PHLX XL

NASDAQ OMX

FINANCIAL AUTOMATION

EQUITY OPTIONS TRADING SYSTEM

SPECIALIZED ORDER FEED

FIRM INTERFACE SPECIFICATION

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1 PURPOSE AND SCOPE

The purpose of this document is to provide details of the message format and protocol of the firm`s connection to the SOF Interface. The intended audience of this document is a firm`s Production Support and Development/R&D personnel. The firm must represent NASDAQ OMX PHLX (PHLX) Specialists and Market Makers that are members of PHLX to be eligible to use this interface.

Following is the list of companion documents that give additional information related to the interface.

- **PHLX TCP/IP Communication Manual**: The intended audience of this document is a firm's Communications personnel. The objective is to help them understand the physical and transport level details of the firm's connection to all the TCP/IP PHLX Interfaces.

- **PHLX SQF Business Manual**: The purpose of this document is to provide details of the supported business functionality to firms that wish to connect to the PHLX Quoting system using the Specialized Quote Feed interface. The intended audience of this document is the marketing and product development personnel at the firm who wish to understand the details of the SQF Business functionality.

- **PHLX SQF Messaging Manual**: The intended audience of this document is a firm's Production Support and Development/R&D personnel. The objective is to help them understand the message format & protocol details of the firm's connection to the PHLX SQF Interface. Using this interface, the firms can send Quotes representing PHLX Market Makers and Specialists..

- **PHLX RMP Messaging Manual**: The intended audience of this document is a firm's Production Support and Development/R&D personnel. The objective is to help them understand the message format & protocol details of the firm's connection to the PHLX RMP Interface. Using this interface, the firms can receive real time updates of all the trades done by the representing Specialists and Market Makers at PHLX.

2 SPECIALIZED ORDER FEED OVERVIEW

NASDAQ OMX PHLX (PHLX) has developed a feed that distributes Single Order Book, Single and Complex Order, Complex Strategy and Complex Order Live Auction information to the firms on a real-time basis. This can be used by the firms for analysis and to generate Sweep requests to trade with the Book or to participate in Strategy auctions.

The Specialized Order Feed (SOF) will provide to its participating firm members real-time information to keep track of the single order book(s), single and complex orders, complex strategy and Live Auction for all Underlyings/symbols for which the firm is configured. Each firm will be configured for one or more Underlyings.

The Single Order Book message consists of the highest bid price, size available at the bid price, lowest ask price and size available at the ask price for a given option symbol. A message is sent to the firm when the Top of the Single Order Book for any of the option symbols for the eligible Underlyings gets updated.

Following are the list of conditions in which Single Orders are not included in the Book message:

1. Market Orders
2. AON, Stop and Stop Limit Orders
3. Orders that are Cancel Pending or time in force IOC (Immediate or Cancel)
4. Order Volume that is Marked for Execution.
5. Linkage Principal as Agent orders, Principal orders and Satisfaction orders received from other exchanges.
6. Linkage orders that are sent by the PHLX specialists and Market Makers to other exchanges
7. Non-Electronic Orders
8. Complex Orders

In addition to the Single Order Book data messages, Single Order messages will be available to provide all the open Orders received by PHLX to the Firm for all the eligible Underlyings. Single and Complex Order messages will be sent to the firm when they are received or any change is made to an order except for fully executed orders upon receipt. Linkage orders sent to other exchanges by PHLX specialists or Market Makers will not be distributed with this feed. Complex strategy definitions will be sent to the firms when they are created. Auction (COLA) notifications will also be sent to the firms when the auctions start so that the firms can send matching or price improving Sweep messages through the SQF interface in order to participate as a Contra in the auction.

Firms may be set up with one or more logical lines. All logical lines for a firm will receive all updates for all configured Underlyings. Each Firm/Logical Line can be configured for one or more of

- Single Book updates
- Single Order updates
- Complex order updates
- Strategy definitions
- COLA notifications

Different configuration options will be available at a Firm/Logical Line level for Book and Order updates.

3 APPLICATION PROTOCOL

3.1 Connection

Firm is responsible for initiating a connection to PHLX on the assigned IP address and port number. PHLX system acts a server for all the connections. Firms should initiate one or more connections to PHLX on the assigned port number(s). All firm connections into the PHLX are routed through the firewall for authorization. If authorized, a TCP/IP session is established between the firm and the PHLX system.

Application requests and responses are exchanged between the PHLX and the firm once the session is established.

PHLX operations will notify the firm if it detects a session disconnect during the trading day. Sessions will be automatically disconnected by the PHLX system at the end of trading day.

The following are recommendations to minimize down time:

1. Support multiple physical communication lines to PHLX. Example: Dual T1 or T1 and a dial backup.
2. Support multiple TCP/IP connections on each of the communication lines.
3. Development of automatic failover mechanism such that in case of failure, data is automatically transferred through one of the other active connections.
4. Development of connection retry logic such that in case of failure, connection is retried every periodic interval.

3.2 Start/Stop Transmission Request Message (Firm -> PHLX)

The Start Transmission Request message is required from the firm to notify SOF when the Firm/Line is ready to receive Book and/or Order messages. Until this message is sent by each Firm/Logical Line at the start of the trading day, no Book/Single or Complex Order/COLA/Strategy messages will be sent to the Firm/Logical Line. This message is also required to restart the transmission to the Firm/Logical Line if a Stop Transmission Request message is sent to SOF. The Stop Transmission Request message may be sent by the Firm/Logical Line at any time to notify SOF to stop sending Book/Single and Complex Order/COLA/Strategy messages down that line. A seven-character firm request id will be echoed back by SOF in the response. Refer to section Start/Stop Transmission Request Message Format (Firm -> PHLX) for the format of the Start/Stop Transmission Request message.

While a firm is in a non-transmission state - either prior to sending a Start Transmission after connection or after sending a Stop Transmission - no real-time Single Book, Open Single or Complex Order, COLA or Strategy messages will be sent from SOF until a Start Transmission request is received from the firm. Once the Start Transmission request is received, a Refresh Request will be available to the firm. After sending a Start Transmission, a Refresh Request should be sent to receive the current Order and Book information. SOF will not automatically send refresh information upon receiving a Start Transmission. During a refresh, SOF will send the current Single Book(s) and/or Open Single and Complex Orders for any or all underlyings or symbols requested. The real-time feed will begin when orders are accepted (typically at 7:30 a.m.).

3.3 Start/Stop Transmission Response Message (PHLX -> Firm)

The Start or Stop Transmission Response message will be sent by PHLX to the firm to acknowledge that SOF successfully received the Start or Stop Transmission message. If there was any error processing the Request message, SOF will return an error code in the Response message. The firm request id from the Start/Stop Transmission Request will be echoed back in the response. Refer to section Start/Stop Transmission Response Message Format (PHLX -> Firm) for the format of the Start/Stop Transmission Response message.

