



ASTM
Technical Specification Guide

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Introduction

This document describes *LabOne's* use of the ASTM E1238-91 Standard Specification for Transferring Clinical Laboratory Data Between Independent Computer Systems. *LabOne* uses this protocol to transmit and receive orders for laboratory testing and the results of that testing.

LabOne can receive results using either the 1991 or 1988 standard. *LabOne* supports only the 1991 standard for receiving orders and sending results.

LabOne has extended the ASTM E1238 standard to include a Patient Billing Segment (B). See below for details on this segment.

Document Use

This document was written for our clients' information systems personnel. It explains the system and how it may be used. Your application software should be capable of accepting all available results, even if your company chooses not to perform additional tests. Your system should be designed to accept any new Result ID without causing software failure. *LabOne* will notify clients in advance of any anticipated changes to the ASTM format. Every attempt will be made to give adequate lead time for any changes. However, advance notification often is only a matter of weeks.

Data Transmissions

LabOne transmits ASTM files to hundreds of locations each day using a variety of transmission methods. We use a combination of synchronous and asynchronous modems at various speeds to ensure compatibility with your equipment. Our primary communication methods are listed in this section. Contact the LabOne Client Technical Support line at (800) 388-4675 for more information.

- **Client-provided PC:** LabOne can provide you with software to run on your PC that can receive a raw data transmission from our network. Optionally, a Network Interface Card (NIC) can be installed in this PC to automate the process by having the data moved to a file server on your network. This method is ideal for clients using the Lincoln Underwriting System.
- **Client's UNIX or Open VMS system:** LabOne can provide the widely used C-Kermit software for your UNIX or Open VMS system to allow you to receive data transmissions from LabOne NET™.
- **Dial-in to LabOne NET™:** LabOne can provide you with password-protected dial-in access to our data transmission system from where you download your data. This can be done using any communication software that supports Kermit as a file transfer protocol, or LabOne can provide software free of charge for this use. This software is available for PCs running DOS, Windows, or OS/2, as well as for UNIX and Open VMS systems.

Other Methods

- **Lab1NetW** -- Windows PC application (not Service -- so it must be started on the PC and left running, or it can be run as a service using the Microsoft toolkit) that connects to LabOne to exchange files. Connection methods include Socket (port 2112 or 4444 to LabOne) over the Internet, VPN or private line, and dial modem to LabOne or LabOne dialout to customer PC. For an Internet connection, the customer is often required to open port 2112 or 4444 for outbound connections to LabOne through their firewall. Data exchange takes place in both directions but the connection is always setup from the customer to LabOne. Lab1NetW can monitor local directories for files to upload and initiate connection, and/or can be scheduled to connect at programmed times to look for data. When used in a Socket environment, the software automatically uses our own implementation of the RSA encryption algorithm.
- **FTP with PGP** encryption
- **LabOne can be the server** that you receive data from (or send to), or

- **LabOne can be the client** of the customer's FTP server
- **Some combination of the above** (e.g. each push to the other's server)
- **FTPS (no PGP required)** -- LabOne can be the server, the FTPS protocol provides the encryption. LabOne does not support FTPS client connection to a customer server at this time.
- **FTP over VPN** or private circuit.

Transmission Windows

If necessary, LabOne can set up specific time windows in which your transmissions will be performed. Contact LabOne for more details on scheduling.

Implementation Schedule

The following areas must be addressed before production implementation:

- Project Authorization
- Communication hardware and software (including phone lines and modems)
- Client application software
- Security and JCL requirements
- Transmission testing between your site and LabOne
- Final production authorization

We will make every effort to conform to your implementation schedule. During testing and phased implementation, your current distribution methods will not be interrupted.

File Specifications

- All fields are variable in length but have a maximum length.
- All fields except the last field in a segment use a field delimiter (|).
- Unused fields within a segment are noted by the presence of a field delimiter. Thus, fields are determined positionally within each segment. Unused fields at the end of a segment do not need to be indicated by a field delimiter. The segment can end after the last field actually used.
- Each segment is terminated by a carriage return (ASCII 13).
- Data from all fields **not** specified in the file layouts below, will be disregarded.

