Specialized Quote Interface

Version 9.0

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1. Overview

Specialized Quote Interface (SQF) provides a low latency, high throughput mechanism for Market Makers to participate in Nasdaq Phlx (Phlx), Nasdaq Options Market (NOM), Nasdaq ISE (ISE), Nasdaq GEMX (GEMX), Nasdaq MRX (MRX) and Nasdaq TX (NTX). 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
- Active QP/ Self-Replenishment Risk Protection (Alternative to Rapid Fire)
- 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 cancelled.

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

Protocol Option	
SoupBinTCP Version 4.10	TCP Interface

* 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	Alpha or Alphanumeric 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.
- **SentTimestamp:** This field is part of Quote and Purge messages that indicates the time the message is being sent to the Exchange. This timestamp is passed to the CAT report system.

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 cancelled or replaced by the originating port only. All the outstanding SQF Sweeps received by a given port are automatically cancelled 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.

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 × 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 requoting with reentry indicator "on".

Note that if the badge is configured for ActiveQP and the quotes were purged due to ActiveQP Contract Limit being exceeded then a quote level reentry is not allowed and firms must use the ActiveQP/ Self-replenishment Request/Reentry message for quotes to be accepted.

Purge on Disconnect

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 cancelled 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

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)
- Order Exposure (created automatically by the system based on market conditions for simple instruments only)
- Complex Exposure Auctions
- Opening Imbalance Auctions
- Flex Auctions (available only for simple and complex Flex instruments on ISE)

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

Quoting in complex instruments is currently not support on Nasdaq. The supporting messages and functionality described below are placeholders for possible future enhancements.

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.

- 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).
- 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.

4.6. Active QP/ Self-replenishment Risk Protection

An alternative Market Maker Risk Protection which is not based on a time-window, unlike Rapid Fire. Any executions within the Active QP counter must be 'actively' removed from the counter by the firm as opposed to having the execution 'passively' removed from the counter after the time interval. This provides firms a simpler method for quote protection which is based on two-way communication Active QP may not be used in conjunction with Rapid Fire.

4.7. 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 and Active QP 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.

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. 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	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. • S=Simple Instrument Directory • s=Complex Instrument Directory • U=Underlying Permission Notification • M=Opening Spread Multiplier Notification • F=MM Parameter Definition Notification • f=ActiveQP/Self-Replenishment Parameter Definition Notification • R=Rapid-Fire Configuration Notification (to be deprecated) • H=Simple Instrument Trading Action • h=Complex Instrument Trading Action • A=Auction Notification • 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 • O=Simple MSAR Notification • o=Complex MSAR Notification • L=Complex MSAR Leg Notification • I = Order Exposure Notification

Notes:

- The value "I" will provide the Auction Notification message only for Order Exposure. All other auction types will be notified if "A" is included in the current session.

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

Name	Offset	Length	Value	Notes
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
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 ≤ n ≤ 30,000
Percentage	30	2	Integer	Displayed size percentage 1 ≤ n ≤ MAX INT
CumQty	32	4	Integer	Total execution volume that will trigger a rapid fire within the interval 1 ≤ n ≤ MAX_INT
Delta	36	4	Integer	1 ≤ n ≤ MAX_INT
Vega	40	4	Integer	1 ≤ n ≤ 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.
- The request will be rejected if the badge is configured for ActiveQP
- The time interval and the four limits can be changed intraday over SQF and by Market Operations on the behalf of the Market Maker or firm/participant.

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
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

5.3.3. ActiveQP/ Self-Replenishment Set Limit Message

This message is used by firms to set the ActiveQP/Self-replenishment limit. The terms “Active QP” and “Self-Replenishment Risk Protection” can be used interchangeably.

If the badge is not configured for Active QP / Self- Replenishment then the message will be rejected.

Name	Offset	Length	Value	Notes
Message Type	0	2	Alpha	“AG” = Self Replenishment Set Limit Message
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Alphanumeric	Firm Defined message identifier
Underlying Symbol	14	13	Alphanumeric	Denotes the unique underlying being replenished
Set Value	27	4	Integer	Absolute value of new contract limit for self-replenishment purge

5.3.4. ActiveQP/ Self-Replenishment Set Limit Reply

Acknowledgement message for Set Limit Message

Name	Offset	Length	Value	Notes
Message Type	0	2	Alpha	“Ag” = Self Replenishment Set Limit Reply
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Alphanumeric	Firm Defined message identifier
Underlying Symbol	14	13	Alphanumeric	Denotes the unique underlying being replenished
Set Value	27	4	Integer	Absolute value of new contract limit for self-replenishment purge
Status Code	31	1	Integer	See Status Code Appendix

