



Specialized Quote Interface (SQF)

VERSION 8.1

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Specialized Quote Interface – Version 8.1

Specialized Quote Interface

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Specialized Quote Interface

1 Overview

Specialized Quote Interface (SQF) provides a low latency, high throughput mechanism for Market Makers to participate in Nasdaq ISE (ISE), Nasdaq GEMX (GEMX) and Nasdaq MRX (MRX). Separate SQF connections are required for each of the individual options markets.

1.1 Low Latency

- The quote interface server resides directly on the matching engine infrastructure
- Compact bandwidth profile by making use of binary data

1.2 High Throughput

- Participants can have multiple connections for increased quoting throughput
- Bulk quoting of up to 200 quotes per quote block message.

1.3 Features

- Enhanced Determinism for quoting. Quote acknowledgement = Quote is processed by the matching engine. Each Quote Acknowledgement provides sequence of the quote from the matching engine, which can be used to conclusively determine ordering between Quotes and Purges within the same underlying.
- Rapid Fire/Curtailment Risk Protection (Curtailment) = Automated Purging of quotes for a given underlying based on firm specified execution parameters
- Purging on Disconnect
- Purging of quotes based on flexible scope
- SQF Sweep messages allow to access liquidity or participate in an ongoing auction.
- Auction information for securities traded on the Options Markets.
- Purge Notification messages, for reporting purges on options quoted on this interface.
- Execution Notification messages, for reporting executions on quotes and SQF Sweep requests sent by this interface. See “Processing Hints and Tips” section for more details.
- Various Administrative and market event messages.

2 Architecture

SQF Lines are configured to automatically purge all line’s quotes immediately on disconnect. All of the outstanding Auction Responses submitted via SQF Sweep messages are also canceled.

The Specialized Quote Interface uses the in the following communication protocol:

| Protocol Option | |
|---|---------------|
| SoupBinTCP Version 4.00 | TCP Interface |

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* Please note that firms are encouraged to provide local redundancy in the NY Metro Area, while using the Mid-Atlantic Region for disaster recovery in the event the Exchange order entry is switched from the NY Metro Area.

2.1 Data Types

| Type | Description |
|-------------------------------|---|
| Integer | Unsigned big-endian (network byte order) binary encoded number. |
| Price | Signed integer field with implied scale of 4 (number of digits to the right of the decimal point). Prices for complex instruments can be positive, negative or zero. Sub-penny prices are automatically rounded to the nearest penny. Quote bids are rounded down; quote asks are rounded up. Buy SQF Sweeps are rounded up; sell SQF Sweeps are rounded down. |
| Price6 | Signed integer field with implied scale of 6 (number of digits to the right of the decimal point). Used on execution notifications for complex instruments where extra precision may be needed due to stock leg execution pricing. |
| Alpha Alphanumeric | <i>Alpha</i> or <i>Alphanumeric</i> field is left-justified and padded with spaces on the right. Field must contain printable ASCII characters only. A non-printable character in such field causes SQF to immediately disconnect its client |

- *MessageId* fields - There is no restriction on the content of this field. It can contain any combination of bits.
- *Timestamp* fields - *Timestamp* reflects the system time at which various events occur. For every message, the timestamp is expressed in two fields: "Seconds", which is the number of whole seconds after midnight of the day that the message is sent; and "Nanoseconds", which is the sub-second portion of the time which represents the integer number of nanoseconds. The "Seconds" field will have a range of 0 to 86399 (i.e. 12:00:00am to 11:59:59pm) and "Nanoseconds" will have a range of 0 to 999999999. All times in this protocol are U.S. Eastern Time zone.

2.2 Message Delivery

SoupBinTCP is the lower level protocol that provides message delivery and session management. Protocol supports guaranteed and best-effort delivery of messages from the Exchange to the client. Sequenced messages can be resent by the SQF host. Unsequenced messages are delivered in real-time and cannot be recovered if client connection is lost or delivery is impossible due to congestion. Details on requesting a resend of sequenced messages can be found in the SOUP specification.

Messages sent from the client to the SQF interface host are inherently non-guaranteed, even if they are carried by a lower level protocol that guarantees delivery (like TCP/IP sockets). It is client's responsibility to process Exchange's responses to their requests.

3 Processing Hints & Tips

Determining when a Quote is processed by the Matching Engine

Upon receipt of a quote response message for a given quote block, all of the firm's quotes for that block have been processed by the matching engine (assuming that the quote was sent after receipt of the "Start of Quote" System Event Message). In addition, the order in which the matching engine processed individual quotes within the same underlying can be determined by the sequence number provided for each quote in the acknowledgement response.

Determining when a Purge takes Quotes out of Play

Upon receipt of a purge response message for a given purge, the firm's quotes are guaranteed to be out of the market. The firm can use sequence number as well to determine sequencing of purges in relation to quotes.

Determining when a SQF Sweep is processed by the Matching Engine

Upon receipt of an SQF MSAR Accept message for a given MSAR Request, the request is guaranteed to have been processed by the matching engine.

Sending a SQF Sweep which cancels or cancel replaces a previous Sweep

A MSAR (of type Auction Response) with a size of zero effectively cancels a prior MSAR for the same instrument/price/side. A MSAR with a size differing from the size of a prior MSAR for the same instrument/price/side is considered a cancel replace. Note, a MSAR can be canceled or replaced by the originating port only. All the outstanding SQF Sweeps received by a given port are automatically canceled by the system if connection to that port is lost regardless of the existence of other connections to the system.

Maximizing Throughput

Quote block messages can contain up to 200 quotes. Densely packing quotes in each quote block increases throughput. However, firms must be aware that there is an inherent trade-off in terms of cost to latency. That is, when densely packaging quotes in a quote block message, processing the block will take longer than processing a less densely packaged quote block. The firms must manage this dynamic to their own preference.

Minimizing Latency

To minimize latency in getting a quote processed by the matching engine, firms can position quotes for more sensitive symbols in the front of each quote block message sent to the Exchange.

Additionally, firms should take advantage of the synchronous nature of the SQF protocol and, while waiting for a quote response from Nasdaq, overwrite older quotes in their system waiting to be sent as badge/symbol pairs are repriced. In this way, when the quote response is received from Nasdaq, the most recent quotes for each badge/symbol pair can be sent.

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Avoiding Queuing

SQF is a one-request-in-flight protocol on a given port. As a best practice, after submitting any request on a given port, regardless of the participant badge to the Nasdaq system, the client should wait for the arrival of either ACCEPT or REJECT response. Arrival of the ACCEPT/REJECT message indicates that the next request can be submitted. Not adhering to this practice can lead to unintentional queuing in the TCP stack.

Avoiding Timing Issues/Race Conditions

Firms may load balance badge/symbol combinations across multiple ports on the same engine infrastructure. However, they should wait until either an ACCEPT or REJECT response is received for a given badge/symbol combination quote or purge in order to avoid race conditions for subsequent quote blocks. If a firm incidentally creates a race condition, the sequence number returned in the quote response message identifies which quote is in play by virtue of it having a higher sequence number.

Race Condition Resolution

Firms may resolve possible race conditions by comparing the Sequence field in quote responses, purge responses and purge notifications. An event with a higher Sequence value was processed by the matching engine after an event with a lower Sequence value. Possible race conditions are quotes for the same badge/symbol sent simultaneously across different connections, system initiated purges near the time of a quote being submitted, etc.

Reentry Indicator

With the exception of a Purge on Disconnect, whenever a Quote for a badge/symbol combination is purged, the next Quote for that badge/symbol combination sent to the exchange must have the "Reentry Indicator" field set to "R" for the Quote to be accepted by the matching engine regardless of which port is used. Quotes can be purged in several ways:

- by the firm entering a 0 x 0 quote
- by the firm sending a purge request (Underlying Purge Message)
- by the system, in this case the firm will receive an Option Symbol Purge Notification or Underlying Purge Notification message

Given the scenario when the firm sends a Quote unaware of the previous Quote having been purged on the system (the Purge Notification sent by Nasdaq is in flight to the firm and not yet processed), the sent Quote will be rejected with "Quote Status Code" set to "I" (reentry required). In this case the firm will receive the notification and rejected quote, will be aware of the scenario, and can take appropriate action, such as quoting with reentry indicator "on".

Purge on Disconnect

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As soon as disconnect is detected all badge / underlying combinations that have been quoted on the affected port since the start of session are immediately purged from the system unless there were no quotes received on the affected port since the last connect. In other words, if a port disconnects, all badge/underlying combinations that have been sent on the disconnected port in that session will be purged from all ports in which they are present.

Like Quotes, all open Auction Response MSARs are canceled immediately if the connection to the originating port is lost.

SQF Sweep (MSAR) Notifications

Executions and cancels from MSAR Requests are always returned. Notification of Executions from Quotes is a subscription option.

Notification Ports

The SQF connection (port) can be configured as a “Notification Port”. A Notification Port is an SQF Port which can receive notification messages, in particular: Purge Notifications and Quote Execution Notifications are sent to SQF lines configured as Notification Ports. Notification ports can concurrently be used for sending quotes as well.

Purge-only Ports

An SQF connection (port) can be configured as a “Purge-only” port. Purge-only port allows entry of underlying-level purges only. Underlying can be specified as a wildcard. Requests of any other type cause Purge-only port to immediately terminate its connection. Purge-only port responds to underlying-level purges with the usual responses specified by the SQF protocol. No notifications are disseminated on Purge-only ports. Underlying-level purge requests received by Purge-only ports are handled by the system in a way that ensures minimum possible latency.

Disaster Recovery (DR) – Alternate Connections

In the event of the primary site becoming inoperable, alternate connectivity to a secondary site will be made available the next trading day. Connectivity parameter information, such as IP Addresses and Ports will be available to firms. The secondary site will be used until a date is announced regarding availability of the primary site.

Options Information before 7 AM

Firms are encouraged to receive Options information for their use by processing Simple and Complex Instrument Directory Messages. In the event the firm needs this information before “Start of System Hours” (approximately 7:00am); this information may be obtained from the Nasdaq Trader Website.

Release Management

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The SQF specification version updates will be conducted such that it remains backward compatible on a Version - n basis. The number of backward compatible releases will be determined by the exchange on a release by release basis.

4 Market Description

4.1 Participant identification

Every user request carries:

- *Badge* – uniquely identifies a Nasdaq Options MM Participant

SQF validates the Badge as well as its association with the port account.

4.2 Trading Instruments

NASDAQ Options exchanges supports trading in both simple and complex instruments. Each trading instrument carries a unique *Instrument ID*. Nasdaq guarantees uniqueness of the Instrument ID within a single trading session. Note, a simple instrument (option) will never have the same ID as a complex strategy.

4.3 Auctions

An auction is a process whereby an order is exposed to the market for a small amount of time, called the auction or exposure period. During the exposure period, market participants can respond to the auction to provide liquidity to the order being exposed. At the end of the exposure period, the order being exposed is executed against the responses and against the order book. There are many different types of auctions, each with different rules.

