



NYSE Arca UGW Binary Gateway Specification

NYSE Arca Equities
NYSE Arca Options
NYSE Amex Options

August 25, 2016
Version 4.9

| Date | Revision | Synopsis of Change |
|------------|----------|--|
| 4/25/2012 | 4.1a | Initial Document |
| 5/05/2012 | 4.1b | <p>Added conditional Liquidity Indicator on small ack message and Verbose Execution Report Message, (Liquidity Indicator (9730) = 1 (Candidate for Liquidity Indicator "S") (Sent on Verbose Order Ack, Cancel pending, Cancelled, C/R Pending, and Replaced)</p> <p>Added Liquidity Indicator "S" = Set Inside Price and Added Liquidity on ARCA</p> |
| 8/03/2012 | 4.1c | <p>Added Differences between 4.1 and prior versions section to specification</p> <p>Added NASD as an away Market for Options</p> <p>Updated Liquidity Indicator Field in STP Cancel (Message 4, Variant 2)</p> |
| 8/13/2012 | 4.1d | Updated byte size of G3 Fast Cancel/Replace Message for Options from 72 to 80 |
| 9/10/2012 | 4.1e | <p>Updated Risk Mitigation for Options – Page 76</p> <p>Added PL Select Order Type for Equities</p> |
| 12/04/2012 | 4.1f | <p>Added Session Throttle Information (Page 21)</p> <p>Added MIAX and ISE2 to Routed Out Values for Arca/Amex Options (Execution Report Message 2.2 Page 62 and Appendix B).</p> |
| 1/03/2013 | 4.1g | <p>Updated Order Type Information - Added Market To Limit (MTL) to Order Types Section, Added Proactive If Locked option to MPL/MPL ALO Orders</p> <p>LU/LD Changes added (Proactive If Locked Field added, new values added – Currently Unavailable). Added Default Proactive if Locked to Logon Variant 2.</p> <p>Added PNP Blind Indicator Values to conditional Liquidity Indicator on small ack message and Verbose Execution Report Message, (Sent on Verbose Order Ack, Cancel pending, Cancelled, C/R Pending, and Replaced)</p> |

| Date | Revision | Synopsis of Change |
|------------|----------|---|
| 4/10/2013 | 4.1h | Adjusted Differences between 4.0 and 4.1 on page 6 – Added ArcaExID differences, added UGW ExDestination Field Notes. Added ExDestination note for UGW for the strict enforcement of the proper value in D.1, D.2, and D.3 Messages. |
| 5/20/2013 | 4.1i | Added NYSE Arca Equities Retail Order Information (Page 11) Corrected Risk Mitigation Alert Message 7.1 (Page 94) – Removed CompanyGroupID Field (5 Bytes) and added 5 Bytes to the Filler. |
| 7/22/2013 | 4.1j | Added NYSE Arca Equities Retail Order Types (Page 104) Updated Complex Order Auction (COA) information in Arca and Amex Options Order Types |
| 9/3/2013 | 4.1k | Updated Risk Mitigation Section (Page 93) with Global Risk Reject Notes. |
| 10/1/2013 | 4.1l | Updated Equities Tracking Order description and Order type Updated Bulk Cancel Message section to include more information (Page 13) |
| 10/28/2013 | 4.1m | Added new Complex Messages (Available in Q1 2014): D.5 - Complex Order using complex symbol B.3 - Complex Cross order using complex symbol F.2 – Complex Order Cancel using complex symbol G.5 - Complex order Cancel/Replace (with leg definition) G.6 - Complex order Cancel/Replace using complex symbol G.7 - Complex order Fast Cancel/Replace using complex symbol R.1 - New Complex Symbol Request r.1 - New Complex Symbol Updated Equities PNP Blind order type description |
| 12/02/2013 | 4.1n | Updated timestamp section on differences page (Page 6). Updated G.5, G.6, B.3, and R.1 Complex Messages. |
| 4/21/2014 | 4.1o | Updated r.1 Complex Request Ack Message. |
| 6/25/2014 | 4.1p | Updated LegRefID field in complex messages. Value cannot be 0. |
| 7/18/2014 | 4.1q | Added note to DisplayRange Field (Page 40) Corrected fields in Random Reserve Order Type (Page 113) |

| Date | Revision | Synopsis of Change |
|------------|----------|--|
| 12/19/2014 | 4.2 | <p>Updated Options Cancel on Disconnection Functionality to always subscribe to this service.</p> <p>Removed details for the following order types:</p> <ul style="list-style-type: none"> - Auction Only Order - Market to Limit Order/Market IOC/Market NOW - Midpoint Cross - ISO PNP Cross/ISO PNP IOC Cross - Cross and Post - Portfolio Crossing Session (PCS) - Discretionary Limit Orders - Passive Discretionary with Reserve - Sweep Reserve/Sweep Reserve with Discretion - Inside Limit Sweep Reserve - Random Reserve - Reserve NOW - PL Select - MPL FOK |
| 3/9/2015 | 4.3 | <p>Detail added to indicate that FOK is valid only on Limit orders.</p> <p>Added detail regarding heartbeat intervals (page 29).</p> <p>Added detail on Minimum Order Size and Exposure Time for CUBE orders (page 98).</p> <p>Updated details of “Customer or Firm” field to indicate that “Professional Customer” is now valid for both NYSE Arca and NYSE Amex Options.</p> <p>Removed Passive Discretion order details.</p> |

| Date | Revision | Synopsis of Change |
|-----------|----------|---|
| 6/8/2015 | 4.4 | <p>Added Section 2, "Pillar Trading Platform for NYSE Arca Equities"</p> <p>Added notes on binary field and value changes to be expected for symbols migrated to Pillar throughout the equities sections of the spec</p> <p>Added Appendix E, "Pillar Reason Codes"</p> <p>Removed details for the following equities order types:</p> <ul style="list-style-type: none"> - Primary Sweep (PSO) - Primary Sweep + Ship (PSOS) - Reserve Orders with IOC Modifiers <ul style="list-style-type: none"> o Limit Reserve IOC o ISO PNP Reserve IOC o PNP Reserve IOC - Inside Limit IOC - ALO PNPB Reserve |
| 11/9/2015 | 4.5 | <p>Added note that any Price on incoming Orders, Cancel Requests, and Cancel/Replace Requests with significant digits in the 5th decimal or beyond will cause the message to be rejected by the gateway.</p> |
| 2/22/2016 | 4.6 | <p>Clarification on meaning of Proactive if Locked values and applicability as "non-display remove liquidity" instruction for MPL orders</p> <p>Clarification on STP functionality for PNP orders</p> <p>Updated Pillar reason codes (Appendix E)</p> |
| 3/24/2016 | 4.7 | <p>Added support for Bulk Cancel by TPID request for NYSE Amex and NYSE Arca Options (Section 3 – Order Management).</p> <p>Added support for upcoming enhancements to Risk Mitigation functionality for NYSE Amex and NYSE Arca Options (Section 6 – Risk Mitigation – Options).</p> <p>Added 'Order Reject Reason' value '7' (reject due to Options Risk Mitigation breach) to Execution Report Verbose Format, Variant 2 (Section 5 – Application Messages).</p> |
| 7/15/2016 | 4.8 | <p>Added ExecInst = y to designate Trade-at ISO order</p> <p>Updated list of Order Capacity values</p> |
| 8/25/2016 | 4.9 | <p>Added codes R154 – R158 in Appendix E: Pillar Reason Codes.</p> |

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Table of Contents

| | |
|--|-----------|
| 1 Overview | 5 |
| UGW Binary Certification | 5 |
| System Architecture..... | 6 |
| 2 Pillar Trading Platform for NYSE Arca Equities..... | 7 |
| 3 NYSE Arca UGW Binary Gateway Overview | 8 |
| Trading Times | 8 |
| Hours of Operation* | 8 |
| Trading Session IDs..... | 8 |
| Common Identifiers | 9 |
| Company Group ID | 9 |
| Option Symbology | 9 |
| How To Distinguish between Equity and Option orders..... | 9 |
| Equities Symbology..... | 10 |
| Order Management | 11 |
| Equity Order Auctions | 11 |
| NYSE Arca Equities Retail Orders..... | 11 |
| Short Sell Rule 201..... | 12 |
| Automatic Order Cancellation on Disconnect (Equities and Options)..... | 12 |
| Bulk Cancel Message (Equities only) | 13 |
| Bulk Cancel by TPID | 14 |
| NYSE Arca Equities Self Trade Prevention Information | 15 |
| NYSE Arca/Amex Options Self Trade Prevention Information..... | 16 |
| Equity Crossing Orders..... | 17 |
| Guarantee and Directed Equity Orders (Currently Unavailable)..... | 17 |
| ISO - Intermarket Sweep Order | 18 |
| Local and Away Market Maker Identification (Arca & AMEX Options)..... | 18 |
| Binary Prices..... | 18 |
| Price Scale Codes | 19 |
| Message Formatting..... | 19 |
| Message Type Summary | 19 |
| 4 Session Management..... | 23 |
| Overview | 23 |
| Disconnects | 23 |
| Session Throttle..... | 23 |
| Logon Message Variants (and Logon Accepted)..... | 24 |
| Logon Message – Variant 1 | 25 |
| Logon Message – Variant 2 | 27 |
| Logon Accepted Message | 30 |
| Logon Reject Message..... | 30 |
| Test Request Message | 31 |

| | |
|---|------------|
| Heartbeat Message | 31 |
| 5 Application Messages..... | 33 |
| D = New Order Message – (Variant 1: Equities Only – Small Message)..... | 33 |
| D = New Order Message (Variant 2) | 36 |
| D = New Order Verbose Format Message (Variant 3) | 41 |
| D = New Complex Order Message - Options (Variant 4) | 46 |
| D = Complex Order Message (complex symbol) - Options (Variant 5)..... | 49 |
| F = Order Cancel Message (Variant 1) | 53 |
| F = Complex Cancel Request (Variant 2) | 55 |
| G = Order Cancel/Replace (Variant 1)..... | 56 |
| G = Order Cancel/Replace Verbose (Variant 2) | 58 |
| G = Fast Cancel/Replace Message Options (Variant 3) | 62 |
| G = Fast Cancel/Replace Message Equities (Variant 4) – Not Available for Pillar | 64 |
| G = Complex Order Cancel/Replace (Variant 5)..... | 65 |
| G = Complex Cancel/Replace Message (Using complex symbol) - Options (Variant 6)..... | 68 |
| G = Complex Fast Cancel/Replace Message (Using complex symbol) - Options (Variant 7) | 69 |
| 6 = Cancel Request Ack Message (Variant 1) | 71 |
| 4 = Order Killed Message (Variant 1) | 72 |
| 4 = Order Killed Message – STP (Variant 2)..... | 73 |
| E = Cancel Replace Ack Message (Variant 1)..... | 74 |
| 5 = Order Replaced Message (Variant 1) | 74 |
| 8 = Order Cancel/Replace Reject Message (Variant 1) | 75 |
| C = Bust/Correct Message (Variant 1)..... | 76 |
| a = Order Ack Message (Variant 1) | 77 |
| 2 = Order Fill Message (Variant 1) | 78 |
| 2 = Execution Report Verbose Format (Variant 2) | 79 |
| How to interpret the Verbose Execution Report (Variant 2) | 83 |
| 2 = Complex Execution Report Format (Variant 3) | 84 |
| How to interpret the Complex Execution Report (Variant 3) | 86 |
| 2 = Options Cross Execution Report (Variant 4)..... | 87 |
| B = Order Cross (Options) – Single (Variant 1) | 89 |
| B = Order Cross – Complex (Variant 2)..... | 92 |
| B = Order Cross – Complex (Using Complex Symbol) - (Variant 3)..... | 95 |
| J = Allocation (Options) - Variant 1 | 98 |
| P = Allocation Ack (Options) - Variant 1 | 100 |
| <i>R = New Complex Symbol Request (Complex) - Variant 1</i> | 101 |
| <i>r = New Complex Symbol Ack (Complex) - Variant 1</i> | 102 |
| 6 Risk Mitigation (Options)..... | 103 |
| Risk Mitigation Types | 104 |
| Risk Mitigation – Per Underlying Symbol..... | 104 |

| | |
|--|------------|
| Risk Mitigation – Firm Level (All Underlying Symbols for a TPID) **Reserved for Future Use | 106 |
| Risk Mitigation Breach Event..... | 106 |
| Update Risk Limits & Re-Enable Order Entry | 107 |
| Gateway Session Disconnects | 107 |
| Global Risk Mitigation..... | 107 |
| X = Risk Mitigation Request Message (Options) - Variant 1 | 108 |
| x = Risk Mitigation Request Ack (Options) - Variant 1 | 109 |
| 7 = Risk Mitigation Alert Message (Options) - Variant 1..... | 110 |
| 7 NYSE Arca Equities Order Types..... | 112 |
| 8 NYSE Arca Options Order Types | 120 |
| 9 NYSE AMEX Options Order Types..... | 124 |
| Appendix A: Liquidity Indicator Values and Definitions (Equities)..... | 127 |
| Appendix B: Liquidity Indicator Values and Definitions (Arca & Amex Options) | 130 |
| Appendix C: Reject Codes | 131 |
| Appendix D: Exchange Destinations (ExDestination)..... | 132 |
| Appendix E: Pillar Reason Codes..... | 133 |

1 Overview

UGW Binary is a messaging interface to send order flow to the NYSE Arca exchange. The protocol is designed to reduce bandwidth and reduce latency with small messages that are easier to parse. The protocol uses fixed length messages over TCP/IP. The contents of fields are binary and fixed length ASCII values where binary values are in network Endian (Big Endian) format. Session behavior, field names, and field contents were designed to follow FIX behavior as closely as possible.

UGW Binary Certification

Testing is currently manual. Each firm must certify their applications with NYSE Arca. To schedule a test, please call the Connectivity hotline at 212-896-2830, Option 2, Sub-Option 2 or email FirmTesting@NYSE.com.

Other Contacts

The NYSE Market Support teams have a centralized phone number: +1 212-896-2830. Through this number, clients are able to reach all support contacts for Trading, Technical, Market Data and Client Relationship Services. Below are the options to quickly get you to the most appropriate team.

+1 212-896-2830

Option 1 - Trading Support

- Sub-Option 1 - NYSE/NYSE MKT Equities
- Sub-Option 2 - NYSE ARCA Equities / NYSE Bonds
- Sub-Option 3 - NYSE Options

Option 2 - API Connectivity/Order Routing Support

- Sub-Option 1 - Production support
- Sub-Option 2 - UAT support

Option 3 - SFTI Network Operations and Colocation Support

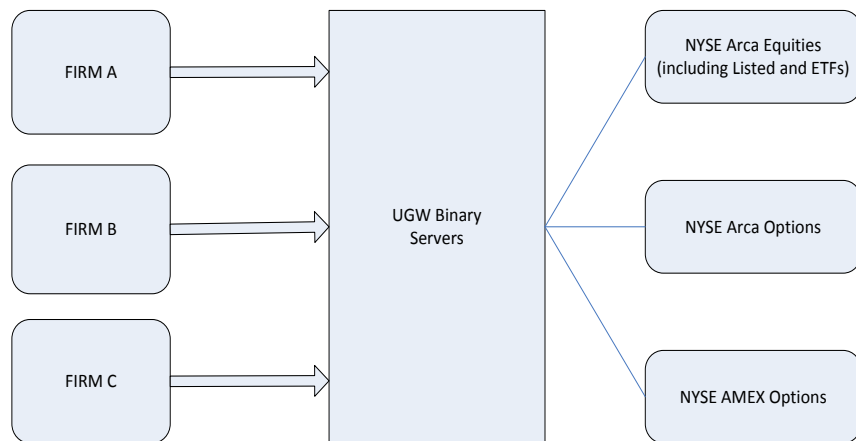
Option 4 - Market Data Support

Option 5 - Client Relationship Services

Option 6 - Other technical support inquiries

System Architecture

Each client will be required to establish one or more connections to route messages to their designated Trading Platform. Each Trading Platform will require independent connections each with their own assigned IP and Port address. The Gateway then routes the messages to the appropriate Trading Engine.



2 Pillar Trading Platform for NYSE Arca Equities

NYSE Arca Equities will be the first market to migrate to Pillar, our new integrated trading technology platform. During Phase I, customers will continue to connect to the existing NYSE Arca gateways and use existing messaging protocols.

However, there are changes to certain order types and messaging that will go into effect on a symbol-by-symbol basis, some indefinitely and some just for Phase I, as the Pillar matching engines are deployed. With regard to gateway messaging, the associated changes to binary fields and values are indicated with notes throughout the equities sections of this gateway specification where applicable.

For information on the functional changes to various order types that will take effect for symbols migrated to Pillar, please visit: <https://www.nyse.com/pillar>

3 NYSE Arca UGW Binary Gateway Overview

Trading Times

This information is subject to change. For up-to-date information on the hours of operations and trading sessions, please visit <http://www.nyse.com>.

Hours of Operation*

| | NYSE Arca Equities (Listed, OTC, ETFs) | Global OTC (BBs, Pinks) | NYSE Arca Options | NYSE AMEX Options |
|-----------------------------------|---|----------------------------|--|--------------------|
| Opening Auction | 4:00am ET | Not available | 9:30am ET | 9:30am ET |
| Session 1, Opening Session | 4:00am – 9:30am ET | Not available | Not Available | Not available |
| Market Order Auction | 9:30am ET | Not available | Not available | Not available |
| Session 2, Core Session | 9:30am – 4:00pm ET | Not available | 9:30am – 4:00pm ET Note: Certain ETF's trade until 4:15 pm ET | 9:30am – 4:00pm ET |
| Session 3, Late Session | 4:00pm – 8:00pm ET | Not available | Not available | Not available |

* all times listed are Eastern Standard Time (EST)

We begin accepting orders for the auction at 3:30 AM.

Global OTC (Bulletin Board (OTCBB), Pinksheets) is currently not available through the NYSE Arca UGW Binary Gateway.

Trading Session IDs

An order's participation in the various auctions and trading sessions is defined in the Trading Session ID and Time In Force fields. Orders can participate in multiple sessions offered for that type of financial instrument. See the [Hours of Operation*](#) table for more information.

- Session 1 (Trading Session ID = "1") equity orders participate in:
 - Opening Auction
 - Session 1 (Opening Session)
 - Market Orders Auction
 - Expire at 9:30 AM
- Session 2 (Trading Session ID = "2") equity orders participate in:
 - Market Order Auction
 - Session 2 (Core Session)

- Expire at 4:00 PM
- Session 2 (Trading Session ID = “2”) option orders participate in:
 - Opening Auction
 - Session 2 (Core Session)
 - Expire based on their TimeInForce field. Day option orders expire at 4:00pm
- Session 3 (Trading Session ID = “3”) equity orders participate in:
 - Session 3 (Late Session) Listed only
 - Expire at 8:00 PM

Orders may combine Trading Session ID values. For example, a DAY equity order might have Trading Session ID = “123”, indicating that it participates in all three sessions. This field is left justified and null padded. So an option order that can only participate in the core session would have “2\0\0” as its Trading Session ID.

The NYSE Arca “Day+” order for equities, which spans all trading sessions, must have Time In Force = DAY and Trading Session ID = “123”

Common Identifiers

Company Group ID

The company Group ID is assigned by NYSE Arca and identifies the market maker or brokerage firm that sends an order. It is used to identify the customer on Exchange exchanges and must be supplied on all orders. NYSE Arca will reject orders with no Company Group ID or with an invalid ID.

Option Symbology

For option orders, the NYSE Arca UGW Binary Gateway accepts three methods to identify the series for an option order:

- Explicit Symbology (Consolidated Underlying Symbols)

Table 1 Fields to Identify a Series

| Field | Description | Explicit |
|-----------------|--|----------|
| Series Symbol | Explicit = 1-6 character explicit symbol for option issue. | ✓ |
| Expiration Date | The year, month and day the series expires | ✓ |
| Put or Call | Whether the series is for a put or call | ✓ |
| Strike Price | The strike price for the series. | ✓ |

For example, a Microsoft series for October 2012 27.50 Calls would be represented as:

- Explicit = MSFT 20121021 27.50 C (Symbol Consolidated)

How To Distinguish between Equity and Option orders

On orders sent to the exchange, set the “Strike Price” field to zero to indicate an Equity order otherwise it indicates an Option order.

Equities Symbology

NYSE Arca uses the Comstock Symbology for stock symbols listed on its equity exchanges. You can also find a list of all stock symbols traded on NYSE Arca at

http://www.nysearca.com/traders/eligible_stocks/eligibleStocks_ArcaEx.xls.

The NYSE Arca UGW Binary Gateway does not allow the symbol suffix field. The full symbol plus suffix must be sent in the Symbol field. The following table describes the class of equity symbols:

Table 2 Stock Symbols with Suffixes

| Stock Symbol Suffix | NYSE Arca Symbology | Example |
|---|-----------------------|------------------|
| Series (or Class) A (A-Z) | .A, .B, .C. etc... | BRK.A |
| Series A When Issued (A-Z) | .A# | BRK.A# |
| EMERGING COMPANY MARKETPLACE | .EC | .EC |
| Preferred | - | LWN- |
| Preferred Series A (Also Series B-L & M-Z) | -A, -B, -C, etc... | LWN-A (B-L, M-Z) |
| Called | * | DUA* |
| Preferred Called | -* | PSA-* |
| Preferred Series A Called. (A-Z) | -A*, -B*, -C*, etc... | PSA-A* |
| Preferred Series A When Issued. (A-Z) | -A#, -B#, -C#, etc... | SAI-A# |
| Preferred When Issued | -# | SAI-# |
| Indicates Class A of a Second Category of Preferred (Also could be B-L and M-S) | -AA | SAI-AA, SAI-AB |
| Rights | .R | TFG.R |
| Exclusive suffix used for intraday quote test message | .TEST | .TEST |
| When Issued | # | KRB# |
| Warrants | + | MMP+ |
| Warrants Series A (A-Z) | +A, +B, +C, etc... | FD+A |
| Warrants When Issued | +# | FD+# |

Order Management

Equity Order Auctions

NYSE Arca offers both early and late auctions for **NYSE Arca Primary Listings and all non-primary ETFs only**. The schedule for these auctions is listed below.

- **Early Limit Order Auction - 4:00 AM EST**
- **Opening Market & Limit Order Auction - 9:30 AM EST**
- **Closing Market & Limit Order Auction - 4:00 PM EST**

Please note that there will be a freeze one minute before each auction. Orders cannot be cancelled during this time, and new orders that increase the imbalance will be rejected.