Notes:

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

5.4. Rapid-Fire Configuration Control

5.4.1. Supported on Phlx, NOM and NTX

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 1 ≤ n ≤ MAX INT
Interval	21	2	Integer	Time interval (in milliseconds) 100 ≤ n ≤ 30,000
CumQty	23	4	Integer	Total execution volume that will trigger a rapid fire within the interval 1 ≤ n ≤ 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.
- 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).
- The Request will be rejected if the badge is not configured for Rapid Fire.

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” or “detailed” 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. “QA” quote is responded with regular reply, “Qa” is responded with the detailed one.
- 0 × 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 × 0 quote. A purge (0 × 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	"QA" = Simple Quote Block (Results in a Regular Reply) including "SentTimestamp" "Qa" = Simple Quote Block (Results in a Detailed Reply) including "SentTimestamp"
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Binary	Firm defined quote message identifier reported on clearing executions
SentTimestamp	14	8	Integer	UNIX epoch time in nanoseconds
Quote Count	22	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	"QM" = Simple Quote Block (Results in a Regular Reply) including "SentTimestamp" "Qm" = Simple Quote Block (Results in a Detailed Reply) including "SentTimestamp"
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Binary	Firm defined message identifier.
SentTimestamp	14	8	Integer	UNIX epoch time nanoseconds
Quote Count	22	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
Bid Price		4	Price	
Bid Size		4	Integer	
Ask Price		4	Price	

Name	Offset	Length	Value	Notes
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	"QD" = Complex Quote Block (Results in a Regular Reply) including "SentTimestamp" "Qd" = Complex Quote Block (Results in a Detailed Reply) including "SentTimestamp"
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Binary	Firm defined message identifier.
SentTimestamp	14	8	Integer	UNIX epoch time in nanoseconds
Quote Count	22	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	N=Normal R=Re-entry
StockLegShortSale		1	Alpha	N=Not Applicable H=Sell Short E=Sell Short Exempt If this is a quote for a stock combo StockLegShortSale 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 “QA”, “QM”, “QD” 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	“QS” = Quote Block Reply Message including “SentTimestamp”
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Binary	Firm defined message identifier
SentTimestamp	14	8	Integer	UNIX epoch time in nanoseconds
Block Status Code	22	1	Alphanumeric	See Status Code Appendix
Quote Count	23	2	Integer	The number of quotes in the submitted quote block
Valid Quote Count	25	2	Integer	The number of valid quotes in the submitted quote block. A valid quote is defined as a quote or purge (0 × 0 quote) that has a 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

Notes:

- Subtracting the Valid Quote Count field from the Quote Count field yields the number of invalid quotes and purges (0×0 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.
- 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.
- An “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 “Qa”, “Qm”, “Qd” 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	“Qs” = Detailed Quote Reply Message including “SentTimestamp”
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination

Name	Offset	Length	Value	Notes
MessageID	6	8	Binary	Firm defined message identifier
SentTimestamp	14	8	Integer	UNIX epoch time in nanoseconds
Block Status Code	22	1	Alphanumeric	See Status Code Appendix
Quote Count	23	2	Integer	The number of quotes in the submitted quote block
Valid Quote Count	25	2	Integer	The number of valid quotes in the submitted quote block. A valid quote is defined as a quote or purge (0 × 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

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 including "SentTimestamp"
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Binary	Firm defined message identifier
SentTimestamp	14	8	Integer	UNIX epoch time in nanoseconds
Underlying Symbol	22	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	35	1	Alpha (Optional)	Type of instruments to be purged: 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.
- The Max Underlying Purge Rate is capped at 25 per second for a given Firm mnemonic or Market Maker badge for each underlying. If the Purge Rate exceeds that the firm will be disconnected to prevent performance degradation of the system. Even wildcard purges are limited to 25.

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 including "SentTimestamp"
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Binary	Firm defined message identifier
Senttimestamp	14	8	Integer	UNIX epoch time in nanoseconds
Status Code	22	1	Alphanumeric	See Status Code Appendix
Sequence	23	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.

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: 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.
- Market reentry message cannot be used for purges due to Active QP/Self-Replenishment curtailments.

5.6.4. Market Reentry Reply Message

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

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.

