XDP INTEGRATED FEED CLIENT SPECIFICATION NYSE ARCA INTEGRATED FEED

Version	Date
1.13c	3 November 2014

PREFACE

DOCUMENT HISTORY

The following table provides a description of all changes to this document.

VERSION NO.	DATE	CHANGE DESCRIPTION
1.0a	12/15/10	Initial distribution
1.0b	2/17/11	Changes to Symbol Index Map message and imbalance message Addition of the vendor mapping message
1.0c	2/22/11	Msg type 3, 4, 32 , 33, 34 (Section 3.14, 3.15, 3.17, 3.18, 3.19) compression clarification
1.0d	3/16/11	Page 23: Updated Overview section for the integrated feed Page 24: Added Trading Session Msgtype usage for NYSE/MKT Page 24: Added Trading Session times Pages 25-28: Added 0 reason code Page 28: Added execution message sending rules Page 31-34: Corrected trade conditions format to ASCII Page 35: Clarification on stock summary volume/prices Pages 38-42: addition of imbalance calculation and publication details Page 58: addition of Trading Session msg type processing rules Page 61-62: addition of the symbol sequence number and change to the sequence of messages that appear in a refresh header
1.0e	3/21/11	Addition of the SourceTime seconds to the imbalance msg type
1.0f	3/23/11	Addition of the Ticker Designation field to the FTP symbol mapping file.
1.0g	5/18/11	Correction to the Trading session msg
1.0h	9/10/11	Edited throughout
1.0i	6/17/11	Added note to SecurityStatus field description in Section 3.18 (Security Status Message) concerning which states are valid for NYSE Arca.
1.0j	6/22/11	Updated description of 'Source Time Reference Message'
1.0k	8/08/11	Corrected the MsgType field in Table 45 (Trading Session Change Message Fields) to read '33' instead of '40'
1.1	9/12/11	– Updated Table 38 (Request Response Message Fields) with new value of '9' – Updated Section 1.2.3 (Refresh Functionality) – Removed Delivery Flags '14', '16', '34' and '36' from Table 1 Packet

VERSION NO.	DATE	CHANGE DESCRIPTION
		Header Fields and Table 39 (Retransmission Message Packet Header) – Updated Section 3.13 (Symbol Index Mapping Message) – Updated Section 3.18.1Refresh Header (Msg Type '35') – Changed "Limitation of Generic Requests Time Interval" to "Limitation of Generic Request Age in Seq Nums" in Chapters 4 and 5. – Updated Section 3.17.1 with statement, "No explicit deletes will be sent." – Added Bit Shift values of 0x03, 0x06 and 0x07 to TradeSession field in Sections 2.1.5 (Add Order Message) and 2.1.9 Order Book Add Order Refresh Message)
1.2	9/29/11	– Removed reference to the line handler – Split original spec into two and created a new "XDP Common Client Spec" – Added Refresh Message types – Formatting changes throughout
1.3	11/08/11	Updated description of PBBO Message (Msg Type '104') with statement, "This message is not yet supported; release date to be determined."
1.4	01/11/12	Addition of chapter on Product ID.
1.5	03/16/12	Added a value of '0x04' (No Liquidity added) to the 'LiquidityIndicatorFlag' field in Table 11 (Trade Message Fields).
1.6	04/12/12	Updated the 'ReasonCode' fields in Table 7 (Order Book Modify Message Fields), Table 8 (Order Book Delete Message Fields) and Table 9 (Order Book Execution Message Fields).
1.7	05/21/12	Updated references to NYSE MKT
	08/14/2012	Rebranded with new NYSE Technologies template
1.8	04/08/2013	Addition of ArcaEdge Integrated Feed messages
1.9	05/07/2013	Removal of ArcaEdge Integrated Feed messages. Removal of Add Order Attributed Messages and removal of Add Refresh Order Attributed Messages.
1.10	05/28/2013	Removal of ArcaEdge Integrated Feed Messages. Addition of Add Order Attributed Messaged and Add Refresh Order Attributed Messages.
1.11	06/13/2013	Removal of ReasonCode fields from Execution Message Msg Type '103'
1.12	08/30/2013	Message Type 105 amended to state that total volume could be negative
1.13	09/12/2013	Addition of '9' – Corrected Last Sale Price in Table 11, TradeCond2. Updated the description "I" in Table 11, TradeCon4 to Odd Lot Trade

VERSION NO.	DATE	CHANGE DESCRIPTION
1.13a	10/01/2013	Section 1.5 Trading Sessions: amended all times listed as 4:15pm to 4:00pm
1.13b	03/26/2014	Added note to Attributed Add Order Message and Attributed Add Order Refresh message stating these are future enhancements.
1.13c	11/03/2014	Removed future enhancement notes from Attr Add, Attr Add Refresh Fixed imbalance times Removed references to NYSE & NYSE MKT (these are moving to v 2.0)