Market on Open (MOO)/Limit On Open (LOO) Orders

NYSE Arca Equities will accept Market-on-Open (“MOO”) and Limit-on-Open (“LOO”) orders. The new MOO/LOO orders will participate in the opening auction only. Any quantity not executed in the opening auction will be immediately cancelled back to the customer.

| | | | |
|----------------------------|---|--|---|
| Market On Open (MOO) Order | OrdType = 1 (Market) TimeInForce = 2 | A market order that is to be executed only during the opening auction for the issue. If all or part of the order is not executed during the opening auction, the balance is cancelled. If this order type is sent in after the opening auction it will reject. | -NYSE Arca Primaries and all Non-Primary ETFs |
| Limit On Open (LOO) Order | OrdType = 2 (Limit) TimeInForce = 2 | A limit order that is to be executed only during the opening auction for the issue. If all or part of the order is not executed during the opening auction, the balance is cancelled. If this order type is sent in after the opening auction it will reject. | -NYSE Arca Primaries and all Non-Primary ETFs |

NYSE Arca Equities Retail Orders

To qualify for the Retail Order Tier, an ETP Holder is currently required to designate certain of its order entry ports at the Exchange as “Retail Order Ports” and attest, in a form and/or manner prescribed by the Exchange, that all orders submitted to the Exchange via such Retail Order Ports are Retail Orders. An ETP Holder must designate its Retail Order Ports no later than the fifth trading day of the month in which the desired change is to become effective.

The Exchange proposes to provide an additional method for ETP Holders to designate orders as Retail Orders. Specifically, the Exchange proposes to allow ETP Holders to designate orders as “Retail Orders” on an order by order basis by entering the value “RET” in the SenderSubID field in the order entry message. To be eligible for Retail Pricing Tier an ETP Holder must attest, in a form and/or manner prescribed by the Exchange, that all orders identified within the order entry message are Retail Orders.

| New Order Message D.1/2/3 | Len | Type | Notes and Values |
|---------------------------|-----|---------------|--|
| SenderSubID | 5 | Alpha Numeric | “RET” – Identifies order for Retail Order Pricing Tier |

To qualify as a “Retail Order,” an order:

- Must be an agency order that originates from a natural person,
- Must be submitted by an ETP Holder with no change to the terms of the order with respect to price or side of market, and
- Cannot originate from a trading algorithm or any other computerized methodology.

As noted above, an ETP Holder that wishes to qualify for the Retail Order Tier must attest that all orders submitted to the Exchange through Retail Order Ports or identified within the order entry message, as applicable, are qualified Retail Orders. The Exchange also requires that ETP Holders have certain written policies and procedures in place that are reasonably designed to assure that the Retail Order requirements are met. Retail Orders will be counted towards a firm’s total volume to qualify for pricing tiers. However, only orders sent via the Retail Order Port or designated within the order entry message can qualify for the Retail Order Tier rebate. Orders that qualify for the Retail Order Tier cannot qualify for the Tape B or C Step-up Tier or Tape C Step-up Tier 2 in the same month.

Short Sell Rule 201

The SEC has a new rule requiring NYSE Arca to prevent the execution or display of a short sale order at a price that is less than or equal to the current national best bid if the price of that covered security decreases by 10% or more from the security’s closing price as determined by the listing market as of the end of regular trading hours on the prior day.

In the event that this scenario occurs NYSE Arca will modify the price of the incoming short sale order to a penny higher than the 10% limit before accepting it. The entering firm can opt for rejection of their orders if Rule 201 is activated by indicating “S” in the Side Field of their New Order message. **Customer will receive Side=5 (Short Sell) on Order Ack, Pending Cancel, Order Killed (Cancelled), Pending Replace, Replaced for orders submitted with Side=S.**

Notes on Cancel/Replace and Cancel for “S” Side Orders: If Cancel/Replacing an “S” side order, you must send in “S” for Side in the Cancel/Replace message (The Side cannot be changed to a Sell, Sell Short, or Sell Short Exempt). If Cancelling an “S” side order, you can send either “S” or “5” for Side in the Cancel message.

Automatic Order Cancellation on Disconnect (Equities and Options)

The NYSE Arca UGW Binary Gateway client session can be set to automatically cancel all live or pending orders whenever a firm disconnects, with exclusions noted below. This is dependent upon the client setting the proper value to enable or disable Cancel On Disconnect on the session(s) in their Logon Message (See Logon Message).

Equities – excluded from cancellation are the following:

- GTC orders
- GTX orders
- GTD orders
- PO+ MOC/LOC orders for NYSE/NYSE MKT symbols after 3:45 PM
- MOO/LOO orders during Market Order Auction freeze
- MOC/LOC orders during Closing Auction freeze

Options – excluded from cancellation are the following:

- GTC orders
- GTX orders
- AON orders

When you logon to your NYSE Arca UGW Binary Gateway session you will need to include the Cancel On Disconnect field in the logon message. If you do not want your live orders canceled upon disconnect, send “0” in this field. If you do want your live orders canceled upon disconnect, send “1” in this field.

For Options connections, cancel on disconnect service is mandatory, and customers will be automatically subscribed as new dedicated options connections are established.

Please note that this feature does not guarantee that all outstanding orders will be successfully canceled. Trades may happen near the disconnection time and will not be reported until the firm reconnects. Cancel requests may also fail due to a software or hardware problem, leaving an order live and subject to execution.

Automatic order cancellation is intended to help firms in emergency situations. Firms must not rely upon this feature as a normal business practice or to prevent liability of execution, nor is it a substitute for contacting the applicable trade desks to verify that all orders are indeed canceled and that the firm has received all trades.

****Note:** For symbols migrated to Pillar, Cancel on Disconnect functionality will additionally exclude from cancellation:

- MOO/LOO orders for 1 minute prior to the Core Opening Auction
- MOC/LOC orders at all times

Bulk Cancel Message (Equities only)

If you want to bulk cancel your orders without disconnecting we offer a specialized cancel message (F). By setting the Bulk Cancel to 1 this will cancel all live orders that were sent in previously on that day’s client session, except for the following:

- GTC orders
- GTX orders
- GTD orders
- PO+ MOC/LOC orders for NYSE/NYSE MKT symbols after 3:45 PM
- MOO/LOO orders during Market Order Auction freeze
- MOC/LOC orders during Closing Auction freeze

When the Exchange receives a bulk cancel request, it will not send an acknowledgment for the message. Instead, it will begin cancelling orders and sending back to the customer Order Killed messages for each of the

orders that are cancelled. If any of the pending orders have been routed to other exchange destinations, it may take longer to receive the out messages from the away destinations.

****Note:** For symbols migrated to Pillar, Bulk Cancel functionality will additionally exclude from cancellation:

- MOO/LOO orders for 1 minute prior to the Core Opening Auction
- MOC/LOC orders at all times

Bulk Cancel by TPID

If you want to bulk cancel your orders across an entire ETPID (Equity Trade Permit ID) or ATPID/OTPID (Options Trade Permit ID) without disconnecting your UGW Binary Gateway session(s), you may use this type of bulk cancel message. The bulk cancel by TPID message is **MsgType = F with Bulk Cancel Flag set to 2 and the Account Field set with the ETPID, ATPID, or OTPID.**

Equities – excluded from cancellation are the following:

- GTC orders
- GTX orders
- GTD orders
- PO+ MOC/LOC orders for NYSE/NYSE MKT symbols after 3:45 PM
- MOO/LOO orders during Market Order Auction freeze
- MOC/LOC orders during Closing Auction freeze

Options – excluded from cancellation are the following:

- GTC orders
- GTX orders
- AON orders

When the Exchange receives a bulk cancel by TPID request, it will not send an acknowledgment for the request. Instead, it will begin cancelling orders and sending back to the customer Order Killed messages for each of the orders that are canceled across all the sessions that trade under the GroupID/TPID subject to cancellation.

In the event that orders subject to cancellation have been routed to other exchange destinations, a cancel pending acknowledgment for each of the routed orders will be sent to the gateway session from which the order originated. It may take longer to receive the out messages from the away destinations.

All Bulk Cancel Messages use Order Cancel (F.1)

| | <u>Bulk Cancel Option</u> | <u>Platform</u> | <u>Fields</u> |
|---|----------------------------------|---|---|
| 1 | Cancel all orders on a session | Arca Equities Arca Options Amex Options | BulkCancel = 1, OrderID = null, Symbol = null and OrigClOrdID = null |

| | | | |
|---|--|---|---|
| 2 | Cancel all orders on a particular side of the market | Arca Equities | BulkCancel = 1, OrderID = null, Side = 1(Buy) or 2 (Sell) and OrigClOrdID = null |
| 3 | Cancel all orders for a particular symbol | Arca Equities | BulkCancel = 1, OrderID=null, Symbol = Equity Stock Symbol (Ex. IBM) and OrigClOrdID = null |
| 4 | Cancel all orders for a particular symbol and side | Arca Equities | Bulk cancel = 1, OrderID=null, Symbol = Equity Stock Symbol (Ex. IBM), Side = 1(Buy) or 2 (Sell) and OrigClOrdID = null |
| 5 | Bulk Cancel by TPID | Arca Equities Arca Options Amex Options | Bulk Cancel = 2, OrderID = null, Symbol = null, OrigClOrdID = null, and Account = ETPID, ATPID, or OTPID |

**Note: For symbols migrated to Pillar, Bulk Cancel by ETPID functionality will additionally exclude from cancellation:

- MOO/LOO orders for 1 minute prior to the Core Opening Auction
- MOC/LOC orders at all times

NYSE Arca Equities Self Trade Prevention Information

Self Trade Prevention (STP) modifiers allow firms to prevent two orders with the same ETPID from executing against each other. Below are the STP options available:

STP Cancel Newest (STPN)

An incoming order marked with the STPN modifier will not execute against opposite side resting interest marked with any of the STP modifiers from the same ETPID. The incoming order marked with the STPN modifier will be cancelled back to the originating ETPID. The resting order, which otherwise would have interacted with the incoming order by the same ETPID, will remain on the NYSE Arca Book.

STP Cancel Oldest (STPO)

An incoming order marked with the STPO modifier will not execute against opposite side resting interest marked with any of the STP modifiers from the same ETPID. The resting order, which otherwise would have interacted with the incoming order by the same ETPID, will be cancelled back to the originating ETP ID. The incoming order marked with the STPO modifier will remain on the NYSE Arca Book.

STP Decrement and Cancel (STPD)

An incoming order marked with the STPD modifier will not execute against opposite side resting interest marked with any of the STP modifiers from the same ETPID. If both orders are equivalent in size, both orders will be cancelled back to the originating ETPIDs. If the orders are not equivalent in size, the equivalent size will be cancelled back to the originating ETPIDs and the larger order will be decremented by the size of the smaller order with the balance remaining on the NYSE Arca Book.

STP Cancel Both (STPC)

An incoming order marked with the STPC modifier will not execute against opposite side resting interest marked with any of the STP modifiers from the same ETPID. The entire size of both orders will be cancelled back to originating ETPID.

General Notes

- STP modifiers are intended to prevent interaction between the same ETPID.
- STP modifiers must be present on both the buy and the sell order in order to prevent a trade from occurring and to effect a cancel instruction.
- An incoming STP order cannot cancel through resting orders that have price and/or time priority.
- When an order with an STP modifier is entered it will first interact with all available interest in accordance with the Order Ranking and Display process pursuant to Exchange Rule 7.36.
- If there is a remaining balance on the order after trading with all orders with higher priority, it may then interact with an opposite side STP order in accordance with the rules established above.
- In situations where there are multiple STP orders resting in the NYSE Arca Book, an incoming STP order will only interact with the first resting STP order that it encounters.
- Incoming STP orders that are priced through the price of a resting STP order may cancel the resting order as long as no other non-STP orders have priority. Additionally, orders marked with one of the STP modifiers will not be prevented from interacting during any Auction process as defined by Rule 7.35.

NYSE Arca/Amex Options Self Trade Prevention Information

Self Trade Prevention for NYSE Arca and NYSE Amex Options functions differently than the Self Trade Prevention features on the Arca Equities platform. When a Market Maker Participant is sending PNP orders via the NYSE Arca UGW Binary Gateway and has a resting PNP offer (bid) order in the book, and also sends a PNP bid (offer) at or thru the resting price, the older of the two orders will be cancelled. The reason text in the cancel message for the old order will state "Self Trade Prevention". Self Trade Prevention for Options is limited to PNP Order Types only and there is no firm opt in/out as it is a global setting and applies to all firms.

Below are the instances where Self Trade Prevention for Options will/will not apply:

- Self Trade Prevention will apply for PNP orders sent via the NYSE Arca UGW Binary Gateway only and is marked as a Market Maker (CustomerOrFirm = 3).
- Self Trade Prevention will apply to a PNP Day order vs. contra resting PNP Day order with the same OPTID or ATPID
- Self Trade Prevention will apply to a PNP IOC order vs. contra resting PNP Day order with the same OPTID or ATPID
- Self Trade Prevention will not apply for PNP Market Maker orders sent via FIX.
- Self Trade Prevention will not apply for any tracking order types or any other non-PNP order type.
- Self Trade Prevention will not apply if a CMTA is defined in the ClearingAccount Field on either the old or the new order.
- Self Trade Prevention will not apply to Auction Trading
- Self Trade Prevention will not apply to Incoming Complex Orders vs. Resting Complex Orders.

- Self Trade Prevention will not apply to Activated Complex to Leg/All or None vs. Resting PNP Orders with the same OTPID or ATPID.

Equity Crossing Orders

An equity crossing order is represented as a single order with Side = Cross(8), Cross Short(9). For example, a broker wants to cross 1000 shares of stock at a price of 50. This is sent as a Limit order with Side = Cross.

For trades or transfers of stock on the Equities trading platforms, NYSE Arca allows the broker to cross the shares. No shares are traded with the Exchange; the broker is allowed to cross the shares internally at the price on the order. Using the previous example, the Execution Report would show a trade with Side = Cross, LastShares = 1000, and LastPx = 50.

If the cross is not able to execute this way, the exchange rejects the order.

When submitting a Cross where the side selling is establishing a short position, send Side = Cross Short(9). When Side = Cross Short, one may expect to see Execution Reports with Side = Cross Short, Buy, and Sell Short.

Due to the dual-sided nature of crossing orders, an extension is being made to Rule80A to indicate differences in capacity between the buying and selling sides of the crossing order, as shown below:

| <i>Buy Side</i> | <i>Sell Side</i> | <i>Capacity Indicator</i> |
|-----------------|------------------|---------------------------|
| Agency | Agency | A or F |
| Principal | Principal | P or E |
| Agency | Principal | J or X |
| Principal | Agency | K or H |

Guarantee and Directed Equity Orders (Currently Unavailable)

The directed equity order process enables registered market makers to interact with retail equity order flow directed to them through the Exchange network. This process involves two types of equity orders:

- **Guarantee Orders:** are non-display equity orders from market makers. Guarantee orders fill the directed orders sent from order provider firms that have an arrangement with the market maker.
NYSE Arca handles short sale and short sale exempt guarantee orders differently:
 - Short Sale: NYSE Arca permits short sales on a zero minus tick (0-) but will not permit short sales on a regular minus tick.
- **Directed Orders:** are sent by order provider firms to interact with guarantee equity orders for a specific market maker. Directed equity orders specify the ETP ID of the market maker they should be routed to in the DeliverToCompID field. The NYSE Arca UGW Binary Gateway accepts directed orders during all trading sessions.

ISO - Intermarket Sweep Order

These are available under Reg NMS. Clients may send ARCA an instruction to trade only with the ARCA Book and ignore all away market quotes (including Protected Quotes). This is known as the Inter-market Sweep Order (ISO):

- **ISO IOC:** Sweep the ARCA Book to the price. Cancel any remaining balance, and ignore all external quotes. Immediate or cancel.
- **ISO PNP:** Sweep the ARCA Book to the price. Post any remaining balance, and ignore all external quotes. It will not route out but the balance if any will sit on the book.

ISO Orders will interact with all resting orders except Tracking Orders. ISO Orders are never routed out.

Local and Away Market Maker Identification (Arca & AMEX Options)

NOTE: This is for OPTIONS Market Makers ONLY

If a Market Maker is entering orders with the CustomerOrFirm field set to 3 (Market Maker) they must identify themselves as an “away” market maker on one of the other options exchanges or a “local” market maker on the Options platform. The New Order Single message contains a field called LocalOrAway. Market Makers must send a 1 if they are a “local” Options market maker or a 2 if they are an “away” market maker.

In addition to identifying the type of market maker that is entering an order, a market maker must populate the SenderSubID field with a valid Market Maker ID. This ID will be an Options MMID for Options market makers or an “away” Market Maker ID for firms that make their markets on other exchanges.

* Please see the SenderSubID and LocalOrAway fields in the New Order Single tables for more detail.

Rule 80a Values and Descriptions

| Order Capacity | Value | Description |
|---------------------------------|--------------|---|
| Rule 80a (aka OrderCapacity) | A | Trading by an ETP Holder acting as agent on behalf of a customer or an affiliate. |
| | P | Trading for the proprietary account of an ETP Holder. |
| | R | Trading by an ETP Holder as principal that is intended to satisfy an originating customer order to buy or sell a security at the same price as the principal execution. |

When sending Cancel Replace, the Rule80A must be the same as original Order

Binary Prices

Prices are represented as whole integers in binary. **Strike prices for options are fixed at 4 decimal places.**

All other prices may have more or fewer decimal places. The decimal position can be determined by using the Price Scale code in the message. To determine the decimal price, divide the whole integer price by the value that the price scale code represents.

- **Example 1:** Whole integer price is 1350 and the price scale code is 2. To determine the decimal price, divide 1350 by 100 (10^2 or 10^2). The result is a decimal price of 13.50.

- **Example 2:** Whole integer price is 135 and the price scale code is 1. To determine the decimal price, divide 135 by 10 (10^1 or 10^1). The result is a decimal price of 13.5 (same as 13.50).
- **Example 3:** Whole integer price is 25 and the price scale code is 0. The price scale code is 0 so no division is necessary. The result is a price of 25 (same 25.00).

The Price Scale field is a single character.

Price Scale Codes

| Price Scale Code | Denominator Value | Denominator Value (factor of 10) |
|------------------|-------------------|--|
| "0" | N/A | N/A |
| "1" | 10 | 10^1 (10^1) |
| "2" | 100 | 10^2 (10^2) |
| "3" | 1,000 | 10^3 (10^3) |
| "4" | 10,000 | 10^4 (10^4) |
| "5" | 100,000 | 10^5 (10^5) (Equity V1 Fill and V1 Bust/Correct) |

Note: Price Scale Code of "0" indicates that the whole integer price in the price field is the actual price and no conversion or division is necessary.

Message Formatting

The message tables provided later in the document indicate when a particular field is needed (✓) for the particular type of instrument on the order (equity or option). When a field is not needed, that field should be set to null (or zeroes in binary). Note that all message fields must be provided in the exact position indicated even if not used (then null filled to binary zeroes if unused). All of the messages are of a fixed size with positional fields at a preset location.

Message Type Summary

| Message Type | | Instrument E= Equities O= Options | Direction | Function | Description |
|--------------|---------|---|----------------------------|----------|---|
| Type Code | Variant | | C = Client X = Exchange | | *(Grayed/Italic messages are currently not available) |

| Message Type | | Instrument E= Equities O= Options | Direction | Function | Description |
|--------------|---|---|-----------|---|---|
| A | 1 | E O | C X | Logon | C - Initial Logon to server for order entry. X – Login Response (Accept) |
| A | 2 | E O | C X | Logon | C - Initial Logon to server for order entry. X – Login Response (Accept) |
| L | 1 | E O | X | Logon Reject | If Logon is rejected for some reason. |
| 1 | 1 | E O | C X | Test Message | Test and heartbeat. |
| 0 | 1 | E O | C X | Heartbeat Message | Test and heartbeat. |
| B | 1 | O | C | Order Cross (Single) | Options Order Cross Single |
| B | 2 | O | C | Complex Cross Order (leg definition) | Options Order Cross Complex (leg definition) |
| B | 3 | O | C | Complex Cross Order (using complex symbol) | Options Order Cross Complex (complex symbol) |
| C | 1 | E O | X | Bust/Correct | Trade Bust or Trade Correction |
| D | 1 | E | C | New Order | Equivalent to V2 API – small message. |
| D | 2 | E O | C | New Order | Equivalent to V3 API. |
| D | 3 | E O | C | Verbose New Order | Equivalent to V3 Verbose API. |
| D | 4 | O | C | New Order (Complex) | Options Complex Orders with Legs |
| D | 5 | O | C | Complex Order using complex symbol | Options Complex Orders with Legs |
| E | 1 | E O | X | Cancel/Replace Ack | Order has pending replacement |
| F | 1 | E O | C | Order Cancel | Supports both Equities and Options |
| F | 2 | O | C | Order Cancel (Complex) | Complex Options Cancel |
| G | 1 | E O | C | Order Cancel/Replace | Supports both Equities and Options |
| G | 2 | E O | C | Order Cancel/Replace (Verbose Format) | Supports both Equities and Options |
| G | 3 | O | C | Cancel/Replace Order | Fast Cancel/Replace Options |

| Message Type | | Instrument E= Equities O= Options | Direction | Function | Description |
|--------------|---|---|-----------|---|---|
| G | 4 | E | C | Cancel/Replace Order | Fast Cancel/Replace Equities **Not Available for Pillar |
| G | 5 | O | C | Complex order Cancel/Replace (with leg definition) | Cancel/Replace Complex (leg definition) |
| G | 6 | O | C | Complex order Cancel/Replace using complex symbol | Cancel/Replace Complex (Complex symbol) |
| G | 7 | O | C | Complex order Fast Cancel/Replace using complex symbol | Fast Cancel/Replace Complex |
| J | 1 | O | C | Allocation | Allocation Message |
| P | 1 | O | X | Allocation Ack | Allocation Acknowledgement Message |
| R | 1 | O | C | New Complex Symbol Request | New Complex Symbol Request |
| r | 1 | O | X | New Complex Symbol Ack | New Complex Symbol Ack |
| a | 1 | E O | X | Order Ack | Order has been booked |
| 2 | 1 | E O | X | Order Filled | Order has filled – small message |
| 2 | 2 | E O | X | Order Filled | Order has filled - verbose format |
| 2 | 3 | O | X | Order Filled | Order has filled – verbose format (Complex Order) |
| 2 | 4 | O | X | Order Filled | Order has filled – verbose format (Complex Cross Order) |
| 4 | 1 | E O | X | Order Killed | Order killed |
| 4 | 2 | E | X | Order Killed - STP Notification | Order canceled partially or entirely due to Self Trade Prevention |
| 5 | 1 | E O | X | Order Replaced | Order has been replaced successfully |
| 6 | 1 | E O | X | Order Cancel Request Ack | Order has pending cancellation |
| 8 | 1 | E O | X | Order Rejected Message | Order or Cxl or Cxl/Replace has been rejected due to incorrect or unaccepted value or invalid |

| Message Type | Instrument E= Equities O= Options | Direction | Function | Description | |
|--------------|---|-----------|----------|-------------|------------|
| | | | | | order type |

4 Session Management

Overview

Clients initiate a TCP/IP session to the Gateway. Session logon is always initiated by the client connection. Application messages may be exchanged between the client and server after logon is successful. A client has five seconds after they connect to send a logon request or the server drops the connection.

