



# Limit Order Reconciliation (LOR) User Guide

August 29, 2007

## Revision History

Date	Initials	Revision
Jul 15, 2006	DD	Original for New Trading Model
Aug 29, 2007	RH/DD	Revised Format & Removed old Examples

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# 1 Overview

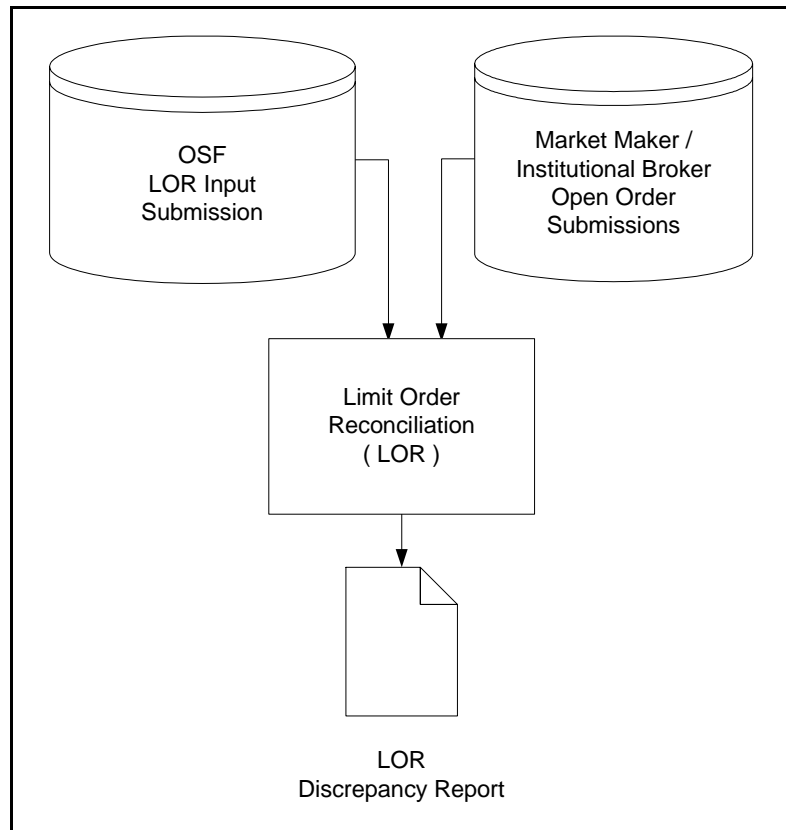
## 1.1 Limit Order Reconciliation Service

The CHX Limit Order Reconciliation (LOR) service provides Order Sending Firms (OSF's) with the ability to compare their internal open orders with the orders routed to CHX. A firm can submit an LOR input file containing all their eligible open orders. The CHX LOR service will compare those submitted open orders against a comprehensive list of orders submitted by Market Makers and Institutional Brokers. Any discrepancies will be printed on the LOR Discrepancy Report.

- ◆ Orders in the LOR input file, or in the list submitted by Market Makers and Institutional Brokers that do not match will be printed on the Discrepancy Report.
- ◆ Orders that match are checked for discrepancies based on side; type; stop price; limit price; quantity; all-or-none, held, do-not increase/reduce qualifiers; and settlement terms.

Corporate actions are applied to the orders by the Market Makers and the Institutional Brokers before submission to the LOR process.

Below is a diagram showing the basic flow of the Limit Order Reconciliation service:



## **1.2 Contacts**

Application Questions, Trading Support, OSF User Support  
CHX Customer Service (312) 663-2626

24/5 Operational support  
CHX IT Operations (312) 663-2606

## **1.3 Order Matching Methods**

CHX offers two order matching methods:

- 1) Match orders on the order branch code and sequence number
- 2) Match orders on the FIX client order ID.

The LOR header record indicates which method of matching to perform.

## 2 LOR Input File Submission

### 2.1 General

Order Sending Firms must submit their LOR input file to CHX each evening between 3:00 PM and 11:00 PM (central time). Prior to submitting an LOR input file, dividend adjustments and stock splits (corporate actions) should be applied. Each submitting OSF's file may contain open orders for multiple entering firms. OSFs submitting the LOR input file must assure that they transmit the correct (current) open order information.

If no file is received from an OSF subscribing to LOR, or an old file is received, the LOR application will notify IT Operations that the input file is missing.

For each entering firm, an LOR application header record must be sent, followed by the application detail records (for only the entering firm), followed by an application trailer record. If the application records are not submitted in the correct sequence, the file will be rejected.

Below is an example of how an OSF's LOR input file (containing multiple entering firms) must be submitted:

Header record for Entering Firm ABCD  
Detail records for Entering Firm ABCD  
Trailer record for Entering Firm ABCD  
Header record for Entering Firm DEF  
Detail records for Entering Firm DEF  
Trailer record for Entering Firm DEF

### 2.2 LOR User Contacts

CHX will need contacts for:

- 1) Operational support.
- 2) LOR Discrepancy Report delivery.

