in Prestige.

5.2.1. Transmission Timing

The followings are the timings for Host to transmit the measurement order messages.

1) The response to the enquiry message from Prestige
   Host transmits the measurement request of the sample about which Prestige inquires.

2) A package transmission of measurement request
   Host transmits the measurement request before Prestige inquires.
   Prestige is always able to receive the measurement request from Host.

When Host transmits the measurement request, which has been transmitted to Prestige before, with the same sample ID again, the defferent registration action will be taken depending on the action code of the measurement order record.

The first measurement order

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|<CR>
O|1|1234||^^^1^GOT^0¥^^^2^GPT^0|R||||||N||||Serum||||||||||O<CR>
L|1|N<CR>
```

The second measurement order (In case of action code is “N”)

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|<CR>
O|1|1234||^^^1^GOT^0¥^^^79^K^0|R||||||N||||Serum||||||||||O<CR>
L|1|N<CR>
```

If transmitted under action code “N”, the registration is over written by the second measurement request transmitted.
The measurement items of the sample ID 1234 transmitted first are changed into “GOT”, “K” from “GOT”, “GPT” by the measurement request transmitted for the second time.
But if designated sample is under testing or has already been tested, no registration renewal occures and measurement request is refused.

The second measurement order (In case of action code is “A”)

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|<CR>
O|1|1234||^^^1^GOT^0¥^^^79^K^0|R||||||A||||Serum||||||||||O<CR>
L|1|N<CR>
```

If transmitted under action code “A”, the measurement request of the second transmittion is registered additionally.
The measurement items of the sample ID 1234 transmitted for the first time are changed into “GOT”, “GPT”, “K” from “GOT”, “GPT” by the measurement request transmitted for the second time. (“GOT” is over written, “K” is new registeration.)
If the measurement requested first has finished when second request is transmitted, the second request is registered as the rerun order. The measurement request items, that will be registered as rerun order items, are “GOT” and “K” of the second transmission.
If the measurement request of the first transmission is under testing, the second measurement request is refused.

5.2.2. Record Configuration

Message record configuration

Level	Message record
0	Message Header Record (H)
1	Patient Information Record (P)
2	Measurement Order Record (O)
1	Patient Information Record (P)
2	Measurement Order Record (O)
:	:
0	Message Terminator Record (L)

Example of transmission No. 1 : no patient information

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|<CR>
O|1|1234||^^^1^GOT^0¥^^^2^GPT^0¥^^^3^ALP^0|R|||||||N|||||Serum||||||||||O<CR>
O|2|1235||^^^1^GOT^0|R|||||||N|||||Serum||||||||||O<CR>
O|3|1236||^^^1^GOT^0|R|||||||N|||||Urine||||||||||O<CR>
L|1|N<CR>
```

Example of transmission No. 2 : with patient information

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|123|||Guillen^Carlos||20000101|M<CR>
O|1|1234||^^^1^GOT^0¥^^^2^GPT^0¥^^^3^ALP^0|R|||||||N|||||Serum||||||||||O<CR>
P|2|124|||Martinez^Edgar||19991231|F|||||Ichiro Suzuki<CR>
O|1|1235||^^^1^GOT^0|R|||||||N|||||Serum||||||||||O<CR>
O|2|1236||^^^1^GOT^0|R|||||||N|||||Urine||||||||||O<CR>
L|1|N<CR>
```

Example of transmission No. 3 : the measurement orders not gathered for each patient

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|<CR>
O|1|1234||^^^1^GOT^0¥^^^2^GPT^0¥^^^3^ALP^0|R|||||||N|||||Serum||||||||||O<CR>
P|2|<CR>
O|1|1235||^^^1^GOT^0¥^^^2^GPT^0¥^^^3^ALP^0|R|||||||N|||||Serum||||||||||O<CR>
P|3|123|||Olerud^John||20000101|M<CR>
O|1|1236||^^^1^GOT^0|R|||||||N|||||Serum||||||||||O<CR>
P|4|123|||Olerud^John||20000101|M<CR>
O|1|1237||^^^1^GOT^0|R|||||||N|||||Serum||||||||||O<CR>
P|5|123|||Olerud^John||20000101|M<CR>
O|1|1238||^^^1^GOT^3|R|||||||N|||||Serum||||||||||O<CR>
L|1|N<CR>
```

5.2.3. Cancellation of measurement order

Host can cancel registered measurment request in Prestige.