3.4 Message Sequencing (PHLX->FIRM)

- Sequencing will be done at connection-level for following messages to support retransmissions requests:
  - Single Book Message
  - Single Order Message
  - Strategy Message
  - Complex Order Message
  - COLA Notification
- Each message will contain a unique, seven-digit sequence number, which will be initialized to 0000001 each morning. This number will be incremented for each message generated for each firm (on each line if multiple lines) throughout the day and can be used to help detect message gaps or to request retransmission of a specific message or range of messages.
- If sending this message is a result of a firm refresh or retransmission request, the firm request id will be echoed back to the firm in every Book message refreshed or retransmitted. For messages not the result of refresh or retransmission request, the firm request id field will be blank.

3.5 Single Book Message(s) (PHLX -> Firm)

When any Single Order is added, modified, or removed from the single order book for an underlying that a firm is configured for and the highest bid or lowest offer changes for the Symbol, a Single Book message containing the book information will be sent to that firm over any firm lines configured to receive the book(s). Refer to section Book Message Format (PHLX -> Firm) for the format of the Single Book messages.

The sequence number will be incremented for each message sent to each firm (on each line if multiple lines) throughout the day and can be used to help detect message gaps or to request retransmission of a specific message or range of messages. If sending this message is a result of a firm refresh or retransmission request, the firm request id will be echoed back to the firm in every Book message refreshed or retransmitted. For messages not the result of refresh or retransmission request, the firm request id field will be blank.

3.6 Single Order Message (PHLX -> Firm)

When a Market, Limit, Stop, or Stop Limit Single Order is received or any change is made to an order for an underlying that a firm is configured for, an Order message containing the order information will be sent to that firm over any firm lines configured to receive single orders except when the order is fully executed. Refer to section Order Message Format (PHLX -> Firm) for the format of the Order message.

The sequence number will be incremented for each message sent to each firm (on each line if multiple lines) throughout the day and can be used to help detect message gaps or to request retransmission of a specific message or range of messages. If sending this message is a result of a firm refresh or retransmission request, the firm request id will be echoed back to the firm in every Order message refreshed or retransmitted. For messages not the result of refresh or retransmission request, the firm request id field will be blank.

The order_id… the PHLX assigned alphanumeric order identifier… is uniquely assigned for each order. Please note that the order_id is designed to be unique only across a single day. That is, it is guaranteed to be unique for a given order for a given day only. A GTC order that persists across days may have a different order_id assigned to it on any given day it persists.

3.7 Strategy Message(s) (PHLX -> Firm)

When any complex strategy is added in the system for an underlying that a firm is configured for, a Strategy message containing the strategy definition will be sent to that firm over any firm lines configured to receive the strategies. Refer to section Strategy Message Format (PHLX -> Firm) for the format of the Strategy messages.

3.8 Complex Order Message (PHLX -> Firm)

When a Market or Limit Complex Order is received or any change is made to a complex order for an underlying that a firm is configured for, a Complex Order message containing the order information will be sent to that firm over any firm lines configured to receive orders. Refer to section Complex Order Message Format (PHLX -> Firm) for the format of the Complex Order messages.

The order_id… the PHLX assigned alphanumeric order identifier… is uniquely assigned for each order. Please note that the order_id is designed to be unique only across a single day. That is, it is guaranteed to be unique for a given order for a given day only. A GTC order that persists across days may have a different order_id assigned to it on any given day it persists.

3.9 Complex Order Live Auction (COLA) Notification Message (PHLX -> Firm)

When a Complex Order Live Auction starts for a strategy of an underlying that a firm is configured for, a COLA notification message containing the auction information will be sent to that firm over any firm lines configured to receive orders. Refer to section COLA Notification Message Format (PHLX -> Firm) for the format of the COLA Notification message.

3.10 Single Book Refresh Request Message(s) (Firm -> PHLX)

The PHLX SOF System will accept requests from the Firm/Line to update the single book for a symbol, root, underlying or all underlyings for which the firm is currently configured. The firm may request a symbol, root, underlying or all underlyings for which the firm is configured. Upon receiving the Single Book Refresh Request from the firm, the PHLX SOF System will send the messages out in refresh mode (“R” in send state) on the same line the request was received. A seven-character firm request id in the request will be echoed back by SOF in the response and in each Book message generated by the request. Multiple records will be put in each message. Refer to section Book Refresh Request Message (Firm -> PHLX) for the format of the Book Refresh Request message. If a refresh is required while the real-time data flow is in progress, any queued real-time data will first be sent. Then real-time data that occurs while processing the refresh will be queued until the refresh is complete and then will be sent. This may cause the queued real-time data sent immediately after the refresh to be data that was already reflected in the refresh. Refresh requests will be denied during any time a retransmission is in progress.

3.11 Book Refresh Response Message(s) (PHLX -> Firm)

The Book Refresh Response message will be sent by PHLX to the firm to indicate whether there was any error processing the Book Refresh Request message. Refer to section Book Refresh Response Message Format (PHLX -> Firm) for the format of the Book Refresh Response message.

3.12 Single Order Refresh Request Message (Firm -> PHLX)

The PHLX SOF System will accept requests from the Firm/Line to refresh all currently open single orders for a symbol, root, underlying or all underlyings for which the firm is currently configured. Order messages will be sent out in the same format as the Firm/Line is configured for real-time messages.

The firm may request a symbol, root, underlying or all underlyings for which the firm is configured. Upon receiving the Refresh Request from the firm, the PHLX SOF System will send the messages out in refresh mode ("R" in send state) on the same line the request was received. A seven-character firm request id in the request will be echoed back by SOF in the response and in each Single Order message generated by the request. Multiple records will be put in each message. Refer to section Single Order Refresh Request Message (Firm -> PHLX) for the format of the Refresh Request message. If a refresh is required while the real-time data flow is in progress, any queued real-time data will first be sent. Then real-time data that occurs while processing the refresh will be queued until the refresh is complete and then will be sent. This may cause the queued real-time data sent immediately after the refresh to be data that was already reflected in the refresh. Refresh requests will be denied during any time a retransmission is in progress.

3.13 Single Order Refresh Response Message (PHLX -> Firm)

The Order Refresh Response message will be sent by PHLX to the firm to indicate whether there was any error processing the Order Refresh Request message. Refer to section Single Order Refresh Response Message Format (PHLX -> Firm) for the format of the Order Refresh Response message.

3.14 Strategy Refresh Request Message (Firm -> PHLX)

The PHLX SOF System will accept requests from the Firm/Line to refresh currently trading strategies for a requested underlying or all underlyings for which the firm is currently configured. Strategy messages will be sent out in the same format as the Firm/Line is configured for real-time messages.