## 2.3 File Layout Differences between CHX and NYSE

The CHX LOR input file layout has been revised to match NYSE's November 22, 2000 Limit Order Reconciliation record layout.

Differences between CHX and NYSE:

- Filler fields will occupy positions in the layout not required by the CHX LOR application. Filler fields can contain any alphanumeric characters or spaces. All filler fields are ignored by the application.
- Datatrak Header/Trailer records are not required. If included in the file, the application bypasses these record.
- The positions beyond 100 characters need not be sent. The CHX LOR application will pad the record to the required length before use.
- The header File Id field must contain 'CHX LOR '.
- The Entering Firm field can be any alpha text. The text must be the same in the header, detail, and trailer records. The firm Give-Up (trading account) is preferred but not required.

In short, the only required difference in the file layout is the header record File Id text.

## 2.4 LOR Input File

The LOR application has a specific input file layout for open order information. See *Appendix A: CHX LOR Input File Layout* for Header, Detail and Trailer record formats.

### 2.4.1 Header Record

For each entering firm, an application header record must be sent. The date contained in the application header record must be the current trade date, not the next trade date. The File ID field must contain 'CHX LOR '. Otherwise, the firm's open order file will be rejected.

### 2.4.2 Detail Records

Each field in the detail record must comply with the specified field definition to be valid.

### 2.4.3 Trailer Record

Each field in the trailer record must comply with the specified field definition to be valid. The trailer record must contain the same date as in the header record, and the total number of detail records for the entering firm. If a trailer record is not found, the date is not current, or the detail record count on the trailer record does not match the actual number of detail records, the entering firm's detail records will be rejected. The submitting firm will be contacted, allowing them to transmit a corrected file.

## 2.5 File Verification

Every evening, after 11:00pm (central time), the CHX LOR application will check to ensure that all files have been received. If there are missing files, the LOR application will notify IT Operations of the entering firm's missing file. The submitting firm will be contacted, allowing them to transmit the file.

## 2.6 File Rejects

The entire set of open orders for an entering firm will be rejected for the following reasons:

- The records are out of sequence. The LOR input file must contain the LOR application header, and trailer. Detail records, if they exist, must be between the header and trailer.
- The total number of detail records does not match the number of records indicated on the trailer record.
- The date on the header does not match the current trading date.
- The entering firm is not a subscriber to the LOR service.

## 2.7 Open Order Bypassing

The entering firm's open orders will be partially bypassed for the following reason:

- If the number of discrepancies exceeds 25% of the entering firm's overall open orders, the entering firm has at least 500 open orders or the number of Market Maker / Institutional Broker orders that do not match is at least 500, and the number of discrepancies is greater than 500. The message "THE NUMBER OF DISCREPANCIES EXCEEDED 25 PERCENT OF THE FIRM LIMIT ORDERS WITH AT LEAST 500 OVERALL FIRM LIMIT ORDERS OR 500 MARKET MAKER/INSTITUTIONAL ORDERS THAT DO NOT MATCH. THE REMAINING ### DISCREPANCIES WERE NOT PRINTED." will print on the discrepancy report.



## **3 Output**

### **3.1 Discrepancy Report**

The LOR service compares the entering firm's open orders against the Market Maker / Institutional Broker submissions. Discrepancies are printed on the LOR report.

#### **3.1.1 Match Criteria**

LOR will first match on Entering Firm and Security Symbol, then match on the order identifier. Depending on the matching method specified in the file header, the order identifier will be the Branch Code and Sequence Number, or the FIX Client Order ID.

Orders that do not match will be printed on the discrepancy report.

#### **3.1.2 Discrepancy Checking**

Orders that do match on Entering Firm, Security Symbol, and order identifier are checked for discrepancies based on side, type, stop price, limit price, quantity, all-or-none, held, do-not increase/reduce, and settlement terms.

Orders that contain discrepancies are printed on the discrepancy report.

#### **3.1.3 Total Counts**

The total number of orders compared, and the total number of discrepancies are printed at the end of the report.

## **4 Delivery**

### **4.1 Discrepancy Report Delivery**

The LOR Discrepancy reports will be delivered between 11:00pm and 7:00am (central time) after each trading day. The delivery method is FTP (ASCII).

#### **4.1.1 FTP Report for Users**

IT Operations will provide the user(s) with an FTP username, password, and site. The user will be able to log on to the site, to view or retrieve reports. The connection can be made from any web browser, such as Microsoft's Internet Explorer, or via any FTP software.

#### **4.1.2 Reports to CHX Customer Service**

CHX Customer Service will receive a copy of the LOR Discrepancy report. CHX Customer Service can review the report, and contact the firm to reconcile order discrepancies.