5.6.5. ActiveQP/ Self-Replenishment Request/Reentry Message

This message is used by firms for either:

- Partial Replenishment: To remove a fixed number of contracts from the Active QP counter.
- Full replenishment: To reset the counter to zero or for re-entry after an underlying purge. Enter “0” for re-entry or full replenishment

If the badge is not configured for Active QP / Self- Replenishment then the message will be rejected.

Name	Offset	Length	Value	Notes
Message Type	0	2	Alpha	“RG” = Self Replenishment Request/Reentry Message
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Alphanumeric	Firm Defined message identifier
Underlying Symbol	14	13	Alphanumeric	Denotes the unique underlying being replenished
Replenishment Value	27	4	Integer	Number of contracts for replenishment or “0” for full replenishment. Note: Full replenishment is required after underlying purge

Note:

- We do not allow Wildcard replenishment but we allow wildcard resets. This implies that if ActiveQP/ Self-Replenishment Request/ Reentry request is sent with symbol as ‘*’ it will reset all symbols as long as Replenishment value is 0.
  The request will be rejected if Underlying Symbol is ‘*’ and the Replenishment Value is non-zero.

5.6.6. ActiveQP/ Self-Replenishment Request/Reentry Reply Message

This message is the acknowledgement for Active QP Request/ Reentry Message

Name	Offset	Length	Value	Notes
Message Type	0	2	Alpha	“Rg” = Self Replenishment Request/ Reentry Reply
Badge	2	4	Alphanumeric	Exchange assigned badge/suffix combination
MessageID	6	8	Alphanumeric	Firm Defined message identifier
Underlying Symbol	14	13	Alphanumeric	Denotes the unique underlying being replenished
Status Code	27	1	Integer	See Status Code Appendix
Requested Replenishment Value	28	4	Integer	Echo requested replenishment value

Name	Offset	Length	Value	Notes
Active Counter Value	32	4	Integer	Risk counter value after processing replenishment request.
Set Contract Limit	36	4	Integer	Current Set Contract limit for triggering purge

Note:

- The "Active Counter Value" field will show unchanged counter values for rejected replenishment requests.
- The "Active Counter Value" will show '0' after a full replenishment request.
- This is an unsequenced message which cannot be replayed upon re-connection.
- In case of 'wildcard' resets for all symbols, the reply message will show Requested Replenishment Value, Active Counter Value and Set Contract Limit as '0' and the Underlying Symbol as '*'.

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:

- 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
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 (you're selling) "S" – Sell side sweep (you're buying)
Contracts	28	4	Integer	Volume to sweep

Notes:

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

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: "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	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.
- Price field cannot be negative in this message. The Debit/Credit Indicator should be used to indicate negative prices. For example:"
  - Price: 0.04
    Debit/Credit Indicator: C
    Side: S
    This will be a Buy order with price -0.04"

– Price: 0.04
Debit/Credit Indicator: D
Side: S
This will be a Buy order with price +0.04"

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 Notification message provided in the Auction
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	• L=Local Market • N=National Market
Reserved	33	4	n/a	Reserved for future enhancements

Notes:

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

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 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 ≤ n ≤ 30,000
Percentage	30	2	Integer	Displayed size percentage 1 ≤ n ≤ MAX INT
CumQty	32	4	Integer	Total execution volume that will trigger a rapid fire within the interval 1 ≤ n ≤ MAX_INT

Name	Offset	Length	Value	Notes
Delta	36	4	Integer	1 ≤ n ≤ MAX_INT
Vega	40	4	Integer	1 ≤ n ≤ MAX_INT
Reserved	44	32	N/A	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 – Phlx, NOM and NTX only

Note:

Rapid-Fire Config Notification (Af) is replaced by a more complete MM Parameter Definition Notification (AJ) for ISE, GEMX and MRX.

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
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 interval 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

6.1.4. ActiveQP/Self-Replenishment Parameter Definition Notification

This optionally delivered message specifies participant's contract limit on the badges configured for ActiveQP.