REFERENCE MATERIAL

The following lists the associated documents, which either should be read in conjunction with this document or which provide other relevant information for the user:

- SFTI US Technical Specification
- SFTI US Customer Guide
- NYSE Symbology

CONTACT INFORMATION

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FURTHER INFORMATION

For additional information about the product, visit the XDP Integrated Feed Product Page

For updated capacity figures, visit our capacity pages at: http://www.nyxdata.com/capacity

For details of IP addresses, visit our IP address pages at: http://www.nyxdata.com/ipaddresses

For a full glossary, visit: http://www.nyxdata.com/glossary/

CONTENTS

1. XDP INTEGRATED FEED ORDER BOOK INFORMATION

1.1 OVERVIEW

The XDP Integrated feed provides a raw feed of the Exchange's order book for all traded securities. Traders will see the complete depth of book, the Trade messages sent to the CTA, the stock security status, Stock Imbalances and the Matching Engine's view of the NBBO, referred to as the PBBO (Protected Best Bid/Offer). All of the data is sent in the order in which is occurs at the Matching Engine. The data feed uses the push-based publishing model. This means that data will be published based on its availability. Once information is available, it will be published to clients.

1.2 PUBLICATION TIMES

Table 1 Normal Trading Days (all times are EST)

MSGTYPE	DESCRIPTION	NYSE ARCA
100	Add Order Message	4:00am – 8:00pm
107	Order Book Attributed Add Order Message	–
101	Modify Order Message	4:00am – 8:00pm
102	Delete Order Message	4:00am – 8:00pm
103	Execution Message	4:00am – 8:00pm
104	PBBO Quote Message	4:00am – 8:00pm
105	Imbalance Message	8:30am-Stock Open, 3:45pm- 4pm
106	Order Book Add Order Refresh Message	4am – 8pm
108	Order Book Attributed Add Order Refresh Message	–
220	Trade Message	4:00am – 8:00pm
221	Trade Cancel or Bust Message	4:00am – 8:00pm
222	Trade Correction Message	4:00am – 8:00pm
223	Stock Summary Message	4:00am – 8:00pm

Table 2 Early Closing Days (all times are EST)

MSGTYPE	DESCRIPTION	NYSE ARCA
100	Add Order Message	4am – 1pm
107	Order Book Attributed Add Order Message	3:30am – 1:15pm
101	Modify Order Message	4am – 1pm
102	Delete Order Message	4am – 1pm
103	Execution Message	4:00am – 1pm

MSGTYPE	DESCRIPTION	NYSE ARCA
104	PBBO Quote Message	4:00am – 1pm
105	Imbalance Message	8:30am-Stock Open, 12:45pm -1pm
106	Order Book Add Order Refresh Message	4:00am – 1pm
108	Order Book Attributed Add Order Refresh Message	3:30am – 4:15pm
220	Trade Message	4:00am – 1:00pm
221	Trade Cancel or Bust Message	4:00am – 1:00pm
222	Trade Correction Message	4:00am – 1:00pm
223	Stock Summary Message	4:00am – 1:00pm

1.3 CONTROL MESSAGE TYPES

Table 3 Control Message Types used in the Data Feed

MSGTYPE	DESCRIPTION
1	Sequence Number Reset
2	Time Reference Message
3	Symbol Index Mapping
4	Vendor Mapping Message
10	Retransmission Request Message
11	Request Response Message
12	Heartbeat Response Message
13	Symbol Index Mapping Request Message
15	Refresh Request Message
31	Message Unavailable
32	Symbol Clear
33	Trading Session Change
34	Security Status Message
35	Refresh Header Message

1.4 REFRESH MESSAGE TYPES

Table 4 Refresh Message Types used in the Refresh Feed

MSGTYPE	DESCRIPTION
35	Refresh Header Message
3	Symbol Index Mapping
105	Imbalance Message
34	Security Status Message
33	Trading Session Change
104	PBBO Quote Message
106	Order Book Add Order Refresh Message
108	Order Book Attributed Add Order Message

1.5 TRADING SESSIONS

Table 5 Trading Sessions (all times are EST)

SESSION VALUE	DESCRIPTION	NYSE ARCA
0x01	Morning Hours	4:00am – 9:30am
0x02	National Hours	9:30am – 4:00pm 9:30am – 4:00pm (ETFs)
0x04	Late Hours	4:00pm – 8:00pm 4:00pm – 8:00pm (ETFs)