Format Example (Sendout/Incoming Result)

```
Message Header Segment
  Patient Segment 1
    Order Segment 1
      Observation Segment 1
      Observation Segment 2
      Comment Segment 1
      Observation Segment n
    Order Segment 2
      Observation Segment 1
      Observation Segment 2
      Observation Segment n
  Patient Segment 2
    Order Segment 1
      Observation Segment 1
      Observation Segment 2
  Patient Segment 3
    Order Segment 1
      Observation Segment 1
      Observation Segment 2
Message Trailer Segment
```

Format Example (Sendout/Incoming Order)

```
Message Header Segment
  Patient Segment 1
  Patient Billing Segment 1
    Order Segment 1
    Order Segment 2
    Order Segment m
  Patient Segment 2
  Patient Billing Segment 2
Message Trailer Segment
```

Header (H:) Records

- The header record indicates where the file came from and to whom it is going, and gives a code/description of expected contents for the file.

Patient (P:) Records

- The patient record includes the patient demographic information and may also include a comment record.

Billing (B:) Records

- Only patients in an Order file will have a billing record.
- The patient's billing information, the person responsible for billing, Medicare, and Medicaid information is included in this record.

Order (OBR:) Records

- The order record describes the panel ordered and gives a brief description of the panel.
- The order record also documents the date and time the specimen was taken, etc.

Result (OBX:) Records

- Each patient for whom a test has been performed will have an OBX record.
- The OBX record will include test results and may have additional comment records.

Comment (C:) Records

- A comment record is optional.
- Comment records can occur before or after the patient record, OBR record or the OBX record.

Suggestions for Design and Implementation

Transmission Time

Transmission times vary.

Retransmissions

Two types of retransmissions may occur:

- A complete retransmission of **all** applicants for a particular processing cycle may be necessary, usually due to a loss of data on the receiving end of the transmission. LabOne retains several months of transmission data on-line to provide a timely and complete retransmission.
- A complete retransmission of **individual** applicant(s) may occur for various reasons but is usually due to a request from the client, or an update to the LabOne history files. When this type of retransmission occurs, all data for the requested/updated applicant(s) will be included in the next normally scheduled transmission.

For either type of retransmission, **all** available data for each applicant will be retransmitted. Because test results may be added, deleted or changed, your system should allow for total replacement of **all** applicant data or for the retention of complete multiple versions of **all** applicant data. **Only the most current set of data should be considered complete, and reported or processed accordingly.**

Matching Criteria

An individual applicant can be uniquely identified in the LabOne database by using the combined data keys of “Date Performed” and “Control # (Lab Id).” However, this data will not be available to you until testing of the applicant is complete.

Record Descriptions

ABBREVIATION	DESCRIPTION
C	Constant – Contains a LabOne assigned value and should not be used for editing purposes.
N	Numeric – Contains only numbers.
AN	Alphanumeric – Contains spaces, letters, numbers, or symbols.
R	Required
O	Optional

Age Default: If AGE = 00, use 36.

Sex Default: If SEX is unknown (U), use MALE.

SSN Default: If SSN is blank, system defaults to spaces.

DOB Default: If DOB is blank, system defaults to spaces.

Message Header Segment

Field	Data Type	Length	Use	Field Description	Format/Values
01	AN	1	R	Record Type ID:	“H”
02	AN	5	R	Delimiter Definition	Field, component, repeat, escape, and Sub-component delimiters “ ^ ~ \ &”
03	AN	12	R	Message Control ID	Generated by Sender
04	AN	0	O	Security	Not Used
05	AN	4	R	Sender ID	On Order files sent to LabOne, this is the 4-chr. account code assigned by LabOne to the sender. LabOne generates "LABONE".

06	AN	0	O	Sender Address	Not Used
07	AN	1	R	Message Type	“O” for Order, “R” for Results, “C” for Combined Order/Result file
08	AN	0	O	Sender Phone Number	Not Used
09	AN	0	O	Characteristics of Sender	Not Used
10	AN	0	O	Receiver ID	Not Used
11	AN	3	O	Special Instructions	Used by LabOne Link to pass the software version that created the ASTM file. (Additional info can be included by using sub-component delimiters like ^.)
12	AN	1	R	Processing ID	'P' for production, 'D' for debugging (testing)
13	AN	3	R	Version	'A.1' = ASTM E1238-88, 'A.2' = ASTM E1238-91
14	AN	14	R	Date & time of message	Generated by Sender. YYYYMMDDHHMM