Messages have a defined number of fixed-length fields, containing both binary and ASCII data. All binary data is sent in network Endian format (Big Endian). All ASCII data is left justified and null padded. Each message contains a message termination field that must contain an ASCII Line Feed character '\n'

During periods of inactivity, the server and/or client use the Test Request and Heartbeat messages to ensure the connection is up and functioning properly. The client must be able to respond to Test Request messages from the server by sending a Heartbeat message.

Disconnects

TCP/IP connections can experience disconnections for many reasons. To ensure that no order flow messages are lost when disconnections occur, each order message has a sequence number. Clients assign sequence numbers to the messages they send the server and the server tracks these numbers. Similarly, the server assigns its own sequence numbers to the order responses that it sends to the client.

When clients log on after a disconnection, information in the Logon message allows the client and server to exchange the sequence number of the last message that they processed from the other party. Each side can then start sending the next message that has not been processed by the other side.

Clients can also choose to have the NYSE Arca UGW Binary Gateway cancel all resting orders when a disconnection happens.

Session Throttle

This type of order gateway has a throttle limit of 1000 total inbound messages read per second for each configured client order session. The Enforced Message Rate Limitation is to ensure a session provides more predictable performance, while also preventing it from affecting the performance of other sessions on the same gateway.

Processing:

After the 1000th message is received within a rolling 1 second, any subsequent message is buffered until that second is completed. The application then sequentially processes queued messages, carrying over to further seconds every additional 1000 messages in the buffer. In this manner; if 5001 messages are sent to the port in under a second, the last one will not be processed by the gateway until the 5th second.

Outbound message rate from the gateway is not inhibited.

Recommendation:

It is recommended that firms monitor their exchange-bound message rate for a session, and adjust their order flow to utilize other sessions if this limit is frequently approached.

Logon Message Variants (and Logon Accepted)

Clients use the Logon message to establish a connection, identify the symbol protocol they will use for the client session and identify the last response message they have processed. The server may accept or reject the client logon. If logon is successful, the NYSE Arca UGW Binary Gateway sends a Logon message back to the client indicating the last request message the server has processed.

The Last Sequence Number field is used to recover order messages when disconnections happen. For the initial connection, clients should set the Last Sequence Number field to zero. The Logon response from the server will also show zero for the initial connection.

If an inadvertent disconnect happens, clients should use the Last Sequence Number field to indicate the last order response message received from the server. The server will begin sending order responses from the next sequence number.

Similarly, the server sends back the sequence number for last client order request that the server processed in the Logon response message. Clients should use this to determine if order messages have been dropped and should be sent again.

Clients should not skip sequence numbers. A client can however pass '-1' as the Last Sequence Number to notify the server not to validate the next sequence number. The server will accept the next sequence from the client and then send what it thinks is the next outbound sequence.

Logon Message – Variant 1

| Logon Message | Length | Type | Equities | Options | Notes and Values | | | | | | | | |
|-------------------------|---|---------------|----------|---------|--|--------|---------|---|---|----|---|-------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'A' | | | | | | | | |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 | | | | | | | | |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message | | | | | | | | |
| SeqNum | 4 | Binary | | | | | | | | | | | |
| Last Sequence Number | 4 | Binary | ✓ | ✓ | Last sequence number processed. <table border="1" data-bbox="740 642 1503 1020"> <thead> <tr> <th>Values</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Replay every message previously sent by the Exchange.</td> </tr> <tr> <td>-1</td> <td>Do not replay any message but continue from the last known transmitted sequence plus one.</td> </tr> <tr> <td>N > 0</td> <td>User specifies the last Sequence you successfully processed. The server will rewind to this number plus one and retransmit from that point up to the current sequence number.</td> </tr> </tbody> </table> | Values | Meaning | 0 | Replay every message previously sent by the Exchange. | -1 | Do not replay any message but continue from the last known transmitted sequence plus one. | N > 0 | User specifies the last Sequence you successfully processed. The server will rewind to this number plus one and retransmit from that point up to the current sequence number. |
| Values | Meaning | | | | | | | | | | | | |
| 0 | Replay every message previously sent by the Exchange. | | | | | | | | | | | | |
| -1 | Do not replay any message but continue from the last known transmitted sequence plus one. | | | | | | | | | | | | |
| N > 0 | User specifies the last Sequence you successfully processed. The server will rewind to this number plus one and retransmit from that point up to the current sequence number. | | | | | | | | | | | | |
| UserName | 5 | Alpha Numeric | ✓ | ✓ | Gateway Login ID | | | | | | | | |
| Symbology | 1 | Binary | | ✓ | Method used to identify an option series. <table border="1" data-bbox="740 1115 1338 1226"> <thead> <tr> <th>Values</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>OCC/OSI Explicit Symbology</td> </tr> </tbody> </table> Values 2 and 3 are both be considered OSI Explicit and strict validation no longer applies. | Values | Meaning | 2 | OCC/OSI Explicit Symbology | | | | |
| Values | Meaning | | | | | | | | | | | | |
| 2 | OCC/OSI Explicit Symbology | | | | | | | | | | | | |
| Message Version Profile | 28 | BytePair | ✓ | ✓ | Provides the desired message versioning profile to use during the session. These consist of an array of up to 9 BytePairs. The first byte of the pair indicates the message type and the second byte is the message version desired. Entries with a null message type or version are ignored. | | | | | | | | |
| Cancel On Disconnect | 1 | Binary | ✓ | ✓ | 0 = Do Not Cancel On Disconnect (Cancel on Disconnect will not be activated for the session) 1 = Enable Cancel on Disconnect (Cancel On Disconnect will be activated for the session) | | | | | | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" | | | | | | | | |
| Total | 48 | | | | | | | | | | | | |

Message Version Profile

The system provides the following “default” profile if the user fails to supply one with the Logon message. Use the first two columns as the data to send, but modify as desired. For example send the following byte stream on the Message Version Profile field: ‘L’,1,’a’,1,’4’,1, ‘E’,1, ‘5’,1,’8’,1,’6’,1,’C’,1,’2’,1.

| MsgType (ASCII) | MsgVersion (Binary) | Description |
|------------------------|----------------------------|---|
| ‘L’ | 1 | Logon Ack |
| ‘a’ | 1 | New Order Ack |
| ‘4’ | 1 | Order Killed Notification |
| ‘E’ | 1 | Cancel/Replace Ack |
| ‘5’ | 1 | Order Replaced Ack |
| ‘8’ | 1 | Order Reject Ack |
| ‘6’ | 1 | Cancel Order Ack |
| ‘C’ | 1 | Bust/Correct Ack |
| ‘2’ | 1 | Order Fill defaults to regular Order Fill message (Variant 1) |

Any profile supplied by the user will override the default profile. If the user fails to supply a particular message type then the corresponding “default” profile will apply for that message.

Self Trade Prevention Note (Order Killed (4) Variant 2: When you log in with Variant 1 of the Order Killed Message in your message profile or choose the default profile, you need to expect to receive both Variants 1 and 2 of the Order Killed messages if you intend to use Self Trade prevention.

Logon Message – Variant 2

Logon Request Variant 2 uses bit map as an indexing technique to indicate which data elements in the session profile are present. The presence of a data element is indicated by a 1 in the assigned position; a zero (0) indicates the absence of a data element. Each session profile element excluding the delimiter is assigned to a specific bit. The bit array can consist up to 32 bits although current implementation only uses from bit 1 to 3, future enhancements may use any of the unused bits. Using this technique allows GCCG to add new configurable profile features without new API changes. Bits that are not set will use the system default values and all unused bits must be set to 0.

| Logon Message | Length | Type | Equities | Options | Notes and Values | | | | | | | | |
|-------------------------|---|---------------|----------|---------|--|--------|---------|---|---|----|---|-------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'A' | | | | | | | | |
| Variant | 1 | Binary | ✓ | ✓ | Value = 2 | | | | | | | | |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message | | | | | | | | |
| SeqNum | 4 | Binary | | | | | | | | | | | |
| Last Sequence Number | 4 | Binary | ✓ | ✓ | Last sequence number processed. <table border="1"> <thead> <tr> <th>Values</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Replay every message previously sent by the exchange.</td> </tr> <tr> <td>-1</td> <td>Do not replay any message but continue from the last known transmitted sequence plus one.</td> </tr> <tr> <td>N > 0</td> <td>User specifies the last Sequence you successfully processed. The server will rewind to this number plus one and retransmit from that point up to the current sequence number.</td> </tr> </tbody> </table> | Values | Meaning | 0 | Replay every message previously sent by the exchange. | -1 | Do not replay any message but continue from the last known transmitted sequence plus one. | N > 0 | User specifies the last Sequence you successfully processed. The server will rewind to this number plus one and retransmit from that point up to the current sequence number. |
| Values | Meaning | | | | | | | | | | | | |
| 0 | Replay every message previously sent by the exchange. | | | | | | | | | | | | |
| -1 | Do not replay any message but continue from the last known transmitted sequence plus one. | | | | | | | | | | | | |
| N > 0 | User specifies the last Sequence you successfully processed. The server will rewind to this number plus one and retransmit from that point up to the current sequence number. | | | | | | | | | | | | |
| Session Profile Bit Map | 4 | Binary | ✓ | ✓ | 32 Bit Map representation of Session Profile. Each bit denotes the presence or absence of the data element in the session profile string. | | | | | | | | |
| UserName | 5 | Alpha Numeric | ✓ | ✓ | Gateway Login ID | | | | | | | | |
| Session Profile String | Variable | Alpha Numeric | ✓ | ✓ | The list of data elements that are set. <u>Must</u> be in the order session profile bit map | | | | | | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: “\n” | | | | | | | | |
| Total | 22 + Session Profile Length | | | | | | | | | | | | |

Session Profile Bit Map

| Bit # | Description | Type | Default |
|-------|--------------------|----------|--|
| 1 | Message Version | Constant | Verbose format |
| 2 | CancelOnDisconnect | Constant | 0 = Do Not Cancel On Disconnect (Cancel on Disconnect will not be activated for the session) |
| 3 | ExtendedExeclnst | Constant | No default |
| 4 | ProactiveIfLocked | Optional | No default |
| 5-32 | Unused (0) | | |

Type

- Constant – bitmap is always enabled regardless what the customer sends in their logon request
- Optional – bitmap is enabled only if the customer set the attribute in their logon request.

Session Profile String

| Bit | Logon Message | Length | Type | Equities | Options | Notes and Values |
|-----|-----------------------------|--------|---------------|----------|---------|---|
| 1 | Message Version Profile | 28 | BytePair | ✓ | ✓ | Provides the desired message versioning profile to use during the session. These consist of an array of up to 9 BytePairs. The first byte of the pair indicates the message type and the second byte is the message version desired. Entries with a null message type or version are ignored. |
| 2 | Cancel On Disconnect | 1 | Binary | ✓ | ✓ | 0 = Do Not Cancel On Disconnect (Cancel on Disconnect will not be activated for the session) 1 = Enable Cancel on Disconnect (Cancel On Disconnect will be activated for the session) |
| 3 | Default Extended Execlnst | 1 | Alpha Numeric | ✓ | | '0' = No interaction with MPL Orders. (Equities) '2' = Opt out of interaction with IOI Dark Pool Quotes (Equities) 'A' = Add Liquidity Only (Equities) Null = No Default Instruction |
| 4 | Default Proactive If Locked | 1 | Alpha Numeric | ✓ | | Null/'0' = No Default Instruction – Not proactive if locked, and cancel if priced through LULD 'Y' = Proactive if Locked/Non-display remove liquidity (MPL orders), and Cancel if priced through LULD '1' = Re-price if priced through LULD '2' = Proactive if Locked/Non-display remove liquidity (MPL orders), and Re-price if priced through LULD |

Example 1

Logon request with Enabled bit 1 (Message Version Profile) and bit 3 (Extended Execution Instruction (Add Liquidity Only)) and Disabled bit 2 (Cancel On Disconnect), Disabled bit 4 (Proactive if Locked)

32 Bitmap Representation – 1010 0000 0000 0000 (binary value = 5)

| A2 Fixed Data Length | Message Version Profile | Cancel On Disconnect | Default Extended Execution Instruction | Default Proactive If Locked |
|----------------------|-------------------------|----------------------|--|-----------------------------|
| 22 | 28 | 0 | 1 | 0 |

Total message length = 51

Example 2

Logon request with enabled bit 1, bit2 and bit 3.

32 Bit Map Representation – 1110 0000 0000 0000 (binary value = 7)

| A2 Fixed Data Length | Message Version Profile | Cancel On Disconnect | Default Extended Execution Instruction | Default Proactive If Locked |
|----------------------|-------------------------|----------------------|--|-----------------------------|
| 22 | 28 | 1 | 1 | 0 |

Total message length = 52

Example 3

Logon request with disabled bit 1, bit2 and bit 3.

32 Bitmap Representation – 0000 0000 0000 0000 (binary value = 0)

| A2 Fixed Data Length | Message Version Profile | Cancel On Disconnect | Default Extended Execution Instruction | Default Proactive If Locked |
|----------------------|-------------------------|----------------------|--|-----------------------------|
| 22 | 28 | 0 | 0 | 0 |

Total message length = 22

Logon Accepted Message

The NYSE Arca UGW Binary Gateway sends a Logon Accept message back to the client with the same structure as described for the Logon Message. Note that the returned Message Version Profile will indicate the actual profile that has been established for that session.

Logon Reject Message

The NYSE Arca UGW Binary Gateway sends a Logon Reject message only when logon validation fails and then closes the connection. If logon was successful, the gateway sends a Logon message back to the client. There are times when the client may not receive a response.

The Client Logon Status field indicates the reason for the rejection.

| Logon Reject Message | Length | Type | Equities | Options | Notes and Values |
|-------------------------------|--------|------------------|----------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'L' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| SeqNum | 4 | Binary | | | Should be ignored |
| Last Sequence Number Received | 4 | Binary | ✓ | ✓ | The last sequence number from a client message that was received and processed. |
| Last Sequence Number Sent | 4 | Binary | ✓ | ✓ | The sequence number for the last message sent to the client. |
| Reject Type | 2 | Binary | ✓ | ✓ | The rejection code (see reject section later in this document). |
| Text | 40 | Alpha | ✓ | ✓ | The rejection reason description. |
| Filler | 1 | | ✓ | ✓ | Null Pad |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 60 | | | | |

Test Request Message

The Test Request message is sent by either side of the connection to request the other side to respond with a Heartbeat message, when that side does not receive a message during periods of inactivity. If the other side does not respond to a Test Request message, the application should assume an abnormal situation and terminate the TCP/IP connection.

The server will send a Test Request message only during periods of inactivity after the first heartbeat period (60 seconds). At a minimum, the client must respond to this message with a Heartbeat message. The server will disconnect the client following a subsequent period with no activity.

| Test Request Message | Length | Type | Equities | Options | Notes and Values |
|----------------------|--------|---------------|----------|---------|--------------------------------|
| Message Type | 1 | Alpha/Numeric | ✓ | ✓ | '1' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence | 4 | Binary | ✓ | ✓ | Ignore (future use) |
| Filler | 3 | | | | Ignore |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 12 | | | | |

Heartbeat Message

The Heartbeat message is used to respond to Test Request messages. It lets the other side know the connection is still good during periods of inactivity. The default server heartbeat interval is 60 seconds. However, a client may request a higher or lower heartbeat interval to be set on a given session if desired. Please contact the Trade Desk to request this change on your sessions.

At a minimum a client must be able to receive Test Request messages and respond with Heartbeat messages. During periods of activity the server will not send Test Request or Heartbeat messages and there is no need for the client to send them.

| Heartbeat Message | Length | Type | Equities | Options | Notes and Values |
|--------------------|--------|---------------|----------|---------|--------------------------------|
| Message Type | 1 | Alpha/Numeric | ✓ | ✓ | '0' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence | 4 | Binary | ✓ | ✓ | Ignore (future use) |
| Filler | 3 | | | | Ignore |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |

| | | | | |
|-------|----|--|--|--|
| Total | 12 | | | |
|-------|----|--|--|--|

5 Application Messages

This section describes the Application Messages for this interface. Binary data is in Network Endian format (Big Endian). All Filler and Padding fields contain null characters. Non-binary fields should be left justified and null padded.

D = New Order Message – (Variant 1: Equities Only – Small Message)

| New Order Message D.1 | Len | Type | Notes and Values |
|-----------------------|-----|---------------|---|
| Message Type | 1 | Alpha Numeric | 'D' |
| Variant | 1 | Binary | 1 - Indicates this type of message |
| Length | 2 | Binary | Binary length of the message |
| Sequence Number | 4 | Binary | Client-assigned sequence number |
| Client Order ID | 4 | Binary | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294 This must be unique per session per day. If duplicate OrderIDs are received, the duplicate order will be rejected. |
| PCS Link ID | 4 | Binary | No Longer Used. Filler |
| Order Quantity | 4 | Binary | The number of shares |
| Price | 4 | Binary | The price as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| ExDestination* | 2 | Binary | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. *On UGW for Arca Equities, this field requires the proper value. If the value is not populated correctly or null padded out, your order will reject. |
| Price Scale | 1 | Alpha Numeric | "0" through "4" |
| Symbol | 8 | Alpha | Equity Stock Symbol |
| CompanyGroupID | 5 | Alpha Numeric | The company ID for the firm that is entering the orders. If the connecting firm is a service bureau, this must be the company ID of the firm that is entering order through the service bureau. |
| DeliverToCompID | 5 | Alpha Numeric | The ID of the market maker to route a Directed order to. " Null Pad if the order is not participating in the Directed Order Processes. |

| New Order Message D.1 | Len | Type | Notes and Values |
|--|-----|---------------|---|
| SenderSubID | 5 | Alpha Numeric | User-defined information that is not validated. Firms entering orders as market makers must send their MMID in this field if this variant is used. |
| ExecInst | 1 | Alpha Numeric | Additional information on how to handle the order. See the <i>Order Types</i> sections of this document for more detail. |
| Side | 1 | Alpha Numeric | "1" = Buy "2" = Sell "5" = Sell Short "6" = Sell Short Exempt (SSR 201) "S" = Sell Short and Cancel (When SSR 201 is in effect) "8" = Cross "9" = Cross Short |
| OrderType | 1 | Alpha Numeric | "1" = Market "2" = Limit "7" = Inside limit "q" = Market Maker |
| TimeInForce | 1 | Alpha Numeric | "0" = Day order "2" = Opening auction only (Arca Primaries only) "3" = IOC (not valid on Market Orders) "4" = FOK (not valid on Market Orders) **Not Available for Pillar Phase I "7" = Closing auction only(Arca Primary and PO+ only) "8" = ROT 1 – IOC "9" = ROT 2 – IOC "A" = ROT 2 – Day or Market Note: Timed Orders are not currently available. |
| **Note: IOC is not a valid TIF on Reserve orders and Inside Limit orders. Inside Limit NOW orders, however, must have TIF of IOC | | | |
| Rule80A | 1 | Alpha/Numeric | A, P, R |
| TradingSessionID | 4 | Alpha Numeric | The trading sessions the order may trade in. This field may contain multiple values and should be left justified and null padded. "1" = 4:00am - 9:30am ET (Equities Only) "2" = 9:30am - 4:00am ET "3" = 4:00pm - 8:00pm ET (Equities Only) |
| Account | 10 | Alpha Numeric | User-defined information that is not validated. This information will appear in trade records and on monthly bills. |

| New Order Message D.1 | Len | Type | Notes and Values |
|-----------------------|-----|---------------|---|
| ISO | 1 | Alpha | 'Y' = ISO Sweep 'N' = No ISO flag |
| ExtendedExecInst | 1 | Alpha Numeric | 0x00 NULL not set '0' (ASCII digit zero) No Midpoint Execution '2' IOI Opting Out 'A' Add Liquidity Only (ALO) 'P' Primary Open Order Plus (PO+) 'p' Primary Open Order Plus Shipping Inst. (PO+S) 'R' RPI Order 'S' PL Select Order |
| ExtendedPNP | 1 | Alpha-Numeric | 0x00 NULL not set 'P' Extended PNP Plus 'B' Extended PNP Blind |
| NoSelfTrade | 1 | Alpha | 'N' Cancel New 'O' Cancel Old 'C' Cancel Both 'D' Cancel Decrement |
| ProactivelyLocked | 1 | Alpha-Numeric | "\0" = Default, no proactive if locked flag, and Cancel if priced through LULD "Y" = Proactive if Locked/Non-display remove liquidity (MPL orders) "1" = Re-price if priced through LULD "2" = Proactive if Locked/Non-display remove liquidity (MPL orders) and re-price if priced through LULD |
| Filler | 1 | | Null Pad Bytes |
| Message Terminator | 1 | Alpha | ASCII new line character: "\n" |
| Total | 76 | | |