4.3.1 One-sided Auctions

- Block Auctions (initiated by Block order type for simple instruments only)
- Flash Auctions (created automatically by the system based on market conditions for simple instruments only)
- Complex Exposure Auctions
- Opening Imbalance Auctions

4.3.2 Two-sided Auctions

- Facilitation Auctions (simple and complex instruments)
- Price Improvement Auctions (simple and complex instruments)
- Solicitation Auctions (simple and complex instruments)

4.4 Quoting in Complex Instruments

All MMs are allowed to quote *all* complex instruments (that have complex quoting activated) regardless of whether they are assigned trading rights to that product or not. Quotes for complex instruments are not subject to any quotation requirements that are applicable to MM quotes in the regular market for individual options series or classes.

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- The net price of complex quotes can be positive, negative, or zero (0).
- The **Complex Quote Block** requests are used to add, modify, or delete multiple quotes. **Underlying Purge Request** can be used to delete all quotes, simple and complex, within a product.
- Complex quotes can only trade with inverse complex orders or quotes. Complex quotes, unlike complex orders, do not leg-in — they do not trade — with orders and quotes on individual legs in the regular book.
- Complex quotes, similar to simple quotes, require reentry after Rapid Fire/Curtailment events or User requested purges.
- There is no Rapid Fire/Curtailment protection for stock combination instruments.

4.5 Market Maker Protection (Rapid Fire/Curtailment)

Rapid Fire/Curtailment mechanism assists MMs by limiting their total exposure in an underlying product. After every trade against a quote, the MM's Rapid Fire/Curtailment accumulations are checked for that product. If the specified limit is *exceeded* within the specified time interval, then all quotes for that badge in that product are *purged*. An **Underlying Purge Notification** is sent to advise the MM that the quotes were purged because Rapid Fire/Curtailment event was triggered.

- New Quotes in the Rapid-Fired product are rejected unless **Market Reentry Request** is submitted on the underlying or **Reentry Indicator** is set on the new quote.
- Rapid Fire/Curtailment parameters are set using the **MM Parameters Definition Request** message. Four discrete counters must be set, as well as the time interval over which the count is to be checked. The four counters are:
 - Cumulative Count — Total number of contracts traded
 - Percentage Count — Traded quantity as a percentage of the quoted quantity
 - Delta — Long vs. Short, evaluated as: Absolute Value(Bought Call + Sold Put – Sold Call – Bought Put)
 - Vega — Bought vs. Sold, evaluated as: Absolute Value(Bought Call + Bought Put – Sold Call – Sold Put)
- All four Rapid Fire/Curtailment counters *must* be set; any one counter triggers Rapid Fire/Curtailment purge
- The time interval is a *rolling* interval and must be specified in milliseconds from 100 ms to 30,000 ms (30 seconds).
- There are separate counters for simple instruments and complex instruments; there are NO counters for complex instruments w/stock.
- The Rapid Fire/Curtailment only counts trades made against the MM's quotes. It does not count IOC orders or auction responses entered by the MM.
- Defaults must be set up with Exchange Market Operations. These defaults will be utilized in the event that a MM Parameter Definition Request message has not been received.

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4.6 Market Wide Speed Bump

The Market Wide Speed bump is an additional risk protection functionality offered for MMs. Market Wide Speed bump counts the number of rapid fire curtailments (across simple and complex quotes) that take place in specified period of time. The MM is required to set how many curtailments in that specified period of time should trigger a market wide speed bump. Once triggered, all MM quotes will be purged and the MM will not be permitted to enter new quotes in the system until the participant requests to be enabled for reentry and Market Operations has re-enabled that market maker.

4.7 Paused Instrument Handling

When legging the stock component of a stock combo complex order, the Exchange will queue further trading in the option legs of the combo until the stock leg execution is accepted by the relevant trading venue.

SQF Interface keeps participants informed on the status of their requests during such pended states using the following mechanisms.

4.7.1 Quote Block

- If the instrument of a quote in the incoming quote block is in a paused state, the participant receives new reject code *Request Pending* for that quote.
- Once the instrument resumes a normal state, a participant asynchronously receives **Quote Update Notification** with an appropriate reason code.

4.7.2 Underlying-level Purge

- If purged underlying contains an instrument which is in a paused state, the participant receives:
 - Immediate Underlying-level purge reply (ack) with *Request Pending* status code
 - Option-level purge notification with *Purge Reason Code=Request Pending*
- Once the instrument resumes a normal state, another Option-level purge notification is sent with *Purge Reason Code=User Requested*

4.7.3 Underlying-level Reentry

- No changes. If an underlying contains a paused series, a Reentry request is accepted and processed in time order with other requests for the instrument upon the pause/pending state ending.

4.7.4 SQF Sweeps

- If an instrument is in a paused state, a **MSAR Reject** message (SR) with *Reject Code = Request Pending* is sent
- Once the instrument resumes a normal state, a **MSAR Accept** message (SA) is sent

5 Request/Reply Messages

5.1 Subscription to Notifications

SQF protocol specifies a number of notification messages types that can be optionally sent to the client. When originally requesting an SQF connection, firm specifies the set of notification it wishes to receive.

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This configuration persists across multiple market sessions. **Subscription Request message** allows client to modify the set of notification types it receives on the SQF connection. Modification made via **Subscription Request Message** is only applicable to the current session. Client should re-issue **Subscription Request** at the beginning of every trading session if the pre-configured persistent default is not desired.

- Subscription Request modifies the types of notifications being delivered regardless of the instrument and/or badge of the messages.
- Effects of the Subscription Request are immediate, but not retroactive. Notification types that were not included prior to the subscription change will not be delivered

5.1.1 Subscription Request

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|--------------|---|
| Message Type | 0 | 2 | Alpha | “AB” = Notification Subscription Request |
| Badge | 2 | 4 | Alphanumeric | Participant identifier |
| MessageID | 6 | 8 | Alphanumeric | Message ID |
| Subscription | 14 | 24 | Alphanumeric | <p>A list of notification types to be included in the current session. This field can contain 0 or more types and should be padded with spaces on the right.</p> <ul style="list-style-type: none"> • S=Simple Instrument Directory • s=Complex Instrument Directory • U=Underlying Permission Notification • M=Opening Spread Multiplier Notification • F=MM Parameter Definition Notification • R=Rapid-Fire Configuration Notification (to be deprecated) • H=Simple Instrument Trading Action • h=Complex Instrument Trading Action • A=Auction Notification • P= Underlying & Simple Notifications (Messages NU/NP) • Z = Underlying & Instrument Notifications (Messages NU/ND) • E=Market Reentry Notification • Q=Simple Quote Execution Notification • q=Complex Quote Execution Notification • e=Complex Quote Leg Execution Notification • D=Quote Update Notification • O=Simple MSAR Notification • o=Complex MSAR Notification • L=Complex MSAR Leg Notification |

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5.1.2 Subscription Reply

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|--------------|--|
| Message Type | 0 | 2 | Alpha | "Ab"=Notification Subscription Reply |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Alphanumeric | Message ID |
| Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |

5.2 Complex Instrument Creation

SQF Participants can define new complex instruments.

5.2.1 Add Complex Instrument Request

A valid **Add Complex Instrument Request** (AC) results in:

- **Add Complex Instrument Reply** (Ac) message with *Status Code*=" " (valid request)
- **Complex Instrument Directory Message** (AR) being published

An invalid request results in **Add Complex Instrument Reply** (Ac) message with *Status Code* explaining the reason for the reject.

| Name | Offset | Length | Value | Notes |
|---|--------|--------|--------------|--|
| Message Type | 0 | 2 | Alpha | "AC" = Add Complex Instrument Request |
| Badge | 2 | 4 | Alphanumeric | Participant identifier |
| MessageID | 6 | 8 | Alphanumeric | Message ID |
| Underlying Symbol | 14 | 13 | Alphanumeric | Denotes the unique underlying stock symbol for the option symbol. Normally matches the stock symbol. The exception is for some corporate actions and underlyings exceeding 5 bytes |
| Number Of Legs | 27 | 1 | Integer | Number of legs in the combo. |
| Leg Definitions, Repeated Number Of Legs times | | | | |
| ➤ Leg Instrument ID | | 4 | Integer | Simple Instrument ID. Zero (0) for Stock Leg. |
| ➤ Leg Side | | 1 | Alpha | "B" = Leg is on Buy side "S" = Leg is on Sell side |
| ➤ Leg Ratio | | 4 | Integer | Strategy Leg Ratio |

5.2.2 Add Complex Instrument Reply Message

This message is sent as a response to the **Add Complex Instrument Request** Message (AC) and indicates the validity of the request.

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|--------------|---|
| Message Type | 0 | 2 | Alpha | "Ac" = Add Complex Instrument Reply Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Alphanumeric | Message ID |

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|--------------------|----|---|--------------|--|
| Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |
|--------------------|----|---|--------------|--|

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection.

5.3 MM Parameter Definition

The **MM Parameter Definition Request** message is used by MMs to set Rapid Fire/Curtailment parameters for the specified instrument type and underlying.

5.3.1 MM Parameter Definition Request

- A valid **MM Parameter Definition Request** (AE) results in:
 - **MM Parameter Definition Reply** (Ae) message with *Status Code*=" " (valid request)
 - **MM Parameter Definition Notification** (AR) being published
- An invalid request results in **MM Parameter Definition Reply** (Ae) message with *Status Code* explaining the reason for the reject.

| Name | Offset | Length | Value | Notes |
|-----------------------|--------|--------|--------------|--|
| Message Type | 0 | 2 | Alpha | "AE" = MM Parameter Definition Request |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Alphanumeric | Message ID |
| InstrumentType | 14 | 1 | Alpha | S=Simple Instruments C=Complex Instruments |
| Underlying | 15 | 13 | Alphanumeric | Underlying Stock Symbol |
| Interval | 28 | 2 | Integer | Time interval (in milliseconds) $100 \leq n \leq 30,000$ |
| Percentage | 30 | 2 | Integer | Displayed size percentage $100 \leq n \leq \text{MAX_INT}$ |
| CumQty | 32 | 4 | Integer | Total execution volume that will trigger a rapid fire within the interval $1 \leq n \leq \text{MAX_INT}$ |
| Delta | 36 | 4 | Integer | $1 \leq n \leq \text{MAX_INT}$ |
| Vega | 40 | 4 | Integer | $1 \leq n \leq \text{MAX_INT}$ |
| Reserved | 44 | 32 | Alpha | Reserved for future enhancements |

Notes:

- Rapid Fire/Curtailment parameters are set using the four counter fields: *CumQty*, *Percentage*, *Delta*, and *Vega*; and the timer field *Interval*.
- There is *no* Rapid Fire/Curtailment protection for the stock combination instrument type.
- Message is padded with unused space to be utilized for future configuration parameter enhancements.

5.3.2 MM Parameter Definition Reply

This message is sent as a response to the **MM Parameter Definition Request** Message (AE) and indicates the validity of the request.

| Name | Offset | Length | Value | Notes |
|------|--------|--------|-------|-------|
|------|--------|--------|-------|-------|

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|---------------------|----|---|--------------|--|
| Message Type | 0 | 2 | Alpha | “Ae” = MM Parameter Definition Reply |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Alphanumeric | Message ID |
| Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection

5.4 Rapid-Fire Configuration Control – deprecated

5.4.1 Deprecation Note

Rapid-Fire Configuration Control messages are replaced by more complete **MM Parameter Definition** messages.

SQF clients can change their risk-protection parameters using Rapid-Fire Control message. Rapid-Fire control changes can be issued any time after the start of system hours and take effect immediately.