The firm may request a strategy for underlying or all underlyings for which the firm is configured. Upon receiving the Refresh Request from the firm, the PHLX SOF System will send the messages out in refresh mode ("R" in send state) on the same line the request was received. A seven-character firm request id in the request will be echoed back by SOF in the response and in each Strategy message generated by the request. Multiple records will be put in each message. Refer to section Strategy Refresh Request Message (Firm -> PHLX) for the format of the Refresh Request message. If a refresh is required while the real-time data flow is in progress, any queued real-time data will first be sent. Then real-time data that occurs while processing the refresh will be queued until the refresh is complete and then will be sent. This may cause the queued real-time data sent immediately after the refresh to be data that was already reflected in the refresh. Refresh requests will be denied during any time a retransmission is in progress.

3.15 Strategy Refresh Response Message (PHLX -> Firm)

The Strategy Refresh Response message will be sent by PHLX to the firm to indicate whether there was any error processing the Strategy Refresh Request message. Refer to section Strategy Refresh Response Message Format (PHLX -> Firm) for the format of the Strategy Refresh Response message.

3.16 Complex Order Refresh Request Message (Firm -> PHLX)

The PHLX SOF System will accept requests from the Firm/Line to refresh currently open complex orders for a strategy, an underlying or all underlyings for which the firm is currently configured. Strategy messages will be sent out in the same format as the Firm/Line is configured for real-time messages.

The firm may request open complex orders for a strategy, underlying or all underlyings for which the firm is configured. Upon receiving the Refresh Request from the firm, the PHLX SOF System will send the messages out in refresh mode (“R” in send state) on the same line the request was received. A seven-character firm request id in the request will be echoed back by SOF in the response and in each complex order message generated by the request. Multiple records will be put in each message. Refer to section Complex Order Refresh Message for the format of the Refresh Request message. If a refresh is required while the real-time data flow is in progress, any queued real-time data will first be sent. Then real-time data that occurs while processing the refresh will be queued until the refresh is complete and then will be sent. This may cause the queued real-time data sent immediately after the refresh to be data that was already reflected in the refresh. Refresh requests will be denied during any time a retransmission is in progress.

3.17 Complex Order Refresh Response Message (PHLX -> Firm)

The Complex Order Refresh Response message will be sent by PHLX to the firm to indicate whether there was any error processing the Complex Order Refresh Request message.

Refer to section Complex Order Refresh Message for the format of the Complex Order Refresh Response message.

3.18 Retransmit Request Message (Firm -> PHLX)

The PHLX SOF System will accept requests from the firm to have messages retransmitted. The three choices for retransmission will be: All messages or a Range of messages. Upon receiving the Retransmission Request from the firm, the PHLX SOF System will send the messages out in retransmission mode ("T" in send state) on the same line the request was received. Messages will be sent exactly as they were originally sent with the original sequence number. If a retransmission is requested while the real-time data flow is in progress, real-time data will be queued until the retransmission is complete and then sent. No retransmission request will be accepted while any previous retransmission is in progress. A seven-character firm request id in the request will be echoed back by SOF in the response. Refer to section Retransmit Request Message (Firm -> PHLX) for the format of the Retransmission Request message.

3.19 Retransmit Response Message (PHLX -> Firm)

The Retransmit Response message will be sent by PHLX to the firm to indicate if there was any error processing the Retransmit Request message. Refer to section Retransmit Response Message Format (PHLX -> Firm) for the format of the Retransmit Response message.

3.20 Heartbeat Message (PHLX -> Firm -> PHLX)

The Heartbeat Message will only be sent by PHLX when no messages have been received or sent on a logical connection for a specified interval. The interval is controlled by PHLX. Upon receipt of a Heartbeat Message, the firm should immediately send the message back to PHLX. Refer to section Heartbeat Message Format (PHLX -> Firm -> PHLX) for the format of the Heartbeat message.

3.21 Error Message (PHLX -> Firm)

The Error Message is sent to the firm by SOF if the firm sends an invalid value in msg_type. Refer to section Error Message Format (PHLX -> Firm) for the format of the Error message.

4 FIRM INFORMATION

PHLX will require the following information from each participating firm:

- The IP address which identifies PHLX on their network. PHLX will then assign a port number on that address for the firm.
- A list of underlying for which the firm would like to receive real-time information.

- For each logical line, the messages that the firm is authorized to receive.

5 MESSAGE FORMATS

5.1 Start/Stop Transmission Message

5.1.1 Start/Stop Transmission Request Message Format (Firm -> PHLX)

The Start Transmission Request Message must be sent by the firm **for each line** at the start of each day to notify PHLX that the Firm/Line is ready to receive messages. The Stop Transmission Request Message may be sent by the firm at any time to stop PHLX from sending more messages until the Start Transmission Request Message is sent again. This could be used if the firm is having problems and would prefer PHLX to queue the messages until the firm is ready to receive messages again.

Field Name	Len	Value	Source/Description
msg_type	3	050 or 051	Start (050) or Stop (051) Transmission Request Type
Firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
Firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
end_msg_id	1	Hex character 03	ETX (End of text)

5.1.2 Start/Stop Transmission Response Message Format (PHLX -> Firm)

The Start or Stop Transmission Response message will be sent by PHLX to the firm to acknowledge that SOF successfully received the Start or Stop Transmission message. If there was any error processing the Request message, SOF will return an error code in the Response message.

Field Name	Len	Value	Source / Description
msg_type	3	150 or 151	Start (150) or Stop (151) Transmission Response Message
Firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
Firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
error_code	2	00 - 03, 09, 10	00 = No Error 01 = Invalid Firm ID 02 = Invalid Format 03 = System Unavailable 09 = Real-Time Feed Already Started 10 = Real-Time Feed Already Stopped
End_msg_id	1	Hex character 03	ETX (End of text)

5.2 Single Book Message

5.2.1 Single Book Message Format (PHLX -> Firm)

If the Firm/Line is configured to receive book updates, this message is sent by PHLX to the firm each time that top of the single order book is updated for one of the firm's configured symbols.

[Header][Data][end_msg_id]

Header:

Field Name	Len	Value	Source / Description
Msg_type	3	154	Book Message Type
Firm_id	4	PHLX assigned code	Unique Firm Identifier
Msg_id	7	0000001 to 9999999	Sequence number identifier for ACK.
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
Firm_request_id	7	Alpha-numeric	Request identifier from the firm refresh or retransmission request. If message is not the result of a refresh or retransmission request, the field is blank.
send_state	1	S, T or R	Indicates if this is the original send (S), a re-transmission message (T) or a refresh message (R)

Data:

[number_of_records][more_to_follow_flag][record_1][record_2][…][record_n]

number_of_records	2	01 to 99	Number of records in this message. Each record starts with security_symbol and ends with 20 character filler.
more_to_follow_flag	1	Y/N	Value ‘Y’ indicates more messages will follow that are included in a refresh. Otherwise, the value will always be ‘N’. Retransmissions will have original content.

record_n:

security_symbol	5	XXXXX	Security Symbol - left justified, space filled.
Year	4	0000 to 9999	Option Year
Month	3	JAN, FEB, MAR, ...	Option Month
Day	2	01,02, ...31	Option Day
option_type	1	C or P	Option Type, Call (C) or Put (P)
Strike	10	WWWWW.FFFF	Option Strike Price WWWWW = whole dollars FFFF = decimal format
Filler	1	<space>	Blank field
buy_or_sell_side	1	B or S	Indicates whether the book change is to the buy side or the sell side.

book_price	10	WWWWW.FFFF	The book change is to this price. WWWWW = whole dollars FFFF = decimal format Value will be zero if book becomes empty for this symbol.
total_volume	8	00000000 to 99999999	Total open volume in the book at this price and the side.

end_msg_id:

end_msg_id	1	Hex character 03	ETX (End of text)

5.3 Single Order Message

5.3.1 Single Order Message Format (PHLX -> Firm)

If the Firm/Line is configured to receive orders, this message is sent by PHLX to the firm each time a single order is received for one of the firm's configured symbols.