Patient Segment

Field	Data Type	Length	Use	Field Description	Format/Values
01	AN	1	R	Record Type ID	“P”
02	N	3	R	Sequence Number	1 for first patient, 2 for second, etc.
03	N	16	O	Client Patient ID	Patient/company information
04	N	8	R	Lab Patient ID	LabOne assigned
05	N	16	O	External Patient ID	Patient/company information
06	N	41	R	Patient Name	Last^First^I chr(25),chr(15), chr(1) Include all component delimiters whether the data is present or not for that component. Ex. Last^first^
07	N	0	O	Mother’s maiden name	Not used
08	AN	8	O	Birthday	YYYYMMDD
09	N	1	R	Patient Sex	M, F, or U (if not given, defaults to U)
10	N	0	O	Patient race or ethnic origin	Not used
11	AN	57	O	Responsible party street address	Required for patient billing Street^apt^city^state^zip – Chr(25), chr(5), chr(15), chr(2), chr(5) Include all component delimiters whether or not data is present for that component. Ex: street^city^state^zip
12	AN	20	O	Office Routing Sequence Code	If not given, defaults to “?”
13	AN	10	O	Responsible Party Phone Number	Optional
14	AN	32	O	Attending Physician ID	Optional UPIN^Last Name. chr(6)^chr(25) Include all component delimiters whether or not data is present for that component. Ex: 123456^
15	AN	10	O	Fax Addl. Copy To	Optional
16	AN	4	O	Patient Comp ID	From CaseView only
17	N	6	O	Patient Height	In inches – Optional value^in&&ANSI+
18	N	3	O	Patient Weight	In pounds – Optional value^in&&ANSI+
19	AN	6	O	ICD9 Diagnosis Code(s)	Required if third party billing. May send up to 8 codes. Ex: code1~code2~code3~code4
20	AN	0	O	Not Used	Not Used
21	AN	3	O	Fasting	Optional: flag^duration. chr(1)^chr(2). flag is Y = Yes, N = No, U = Unknown Duration in hours. Include all component delimiters whether or not data is present for that component. Ex: N^
22	AN	0	O	Not Used	Not Used
23	AN	0	O	Not Used	Not Used
24	AN	20	O	Airbill Number	Tracking Purposes

Patient Billing Segment

Note: This is a LabOne extension of the ASTM E1238 standard. The standard does not provide for the transfer of billing information. This is an optional segment. If this segment is not included, LabOne will bill the Account identified in the Sender ID field of the Message Header Segment on the Order message. This segment is only included in the Order message. It is not included in the Result message.

Field	Data Type	Length	Use	Field Description	Format/Values
01	AN	1	R	Record Type ID	"B"
02	N	3	R	Sequence Number	1 for first patient, 2 for second, etc.
03	N	16	R	Client Patient ID	Patient/company information
04	N	8	R	Lab Patient ID	LabOne assigned
05	AN	1	O	Billing Type	Optional – It not included, defaults to Account billing, A – Account D – Medicaid M – Medicare O – Other Insurance P – Patient
06	AN	4	O	Billing Account	Optional – Used to bill account other than the account that requested the testing. If not included, defaults to bill account that requested testing. This is a LabOne assigned account number.
07	AN	12	O	Medicare Number	Required for Medicare billing
08	AN	15	O	Medicaid Number	Required for Medicaid billing
09	AN	4	O	ESRD Patient Type	CAPD – Continuous Ambulatory Peritoneal Disease CCPD – Continuous Cycling Peritoneal Disease HEMO – Hemodialysis PERI – Peritoneal
10	AN	8	O	ESRD First Treatment Date	Required for dialysis patients – YYYYMMDD. Note: This is the date of onset of illness or accident as required by Medicare.
11	N	2	O	ESRD Test Frequency	1 = 1 st time period, 2 = 2 nd time period, etc.
12	AN	15	O	ESRD Test Period	Required for certain tests on dialysis patients. WEEKLY, MONTHLY, QUARTERLY, BI-ANNUALLY, ANNUALLY
13	AN	24	O	Other Insurance Name	Required for insurance billing
14	AN	24	O	Other Insurance Group No./ID No.	Required for insurance billing
15	AN	25	R	Responsible Party Name	Required for insurance billing
16	AN	1	R	Relation to Insured/Responsible Party	C – Child I – Self O – Other S – Spouse U – Unknown
17	AN	30	O	Employer	Required for Medicare billing involving worker's comp.