D = New Order Message (Variant 2)

| New Order Message D.2 | Length | Type | Equities | Options | Notes and Values |
|-----------------------|--------|---------------|----------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'D' |
| Variant | 1 | Binary | ✓ | ✓ | 2 – Indicates this type of message |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Client-assigned sequence number |
| Client Order ID | 4 | Binary | ✓ | ✓ | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294 This must be unique per session per day. If duplicate orders IDs are received, the duplicate order will be rejected. |
| Link ID | 4 | Binary | ✓ | ✓ | Client order link ID |
| OrderQty | 4 | Binary | ✓ | ✓ | The number of shares (equity orders) or contracts (option orders) for this order. |
| Strike Price | 4 | Binary | | ✓ | The strike price for an option, as a long value with a fixed scale of 4. For equity orders this field is set to zero (0). |
| Price | 4 | Binary | ✓ | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| Price Scale | 1 | Alpha Numeric | ✓ | ✓ | "0" through "4" |
| Put or Call | 1 | Binary | | ✓ | The option class (not applicable to equity orders): 0 = Put 1 = Call |
| Underlying Quantity | 2 | Binary | | ✓ | The number of shares per option contract for this series (option orders only) |
| Corporate Action | 1 | Alpha Numeric | | ✓ | Flag indicating the series was created because of corporate changes in the underlying stock. '0' = No corporate changes '1' = Created for a corporate action |
| Open or Close | 1 | Alpha | | ✓ | Open or Close the position. |

| New Order Message D.2 | Length | Type | Equities | Options | Notes and Values |
|------------------------|--------|---------------|----------|---------|---|
| | | | | | "O" = Open "C" = Close 0x00 = Null Pad (Equities Only) |
| ExDestination* | 2 | Binary | ✓ | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. *On UGW for Equities or Options, this field requires the proper value. If the value is not populated correctly or null padded out, your order will reject. |
| Symbol | 8 | Alpha | ✓ | ✓ | Stock symbol, for equity orders, or the Explicit Options symbol the client has chosen to use, for option orders. In options orders, this field is set to the Series Symbol in Explicit naming. |
| Strike Date | 8 | Alpha | | ✓ | The option expiration date (not applicable to equity orders) in YYYYMMDD format. |
| Company GroupID | 5 | Alpha Numeric | ✓ | ✓ | The company ID for the firm that is entering the orders. If the connecting firm is a service bureau, this must be the company ID of the firm that is entering order through the service bureau. |
| DeliverTo CompID | 5 | Alpha Numeric | ✓ | | The ID of the market maker to route a Directed order to. (Equities Directed Orders Only- Currently Unavailable) <i>Null Pad this field out if the order is not participating in the Directed Order Processes.</i> |
| SenderSubID | 5 | Alpha Numeric | ✓ | ✓ | User-defined information that is not validated. <u>Note: Firms entering orders as market makers must send their MMID in this field if this variant is used.</u> |
| Execution Instructions | 1 | Alpha Numeric | ✓ | ✓ | Additional information on how to handle the order. See the <i>Order Types</i> sections of this document for more detail. |
| Side | 1 | Alpha Numeric | ✓ | ✓ | "1"= Buy "2"= Sell "5" = Sell Short "6" = Sell Short Exempt (SSR 201) "S" = Sell Short and Cancel (When SSR 201 is in effect) |

| New Order Message D.2 | Length | Type | Equities | Options | Notes and Values |
|---|--------|---------------|----------|---------|--|
| | | | | | "8" = Cross "9" = Cross Short |
| Order Type | 1 | Alpha Numeric | ✓ | ✓ | "1" = Market "2" = Limit "7" = Inside Limit "q" = Market Maker |
| Time In Force **Note: IOC is not a valid TIF on Reserve orders and Inside Limit orders. Inside Limit NOW orders, however, must have TIF of IOC | 1 | Alpha Numeric | ✓ | ✓ | "0" = Day order "2" = Opening auction only (Arca Primary Equities only) "3" = IOC (not valid on Market Orders) "4" = FOK (not valid on Market Orders) **Not Available for Pillar Phase I "7" = Closing auction only (Arca Primary Equities and PO+ only) "8" = ROT 1 – IOC "9" = ROT 2 – IOC "A" = ROT 2 – Day or Market Note: Timed Orders are not currently available. |
| Rule80A | 1 | Alpha Numeric | ✓ | | A, P, R (Equity orders only) |
| Customer Or Firm | 1 | Alpha Numeric | | ✓ | "0" = Customer "1" = Firm "2" = Broker "3" = Market Maker "8" = Professional Customer |
| Trading Session ID | 4 | Alpha Numeric | ✓ | ✓ | The trading sessions the order may trade in. This field may contain multiple values and should be left justified and null padded. "1" = 4:00am - 9:30am ET (Equities only) "2" = 9:30am - 4:00am ET (Equities and Options) "3" = 4:00pm - 8:00pm ET (Equities only) |
| Account | 10 | Alpha Numeric | ✓ | ✓ | User-defined information that is not validated. Common examples include user or account IDs.. This information will appear in trade records and on monthly bills. |

| New Order Message D.2 | Length | Type | Equities | Options | Notes and Values |
|-----------------------|--------|---------------|----------|---------|---|
| Clearing Firm | 5 | Alpha | | ✓ | The OCC code for the clearing firm to use for an option order. This is typically the default clearing firm for all orders for this brokerage firm. (Optional Field) |
| Clearing Account | 5 | Alpha | | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. This is an optional field for option orders only. |
| LocalOrAway | 1 | Binary | | ✓ | 1 = Local Options MM 2 = Away MM for another options exchange. 3= Adds Customer Sub-Account Suffix (For use by "away" market makers only) |
| ISO | 1 | Alpha | ✓ | ✓ | 'Y' = ISO Sweep 'N' = No ISO flag Additional parameters are used to specify the variation of the ISO Order. See Section 5. *On Options, TimeInForce=3 and ExecInst = f along with ISO = Y defines an ISO IOC Order |
| ExtendedExecInst | 1 | Alpha Numeric | ✓ | | 0x00 NULL not set '0' (ASCII digit zero) No Midpoint Execution '2' IOI Opting Out 'A' Add Liquidity Only (ALO) 'P' Primary Open Order Plus (PO+) 'p' Primary Open Order Plus Shipping Inst. (PO+S) 'R' RPI Order 'S' PL Select Order |
| Extended PNP | 1 | Alpha | ✓ | ✓ | 0x00 NULL not set 'P' Extended PNP Plus 'B' Extended PNP Blind |
| NoSelfTrade | 1 | Alpha | ✓ | | 'N' Cancel New 'O' Cancel Old 'C' Cancel Both |

| New Order Message D.2 | Length | Type | Equities | Options | Notes and Values |
|-----------------------|--------|---------------|----------|---------|---|
| | | | | | 'D' Cancel Decrement |
| Proactivelocked | 1 | Alpha/Numeric | ✓ | | "\0" = Default, no proactive if locked flag "Y" = Proactive if Locked/Non-display remove liquidity (MPL orders) "1" = Re-price if priced through LULD "2" = Proactive if Locked/Non-display remove liquidity (MPL orders), and re-price if priced through LULD |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 104 | | | | |

D = New Order Verbose Format Message (Variant 3)

Note: Verbose Message format must be used for Pegged Orders, Discretionary Orders and Primary Orders.

| New Order Message D.3 [verbose] | Length | Type | Equities | Options | Notes and Values |
|------------------------------------|--------|------------------|----------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'D' |
| Variant | 1 | Binary | ✓ | ✓ | 3 – Use to indicate this type of message |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Client-assigned sequence number |
| Client Order ID | 4 | Binary | ✓ | ✓ | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294 This must be unique per session per day. If duplicate orders IDs are received, the duplicate order will be rejected. |
| PCS Link ID | 4 | Binary | ✓ | | No Longer Used. Filler |
| Order Quantity | 4 | Binary | ✓ | ✓ | The number of shares (equity orders) or contracts (option orders) for this order. |
| Strike Price | 4 | Binary | | ✓ | The strike price for an option, as a long value with a fixed scale of 4. Equity orders in this field are set to zero (0). |
| MinQty | 4 | Binary | ✓ | | > = 100 (Cannot be mixed lot or odd lot amount) |
| Max Floor | 4 | Binary | ✓ | ✓ | > = 100 (Cannot be mixed lot or odd lot amount) **Note: PNP Blind ALO orders may not be entered as Reserve **Note: For symbols migrated to Pillar, PNP ALO, PNP Blind ALO, and PNP ISO ALO orders may not be entered as Reserve. Additionally, Max Floor may only be entered with round lot values. |
| Display Range | 4 | Binary | ✓ | | 0 – 999,999 (Null pad field if not used) |
| DiscretionOffset | 4 | Binary | ✓ | | Price Fixed at Price Scale 2 -9999.99 – 9999.99 **Not Available for Pillar Phase I |
| Peg Difference | 4 | Binary | ✓ | | Price Fixed at Price Scale 2 -9999.99 – 9999.99 |
| StopPx | 4 | Binary | | ✓ | Price Field fixed at Price Scale of 2 |

| New Order Message D.3 [verbose] | Length | Type | Equities | Options | Notes and Values |
|------------------------------------|--------|---------------|----------|---------|---|
| | | | | | .01 to 99,999 |
| Price | 4 | Binary | ✓ | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| ExDestination* | 2 | Binary | ✓ | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. *On UGW for Equities or Options, this field requires the proper value. If the value is not populated correctly or null padded out, your order will reject. |
| Underlying Quantity | 2 | Binary | | ✓ | The number of shares per option contract for this series (option orders only) |
| Put Call | 1 | Binary | | ✓ | The option class (not applicable to equity orders): 0 = Put 1 = Call |
| LocalOrAway | 1 | Binary | | ✓ | 1 = Local OptionsMM 2 = Away MM for another options exchange. 3= Adds Customer Sub-Account Suffix (For use by “away” market makers only) |
| Price Scale | 1 | Alpha Numeric | ✓ | ✓ | “0” through “4” |
| Corporate Action | 1 | Alpha Numeric | | ✓ | Flag indicating the series was created because of corporate changes in the underlying stock. ‘0’ = No corporate changes ‘1’ = Created for a corporate action |
| Open Close | 1 | Alpha Numeric | | ✓ | “O” = Open “C” = Close 0x00 = Null Pad (Equities Only) |
| Symbol | 8 | Alpha | ✓ | ✓ | Stock symbol, for equity orders, or the type of symbol the client has chosen to use, for option orders. In options orders this field is set to the Series Symbol in either OCC or Explicit naming. |
| Strike Date | 8 | Alpha | | ✓ | The option expiration date (not applicable to equity orders) |

| New Order Message D.3 [verbose] | Length | Type | Equities | Options | Notes and Values |
|--|--------|---------------|----------|---------|---|
| | | | | | in YYYYMMDD format. |
| CompanyGroupID | 5 | Alpha Numeric | ✓ | ✓ | The company ID for the firm that is entering the orders. If the connecting firm is a service bureau, this must be the company ID of the firm that is entering order through the service bureau. |
| DeliverToCompID | 5 | Alpha Numeric | ✓ | | The ID of the market maker to route a Directed order to. <i>Null Pad this field out if the order is not participating in the Directed Order Processes.</i> |
| SenderSubID | 5 | Alpha Numeric | ✓ | ✓ | User-defined information that is not validated. Note: Firms entering orders as market makers must send their MMID in this field if this variant is used. |
| Execution Instructions | 1 | Alpha Numeric | ✓ | ✓ | Additional information on how to handle the order. See the <i>Order Types sections</i> of this document for more detail. |
| Side | 1 | Alpha Numeric | ✓ | ✓ | "1" = Buy "2" = Sell "5" = Sell Short "6" = Sell Short Exempt (SSR 201) "S" = Sell Short and Cancel (When SSR 201 is in effect) "8" = Cross "9" = Cross short |
| Order Type | 1 | Alpha Numeric | ✓ | ✓ | "1" = Market "2" = Limit "7" = Inside Limit "P" = Peg "q" = Market Maker |
| Time In Force **Note: IOC is not a valid TIF on Reserve orders and Inside Limit orders. Inside Limit NOW orders, however, | 1 | Alpha Numeric | ✓ | ✓ | "0" = Day order "2" = Opening auction only (Arca Primary Equities only) "3" = IOC (not valid on Market Orders) "4" = FOK (not valid on Market Orders) **Not Available for Pillar Phase I "7" = Closing auction only (Arca Primary Equities and PO+ only) "8" = ROT 1 – IOC |

| New Order Message D.3 [verbose] | Length | Type | Equities | Options | Notes and Values |
|------------------------------------|--------|---------------|----------|---------|---|
| must have TIF of IOC | | | | | "9" = ROT 2 – IOC "A" = ROT 2 – Day or Market Note: Timed Orders are not currently available. |
| Rule80A | 1 | Alpha Numeric | ✓ | | A, P, R (equity orders only) |
| Customer Or Firm | 1 | Alpha Numeric | | ✓ | "0"= Customer "1"= Firm "2"= Broker "3"= Market Maker "8" = Professional Customer |
| TradingSessionID | 4 | Alpha Numeric | ✓ | ✓ | The trading sessions the order may trade in. This field may contain multiple values and should be left justified and null padded. "1" = 4:00am-9:30am ET (equities only) "2" = 9:30am-4:00pm ET "3" = 4:00pm-8:00pm ET (equities only) |
| Account | 10 | Alpha Numeric | ✓ | ✓ | User-defined information that is not validated. Common examples include user or Account IDs. This information will appear in trade records and on monthly bills. |
| Optional Data | 16 | Alpha | | ✓ | If not null, then the data should be left justified and it will be passed on to the clearing process as is. |
| Clearing Firm | 5 | Alpha Numeric | | ✓ | The OCC code for the clearing firm to use for an option order. This is typically the default clearing firm for all orders for this brokerage firm. This is an optional field for option orders only. |
| Clearing Account | 5 | Alpha Numeric | | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. This is an optional field for option orders only. |
| Expire Time Flag | 1 | Alpha | ✓ | ✓ | "D" – Date, |
| ExpireTime | 4 | Alpha Numeric | ✓ | | "MMDD" or "HHMM" If HHMM (Local Eastern Time applies, 24 Hour Clock) Ex. 1900 (7:00pm ET) |
| Effective Time | 4 | Alpha Numeric | ✓ | | No Longer Used. Filler |
| DiscretionInst | 1 | Alpha Numeric | ✓ | | "\0" = Not Used |

| New Order Message D.3 [verbose] | Length | Type | Equities | Options | Notes and Values |
|------------------------------------|--------|---------------|----------|---------|---|
| | | | | | "0" = DiscretionInst is set **Not Available for Pillar Phase I |
| Proactive Discretion Indicator | 1 | Alpha Numeric | ✓ | | "\0" = Not Used "1" = Discretion Order **Not Available for Pillar Phase I |
| Proactivelocked | 1 | Alpha Numeric | ✓ | | "\0" = Default, no proactive if locked flag "Y" = Proactive if Locked/Non-display remove liquidity (MPL orders) "1" = Re-price if priced through LULD "2" = Proactive if Locked/Non-display remove liquidity (MPL orders), and re-price if priced through LULD |
| ExecBroker | 5 | Alpha | ✓ | | Set to "POO" on Primary Open Order |
| ISO | 1 | Alpha | ✓ | ✓ | 'Y' = ISO Sweep 'N' = No ISO flag Additional parameters are used to specify the variation of the ISO Order. See Section 5. *On Options, TimeInForce=3 and ExecInst=f along with ISO = Y defines an ISO IOC Order |
| Symbol Type | 1 | Alpha Numeric | | | Null Pad this field out. Reserved for future use. |
| ExtendedExecInst | 1 | Alpha numeric | ✓ | ✓ | 0x00 NULL not set '0' (ASCII digit zero) No Midpoint Execution '2' IOI Opting Out 'A' Add Liquidity Only (ALO) 'P' Primary Open Order Plus (PO+) 'p' Primary Open Order Plus Shipping Inst. (PO+S) 'R' RPI Order 'S' PL Select Order |
| Extended PNP | 1 | Alpha | ✓ | | 0x00 NULL not set 'P' Extended PNP Plus 'B' Extended PNP Blind |
| NoSelfTrade | 1 | Alpha | ✓ | | 'N' Cancel New |

| New Order Message D.3 [verbose] | Length | Type | Equities | Options | Notes and Values |
|------------------------------------|--------|---------------|----------|---------|---|
| | | | | | 'O' Cancel Old 'C' Cancel Both 'D' Cancel Decrement |
| Filler | 3 | Alpha Numeric | | | |
| Message Terminator | 1 | Alpha | | | ASCII new line character: "\n" |
| Total | 164 | | | | |

D = New Complex Order Message - Options (Variant 4)

| New Order Message D.4 [Complex] | Length | Type | Options | Notes and Values |
|------------------------------------|--------|---------------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | 'D' |
| Variant | 1 | Binary | ✓ | Value = 4 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Client-assigned sequence number |
| ClOrdID | 4 | Binary | ✓ | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294 This must be unique per session per day. If duplicate ClOrdIDs are received, the duplicate order will be rejected. |
| Order Quantity | 4 | Binary | ✓ | The number of shares (equity orders) or contracts (option orders) for this order. |
| Price | 8 | Binary | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. *On UGW for Options, this field requires the proper value. If the |

| New Order Message D.4 [Complex] | Length | Type | Options | Notes and Values |
|---------------------------------|--------|---------------|---------|--|
| | | | | value is not populated correctly or null padded out, your order will reject. |
| Company Group ID | 5 | Alpha Numeric | ✓ | The company ID for the firm that is entering the orders. If the connecting firm is a service bureau, this must be the company ID of the firm that is entering order through the service bureau. |
| Price Scale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| Order Type | 1 | Alpha Numeric | ✓ | "2" = Limit |
| Time In Force | 1 | Alpha Numeric | ✓ | "0" = Day order "3" = IOC (not valid on Market Orders) "5" = Good Till Crossing (GTX) (Complex Order Auction) Note: Timed Orders are not currently available. |
| TradingSessionID | 4 | Alpha Numeric | ✓ | The trading sessions the order may trade in. This field may contain multiple values and should be left justified and null padded. "2" = 9:30am-4:00pm ET |
| Account | 10 | Alpha Numeric | ✓ | User-defined information that is not validated. Common examples include user or account IDs. This information will appear in trade records and on monthly bills. |
| Clearing Firm | 5 | Alpha | ✓ | The OCC code for the clearing firm to use for an option order. This is typically the default clearing firm for all orders for this brokerage firm. This is an optional field for option orders only. |
| Clearing Account | 5 | Alpha | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. This is an optional field for option orders only. |
| Customer Or Firm | 1 | Alpha Numeric | ✓ | "0" = Customer "1" = Firm "2" = Broker "3" = MarketMaker "8" = Professional Customer |

| New Order Message D.4 [Complex] | Length | Type | Options | Notes and Values |
|---------------------------------|--------|---------------|---------|---|
| ExecInst | 1 | Alpha Numeric | ✓ | Additional information on how to handle the order. See the <i>Order Types</i> sections of this document for more detail. |
| ExtendedExecInst | 1 | Char | ✓ | "C" Complex Order Auction Note: Complex orders marked Complex Order Auction ('C') should only be submitted in trading session 2 (Core) and not during session 1 (pre-market) |
| Extended PNP | 1 | Char | ✓ | 'P' Complex PNP Plus |
| DeliverToCompID | 5 | Alpha | | This field is not used and should be null padded out |
| SenderSubID | 5 | Alpha Numeric | ✓ | User-defined information that is not validated. Note: Firms entering orders as market makers must send their MMID in this field if this variant is used. |
| Number Of Legs | 1 | Binary | ✓ | The total number of repeating legs. (Max.number of legs = 5) |

Complex Order Leg

| New Complex Order Message 'D.4' | Length | Type | Options | Notes and Values |
|---------------------------------|--------|---------------|---------|---|
| LegRefID | 4 | Binary | ✓ | Unique Indicator for a specific leg. Value cannot be 0. |
| Strike Price | 4 | Binary | ✓ | The strike price for an option, as a long value with a fixed scale of 4. |
| LegRatioQty | 2 | Binary | ✓ | The ratio of quantity for this individual leg relative to the order quantity |
| Underlying Quantity | 2 | Binary | ✓ | The number of shares per option contract for this series (option orders only) |
| Symbol | 8 | Alpha | ✓ | Stock symbol or the type of symbol the client has chosen to use, for option orders. |
| Strike Date | 8 | Alpha Numeric | ✓ | The option expiry date in YYYYMMDD format. |
| Security Type | 8 | Alpha | ✓ | Indicates type security. Valid security type "OPT" and "CS" |

| New Complex Order Message 'D.4' | Length | Type | Options | Notes and Values |
|------------------------------------|--------|---------------|---------|--|
| Side | 1 | Alpha Numeric | ✓ | '1'= Buy, '2'= Sell, '5'= Sell Short (Equity Leg Only) |
| Put Call | 1 | Binary | ✓ | 0 = Put, 1 = Call |
| Open Close | 1 | Alpha Numeric | ✓ | "O" = Open, "C" = Close |
| Padding | 1 | Binary | ✓ | |

Note: The Complex Order Leg is only to be used embedded inside the Complex Order Message.

| New Order Message D.4 [Complex] | Length | Type | Options | Notes and Values |
|------------------------------------|--------|-------|---------|--------------------------------|
| Local Away | 1 | Alpha | ✓ | |
| Filler | 5 | Alpha | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 280 | | | |

D = Complex Order Message (complex symbol) - Options (Variant 5)

| Complex Order Message (using complex symbol) D.5 [Complex] | Length | Type | Options | Notes and Values |
|---|--------|---------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | 'D' |
| Variant | 1 | Binary | ✓ | Value = 5 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Client-assigned sequence number |
| CIOrdID | 4 | Binary | ✓ | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294. This must be unique per session per day. If duplicate CIOrdIDs are received, the duplicate order will be rejected. |
| Order Quantity | 4 | Binary | ✓ | The number of contracts for this order. |

| Complex Order Message (using complex symbol) D.5 [Complex] | Length | Type | Options | Notes and Values |
|---|--------|---------------|---------|---|
| Price | 8 | Binary | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. *On UGW for Options, this field requires the proper value. If the value is not populated correctly or null padded out, your order will reject. |
| Symbol | 21 | Alpha Numeric | ✓ | Complex Symbol |
| Price Scale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| Order Type | 1 | Alpha Numeric | ✓ | "2" = Limit |
| Side | 1 | Alpha Numeric | ✓ | '1' = Buy, '2' = Sell |
| Time In Force | 1 | Alpha Numeric | ✓ | "0" = Day order "1" = GTC (Good Till Cancel) "2" = At the Opening "3" = IOC (Immediate or Cancel) "4" = FOK (Fill or Kill) "5" = Good Till Crossing (GTX) (Complex Order Auction) |
| ExecInst | 1 | Alpha Numeric | ✓ | Additional information on how to handle the order. See the <i>Order Types</i> sections of this document for more detail. No ExecInst Value = (null) G = All or None (AON) M = PNP Plus |
| ExtendedExecInst | 1 | Char | ✓ | "C" Complex Order Auction Note: Complex orders marked Complex Order Auction ('C') should only be submitted in trading session 2 (Core) and not during session 1 (pre-market) |

| Complex Order Message (using complex symbol) D.5 [Complex] | Length | Type | Options | Notes and Values |
|---|--------|---------------|---------|--|
| Customer Or Firm | 1 | Alpha Numeric | ✓ | "0" = Customer "1" = Firm "2" = Broker "3" = MarketMaker "8" = Professional Customer |
| LocalOrAway | 1 | Binary | ✓ | 1 = Local Options MM 2 = Away MM for another options exchange. 3= Adds Customer Sub-Account Suffix (For use by "away" market makers only) |
| Short Sell Indicator | 1 | Alpha Numeric | ✓ | "Y" = Short Sell "N" = Not a Short Sell |
| Company Group ID | 5 | Alpha Numeric | ✓ | The company ID for the firm that is entering the orders. If the connecting firm is a service bureau, this must be the company ID of the firm that is entering order through the service bureau. |
| TradingSessionID | 4 | Alpha Numeric | ✓ | The trading sessions the order may trade in. This field should be left justified and null padded. "2" = 9:30am-4:00pm ET |
| Account | 10 | Alpha Numeric | ✓ | User-defined information that is not validated. Common examples include user or account IDs. This information will appear in trade records and on monthly bills. |
| Clearing Firm | 5 | Alpha | ✓ | The OCC code for the clearing firm to use for an option order. This is typically the default clearing firm for all orders for this brokerage firm. This is an optional field for option orders only. |
| Clearing Account | 5 | Alpha | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. This is an optional field for option orders only. |
| SenderSubID | 5 | Alpha Numeric | ✓ | User-defined information that is not validated. Note: Firms entering orders as market makers must send their |

| Complex Order Message (using complex symbol) D.5 [Complex] | Length | Type | Options | Notes and Values |
|---|--------|---------------|---------|---|
| | | | | MMID in this field if this variant is used. |
| StockLegGiveUp | 5 | Alpha | ✓ | |
| OptionalData | 16 | Alpha Numeric | ✓ | If not null, then the data should be left justified and it will be passed on to the clearing process as is. |