[Header][Data][end_msg_id]

Header:

Field Name	Len	Value	Source / Description
msg_type	3	124	Order Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
msg_id	7	0000001 to 9999999	Sequence number identifier for ACK.
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp

firm_request_id	7	Alpha-numeric	Request identifier from the firm refresh or retransmission request. If message is not the result of a refresh or retransmission request, the field is blank.
send_state	1	S, T or R	Indicates if this is the original send (S), a re-transmission message (T) or a refresh message (R)

Data:

[number_of_records][more_to_follow_flag][record_1][record_2][…][record_n]

Number_of_msgs	2	01 to 99	Number of records in this message. Each record starts with security_symbol and ends with covered_ind.
more_to_follow_flag	1	Y/N	Value 'Y' indicates more messages will follow that are included in a refresh. Otherwise, the value will always be 'N'. Retransmissions will have original content.

record_n:

security_symbol	5	XXXXX	Security Symbol - left justified, space filled.
Year	4	0000 to 9999	Option Year

Month	3	JAN, FEB, MAR, ...	Option Month
Day	2	01,02, ...31	Option Day
Option_type	1	C or P	Option Type, Call (C) or Put (P)
Strike_price	10	WWWWW.FFFF	Option Strike Price WWWWW = whole dollars FFFF = decimal format
buy_or_sell_side	1	B or S	Indicates whether order is a buy or sell order.
order_id	5	XXXXX	PHLX assigned alphanumeric order id
original_order_volume	7	0000000 to 9999999	Original Order Volume for this order
open_order_volume	7	0000000 to 9999999	Open Order Volume for this order
Cancelled_volume	7	0000000 to 9999999	Cancelled Volume for this order For XL II this volume will be zero.
executed_order_volume	7	0000000 to 9999999	Executed Order Volume for this order For XL II this volume will be zero.
Marked_for_execution_volume	7	0000000 to 9999999	Order volume that is marked for execution, hence ineligible for posting. For XL II this volume will be zero.

order_received_date_time	14	CCYYMMDDHHMMSS	Date/Time order was received
order_status	1	O, F, C, D, R	Indicates the current status of the order O = Open F = Filled C = Cancelled D = Deleted R = Rejected
order_type	1	M, L, S, X	Indicates the type of order M = Market L = Limit S = Stop X = Stop Limit
market_qualifier	1	<space>, O	Indicates if Market order is for opening. <space> = Neither O = Opening Used for Market orders only. Otherwise, the field should be blank.
Reinstatement_count	5	NNNNN, right justified padded with zeros	Incremented if the order was traded and has been reinstated
pending_flag	1	<space> or C	Indicates whether there is a cancel pending on this order (C) or not (<space>) Will be space filled at a future date.
Limit_price	10	WWWWW.FFFF	Limit Price, filled in if order is a limit or stop limit order, otherwise zeroes. WWWWW = whole dollars FFFF = decimal format

Stop_price	1 0	WWWWW.FFFF	Stop Price, filled in if order is a stop or stop limit order, otherwise zeroes. WWWWW = whole dollars FFFF = decimal format
all_or_none_ind	1	Y/N	Indicates whether the order is an all or none order
Time_in_force_ind	1	D, G, or I	Indicates whether this is a day order, good till cancelled (GTC), or immediate or cancel (IOC)
Open_close_ind	1	O, C or <space>	Indicates whether this order opens or closes a position
customer_firm_ind	1	C, F, M, B or <space>	Indicates whether this is a C = Customer order (includes Professional Customer Orders) F = Firm order M = On-floor Market maker order B = Broker Dealer order
linkage_type_ind	1	A, P, S or <space>	Indicates whether this is a A = Linkage Principal As Agent Order P = Linkage Principal Order S = Linkage Satisfaction Order <space> = Not a Linkage Order Will be space filled at a future date. **NOTE**: As of 10/02/09 this field will be unconditionally space field and should not be used as an indicator of a linkage order type.

linkage_exchange	1	A,B,C,I,P,X,Q,N or <space>	Indicates whether this linkage or off-floor Market Maker order is from A = AMEX B = BOX C = CBOE I = ISE P = Pacific (see **NOTE** below) N = NYSE (see **NOTE** below) Q = NASDAQ X = PHLX <space> = Not a Linkage Order Will be space filled at a future date. **NOTE**: As of 10/02/09 this field will be unconditionally space field and should not be used as an indicator of a linkage or off-floor market maker order.
covered_ind	1	C or U <space>	Indicates whether this order is covered or uncovered. For XL II, this will be a space.

market_maker_number	5	XXXXX or <spaces>	PHLX Market Maker badge number or spaces Will be space filled at a future date
market_maker_suffix	1	X or <space>	PHLX Market Maker suffix or space Will be space filled at a future date
filler	1	Y/N	filler for future use
Multi_account	5	XXXXX or <spaces> Left justified padded with spaces	Account ID for a BD off floor market maker order or linkage order Will be space filled at a future date
Filler	2 0	<space>	Blank field

end_msg_id:

end_msg_id	1	Hex character 03	ETX (End of text)

5.4 Strategy Message

5.4.1 Strategy Message Format (PHLX -> Firm)

If the Firm/Line is configured to receive Strategy definition messages, this message is sent by PHLX to the firm each time a new strategy is created for one of the firm's configured symbols.