Patient Order Segment

Field	Data Type	Length	Use	Field Description	Format/Values
01	AN	3	R	Record Type ID	"OBR"
02	N	3	R	Sequence Number	1 for first patient, 2 for second, etc.

03	AN	16	R	Client Patient ID	Patient/company information
04	AN	8	R	Lab Patient ID	LabOne assigned
05	AN	65	R	Order ID	order id^order description^L chr(4)^chr(60)^chr(1) When sending orders to or receiving results from LabOne, the order ID is the LabOne panel identifier. When LabOne sends orders to or receives results from a referral lab, the order ID is the referral lab's test code. The order description is an English language description of the panel, and 'L' is a constant designating a local code.
06	AN	0	O	Priority	Not used
07	AN	0	O	Requested date-time	Not Used
08	AN	14	R	Specimen collection date-time	YYYYMMDDHHMMSS
09	AN	14	O	Timed urine collection & time	YYYYMMDDHHMMSS (used w/ 4.8 to calculate timed urine collection duration)
10	N	5	O	Timed urine collection volume	In milliliters
11	N	3	O	Timed urine collection duration	In hours. (A value entered in this field will override the calculated duration derived from 4.8 and 4.9)
12	AN	1	O	Action Code	"N"
13	AN	0	O	Danger Code	Not Used
14	AN	0	O	Not Used	Not Used
15	AN	14	O	Not Used	Not Used
16	AN	90	O	Source of specimen	Required for microbiology testing. code&free text^^. chr(10)&chr(80)^^. Use free text if not in the table below or if more details required. (Note: This field has 3 parts. The first component is divided into 2 subcomponents. LabOne uses only the 2 sub-components of component 1. Components 2 and 3 are not used. Include all delimiters whether or not all components are used. Ex: BLOOD&^^) BLOOD Blood RESPIRTORY Respiratory BODYFLUID Body Fluid STOOL Stool ENVIRNMT Environmental THROAT Throat EYE Eye UNKNOWN Unknown GENITAL Genital URINE Urine NOSE Nose WOUND Wound
17	AN	0	O	Not Used	Not Used
18	AN	10	O	Call Back telephone number	Optional
19	AN	2	O	Send Direct to referral lab	"RF=___". "___" is the two character facility id. This field is only used when a specimen is sent direct to a referral lab.
20	AN	0	O	Not Used	Not Used
21	AN	5	O	CPT Code	Optional
22	AN	0	O	Not Used	Not Used
24	AN	0	O	Not Used	Not Used
24	AN	0	O	Not Used	Not Used
25	AN	0	O	Not Used	Not Used
26	AN	1	R	Order Result Status	used in result file. not used in order file.

					F = Final P = Partial (some results ready to report)
27 - 37	AN	0	O	Not Used	Not Used

Patient Result (OBX) Segment

Field	Data Type	Length	Use	Field Description	Format/Values
01	AN	3	R	Record Type ID	“OBX”
02	N	3	R	Sequence Number	1 for first patient, 2 for second, etc.
03	AN	2	R	Value Type	“ST” string text data
04	AN	96	R	Observation Identifier	result code^description^code type chr(15)^chr(80)^chr(1). When LabOne creates a result file, the following are true...Result code is blank for tests LabOne sends to a referral lab. Code type is ‘L’ for tests performed at LabOne. Code type is ‘R’ for tests LabOne sends to a referral lab. An order may not have any result records at all. The result information may be passed as comments.
05	AN	0	O	Observation Sub ID	Not used
06	AN	80	O	Observation value	Not used
07	AN	18	R	Units	Units: code^text^L chr(5)^chr(12)^chr(1) Include all component delimiters whether or not that component is used. Ex: ^mg/ml^L
08	AN	60	O	Reference Range	
09	AN	10	O	Abnormal Flags	
10	AN	0	O	Not Used	Not Used

Patient Comment Segment

Field	Data Type	Length	Use	Field Description	Format/Values
01	AN	1	R	Record Type ID	“C”
02	N	3	R	Sequence Number	1 for first patient, 2 for second, etc.
03	AN	1	R	Comment Source	“L” for Laboratory comment
04	AN	80	O	Comment text	Comments

Message Trailer Segment

Field	Data Type	Length	Use	Field Description	Format/Values
01	AN	1	R	Record Type ID	“L” means Last
02	N	1	R	Sequence Number	Always 1
03	AN	0	O	Not Used	Not Used
04	N	4	O	Patient Count	Count