NOTE
Cancellation of measurement request means to cancel all the measurement items for the sample which measurement request is cancelled.
If sample operation mode is sample ID mode, the sample to be cancelled is to be the sample of the present sample round in Prestige.

When the sample is under measurement or has been completed to measure, the measurement request cannot be cancelled.
If designated sample is not exsisting, measurement request (cancel request) is refused.

Example of transmission No. 1: cancellation of measurement order

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|<CR>
O|1|1234||^^^1^GOT^0¥^^^2^GPT^0|R|||||||C|||||Serum||||||||||O<CR>
L|1|N<CR>
```

5.2.4. Control sample measurement order

It is possible to enter control sample measurement request for the samples at the ordinary positions (1 – 400).
But for the positions C1 – C66, only control sample measurement request is accepted.
If patient sample or STAT sample measurement request is entered for the samples at C1 – C66 positions, an error occurs.

Example of transmittion:

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|<CR>
O|1|QC001|^1^C7|^^^1^GOT^0¥^^^2^GPT^0|R||||||Q||||Serum||||||||||O<CR>
O|2|QC002|^1^C8|^^^1^GOT^0¥^^^2^GPT^0|R||||||Q||||Serum||||||||||O<CR>
O|3|QC003|^1^20|^^^1^GOT^0¥^^^2^GPT^0|R||||||Q||||Serum||||||||||O<CR>
L|1|N<CR>
```

5.2.5. STAT sample measurement request

It is possible to enter STAT sample measurement request for the samples at the ordinary positions (1 – 400).
But for the positions E1 – E50, only STAT sample measurement request is accepted.
If patient sample or control sample measurement request is entered for the samples at E1 – E50 positions, an error occurs.

Example of transmittion:

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
P|1|<CR>
O|1|STAT_001|^1^E1|^^^1^GOT^0¥^^^2^GPT^0|S||||||N||||Serum|||||||||O<CR>
O|2|STAT_002|^1^E2|^^^1^GOT^0¥^^^2^GPT^0|S||||||N||||Serum|||||||||O<CR>
O|3|STAT_003|^1^8|^^^1^GOT^0¥^^^2^GPT^0|S||||||N||||Serum|||||||||O<CR>
L|1|N<CR>
```

5.2.6. Measurement Request Refusal (From Prestige to Host)

Prestige can refuse the measurement request from Host.

The conditions to refuse the measurement request are as follows.

1) In case that the wrong values are included in the measurement order message.
2) In case that the sample to be cancelled is under measurement or has been finished to measure.
3) In case that the sample with the repeated measurement request is under measurement or has been finished to measure.

Example of transmission from Host :

```
H|¥^&|||Host^PC1|||||Prestige24i^System1||P|1|20000530192631<CR>
O|1|SAMPLE_1||^^^1^GOT^0|R||||||N||||Serum||||||||||O<CR>
P|1|<CR>
O|1|SAMPLE_2||^^^1^GOT^0|R||||||N||||Serum||||||||||O<CR>
O|1|SAMPLE_3||^^^1^GOT^0|R||||||N||||Serum||||||||||O<CR>
O|2|SAMPLE_4|^1^C1|^^^1^GOT^0|R||||||N||||Urine||||||||||O<CR>
O|3|SAMPLE_5|^1^C1|^^^1^GOT^0|S||||||Q||||Urine||||||||||O<CR>
O|4|SAMPLE_6|^1^E1|^^^1^GOT^0|R||||||N||||Urine||||||||||O<CR>
O|5|SAMPLE_7|^1^E1|^^^1^GOT^0|S||||||Q||||Urine||||||||||O<CR>
L|1|N<CR>
```

Example of response