2. ORDER BOOK ADD ORDER MESSAGE – MSG TYPE '100'

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 31 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 100 – Add Order Message
SourceTimeNS	4	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	8	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	12	4	Binary Integer	This field contains the symbol sequence number
OrderID	16	4	Binary Integer	The Order ID identifies a unique order.
Price	20	4	Binary Integer	This field contains the price point. Use the Price scale from the symbol-mapping index.
Volume	24	4	Binary Integer	This field contains the order quantity in shares
Side	28	1	ASCII Character	This field indicates the side of the order Buy/Sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell
OrderIDGTCIndicator	29	1	Binary Integer	This field specifies if Trade Order ID is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order
TradeSession	30	1	Binary Integer	Bit Shift values: ■ 0x01 Ok for morning hours ■ 0x02 Ok for national hours (core) ■ 0x03 OK for morning and core ■ 0x04 Ok for late hours ■ 0x06 OK for core and late ■ 0x07 OK for morning, core, and late

3. ORDER BOOK ATTRIBUTED ADD ORDER MESSAGE – MSG TYPE '107'

NOTE: This message type is left as a future enhancement for the Integrated Feed. The current production Arca Integrated Feed does not send this message type.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	This field indicates the size of the message.
Msg Type	2	2	Binary Integer	This field identifies the type of message. 107 – Attributed Add Order Message
SourceTimeNS	4	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	8	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	12	4	Binary Integer	This field contains the symbol sequence number
OrderID	16	4	Binary Integer	The Order ID identifies a unique order
Price	20	4	Binary Integer	This field contains the price point. Use the Price scale from the symbol-mapping index.
Volume	24	4	Binary Integer	This field contains the order quantity in shares
Side	28	1	ASCII Character	This field indicates the side of the order Buy/Sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell
OrderIDGTCIndicator	29	1	Binary Integer	This field specifies if Trade Order ID is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order
TradeSession	30	1	Binary Integer	Bit Shift values: ■ 0x01 Ok for morning hours ■ 0x02 Ok for national hours (core) ■ 0x03 OK for morning and core ■ 0x04 Ok for late hours ■ 0x06 OK for core and late

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
				■ 0x07 OK for morning, core, and late
FirmID	31	5	Binary Integer	This field provides market participant's firm ID

4. ORDER BOOK MODIFY MESSAGE – MSG TYPE '101'

XDP Integrated feed sends this message when an order in the Order Book is modified. The Order ID refers to the original order sent in the add order message. The following events trigger a modify order message.

- The price of an order changes
- The size of an order changes
- An order is routed to an away market with some shares remaining in the Order Book

Note: If an away market declines a routed order, a Modify Order message is sent to "add" the declined shares back to Order Book.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 31 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 101 – Modify Message
SourceTimeNS	4	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	8	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	12	4	Binary Integer	This field contains the symbol sequence number
OrderID	16	4	Binary Integer	The Order ID identifies a unique order.
Price	20	4	Binary Integer	This field contains the price point. Use the Price scale from the symbol mapping index.
Volume	24	4	Binary Integer	This field contains the order quantity in shares
Side	28	1	ASCII Character	This field indicates the side of the order Buy/sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell
OrderIDGTCIndicator	29	1	Binary Integer	This field specifies if Trade Order ID is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order
ReasonCode	30	1	Binary	Modify Reason:

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
			Integer	■ 5 – Change (lost position in book) ■ 6 – Routed (keep position in book) ■ 7 – Modify Fill keep position

5. ORDER BOOK DELETE MESSAGE – MSG TYPE '102'

XDP Integrated feed sends this message when an order is taken off of the order book. The following events will trigger the transmission of a delete order message:

- An order is cancelled
- An order expires
- An order is routed to an away market. **Note**: If the away market declines the Matching Engine preference, an Add Order message with the original Order ID will be sent to return the order to the Order Book.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 23 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 102 – Delete Message
SourceTimeNS	4	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	8	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	12	4	Binary Integer	This field contains the symbol sequence number
OrderID	16	4	Binary Integer	The Order ID identifies a unique order.
Side	20	1	ASCII Character	This field indicates the side of the order Buy/sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell
OrderIDGTCIndicator	21	1	Binary Integer	This field specifies if Trade Order ID is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order
ReasonCode	22	1	Binary Integer	Delete Reason: ■ 1 – User Cancel ■ 2 – Modify (taken off book, Order ID may add again) ■ 3 – Delete Filled

6. ORDER BOOK EXECUTION MESSAGE – MSG TYPE '103'

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 34 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 103 – Execution Message
SourceTimeNS	4	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	8	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	12	4	Binary Integer	This field contains the symbol sequence number
OrderID	16	4	Binary Integer	The Order ID identifies a unique order.
Price	20	4	Binary Integer	This field contains the price the order execution price. Use the Price scale from the symbol mapping index.
Volume	24	4	Binary Integer	This field contains the order quantity in shares
OrderIDGTCIndicator	28	1	Binary Integer	This field specifies if executed Order is a GTC order: ■ '0' – Day Order ■ '1'- GTC Order
ReasonCode	29	1	Binary Integer	Default: 0 See Section 6.2 for more information.
TradeID	30	4	Binary Integer	The TradeID identifies a unique transaction in the matching and allows you to correlate execution reports to the last sale.