5.4.2 Rapid-Fire Config Request Message

| Name | Offset | Length | Value | Notes |
|--------------------------|--------|--------|--------------|--|
| Message Type | 0 | 2 | Alpha | “AF” = Rapid Fire/Curtailment Config Request Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Underlying Symbol | 6 | 13 | Alphanumeric | Underlying Stock Symbol |
| Percentage | 19 | 2 | Integer | Displayed size percentage $100 \leq n \leq \text{MAX_INT}$ |
| Interval | 21 | 2 | Integer | Time interval (in milliseconds) $100 \leq n \leq 30,000$ |
| CumQty | 23 | 4 | Integer | Total execution volume that will trigger a rapid fire within the interval $1 \leq n \leq \text{MAX_INT}$ |

Notes:

- A valid **Rapid Fire/Curtailment Config Request** Message results in a **Rapid-Fire Config Notification** message sent out to all “notification” ports configured for the same badge/underlying pair.
- New percentage parameters of a **Rapid Fire/Curtailment Config Request** take effect immediately. Any ongoing volume accumulated for the specified badge/underlying pair prior to the submitted update is preserved and counted toward the new updated percentage parameter. New interval changes are applied from the next transaction forward.
- **Rapid Fire/Curtailment Config Request** settings are maintained for the duration of the current trading session. System reverts to the default as well as the settings maintained by NASDAQ personnel at the beginning of every trading day.
- This message can’t be used to disable Rapid Fire/Curtailment.

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- Percentage and Volume can't both be zero (i.e. it is only valid for exactly one of them to be zero, or for neither of them to be zero).

5.4.3 Rapid-Fire Config Reply Message

This message is sent as a response to the **Rapid-Fire Config Request** Message (AF) and indicates the validity of the request.

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|--------------|--|
| Message Type | 0 | 2 | Alpha | "AA" = Rapid-Fire Config Reply Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Status Code | 6 | 1 | Alphanumeric | See Status Code Appendix |

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection

5.5 Quote Messages

- Quote Block messages are used to submit multiple quotes packaged into a single transmission.
- Quote Block messages can contain a variable number of quotes (up to 200).
- Quotes for simple instruments must be submitted via **Simple Quote Block Message**, short or long form.
- Quotes for complex instruments must be submitted via **Complex Quote Block Message**.
- Both Bid and Ask prices must be provided for each quote submitted
- Bid/Ask Prices for quotes in Complex instruments can be zero or negative.
- NASDAQ supports two different message formats for quote submission. It is possible to receive a "regular" (All markets) or "detailed" (NOM/BX only) reply message (acknowledgment) for each of the quote request types. Detailed replies contain system assigned unique sequence numbers for the Bid and Ask parts of the quote. The reply format is controlled by the case of the quote message subtype – upper case subtype requests are replied with regular acknowledgments; lower case subtype requests are replied with detailed acknowledgments. E.g. "QQ" quote is responded with regular reply, "Qq" is responded with the detailed one.
- 0 x 0 quotes are accepted and are processed as a purge of that symbol. The firms are required to specify the re-entry indicator on the first quote following a 0 x 0 quote. A purge (0 x 0 quote) may be submitted with Reentry Indicator set to 'N' or 'R'.

5.5.1 Simple Quote Block Message (short form)

- Compact message for entering quotes in Simple Instruments
- Message contains a single *MessageID* field for the entire block to provide the firm with a means to identify the quote block. While the *MessageID* is not validated for uniqueness, participants are encouraged to provide a unique value to ensure traceability through the system for requests/responses and quotes/executions.

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|-------|--|
| Type/Subtype | 0 | 2 | Alpha | "QQ" = Simple Quote Block (Results in a Regular Reply) |

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| | | | | |
|--|----|---|--------------|---|
| | | | | “Qq” = Simple Quote Block (Results in a Detailed Reply) |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined quote message identifier reported on clearing executions |
| Quote Count | 14 | 2 | Integer | Number of quotes in the message |
| 1 – 200 quotes comprised of the following fields... | | | | |
| ➤ Instrument ID | | 4 | Integer | Simple Instrument ID |
| ➤ Bid Price | | 4 | Price | |
| ➤ Bid Size | | 4 | Integer | |
| ➤ Ask Price | | 4 | Price | |
| ➤ Ask Size | | 4 | Integer | |
| ➤ Reentry Indicator | | 1 | Alpha | ‘N’ = Normal ‘R’ = Re-entry |

Notes:

- The *MessageID* contents will appear in the *MessageID* field in the Execution Notification messages and the Clearing Trade Interface (CTI) trade messages. In the short quote block message above, this field identifies the quote block, not the individual quote within the block which may be executed against. While the *MessageID* is not validated for uniqueness, participants are encouraged to provide a unique value to ensure traceability through the system for requests/responses and quotes/executions.

•

5.5.2 Simple Quote Block Message (long form)

The **Simple Quote Block (long form)** message differs from the **Simple Quote Block (short form)** as it includes a per-quote *QuoteID* field to provide the firms with a means to identify each quote within the block. While the *QuoteID* is not validated for uniqueness, participants are encouraged to provide a unique value to ensure traceability through the system for requests/response and quotes/executions.

| Name | Offset | Length | Value | Notes |
|--|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | “QL” = Simple Quote Block (Results in a Regular Reply) “Ql” = Simple Quote Block (Results in a Detailed Reply) |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier. |
| Quote Count | 14 | 2 | Integer | Number of quotes in the message |
| 1 – 200 quotes comprised of the following fields... | | | | |
| ➤ QuoteID | | 8 | Binary | Firm defined quote identifier reported on clearing executions. Overrides the message identifier on clearing executions. |
| ➤ Instrument ID | | 4 | Integer | Simple Instrument ID |

Specialized Quote Interface

| | | | | |
|----------------------------|--|---|---------|--------------------------------|
| ➤ Bid Price | | 4 | Price | |
| ➤ Bid Size | | 4 | Integer | |
| ➤ Ask Price | | 4 | Price | |
| ➤ Ask Size | | 4 | Integer | |
| ➤ Reentry Indicator | | 1 | Alpha | 'N' = Normal 'R' = Re-entry |

Notes:

- The *QuoteID* contents will appear in the *MessageID* field in the Execution Notifications and the Clearing Trade Interface (CTI) trade messages. In the long quote block message above, this field identifies the individual quote within the block which may be executed against. While the *QuoteID* is not validated for uniqueness, participants are encouraged to provide a unique value to ensure traceability through the system for requests/responses and quotes/executions.

5.5.3 Complex Quote Block Message

- Message for entering quotes in Complex Instruments
- Message contains a per-quote *QuoteID* field to provide the firms with a means to uniquely identify each quote within the block.

| Name | Offset | Length | Value | Notes |
|--|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | "QC" = Complex Quote Block (Results in a Regular Reply) "Qc" = Complex Quote Block (Results in a Detailed Reply) |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier. |
| Quote Count | 14 | 2 | Integer | Number of quotes in the message |
| 1 – 200 quotes comprised of the following fields... | | | | |
| ➤ QuoteID | | 8 | Binary | Firm defined quote identifier reported on clearing executions. Overrides the message identifier on clearing executions. |
| ➤ Instrument ID | | 4 | Integer | Complex Instrument ID |
| ➤ Bid Price | | 4 | Price | |
| ➤ Bid Size | | 4 | Integer | |
| ➤ Ask Price | | 4 | Price | |
| ➤ Ask Size | | 4 | Integer | |
| ➤ Reentry Indicator | | 1 | Alpha | <ul style="list-style-type: none"> • N=Normal • R=Re-entry |
| ➤ StockLegShortSale | | 1 | Alpha | <ul style="list-style-type: none"> • N=Not Applicable • H=Sell Short • E=Sell Short Exempt If this is a quote for a stock combo |

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| | | | | |
|-------------------|--|---|-----|--|
| | | | | <i>StockLegShortSale</i> may be set to H or E. In all other cases value N should be used |
| ➤ Reserved | | 4 | n/a | Reserved for future use |

5.5.4 Quote Block Reply Message

This message is a response to “QQ”, “QL”, “QC” requests.

The **Quote Block Reply** message is used to inform the firm of the status of the quotes sent to the matching engine. A quote may be rejected by the matching engine, in which case a quote status code states the reason why the quote was rejected. Sequencing information for valid quotes is returned which may be used to determine the relative order of quotes or purges processed by the matching engine.

| Name | Offset | Length | Value | Notes |
|---|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “QR” = Quote Block Reply Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier |
| Block Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |
| Quote Count | 15 | 2 | Integer | The number of quotes in the submitted quote block |
| Valid Quote Count | 17 | 2 | Integer | The number of valid quotes in the submitted quote block. A valid quote is defined as a quote or purge (0 x 0 quote) that has a <i>Status Code</i> of “ ” |
| 1-200 quote responses comprised of the following fields... | | | | |
| ➤ Quote Status Code | | 1 | Alphanumeric | See Status Code Appendix |
| ➤ Sequence | | 8 | Integer | Relative sequence of the valid quote processed by the matching engine. Quotes/purges with higher sequence number occur after quotes/purges with lower sequence number. This field is zero if the request was invalid. Unique for each underlying across all ports. |

Notes:

- Subtracting the Valid Quote Count field from the Quote Count field yields the number of invalid quotes and purges (0x0 quotes) in the quote block.
- As a best practice, for a given port, firms should wait until the quote block response is received prior to sending another quote block to avoid unintentionally queuing within the TCP stack.
- If firms load balance symbols across multiple connections, the firm is advised to wait for the quote response prior to submitting a new quote for a given symbol down a different connection to avoid timing issues/race conditions.
- This is an unsequenced message and therefore cannot be replayed upon re-connection.

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- It is recommended that the firm send one quote per badge/option combination in one block for a given symbol. If more than one quote is sent in a block, each quote will be processed by the matching engine in the order that they appear in the quote block.
- A “opening rotation in progress” Quote Status Code means that the option is opening. The book is momentarily locked and the quote cannot be accepted by the matching engine.

5.5.5 Detailed Quote Block Reply Message

This message is a response to “Qq”, “Ql”, “Qc” requests.