```
H|¥^&|||Prestige24i^System1|||||Host^PC1||P|1|20000530192631<CR>
P|1|<CR>
O|1|SAMPLE_1||^^^1^GOT^0|R||||||N||||Serum||||||||||X<CR>
C|1|I|ASTM_9_4_1|I<CR>   … SAMPLE_1 message level abnormal
O|2|SAMPLE_3||^^^1^GOT^0|R||||||N||||Serum||||||||||X<CR>
C|1|I|ASTM_9_4_2|I<CR>   … SAMPLE_3 sequence number abnormal
O|3|SAMPLE_4||^^^1^GOT^0|R||||||N||||Urine||||||||||X<CR>
C|1|I|A3|I<CR>           … SAMPLE_4 sample position abnormal
O|4|SAMPLE_5|^1^C1|^^^1^GOT^0|S||||||Q||||Urine||||||||||X<CR>
C|1|I|A3|I<CR>           … SAMPLE_5 sample position abnormal
O|5|SAMPLE_6|^1^E1|^^^1^GOT^0|R||||||N||||Urine||||||||||X<CR>
C|1|I|A3|I<CR>           … SAMPLE_6 sample position abnormal
O|6|SAMPLE_7|^1^E1|^^^1^GOT^0|S||||||Q||||Urine||||||||||X<CR>
C|1|I|A3|I<CR>           … SAMPLE_7 sample position abnormal
L|1|N<CR>
```

5.3. Measurement Result Message (From Prestige to Host)

The measurement result message is a message to transmit the measurement results of samples.

5.3.1. Transmission Timing

The timing for Prestige to transmit the measurement result message is the followings. Each transmission timing can be changed by setting of measurement result transmission mode.

1) At the time when the measurement of sample is completed
   In case that the measurement result transmission mode is the real-time transmission mode, Prestige transmits the measurement result of the sample at the time when the measurement of the sample is completed.

2) Batch transmission
   The measurement results designated by an operator of Prestige will be transmitted as a package.

5.3.2. Record Configuration

Message record configuration

Level	Message record
0	Message Header Record (H)
1	Patient Information Record (P)
2	Measurement Order Record (O)
3	Measurement Result Record (R)
4	Comment Record (C)
1	Patient Information Record (P)
2	Measurement Order Record (O)
3	Measurement Result Record (R)
:	:
0	Message Terminator Record (L)

Example of transmission

```
H|¥^&|||Prestige24i^System1|||||Host^PC1||P|1|20000530192631<CR>
P|1|<CR>
O|1||^1^30|^^^1^GOT^0¥^^^2^GPT^0¥^^^27^TG^0|R||||||||N||||20000530|Serum||||||||||
|F<CR>
R|1|^^^1^GOT^0|21.5143|IU/L|8 TO 38|N||F||||20010530192515<CR>
R|2|^^^2^GPT^0|8.5793|IU/L|4 TO 44|N||F||||20010530192517<CR>
C|1|I|Operator's Comment|G<CR>
R|3|^^^27^TG^0|381.596|mg/dl|50 TO 130|H||F||||20010530192520<CR>
L|1|N<CR>
```

For the measurement record, one record is by each measurement item.
When an operator put a comment to the measurement result, the comment record is transmitted.

Example of transmission : in case that there are remeasured data.