6.1 MESSAGE SENDING RULES

If the reason codes are set to zero, signifying that this feature has not yet been implemented, then the feed will disseminate the following:

1. In the event an order is partially filled, the data feed will first send an execution message followed by a modify message for the Order ID that has been partially executed.
2. In the event an order is fully executed, the data feed will first send an execution message followed by a delete for the Order ID that has been fully executed.

If the reason codes are not to zero, then the data feed will only send the execution message with the appropriate reason code when a trade occurs

3. In the event an order is partially filled, the execution message will show a reason code value of “7” requiring that the corresponding Order ID should have its volume reduced by the volume amount on the execution message.
4. In the event an order is fully executed, the data feed will send an execution message with a reason code value of “3”. The corresponding Order ID should then be removed from the book since the volume has been fully executed.

7. ORDER BOOK ADD ORDER REFRESH MESSAGE – MSG TYPE '106'

NYSE ARCA Integrated feed sends this message only during a refresh or after a symbol clear which will result in a book refresh.

NOTE: This message type is left as a future enhancement for the Integrated Feed. The current production Arca Integrated Feed does not send this message type.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 35 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 106 – Add Order Refresh Message
SourceTime	4	4	Binary Integer	This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (EPOCH)
SourceTimeNS	8	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	12	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	16	4	Binary Integer	This field contains the symbol sequence number
OrderID	20	4	Binary Integer	The Order ID identifies a unique order.
Price	24	4	Binary Integer	This field contains the price point. Use the Price scale from the symbol-mapping index.
Volume	28	4	Binary Integer	This field contains the order quantity in shares
Side	32	1	ASCII Character	This field indicates the side of the order Buy/sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell
OrderIDGTCIndicator	33	1	Binary Integer	This field specifies if Trade Order ID is a GTC order ■ '0' – Day Order ■ '1'- GTC Order

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
TradeSession	34	1	Binary Integer	Bit Shift values: ■ 0x01 Ok for morning hours ■ 0x02 Ok for national hours (core) ■ 0x03 OK for morning and core ■ 0x04 Ok for late hours ■ 0x06 OK for core and late ■ 0x07 OK for morning, core, and late

8. ORDER BOOK ATTRIBUTED ADD ORDER REFRESH MESSAGE – MSG TYPE '108'

NYSE ARCA Integrated feed sends this message only during a refresh or after a symbol clear which will result in a book refresh.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	This field indicates the size of the message.
Msg Type	2	2	Binary Integer	This field identifies the type of message. 108 – Attributed Add Order Refresh Message
SourceTime	4	4	Binary Integer	This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (EPOCH)
SourceTimeNS	8	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	12	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	16	4	Binary Integer	This field contains the symbol sequence number
OrderID	20	4	Binary Integer	The Order ID identifies a unique order.
Price	24	4	Binary Integer	This field contains the price point. Use the Price scale from the symbol-mapping index.
Volume	28	4	Binary Integer	This field contains the order quantity in shares
Side	32	1	ASCII Character	This field indicates the side of the order Buy/sell. Valid values: ■ 'B' – Buy ■ 'S' – Sell
OrderIDGTCIndicator	33	1	Binary Integer	This field specifies if Trade Order ID is a GTC order ■ '0' – Day Order ■ '1'- GTC Order
TradeSession	34	1	Binary Integer	Bit Shift values: ■ 0x01 Ok for morning hours

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
				■ 0x02 Ok for national hours (core) ■ 0x03 OK for morning and core ■ 0x04 Ok for late hours ■ 0x06 OK for core and late ■ 0x07 OK for morning, core, and late
FirmID	31	5	Binary Integer	This field provides market participant's firm ID