[Header][Data][end_msg_id]

Header:

Field Name	Len	Value	Source / Description
msg_type	3	180	Strategy Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
msg_id	7	0000001 to 9999999	Sequence number identifier for ACK.
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier from the firm refresh or retransmission request. If message is not the result of a refresh or retransmission request, the field is blank.
Send_state	1	S, T or R	Indicates if this is the original send (S), a re-transmission message (T) or a refresh message (R)

Data:

[number_of_records][more_to_follow_flag][record_1][record_2][…][record_n]

Number_of_msgs	2	01 to 99	Number of records in this message. Each record starts with Strategy_id and ends with Leg_ratio
More_to_follow_flag	1	Y/N	Value ‘Y’ indicates more messages will follow that are included in a refresh. Otherwise, the value will always be ‘N’. Retransmissions will have

			original content.

record_n:

Strategy_id		6	A-Z,0-9	PHLX Strategy Id is assigned daily and is valid till the life of last open complex order existing for the strategy for a given day.
Und		*5*	A..Z, 0-9	Underlying Symbol for strategy. Each leg of the strategy belongs to same underlying
Action		1	A, D	Strategy state as following: 'A' = Add, 'D' = Delete
Num_legs		2	00-99	Number of legs in the strategy
Leg Info (Gets repeated times the value of num_legs)	security_symbol	5	A..Z, 0-9	Security Symbol - left justified, space filled.
	month_code	1	A..X	Standard Expiration Month Code (will become space-filled for an option that has been converted to symbology)
	strike_code	1	A..Z	Standard Strike Price Code (will become space-filled for an option that has been converted to symbology)
	year	4	0000 to 9999	Option Year

	month	3	JAN, FEB, ...	Option Month
	day	2	01, 02, ... 31	Option Day
	option_type	1	C or P	Option Type, Call (C) or Put (P)
	strike	10	WWWWW.FFFF	Option Strike Price WWWWW = whole dollars FFFF = decimal format
	buy_or_sell_side	1	B or S	Indicates whether the leg is a buy or sell in this strategy.
	Leg_ratio	6	000001-999999	Strategy Leg Ratio

end_msg_id:

end_msg_id	1	Hex character 03	ETX (End of text)

NOTE: When action=D, do not use the canonical information in the message due to the fact that this could be different than the canonical specified in the message that was sent earlier with action=A.

5.5 Complex Order Message

5.5.1 Complex Order Message Format (PHLX -> Firm)

If the Firm/Line is configured to receive complex orders, this message is sent by PHLX to the firm each time a complex order is received for one of the firm's configured symbols.

[Header][Data][end_msg_id]

Header:

Field Name	Len	Value	Source / Description
msg_type	3	181	Order Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
msg_id	7	0000001 to 9999999	Sequence number identifier for ACK.
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier from the firm refresh or retransmission request. If message is not the result of a refresh or retransmission request, the field is blank.
send_state	1	S, T or R	Indicates if this is the original send (S), a re-transmission message (T) or a refresh message (R)

Data:

[number_of_records][more_to_follow_flag][record_1][record_2][…][record_n]

Number_of_msgs	2	01 to 99	Number of records in this message. Each record starts with root_symbol and ends with covered_ind.
more_to_follow_flag	1	Y/N	Value 'Y' indicates more messages will follow that are included in a refresh. Otherwise, the value will always be 'N'. Retransmissions will have

			original content.

record_n:

Strategy_id	6	XXXXXX	PHLX assigned Id of the strategy for which the complex order is received.
buy_or_sell_side	1	B, S or *	Indicates whether order is a buy or sell side for the strategy. This field will be masked with * for new Complex Orders that initiated a COLA.
Order_id	6	XXXXXX	PHLX assigned alphanumeric order id
original_order_volume	7	0000001 to 9999999	Original Order Volume for this order
open_order_volume	7	0000000 to 9999999	Open Order Volume for this order
Cancelled_volume	7	0000000 to 9999999	Cancelled Volume for this order. For XL II this volume will be zero.
executed_order_volume	7	0000000 to 9999999	Executed Order Volume for this order. For XL II this volume will be zero.
order_received_date_time	1 4	CCYYMMDDHHMMSS	Date/Time order was received

order_status	1	O, F, C, D, R	Indicates the current status of the order O = Open F = Filled C = Cancelled D = Deleted R = Rejected
order_type	1	M, L or *	Indicates the type of order M = Market L = Limit This field will be masked with * for new Complex Orders that initiated a COLA.
Reinstatement_count	5	NNNNN, right justified padded with zeros	Incremented if the order was traded and has been reinstated
pending_flag	1	<space> or C	Indicates whether there is a cancel pending on this order © or not (<space>) Will be space filled at a future date.
Limit_price	1 0	WWWWW.FFFF or **********	Limit Price of the order. WWWWW = whole dollars FFFF = decimal format. This field will be masked with *s for new Complex Orders that initiated a COLA.
debit_or_credit	1	D, C , ‘ ‘ or *	Indicates whether the price is net debit, net credit or even. This field will be masked with * for new Complex Orders that initiated a COLA.

all_or_none_ind	1	Y/N	Indicates whether the order is an all or none order
Time_in_force_ind	1	D, G, or I	Indicates whether this is a day order, good till cancelled (GTC), or immediate or cancel (IOC)
customer_firm_ind	1	C, F, M, B or <space>	Indicates whether this is a C = Customer order (includes Professional Customer Orders) F = Firm order M = On-floor Market maker order B = Broker Dealer order.
market_maker_number	5	XXXXX or <spaces>	PHLX Market Maker badge number or spaces Will be space filled at a future date.
market_maker_suffix	1	X or <space>	PHLX Market Maker suffix or space Will be space filled at a future date.
Multi_account	5	XXXXX or <spaces> Left justified padded with spaces	Account ID for a BD off floor market maker order or linkage order Will be space filled at a future date.

market_id	1	A,B,C,I,X,N,Q,P or <space>	Indicates whether off-floor Market Maker order is from A = AMEX B = BOX C = CBOE I = ISE P = Pacific (see **NOTE** below) N = NYSE Q = NASDAQ X = PHLX <space> = Not an off-floor MM Order Will be space filled at a future date. 10/02/09 this field will be unconditionally space field and should not be used as an indicator of an off-floor market maker order.
cnbbo_protection	1	‘T’, ‘F’	‘T = True (cNBBO Protection) ‘F’ = False (No cNBBO Protection) Indicate if order is allowed to trade thru complex NBBO.
Num_legs	2	02-99	Number of legs in the strategy

Leg Info (Gets repeated times the value of num_legs)	Open_close_ind	1	O, C or <space>	Indicates whether this order opens or closes a position for leg.

end_msg_id:

end_msg_id	1	Hex character 03	ETX (End of text)

5.6 COLA Notification Message

5.6.1 COLA Notification Message Format (PHLX -> Firm)

If the Firm/Line is configured to receive Complex order strategy auction notifications, this message is sent by PHLX to the firm each time an auction is started for a strategy for one of the firm's configured symbols.