```
H|¥^&|||Prestige24i^System1|||||Host^PC1||P|1|20000530192631<CR>
P|1|<CR>
O|1||^1^30|^^^1^GOT^0¥^^^2^GPT^0¥^^^27^TG^0|R||||||N||||Serum|||||||||F
<CR>
R|1|^^^1^GOT^0|21.5143|IU/L|8 TO 38|N||F||||20010530192515<CR>
R|2|^^^2^GPT^0||IU/L|4 TO 44|N||X||||20010530192517<CR>
R|3|^^^2^GPT^1||IU/L|4 TO 44|N||X||||20010530192931<CR>
R|4|^^^2^GPT^2|8.6212|IU/L|4 TO 44|N||F||||20010530193551<CR>
R|5|^^^27^TG^0|381.596|mg/dl|50 TO 130|H||F||||20010530192520<CR>
L|1|N<CR>
```

The measurement item “GPT” is remeasured.
In case of remeasurement, the ordinary measurement result and all the remeasured data are transmitted.
Please recognize the newest remeasurement data by the measurement ending date and time.

Transmission example of the waiting state for automatic remeasurement:

“State of result” of the measurement result record for the item which is in the waiting state is transmitted as the waiting result of “I”. (Without measurement result)
When the measurement is completed, the measurement result will be retransmitted with the state of result, “F”.

```
H|¥^&|||Prestige24i^System1|||||Host^PC1||P|1|20000530192631<CR>
P|1|<CR>
O|1||^1^30|^^^1^GOT^0¥^^^2^GPT^0¥^^^27^TG^0|R||||||N||||Serum|||||||||F<CR>
R|1|^^^1^GOT^0|21.5143|IU/L|8 TO 38|N||F||||20010530192515<CR>
R|2|^^^2^GPT^1|230.5687|IU/L|4 TO 44|N||F||||20010530192931<CR>
R|3|^^^2^GPT^2||IU/L|4 TO 44|N||I||||<CR>
R|4|^^^27^TG^0|381.596|mg/dl|50 TO 130|H||F||||20010530192520<CR>
L|1|N<CR>
```

5.3.3. Measuring Failure

In case of the measuring failure of sample, the following measurement result comes on.
And the cause of the measuring failure is included in the comment record.