9. TRADE MESSAGE – MSG TYPE ‘220’

The trade messages provided on the NYSE ARCA Trades feed are the same Trade messages provided to the CTA.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 54 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 220 – Trade Message
SourceTime	4	4	Binary Integer	This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH)
SourceTimeNS	8	4	Binary Integer	This field specifies the number represents the nanosecond portion of UTC time (since EPOCH)
SymbolIndex	12	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	16	4	Binary Integer	This field contains the symbol sequence number
TradeID	20	4	Binary Integer	The TradeID identifies a unique transaction in the matching and allows you to correlate execution reports to the last sale.
Price	24	4	Binary Integer	This field specifies the price of the order. Use the Price scale from the symbol mapping index.
Volume	28	4	Binary Integer	Volume of the trade in actual shares
TradeCond1	32	1	ASCII Char	This field contains a settlement related conditions. Valid values: ■ ‘@’ - Regular Sale ■ ‘C’ – Cash ■ ‘N‘– Next Day Trade ■ ‘R’ – Seller
TradeCond2	33	1	ASCII	This field contains a the Reason for Trade Through Exemptions. Valid

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
			Char	values: ■ ‘0x20’ – N/A ■ ‘F’ – Intermarket Sweep Order ■ ‘O’ – Market Center Opening Trade ■ ‘4’ – Derivatively Priced ■ ‘5’ – Market Center Reopening Trade ■ ‘6’ – Market Center Closing Trade ■ ‘9’ – Corrected Last Sale Price
TradeCond3	34	1	ASCII Char	This field contains extended hours/sequencing related conditions. Valid values: ■ ‘0x20’ – N/A ■ ‘L’ – Sold Last ■ ‘T’ – Extended Hours Trade ■ ‘U’ – Extended Hours Sold (Out of Sequence) ■ ‘Z’ – Sold
TradeCond4	35	1	ASCII Char	This field contains the SRO Required Detail. Valid values: ■ ‘@’ - Regular Sale ■ ‘0x20’ – N/A ■ ‘B’ – Average Price Trade ■ ‘E’ – Automatic Execution ■ ‘H’ – Price Variation Trade ■ ‘I’ – Odd Lot Trade ■ ‘M’ – Official Closing Price ■ ‘P’ – Prior Reference Price ■ ‘Q’ – Official Open Price ■ ‘V’ – Stock-Option Trade ■ ‘X’ – Cross Trade
Trade Through Exempt	36	1	ASCII	■ ‘X’ – 611 Trade through Exempt

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
			Char	■ '0x20' – N/A
LiquidityIndicatorFlag	37	1	Binary	This field indicates which side added liquidity to the trade. Bit Shift values: ■ 0x01 Buy Side ■ 0x02 Sell Side ■ 0x04 No Liquidity added
Ask Price	38	4	Binary Integer	This field specifies the Ask price of the last quote at the time of the trade. Use the Price scale from the symbol mapping index.
Ask Volume	42	4	Binary Integer	This field contains the Ask size of the last quote at the time of the trade
Bid Price	46	4	Binary Integer	This field specifies the Bid price of the last quote at the time of the trade. Use the Price scale from the symbol mapping index.
Bid Volume	50	4	Binary Integer	This field contains the Bid size of the last quote at the time of the trade

10. TRADE CANCEL OR BUST MESSAGE – MSG TYPE ‘221’

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 24 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 221 – Trade Cancel or Bust Message
SourceTime	4	4	Binary Integer	This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH)
SourceTimeNS	8	4	Binary Integer	This field specifies the number represents the nanosecond portion of UTC time (since EPOCH)
SymbolIndex	12	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	16	4	Binary Integer	This field contains the symbol sequence number
OriginalTradeID	20	4	Binary Integer	This field is the TradeID of the original trade marked as a correction by this message.

11. TRADE CORRECTION MESSAGE – MSG TYPE ‘222’

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 41 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 222 – Trade Correction Message
SourceTime	4	4	Binary Integer	This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH)
SourceTimeNS	8	4	Binary Integer	This field specifies the number represents the nanosecond portion of UTC time (since EPOCH)
SymbolIndex	12	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	16	4	Binary Integer	This field contains the symbol sequence number
OriginalTradeID	20	4	Binary Integer	This field is the source sequence number of the original trade marked as a correction by this message.
TradeID	24	4	Binary Integer	The LinkID identifies a unique transaction in the matching and allows you to correlate execution reports to the last sale.
Price	28	4	Binary Integer	This field specifies the price of the order. Use the Price scale from the symbol mapping index.
Volume	32	4	Binary Integer	Volume of the trade in actual shares
TradeCond1	36	1	ASCII Char	This field contains a settlement related conditions. Valid values: ■ ‘@’ - Regular Sale ■ ‘C’ – Cash ■ ‘N‘– Next Day Trade ■ ‘R’ – Seller
TradeCond2	37	1	ASCII Char	This field contains a the Reason for Trade Through Exemptions. Valid values:

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
				■ ‘0x20’ – N/A ■ ‘F’ – Intermarket Sweep Order ■ ‘O’ – Market Center Opening Trade ■ ‘4’ – Derivatively Priced ■ ‘5’ – Market Center Reopening Trade ■ ‘6’ – Market Center Closing Trade
TradeCond3	38	1	ASCII Char	This field contains extended hours/sequencing related conditions. Valid values: ■ ‘0x20’ – N/A ■ ‘L’ – Sold Last ■ ‘T’ – Extended Hours Trade ■ ‘U’ – Extended Hours Sold (Out of Sequence) ■ ‘Z’ – Sold
TradeCond4	39	1	ASCII Char	This field contains the SRO Required Detail. Valid values: ■ ‘@’ - Regular Sale ■ ‘0x20’ – N/A ■ ‘B’ – Average Price Trade ■ ‘E’ – Automatic Execution ■ ‘H’ – Price Variation Trade ■ ‘I’ – CAP Election Trade ■ ‘M’ – Official Closing Price ■ ‘P’ – Prior Reference Price ■ ‘Q’ – Official Open Price ■ ‘V’ – Stock-Option Trade ■ ‘X’ – Cross Trade
Trade Through Exempt	40	1	ASCII Char	‘X’ – 611 Trade through Exempt ‘0x20’ – N/A

12. STOCK SUMMARY MESSAGE – MSG TYPE '223'

The stock summary message is sent every one minute on a separate channel from the main trades feed. The message will be sent out every one minute regardless if there is a change to a particular value or not.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 36 bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 223 – Stock Summary Message
SourceTime	4	4	Binary Integer	This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH)
SourceTimeNS	8	4	Binary Integer	This field specifies the number represents the nanosecond portion of UTC time (since EPOCH)
SymbolIndex	12	4	Binary Integer	This field identifies the numerical representation of the symbol.
HighPrice	16	4	Binary Integer	This field specifies the exchange high price of the stock for the day. Use the Price scale from the symbol mapping index.
LowPrice	20	4	Binary Integer	This field specifies the exchange Low price of the stock for the day. Use the Price scale from the symbol mapping index.
Open	24	4	Binary Integer	This field specifies the exchange Opening price of the stock for the day. Use the Price scale from the symbol mapping index.
Close	28	4	Binary Integer	This field specifies the exchange Closing price of the stock for the day. Use the Price scale from the symbol mapping index.
TotalVolume	32	4	Binary Integer	This field specifies the exchange cumulative volume for the stock throughout the day.

13. PBBO MESSAGE – MSG TYPE '104'

IMPORTANT: This message is not yet supported; release date to be determined.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: NYSE Arca – 24 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 104 – PBBO Message
SourceTimeNS	4	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	8	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	12	4	Binary Integer	This field contains the symbol sequence number
BidPrice	16	4	Binary Integer	This field contains the Bid Price. Use the Price scale from the symbol-mapping index.
AskPrice	20	4	Binary Integer	This field contains the Ask Price. Use the Price scale from the symbol-mapping index.

13.1 PBBO CALCULATION

5. The PBBO message will not be disseminated if it is the same as the NBBO
6. Slow quotes are excluded from the calculation
7. Quotes from trading venues to which the exchange does not route to are excluded

14. IMBALANCE MESSAGE– MSG TYPE ‘105’

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary Integer	Size of the message: 52 Bytes
Msg Type	2	2	Binary Integer	This field identifies the type of message. 105 – Imbalance Message
SourceTime	4	4	Binary Integer	This field specifies the time when the msg was generated in the order book. The number represents the number of seconds in UTC time (since EPOCH)
SourceTimeNS	8	4	Binary Integer	This field represents the nanosecond offset from the time reference second in UTC time (EPOCH)
SymbolIndex	12	4	Binary Integer	This field identifies the numerical representation of the symbol.
SymbolSeqNum	16	4	Binary Integer	This field contains the symbol sequence number
ReferencePrice	20	4	Binary Integer	The Reference Price is the Last Sale if the last sale is at or between the current best quote. Otherwise the Reference Price is the Bid Price if last sale is lower than Bid price, or the Offer price if last sale is higher than Offer price.
PairedQty	24	4	Binary Integer	This field contains the paired off quantity at the reference price point
TotalImbalanceQty	28	4	Binary Integer	This field contains the total imbalance quantity at the reference price point. Please note that Total Imbalance Quantity could be negative.
MarketImbalanceQty	32	4	Binary Integer	This field indicates the total market order imbalance at the reference price
AuctionTime	36	2	Binary Integer	Projected Auction Time (hhmm)
AuctionType	38	1	ASCII Character	■ ‘O’ – Open (4am) Arca Only ■ ‘M’ – Market (9:30am) ■ ‘H’ - Halt ■ ‘C’ – Closing ■ ‘R’ – Regulatory Imbalance
ImbalanceSide	39	1	ASCII	This field indicates the side of the imbalance