Complex Order Leg (up to 5 legs)

| Complex Order Message (using complex symbol) D.5 [Complex] | Length | Type | Options | Notes and Values |
|---|--------|------------------|---------|---|
| LegRefID | 4 | Binary | ✓ | Unique Indicator for a specific leg. Value cannot be 0. |
| Open Close | 1 | Alpha Numeric | ✓ | “O” = Open “C” = Close |

Note: The Complex Order Leg is only to be used embedded inside the Complex Order Message.

| Complex Order Message (using complex symbol) D.5 [Complex] | Length | Type | Options | Notes and Values |
|---|--------|-------|---------|--------------------------------|
| Filler | 7 | Alpha | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: “\n” |
| Total | 144 | | | |

F = Order Cancel Message (Variant 1)

This message requests that an order booked at the Exchange be canceled. There are several possible responses: Cancel Ack, Reject or Order Killed.

| Order Cancel Message F.1 | Length | Type | Equities | Options | Notes and Values |
|-----------------------------|--------|---------------|----------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'F' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Client-assigned sequence number |
| OrderID | 8 | Binary | ✓ | ✓ | NYSE Arca assigned OrderID. |
| OriginalCLOrdID | 4 | Binary | ✓ | ✓ | Client order ID of the order to be canceled. If the order to be canceled is an order that has been replaced, this should be the ID of the replacement order. |
| Strike Price | 4 | Binary | | ✓ | The strike price for an option, as a long value with a fixed scale of 4. <i>(Null Pad this field on Equity Order Cancels)</i> |
| UnderlyingQty | 2 | Binary | | ✓ | The number of shares per option contract for this series (option orders only) <i>(Null Pad this field on Equity Order Cancel Requests)</i> |
| ExDestination | 2 | Binary | ✓ | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. <i>Must be the same Exchange Code from the New Order Message.</i> |
| Corporate Action | 1 | Alpha Numeric | | ✓ | Flag indicating the series was created because of corporate changes in the underlying stock. 0 = No corporate changes 1 = Created for a corporate action <i>(Null Pad this field on Equity Order Cancel Requests)</i> |
| Put or Call | 1 | Binary | | ✓ | The option class (not applicable to equity orders): 0 = Put 1 = Call <i>(Null Pad this field on Equity Order Cancel Requests)</i> |

| Order Cancel Message F.1 | Length | Type | Equities | Options | Notes and Values |
|-----------------------------|--------|---------------|----------|---------|---|
| Bulk Cancel | 1 | Binary | ✓ | ✓ | 0 = not set 1 = Perform Bulk Cancel 2 = Bulk Cancel by ETPID (Equities) or ATPID/OTPID (Options) |
| Open or Close | 1 | Alpha | | ✓ | "O" = Open "C" = Close <i>(Null Pad this field on Equity Order Cancel Requests)</i> |
| Symbol | 8 | Alpha | ✓ | ✓ | Stock symbol, for equity orders, or the type of symbol the client has chosen to use, for option orders. |
| Strike Date | 8 | Alpha | | ✓ | The option expiry date (not applicable to equity orders) in YYYYMMDD format. <i>(Null Pad this field on Equity Order Cancel Requests)</i> |
| Side | 1 | Alpha Numeric | ✓ | ✓ | "1" = Buy "2" = Sell "5" = Sell Short "6" = Sell Short Exempt (SSR 201) "S" = Sell Short and Cancel (When SSR 201 is in effect) "8" = Cross "9" = Cross Short |
| DeliverToCompID | 5 | Alpha | ✓ | ✓ | Use only if Cancelling a Directed Order |
| Account | 10 | Alpha | ✓ | ✓ | Used in Bulk Cancel by ETPID (Equities) or ATPID/OTPID (Options) when Bulk Cancel is enabled |
| Filler | 7 | Alpha | ✓ | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 72 | | | | |

F = Complex Cancel Request (Variant 2)

This message requests that an order booked at the Exchange be canceled. There are several possible responses: Cancel Ack, Reject or Order Killed.

| Complex Cancel Message F.2 | Length | Type | Options | Notes and Values |
|-------------------------------|--------|------------------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | 'F' |
| Variant | 1 | Binary | ✓ | Value = 2 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Client-assigned sequence number |
| OrderID | 8 | Binary | ✓ | Exchange assigned OrderID. |
| ClOrdID | 4 | Binary | ✓ | Client order ID of the complex order to be canceled. If the order to be canceled is an order that has been replaced, this should be the ID of the replacement order. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. <i>Must be the same Exchange Code from the D.5 Complex Order Message.</i> |
| Symbol | 21 | Alpha | ✓ | Complex Symbol |
| Filler | 12 | Alpha | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 56 | | | |

G = Order Cancel/Replace (Variant 1)

This message requests that an order booked at the Exchange be modified. Clients can change the quantity, price, or type of order.

| Order Cancel/Replace Message G.1 | Length | Type | Equities | Options | Notes and Values |
|----------------------------------|--------|------------------|----------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'G' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Client-assigned sequence number |
| OrderID | 8 | Binary | ✓ | ✓ | Exchange assigned OrderID. |
| ClOrdID | 4 | Binary | ✓ | ✓ | Client Order ID for the new order that is replacing an existing order. This must be a unique value. |
| Original ClOrdID | 4 | Binary | ✓ | ✓ | Client Order ID of the order being replaced |
| Order Quantity | 4 | Binary | ✓ | ✓ | Shares or contracts for this order. |
| Strike Price | 4 | Binary | ✓ | | The strike price for an option, as a long value with a fixed scale of 4. Equity orders in this field are set to zero (0). |
| Price | 4 | Binary | ✓ | ✓ | Price for the order, as a long value. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| ExDestination | 2 | Binary | ✓ | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. <i>Must be the same Exchange Code from the New Order Message.</i> |
| Under Qty | 2 | Binary | | ✓ | The number of shares per option contract for this series. |
| Price Scale | 1 | Alpha Numeric | ✓ | ✓ | "0" through "4" |
| Put or Call | 1 | Binary | | ✓ | The option class (not applicable to equity orders): 0 = Put |

| Order Cancel/Replace Message G.1 | Length | Type | Equities | Options | Notes and Values |
|----------------------------------|--------|------------------|----------|---------|---|
| | | | | | 1 = Call |
| Corporate Action | 1 | Alpha Numeric | | ✓ | Flag indicating the series was created because of corporate changes in the underlying stock. 0 = No corporate changes 1 = Created for a corporate action |
| Open or Close | 1 | Alpha | | ✓ | "O" = Open "C" = Close |
| Symbol | 8 | Alpha | ✓ | ✓ | Stock symbol or Options Symbol |
| Strike Date | 8 | Alpha | | ✓ | The option expiry date (not applicable to equity orders) in YYYYMMDD format. |
| Execution Instructions | 1 | Alpha Numeric | ✓ | ✓ | Must be the same as the existing order |
| Side | 1 | Alpha Numeric | ✓ | ✓ | "1" = Buy "2" = Sell "5" = Sell Short "6" = Sell Short Exempt (SSR 201) "S" = Sell Short and Cancel (When SSR 201 is in effect) "8" = Cross "9" = Cross Short |
| Order Type | 1 | Alpha Numeric | ✓ | ✓ | "1" = Market "2" = Limit "7" = Inside Limit |
| Time In force | 1 | Alpha Numeric | ✓ | ✓ | "0" = Day order "2" = Early auction only (Equities only) "7" = Late auction only (Equities only) |
| Rule80A | 1 | Alpha Numeric | ✓ | | A, P, R (equity orders only) |

| Order Cancel/Replace Message G.1 | Length | Type | Equities | Options | Notes and Values |
|----------------------------------|--------|---------------|----------|---------|---|
| Trading Session ID | 4 | Alpha Numeric | ✓ | ✓ | The trading sessions the order may trade in. This field may contain multiple values and should be left justified and null padded. "1" = 4:00am – 9:30am ET "2" = 9:30am – 4:00pm ET "3" = 4:00pm – 8:00pm ET |
| Deliver To Comp ID | 5 | Alpha | ✓ | ✓ | Use only if Cancel/Replacing a Directed or DOP Order |
| Account | 10 | Alpha Numeric | ✓ | ✓ | User-defined information that is not validated. Common examples include user or account IDs |
| Filler | 3 | Alpha | ✓ | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 88 | | | | |

G = Order Cancel/Replace Verbose (Variant 2)

This message requests that an order previously booked on the Exchange be modified. Clients can change the quantity, price, or type of order.

| Order Cancel/Replace Message Verbose | Length | Type | Equities | Options | Notes and Values |
|--------------------------------------|--------|---------------|----------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'G' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 2 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Client-assigned sequence number |
| OrderID | 8 | Binary | ✓ | ✓ | Exchange assigned OrderID |
| ClOrdID | 4 | Binary | ✓ | ✓ | Client Order ID for the new order that is replacing an existing order. This must be a unique value. |
| OrigClOrdID | 4 | Binary | ✓ | ✓ | Client Order ID of the order being replaced |
| Order Quantity | 4 | Binary | ✓ | ✓ | Shares or contracts for this order. |
| Strike Price | 4 | Binary | | ✓ | The strike price for an option, as a long value with a fixed |

| Order Cancel/Replace Message Verbose | Length | Type | Equities | Options | Notes and Values |
|--------------------------------------|--------|--------|----------|---------|---|
| | | | | | scale of 4. Equity orders in this field are set to zero (0). |
| MinQty | 4 | Binary | ✓ | | > = 100 (Cannot be mixed lot or odd lot amount) |
| Max Floor | 4 | Binary | ✓ | | > = 100 (Cannot be mixed lot or odd lot amount) **Note: PNP Blind ALO orders may not be entered as Reserve **Note: For symbols migrated to Pillar, PNP ALO, PNP Blind ALO, and PNP ISO ALO orders may not be entered as Reserve. Additionally, Max Floor may only be entered with round lot values. |
| Display Range | 4 | Binary | ✓ | | 0 – 999,999 |
| DiscretionOffset | 4 | Binary | ✓ | | Price Fixed at Price Scale 2 -9999.99 – 9999.99 **Not Available for Pillar Phase I |
| Peg Difference | 4 | Binary | ✓ | | Price Fixed at Price Scale 2 -9999.99 – 9999.99 |
| StopPx | 4 | Binary | | ✓ | Price Field fixed at Price Scale of 2 .01 to 99,999 |
| Price | 4 | Binary | ✓ | ✓ | Price for the order, as a long value. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| Underlying Quantity | 2 | Binary | | ✓ | The number of shares per option contract for this series (option orders only) |
| ExDestination | 2 | Binary | ✓ | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. <i>Must be the same Exchange Code from the New Order Message.</i> |
| Put Call | 1 | Binary | | ✓ | The option class (not applicable to equity orders): 0 = Put |

| Order Cancel/Replace Message Verbose | Length | Type | Equities | Options | Notes and Values |
|--------------------------------------|--------|---------------|----------|---------|---|
| | | | | | 1 = Call |
| Price Scale | 1 | Alpha Numeric | ✓ | ✓ | "0" through "4" |
| Corporate Action | 1 | Alpha Numeric | | ✓ | Flag indicating the series was created because of corporate changes in the underlying stock. 0 = No corporate changes 1 = Created for a corporate action |
| Open Close | 1 | Alpha Numeric | | ✓ | "O" = Open "C" = Close |
| Symbol | 8 | Alpha | ✓ | ✓ | Stock symbol, for equity orders, or the type of symbol the client has chosen to use, for option orders. |
| Strike Date | 8 | Alpha | | ✓ | The option expiry date (not applicable to equity orders) in YYYYMMDD format. |
| Execution Instructions | 1 | Alpha Numeric | ✓ | ✓ | Must be the same as the existing order |
| Side | 1 | Alpha Numeric | ✓ | ✓ | "1" = Buy "2" = Sell "5" = Sell Short "6" = Sell Short Exempt (SSR 201) "S" = Sell Short and Cancel (When SSR 201 is in effect) "8" = Cross "9" = Cross Short |
| Order Type | 1 | Alpha Numeric | ✓ | ✓ | "1" = Market "2" = Limit "7" = Inside Limit "P" = Peg |
| TimeInForce | 1 | Alpha Numeric | ✓ | ✓ | "0" = Day order "2" = Early auction only (Equities only) "7" = Late auction only (Equities only) |

| Order Cancel/Replace Message Verbose | Length | Type | Equities | Options | Notes and Values |
|--------------------------------------|--------|---------------|----------|---------|---|
| Rule80A | 1 | Alpha Numeric | ✓ | | A, P, R (equity orders only) |
| CustomerOrFirm | 1 | Alpha Numeric | | ✓ | "0" = Customer "1" = Firm "2" = Broker "3" = Market Maker "8" = Professional Customer |
| TradingSessionID | 4 | Alpha Numeric | ✓ | ✓ | The trading sessions the order may trade in. This field may contain multiple values and should be left justified and null padded. "1" = 4:00am – 9:30am ET (Equities only) "2" = 9:30am – 4:00pm ET "3" = 4:00pm – 8:00pm ET (Equities only) |
| ExpireTime Flag | 1 | Alpha | | ✓ | "D" – Date |
| ExpireTime | 4 | Alpha Numeric | | ✓ | "MMDD" |
| Effective Time | 4 | Alpha Numeric | ✓ | ✓ | No longer Used. Filler |
| DiscretionInst | 1 | Alpha Numeric | ✓ | ✓ | "\0" = Not Used "0" = DiscretionInst is set **Not Available for Pillar Phase I |
| Proactive Discretion Indicator | 1 | Alpha Numeric | ✓ | | "\0" = Not Used "1" = Discretion Order **Not Available for Pillar Phase I |
| DeliverToCompID | 5 | Alpha | ✓ | | |
| Clearing Account | 5 | Alpha Numeric | | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. This is an optional field for option orders only. |
| Account | 10 | Alpha Numeric | ✓ | ✓ | User-defined information that is not validated. Common examples include user or account IDs |

| Order Cancel/Replace Message Verbose | Length | Type | Equities | Options | Notes and Values |
|--------------------------------------|--------|-------|----------|---------|--------------------------------|
| Filler | 2 | | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: “\n” |
| Total | 128 | | | | |

G = Fast Cancel/Replace Message Options (Variant 3)

Fast cancel replace functionality is available on Option PNP orders only. One can change the volume and/or price only. All other fields will be ignored. Unlike standard cancel replace messages on our platform you will receive one execution report (MsgType=5) indicating that the order is replaced. You can suppress the pending cancel replace message (MsgType=E) with the field “Suppress Ack” set to “Y”.

Unlike traditional cancel replaces where the ClOrdID changes each time you modify an order, the fast cancel replace maintains the ClOrdID of the first order that was entered, therefore you must send the ClOrdID of the first order in the order chain in the OriginalClOrdID. The OrderID of the original order must also be included.

A reject of this message will be message type ‘8’ with the ClOrdID and OrigClOrdID Fields set the same as the client order id of the original order and the Type field set to ‘3’. On success, a Message type of “5” will be returned. A message Type “E” will be returned as an Ack of this message.

| Fast Cancel/Replace Message | Length | Type | Options | Notes and Values |
|-----------------------------|--------|---------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | ‘G’ |
| Variant | 1 | Binary | ✓ | Value = 3 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ArcaEx-assigned sequence number |
| OrderID | 8 | Binary | ✓ | Exchange assigned order ID. This value is required and can be found returned to you on the Order Ack of the original order. |
| Original ClOrderID | 4 | Binary | ✓ | Client order ID |
| Order Quantity | 4 | Binary | ✓ | The number of shares |
| Strike Price | 4 | Price | ✓ | The strike price for an option, as a long value with a fixed scale of 4. |

| Fast Cancel/Replace Message | Length | Type | Options | Notes and Values |
|-----------------------------|--------|---------------|---------|--|
| | | | | Equity orders in this field are set to zero (0). |
| Price | 4 | Binary | ✓ | The price as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. <i>Must be the same Exchange Code from the New Order Message.</i> |
| Underlying Quantity | 2 | Binary | ✓ | The number of shares per option contract for this series (option orders only) |
| Price Scale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| Put Call | 1 | Binary | ✓ | The option class (not applicable to equity orders): 0 = Put 1 = Call |
| Corporate Action | 1 | Alpha Numeric | ✓ | Flag indicating the series was created because of corporate changes in the underlying stock. 0 = No corporate changes 1 = Created for a corporate action |
| Symbol | 8 | Alpha | ✓ | Stock symbol, for equity orders, or the type of symbol the client has chosen to use, for option orders. |
| Strike Date | 8 | Alpha Numeric | ✓ | The option expiry date (not applicable to equity orders) in YYYYMMDD format. |
| Suppress Ack | 1 | Alpha | ✓ | "Y" Ack will be suppressed All other values, Acks will be sent |
| DeliverToCompID | 5 | Alpha | | |
| Account | 10 | Alpha Numeric | ✓ | User-defined information that is not validated. Common examples include user or account IDs |
| Filler | 8 | | ✓ | |

| Fast Cancel/Replace Message | Length | Type | Options | Notes and Values |
|-----------------------------|--------|-------|---------|--------------------------------|
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 80 | | | |

G = Fast Cancel/Replace Message Equities (Variant 4) – Not Available for Pillar

Fast Cancel replace –For Equity PNP Orders Only. One can change the volume and/or price, or side (If Sell to Sell Short) only. All other fields will be ignored. Unlike standard cancel replace messages on our platform you will receive one execution report (MsgType=5) indicating that the order is replaced. You can suppress the pending cancel replace message (MsgType=E) with the field "Suppress Ack" set to "Y".

Unlike traditional cancel replaces where the ClOrdID changes each time you modify an order, the fast cancel replace maintains the ClOrdID of the first order that was entered, therefore you must send the ClOrdID of the first order in the order chain in the OriginalClOrdID. The OrderID of the original order must also be included.

A reject of this message will be message type '8' with the ClOrdID and OrigClOrdID Fields set the same as the client order id of the original order and the Type field set to '3'. On success, a Message type of "5" will be returned. A message Type "E" will be returned as an Ack of this message.

| Equities Fast Cancel/Replace Message | Length | Type | Equities | Notes and Values |
|--------------------------------------|--------|---------------|----------|--|
| Message Type | 1 | Alpha Numeric | ✓ | 'G' |
| Variant | 1 | Binary | ✓ | Value = 4 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Exchange assigned sequence number |
| OrderID | 8 | Binary | ✓ | Exchange assigned order ID. This value is required and can be found returned to you on the Order Ack of the original order. |
| Original ClOrdID | 4 | Binary | ✓ | Client Order ID of Initial Order |
| Order Quantity | 4 | Binary | ✓ | The number of shares |
| Price | 4 | Binary | ✓ | The price as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th |

| Equities Fast Cancel/Replace Message | Length | Type | Equities | Notes and Values |
|--------------------------------------|--------|---------------|----------|---|
| | | | | decimal place or beyond will cause the order to be rejected by the gateway. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. 102 – NYSE Arca Equities |
| Price Scale | 1 | Alpha Numeric | ✓ | “0” through “4” |
| Symbol | 8 | Alpha | ✓ | Equity Stock Symbol |
| Side | 1 | Alpha Numeric | ✓ | Optional. If not changing a Sell to a Sell Short, null pad this field out. |
| Suppress Ack | 1 | Alpha | ✓ | “Y” Ack will be suppressed (Note: All other values, Acks will be sent) |
| Deliver to Comp ID | 5 | Alpha | ✓ | |
| Account | 10 | Alpha Numeric | ✓ | User-defined information that is not validated. Common examples include user or account IDs |
| Filler | 7 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: “\n” |
| Total | 64 | | | |

G = Complex Order Cancel/Replace (Variant 5)

This message requests that an order previously booked on the Exchange be modified. Clients can change the quantity, price, or type of order.

| Cancel/Replace Message G.5 [Complex] | Length | Type | Options | Notes and Values |
|--------------------------------------|--------|---------------|---------|---------------------------------|
| Message Type | 1 | Alpha Numeric | ✓ | ‘G’ |
| Variant | 1 | Binary | ✓ | Value = 5 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Client-assigned sequence number |

| Cancel/Replace Message G.5 [Complex] | Length | Type | Options | Notes and Values |
|--------------------------------------|--------|---------------|---------|---|
| OrderID | 8 | Binary | | Exchange assigned order ID. This value is required and can be found returned to you on the Order Ack of the original order. |
| ClOrdID | 4 | Binary | ✓ | A client-assigned ID for the replacement order. Valid values are 1 to 4,294,967,294 This must be unique per session per day. If duplicate ClOrdIDs are received, the duplicate order will be rejected. |
| OrigClOrdID | 4 | Binary | | ClOrdID of the order being replaced |
| Order Quantity | 4 | Binary | ✓ | The number of contracts (option orders) for this order. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. |
| Price | 8 | Binary | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| Price Scale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| Clearing Account | 5 | Alpha | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. This is an optional field for option orders only. |
| DeliverToCompID | 5 | Alpha | ✓ | |
| Number Of Legs | 1 | Binary | ✓ | The total number of repeating legs. (Maximum number of legs = 5) |