Name	Offset	Length	Value	Notes
Message Type	0	2	Alpha	"AK" = ActiveQP/Self-Replenishment 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

Name	Offset	Length	Value	Notes
Underlying	14	13	Alphanumeric	Underlying Stock Symbol
Set Contract Limit	27	4	Integer	Current Set Contract Limit
Reserved	31	32	N/A	Reserved for future enhancements

Notes:

- 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

6.2. 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 9
Sub-version	12	1	Integer	Sub-version of the SQF Quote Interface. Currently set to 0

Notes:

- 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	8	Alphanumeric	Industry assigned security symbol for the option contract
Expiration	22	2	Integer	Expiration Field
Strike Price	24	4	Price	Denotes the explicit strike price of the option. Refer to Data Types for field processing notes.
Option Type	28	1	Alpha	“C” = Call “P” = Put
Underlying Symbol	29	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	42	1	Alpha	“N” = Normal Hours “L” = Late Hours “W” = WCO Early Closing 12:00 Noon
Tradable	43	1	Alpha	“Y” = Option is tradable “N” = Option is not tradable

Name	Offset	Length	Value	Notes
MPV	44	1	Alpha	See MPV
Reserved	45	16	N/A	Reserved for future use

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
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
Reserved	27	1	Integer	Reserved field with value zero
Number Of Legs	28	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

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
Trading State	14	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
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

Name	Offset	Length	Value	Notes
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	• L=Limit • M=Market • N=Not Disclosed
Side	20	1	Alpha	Indicates the side of the auction: • 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 OrderType=L
Matched Volume	25	4	Integer	• For Opening Auction indicates matched volume at the specified price • For all other auction types set to 0 (zero)
Volume	29	4	Integer	• 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 flagged Attributable auction not
CMTA	43	4	Integer	0 when auction not flagged Attributable
AuctionEvent	47	1	Alpha	S=Start U-Auction Update E=End of Auction
Auction Type	48	1	Alpha	Auction Type Field
Auction Duration	49	4	Integer	Duration of the auction
BestResponsePrice	53	4	Price	Best response price; 0 if not disclosed
BestResponseSize	57	4	Integer	Aggregated quantity at best response price; 0 if not disclosed
(Reserved)	61	9	Integer	Reserved for future use
Number of Flex DAC Legs	70	1	Integer	To be used in future to support Delta-Adjusted at Close functionality on Flex.
Leg Definitions, Repeated Number Of Legs times				
(Reserved)		8	Integer	Reserved for future use

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection.
- For Order Exposure the auction notification will not be sent with 'AuctionEvent' as 'S' (Start) since Exposure is different from other auctions where the start of lifecycle is clearly defined. The first notification for Order Exposure will have 'AuctionEvent' as 'U' (Auction Update).
- For NOM and NTX Options, the Capacity will not be displayed on any Auction notifiation.

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.

6.6.2. 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:

- 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	S=System initiated Q=Anti-Internalize
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

6.6.3. 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 or ActiveQP/Self-replenishment Risk 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
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.

Name	Offset	Length	Value	Notes
Purge Reason	27	1	Alphanumeric	• U=User requested (Simple) • S=System initiated (Simple) • K=Auto Killswitch initiated (All Instruments) • M=Manual Killswitch initiated (All Instruments) • P=Purge On Disconnect (All instruments) • u=User requested Complex) • s=System initiated (Complex)
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	• 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

Notes:

- This is an unsequenced message and therefore cannot be replayed upon re-connection.
- The notification will be sent on reentry whether the badge is configured for Rapid Fire or ActiveQP.

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

Name	Offset	Length	Value	Notes
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
MessageID	18	8	Binary	MessageID (Simple Quote Block – short form) QuoteID (Simple Quote Block – long form)
Auction ID	26	4	Integer	Auction ID (if quote participated in an auction)
Price	30	4	Price	Execution Price
Side	34	1	Alphanumeric	"B" = Bought "S" = Sold
Contracts	35	4	Integer	Volume Traded
Liquidity Indicator	39	1	Integer	Liquidity Indicator
Cross Id	40	4	Integer	Identifies the execution. This can be matched with the Cross Id in the exchange Clearing Trade Interface (CTI) messages
Match Id	44	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.

6.8.2. 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	QuoteID 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	QuoteID 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 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.

6.9. 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

Name	Offset	Length	Value	Notes
Badge	10	4	Alphanumeric	Exchange assigned badge/suffix combination
Instrument ID	14	4	Integer	Simple Instrument ID
Notification Type	18	1	Alpha	“E” = Executed “C” = Cancelled
MessageID	19	8	Binary	MessageID from the MSAR request
Auction ID	27	4	Integer	Auction ID
Price	31	4	Price	Execution Price. 0 for Notification Type=C.
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 sweep 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

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.