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
			Character	Buy/sell. Valid Values: ■ 'B' – Buy ■ 'S' – Sell ■ Space – No imbalance Note: This field is a future enhancement for NYSE Arca and will have a '0' value until such time.
ContinuousBook ClearingPrice	40	4	Binary Integer	The Continuous Book Clearing Price is defined as the price closest to last sale where imbalance is zero. If a Book Clearing Price is not reached, the Clearing Price, a zero will be published in the Book Clearing Price Field Note: This field is a future enhancement for NYSE Arca and will have a '0' value until such time.
ClosingOnly ClearingPrice	44	4	Binary Integer	This field contains the indicative price against closing only order only Note: This field is a future enhancement for NYSE Arca and will have a '0' value until such time.
SSRFilingPrice	48	4	Binary Integer	This field contains the SSR Filing Price. This price is the price at which Sell Short interest will be filed in the matching in the event a Sell Short Restriction is in effect for the security. Note: The SSR Filing price is based on the National Best Bid at 9:30am. This price remains static after the SSR Filing price has been determined. Note: This field is a future enhancement for NYSE Arca and will have a '0' value until such time.

14.1 NYSE ARCA IMBALANCE CALCULATION

NYSE Arca conducts three single-price auctions for NYSE Arca primary listings in; the Opening Auction, the Market Order Auction and the Closing Auction. The Opening and Closing Auctions allow NYSE Arca ETP holders to participate in real-time price discovery. As a part of the auction process, NYSE Arca calculates and continually disseminates the indicative match price, indicative match volume and the auction imbalance.

Table 6 NYSE Arca Imbalance Calculation

MESSAGE TYPE	DESCRIPTION
Limit Order Opening Auction	**Interest Included** All order types are eligible to participate in the Opening Auction with the exception of Passive Liquidity (PL), Midpoint Passive Liquidity (MPL) and Discretionary orders. Only Limit Orders that are eligible for the Opening Session will participate in the Opening Auction. Orders that participate in the Opening Auction cannot be canceled between 3:59 a.m. ET and 4:00 a.m. ET, the conclusion of the Opening Auction. **Calculation** ■ The Opening Auction will occur at the Indicative Match Price — the price at which the maximum volume of orders is executable at the time of the auction. ■ If two or more prices can maximize executable volume, the Opening Auction occurs at the price closest to the previous closing price in an effort to maintain continuity. In such a situation, for the purpose of determining the indicative match price, NYSE Arca uses the maximum size of both sides and displays the price closest to the previous close at the larger aggregate size. ■ Unexecuted orders become eligible for the Opening Session immediately upon conclusion of the Opening Auction. **Reference Price** - The price at which the maximum volume of shares are executable. **Continuous Book Clearing Price** - Field is set to zero, this is a future enhancement. **SSR Filing Price** - Field is set to zero, this is a future enhancement.
Market Order Opening Auction	**Eligible Symbols** ■ The Market Order Auction is run for NYSE Arca primary listed stocks, ■ NYSE listed stock subject to a sub-penny trading conditions and exchange listed ETFs and ETNs. ■ Auction specific order types, such as Limit on Open or Market on Open if submitted in non-NYSE Arca listed symbols are rejected. ■ Market Orders submitted in non-NYSE Arca listed symbols are routed to the primary listing exchange. **Interest Included** ■ Limit Orders (eligible for either the Opening Session and/or National hours Trading Session) ■ Market Orders and auction-only limit orders will participate in the Market Order Auction. **Calculation** ■ The match price is the price that maximizes the volume that can be executed. ■ The Market Order Auction will use the match price closest to the closing price of