This reply is identical in circumstance and behavior to the **Quote Block Reply** Message described in the previous chapter. The only difference is inclusion of individual Bid/Ask sequence numbers.

| Name | Offset | Length | Value | Notes |
|---|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “Qr” = Detailed Quote Reply Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier |
| Block Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |
| Quote Count | 15 | 2 | Integer | The number of quotes in the submitted quote block |
| Valid Quote Count | 17 | 2 | Integer | The number of valid quotes in the submitted quote block. A valid quote is defined as a quote or purge (0 x 0 quote) that has a Quote Status Code of “ ” |
| 1-200 quote responses comprised of the following fields... | | | | |
| ➤ Quote Status Code | | 1 | Alphanumeric | See Status Code Appendix |
| ➤ Sequence | | 8 | Integer | Relative sequence of the valid quote processed by the matching engine. Quotes/purges with higher sequence number occur after quotes/purges with lower sequence number. This field is zero if the request was invalid. Unique for each underlying across all ports. |
| ➤ Bid Sequence | | 8 | Integer | Day-unique order reference number assigned by NASDAQ to the Bid side of the quote |
| ➤ Ask Sequence | | 8 | Integer | Day-unique order reference number assigned by NASDAQ to the Sell side of the quote |

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5.6 Purge / Reentry Messages

5.6.1 Underlying Purge Request Message

The **Underlying Purge** message is used to pull all quotes from the market for all options contracts of the specified underlying symbol. This request deletes quotes for the specified underlying and also inhibits entry of new quotes unless **Market Reentry** is submitted prior to quote entry or **Reentry Indicator** is set to R on the quote.

| Name | Offset | Length | Value | Notes |
|--------------------------|--------|--------|------------------|--|
| Type/Subtype | 0 | 2 | Alpha | "PU" = Underlying Purge Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier |
| Underlying Symbol | 14 | 13 | Alphanumeric | Denotes the unique underlying stock symbol. Normally matches the stock symbol. If the field is "*" (blank padded on the right), then all underlyings for this badge will be purged. |
| Instrument Type | 27 | 1 | Alpha (Optional) | Type of instruments to be purged: <ul style="list-style-type: none">• O=Simple Instrument (default)• C=Complex Instrument This field is optional (SQF will treat message that is 1-byte short as a request to purge Simple Instruments) |

Notes:

- The exchange Underlying is in most cases the same as the industry standard ticker underlying except for cases where the industry standard ticker underlying exceeds 5 bytes (internal system limit). The exchange also assigns unique underlyings for special settlement symbols. The underlying associated with each option is accompanied with each option in the Simple Instrument Directory message.
- See the Processing Hints & Tips Section for tips on purge message processing.
- **Underlying Purge Notification** Messages will be sent to all SQF connections configured as Notification Ports. If a wildcard underlying purge is submitted (Underlying Symbol field with "*" blank padded on the right), an **Underlying Purge Notification** Message for each of the badge's underlyings will be sent to all Notification Ports.

5.6.2 Underlying Purge Reply Message

The Underlying Purge Reply message is used to inform firms of the validity of an underlying purge request.

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|-------|---------------------------------------|
| Type/Subtype | 0 | 2 | Alpha | "PR" = Underlying Purge Reply Message |

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| | | | | |
|--------------------|----|---|--------------|--|
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier |
| Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |
| Sequence | 15 | 8 | Integer | Relative sequence of the underlying purge processed by the matching engine. Quotes/purges with higher sequence number occur <u>after</u> quotes/purges with lower sequence number. |

Notes:

- If firms load balance symbols across multiple connections, the firm is advised to wait for the purge response prior to submitting a new quote and/or a purge for a given symbol down a different connection to avoid timing issues/race conditions.
- This is an unsequenced message and therefore cannot be replayed upon re-connection.

5.6.3 Market Reentry Request Message

Market Reentry message is used to reset risk protection that has previously been triggered by either a system Rapid Fire/Curtailment event or a user Purge request. This message provides a larger scope alternative to specifying *reentry indicator* on individual quotes. Once a Reentry request has been successfully handled by the system it is no longer necessary to set reentry indicator on individual quotes to 'R'.

| Name | Offset | Length | Value | Notes |
|--------------------------|--------|--------|------------------|--|
| Type/Subtype | 0 | 2 | Alpha | "RU" = Market Reentry Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier |
| Underlying Symbol | 14 | 13 | Alphanumeric | Denotes the unique underlying stock symbol. Normally matches the stock symbol. If the field is "*" (blank padded on the right), then all underlyings for this badge will be reset for reentry. |
| Instrument Type | 27 | 1 | Alpha (Optional) | Type of instruments to be Reentered: <ul style="list-style-type: none"> • O=Simple Instrument (default) • C=Complex Instrument This field is optional (SQF will treat message that is 1-byte short as a request to reenter Simple Instruments) |

Notes:

- Market Reentry does not restore the quotes that have been removed from the system due to purge or Rapid Fire/Curtailment.

5.6.4 Market Reentry Reply Message

This message informs user of the completion and validity of the previously submitted Market Reentry request.

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| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “RR” = Market Reentry Reply Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier |
| Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |
| Reserved | 15 | 8 | | Unused |

Notes:

- When load balancing symbols across multiple connections, the firm is advised to wait for the Market Reentry response prior to submitting new quotes for the related symbols down a different connection to avoid timing issues/race conditions.
- This is an unsequenced message and therefore cannot be replayed upon re-connection.

5.7 MSAR – SQF Market Sweep and Auction Responses

A MSAR (of type Auction Response) with a size of zero effectively cancels a prior MSAR for the same instrument/price/side. A MSAR with a size differing from the size of a prior MSAR for the same instrument/price/side is considered a cancel replace. Note, a MSAR can be canceled or replaced by the originating port only. All the outstanding MSARs received by a given port are automatically canceled by the system if connection to that port is lost regardless of the existence of other connections to the system.

A MSAR Accept or Reject message indicates that the MSAR Request was accepted or rejected by the matching engine respectively. For each MSAR Execution, one MSAR Notification will be sent, displaying an execution price and number of contracts traded. Another MSAR Execution Notification may be sent for the unexecuted portion of the MSAR Request; it will be Price field of zero, the Contracts field with the remaining unexecuted volume and a notification type of cancelled.

5.7.1 Simple MSAR Request Message

Simple MSAR Request message allows participant to submit an MSAR request for a simple instrument.

| Name | Offset | Length | Value | Notes |
|----------------------|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | “SB” MSAR Request |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier. |
| Instrument ID | 14 | 4 | Integer | Simple Instrument ID |
| MSAR Type | 18 | 1 | Alpha | “A” = Auction Response “M” = SQF Market Sweep |
| Auction ID | 19 | 4 | Integer | The exchange assigned Auction ID as provided in the Auction Notification message if applicable. |
| Price | 23 | 4 | Price | Price at which to sweep |
| Side | 27 | 1 | Alphanumeric | “B” = Buy side sweep “S” = Sell side sweep |
| Contracts | 28 | 4 | Integer | Volume of contracts to sweep |

Notes:

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- For Opening/Reopening auctions, the quoter can enter multiple auction responses at various price points to layer the auction.
- SQF Market Sweeps are submitted during free trading and will attempt to sweep the market and are treated as immediate or cancel (IOC).
- The quoters can cancel an auction response by entering a response with the same badge with a volume of zero.
- The quoters can replace an auction response by entering a response at the original price with the changed volume from the same badge.
- For SQF Market Sweeps (MSAR type 'M'), the Auction ID field must be set to zero else it will be rejected.
- If a SQF Market Sweep (MSAR type 'M') is received while an opening auction is in progress, it will get rejected.
- For Auction Responses (MSAR type 'A'), the Auction ID is: 0 (zero) for Opening/Reopening auctions; non-zero for all other auction types. If an Auction ID is provided in this message, it must match the ongoing auction. If the Auction ID is 0, the MSAR will participate in an Opening/Reopening auction if one is currently in progress; MSAR will be rejected otherwise.

5.7.2 MSAR Accept Message

The MSAR Accept message is used to inform firms that a MSAR is valid and accepted.

| Name | Offset | Length | Value | Notes |
|------------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | "SA" = MSAR Accept Message |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier. |
| Instrument ID | 14 | 4 | Integer | Simple Instrument ID |
| Security Symbol | 18 | 5 | Alpha | Industry assigned security symbol for the option contract |
| Expiration | 23 | 2 | Integer | Expiration Field |
| Strike Price | 25 | 4 | Price | Denotes the explicit strike price of the option. Refer to Data Types for field processing notes. |
| Option Type | 29 | 1 | Alpha | "C" = Call "P" = Put |
| MSAR Type | 30 | 1 | Alpha | "A" = Auction Response "M" = SQF Market Sweep |
| Auction ID | 31 | 4 | Integer | The exchange assigned Auction ID as provided in the Auction Notification message |
| Price | 35 | 4 | Price | Price at which to sweep |
| Side | 39 | 1 | Alphanumeric | "B" = Buy side sweep (you're selling) "S" – Sell side sweep (you're buying) |
| Contracts | 40 | 4 | Integer | Volume to sweep |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.

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5.7.3 MSAR Reject Message

The **MSAR Reject** message is used to inform firms that a **MSAR Request** is invalid and therefore rejected.

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “SR” = MSAR Reject |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier. |
| Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.

5.7.4 Complex MSAR Functionality

The Complex MSAR is a means for the Specialist and Market maker to participate in auctions in complex Instruments, or to sweep the complex order book.

The price and debit/credit indicator in the request is the limit price of the sender’s Complex MSAR request.

For Strategies with a stock component, Sweep values of ‘T’ (buy book side - short) and ‘X’ (buy book side - short exempt) represent sweep order on the buy side with a sell short or sell short exempt stock order, respectively. Similarly, Sweep values of ‘Y’ (sell book side - short) and ‘Z’ (sell book side - short exempt) represent sweep order on the sell side with a sell short or sell short exempt stock order, respectively. If a sweep request is sent with a buy short or sell short indicator and the stock component of the complex order is calculated to be a net buy, the sweep is rejected with “invalid side” reason.

5.7.5 Complex MSAR Request Message

| Name | Offset | Length | Value | Notes |
|-------------------------------|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | “SX” = Complex MSAR Request |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier. |
| Instrument ID | 14 | 4 | Integer | Complex Instrument ID |
| MSAR Type | 18 | 1 | Alpha | “A” = Auction Response “M” = SQF Market Sweep |
| Auction ID | 19 | 4 | Integer | The exchange assigned Auction ID as provided in the Complex Auction Notification message if applicable. |
| Price | 23 | 4 | Price | Price at which to sweep |
| Side | 27 | 1 | Alphanumeric | “B” = Buy book side “T” = Buy book side (short) “X” = Buy book side (short exempt) “S” = Sell book side “Y” = Sell book side (short) “Z” = Sell book side (short exempt) |
| Debit/Credit Indicator | 28 | 1 | Alphanumeric | Indicates whether the specified sweep price is debit or credit: |

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| | | | | |
|-------------------------|----|---|---------|---|
| | | | | "D" – Sweep Price is Debit "C" – Sweep Price is Credit " " – Sweep Price is 0.0 |
| Contracts | 29 | 4 | Integer | Volume to sweep |
| Price Protection | 33 | 1 | Alpha | <ul style="list-style-type: none"> • L=Local Market • N=National Market |
| Reserved | 34 | 4 | n/a | Reserved for future enhancements |

Notes:

- Participant can enter multiple Complex MSAR requests at various price points to layer the Auctions (where allowed by auction type).
- For Complex Book Sweeps (MSAR type 'M' = Book Sweep), the Auction ID field must be set to zero else it will reject.
- For Auction Responses (MSAR type 'A'), the Auction ID is mandatory. The Auction ID must match an ongoing auction.