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 Notification Type=C. Carries default precision of 6.4; Price6 field contains full precision.
Side	40	1	Alphanumeric	“B” = Buy side sweep (Strategy) “S” = Sell side sweep (Strategy)

Name	Offset	Length	Value	Notes
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 Price 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.
- 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 Notification Type=C. Carries default precision of 6.4; Price6 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

Name	Offset	Length	Value	Notes
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 Price 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.
- 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	optionshelpdesk@nasdaq.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)

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	Order Exposure
O	Opening Auction
X	Flex 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
- J=Joint BackOffice (JBO)
- " " (space)=N/A

Note, Retail and JBO order capacities are placeholders for future functionality on ISE, GEMX and MRX. Phlx, NOM and NTX support JBO Capacity while Retail Capacity is a placeholder on Phlx, NOM and NTX too.

8.1.4. Liquidity Indicator

Code	Description
0	None
1	Maker
2	Taker
4	Response
5	Hidden
6	Opening Rotation

Code	Description
7	Cross
8	Flashed Order
9	Flash Response
10	Routed Out
11	Trade Report
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

Code	Description
49	Combo Qualified Contingent Cross
50	Combo Customer to Customer
51	Sweep Routed Out
52	Sweep Trade Report
53	Combo Taker Against Regular – Thru NBBO
54	Combo Taker Against IO – Thru NBBO
55	Simple Exposure Order – Upon Receipt
56	Simple Exposure Order – Subsequent
57	Simple Exposure Order – Responder
58	Flex Auction
59	Flex Auction Responder
60	Flex Price Improvement
61	Flex Price Improvement Responder
62	Flex Broken Price Improvement
63	Flex Solicitation
64	Flex Solicitation Responder
65	Flex Broken Solicitation
66	Combo Flex Auction
67	Combo Flex Auction Responder
68	Combo Flex Price Improvement
69	Combo Flex Price Improvement Responder
70	Combo Flex Broken Price Improvement
71	Combo Flex Solicitation
72	Combo Flex Solicitation Responder
73	Combo Flex Broken Solicitation

8.1.5. System Event Codes

Code	Explanation	When (typically)
“O”	Start of Messages. This is always the first message sent in any trading day.	After ~12:30am
“S”	Start of System Hours. This message indicates that the system is up and ready to start accepting orders.	~7:00am
“B”	Start of Quote. 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”	Start of Opening Process. This message is intended to indicate that the system has started its opening process.	9:30:00am
“W”	End of WCO Early closing. 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”	End of Normal Hours Processing. 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”	End of Late Hours Processing. 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”	End of System Hours. This message indicates that the system is now closed.	~5:30pm
“C”	End of Messages. 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
H	Invalid Indicator/Attribute
I	Reentry Required
J	Opening Rotation in Progress
K	Kill-Switch Reentry Required
L	Full Replenishment Required
M	Active Counter Exceeded
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

8.1.8. Flex Symbology

Underlying Security	Lead Character	Settlement Type	Exercise Style
Index	1	AM	American
Index	2	AM	European
Index	3	PM	American
Index	4	PM	European
Equity/ETF	1	PM	American
Equity/ETF	2	PM	European
ETF Cash	3	PM	American
ETF Cash	4	PM	European

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
ActiveQP Set Limit 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
ActiveQP Parameter Definition 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 Execution Notification	Sequenced
Complex Quote Execution Notification	Sequenced
Complex Quote Leg Execution Notification	Sequenced
Sequenced MSAR Notification	Sequenced
Complex MSAR Leg Notification	Sequenced
Complex MSAR Notification	Sequenced
Subscription Reply	Unsequenced

8.3. Revision Control Log

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”
- 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

August 16, 2019: CAT SentTimeStamp implementation

- Added SentTimestamp field to Quote/Purge messages as per CAT requirements

February 13, 2020: Additional Type/Sub Type values added

- Added additional Type/SubType values to the following fields to offer option of including or excluding “SentTimeStamp” field: Simple Quote Block Message (short form), Simple Quote Block Message (long form), Complex Quote Block Message, Quote Block Reply Message, Detailed Quote Block Reply Message, Underlying Purge Request Message, Underlying Purge Reply Message.