[Header][Data][end_msg_id]

Header:

Field Name	Len	Value	Source / Description
msg_type	3	182	Order Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
msg_id	7	0000001 to 9999999	Sequence number identifier for ACK.
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier from the firm refresh or retransmission request. If message is not the result of a refresh or retransmission request, the field is blank.
Send_state	1	S or T	Indicates if this is the original send (S), a re-transmission message (T)

Data:

[number_of_records][more_to_follow_flag][record_1][record_2][…][record_n]

Number_of_msgs	2	01 to 99	Number of records in this message. Each record starts with strategy_id and ends with volume.
More_to_follow_flag	1	Y/N	Value ‘Y’ indicates more messages will follow that are included in a refresh. Otherwise, the value will always be ‘N’. Retransmissions will have original content.

record_n:

Strategy_id	6	A-Z,0-9	PHLX assigned Id of strategy for which the COLA is started.
Price	1 0	WWWWW.FFFF or **********	Price at which COLA is started WWWWW = whole dollars FFFF = decimal format. This field will be masked with *s for COLA that was initiated due to new Complex orders.
buy_or_sell_side	1	B, S or *	Indicates whether the auction is for a buy or sell side. This field will be masked with * for COLA that was initiated due to new Complex orders.

debit_or_credit	1	D, C, ‘ ‘, *	Indicates whether the price is net debit, net credit or even. This field will be masked with * for COLA that was initiated due to new Complex orders.
Volume	8	00000001 to 99999999	Total volume available in COLA

end_msg_id:

end_msg_id	1	Hex character 03	ETX (End of text)

5.7 Single Book Refresh Message

5.7.1 Single Book Refresh Request Message (Firm -> PHLX)

The Single Book Refresh Request Message is sent by the firm to PHLX whenever a Single Book refresh is needed by the firm. Refresh can be for a security_symbol, underlying, or all underlyings for which the firm is configured. If underlying is specified, only roots associated with that underlying will be sent, not necessarily all the roots for that product. PHLX will reply first with a Book Refresh Response Message and then with Book messages described above. If the Single Book Refresh Response Message is not received within 30 seconds, the firm should resend the Single Book Refresh Request Message.

Field Name	Len	Value	Source / Description
msg_type	3	055	Book Refresh Request Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp

firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
which_book	1	0, 1, 2, 3 and 4	Indicates which Book to refresh. 0 = All Books 1 = ONLY Limit Book 2 = AON 3 = MM 4 = BD
Filler	1	<space>	Blank field
security_or_underlying_flag	1	S or U	Indicates whether next field is a security symbol (formerly Root) or an underlying
security_or_underlying	5	XXXXX, *	Security symbol or Underlying, * = all underlyings for which the firm is configured. If * is chosen, then security_or_underlying_flag field should be U. Left justified, space filled.
end_msg_ind	1	Hex character 03	ETX (End of text)

5.7.2 Single Book Refresh Response Message Format (PHLX -> Firm)

The Book Refresh Response message will be sent by PHLX to the firm to indicate if there was any error processing the Book Refresh Request message.

Field Name	Len	Value	Source / Description
msg_type	3	162	Book Refresh Response Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
error_code	2	00 – 05, 07	00 = No Error 01 = Invalid Firm ID 02 = Invalid Format 03 = System Unavailable 04 = Invalid Underlying/Symbol 05 = Not Configured for Book Refresh 07 = No Book Messages to Refresh
end_msg_id	1	Hex character 03	ETX (End of text)

5.8 Single Order Refresh Message

5.8.1 Single Order Refresh Request Message (Firm -> PHLX)

The Single Order Refresh Request Message is sent by the firm to PHLX whenever a refresh of all currently open orders is needed by the firm. Refresh can be for a security_symbol, underlying, or all underlyings for which the firm is configured. If underlying is specified, only roots associated with that underlying will be sent, not necessarily all the roots for that product. PHLX will reply first with a Single Order Refresh Response Message and then with Single Order messages described above. If the Single Order Refresh Response Message is not received within 30 seconds, the firm should resend the Single Order Refresh Request Message.

Field Name	Len	Value	Source / Description
msg_type	3	056	Order Refresh Request Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
security_or_underlying_flag	1	S or U	Indicates whether next field is a security symbol (formerly Root)or an underlying
security_or_underlying	5	XXXXX, *	Security symbol or Underlying, * = all underlyings for which the firm is configured. If * is chosen, then secuirity_or_underlying_flag field should be U. Left justified, space filled.

end_msg_ind	1	Hex character 03	ETX (End of text)

5.8.2 Order Refresh Response Message Format (PHLX -> Firm)

The Order Refresh Response message will be sent by PHLX to the firm to indicate if there was any error processing the Order Refresh Request message.

Field Name	Len	Value	Source / Description
msg_type	3	163	Order Refresh Response Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
error_code	2	00 – 04, 06, 07	00 = No Error 01 = Invalid Firm ID 02 = Invalid Format 03 = System Unavailable 04 = Invalid Underlying/Symbol 06 = Not Configured for Order Refresh 07 = No Orders to Refresh
end_msg_id	1	Hex character 03	ETX (End of text)

5.9 Strategy Refresh Message

5.9.1 Strategy Refresh Request Message (Firm -> PHLX)

The Strategy Refresh Request Message is sent by the firm to PHLX whenever a refresh of strategies is needed by the firm. Refresh can be for a strategy, underlying or all underlyings for which the firm is configured. If underlying is specified, only strategies associated with that underlying will be sent. PHLX will reply first with a Strategy Refresh Response Message and then with Strategy messages described above. If the Strategy Refresh Response Message is not received within 30 seconds, the firm should resend the Strategy Refresh Request Message.

Field Name	Len	Value	Source / Description
msg_type	3	067	Strategy Refresh Request Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
underlying_strategy_flag	1	U or S	Indicates whether next field is a strategy or an underlying U = Underlying S = Strategy
underlying_or_strategy	6	XXXXXX, *	Underlying, * = all underlyings for which the firm is configured. If * is chosen, then underlying_or_ strategy flag field should be U. Left justified, space filled.

end_msg_ind	1	Hex character 03	ETX (End of text)

5.9.2 Strategy Refresh Response Message Format (PHLX -> Firm)

The Strategy Refresh Response message will be sent by PHLX to the firm to indicate if there was any error processing the Strategy Refresh Request message.

Field Name	Len	Value	Source / Description
msg_type	3	167	Strategy Refresh Response Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
error_code	2	00 – 04, 07, 12	00 = No Error 01 = Invalid Firm ID 02 = Invalid Format 03 = System Unavailable 04 = Invalid Underlying/Strategy 07 = No Strategies to Refresh 12 = Not Configured for Strategy Refresh
end_msg_id	1	Hex character 03	ETX (End of text)

5.10 Complex Order Refresh Message

5.10.1 Complex Order Refresh Request Message (Firm -> PHLX)

The Complex Order Refresh Request Message is sent by the firm to PHLX whenever a refresh of all currently open complex orders is needed by the firm. Refresh for complex orders can be for a strategy, underlying, or all underlyings for which the firm is configured. If underlying is specified, only complex orders associated with that underlying will be sent. PHLX will reply first with a Complex Order Refresh Response Message and then with Complex Order messages described above. If the Complex Order Refresh Response Message is not received within 30 seconds, the firm should resend the Complex Order Refresh Request Message.