<table>
<tr><th>MESSAGE TYPE</th><th>DESCRIPTION</th></tr>
<tr><td></td><td>the previous trading day (based on normal market hours) if more than one indicative match price is valid.
■ Imbalances and indicative match prices in the Market Order Auction reflect market orders only. In the following examples, the limit orders are “auction only” limit orders.
Reference Price - The price at which the maximum volume of shares are executable.
Continuous Book Clearing Price - Field is set to zero, this is a future enhancement.
SSR Filing Price - Field is set to zero, this is a future enhancement.</td></tr>
<tr><td>Closing Auction</td><td>Eligible Symbols
■ The Closing Auction is run for NYSE Arca primary listed stocks, NYSE listed stocks subject to a sub-penny trading conditions and exchange listed ETFs and ETNs.
■ Auction specific order types, such as Limit on Close or Market on Close, submitted in non-NYSE Arca listed primaries are rejected.
Interest Included
■ All MOC/LOC interest eligible for the close will be included
■ Auction Only Orders
■ The non-displayed portions of reserve orders, will participate in the NYSE Arca Closing Auction.
■ The reserve portion of an order will not display in the indicative matched volume, but will contribute to the indicative match price.
Calculation
■ If there are no order imbalances, orders will be executed in the Closing Auction at the Indicative Match Price as of 4:00 p.m. ET.
■ The indicative match price will be the price at which the maximum number of shares in the total imbalance can execute.
■ If there are multiple prices at which the total imbalance can equally execute, the indicative price will be based on the price closest to the Consolidated Tape last sale.
■ If the price closest to the Consolidated Tape last sale would trade through the NYSE Arca Book, the indicative match price will be the best price available where no trade through occurs.
Reference Price - The price at which the maximum volume of shares are executable.
Continuous Book Clearing Price - Field is set to zero, this is a future enhancement.
Closing Only Clearing Price - Field is set to zero, this is a future enhancement.</td></tr>
</table>

14.2 NYSE ARCA PUBLICATION TIMES

Table 7 NYSE Arca Publication Times

MESSAGE	PUBLICATION PERIOD
Opening Imbalances	Beginning at 3:30 a.m. ET and updated real-time thereafter until 4:00am
Market Imbalances	Beginning at 4:00a.m. ET and updated real-time thereafter until 9:30am
Closing Imbalances	Beginning at 3:00 p.m. ET and updated real-time thereafter until 4:00pm

15. POSSIBLE MESSAGE SEQUENCE

Events with Add Order Messages:

- A) 100 share Buy Order entered at $49.99 for stock ABC
- B) 400 share Sell Order entered at $30.00 for stock XYZ
- C) PBBO Message for Stock ABC
- D) 500 share execution ABC at$49.99 for Stock ABC
- E) 200 share cancel at $30.00 for stock XYZ
- F) Time Reference Message Stock XYZ

Based on the example above, the following would be the following messages received

EVENT	MSGSEQNUM	MSGTYPE	SYMBOLSEQNUM	SYMBOL	MESSAGE
A	1	100	50	ABC	Add Order
B	2	100	32	XYZ	Add Order
C	3	104	51	ABC	PBBO
D	4	103	52	ABC	Execution
D	5	220	53	ABC	Trade
E	6	102	33	XYZ	Delete
F	7	2	34	XYZ	Time Reference

Events with Attributed Add Order Messages:

- A) 100 share Buy Order entered at $50.00 for stock ABC
- B) 300 share Sell Order entered at $50.00 for stock ABC
- C) PBBO Message for Stock ABC
- D) 100 share execution ABC at$50.00 for Stock ABC
- E) 200 share cancel at $50.00 for stock ABC
- F) Time Reference Message Stock ABC

Based on the example above, the following would be the following messages received

EVENT	MSGSEQNUM	MSGTYPE	SYMBOLSEQNUM	SYMBOL	MESSAGE
A	1	107	50	ABC	Attributed Add Order
B	2	107	32	ABC	Attributed Add Order
C	3	104	51	ABC	PBBO
D	4	103	52	ABC	Execution
D	5	220	53	ABC	Trade
E	6	102	33	ABC	Delete
F	7	2	34	ABC	Time Reference

Events with Attributed Add Order Messages:

- A) 500 share Buy Order entered at $50.00 for stock ABC
- B) 300 share Sell Order entered at $50.00 for stock ABC
- C) PBBO Message for Stock ABC
- D) 300 share execution ABC at$50.00 for Stock ABC
- E) 200 shares post to the book at $50.00 for stock ABC
- F) Time Reference Message Stock ABC

Based on the example above, the following would be the following messages received

EVENT	MSGSEQNUM	MSGTYPE	SYMBOLSEQNUM	SYMBOL	MESSAGE
A	1	107	50	ABC	Attributed Add Order
B	2	107	32	ABC	Attributed Add Order
C	3	104	51	ABC	PBBO
D	4	103	52	ABC	Execution
D	5	220	53	ABC	Trade
E	6	108	33	ABC	Attributed Add Order Refresh
F	7	2	34	ABC	Time Reference

16. PRODUCT ID

Table 8 describes the Product IDs associated with NYSE, NYSE MKT and NYSE Arca XDP Integrated Feed.

Table 8 Product ID

EXCHANGE	PRODUCT ID	DESCRIPTION
NYSE	11	NYSE Integrated Feed
NYSE MKT	59	NYSE MKT Integrated Feed
NYSE Arca	157	NYSE Arca Integrated Feed