```
H|¥^&|||Prestige24i^System1|||||Host^PC1||P|1|20000530192631<CR>
P|1|<CR>
O|1||^1^30|^^^^GOT^0¥^^^^GPT^0|R||||||N||||Serum|||||||||F<CR>
R|1|^^^1^GOT^0|0.02|IU/L|8 TO 38|N||P||||20010530192515<CR>
C|1|I|R1|I<CR>
R|2|^^^2^GPT^0||IU/L|4 TO 44|N||X||||20010530192517<CR>
C|1|I|S,R1|I<CR>
L|1|N<CR>
```

Appendix A Error Code List

No.	Error code	Explanation
1	R1	A shortage of R1 reagent
2	R2	A shortage of R2 reagent
3	S	A shortage of sample
4	C	The cell blank value is over 0.3700 Abs or lower than 0.001 Abs.. (The cuvette is unreliable.)
5	P	The value exceeded the upper limit/the lower limit by prozone check.
6	E	The value exceeded the end point limit in the end point assay.
7	B	All the points of the measurement range (main wavelength) or the absorbance of the first point is lower than the ABS limit Low.
8	G	All the points of the measurement range (main wavelength) or the absorbance of the first point is higher than the ABS limit High.
9	T	The temperature of the reaction tray under measurement exceeded ±1℃ to the set temperature.
10	t	The measurement data under warming up.
11	L	The value exceeded the linearity limit in the rate assay.
12	ASTM_x_y_z	The value of specific field is defective. "x, y, z" are the chapter numbers of "ASTM E1394-91 Standard Specification for Transferring Information Between Clinical Instruments and Computer Systems Approved April 2, 1991, Published June 1991". "**ASTM_7_1_x**" : Message Header Record "**ASTM_8_1_x**" : Patient Information Record "**ASTM_9_4_x**" : Measurement Order Record "**ASTM_10_1_x**" : Measurement Result Record "**ASTM_11_1_x**" : Comment Record "**ASTM_12_1_x**" : Enquiry Record "**ASTM_13_1_x**" : Message Terminator Record In case that "x" is "1", it means the abnormal message level, the maximum record length over. Other than this means the field number of the corresponding record.
13	A1	The measurement order registration error (system error)
14	A2	The designated sample for which measurement order entry was done is under measurement, or has been finished to measure.
15	A3	Sample position error. Measurement order entry of patient sample or control sample was performed to STAT sample position. Measurement order entry of patient sample or STAT sample was performed to control sample position.
16	A4	No designated sample. Cancelation for un-registered measurement order in Prestige was done.

Appendix B ASTM Message Record List

B-1 Message Header Record

The message header record is the first record of message.

Field No	Field name	Explanation	Max. digit	Necessity of transmission
1	Record ID	The character to distinguish this record. The field with a single character, “H”.	1	Indispensable
2	Delimiter definition	The definitions of Field delimiter, Repeat delimiter, Component delimiter and Escape delimiter. Prestige initial values are as follows. Field delimiter | Repeat delimiter ¥ Component delimiter ^ Escape delimiter &	3	Indispensable (setting available)
3	Message Control ID	ID to recognize a transmission by a unique number or a network system.	-	Not supported
4	Access password	The password approved by sender and receiver.	-	Not supported
5	Sender ID	It consists of two components, sender name and system ID.		Indispensable
	Sender name	The name of system to transmit When the sender is Prestige, it is “Prestige24i”.	20	Indispensable (setting available)
	System ID	ID of the system to transmit	20	Indispensable (setting available)
6	Sender street address	The street address of sender	-	Not supported
7	Reserved field		-	Not supported
8	Sender Tel. No.	Telephone number of sender	-	Not supported
9	Quality of sender	The quality of sender to establish the connection of receiver.	-	Not supported
10	Receiver ID	It consists of two components, receiver name and system ID.		Indispensable
	Receiver name	The name of system to receive When the receiver is Prestige, it is “Prestige24i”.	20	Indispensable (setting available)
	System ID	ID of the system to receive	20	Indispensable (setting available)
11	Annotation or particular order	The particular orders concerned with comments or the following message fields	-	Not supported
12	Process ID	ID to designate which process to use. “P” : Production “T” : Training “D” : Debugging “Q” : Quality control	-	Not supported
13	Version number	To define the version level of ASTM. In ASTM 1394-91, a single character is “1”.	1	Indispensable
14	Date & time of message	Date and time the message was generated. In the form of “YYYYMMDDHHMMSS” (year/month/day/hour/min./sec.)	14	Indispensable

B-2 Patient Information Record