5.7.6 Complex MSAR Accept Message

The **Complex MSAR Accept** message is used to inform firms that a **Complex MSAR Request** is valid and accepted.

| Name | Offset | Length | Value | Notes |
|-------------------------|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | "SY" = Complex MSAR Accept |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier. |
| Instrument ID | 14 | 4 | Integer | Complex Instrument ID |
| MSAR Type | 18 | 1 | Alpha | "A" = Auction Response "M" = SQF Market Sweep |
| Auction ID | 19 | 4 | Integer | The exchange assigned Auction ID as provided in the Auction Notification message |
| Price | 23 | 4 | Price | Price at which to sweep |
| Side | 27 | 1 | Alphanumeric | "B" = Buy side sweep "T" = Buy book side (short) "X" = Buy book side (short exempt) "S" = Sell side sweep "Y" = Sell book side (short) "Z" = Sell book side (short exempt) |
| Contracts | 28 | 4 | Integer | Volume to sweep |
| Price Protection | 32 | 1 | Alpha | <ul style="list-style-type: none"> • L=Local Market • N=National Market |
| Reserved | 33 | 4 | n/a | <ul style="list-style-type: none"> • Reserved for future enhancements |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.

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5.7.7 Complex MSAR Reject Message

Complex MSAR Reject message is used to inform firms that a **Complex MSAR Request** is invalid and therefore rejected.

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “SN” = Complex MSAR Reject |
| Badge | 2 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 6 | 8 | Binary | Firm defined message identifier. |
| Status Code | 14 | 1 | Alphanumeric | See Status Code Appendix |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.

6 Notifications

Notifications are optionally delivered host-to-client messages relaying various information about Nasdaq’s Options exchanges. Notification messages inform participants of:

- System and participant configuration
- System state and status
- Executions of quotes
- Executions and Cancellations of MSARs

6.1 Participant Configuration Notifications

6.1.1 Underlying Permission Notification

This optionally delivered message indicates underlyings permitted to be quoted/swept by individual badges configured for the port.

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|--------------|--|
| Message Type | 0 | 2 | Alpha | “AP” = Underlying Permission Message |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Underlying | 14 | 13 | Alphanumeric | Underlying Stock Symbol |
| Permitted | 27 | 1 | Alpha | Y = Permitted N = Not Permitted |

Notes:

- The Underlying permission messages are sent once per badge/underlying pair, typically right after Simple and Complex Instrument Directory messages. Should it be necessary, intra-day updates to the permissions will be sent as they occur.
- This is a sequenced message and therefore can be replayed upon re-connection.
- If a permission pair is removed from the system intra-day, a new Underlying Permission message will be sent with “Permitted” field set to “N”. Any new Quotes/MSARs/Purges sent for

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the removed badge/underlying will be rejected. All existing quotes for the badge/underlying will be purged.

6.1.2 MM Parameter Definition Notification

This optionally delivered message specifies participant's per-underlying/instrument type configuration settings.

| Name | Offset | Length | Value | Notes |
|-----------------------|--------|--------|--------------|--|
| Message Type | 0 | 2 | Alpha | "AJ" = MM Parameter Definition Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| InstrumentType | 14 | 1 | Alpha | S=Simple Instruments C=Complex Instruments |
| Underlying | 15 | 13 | Alphanumeric | Underlying Stock Symbol |
| Interval | 28 | 2 | Integer | Time interval (in milliseconds) $100 \leq n \leq 30,000$ |
| Percentage | 30 | 2 | Integer | Displayed size percentage $10 \leq n \leq 1,000$ |
| CumQty | 32 | 4 | Integer | Total execution volume that will trigger a rapid fire within the interval $1 \leq n \leq \text{MAX_INT}$ |
| Delta | 36 | 4 | Integer | $1 \leq n \leq \text{MAX_INT}$ |
| Vega | 40 | 4 | Integer | $1 \leq n \leq \text{MAX_INT}$ |
| Reserved | 44 | 32 | Alpha | Reserved for future enhancements |

Notes:

- Default MM parameters are not disseminated
- Intra-day updates to the MM settings will be sent out as soon as the changes initiated via mechanisms mentioned above take effect.
- This is a sequenced message and therefore can be replayed upon re-connection

6.1.3 Rapid-Fire Config Notification - deprecated

Note:

Rapid-Fire Config Notification (Af) is replaced by a more complete **MM Parameter Definition Notification** (AJ). A participant can request the port to be configured to receive either one of those notifications, not both.

This optionally delivered message specifies participant's per-underlying risk mitigation parameters (Rapid Fire/Curtailment settings).

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|---------|---|
| Message Type | 0 | 2 | Alpha | "Af" = Rapid Fire/Curtailment Config Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of timestamp |

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| | | | | |
|-------------------|----|----|--------------|---|
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Underlying | 14 | 13 | Alphanumeric | Underlying Stock Symbol |
| Percentage | 27 | 2 | Integer | Displayed size percentage (e.g. 100) |
| Interval | 29 | 2 | Integer | Time interval (in milliseconds) |
| Volume | 31 | 4 | Integer | Total execution volume that will trigger a rapid fire within the interval |

Notes:

- The Rapid-Fire Config Notification messages are sent per badge/underlying pair, typically after Simple and Complex Instrument Directory messages. Rapid fire parameters are set to system default values unless specifically overridden via SQF **Rapid Fire/Curtailment Config Request** message or by NASDAQ operations personnel.
- Default Rapid-Fire parameters are not disseminated
- Intra-day updates to the rapid-fire settings will be sent out as soon as the changes initiated via mechanisms mentioned above take effect.
- This is a sequenced message and therefore can be replayed upon re-connection

6.2 System Event Message

The system event message type is used to signal a market or data feed handler event. The format is as follows:

| Name | Offset | Length | Value | Notes |
|---------------------|--------|--------|---------|--|
| Message Type | 0 | 2 | Alpha | “AS” = System Event Message |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Event Code | 10 | 1 | Alpha | System Event Codes |
| Version | 11 | 1 | Integer | Version of the SQF Quote Interface. Currently set to 8 |
| Sub-version | 12 | 1 | Integer | Sub-version of the SQF Quote Interface. Currently set to 0 |

Notes:

- 1) This is a sequenced message and therefore can be replayed upon re-connection.

6.3 Instrument Definition Messages

6.3.1 Simple Instrument Directory Message

At the start of each trading day, the system disseminates directory messages for all symbols trading on the system.

| Name | Offset | Length | Value | Notes |
|------------------------|--------|--------|--------------|---|
| Message Type | 0 | 2 | Alpha | “AD” = Simple Instrument Directory Message |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Instrument ID | 10 | 4 | Integer | Unique Instrument ID |
| Security Symbol | 14 | 5 | Alphanumeric | Industry assigned security symbol for the option contract |

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| | | | | |
|--------------------------|----|----|---------|--|
| Expiration | 19 | 2 | Integer | Expiration Field |
| Strike Price | 21 | 4 | Price | Denotes the explicit strike price of the option. Refer to Data Types for field processing notes. |
| Option Type | 25 | 1 | Alpha | “C” = Call “P” = Put |
| Source | 26 | 1 | Integer | Identifies the source of the Option, valid for the trading day |
| Underlying Symbol | 27 | 13 | Alpha | Denotes the unique underlying stock symbol for the option symbol. Normally matches the stock symbol. The exception is for some corporate actions and underlyings exceeding 5 bytes |
| Closing Type | 40 | 1 | Alpha | “N” = Normal Hours “L” = Late Hours “W” = WCO Early Closing 12:00 Noon |
| Tradable | 41 | 1 | Alpha | “Y” = Option is tradable “N” = Option is not tradable |
| MPV | 42 | 1 | Alpha | See MPV |

Notes:

- The Simple and complex instrument directory messages are sent once per symbol, typically before the “Start of System Hours” System Event. Should it be necessary, intra-day updates to this message will be sent as they occur. In the case of an intra-day update, for a given Option Id, the canonical information for the option is invariant (will not change). The canonical information consists of Security Symbol, Expiration Year Month and Day, Strike Price and Option Type. Other attributes for the Option may change.
- The Underlying is in most cases the same as the industry standard ticker underlying except for cases where the industry standard ticker underlying exceeds 5 bytes (internal system limit). The exchange also assigns unique underlyings for special settlement symbols.
- This is a sequenced message and therefore can be replayed upon re-connection.
- If an Option is removed from the system intra-day, a new simple instrument directory message will be sent with “Tradable” field set to “N”. Any Quotes sent for this removed Option will be rejected. All existing quotes for this option will be purged.

6.3.2 Complex Instrument Directory Message

A Complex Instrument Directory Message is sent when new complex strategy is created for the first time. For GTC strategies, these will be assigned each trading day and will not be persistent across trading days.

| Name | Offset | Length | Value | Notes |
|----------------------|--------|--------|---------|--|
| Message Type | 0 | 2 | Alpha | “AR” = Complex Instrument Directory Message |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of timestamp |
| Instrument ID | 10 | 4 | Integer | Complex Instrument ID |
| Source | 14 | 1 | Integer | Identifies the source of the Strategy, valid for the trading day |

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| | | | | |
|---|----|----|--------------|--|
| Underlying Symbol | 15 | 13 | Alphanumeric | Denotes the unique underlying stock symbol for the option symbol. Normally matches the stock symbol. The exception is for some corporate actions and underlyings exceeding 5 bytes |
| Reserved | 28 | 1 | Integer | Reserved field with value zero |
| Number Of Legs | 29 | 1 | Integer | Number of legs in the combo. |
| Leg Definitions, Repeated Number Of Legs times | | | | |
| ➤ Leg Instrument ID | | 4 | Integer | Simple Instrument ID. Zero (0) for Stock Leg. |
| ➤ Security Symbol | | 5 | Alphanumeric | Industry assigned security symbol for the option contract. Blank for Stock Leg. Use Underlying Symbol field. |
| ➤ Expiration | | 2 | Integer | Expiration Field Zero (0) for Stock Leg. |
| ➤ Strike Price | | 4 | Price | Denotes the explicit strike price of the option. Refer to Data Types for field processing notes. Zero (0) for Stock Leg. |
| ➤ Option Type | | 1 | Alpha | "C" = Call "P" = Put Blank (" ") for Stock Leg. |
| ➤ Leg Side | | 1 | Alpha | "B" = Leg is on Buy side "S" = Leg is on Sell side |
| ➤ Leg Ratio | | 4 | Integer | Strategy Leg Ratio |

Notes:

- The Underlying is in most cases the same as the industry standard ticker underlying except for cases where the industry standard ticker underlying exceeds 5 bytes (internal system limit). The exchange also assigns unique underlyings for special settlement symbols.
- This is a sequenced message and therefore can be replayed upon re-connection.
- All Complex Strategies have Minimum Price Variation of \$0.01. Fractional cents in the Quote is not permitted.

6.4 Trading Action Notifications

6.4.1 Simple Instrument Trading Action

After the start of system hours, the system will use the Trading Action notification message to relay changes in trading status for an individual instrument. Messages will be sent when an option is halted or is released for trading.

| Name | Offset | Length | Value | Notes |
|----------------------|--------|--------|---------|---|
| Message Type | 0 | 2 | Alpha | "AH" = Simple Instrument Trading Action |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of timestamp |
| Instrument ID | 10 | 4 | Integer | Simple Instrument ID |

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| | | | | |
|------------------------|----|---|--------------|---|
| Security Symbol | 14 | 5 | Alphanumeric | Industry assigned security symbol for the option contract |
| Expiration | 19 | 2 | Integer | Expiration Field |
| Strike Price | 21 | 4 | Price | Denotes the explicit strike price of the option. Refer to Data Types for field processing notes. |
| Option Type | 25 | 1 | Alpha | Option Type: “C” = Call “P” = Put |
| Trading State | 26 | 1 | Alpha | Reflects the current trading state for the option. The allowable values are: H = Halt in effect T = Trading Resumed |

Notes:

- At the start of the day, all tradable options are assumed to be trading unless notified by this message.
- This is a sequenced message and therefore can be replayed upon re-connection.