Complex Cancel/Replace Leg (Up to 5 legs)

| Cancel/Replace Message Leg G.5 [Complex] | Length | Type | Options | Notes and Values |
|--|--------|--------|---------|--|
| LegRefID | 4 | Binary | ✓ | Unique Indicator for a specific leg being replaced. Value cannot be 0. |
| Strike Price | 4 | Binary | ✓ | The strike price for an option, as a long value with a fixed |

| Cancel/Replace Message Leg G.5 [Complex] | Length | Type | Options | Notes and Values |
|--|--------|---------------|---------|---|
| | | | | scale of 4. |
| LegRatioQty | 2 | Binary | ✓ | The ratio of quantity for this individual leg relative to the order quantity |
| Underlying Quantity | 2 | Binary | ✓ | The number of shares per option contract for this series (option orders only) |
| Symbol | 8 | Alpha | ✓ | Stock symbol or the type of symbol the client has chosen to use, for option orders. |
| Strike Date | 8 | Alpha Numeric | ✓ | The option expiry date in YYYYMMDD format. |
| Security Type | 8 | Alpha | ✓ | Indicates type security. Valid security type "OPT" and "CS" |
| Side | 1 | Alpha Numeric | ✓ | '1'= Buy '2'= Sell '5'= Sell Short (Equity Leg Only) |
| Put Call | 1 | Binary | ✓ | 0 = Put 1 = Call |
| Open Close | 1 | Alpha Numeric | ✓ | "O" = Open "C" = Close |
| Padding | 1 | Binary | ✓ | |

Note: The Complex Order Leg is only to be used embedded inside the Complex Cancel/Relplace Message.

| Cancel/Replace Message Leg G.5 [Complex] | Length | Type | Options | Notes and Values |
|--|--------|-------|---------|--------------------------------|
| Filler | 13 | Alpha | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 264 | | | |

G = Complex Cancel/Replace Message (Using complex symbol) - Options (Variant 6)

| Complex Cancel/Replace Message (Complex Symbol) G.6 [Complex] | Length | Type | Options | Notes and Values |
|--|--------|---------------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | 'G' |
| Variant | 1 | Binary | ✓ | Value = 6 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Client-assigned sequence number |
| OrderID | 8 | Binary | ✓ | Exchange assigned order ID. This value is required and can be found returned to you on the Order Ack of the original order. |
| CIOrdID | 4 | Binary | ✓ | A client-assigned ID for the replacement order. Valid values are 1 to 4,294,967,294. This must be unique per session per day. If duplicate CIOrdIDs are received, the duplicate order will be rejected. |
| OrigCIOrdID | 4 | Binary | ✓ | CIOrdID of Complex Order being replaced |
| OrderQty | 4 | Binary | ✓ | The number of contracts for this order. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. |
| Price | 8 | Binary | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| Price Scale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| Symbol | 21 | Alpha Numeric | ✓ | Complex Symbol |
| Clearing Account | 5 | Alpha | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. This is an optional field for option orders only. |

| Complex Cancel/Replace Message (Complex Symbol) G.6 [Complex] | Length | Type | Options | Notes and Values |
|--|--------|---------------|---------|--|
| Short Sell Indicator | 1 | Alpha Numeric | ✓ | “Y” = Short Sell “N” = Not a Short Sell |
| DeliverToCompID | 5 | Alpha | ✓ | |

Complex Cancel/Replace Leg (Up to 5 legs)

| Complex Cancel/Replace Message (Complex Symbol) G.6 [Complex] | Length | Type | Options | Notes and Values |
|--|--------|------------------|---------|---|
| LegRefID | 4 | Binary | ✓ | Unique Indicator for a specific leg. Value cannot be 0. |
| OpenClose | 1 | Alpha Numeric | ✓ | “O” = Open “C” = Close |

| Complex Cancel/Replace Message (Complex Symbol) G.6 [Complex] | Length | Type | Options | Notes and Values |
|--|--------|-------|---------|--------------------------------|
| Filler | 7 | Alpha | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: “\n” |
| Total | 104 | | | |

G = Complex Fast Cancel/Replace Message (Using complex symbol) - Options (Variant 7)

One can change the volume and/or price only. All other fields will be ignored. Unlike standard cancel replace messages on our platform you will receive one execution report (MsgType=5) indicating that the order is replaced. You can suppress the pending cancel replace message (MsgType=E) with the field “Suppress Ack” set to “Y”. Unlike traditional cancel replaces where the ClOrdID changes each time you modify an order, the fast cancel replace maintains the ClOrdID of the first order that was entered, therefore you must send the ClOrdID of the first order in the order chain in the OriginalClOrdID. The OrderID of the original order must also be

included. A reject of this message will be message type '8' with the ClordID and OrigClordID Fields set the same as the client order id of the original order and the Type field set to '3'. On success, a Message type of "5" will be returned. A message Type "E" will be returned as an Ack of this message.

| Fast Cancel/Replace Message | Length | Type | Options | Notes and Values |
|-----------------------------|--------|---------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | 'G' |
| Variant | 1 | Binary | ✓ | Value = 7 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Client-assigned sequence number |
| OrderID | 8 | Binary | ✓ | Exchange assigned order ID. This value is required and can be found returned to you on the Order Ack of the original order. |
| OrigClordID | 4 | Binary | ✓ | Client order ID |
| OrderQty | 4 | Binary | ✓ | The number of contracts |
| Price | 8 | Binary | ✓ | The price as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. <i>Must be the same Exchange Code from the New Order Message.</i> |
| Price Scale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| Symbol | 21 | Alpha | ✓ | Complex Symbol |
| Suppress Ack | 1 | Alpha | ✓ | "Y" Ack will be suppressed All other values, Acks will be sent |
| DeliverToCompID | 5 | Alpha | | |
| Account | 10 | Alpha Numeric | ✓ | User-defined information that is not validated. Common examples include user or account IDs |
| Filler | 7 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |

| Fast Cancel/Replace Message | Length | Type | Options | Notes and Values |
|-----------------------------|--------|------|---------|------------------|
| Total | 80 | | | |

6 = Cancel Request Ack Message (Variant 1)

This message informs clients when a Cancel Order message has been received but is not yet applied because the order is not available, for example if it has been routed to an away market. Once the order is available, clients may receive an Order Fill message and/or an Order Killed message.

| Cancel Request Ack Message 6.1 | Length | Type | Equities | Options | Notes and Values |
|-----------------------------------|--------|------------------|----------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | '6' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Exchange-assigned sequence number |
| Sending Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Transaction Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| CIOrdID | 4 | Binary | ✓ | ✓ | The client order ID of the canceled order |
| OrderID | 8 | Binary | ✓ | ✓ | Exchange assigned Order ID |
| Filler | 3 | Alpha | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 40 | | | | |

4 = Order Killed Message (Variant 1)

This message informs clients that an order has been canceled. It is sent in response to Order Cancel messages, cancellations at the end of sessions and administrative cancellations.

| Order Killed Message | Length | Type | Equities | Options | Notes and Values |
|----------------------|--------|------------------|----------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | '4' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Exchange-assigned sequence number |
| Sending Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Transaction Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| ClOrdID | 4 | Binary | ✓ | ✓ | Client Order ID of the canceled order |
| Order ID | 8 | Binary | ✓ | ✓ | Exchange assigned Order ID |
| Information Text | 1 | Binary | ✓ | ✓ | Indicates whether the kill was initiated by the user or by exchange rules. "0" = user-initiated kill "1" = exchange-initiated for PNP crossed market |
| Filler | 2 | Alpha | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 40 | | | | |

4 = Order Killed Message – STP (Variant 2)

This message informs clients that an order would have traded against another order under the same ETPID. It is sent in response to Self Trade Prevention situations when clients define NoSelfTrade values on their orders.

| STP Order Killed Message | Length | Type | Equities | Notes and Values |
|--------------------------|--------|------------------|----------|--|
| Message Type | 1 | Alpha Numeric | ✓ | '4' |
| Variant | 1 | Binary | ✓ | Value = 2 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Exchange-assigned sequence number |
| Sending Time | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Transaction Time | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| CIOrdID | 4 | Binary | ✓ | Client Order ID of the canceled order |
| OrderID | 8 | Binary | ✓ | Exchange assigned Order ID |
| Last Shares | 4 | Binary | ✓ | Number of equity shares filled |
| Information Text | 1 | Binary | ✓ | 2 = STP (Self trade Prevention) activated kill |
| Text | 40 | Alpha Numeric | ✓ | Will contain text of Self + CIOrdID of the order would have potentially traded against. |
| Liquidity Indicator | 1 | Alpha Numeric | ✓ | Please refer to Appendix A for Values <u>Note:</u> We will populate this field only on "Cancel Both (C)" and "Cancel Decrement (D)" STP Cancels. This field will be null on "Cancel New (N)" and "Cancel Old (O) STP Cancels. |
| Padding | 5 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 88 | | | |

Self Trade Prevention Note (Order Killed (4) Variant 2: When NoSelfTrade is used on your orders you need to expect to receive both Variants 1 and 2 of the Order Killed messages.

E = Cancel Replace Ack Message (Variant 1)

This message informs clients that a Cancel/Replace message has been received but is not yet applied because an order cannot be immediately replaced (for example, the order is linked to another exchange). See also the Replaced Message for other responses to Cancel/Replace messages.

| Cancel Replace Ack Message E.1 | Length | Type | Equities | Options | Notes and Values |
|-----------------------------------|--------|------------------|----------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'E' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Exchange-assigned sequence number |
| Sending Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Transaction Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Client Order Id | 4 | Binary | ✓ | ✓ | Client order ID of the original order |
| Order ID | 8 | Binary | ✓ | ✓ | Exchange assigned Order ID |
| Filler | 3 | Alpha | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 40 | | | | |

5 = Order Replaced Message (Variant 1)

This message indicates that an order has been successfully replaced. It is sent only when the replacement order is not immediately executable (it is booked). The Client Order ID from the new order becomes the client order ID in the replaced message.

| Replaced Message 5.1 | Length | Type | Equities | Options | Notes and Values |
|-------------------------|--------|------------------|----------|---------|------------------|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | '5' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |

| | | | | | |
|--------------------|----|--------|---|---|--|
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Exchange-assigned sequence number |
| Sending Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Transaction Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Client Order ID | 4 | Binary | ✓ | ✓ | Client order ID of the new order |
| Order ID | 8 | Binary | ✓ | ✓ | Exchange assigned Order ID |
| Filler | 3 | Alpha | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: “\n” |
| Total | 40 | | | | |

8 = Order Cancel/Replace Reject Message (Variant 1)

This message informs clients that an order, cancel, or cancel/replace message has been rejected. The Text field contains an explanation of the problem.

| Order Cancel/Replace Reject Message 8.1 | Length | Type | Equities | Options | Notes and Values |
|--|--------|------------------|----------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | '8' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Exchange-assigned sequence number |
| Sending Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Transaction Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| CIOrdID | 4 | Binary | ✓ | ✓ | Client Order ID of the order, cancel, or cancel replace that was sent |
| OriginalCIOrdID | 4 | Binary | ✓ | ✓ | ID of original order |
| Rejected Message | 1 | Numeric | ✓ | ✓ | “1”=order reject |

| | | | | | |
|--------------------|----|-------|---|---|--|
| Type | | | | | "2"=cancel reject "3"=cancel replace reject |
| Text | 40 | Alpha | ✓ | ✓ | Reason for the rejection |
| Reject Reason | 1 | Alpha | ✓ | ✓ | 0 = Too late to cancel 1 = Unknown order |
| Filler | 5 | Alpha | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 80 | | | | |

C = Bust/Correct Message (Variant 1)

This message is sent when an order execution has been busted or corrected. In all cases, the Trade Desk will discuss the bust or correction with the customer that entered the order prior to busting or correcting it.

| Bust or Correct Message | Length | Type | Equities | Options | Notes and Values |
|-------------------------|--------|------------------|----------|---------|--|
| C.1 | | | | | |
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | 'C' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Exchange-assigned sequence number |
| SendingTime | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Transaction Time | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| CIOrdID | 4 | Binary | ✓ | ✓ | Client Order ID of the order that is being busted or corrected. |
| Execution ID | 8 | Binary | ✓ | ✓ | Exchange assigned Execution ID from the order fill message (64 bit binary) |
| Order Quantity | 4 | Binary | ✓ | ✓ | Shares or contracts executed |
| Price | 4 | Binary | ✓ | ✓ | Corrected price in a correct message |
| Price Scale | 1 | Alpha Numeric | ✓ | ✓ | "0" through "5" |

| | | | | | |
|--------------------|----|------------------|---|---|--------------------------------|
| Type | 1 | Alpha Numeric | ✓ | ✓ | "1"=Bust "2"=Correct |
| Filler | 1 | | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |
| Total | 48 | | | | |

a = Order Ack Message (Variant 1)

This message informs clients that an order has been received and booked.

| Order Ack Message a.1 | Length | Type | Equities | Options | Notes and Values |
|--------------------------|--------|-------------------|----------|---------|---|
| Message Type | 1 | Alpha/ Numeric | ✓ | ✓ | 'a' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Arca-assigned sequence number |
| SendingTime | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| TransactionTime | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Client Order ID | 4 | Binary | ✓ | ✓ | Client order ID |
| OrderID | 8 | Binary | ✓ | ✓ | Exchange assigned Order ID |
| Price | 4 | Binary | ✓ | ✓ | Price at which the order was acked |
| Price Scale | 1 | Alpha Numeric | ✓ | ✓ | "0" through "5" |
| Liquidity Indicator | 1 | Alpha Numeric | ✓ | | Conditionally sent with value, otherwise null: 1 = Candidate for Liquidity Indicator "S" 2 = Blind 3 = Not Blind |
| Filler | 5 | Alpha | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: "\n" |

| | | | | | |
|-------|----|--|--|--|--|
| Total | 48 | | | | |
|-------|----|--|--|--|--|

2 = Order Fill Message (Variant 1)

This message informs clients when an order has been partially or entirely filled.

| Order Fill Message 2.1 | Length | Type | Equities | Options | Notes and Values |
|---------------------------|--------|---------------|----------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | '2' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Arca-assigned sequence number |
| SendingTime | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| TransactionTime | 8 | Binary | ✓ | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Client Order ID | 4 | Binary | ✓ | ✓ | Client order ID |
| OrderID | 8 | Binary | ✓ | ✓ | Exchange assigned Order ID |
| Execution ID | 8 | Binary | ✓ | ✓ | Exchange assigned Execution ID |
| ArcaExID | 20 | Alpha Numeric | ✓ | ✓ | Trade record |
| Last Shares or Contracts | 4 | Binary | ✓ | ✓ | Number of equity shares or option contracts filled |
| Last Price | 4 | Binary | ✓ | ✓ | Price at which the shares or contracts were filled |
| Price Scale | 1 | Alpha Numeric | ✓ | ✓ | "0" through "5" |
| Liquidity Indicator | 1 | Alpha Numeric | ✓ | ✓ | See Appendix A for Values and Definitions (Equities) See Appendix B for Values and Definitions (Options) |
| Side | 1 | Alpha Numeric | ✓ | ✓ | "1" = Buy "2" = Sell "5" = Sell Short "6" = Sell Short Exempt (SSR 201) "9" = Cross Short |

| Order Fill Message 2.1 | Length | Type | Equities | Options | Notes and Values |
|---------------------------|--------|-------|----------|---------|---|
| LastMkt | 2 | Alpha | ✓ | | See Appendix A for Values and Definitions (Equities) See Appendix B for Values and Definitions (Options) |
| Filler | 10 | Alpha | | | |
| Message Terminator | 1 | Alpha | ✓ | ✓ | ASCII new line character: “\n” |
| Total | 88 | | | | |

2 = Execution Report Verbose Format (Variant 2)

This message is transmitted from the exchange to the client to notify the result of an order previously requested by the client. This message has the same function (superset) of any of the following messages types: Order Fill (z), Bust or Correct I, Order Ack(a), Cancel Ack(6), Order Killed(4), Replace Ack(E), Replace (5). Client request to be send verbose execution reports by setting a flag in the initial Logon message to the Exchange. This will supersede all messages variant defined above.

| Execution Report Verbose Format 2.2 | Length | Type | Equities | Options | Notes and Values |
|--|--------|---------------|----------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | ✓ | '2' |
| Variant | 1 | Binary | ✓ | ✓ | Value = 2 |
| Length | 2 | Binary | ✓ | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | ✓ | Exchange assigned sequence number |
| SendingTime | 8 | Binary | ✓ | ✓ | UTP Time the message was sent in microseconds since Midnight |
| TransactionTime | 8 | Binary | ✓ | ✓ | UTP Time the message was sent in microseconds since Midnight |
| ClOrdID | 4 | Binary | ✓ | ✓ | Client Order ID of the original order |
| OrderID | 8 | Binary | ✓ | ✓ | Exchange assigned Order ID |
| ExecID | 8 | Binary | ✓ | ✓ | Exchange assigned Execution ID. Unique identifier of execution message. Unique per session, per day. |
| ExecRefID | 8 | Binary | ✓ | ✓ | Exchange assigned Execution ID |
| ArcaExID | 20 | Alpha Numeric | ✓ | ✓ | Trade record |
| Order Qty | 4 | Binary | | | Number of shares or contracts in the initial order |

| Execution Report Verbose Format 2.2 | Length | Type | Equities | Options | Notes and Values |
|---|--------|---------------|----------|---------|--|
| Price | 4 | Binary | ✓ | ✓ | Fixed at Price Scale 4 |
| Leaves | 4 | Binary | ✓ | ✓ | Volume remaining |
| CumQty | 4 | Binary | ✓ | ✓ | Total Volume filled |
| AvgPx | 4 | Binary | ✓ | ✓ | Average Price – Fixed Price Scale 4 |
| StopPrice | 4 | Binary | ✓ | ✓ | Fixed at Price Scale 2 |
| Discretion OffSet | 4 | Binary | ✓ | | Fixed at Price Scale 2 |
| Peg Difference | 4 | Binary | ✓ | | Fixed at Price Scale 2 |
| Last Shares | 4 | Binary | ✓ | ✓ | Number of equity shares or option contracts filled |
| Last Price | 4 | Binary | ✓ | ✓ | Price at which the shares or contracts were filled, Fixed Price scale at 4 |
| Strike Price | 4 | Binary | | ✓ | The strike price for an option, as a long value with a fixed scale of 4. Equity orders in this field are set to zero (0). |
| Put Call | 1 | Binary | | ✓ | The option class (not applicable to equity orders): 0 = Put 1 = Call |
| Open Or Close | 1 | Alpha Numeric | | ✓ | “O”-Open “C”-Close |
| Symbol | 8 | Alpha Numeric | ✓ | ✓ | Stock symbol for equity order acked, executed, in a pending state canceled, replaced, or rejected. Series Symbol in either OCC or Explicit naming for option order acked, executed, in a pending state canceled, replaced, or rejected. |
| Strike Date | 8 | Alpha Numeric | | ✓ | The option expiry date (not applicable to equity orders) in YYYYMMDD format. |
| ExecTransType | 1 | Alpha Numeric | ✓ | ✓ | Valid values: ‘0’ = New ‘1’ = Cancel ‘2’ = Correct ‘3’ = Status |
| Order Reject Reason | 1 | Alpha Numeric | ✓ | ✓ | Only relevant if OrderStatus=Rejected Valid values: ‘1’ = See Text field for reason ‘3’ = See Text field for reason |

| Execution Report Verbose Format 2.2 | Length | Type | Equities | Options | Notes and Values |
|--|--------|---------------|----------|---------|--|
| | | | | | '7' = Order Rejected due to Options Risk Mitigation Breach (Options only) |
| Order Status | 1 | Alpha Numeric | ✓ | ✓ | Identifies the current status of an order. Valid values: '0' = New/Open '1' = Partially Filled '2' = Filled '3' = Expired '4' = Canceled '5' = Replaced '6' = Cancel pending '8' = Rejected 'C' = Self Trade Prevention Cancel 'E' = Pending Replace |
| Execution Type | 1 | Alpha Numeric | ✓ | ✓ | Describes the specific Execution Report (i.e. Pending Cancel) while OrdStatus will always identify the current order status (i.e. Partially Filled) Valid values: '0' = New '1' = Partial fill '2' = Fill '3' = Done for day '4' = Canceled '5' = Replaced '6' = Pending Cancel (e.g. result of Order Cancel Request) '8' = Rejected '9' = Suspended 'C' = Self Trade Prevention Cancel |
| Side | 1 | Alpha Numeric | ✓ | ✓ | "1" = Buy "2" = Sell "5" = Sell Short "6" = Sell Short Exempt (SSR 201) "8" = Cross |

| Execution Report Verbose Format 2.2 | Length | Type | Equities | Options | Notes and Values |
|--|--------|---------------|----------|---------|--|
| | | | | | "9" = Cross Short |
| Order Type | 1 | Alpha Numeric | ✓ | ✓ | Return from the Original order. |
| TimeInForce | 1 | Alpha Numeric | ✓ | ✓ | "0" = Day Order "2" = Early Auction Only (equities only) "3" = IOC "7" = Late Auction Only (equities only) |
| Account | 10 | Alpha Numeric | ✓ | ✓ | This is returned to the user from the new order message. |
| Text | 40 | Alpha Numeric | ✓ | ✓ | Please note that ARCA sometimes sends a value in the Text (58) field echoing the state of the order. This value is not to be taken as verbatim and should not be coded against. Please refer to the OrdStatus/ExecType values to determine the status of the order. Furthermore, NYSE Arca reserves the right to change the values populated in the Text field at anytime. |
| Discretion Instruction | 1 | Alpha Numeric | ✓ | | Returned to user from New Order message. **Not Available for Pillar Phase I |
| Liquidity Indicator | 1 | Alpha Numeric | ✓ | ✓ | 1 = Candidate for Liquidity Indicator "S" 2 = Blind 3 = Not Blind (Sent on Order Ack, Cancel pending, Cancelled, C/R Pending, and Replaced Acks conditionally) (Arca Equities). For Partial Fills and Fills: See Appendix A for Values and Definitions (Equities) See Appendix B for Values and Definitions (Options) |

| Execution Report Verbose Format 2.2 | Length | Type | Equities | Options | Notes and Values |
|--|--------|---------------|----------|---------|---|
| ExecBroker | 5 | Alpha Numeric | | ✓ | Route Destination (Options): Boston Options Exchange = BOX Chicago Board Options Exchange = CBO International Securities Exchange = ISX NASDAQ OMX Options = NDQ NASDAQ PHLX Options = PHO NYSE Arca Options = NYO NYSE Amex Options = ASE BZX Options = BATS Chicago Board Options Exchange = CB2 Nasdaq BX Options = NASD MIAX Options Exchange = MIAX International Securities Exchange Gemini = ISE2 ISE Mercury = MRCY EDGX Options = EDGO |
| LastMkt | 2 | Alpha | ✓ | | See Appendix A for Values and Definitions (Equities) See Appendix B for Values and Definitions (Options) |
| Filler | 7 | Alpha | | | |
| Message Terminator | 1 | | ✓ | ✓ | ASCII new line character: “\n” |
| Total | 208 | | | | |

How to interpret the Verbose Execution Report (Variant 2)

Since the Verbose Execution Report encompasses the data of a number of the other messages, the table below summarizes the equivalency of the fields to indicate the different scenarios.