Field No	Field name	Explanation	Max. digit	Necessity of transmission
1	Record ID	The character to distinguish this record. The field with a single character, “P”.	1	Indispensable
2	Sequence No.	Sequence number of patient information record	2	Indispensable
3	Patient ID	ID which is put by doctor in charge to distinguish the patient. The max. digit is the previous digit which is not yet overlaid with escape characters.	20	Optional
4	Lab. patient ID	ID which is put to distinguish the patient in the laboratory.	-	Not supported
5	System patient ID	ID set by the system	-	Not supported
6	Patient name	Patient name is divided into family, first, middle (initial) names, suffix, and title by components.		Optional
	Family name	Patient’s family name The max. digit is the previous digit which is not yet overlaid with escape characters.	30	Optional
	First name	Patient’s first name The max. digit is the previous digit which is not yet overlaid with escape characters.	30	Optional
	Middle name (initial)	Patient’s middle name	-	Not supported
	Suffix	Patient’s suffix	-	Not supported
	Title	Patient’s title	-	Not supported
7	Maiden name	Family name before marriage		Not supported
8	Date of birth	Date of birth in the form of “YYYYMMDD”	8	Optional
9	Sex	Patient’s sex “M” : man “F” : female “U” : unknown	1	Optional
10	The human race	The race of patient “W” : white “B” : colored “O” : Asian, Pacific islander “NA” : Native American, Alaskan native “H” : Hispanic	-	Not supported
11	Address	Patient’s address	-	Not supported
12	Reserved field		-	Not supported
13	Telephone No.	Patient’s telephone number	-	Not supported
14	Doctor in charge	Name of doctor in charge, or his code. The max. digit is the previous digit which is not yet overlaid with escape characters.	30	Optional
15	Special field 1	The field for the maker use	-	Not supported
16	Special field 2	The field for the maker use	-	Not supported
17	Height	Patient’s height (cm)	-	Not supported
18	Weight	Patient’s weight (kg)	-	Not supported
19	Diagnosis	Known or suspected diagnosis to the patient. Write ICD-9 code or patient’s bed.	-	Not supported
20	Active medications	Patient suspected in overdose situations.	-	Not supported
21	Treatment meal		-	Not supported

Field No	Field name	Explanation	Max. digit	Necessity of transmission
22	Practice field 1	Text field for the doctor use	-	Not supported
23	Practice field 2	Text field for the doctor use	-	Not supported
24	Date in hospital	Dates the patient entered in and out of hospital	-	Not supported
25	Admission status	"OP" : outpatient "PA" : readmit "IP" : inpatient "ER" : emergency room	-	Not supported
26	Location	Ward, bed location in hospital	-	Not supported
27	Alternative diagnostic code & classifications	Code class or classifications	-	Not supported
28	Diagnostic code and classifications	Diagnostic code	-	Not supported
29	Religion	Religion of patient	-	Not supported
30	Marital status	Marital status "M" : married "S" : single "D" : divorced "W" : widowed "A" : separated	-	Not supported
31	Isolation status	Code to protect the patient or the staff against infection.	-	Not supported
32	Language	Patient's mother language	-	Not supported
33	Hospital service	The hospital service currently assigned to the patient.	-	Not supported
34	Hospital institution	The hospital institution currently assigned to the patient.	-	Not supported
35	Dosage category	Indicates the patient dosage group. "A" : Adult "P1" : Pediatric (1-6 months) "P2" : Pediatric (6 months – 3 years)	-	Not supported

B-3 Measurement Order Record

Field No	Field name	Explanation	Max. digit	Necessity of transmission
1	Record ID	The character to distinguish this record. The field with a single character, "O".	1	Indispensable
2	Sequence No.	Sequence number of measurement order record	2	Indispensable
3	Sample ID	Sample ID The max. digit is the previous digit which is not yet overlaid with escape characters.	18	Indispensable
4	System sample ID	Sample ID the system uses. It consists of three components: sample tag, tray number and sample position.		Indispensable
	Sample tag			Not supported
	Sample round No.		2	Indispensable
	Sample position		4	Indispensable
5	Test item ID	Multiple test item IDs can be designated with repeat delimiters.		Indispensable
	Test ID		-	Not supported
	Test name		-	Not supported
	Test type		-	Not supported
	Test item No.	Measurement item number	2	Indispensable
	Test item name	Measurement item name	5	Indispensable
	Dilution rate	The dilution rate for sample is designated. "0" : No dilution (default) "1" : 1 : 6 "7 " : 1 : 60 "2" : 1 : 10 "8" : 1 : 70 "3" : 1 : 20 "9" : 1 : 80 "4" : 1 : 30 "10" : 1 : 90 "5" : 1 : 40 "11" : 1 : 100 "6" : 1 : 50	2	Optional