6.4.2 Complex Instrument Trading Action

After the start of system hours, NASDAQ will use the Trading Action message to relay changes in trading status for a complex strategy. Messages will be sent when a strategy is halted or is released for trading.

| Name | Offset | Length | Value | Notes |
|----------------------|--------|--------|---------|---|
| Message Type | 0 | 2 | Alpha | “AI” = Complex Instrument Trading Action |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of timestamp |
| Instrument ID | 10 | 4 | Integer | Complex Instrument ID |
| Trading State | 14 | 1 | Alpha | Reflects the current trading state for the strategy. The allowable values are: H = Halt in effect T = Trading Resumed |

Notes:

- At the start of the day, the strategy is assumed to be trading unless notified by this message
- This is a sequenced message and therefore can be replayed upon re-connection.

6.5 Auction Notification

Auction Notification message announces start/update/end of an Auction. Auction types include Block, Exposure, Flash, Facilitation, Solicitation, and PIM.

- Used for simple, complex and stock combo instruments, as specified by *InstrumentType* field.
- Auction notification informing of auction termination (*AuctionEvent=E*) will have all fields after *AuctionId* zeroed and blanked out.

| Name | Offset | Length | Value | Notes |
|------|--------|--------|-------|-------|
|------|--------|--------|-------|-------|

Specialized Quote Interface

| | | | | |
|--------------------------|----|---|--------------|--|
| Message Type | 0 | 2 | Alpha | “NA” = Auction Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of timestamp |
| InstrumentType | 10 | 1 | Alpha | S=Simple Instrument C=Complex Instrument |
| Instrument ID | 11 | 4 | Integer | Instrument ID (simple or complex) |
| Auction ID | 15 | 4 | Integer | Auction ID |
| OrderType | 19 | 1 | Alpha | <ul style="list-style-type: none"> • L=Limit • M=Market • N=Not Disclosed |
| Side | 20 | 1 | Alpha | Indicates the side of the auction: <ul style="list-style-type: none"> • B=Buy side • S=Sell side *=Not Disclosed |
| Price | 21 | 4 | Price | Auction Price. Can be 0 or negative for complex instruments. Set to 0 unless <i>OrderType=L</i> |
| Matched Volume | 25 | 4 | Integer | <ul style="list-style-type: none"> • For Opening Auction indicates matched volume at the specified price • For all other auction types set to 0 (zero) |
| Volume | 29 | 4 | Integer | <ul style="list-style-type: none"> • For Opening Auction - total number of contracts better than Price (includes Orders that cannot be filled) • For all other auction types – quantity being auctioned at the specified price |
| ExecFlag | 33 | 1 | Alpha | 0 = None 1 = AON |
| Order Capacity | 34 | 1 | Alpha | Capacity Indicator |
| FirmID | 35 | 4 | Alphanumeric | Spaces when auction not flagged Attributable |
| OCCAccount | 39 | 4 | Integer | Account number used for clearing give up. 0 when auction not flagged Attributable |
| CMTA | 43 | 4 | Integer | 0 when auction not flagged Attributable |
| AuctionEvent | 47 | 1 | Alpha | <ul style="list-style-type: none"> • S=Start • U=Auction Update • E=End of Auction |
| Auction Type | 48 | 1 | Alpha | Auction Type Field |
| BestResponsePrice | 49 | 4 | Price | Best response price; 0 if not disclosed |
| BestResponseSize | 53 | 4 | Integer | Aggregated quantity at best response price; 0 if not disclosed |

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection.

Specialized Quote Interface

6.6 Purge Notifications

6.6.1 Deprecation Note

Simple Instrument Purge Notification (NP) is replaced with a more generic **Instrument Purge Notification** (ND) that can accommodate simple and complex instruments. A participant can request the port to be configured to receive either one of those notifications, not both.

6.6.2 Simple Instrument Purge Notification – deprecated

The **Simple Instrument Purge Notification** message is used to inform participants that their quote for a given option symbol has been purged/removed from the market. This message can be triggered by:

- User request (via 0x0 quote)
- Full execution of either bid or ask side of a single quote
- Self-trade avoidance mechanism (Anti-internalization)

| Name | Offset | Length | Value | Notes |
|------------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “NP” = Simple Instrument Purge Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Instrument ID | 14 | 4 | Integer | Simple Instrument ID |
| Security Symbol | 18 | 5 | Alpha | Industry assigned security symbol for the option contract |
| Expiration | 23 | 2 | Integer | Expiration Field |
| Strike Price | 25 | 4 | Price | Denotes the explicit strike price of the option. Refer to Data Types for field processing notes. |
| Option Type | 29 | 1 | Alpha | C=Call P=Put |
| Purge Reason | 30 | 1 | Alphanumeric | U=User requested S=System initiated Q=Anti-Internalize T=Request Pending |
| MessageID | 31 | 8 | Binary | Firm defined message identifier. This field is padded with blanks for system initiated purges. |
| Sequence | 39 | 8 | Integer | Relative sequence of the purge processed by the matching engine. Quotes/purges with higher sequence number occur after quotes/purges with lower sequence number. This field is zero if the request was invalid. Unique for each underlying across all ports. |

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection.

Specialized Quote Interface

6.6.3 Instrument Purge Notification

The **Instrument Purge Notification** message is used to inform participants that their quote for a given instrument has been purged/removed from the market. This message can be triggered by:

- User request (via 0x0 quote)
- Full execution of either bid or ask side of a single quote
- Self-trade avoidance mechanism (Anti-internalization)

| Name | Offset | Length | Value | Notes |
|----------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “ND” = Instrument Purge Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 14 | 8 | Binary | Firm specified message identifier. This field is filled with blanks for system initiated purges. |
| Instrument ID | 22 | 4 | Integer | Simple or Complex Instrument ID |
| Purge Reason | 26 | 1 | Alphanumeric | U=User requested S=System initiated Q=Anti-Internalize T=Request Pending |
| Sequence | 27 | 8 | Integer | Relative sequence of the purge processed by the matching engine. Quotes/purges with higher sequence number occur after quotes/purges with lower sequence number. This field is zero if the request was invalid. Unique for each underlying across all ports. |
| Reserved | 35 | 16 | Alpha | Reserved for future use |

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection

6.6.4 Underlying Purge Notification

The **Underlying Purge Notification** message is used to inform firms that all the quotes for instruments associated with the given underlying have been purged/removed from the market. This notification may be caused by one of the following:

- User request (via Underlying Purge Message)
- Rapid Fire/Curtailment Protection
- Kill-Switch mechanism

Underlying-level purge requests as well as Rapid Fire protection operate on simple and complex instruments independently. *Purge Reason* field indicates the reason for the purge as well as the type of instruments it applies to.

| Name | Offset | Length | Value | Notes |
|------|--------|--------|-------|-------|
|------|--------|--------|-------|-------|

Specialized Quote Interface

| | | | | |
|---------------------|----|----|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “NU” = Underlying Purge Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Underlying | 14 | 13 | Alphanumeric | Denotes the unique underlying stock symbol. |
| Purge Reason | 27 | 1 | Alphanumeric | <ul style="list-style-type: none"> • U=User requested (Simple) • S=System initiated (Simple) • K=Auto Killswitch initiated (All Instruments) • M=Manual Killswitch initiated (All Instruments) • u=User requested Complex) • s=System initiated (Complex) • P=Purge On Disconnect |
| MessageID | 28 | 8 | Binary | Firm defined message identifier. This field is filled with blanks for system initiated purges. |
| Sequence | 36 | 8 | Integer | Relative sequence of the underlying purge processed by the matching engine. Quotes/purges with higher sequence number occur after quotes/purges with lower sequence number. This field is zero if the request was invalid. Unique for each underlying across all ports. |

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection.

6.7 Market Reentry Notification

The Market Reentry Notification message informs that risk protection triggered by rapid fire /purge has been reset for the specified scope.

| Name | Offset | Length | Value | Notes |
|--------------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “NR” = Market Reentry Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Underlying Symbol | 14 | 13 | Alphanumeric | Denotes the unique underlying stock symbol. Normally matches the stock symbol. The exception is for corporate actions assigned by the exchange and underlyings exceeding 5 bytes. |
| Reentry Scope | 27 | 1 | Alphanumeric | <ul style="list-style-type: none"> • N=User requested (Simple Instruments) • n=User requested (Complex Instruments) • K=Post-Killswitch (All Instruments) |
| MessageID | 28 | 8 | Binary | Firm defined message identifier |
| Reserved | 36 | 8 | | Reserved – unused |

Specialized Quote Interface

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection.

6.8 Quote Notifications

6.8.1 Simple Quote Execution Notification

Simple Quote Execution Notification message is used to inform firms that their quote for a given simple instrument has been executed in the market.

| Name | Offset | Length | Value | Notes |
|----------------------------|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | “NE” = Simple Quote Execution Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Instrument ID | 14 | 4 | Integer | Simple Instrument ID |
| Security Symbol | 18 | 5 | Alpha | Industry assigned security symbol for the option contract |
| Expiration | 23 | 2 | Integer | Expiration Field |
| Strike Price | 25 | 4 | Price | Denotes the explicit strike price of the option. Refer to Data Types for field processing notes. |
| Option Type | 29 | 1 | Alpha | “C” = Call “P” = Put |
| MessageID | 30 | 8 | Binary | MessageID (Simple Quote Block – short form) QuoteID (Simple Quote Block – long form) |
| Auction ID | 38 | 4 | Integer | Auction ID (if quote participated in an auction) |
| Price | 42 | 4 | Price | Execution Price |
| Side | 46 | 1 | Alphanumeric | “B” = Bought “S” = Sold |
| Contracts | 47 | 4 | Integer | Volume Traded |
| Liquidity Indicator | 51 | 1 | Integer | Liquidity Indicator |
| Cross Id | 52 | 4 | Integer | Identifies the execution. This can be matched with the Cross Id in the exchange Clearing Trade Interface (CTI) messages |
| Match Id | 56 | 4 | Integer | Identifies the component of an execution |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.
- This notification is only sent if the firm is subscribed to receive these messages.
- It is possible for a Quote to have more than one execution for a given Cross Id. The Cross Id and Match Id combination uniquely identifies the Quote Execution.

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6.8.2 Complex Quote Execution Notification

Complex Quote Execution Notification message informs the participant that their quote for a given complex instrument has been executed in the market.

| Name | Offset | Length | Value | Notes |
|----------------------------|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | “NV” = Complex Quote Execution Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 14 | 8 | Binary | <i>QuoteID</i> from Complex Quote Block |
| Instrument ID | 22 | 4 | Integer | Complex Instrument ID |
| Auction ID | 26 | 4 | Integer | Auction ID (if quote participated in an auction) |
| Price6 | 30 | 8 | Price6 | Execution Price (6.6 format) |
| Side | 38 | 1 | Alphanumeric | “B” = Bought “S” = Sold |
| Contracts | 39 | 4 | Integer | Volume Traded |
| Liquidity Indicator | 43 | 1 | Integer | Liquidity Indicator |
| Cross Id | 44 | 4 | Integer | Identifies the execution. This can be matched with the Cross Id in the exchange Clearing Trade Interface (CTI) messages |
| Match Id | 48 | 4 | Integer | Identifies the component of an execution |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.
- This notification is only sent if the firm is subscribed to receive these messages.
- It is possible for a Quote to have more than one execution for a given Cross Id. The Cross Id and Match Id combination uniquely identifies the Quote Execution.