## Appendix A: CHX LOR Input File layout

The file layout differences between CHX and NYSE are in **bold** print.

### LOR Application Header Record (160 characters)

Field Name	Relative Position	Size	Description
Entering Firm	1	4	Firm mnemonic, or trading symbol give-up.
Trade Date	5	8	Last trade date in MMDDYYYY format. For example: If you are sending open-orders from the end-of-Monday, the file should contain Monday's date—not Tuesday's date. (The reconciliation report will be for Tuesday's trading day.)
File Id	13	18	'CHX LOR'
(filler)	31	1	Occupy the positions used by NYSE and not by CHX.
(filler)	32	4	Occupy the positions used by NYSE and not by CHX.
(filler)	36	65	Occupy the positions used by NYSE and not by CHX.
<b>CHX Order Matching Method</b>	<b>101</b>	<b>3</b>	<b>'FIX' = Match open orders with the FIX Client Order ID blank = Match open orders with the Branch Code/Sequence Number (order number).</b>
(filler)	<b>104</b>	<b>57</b>	<b>Future use. Not required by the application.</b>

## LOR Application Detail Record (160 characters)

Field Name	Relative Position	Size	Description
(filler)	1	4	Occupy the positions used by NYSE and not by CHX.
Entering Firm	5	4	Firm mnemonic, or trading symbol give-up. (Same date as in the header record.)
Security Symbol	9	15	Issue symbol. If the Issue symbol has a suffix, put a period between the Issue symbol and the suffix.
Branch Code	24	4	The branch office code. Left justified, blank filled. (Fill with blanks if the CHX Order Matching Method is FIX.)
Sequence Number	28	5	The branch office sequence number. Right justified, zero filled. (Fill with blanks if the CHX Order Matching Method is FIX.)
Order Side	33	1	1 = Buy, 2 = Sell, 3 = Sell Short
Order Type	34	1	1 = Limit, 2 = Stop, 3 = Stop Limit, 9 = Or better
Entry Date	35	8	Date order was entered in MMDDYYYY format.
Share Quantity	43	9	Number of shares. Numeric. Right Justified, zero filled.
Stop Price	52	12	Numeric, zero filled. The format depends on the Stop Price Code. For limit orders, this field should be zeroes.
Stop Price Code	64	1	Blank or 0 = whole number no decimal positions. 1 thru 9 = the number of decimal positions. (See Appendix B: Price Field Formats)
Limit Price	65	12	Numeric, zero filled. The format depends on the Limit Price Code. For stop orders, this field should be zeroes.
Limit Price Code	77	1	Blank or 0 = whole number no decimal positions. 1 thru 9 = the number of decimal positions. (See Appendix B: Price Field Formats)
(filler)	78	3	Occupy the positions used by NYSE and not by CHX.
Time In Force	81	1	4 = GTC, 8 = GTX, 9 = GT, A = GTW, B = GTM
Settlement Terms	82	2	Special Instructions: blank = regular-way, C = Cash, ND = Next Day, nn = number of seller days
All or None Indicator	84	1	Blank = Execute on discretion, 1 = AON (All or None), 2 = NH (Not Held), 3 = AON + NH.
Do Not Indicator	85	1	blank = adjust for dividends, 1 = DNI (Do Not Increase), 2 = DNR (Do Not Reduce), 3 = both DNI and DNR.
(filler)	86	1	Occupy the positions used by NYSE and not by CHX.
(filler)	87	1	Occupy the positions used by NYSE and not by CHX.
(filler)	88	1	Occupy the positions used by NYSE and not by CHX.
(filler)	89	12	Occupy the positions used by NYSE and not by CHX.
<b>FIX Client Order ID</b>	<b>101</b>	<b>40</b>	<b>Fix format Client Order ID (Clordid) if the CHX Order Matching Method is FIX. Otherwise, fill with blanks.</b>
(filler)	<b>141</b>	<b>20</b>	<b>Future use. Not required by the application.</b>

LOR Application Trailer Record (160 characters)

Field Name	Relative Position	Size	Description
Entering Firm	1	4	Firm mnemonic, or trading symbol give-up. (Same date as in the header record.)
Trade Date	5	8	Last trade date in MMDDYYYY format. (Same date as in the header record.)
Detail Record Count	13	6	Numeric; Right justified, zero filled. Total number of detail records. The count does not include the header and trailer records.
(filler)	19	82	Occupy the positions used by NYSE and not by CHX.
<b>(filler)</b>	<b>101</b>	<b>60</b>	<b>Future use. Not required by the application.</b>

## Appendix B: Price Field Formats

### Price Code:

- Space = No decimal positions.
- 0 - 9 = The number of decimal positions.

### Examples:

Price	Price Field	Price Code
\$31.00	000000031000	3
\$77.83	000000007783	2
\$66.12345	000006612345	5
(no price)	000000000000	0 or space