November 7, 2022: MRX Replatform version 8.2d

- Introducing new Liquidity Indicators available on MRX only, where applicable at this time. MRX will only support the new liquidity codes as symbol migrate to the new platform
- Denoting Rapid Fire configuration request and notification will only be supported on BX
- Adjusting MM Parameter percentage allowable values
- Other exchanges will continue to support SQF 8.2b
- Removing references to BX/NOM only features.
- Eliminating support for message types that exclude “SentTimeStamp”. SentTimeStamp will be a required field on SQF 8.2d. See below for list of eliminated message types:
  - “QQ” = Simple Quote Block (Results in a Regular Reply) excluding “SentTimestamp”
  - “Qq” = Simple Quote Block (Results in a Detailed Reply) excluding “SentTimestamp”
  - “QL” = Simple Quote Block (Results in a Regular Reply) excluding “SentTimestamp”
  - “Ql” = Simple Quote Block (Results in a Detailed Reply) excluding “SentTimestamp”
  - “QC” = Complex Quote Block (Results in a Regular Reply) excluding “SentTimestamp”
  - “Qc” = Complex Quote Block (Results in a Detailed Reply) excluding “SentTimestamp”
  - "QR” = Quote Block Reply Message excluding “SentTimestamp”
  - “Qr” = Detailed Quote Reply Message excluding “SentTimestamp”
  - “PU” = Underlying Purge Message excluding “SentTimestamp”
  - “PR” = Underlying Purge Reply Message excluding “SentTimestamp

January 7, 2022: Clarifying Update version 8.2d

- Clarifying Purge reason “P” is for all instruments in Underlying Purge Notification (Section 6.6.4)

March 31, 2023: GEMX Replatform Spec Update

- November 2023: GEMX to adopt SQF version 8.2d during the Replatform that is scheduled to complete November 13, 2023

June 5, 2023: ActiveQP/Self-Replenishment Update (Going live with GEMX Replatform – November 2023)

- Adding messages related to ActiveQP/ Self-replenishment
- Active QP Set Limit Message
  - – Active QP Set Limit Reply Message
  - – Active QP Request/ Reentry Message
  - – Active QP Request/Reentry Reply Message
  - – ActiveQP Parameter Definition Notification
- Adding new Status Code:
  - – "L" = Full Replenishment Required

July 17, 2023: ActiveQP/Self-Replenishment Update (Going live with GEMX Replatform – November 2023)

- Adding new Status Code:
  - – "M" = Active Counter Exceeded

August 9, 2023: Clarifying Update

- Clarifying the Purge on Disconnect behavior for ActiveQP
- Clarifying that Quote Update Notification will be deprecated

March 6, 2024: Clarifying Update

- Combining BX SQF Spec with GEMX and MRX
- ActiveQP Updates for MRX and BX
  - – Expected Go-live for ActiveQP in MRX is 03/18/2024
  - – Expected Go-live for ActiveQP in BX is 04/01/2024

March 13, 2024: ISE Replatform

- ISE to adopt SQF version 8.2d during the replatform scheduled to complete on September 23, 2024.

July 2, 2024: Electronic Flex Options

- Adding support for Electronic Flex Options.
- The fields of Strike Price, Expiration, Security Symbol, Option Type will be removed from the following messages:
  1. MSAR Accept Message
  2. Complex Instrument Directory Message
  3. Simple Instrument Trading Action
  4. Simple Quote Execution Notification
  5. Simple MSAR Notification Message
- Removing the Source field from Simple Directory message and Complex Directory message.
- Simple Instrument Purge Notification will be decommissioned.
- The Security Symbol field on Simple Directory message will be increased from 5 bytes to 8 bytes. 16 bytes reserved field will be added to the end of the message.
- Complex Directory message will have a 1 byte reserved field.
- The Auction message will have a new field for Auction Duration. A new AuctionType "X" for Flex Auctions and a repeating group with reserved fields in preparation for future functionality updates.
- New liquidity codes from 58 to 73.

February 10, 2025: Electronic Flex Options

- Removing "P" as a notification type in Subscription Request

March 17, 2025: PHLX Replatform

- PHLX to adopt SQF version 9.0 during the replatform scheduled to complete in December 2025

May 12th, 2025: Clarifying Update

- Clarifying Sweep Orders Price field.

June 9th, 2025:

- Clarifying the version of SoupBinTCP.

August 12th, 2025:

- Clarifying the Max Underlying Purge Rate limits and the system behavior if exceeded.

September 9th, 2025:

- Clarifying the support of JBO Capacity. PHLX and BX will support JBO while ISE, GEMX and MRX will not support JBO at this time.

December 22nd, 2025:

- BX will not display the Capacity on Auction Notifications.

February 18th, 2026:

- NOM to adopt SQF version 9.0 during the replatform scheduled to complete in August 2026.
- BX Options to be renamed to NTX Options.