6.8.3 Complex Quote Leg Execution Notification

Complex Quote Execution Notification message informs the participant that their quote for a given complex instrument has been executed in the market.

| Name | Offset | Length | Value | Notes |
|--------------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | “NW” = Complex Quote Leg Execution Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 14 | 8 | Binary | <i>QuoteID</i> from Complex Quote Block |
| Instrument ID | 22 | 4 | Integer | Complex Instrument ID |
| Leg Instrument ID | 26 | 4 | Integer | Leg Instrument ID, 0 (zero) for stock leg |
| LegId | 30 | 1 | Integer | Leg reference of the strategy involved in the Complex MSAR execution. The reference is the |

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| | | | | |
|----------------------------|----|---|--------------|---|
| | | | | index of the leg, starting at zero, in the Complex Instrument Directory message |
| Auction ID | 31 | 4 | Integer | Auction ID (if quote participated in an auction) |
| Price6 | 35 | 8 | Price6 | Execution Price (6.6 format) |
| Side | 43 | 1 | Alphanumeric | “B” = Bought “S” = Sold |
| Contracts | 44 | 4 | Integer | Volume Traded |
| Liquidity Indicator | 48 | 1 | Integer | Liquidity Indicator |
| Cross Id | 49 | 4 | Integer | Identifies the execution. This can be matched with the Cross Id in the exchange Clearing Trade Interface (CTI) messages |
| Match Id | 53 | 4 | Integer | Identifies the component of an execution |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.
- This notification is only sent if the firm is subscribed to receive these messages.
- It is possible for a Quote to have more than one execution for a given Cross Id. The Cross Id and Match Id combination uniquely identifies the Quote Execution.

6.8.4 Quote Update Notification

Quote Update Notification informs participant of a status change of an individual quote.

- Necessitated by quote reprice and instrument freezing functionality.

| Name | Offset | Length | Value | Notes |
|----------------------|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | “NT” = Quote Update Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| MessageID | 14 | 8 | Binary | MessageID or QuoteID from the Quote Block request |
| Instrument ID | 22 | 4 | Integer | Instrument ID |
| Reason | 26 | 1 | Alpha | A=Accepted R=Rejected B=Bid Repriced C=Ask Repriced |
| Price | 27 | 4 | Price | Resting price of the indicated quote side, 0 (zero) if Reason=A,R |

Notes:

- This is an unsequenced message

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6.9 MSAR Notifications

6.9.1 Simple MSAR Notification

Simple MSAR Notification message is used to inform firms that their **MSAR Request** for a given simple instrument has been executed or cancelled in the market.

| Name | Offset | Length | Value | Notes |
|----------------------------|--------|--------|--------------|--|
| Type/Subtype | 0 | 2 | Alpha | "NS" = Execution Notification Message |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Instrument ID | 14 | 4 | Integer | Simple Instrument ID |
| Security Symbol | 18 | 5 | Alpha | Industry assigned security symbol for the option contract |
| Expiration | 23 | 2 | Integer | Expiration Field |
| Strike Price | 25 | 4 | Price | Denotes the explicit strike price of the option. Refer to Data Types for field processing notes. |
| Option Type | 29 | 1 | Alpha | "C" = Call "P" = Put |
| Notification Type | 30 | 1 | Alpha | "E" = Executed "C" = Cancelled |
| MessageID | 31 | 8 | Binary | MessageID from the MSAR request |
| Auction ID | 39 | 4 | Integer | Auction ID |
| Price | 43 | 4 | Price | Execution Price. 0 for <i>Notification Type=C</i> . |
| Side | 47 | 1 | Alphanumeric | "B" = Buy side sweep "S" = Sell side sweep |
| Contracts | 48 | 4 | Integer | Volume of Contracts Traded or number of cancelled contracts for a sweep that is out. |
| Liquidity Indicator | 52 | 1 | Integer | Liquidity Indicator |
| Cross Id | 53 | 4 | Integer | Identifies the execution. This can be matched with the Cross Id in the Exchange Clearing Trade Interface (CTI) messages. Zero for outed MSARs. |
| Match Id | 57 | 4 | Integer | Identifies the component of an execution. Zero for outed MSARs |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.
- It is possible for a MSAR to have more than one execution for a given Cross Id. The Cross Id and Match Id combination uniquely identifies the MSAR Execution.
- For MSAR executions and cancel notifications, the Side field reflects the side being swept. If a MSAR execution notification has a value of "B", that means you sold and a value of "S" means you bought.

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6.9.2 Complex MSAR Leg Notification

The **Complex MSAR Leg Notification** message is used to inform firms that their MSAR for a given complex instrument has been executed or outed and provides leg-level information regarding the execution/out of the MSAR.

| Name | Offset | Length | Value | Notes |
|----------------------------|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | "NL" = Complex MSAR Leg Notification Message |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Instrument ID | 14 | 4 | Integer | Complex Instrument ID |
| LegId | 18 | 1 | Integer | Leg reference of the strategy involved in the Complex MSAR execution. The reference is the index of the leg, starting at zero, in the Complex Instrument Directory message |
| Leg Instrument ID | 19 | 4 | Integer | Leg Instrument ID. Zero (0) for Stock Leg. |
| Notification Type | 23 | 1 | Alpha | "E" = Execution "C" = Cancelled |
| MessageID | 24 | 8 | Binary | MessageID from the Complex MSAR request |
| Auction Id | 32 | 4 | Integer | Auction ID |
| Price | 36 | 4 | Price | Leg Execution Price. 0 for <i>Notification Type=C</i> . Carries default precision of 6.4; <i>Price6</i> field contains full precision. |
| Side | 40 | 1 | Alphanumeric | "B" = Buy side sweep (Strategy) "S" = Sell side sweep (Strategy) |
| Leg Side | 41 | 1 | Alphanumeric | "B" = Buy side sweep (Leg) "S" = Sell side sweep (Leg) (see Notes below) |
| Contracts | 42 | 4 | Integer | Leg volume of Contracts traded or number of cancelled contracts for a sweep that is out |
| Liquidity Indicator | 46 | 1 | Integer | Liquidity Indicator |
| Cross Id | 47 | 4 | Integer | Identifies the execution. This can be matched with the Cross Id in the exchange Clearing Trade Interface (CTI) message. Zero for outed MSARs. |
| Match Id | 51 | 4 | Integer | Identifies the component of the execution. Zero for outed MSARs. |
| Price6 | 55 | 8 | Price6 | Same as <i>Price</i> field above, but with full 6.6 precision |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.
- The Complex MSAR Leg Notification messages will precede the corresponding Complex MSAR Notification message. These messages will all have the same Cross Id and each Leg Execution will have a unique Match Id, also displayed in the CTI interface.

Specialized Quote Interface

- Typically, one message per leg will be sent. One option leg and a stock leg (for tied to stock) may have 2 messages sent for executions; the two messages differing by price.
- For a Complex MSAR Message sent with Side field “B” and with a Complex Order Strategy having two legs, the first leg having Side “B” and second leg with side “S” and there is an Execution on the MSAR, three Notifications will be sent. The first message is a Complex MSAR Leg Notification Message will have Strategy Leg = 0, Side = “B” and Leg Side = “B”. The second message is a Complex MSAR Leg Notification Message will have Strategy Leg = 1, Side = “B” and Leg Side = “S”. The third message will be a Complex MSAR Notification Message with Side = “B”.

6.9.3 Complex MSAR Notification

The **Complex MSAR Notification** message is used to inform participants that their **Complex MSAR Request** for a given complex instrument has been executed or cancelled in the market.

| Name | Offset | Length | Value | Notes |
|----------------------------|--------|--------|--------------|---|
| Type/Subtype | 0 | 2 | Alpha | “NX” = Complex MSAR Execution Notification |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of the timestamp |
| Badge | 10 | 4 | Alphanumeric | Exchange assigned badge/suffix combination |
| Instrument ID | 14 | 4 | Integer | Complex Instrument ID |
| Notification Type | 18 | 1 | Alpha | “E” = Execution “C” = Cancelled |
| MessageID | 19 | 8 | Binary | MessageID from Complex MSAR request |
| Auction ID | 27 | 4 | Integer | Auction ID |
| Price | 31 | 4 | Price | Leg Execution Price. 0 for <i>Notification Type=C</i> . Carries default precision of 6.4; <i>Price6</i> field contains full precision. |
| Side | 35 | 1 | Alphanumeric | “B” = Buy side sweep “S” = Sell side sweep |
| Contracts | 36 | 4 | Integer | Volume of Contracts Traded or number of cancelled contracts for a MSAR that is out. |
| Liquidity Indicator | 40 | 1 | Integer | Liquidity Indicator |
| Cross Id | 41 | 4 | Integer | Identifies the execution. This can be matched with the Cross Id in the exchange Clearing Trade Interface (CTI) messages. Zero for outed MSARs |
| Match Id | 45 | 4 | Integer | Identifies the component of an execution. Zero for outed MSARs |
| Price6 | 49 | 8 | Price6 | Same as <i>Price</i> field above, but with full 6.6 precision |

Notes:

- This is a sequenced message and therefore can be replayed upon re-connection.
- It is possible for a Complex MSARs to have more than one execution for a given Cross Id. The Cross Id and Match Id combination uniquely identifies the Complex MSAR Execution.

Specialized Quote Interface

- For MSAR executions and cancel notifications, the Side field reflects the side being swept. If a MSAR execution notification has a value of “B”, that means you sold and a value of “S” means you bought.

6.10 Opening Rotation Quote Spread Multiplier Notification

This optionally delivered notification specifies per-underlying quote spread multiplier the system uses to determine validity of quote spreads during opening/reopening rotations. Note, the table itself can be obtained from NASDAQ Web site.

| Name | Offset | Length | Value | Notes |
|--------------------------|--------|--------|--------------|--|
| Message Type | 0 | 2 | Alpha | “AM” = Quote Spread Multiplier Message |
| Seconds | 2 | 4 | Integer | Seconds portion of the timestamp |
| Nanoseconds | 6 | 4 | Integer | Nanoseconds portion of timestamp |
| Underlying Symbol | 10 | 13 | Alphanumeric | Underlying Stock Symbol |
| Multiplier | 23 | 1 | Integer | Spread Multiplier |

Notes:

- Quote spread multiplier message will be sent once per each underlying permitted on the port plus whenever effective multiplier changes intraday
- Disseminated multiplier is not applicable to leaps
- Disseminated multiplier is not applicable to normal continuous trading
- This is a sequenced message and therefore can be replayed upon re-connection

7 Support

| Department | Contact | Phone | Email |
|----------------------------|---------------------|-----------------|--|
| Market Operations | System Support | +1 215 496 1571 | phlxsystemsupport@nasdaqomx.com |
| NOC | NOC | +1 212 231 5049 | nocgroup@nasdaqomx.com |
| Subscriber Services | Subscriber Services | +1 212 231 5180 | subscriber@nasdaqomx.com |

For technical questions please contact devsupport@nasdaqomx.com

8 Appendix

8.1 Field Details

8.1.1 Expiration Field

Expiration year, month, day encoded into a 2-byte integer.