Field Name	Len	Value	Source / Description
msg_type	3	068	Order Refresh Request Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
Sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
strategy_or_underlying_flag	1	S or U	Indicates whether next field is a root or an underlying
strategy_or_underlying	6	XXXXXX, *	Strategy or Underlying, * = all underlyings for which the firm is configured. If * is chosen, then strategy_or_underlying_flag field should be U. Left justified, space filled.
end_msg_ind	1	Hex character 03	ETX (End of text)

5.10.2 Complex Order Refresh Response Message Format (PHLX -> Firm)

The Complex Order Refresh Response message will be sent by PHLX to the firm to indicate if there was any error processing the Complex Order Refresh Request message.

Field Name	Len	Value	Source / Description
msg_type	3	168	Order Refresh Response Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
error_code	2	00 – 04, 07,11	00 = No Error 01 = Invalid Firm ID 02 = Invalid Format 03 = System Unavailable 04 = Invalid Underlying/Strategy 07 = No Complex Orders to Refresh 11 = Not Configured for Complex Order Refresh
end_msg_id	1	Hex character 03	ETX (End of text)

5.11 Retransmit Message

5.11.1 Retransmit Request Message (Firm -> PHLX)

The Retransmit Request Message is sent by the firm to PHLX whenever retransmission of previous Book and/or Order messages is needed by the firm. PHLX will reply with the original Book and Order messages with their original message ids.

Field Name	**Len**	**Value**	**Source / Description**
msg_type	3	064	Retransmit Request Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
retransmit_type	1	A or R	Indicates whether retransmission will be for All Messages Today (A) or a Range of Messages (R)
range_start	7	0000000 to 9999999	Starting value for range. Must be filled in if retransmit_type is range. Otherwise, this field should be zeroes.
range_end	7	0000000 to 9999999	Ending value for range. Must be filled in if retransmit_type is range. Otherwise, this field should be zeroes.
end_msg_ind	1	Hex character 03	ETX (End of text)

5.11.2 Retransmit Response Message Format (PHLX -> Firm)

The Retransmit Response message will be sent by PHLX to the firm to indicate if there was any error processing the Retransmit Request message.

Field Name	Len	Value	Source / Description
msg_type	3	164	Retransmit Response Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
firm_request_id	7	Alpha-numeric	Request identifier echoed by SOF in the response
error_code	2	00 – 03, 07, 08	00 = No Error 01 = Invalid Firm ID 02 = Invalid Format 03 = System Unavailable 07 = No Messages to Retransmit 08 = Invalid Msg Range
end_msg_id	1	Hex character 03	ETX (End of text)

5.12 Heartbeat Message Format (PHLX -> Firm -> PHLX)

The Heartbeat Message will only be sent by PHLX, when no messages have been received or sent on a logical connection for a specified interval. The interval is controlled by PHLX. Upon receipt of a Heartbeat Message, the firm should immediately send the message back to PHLX.

Field Name	Len	Value	Source / Description
msg_type	3	170	Heartbeat Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier

end_msg_ind	1	Hex character 03	ETX (End of text)

5.13 Error Message Format (PHLX -> Firm)

The Error Message is sent to the firm by SOF if the firm sends an invalid value in msg_type or the msg_type is not valid for the message Version that the firm is configured for.

Field Name	Len	Value	Source / Description
msg_type	3	171	Error Message Type
firm_id	4	PHLX assigned code	Unique Firm Identifier
sender_timestamp	14	CCYYMMDDHHMMSS	Date/Timestamp
error_code	2	98, 99	98 = Message Type inconsistent will Message Version configuration 99 = Invalid Message Type
end_msg_id	1	Hex character 03	ETX (End of text)

6 DISASTER/RECOVERY SUPPORT

6.1 Dual SOF Sourcing

The new XL platform has full disaster/recovery capability for SOF.

The connection level message sequencing on each firm line for order messages disseminated from the primary site (Carteret, NJ) will differ from those disseminated from the secondary site (Ashburn, VA).

Firms are advised to connect to the backup site and process the SOF feed sourced from this site in such a manner that it may easily begin using this feed in the event of a failure at the primary site. This would provide the most seamless transition in the event of a failure. The order ID in each order message can be used to reconcile order updates received from both sites.

Firms not previously connected to the backup site, that failover to that site in the event of a failure, will need to request an order refresh once they are connected.

7 VERSION CONTENTS

7.1 Version 1.2

Initial published released.

7.2 Version 1.3

Updated overview for Interim Linkage orders.

Updated wording in section 3.7 – Book Refresh Request Message.

Updated wording in section 3.9 – Order Refresh Request Message.

Updated wording in section 3.11 – Retransmit Request Message.

Updated section 5.3 – Order Message to update time_in_force_ind "I" for immediate or cancel (IOC).

Updated section 5.4 – Order With Customer Information
- Updated time_in_force_ind "I" for immediate or cancel (IOC).
- Updated phlx_quote_conditions to include "I" for inactive and removed condition "A" for Autoex Eligible.
- Updated best_quote_bid_condition to include "N" for no quote and removed condition "A" for Autoex Eligible.
- Updated best_quote_ask_condition to include "N" for no quote and removed condition "A" for Autoex Eligible.

7.3 Version 1.4

Changes to support Market Maker Limit Book.

Updated overview for Market Maker Limit Order Book.

Updated section 3.3 Book Messages for Market Maker Book.

Updated section 3.7 Book Refresh for Market Maker Book.

Updated section 5.2.1 Book Message Format for Market Maker Book.

Updated section 5.2. Book Message Acknowledgement Format for Market Maker Book.

Updated section 5.3.1 Order Message Format to include market_maker_number and market_maker_suffix. Updated customer_firm_ind to include a "M" for a market maker order.

Updated section 5.4.1 Order with Customer Info Message Format to include market_maker_number and market_maker_suffix. Updated customer_firm_ind to include a "M" for a market maker order. Also updated best_quote_bid_market and best_quote_ask_market to include a space for no market.

Updated section 5.5 Book Refresh Message to include which_book field of 3 for ONLY Market Maker Limit Book.

7.4 Version 2.0

Changes to support Broker/Dealer limit book.

Updated section 1 Special Order Feed Overview.

Removed the following:

- **Limit Book Update – Changes to Top of Limit Book ONLY** – Any new entry at the Top of the Limit Book or changes to price or volume at the Top of the Limit Book for either side (buy or sell) – Publish symbol, side, price, and total open volume.
- **AON Limit Book Update – Changes to Top of AON Limit Book ONLY** – Any new entry at the Top of the Limit Book or changes to price or volume at the Top of the Limit Book for either side (buy or sell) – Publish symbol, side, price, and total open volume.
- **Market Maker Limit Book Update – Changes to Top of Market Maker Limit Book ONLY** – Any new entry at the Top of the Limit Book or changes to price or volume at the Top of the Limit Book for either side (buy or sell) – Publish symbol, side, price, and total open volume.

Added:
Broker Dealer Limit Book

- **Broker Dealer Limit Book Update -** Any new entry or changes to price or volume in the Broker Dealer Limit Book for either side – Publish symbol, side, price, and total Market Maker limit open volume.