6	Priority	Measurement priority "S" : STAT "A" : in a hurry "R" : routine (default) "C" : call back "P" : pre-operation	1	Optional
7	Date & time of test request	Date and time that measurement was requested.	-	Not supported
8	Date & time of blood collection	Date and time that sample was collected.	-	Not supported
9	Latest date & time of blood collection	The latest date and time that sample was collected.	-	Not supported
10	Collection amount	The collection amount of sample	-	Not supported
11	Collector ID	ID of blood collector	-	Not supported
12	Action code	Action to take for this measurement request "C" : Cancellation of measurement request "A" : Addition of measurement item "N" : New measurement request "P" : Pending "L" : Reservation completed "X" : Under measurement "Q" : Sample to be treated as QC	1	Indispensable

Field No	Field name	Explanation	Max. digit	Necessity of transmission
13	Danger code	It indicates any special hazard associated with the sample.	-	Not supported
14	Relevant clinical information	Additional information about the sample.	-	Not supported
15	Date sample received	Date the sample was received. In the form of YYYYMMDD.	8	Not supported
16	Sample information			Indispensable
	Sample type	Sample types "Serum" : Serum "Urine" : Urine "Plasma" : Plasma "CSF" : marrow fluid "Dialysis" : dialysis fluid "Other" : Other	8	Indispensable
	Sample information		-	Not supported
17	Ordering doctor	Doctor's name who ordered measurement	-	Not supported
18	Doctor's Tel. No.	Telephone number of requesting doctor	-	Not supported
19	User field 1	Text sent by the requestor	-	Not supported
20	User field 2	Text sent by the requestor	-	Not supported
21	Laboratory field 1	The field used by laboratory	-	Not supported
22	Laboratory field 2	The field used by laboratory	-	Not supported
23	Date/Time results reported		-	Not supported
24	Charge	It contains the billing charge or accounting reference by this system for tests performed.	-	Not supported
25	System section ID	This ID may denote the section of the system where the test was performed.	-	Not supported
26	Report type	"O" order record; user asking that analysis is performed. "C" correction of previously transmitted results "P" preliminary results "F" final results "X" results cannot be got, request cancelled "I" in system pending "Y" no order on record for this test (in response to query) "Z" no record of this patient (in response to query) "Q" response to query (this record is a response to a request-information query.)	1	Indispensable
27	Reserved field		-	Not supported
28	Location or ward of sample collection	This defines the ward of sample collection if different from the patient ward.	-	Not supported
29	Nosocomial infection flag	This shows whether the organism identified is the result of a nosocomial (hospital acquired) infection.	-	Not supported
30	Sample service		-	Not supported
31	Sample institution	This is used to record the institution of sample collection.	-	Not supported

B-4 Measurement Result Record

Field No	Field name	Explanation	Max. digit	Necessity of transmission
1	Record ID	The character to distinguish this record. The field with a single character, “R”.	1	Indispensable
2	Sequence No.	Sequence number of measurement result record	2	Indispensable
3	Test item ID			Indispensable
	Test ID		-	Not supported
	Test name		-	Not supported
	Test type		-	Not supported
	Test item number	Test item number	2	Indispensable
	Test item name	Test item name	5	Indispensable
	Dilution rate	The dilution rate for the sample “0” : No dilution (default) “1” : 1 : 6 “7 “ : 1 : 60 “2” : 1 : 10 “8” : 1 : 70 “3” : 1 : 20 “9” : 1 : 80 “4” : 1 : 30 “10” : 1 : 90 “5” : 1 : 40 “11” : 1 : 100 “6” : 1 : 50	2	Optional
4	Measurement value	Measurement value is shown in ASCII text.	9	Indispensable
5	Unit	Abbreviation of unit of test result is used according to ISO2955.	8	Indispensable
6	Reference range	Reference range of normal value. In the form of “the lower limit to the upper limit”	21	Indispensable
7	Abnormal result flag	Abnormal test result is shown. “L” : lower than the lower limit “H” : higher than the upper limit “LL” : lower than the lowest limit “HH” : higher than the highest limit “<” : lower than the low limit absolute value “>” : higher than the high limit absolute value “N” : normal “A” : abnormal “U” : the significant digit goes up. “D” : the significant digit goes down. “B” : good “W” : wrong	2	Indispensable