| ExecType | ExecTranType | Meaning | Equivalent Short Message | Relevant Fields |
|----------|--------------|-----------|--------------------------|--|
| 0 | 0 | Order Ack | a | ClientOrderID, OrderID, SendingTime, TransactTime, |

| | | | | |
|--------------------------------------|-------------------------|---------------------|---|--|
| | | | | Price, LiquidityIndicator (If candidate for Indicator S) |
| 1 or 2 | 0 | Order Fill | 2 | ClientOrderID, OrderID, SendingTime, TransactTime, ExecID, LastShares, LastPx, LiquidityIndicator, Side, LastMkt |
| 6 | | Cancel Request Ack | 6 | ClientOrderID, OrderID, SendingTime, TransactTime |
| 3 or 4 | 0 | Order Kill | 4 | ClientOrderID, OrderID, SendingTime, TransactTime |
| E | | Replace Request Ack | E | ClientOrderID, OrderID, SendingTime, TransactTime, LiquidityIndicator (If candidate for Indicator S) |
| 5 | 0 | Order Replaced | 5 | ClientOrderID, OrderID, SendingTime, TransactTime, LiquidityIndicator (If candidate for Indicator S) |
| 8 | 0 | Order Reject | 8 | ClientOrderID, SendingTime, TransactTime |
| 2 | 1 – bust 2 – correct | Trade Bust/Correct | C | ClientOrderID, ExecID, SendingTime, TransactTime, Volume, LastPx, Price |
| C | C | Order Kill – STP | s | ClientOrderID, OrderID, SendingTime, TransactTime, LastShares, Reason, Text. LiquidityIndicator |
| Verbose Execution Report Equivalence | | | | |

2 = Complex Execution Report Format (Variant 3)

This message is transmitted from the exchange to the client to notify the result of a complex order previously requested by the client. This message will be use for all complex related reports – Order Fill, Bust or Correct, Order Ack, Cancel Ack, and Order Killed regardless of logon verbose message flag setting.

| Execution Report Verbose Format 2.3 | Length | Type | Options | Notes and Values |
|--|--------|---------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | '2' |
| Variant | 1 | Binary | ✓ | Value = 3 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Exchange-assigned sequence number |
| SendingTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| TransactionTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Client Order ID | 4 | Binary | ✓ | Client order ID of the original order |
| Order ID | 8 | Binary | ✓ | OrderID assigned by NYSE Arca |

| Execution Report Verbose Format 2.3 | Length | Type | Options | Notes and Values |
|--|--------|---------------|---------|---|
| Execution ID | 8 | Binary | ✓ | NYSE Arca assigned Execution ID. Unique identifier of execution message (64 bit binary). |
| ExecRefID | 8 | Binary | ✓ | NYSE Arca assigned Execution ID |
| ArcaExID | 20 | Alpha Numeric | ✓ | Trade record |
| LegRefID | 4 | Binary | ✓ | Complex order Leg Reference ID |
| Last Shares or Contracts | 4 | Binary | ✓ | Number of equity shares or option contracts filled |
| Last Price | 4 | Binary | ✓ | Price at which the shares or contracts were filled, Fixed Price scale at 4 |
| ExecTransType | 1 | Alpha Numeric | ✓ | Valid values: '0' = New '1' = Cancel '2' = Correct '3' = Status '4' = Status |
| Order Reject Reason | 1 | Alpha Numeric | ✓ | Valid values: '0' = See Text field for reason '1' = See Text field for reason '2' = See Text field for reason '3' = See Text field for reason '7' = Order Rejected due to Options Risk Mitigation Breach |
| Execution Type | 1 | Alpha Numeric | ✓ | Describes the specific Execution Report (i.e. Pending Cancel) while OrdStatus will always identify the current order status (i.e. Partially Filled) Valid values: '0' = New '1' = Partial fill '2' = Fill '3' = Done for day '4' = Canceled '5' = Replaced |

| Execution Report Verbose Format 2.3 | Length | Type | Options | Notes and Values |
|--|--------|---------------|---------|---|
| | | | | '6' = Pending Cancel (e.g. result of Order Cancel Request) 'E' = Pending Complex Cancel/Replace (e.g. result of Complex Cancel/Replace Request) '8' = Rejected '9' = Suspended |
| Side | 1 | Alpha Numeric | ✓ | "1" = Buy "2" = Sell "5" = Sell Short "8" = Cross "9" = Cross Short |
| Text | 40 | Alpha Numeric | ✓ | Please note that ARCA sometimes sends a value in the Text(58) field echoing the state of the order. This value is not to be taken as verbatim and should not be coded against. Please refer to the ExecType values to determine the status of the order. Furthermore, ARCA reserves the right to change the values populated in the Text field at any time. |
| Liquidity Indicator | 1 | Alpha Numeric | ✓ | See Appendix B for Values and Definitions (Options) |
| Filler | 6 | | | |
| Message Terminator | 1 | | ✓ | ASCII new line character: "\n" |
| Total | 136 | | | |

How to interpret the Complex Execution Report (Variant 3)

Since the Complex Execution Report encompasses the data of a number of the other messages, the table below summarizes the equivalency of the fields to indicate the different scenarios.

| ExecType | ExecTranType | Meaning | Equivalent Short Message | Relevant Fields |
|----------|--------------|-------------------|--------------------------|---|
| 0 | | Complex Order Ack | | ClientOrderID, OrderID, SendingTime, TransactTime |

| | | | | |
|--------|-------------------------|--------------------|--|---|
| 1 or 2 | 0 | Complex Order Fill | | ClientOrderID, OrderID, SendingTime, TransactTime, ExecID, LastShares, LastPx, LiquidityIndicator, Side |
| 6 | | Cancel Request Ack | | ClientOrderID, OrderID, SendingTime, TransactTime |
| 3 or 4 | | Order Kill | | ClientOrderID, OrderID, SendingTime, TransactTime |
| 8 | | Order Reject | | ClientOrderID, SendingTime, TransactTime |
| 2 | 1 – bust 2 – correct | Trade Bust/Correct | | ClientOrderID, ExecID, SendingTime, TransactTime, Volume, LastPx, Price |

2 = Options Cross Execution Report (Variant 4)

This message is transmitted from the exchange to the client to notify the result of a options cross order previously requested by the client. This message will be used for all options cross related reports – Order Fill, Bust or Correct, Order Ack, Cancel Ack, and Order Killed regardless of logon verbose message flag setting.

| Options Cross Execution Report 2.4 | Length | Type | Options | Notes and Values |
|------------------------------------|--------|---------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | '2' |
| Variant | 1 | Binary | ✓ | Value = 4 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Exchange-assigned sequence number |
| SendingTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| TransactionTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Client Order ID | 4 | Binary | ✓ | Client order ID of the original order |
| Order ID | 8 | Binary | ✓ | OrderID assigned by NYSE Arca |
| Execution ID | 8 | Binary | ✓ | NYSE Arca assigned Execution ID. Unique identifier of execution message (64 bit binary). |
| ExecRefID | 8 | Binary | ✓ | NYSE Arca assigned Execution ID |
| ArcaExID | 20 | Alpha Numeric | ✓ | Trade record |
| LegRefID | 4 | Binary | ✓ | Complex order Leg Reference ID |
| Last Shares or Contracts | 4 | Binary | ✓ | Number of equity shares or option contracts filled |

| Options Cross Execution Report 2.4 | Length | Type | Options | Notes and Values |
|------------------------------------|--------|---------------|---------|--|
| Last Price | 4 | Binary | ✓ | Price at which the shares or contracts were filled, Fixed Price scale at 4 |
| CrossID | 4 | Binary | ✓ | Identifier for a cross order. Must be unique during a given trading day. |
| ExecTransType | 1 | Alpha Numeric | ✓ | Valid values: '0' = New '1' = Cancel '2' = Correct '3' = Status '4' = Status |
| Order Reject Reason | 1 | Alpha Numeric | ✓ | Valid values: '1' = See Text field for reason '3' = See Text field for reason |
| Execution Type | 1 | Alpha Numeric | ✓ | Describes the specific Execution Report (i.e. Pending Cancel) while OrdStatus will always identify the current order status (i.e. Partially Filled) Valid values: '0' = New '1' = Partial fill '2' = Fill '3' = Done for day '4' = Canceled '5' = Replaced '6' = Pending Cancel (e.g. result of Order Cancel Request) '8' = Rejected '9' = Suspended |
| Side | 1 | Alpha Numeric | ✓ | "1" = Buy "2" = Sell |
| Text | 40 | Alpha Numeric | ✓ | Please note that ARCA sometimes sends a value in the Text(58) field echoing the state of the order. This value is not to be taken as verbatim and should not be coded against. Please refer to the ExecType values to determine the status of the order. |

| Options Cross Execution Report 2.4 | Length | Type | Options | Notes and Values |
|---------------------------------------|--------|---------------|---------|--|
| | | | | Furthermore, ARCA reserves the right to change the values populated in the Text field at any time. |
| Liquidity Indicator | 1 | Alpha Numeric | ✓ | See Appendix B for Values and Definitions (Options) |
| Filler | 2 | | | |
| Message Terminator | 1 | | ✓ | ASCII new line character: “\n” |
| Total | 136 | | | |

B = Order Cross (Options) – Single (Variant 1)

| New Order Cross B.1 | Length | Type | Options | Notes and Values |
|------------------------|--------|---------------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | 'B' |
| Variant | 1 | Binary | ✓ | 1 |
| Length | 2 | Binary | ✓ | Binary Length of Message |
| Sequence Number | 4 | Binary | ✓ | Client assigned sequence number |
| Symbol | 8 | Alpha | ✓ | Options Explicit Symbol |
| Strike Date | 8 | Alpha | ✓ | YYYYMMDD |
| Put or Call | 1 | Binary | ✓ | 0 = Put, 1 = Call |
| StrikePrice | 4 | Binary | ✓ | The strike price for an option, as a long value with a fixed scale of 4. |
| Company GroupID | 5 | Alpha Numeric | ✓ | The Company ID for the firm that is entering the orders. If the connecting firm is a service bureau, this must be the company ID of the firm that is entering order through the service bureau. |
| DeliverToCompID | 5 | Alpha Numeric | ✓ | The ID of the market maker to route a Directed order to. |
| SpecialOrderType | 1 | Alpha Numeric | ✓ | C = Customer F = CUBE (minimum OrderQty = 50 contracts) |

| New Order Cross B.1 | Length | Type | Options | Notes and Values |
|------------------------|--------|---------------|---------|--|
| | | | | P = CUBE (minimum OrderQty = 1 contract) S = Solicitation Q = Qualified Contingent Cross (QCC) |
| PriceScale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. |
| CrossID | 4 | Binary | ✓ | Identifier for a cross order. Must be unique during a given trading day. |
| OrderQty | 4 | Binary | ✓ | The number of contracts for this order. |
| Execlnst | 1 | Alpha Numeric | ✓ | Reserved for future use. |
| Time In Force | 1 | Alpha Numeric | ✓ | "0" = Day order "3" = IOC "4" = FOK |

Side Details (Must have 2)

| New Order Cross B.1 | Length | Type | Options | Notes and Values |
|------------------------|--------|---------------|---------|---|
| ClOrdID | 4 | Binary | ✓ | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294. This must be unique per session per day. If duplicate orders IDs are received, the duplicate order will be rejected. |
| Price | 4 | Binary | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| Side | 1 | Alpha Numeric | ✓ | '1' = Buy, '2' = Sell, '9' = Automatch Limit |

| New Order Cross B.1 | Length | Type | Options | Notes and Values |
|-------------------------|--------|------------------|---------|--|
| Covered or UnCovered | 1 | Alpha Numeric | ✓ | 'E' – Exposed 'C' – Covered |
| Order Type | 1 | Alpha Numeric | ✓ | 1 = Market 2 = Limit |
| CustomerOrFirm | 1 | Alpha Numeric | ✓ | "0"= Customer "1"= Firm "2"= Broker "3"= Market Maker "R" = Satisfaction |
| OpenClose | 1 | Alpha Numeric | ✓ | 'O' = Open, 'C' = Close |
| LocalOrAway | 1 | Binary | ✓ | 1= Local Options MM 2= Away MM for another options exchange 3= Adds Customer Sub-Account Suffix (For use "away" market makers only) |
| Account | 10 | Alpha Numeric | ✓ | User-defined information that is not validated. This information will appear in trade records and on monthly bills. |
| Clearing Firm | 5 | Alpha | ✓ | The OCC code for the clearing firm to use for an option order. This is typically the default clearing firm for all orders for this brokerage firm. |
| ClearingAccount | 5 | Alpha | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. |
| SenderSubID | 5 | Alpha Numeric | ✓ | User-defined information that is not validated. Note: Firms entering orders as market makers must send their MMID in this field if this variant is used. |
| Optional Data | 16 | Alpha | ✓ | If not null, then the data should be left justified and it will be passed on to the clearing process as is. |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |

| New Order Cross B.1 | Length | Type | Options | Notes and Values |
|------------------------|--------|------|---------|------------------|
| Total | 164 | | | |

B = Order Cross – Complex (Variant 2)

| Order Cross (Complex) B.2 | Length | Type | Options | Notes and Values |
|---------------------------------|--------|---------------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | 'B' |
| Variant | 1 | Binary | ✓ | 2 |
| Length | 2 | Binary | ✓ | Binary Length of Message |
| Sequence Number | 4 | Binary | ✓ | Client assigned sequence number |
| Company GroupID | 5 | Alpha Numeric | ✓ | The Company ID for the firm that is entering the orders. If the connecting firm is a service bureau, this must be the company ID of the firm that is entering order through the service bureau. |
| DeliverToCompID | 5 | Alpha Numeric | ✓ | The ID of the market maker to route a Directed order to. |
| SpecialOrderType | 1 | Alpha Numeric | ✓ | C = Customer Q = Qualified Contingent Cross (QCC) |
| PriceScale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. |
| CrossID | 4 | Binary | ✓ | Identifier for a cross order. Must be unique during a given trading day. |
| OrderQty | 4 | Binary | ✓ | The number of contracts for this order. |
| ExecInst | 1 | Alpha Numeric | ✓ | 'G' – AON |
| Time In Force | 1 | Alpha Numeric | ✓ | "0" = Day order "3" = IOC "4" = FOK |

Side Details (Must have 2)

| Order Cross (Complex) B.2 | Length | Type | Options | Notes and Values |
|------------------------------|--------|---------------|---------|---|
| ClOrdID | 4 | Binary | ✓ | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294. This must be unique per session per day. If duplicate orders IDs are received, the duplicate order will be rejected. |
| Price | 8 | Binary | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| Covered or UnCovered | 1 | Alpha Numeric | ✓ | 'E' - Exposed 'C' - Covered |
| Order Type | 1 | Alpha Numeric | ✓ | '1' = Market, '2' = Limit, '9' = Automatch Limit |
| CustomerOrFirm | 1 | Alpha Numeric | ✓ | "0" = Customer "1" = Firm "2" = Broker "3" = Market Maker "R" = Satisfaction |
| LocalOrAway | 1 | Binary | ✓ | 1= Local Options MM 2= Away MM for another options exchange 3= Adds Customer Sub-Account Suffix (For use by "away" market makers only) |
| Clearing Firm | 5 | Alpha | ✓ | The OCC code for the clearing firm to use for an option order. This is typically the default clearing firm for all orders for this brokerage firm. |
| ClearingAccount | 5 | Alpha | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. |
| SenderSubID | 5 | Alpha Numeric | ✓ | User-defined information that is not validated. Note: Firms entering orders as market makers must send their MMID in this field if this variant is used. |
| StockLegGiveup | 5 | Alpha Numeric | ✓ | |

| Order Cross (Complex) B.2 | Length | Type | Options | Notes and Values |
|------------------------------|--------|---------------|---------|---|
| Account | 10 | Alpha Numeric | ✓ | User-defined information that is not validated. This information will appear in trade records and on monthly bills. |
| Optional Data | 16 | Alpha | ✓ | If not null, then the data should be left justified and it will be passed on to the clearing process as is. |
| NumberOfLegs | 1 | Binary | ✓ | Up to 5 Legs (including 1 Equity Leg) |

Leg Details (Must have 5 per Side)

| Order Cross (Complex) B.2 | Length | Type | Options | Notes and Values |
|------------------------------|--------|---------------|---------|--|
| LegRefID | 4 | Binary | ✓ | Unique Indicator for a specific Leg |
| Strike Price | 4 | Binary | ✓ | The strike price for an option, as a long value with a fixed scale of 4. |
| LegRatioQty | 2 | Binary | ✓ | The ratio of quantity for this individual leg relative to the order quantity |
| Symbol | 8 | Alpha | ✓ | Options Explicit Symbol |
| Strike Date | 8 | Alpha | ✓ | YYYYMMDD |
| SecurityType | 8 | Alpha | ✓ | Indicates type security. Valid security type "OPT" |
| Side | 1 | Alpha Numeric | ✓ | '1' = Buy, '2' = Sell |
| PutOrCall | 1 | Binary | ✓ | '0' = Put, '1' = Call |
| OpenClose | 1 | Alpha Numeric | ✓ | 'O' = Open, "C" = Close |

| Order Cross (Complex) B.2 | Length | Type | Options | Notes and Values |
|------------------------------|--------|-------|---------|--------------------------------|
| Filler | 7 | | | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 536 | | | |

B = Order Cross – Complex (Using Complex Symbol) - (Variant 3)

| Order Cross (Complex) B.3 | Length | Type | Options | Notes and Values |
|------------------------------|--------|---------------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | 'B' |
| Variant | 1 | Binary | ✓ | 3 |
| Length | 2 | Binary | ✓ | Binary Length of Message |
| Sequence Number | 4 | Binary | ✓ | Client assigned sequence number |
| CompanyGroupID | 5 | Alpha Numeric | ✓ | The Company ID for the firm that is entering the orders. If the connecting firm is a service bureau, this must be the company ID of the firm that is entering order through the service bureau. |
| DeliverToCompID | 5 | Alpha Numeric | ✓ | The ID of the market maker to route a Directed order to. |
| Symbol | 21 | Alpha | ✓ | Complex Symbol |
| SpecialOrderType | 1 | Alpha Numeric | ✓ | C = Customer Q = Qualified Contingent Cross (QCC) |
| PriceScale | 1 | Alpha Numeric | ✓ | "0" through "4" |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. |
| CrossID | 4 | Binary | ✓ | Identifier for a cross order. Must be unique during a given trading day. |
| OrderQty | 4 | Binary | ✓ | The number of contracts for this order. |
| ExecInst | 1 | Alpha Numeric | ✓ | 'G' – AON |
| Time In Force | 1 | Alpha Numeric | ✓ | "0" = Day order "3" = IOC "4" = FOK |

Side Details (Must have 2)

| Order Cross (Complex) B.3 | Length | Type | Options | Notes and Values |
|------------------------------|--------|------|---------|------------------|
|------------------------------|--------|------|---------|------------------|

| Order Cross (Complex) B.3 | Length | Type | Options | Notes and Values |
|------------------------------|--------|------------------|---------|---|
| CIOrdID | 4 | Binary | ✓ | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294. This must be unique per session per day. If duplicate orders IDs are received, the duplicate order will be rejected. |
| Price | 8 | Binary | ✓ | The price, as a long value. Price is scaled based on the Price Scale field. Prices with significant digits (numbers other than 0) in the 5 th decimal place or beyond will cause the order to be rejected by the gateway. |
| Covered Or Uncovered | 1 | Alpha Numeric | ✓ | 'E' = Exposed 'C' = Covered |
| Order Type | 1 | Alpha Numeric | ✓ | '2' = Limit |
| Side | 1 | Alpha Numeric | ✓ | '1' = Buy. '2' = Sell, '9' = Automatch Limit |
| Short Sell Indicator | 1 | Alpha Numeric | ✓ | "Y" = Short Sell "N" = Not a Short Sell |
| CustomerOrFirm | 1 | Alpha Numeric | ✓ | "0" = Customer "1" = Firm "2" = Broker "3" = Market Maker "R" = Satisfaction |
| LocalOrAway | 1 | Binary | ✓ | 1 = Local Options MM 2 = Away MM for another options exchange 3 = Adds Customer Sub-Account Suffix (For use by "away" market makers only) |
| Clearing Firm | 5 | Alpha | ✓ | The OCC code for the clearing firm to use for an option order. This is typically the default clearing firm for all orders for this brokerage firm. |
| Clearing Account | 5 | Alpha | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. |
| SenderSubID | 5 | Alpha Numeric | ✓ | User-defined information that is not validated. Note: Firms entering |

| Order Cross (Complex) B.3 | Length | Type | Options | Notes and Values |
|------------------------------|--------|---------------|---------|---|
| | | | | orders as market makers must send their MMID in this field if this variant is used. |
| StockLegGiveup | 5 | Alpha Numeric | ✓ | |
| Account | 10 | Alpha Numeric | ✓ | User-defined information that is not validated. This information will appear in trade records and on monthly bills. |
| OptionalData | 16 | Alpha | ✓ | If not null, then the data should be left justified and it will be passed on to the clearing process as is. |

Leg Details (Must have 5 per Side)

| Order Cross (Complex) B.3 | Length | Type | Options | Notes and Values |
|------------------------------|--------|---------------|---------|-------------------------------------|
| LegRefID | 4 | Binary | ✓ | Unique Indicator for a specific Leg |
| OpenClose | 1 | Alpha Numeric | ✓ | 'O' = Open 'C' = Close |

| Order Cross (Complex) B.3 | Length | Type | Options | Notes and Values |
|------------------------------|--------|-------|---------|--------------------------------|
| Filler | 8 | | | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 240 | | | |

Minimum Order Size and Exposure Time parameters by Crossing Order Type

| Crossing Order Type | Minimum Order Size | Exposure Time |
|-----------------------------------|--------------------|---------------------------------------|
| CUBE Order (SpecialOrderType = F) | 50 contracts | 500 – 750 millisecond random timer |
| CUBE Order (SpecialOrderType = P) | 1 contract | 500 – 750 millisecond random timer |