The firm will be required to determine the Top of Book by using the SOF distribution of the Book and/or Order information.

Updated section 3.3 Book Message(s) (PHILX-> Firm). Added Broker Dealer Limit Book.

Updated section 3.7 Book Refresh Request Message(s) (Firm-> PHLX). Added references to Broker Dealer Limit Book. Removed: Also, the firm may request a Top of Book refresh or a complete refresh.

Updated section 4 FIRM INFORMATION. Added reference to Broker Dealer limit. Removed : and top of book or whole book must be chosen.

Updated section 5.2.1 Book Message Format (PHLX-> Firm). Added reference to Broker Dealer Limit Book(155).
Removed: (or top of book depending on the Firm/Line configuration). Removed: top_of_book_ind field in message. Changed to Filler space.

Updated section 5.2.2 Book Message Acknowledgement Format (Firm -> PHLX). Added reference to Broker Dealer message (055).

Updated section 5.3.1 Order Message Format (PHLX -> Firm). Added to the end of the message internalization field length of 1 value Y/N and filler length of 20. Changed msg_type value from 160 to 120. Added B to customer_firm_ind. Added muti_account field.

Updated section 5.3.2 Order Message Acknowledgement Format (Firm -> PHLX). Changed msg_type value from 060 to 020.

Updated section 5.4.1 Order with Customer Info Message Format (PHLX -> Firm). Changed msg_type value from 161 to 121. Added internalization field length of 1 value of Y/N and filler length of 20. Added muti_account field.

Updated section 5.4.2 Order with Customer Info Message Acknowledgement Format (Firm -> PHLX). Changed msg_type value from 061 to 021.

Updated section 5.5.1 Book Request Message (Firm -> PHLX). Added to which_book value 4, to Description 4 = ONLY Broker Dealer Limit Book. Changed top_of_book_only to filler.

7.5 Version 3.0

Changes to support linkage orders

Updated section 1 to include Linkage Orders

Updated Section 5.3 to add/update the following fields

- New order status rejected for orders
- linkage type indicator
- Marked for execution volume

Updated Section 5.4 to add/update the following fields in addition to the fields in 5.3

- fix order id
- nbbo_bid_markets
- nbbo_ask_markets

Added symbol canonical form fields to Book Refresh and Order Refresh Message Requests.

Changed Values for Message Type field (msg_type) for:

```
message                          V2.0          V3.0
======================================================
order message                    120           122
order_with_cust message          121           123
book refresh request             062           065
order refresh request            063           066
```

7.6 Version 3.0a

Added BOX.

7.7 Version 3.1

Removed support for Multiple Books.

Converted to Standard Format.

Changed the Overview to reflect current functionality

7.8 Version 3.1.1

Removed the following fields because the information is no longer available.

Firm_mnemonic, cmta_supp_no, order_cmta_no, supp_id

7.9 Version 3.1.2

Added NYSE and NASDAQ market exchange ids.

7.10 Version 3.1.3

Remove support of Order Message with customer information format.

7.11 Version 4.0

Added support for Complex Orders, Strategy and COLA messages along with Complex Order and Strategy refresh

Deprecated ACK messages

7.12 Version 5.0

There are two types of change with this release: functionality changes to improve performance and message format changes to support Symbology.

- The new message types for Symbology will not be activated for a firm until it is configured to send and receive Version 5 messages.
- The functionality changes for performance enhancement ***will affect all firms*** regardless of their message version configuration.

Changes in functionality to support Performance improvements:

- Messages will not be queued for firms that are not connected. The messages will be available for retransmission, but firms should always follow a connection with a Refresh Request. Firms will no longer receive previous activity automatically upon connection. See Section 3.2 for details.
- Since messages are stored to disk instead of being sent upon connection, the starting sequence number sent to a firm is likely to be greater than 1. See Section 3.4.

Changes to message formats Version 5 for Symbology (V5.0):

- New message type codes:

message	V3.0	V5.0
order message	122	124
book message	152	154
book refresh request	065	055
order refresh request	066	056

- Added explicit Day field for Order and Book Messages.
- Changed root_or_underlying flags to security_or_underlying and changed field value of "R" to "S"
- Removed deprecated month_code and strike_code fields.
- In Book and Order Refresh requests, deprecated explicit or wildcard use of all Option Series fields except for security symbol or underlying, Refreshes can still be requested for a specific security or underlying, or this field may contain a wild card for all securities or underlyings, but a refresh for a specific Option Series is no longer supported. The following fields are deprecated in refresh requests:
    - month_code
    - stirke_code
    - Year
    - Month
    - Strike_price

- Option_type

7.13 Version 5.0.1,5.0.2

Added comment in the Single Order Message (PHLX->Firm) and Complex Order Message (PHLX->Firm) sections on the order_id uniqueness being limited to the current day only.

Added section on Disaster/Recovery.

Updated contact list info.

Added notes that the Cancelled_volume, executed_order_volume and Marked_for_execution_volume will be zero filled under XL II.

Updated notes for StrategyID assignment and covered_ind will be space under XL II.

7.14 Version 5.0.3

Updated contact list info.

7.15 Version 5.0.3b

Updated customer_firm_ind to include a space as a potential value. This field will continue to be populated according to current functionality.
Updated open_close_ind to include a space as a potential value. This field will continue to be populated according to current functionality.
The following fields in the simple order message will all be space filled at a future date as determined by the exchange: linkage_type_ind, linkage_exchange, covered_ind, market_maker_number, market_maker_suffix, multi-account, pending_flag
The following fields in the complex order message will all be space filled at a future date as determined by the exchange: market_id, market_maker_number, market_maker_suffix, multi-account, pending_flag.

7.16 Version 5.0.3c

Added a notation to the customer value of the customer_firm_ind noting that orders marked as customer also include professional customer orders.

8 Contact List

Role	Department	Contact	Phone	Email
New membership/ Changes to existing membership	Membership Services	Susan Murray	+1 215 496 5322	susan.murray@nasdaqomx.com
Key Functionality/Fees	Sales	NASDAQ OMX Market Sales	+1 800 846 0477	sales@nasdaqomx.com
Operational Issues	Market Operations	System Support	+1 215 496 1571	phlxsystemsupport@nasdaqomx.c om
Functional & Application Message Interface Specification	Financial Automation	Doug Schafer Matt Rotella	+1 215 49 6 5628 +1 215 496 1186	douglas.schafer@nasdaqomx.com matt.rotella@nasdaqomx.com
TCP/IP Connectivity Options	Communication	Frank Ziegler	+1 215 496 6745	frank.ziegler@nasdaqomx.com
Establish Network Connection Firewall Configuration	Subscriber Services	Subscriber Services	+1 212 231 5180	subscriber@nasdaqomx.com
Schedule Testing	Subscriber Services	Subscriber Services	+1 212 231 5180	subscriber@nasdaqomx.com