8	Cause of abnormality	Causes of abnormality “A” : result based on population “S” : sex based on population “R” : human race based on population “N” : normal range applied generally	-	Not supported

Field No	Field name	Explanation	Max. digit	Necessity of transmission
9	Result status	Condition of measurement result “C”: correction of previously transmitted results “P” : preliminary results “F” : final results “X” : results cannot be done, request will not be honored. “I” : in instrument, result pending “S” : partial result “M” : this result is a MIC level. “R” : this result was previously transmitted. “N” : this result record contains necessary information to run a new order “Q” : this result is response to an outstanding query. “V” : operator verified/approved result	-	Indispensable
10	Changed date	Date to have changed normal value or unit. In the form of YYYYMMDDHHMMSS	-	Not supported
11	Operator ID	Operator ID	-	Not supported
12	Date & time of test start	Date and time of test start. In the form of YYYYMMDDHHMMSS	-	Not supported
13	Date & time of test end	Date and time of test end In the form of YYYYMMDDHHMMSS	-	Indispensable
14	Instrument ID code	ID of the system used for measurement.	-	Not supported

B-5 Comment Record

Field No	Field name	Explanation	Max. digit	Necessity of transmission
1	Record ID	The character to distinguish this record. The field with a single character, “C”.	1	Indispensable
2	Sequence No.	Sequence number of comment record	2	Indispensable
3	Comment source	The source of comment “P” : doctor in charge “L” : computer system “I” : clinical inspection system	1	Indispensable
4	Comment text	In Prestige, mainly error message is transmitted. For example, “R1, 2” : shortage of 1st reagent and 2nd reagent “R1” : shortage of 1st reagent “R2” : shortage of 2nd reagent etc. Refer to the error code list of Appendix A for other error codes. The max. digit is the previous digit which is not yet overlaid with escape characters.	160	Indispensable
5	Comment type	It is used when the form of comment record is limited. “G” : general test comment “T” : text name comment “P” : positive test comment “N” : negative test comment “I” : instrument flag comment	1	Indispensable

B-6 Enquiry Record

Field No	Field name	Explanation	Max. digit	Necessity of transmission
1	Record ID	The character to distinguish this record. The field with a single character, “Q”.	1	Indispensable
2	Sequence No.	Sequence number of enquiry record	2	Indispensable
3	Starting range ID	When inquiry of specific sample is not made, set “ALL”.	-	Indispensable
	Patient ID		-	Not supported
	Sample ID	Sample ID that is managed by barcode or Host.	18	Optional
	Sample round No.	Sample round number	2	Optional
	Sample position	Sample position	4	Optional
4	Termination range ID	To designate the selection standard of patient/ sample/ manufacturer.	-	Not supported
5	Test item ID	In Prestige, only “ALL” is supported.	3	Indispensable
6	Request time range	Date and time of sample collection and order.		
7	Date & time of starting to request results	The oldest date and time of starting to request the results.	-	Not supported
8	Date & time of terminating to request results	The ending date and time of request for the results.	-	Not supported
9	Requesting doctor name	The name of the physician requesting the results.	-	Not supported
10	Doctor’s Tel. No	The telephone number of the requesting physician.	-	Not supported
11	User field No.1	User defined field.	-	Not supported
12	User field No.2	User defined field	-	Not supported
13	Request information status codes	The following codes shall be used: “C” : correction of previously transmitted results “P” : preliminary results “F” : final results “X” : results cannot be got, request will not be honored. “I” : in instrument, results pending “S” : partial results “M”: this result is a MIC level. “R” : this result was previously transmitted. “A” : condition suspension/cancellation of the last request. “N”: requesting only new or changed results “O”: request for only test order and population statistics. “D”: request for only population statistics.	1	Indispensable

B-7 Message Terminator Record

Field No	Field name	Explanation	Max. digit	Necessity of transmission
1	Record ID	The character to distinguish this record. The field with a single character, “L”.	1	Indispensable
2	Sequence No.	Sequence number of the message terminator record	1	Indispensable
3	Terminator record	“N”: normal termination “T”: sender aborted “R”: receiver requested abort “E”: unknown system error “Q”: error in last request for information “I” : no information available from last query “F” : last request for information processed	1	Indispensable