- Bits 0-6 = Year (0-99)
- Bits 7-10 = Month (1-12)
- Bits 11-15 = Day (1-31)

Specialized Quote Interface

Note, Bit 15 is the least significant bit

8.1.2 Auction Type Field

AuctionType field differentiates various auction types.

| Code | Description |
|----------|--|
| B | Block Order Auction |
| C | Combo Exposure Auction (aka COLA) |
| I | Flash Auction |
| O | Opening Auction |
| P | PIM Auction (PIXL) |
| H | Facilitation Auction |
| S | Solicitation Auction |

8.1.3 Capacity Indicator

Indicates the order capacity:

- C=Customer
- F=Firm
- M=Market Maker
- O=Other-Exchange Registered Market Maker (FARMM/AWAYMM)
- P=Professional Customer
- B=Broker/Dealer - Customer
- K – Broker Deal - Firm
- J=Joint BackOffice (JBO)
- R=Retail
- E = Proprietary Customer
- " " (space)=N/A

Note, Retail and JBO order capacities are placeholders for future functionality.

8.1.4 Liquidity Indicator

| Code | Description |
|-----------|------------------|
| 0 | None |
| 1 | Maker |
| 2 | Taker |
| 4 | Response |
| 5 | Hidden |
| 6 | Opening Rotation |
| 7 | Cross |
| 8 | Flashed Order |
| 9 | Flash Response |
| 10 | Routed Out |
| 11 | Trade Report |

Specialized Quote Interface

| | |
|----|--------------------------------------|
| 12 | Combo Maker Against Combo |
| 13 | Combo Taker Against Combo |
| 14 | Combo Response Against Combo |
| 15 | Combo Hidden Against Combo |
| 16 | Combo Opening Rotation |
| 17 | Combo Cross |
| 18 | Combo Taker Against Regular |
| 19 | Regular Maker Against Combo |
| 20 | Combo Taker Against IO |
| 21 | Regular (incl. PIM) Taker Against IO |
| 22 | IO Maker Against Combo |
| 23 | IO Maker Against Regular |
| 24 | Regular Maker Against IO Participant |
| 25 | IO Participant Taker Against Regular |
| 26 | Broken Price Improvement |
| 27 | Broken Facilitation |
| 28 | Broken Solicitation |
| 29 | Combo Broken Price Improvement |
| 30 | Combo Broken Facilitation |
| 31 | Combo Broken Solicitation |
| 32 | Block |
| 33 | Block Response |
| 34 | Directed Response |
| 35 | Facilitation |
| 36 | Facilitation Response |
| 37 | Price Improvement |
| 38 | Price improvement Response |
| 39 | Solicitation |
| 40 | Solicitation Response |
| 41 | Qualified Contingent Cross |
| 42 | Customer to Customer |
| 43 | Combo Facilitation |
| 44 | Combo Facilitation Response |
| 45 | Combo Price Improvement |
| 46 | Combo Price Improvement Response |
| 47 | Combo Solicitation |
| 48 | Combo Solicitation Response |
| 49 | Combo Qualified Contingent Cross |
| 50 | Combo Customer to Customer |
| 51 | Sweep Routed Out |
| 52 | Sweep Trade Report |

8.1.5 System Event Codes

| Code | Explanation | When (typically) |
|------|-------------|------------------|
|------|-------------|------------------|

Specialized Quote Interface

| | | |
|------------|--|-------------------|
| "O" | <i>Start of Messages.</i> This is always the first message sent in any trading day. | After ~12:30am |
| "S" | <i>Start of System Hours.</i> This message indicates that the system is up and ready to start accepting orders. | ~7:00am |
| "B" | <i>Start of Quote.</i> This message indicates that quotes sent to the system will now be added to the book and be considered for execution when trading starts on this option. Quotes sent to the system before this message are not added to the book and will not be considered for execution when the option opens for trading. | 9:25:00am |
| "Q" | <i>Start of Opening Process.</i> This message is intended to indicate that the system has started its opening process. | 9:30:00am |
| "W" | <i>End of WCO Early closing.</i> This message is intended to indicate that the exchange will no longer accept any new orders or changes to existing Orders on last trading date of WCO options. | 12:00 Noon |
| "N" | <i>End of Normal Hours Processing.</i> This message is intended to indicate that the system will no longer generate new executions for options that trade during normal hours. | 4:00:00pm |
| "L" | <i>End of Late Hours Processing.</i> This message is intended to indicate that the system will no longer generate new executions for options that trade during extended hours. | 4:15:00pm |
| "E" | <i>End of System Hours.</i> This message indicates that the system is now closed. | ~5:30pm |
| "C" | <i>End of Messages.</i> This is always the last message sent in any trading day. | ~5:35pm |

8.1.6 MPV

Minimum Price Variation (MPV) has the following values:

- "E" – All prices are in penny increments
- "S" – Scaled. Prices below \$3.00 are in increments of \$0.05, prices above \$3.00 are in increments of \$0.10
- "P" – Penny Pilot. Prices below \$3.00 are in increments of \$0.01, prices above \$3.00 are in increments of \$0.05

8.1.7 Status Code

Note: New Status Codes may be added. Please contact support when receiving unrecognized status code.

| Reason | Value |
|--------|-------------------------------|
| Space | Valid Request |
| A | Invalid Badge |
| B | Invalid Instrument/Underlying |
| C | Not Permitted |
| D | Invalid Side |
| E | Invalid Size |
| F | Invalid Price |
| G | Invalid Spread |

Specialized Quote Interface

| | |
|---|------------------------------|
| H | Invalid Indicator/Attribute |
| I | Reentry Required |
| J | Opening Rotation in Progress |
| K | Kill-Switch Reentry Required |
| N | Too Late To Act |
| P | Not in Free Trading |
| Q | Invalid Auction Information |
| R | Market Closed |
| S | Post-Only Reprice |
| T | Request Pending |
| Y | Invalid Format/Bad Block |
| Z | System Error |

8.2 SQF Host to Client Messages

The following table summarizes which host to client messages are sequenced (can be resent by host using SOUP protocol semantics) or unsequenced (cannot be resent).

| Message | Notes |
|---|-------------|
| Replies | |
| Add Complex Instrument Reply | Unsequenced |
| MM Parameter Definition Reply | Unsequenced |
| Rapid Fire/Curtailment Control Reply | Unsequenced |
| Quote Reply | Unsequenced |
| Underlying Purge Reply | Unsequenced |
| MSAR Accept Message | Sequenced |
| MSAR Reject Message | Sequenced |
| Complex MSAR Accept Message | Sequenced |
| Complex MSAR Reject Message | Sequenced |
| Notifications | |
| System Event Notification | Sequenced |
| Simple Instrument Directory Notification | Sequenced |
| Complex Instrument Notification | Sequenced |
| Security Trading Action Notification | Sequenced |
| Complex Trading Action Notification | Sequenced |
| MM Parameter Definition Notification | Sequenced |
| Rapid Fire/Curtailment Notification | Sequenced |
| Opening Rotation Spread Multiplier | Sequenced |
| Underlying Permission Notification | Sequenced |
| Auction Notification Message | Unsequenced |
| Complex Auction Notification | Unsequenced |
| Instrument Purge Notification | Unsequenced |
| Option Symbol Purge Notification | Unsequenced |
| Underlying Purge Notification | Unsequenced |
| Market Reentry Notification | Unsequenced |
| Quote Update Notification | Unsequenced |

Specialized Quote Interface

| | |
|---|-------------|
| Quote Execution Notification | Sequenced |
| Complex Quote Execution Notification | Sequenced |
| Complex Quote Leg Execution Notification | Sequenced |
| MSAR Notification | Sequenced |
| Complex MSAR Leg Notification | Sequenced |
| Complex MSAR Notification | Sequenced |
| Subscription Reply | Unsequenced |

8.3 Revision Control Log

February 20, 2018: Purge on Disconnect Enhancement-version 8.1

- Adding Purge Reason “Purge On Disconnect” to Underlying Purge Notification Message on GEMX

February 12, 2018: Purge on Disconnect Enhancement-version 8.1

- Adding Purge Reason “Purge On Disconnect” to Underlying Purge Notification Message on MRX

December 1, 2017: Purge on Disconnect Enhancement-version 8.1

- Adding Purge Reason “Purge On Disconnect” to Underlying Purge Notification Message on ISE

November 18, 2016: Complex Update and Auction Notification Enhancement-version 8.1

- Adding notification subscription request/response functionality
- Adjusting Purge/Re-Entry Request Messages to support separate processing for simple vs complex quotes
- Adjusting Purge Response Notification valid values to support processing for simple vs complex quotes
- Adding System Event code for “*Start of Currency Opening Process*”
- Adding OrderType, BestResponsePrice, ExecFlag, FirmID, OCCAccount, CMTA to Auction and Complex Auction Notification Messages

December 16, 2016: Clarifying updates and Auction notification enhancement – version 8.1

- One common message type is now used for simple and complex Auction Notifications.
- Added BestResponseSize Auction Notification to keep consistent with order feed
- Removed Complex Auction Notification
- Removed canonical fields from Simple Auction Notification
- Changing proprietary enumeration to "E"
- Changing Start of opening process enumeration to "W"
- Updated capacity codes for consistency across all protocols
- Adjusting Complex Quote Leg Execution notification enumeration to "NW"
- Adjusting Complex Quote Execution notification enumeration to "NV"
- Added Market Wide Speed Bump description section

January 13, 2017: Clarifying Update version 8.1

- Changing Enumeration for *Start of Currency Opening Process* System Event from “W” to “F”

Specialized Quote Interface

- Host to Client correction
- Adding subscription reply to host to client messages
- *Add complex instrument reply* enumeration adjusted to “Ac”
- **MM Parameter Definition Reply** enumeration adjusted to “Ae”
- Adding Subscription types to support purge notifications to Subscription request message
- *BestResponsePrice* in Auction notification message length changed from 8 to 4

March 9, 2017: Clarifying Update version 8.1

- Clarifying Rapid Fire percentage description valid values (Section 5.3)
- Clarifying *InstrumentID* description in Quote Update Notification Message (Section 6.8.4)
- Clarifying *Purge Reason* “K” and “M” are for all instruments in Underlying Purge Notification (Section 6.6.4)
- Clarifying Market Re-entry Scope Enumerations (Section 6.7)

April 5, 2017: Clarifying Update version 8.1

- Adding Liquidity Code “0”
- Clarifying handling of *MessageID* and *QuoteID*

April 19, 2017: Clarifying Update version 8.1

- Clarifying *Trading State* in *Simple and Complex Instrument Directory* messages are data type Alpha
- Removing FX Opening System Event Enumeration as FX products will open at 9:30 with other options

June 13, 2017: Clarifying Update version 8.1

- Adding System Event enumeration “W” for early close of FX symbols on expiration day
- Adjusting System Event enumeration “O” *Start of Messages* to 12:30 AM

August 18, 2017: Clarifying Update version 8.1

- Correcting Rapid Fire allowable percentage range to be a minimum of 100% on the *Market Maker Parameter Definition* Message