J = Allocation (Options) - Variant 1

| Allocation J.1 | Length | Type | Options | Notes and Values |
|-------------------|--------|---------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | 'J' |
| Variant | 1 | Binary | ✓ | 1 |
| Length | 2 | Binary | ✓ | Binary Length of Message |
| Sequence Number | 4 | Binary | ✓ | Client assigned sequence number |
| Symbol | 8 | Alpha | ✓ | Options Explicit Symbol |
| Strike Date | 8 | Alpha | ✓ | YYYYMMDD |
| StrikePrice | 4 | Binary | ✓ | The strike price for an option, as a long value with a fixed scale of 4. |
| AllocID | 4 | Binary | ✓ | Unique Identifier for Allocation Message |
| ExecID | 8 | Binary | ✓ | Exchange Assigned Execution ID. Unique per session, per day. |
| CIOrdID | 4 | Binary | ✓ | A client-assigned ID for this order. Valid values are 1 to 4,294,967,294. This must be unique per session per day. If duplicate orders IDs are received, the duplicate order will be rejected. |
| OrderQty | 4 | Binary | ✓ | The number of contracts for this order. |
| GroupID | 5 | Alpha Numeric | ✓ | The Company ID for the firm that is entering the orders. |
| DeliverToCompID | 5 | Alpha Numeric | ✓ | The ID of the market maker to route a Directed order to. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. |
| Put or Call | 1 | Binary | ✓ | 0 = Put 1= Call |

| | | | | |
|-------------------|---|---------------|---|----------------------------------|
| Side | 1 | Alpha Numeric | ✓ | '1' = Buy '2' = Sell |
| MultiLegIndicator | 1 | Alpha Numeric | ✓ | '2' – Multi-leg Cross Allocation |
| NumAllocs | 1 | Binary | ✓ | Up to 10 |

Allocation Detail(Must have 10)

| Allocation J.1 | Length | Type | Options | Notes and Values |
|-------------------|--------|---------------|---------|--|
| AllocQty | 4 | Binary | ✓ | Number of contracts to allocate |
| CustomerOrFirm | 1 | Alpha Numeric | ✓ | "0"= Customer "1"= Firm "2"= Broker "3"= Market Maker "8" = Professional Customer |
| OpenClose | 1 | Alpha Numeric | ✓ | 'O' = Open, 'C' = Close |
| LocalOrAwayMM | 1 | Binary | ✓ | 1 = Local Options MM 2 = Away MM for another options exchange. 3= Adds Customer Sub-Account Suffix (For use by "away" market makers only. |
| SenderSubID | 5 | Alpha Numeric | ✓ | User-defined information that is not validated. Note: Firms entering orders as market makers must send their MMID in this field if this variant is used. |
| Clearing Firm | 5 | Alpha | ✓ | The OCC code for the clearing firm to use for an option order. This is typically the default clearing firm for all orders for this brokerage firm. |
| ClearingAccount | 5 | Alpha | ✓ | The CMTA number that identifies the clearing firm that should be used for an option order instead of the default clearing firm. |
| Optional Data | 16 | Alpha | ✓ | If not null, then the data should be left justified and it will be passed on to the clearing process as is. |

| | | | | |
|--------------------|--------|-------|---------|--------------------------------|
| Filler | 2 | | ✓ | |
| Allocation J.1 | Length | Type | Options | Notes and Values |
| Filler | 7 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: “\n” |
| Total | 472 | | | |

P = Allocation Ack (Options) - Variant 1

| Allocation P.1 | Length | Type | Options | Notes and Values |
|--------------------|--------|------------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | 'P' |
| Variant | 1 | Binary | ✓ | 1 |
| Length | 2 | Binary | ✓ | Binary Length of Message |
| Sequence Number | 4 | Binary | ✓ | Client assigned sequence number |
| SendingTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| TransactionTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| AllocID | 4 | Binary | ✓ | Unique Identifier for Allocation Message |
| AccountID | 5 | Alpha Numeric | ✓ | |
| AllocStatus | 1 | Alpha | ✓ | |
| Text | 40 | Alpha Numeric | ✓ | Information about the Allocation |
| Filler | 5 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: “\n” |

| | | | | |
|-------|----|--|--|--|
| Total | 80 | | | |
|-------|----|--|--|--|

R = New Complex Symbol Request (Complex) - Variant 1

| New Complex Symbol Request R.1 | Len | Type | Opt | Notes and Values |
|--------------------------------|-----|---------------|-----|--|
| Message Type | 1 | Alpha Numeric | ✓ | 'R' |
| Variant | 1 | Binary | ✓ | 1 |
| Length | 2 | Binary | ✓ | Binary Length of Message |
| Sequence Number | 4 | Binary | ✓ | Client assigned sequence number |
| CompanyGroupID | 5 | Alpha Numeric | ✓ | GroupID of firm making the symbol request |
| SymbolRefID | 4 | Numeric | ✓ | A client-assigned unique identifier of complex symbol request. |
| ExDestination | 2 | Binary | ✓ | See Appendix D for the Exchange Codes. |
| NumberOfLegs | 1 | Binary | ✓ | Up to 5 Legs |

Complex Option Leg Symbol Requests (Up to 5)

| New Complex Symbol Request R.1 | Len | Type | Opt | Notes and Values |
|--------------------------------|-----|---------------|-----|--|
| Strike Price | 4 | Binary | ✓ | The strike price for an option, as a long value with a fixed scale of 4. |
| LegRatioQty | 2 | Binary | ✓ | The ratio of quantity for this individual leg |
| Symbol | 8 | Alpha | ✓ | Options Explicit Symbol |
| Strike Date | 8 | Alpha | ✓ | YYYYMMDD |
| SecurityType | 8 | Alpha | ✓ | Indicates type security. Valid security type "OPT" |
| Side | 1 | Alpha Numeric | ✓ | '1' = Buy, '2' = Sell |
| PutOrCall | 1 | Binary | ✓ | '0' = Put, '1' = Call |
| Pad | 1 | | ✓ | |

| New Complex Symbol Request R.1 | Len | Type | Opt | Notes and Values |
|--------------------------------|-----|-------|-----|--------------------------------|
| Filler | 6 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 192 | | | |

r = New Complex Symbol Ack (Complex) - Variant 1

| New Complex Symbol Request Ack (r.1) | Length | Type | Options | Notes and Values |
|--------------------------------------|--------|---------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | 'r' |
| Variant | 1 | Binary | ✓ | 1 |
| Length | 2 | Binary | ✓ | Binary Length of Message |
| Sequence Number | 4 | Binary | ✓ | Client assigned sequence number |
| SendingTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| TransactionTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Symbol | 21 | Alpha | ✓ | Complex Symbol |
| SymbolRefID | 4 | Numeric | ✓ | A client-assigned unique identifier of complex symbol request |
| Side | 1 | Alpha Numeric | ✓ | '1' = Buy '2' = Sell |
| RequestStatus | 1 | Binary | ✓ | C – Complex symbol Created E – Complex symbol already exists R – Complex symbol Rejected |
| NumberOfLegs | 1 | Binary | ✓ | Up to 5 Legs |

Complex Symbol Legs (Up to 5)

| New Complex Symbol Request Ack (r.1) | Len | Type | Opt | Notes and Values |
|--------------------------------------|-----|---------------|-----|--|
| Strike Price | 4 | Binary | ✓ | The strike price for an option, as a long value with a fixed scale of 4. |
| LegRatioQty | 2 | Binary | ✓ | The ratio of quantity for this individual leg |
| Symbol | 8 | Alpha | ✓ | Options Explicit Symbol |
| Strike Date | 8 | Alpha | ✓ | YYYYMMDD |
| SecurityType | 8 | Alpha | ✓ | Indicates type security. Valid security type "OPT" |
| Side | 1 | Alpha Numeric | ✓ | '1' = Buy, '2' = Sell |
| PutOrCall | 1 | Binary | ✓ | '0' = Put, '1' = Call |
| Pad | 1 | | ✓ | |

| New Complex Symbol Request Ack (r.1) | Len | Type | Opt | Notes and Values |
|--------------------------------------|-----|-------|-----|--------------------------------|
| Filler | 2 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: "\n" |
| Total | 220 | | | |

6 Risk Mitigation (Options)

The NYSE Amex and NYSE Arca Options markets offer activity-based Risk Mitigation (RM) controls to help protect firms from excessive executions due to unusually rapid trading activity, and are configured per underlying symbol for a given firm's ATPID/OTPID. Once a configured risk mitigation limit is reached, the Options market will cancel all the firm's open orders for the affected symbol(s).

The Exchange is currently developing enhancements to Options RM functionality. See below for a summary of differences between today's features and the features planned for the future.

Currently:

- Use of Options RM is optional for Order Sending Firms, and by default the firms are not subscribed to use RM functionality.
- Firms must elect to use and configure the settings for Options RM on a daily basis using the 'X' message, or they will not be subscribed to use these controls.
- Only **Single Leg PNP** orders are included in Options RM calculations.
- Firms must subscribe to and configure risk settings on a per underlying symbol basis only for the firm's TPID.

On a future date in 2016 to be announced by the Exchange, NYSE Amex and NYSE Arca Options will roll out the following changes to Options RM functionality:

- All Options order types as well as both single and complex orders will be included in Options RM calculations.
- Order Sending Firms will have a choice of configuring risk settings at either of two levels from the gateway – individually per underlying symbol, or for all underlying symbols traded by the firm using their ATPID/OTPID via a single request message.
- Options RM settings will be persisted on an overnight basis and will remain in effect until changed by the Order Sending Firm.

Applicability to Orders Only

The UGW Binary Gateway allows firms to enter options orders only – not quotes. Therefore, these Options RM controls will only take into account a firm's order activity.

A similar solution is available to Market Maker quotes via the Options Market Maker Direct Gateway. However, those controls are entirely separate and only take into account a firm's quote activity.

RM limits must be set separately for orders and quotes, and risk calculations will not be aggregated between the two.

Minimum and Maximum Risk Limits

For each RM Type, the Exchange may set a minimum and maximum risk limit ('UserLimit'). All Order Sending Firms will be able to select a UserLimit value at or within this range.

Auctions and Core Trading

Risk mitigation will apply during opening and post-halt auctions as well as core trading sessions. OTP/ATP Order Sending Firms will be able to adjust their risk limits at any time. They may also query the status of their risk settings at any given time.

Risk Mitigation Types

Order Sending Firms may select from the following different types of Risk Mitigation controls:

1. **Transaction Based** counts the number of transactions that occur over a 100 millisecond time period.
2. **Volume Based** counts the number of contracts executed over a 100 millisecond time period.
3. **Percentage Based** calculates the number of contracts executed as a percent of order quantity over a 100 millisecond time period. This percentage is calculated for each of the firm’s orders for a given symbol, and these individual percentages are summed and compared against the configured risk limit.

Example of Percentage Based: If a firm has four open orders for a given underlying symbol on the book, and specifies its percentage based risk limit for that underlying symbol to be 100%, its risk level would be calculated as follows:

| | Order Quantity | # of Contracts Executed | Percentage Calculation for the Underlying Symbol |
|--------------|----------------|-------------------------|--|
| Order 1 | 100 | 40 | 40% |
| Order 2 | 50 | 20 | 40% |
| Order 3 | 200 | 20 | 10% |
| Order 4 | 150 | 15 | 10% |
| Total | 500 | 95 | 100% |

When the aggregate percentage of contracts executed among all the firm’s orders for this underlying symbol during the 100 millisecond time period reaches the specified limit of 100%, Percentage Based RM would be breached, and the remaining open quantity in the four orders would be cancelled by the Exchange. In this case, that occurs when 95 contracts are executed.

Risk Mitigation – Per Underlying Symbol

Configure RM – Per Underlying Symbol

To configure risk settings for a particular underlying symbol for the firm’s TPID, send a Risk Mitigation Request specifying the symbol. Risk setting updates can be sent on just one gateway session even if orders for the same underlying symbol will be sent from different sessions using the same TPID.

The example below is for Volume Based Risk Mitigation:

- Symbol = valid underlying symbol
- Type = V
- Action = E (updates RM/enables underlying for trading)
- UserLimit = valid risk limit value for the specified underlying symbol (depends on which ‘Type’ is selected)

Upon receipt of a Symbol-level risk request, the Options trading platform will validate the request and send back to the customer gateway session a Risk Mitigation Request Acknowledgement message ('x') with a status code ('RequestStatus'). This code indicates whether the trading platform accepted and successfully applied the request, or rejected it.

Query Current RM Settings – Per Underlying Symbol Only

To query the current risk settings and order entry status for a particular underlying symbol for the firm's TPID, send a Risk Mitigation Request with:

- Symbol = valid underlying symbol
- UserLimit = null. (If sent, must be a valid value but will be ignored.)
- Type = null. (If sent, must be a valid value but will be ignored.)
- Action = N

Request to Cancel All Orders and Disable Order Entry – Per Underlying Symbol Only

Order Sending Firms may simultaneously cancel all open orders as well as disable order entry for an underlying symbol upon request, by sending the field values below. This request will instruct the Options trading platform to cancel all the firm's eligible open orders from all gateway sessions for that underlying. It will also disable the firm's ability to enter new orders for the underlying symbol.

To breach RM and disable order entry for a particular underlying symbol, send a Risk Mitigation Request with:

- Symbol = valid underlying symbol
- UserLimit = null. (If sent, must be a valid value but will be ignored.)
- Type = null. (If sent, must be a valid value but will be ignored.)
- Action = D

Once the Options trading platform accepts and processes the request, a Risk Alert message will be sent out to all gateway sessions that had open orders in that underlying symbol. However, no Order Killed messages will be sent out for the individual cancelled orders.

The Alert message serves as indication that the request was processed and that the firm's orders in the underlying symbol have been cancelled by the Exchange.

To re-enter the market, the Order Sending Firm will be required to re-enable order entry for the underlying symbol. See "Update Risk Limits/Enable Order Entry" below for instructions.

Unsubscribe from Risk Mitigation – Per Underlying Symbol Only

Currently, Order Sending Firms may elect to unsubscribe from Options RM for a particular underlying symbol for the firm's TPID via gateway request. To unsubscribe, send a Risk Mitigation Request with:

- Symbol = valid underlying symbol
- Type = X – Disable
- Action = E

Risk Mitigation – Firm Level (All Underlying Symbols for a TPID)

****Reserved for Future Use**

To configure risk settings for all underlying symbols traded by a firm under their OTPID/ATPID, send a Risk Mitigation Request with the Symbol field set to null.

The example below is for Volume Based Risk Mitigation:

- Symbol = null
- Type = V
- Action = E (updates RM/enables underlying for trading)
- UserLimit = valid risk limit value (depends on which 'Type' is selected)

Immediately upon receiving a firm level risk request, the gateway will generate a single Risk Mitigation Request Acknowledgement message ('x') and send it back to the customer before passing the request to the trading platform. All this message indicates is that the gateway received the request. The Acknowledgement message does NOT guarantee that the request will pass business validation, be accepted by the trading platform, or be successfully processed for all symbols.

Furthermore, if the request is subsequently rejected by the trading platform because it fails business validation (e.g. the customer sends an invalid value for 'Action'), or in a very rare case updates some but not all symbols due to system error – a reject message will NOT be sent back to the customer.

To verify that a firm-level risk request was accepted and successfully applied, Order Sending Firms must use the Client Management Tool (CMT) user interface or query their settings on a per underlying basis through the gateway.

Alternatively, firms that wish to receive definitive Acknowledgements from the trading platform should use Underlying Symbol-level risk requests only.

Risk Mitigation Breach Event

The following workflow details an Options RM breach event, where a firm's execution activity breaches their configured UserLimit for a given underlying symbol:

- Options RM calculations are done on a post-trade basis. Therefore, please note that an execution that would breach the threshold will not be prevented before the trade occurs.
- Once the limit for an underlying symbol has been breached, all eligible open orders for that underlying will be cancelled and any new incoming orders for that symbol will be rejected with 'Text' = "Firm GRMP Disabled".
- The Options trading platform will generate a Risk Mitigation Alert message ('7') to the Order Sending Firm. The Alert message will be sent to all gateway sessions that had open orders in the affected symbol.
- For UGW Binary users, Order Killed messages will be NOT be sent to the firm for the individual cancelled orders.

- The Alert message serves as indication that the RM mechanism was breached and that the firm’s orders in the underlying symbol have been cancelled by the Exchange.

To re-enter the market, the Order Sending Firm will be required to re-enable order entry for the underlying symbol. See “Update Risk Limits/Enable Order Entry” below for instructions.

Update Risk Limits & Re-Enable Order Entry

Following an RM breach event, Order Sending Firms may simultaneously update risk limits for underlying symbols as well as re-enable order entry for those symbols by sending the field values below.

| Per Underlying Symbol | Firm Level – OTPID/ATPID (All Underlying Symbols) **Reserved for future use |
|--|---|
| <p>Send a Risk Mitigation Request with:</p> <ul style="list-style-type: none"> • Symbol = valid underlying symbol • Type = T, V, or P • Action = E • UserLimit = valid risk limit value (depends on which ‘Type’ is selected). This value will reflect the new limit for the symbol upon re-enabling order entry | <p>Send a Risk Mitigation Request with:</p> <ul style="list-style-type: none"> • Symbol = null • Type = T, V, or P • Action = E • UserLimit = valid risk limit value (depends on which ‘Type’ is selected). This value will reflect the new limit for all symbols traded by the firm upon re-enabling order entry |

Gateway Session Disconnects

Risk Mitigation settings will persist following a customer session disconnect.

Orders entered on a customer gateway session that subsequently disconnected will be cancelled only if the session has the ‘Cancel on Disconnect’ property on.

Global Risk Mitigation

In addition to the above, NYSE Amex and NYSE Arca Options offer Order Sending Firms a Global Risk Mitigation control (Global RM). Global RM allows a firm to specify an aggregate limit for the number of symbol-level risk breaches that may occur over a fixed 100 millisecond time frame. Firms must contact the Options Trade Desk to establish their Global RM limit.

If the Global RM limit is breached, RM will be breached for all underlying symbols traded under the firm’s ATPID/OTPID. All the firm’s cancel eligible open orders for all symbols will be cancelled by the Exchange, and order entry by the firm will be disabled for all symbols.

- The Exchange sets a min/max threshold range for the Global RM limit, and firms can select a value within that range.
- Global RM is not dependent on the Type of risk mitigation configured for each underlying symbol.
 - Transaction, Volume, or Percentage of order
- Aggregated at OTPID/ATPID level

- Following a Global RM event, UGW Binary users will receive an RM Alert for each underlying symbol. Additionally, both new orders and new Risk Mitigation Requests will be rejected with text “Firm GRMP Disabled”.
- To re-enter the market after a Global RM event, the firm will need to submit a request by email to the Options Trade Desk (order entry cannot be re-enabled through the gateway).
- Once globally re-enabled, firms will be able to re-enable each underlying symbol via gateway request.

X = Risk Mitigation Request Message (Options) - Variant 1

This message is used to configure/update risk mitigation parameters, enable/disable order entry, and query current risk settings for underlying symbols.

| Risk Management Request X.1 | Length | Type | Options | Notes and Values |
|--------------------------------|--------|------------------|---------|--|
| Message Type | 1 | Alpha Numeric | ✓ | 'X' |
| Variant | 1 | Binary | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Client-assigned sequence number |
| Company GroupID | 5 | Alpha Numeric | ✓ | The Company ID for the firm that is entering the Risk Mitigation Request. |
| Symbol | 8 | Alpha | ✓ | Request per Underlying Symbol (for the firm's TPID) – populate with Options Explicit Symbol Firm Level Request (ALL underlying symbols for the firm's TPID) – set to null |
| RiskMgmtID | 4 | Binary | ✓ | Customer defined ID Value, similar to ClOrdID, but will not validate for uniqueness. |
| UserLimit | 4 | Binary | ✓ | Meaning of this value depends on which Type is selected. Valid values are 0 to 999,999,999. Set to null when 'Action' = 'D' or 'N'. |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. |
| Type | 1 | Alpha Numeric | ✓ | T – Trade based risk mitigation V – Volume based risk mitigation P – Percentage of orders risk mitigation |

| | | | | |
|--------------------|----|------------------|---|--|
| | | | | X – Unsubscribe from Risk Mitigation Set to null when 'Action' = 'D' or 'N'. |
| Action | 1 | Alpha Numeric | ✓ | E – Configure/Update Risk Mitigation Settings and Enable Order Entry D – Request to Cancel All Open Orders and Disable Order Entry for the Underlying Symbol N – Query Current Risk Mitigation Settings, and Retain Current Settings for the Underlying Symbol |
| Filler | 2 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: “\n” |
| Total | 36 | | | |

x = Risk Mitigation Request Ack (Options) - Variant 1

| Risk Management Ack x.1 | Length | Type | Options | Notes and Values |
|----------------------------|--------|------------------|---------|---|
| Message Type | 1 | Alpha Numeric | ✓ | 'x' |
| Variant | 1 | Binary | ✓ | Value = 1 |
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Exchange-assigned sequence number |
| SendingTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Symbol | 8 | Alpha | ✓ | Options Explicit Symbol |
| RiskMgmtID | 4 | Binary | ✓ | Customer defined ID value returned from Risk Mitigation Request |
| UserLimit | 4 | Binary | ✓ | Meaning of this value depends on which Type is selected. Valid values are 0 to 999,999,999. |
| Type | 1 | Alpha Numeric | ✓ | T – Trade based risk mitigation V – Volume based risk mitigation P – Percentage of orders risk mitigation |

| | | | | |
|--------------------|----|------------------|---|--|
| | | | | <p>X – Unsubscribe from Risk Mitigation</p> <p>As a response to risk request with Action = E, this represents the newly updated risk settings as a result of customer request.</p> <p>As a response to a risk request with Action = D or N, this value will represent the currently configured risk settings.</p> |
| ActionStatus | 1 | Alpha Numeric | ✓ | <p>E – Underlying Symbol Configured for Risk Mitigation and Order Entry Enabled</p> <p>D – Cancel All Open Orders and Disable Order Entry for the Underlying Symbol (due to user request)</p> <p>B – Underlying Symbol Breached Risk Mitigation and Order Entry Disabled (due to execution activity)</p> <p>As a response to risk request with Action = E, this represents the newly updated risk settings as a result of customer request.</p> <p>As a response to a risk request with Action = D or N, this value will represent the currently configured risk settings.</p> |
| RequestStatus | 1 | Alpha Numeric | ✓ | <p>'0' – Success</p> <p>'1' – Error</p> |
| Text | 40 | Alpha Numeric | ✓ | Information about the Risk Mitigation Request |
| Filler | 4 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: “\n” |
| Total | 80 | | | |

7 = Risk Mitigation Alert Message (Options) - Variant 1

| Risk Management Alert 7.1 | Length | Type | Options | Notes and Values |
|------------------------------|--------|------------------|---------|------------------|
| Message Type | 1 | Alpha Numeric | ✓ | '7' |
| Variant | 1 | Binary | ✓ | Value = 1 |

| | | | | |
|--------------------|----|------------------|---|---|
| Length | 2 | Binary | ✓ | Binary length of the message |
| Sequence Number | 4 | Binary | ✓ | Exchange-assigned sequence number |
| SendingTime | 8 | Binary | ✓ | UTC Time the message was sent in microseconds since Midnight |
| Symbol | 8 | Alpha | ✓ | Options Explicit Symbol |
| UserLimit | 4 | Binary | ✓ | Value depends on what Type is selected |
| ExDestination | 2 | Binary | ✓ | Indicates the Exchange code of the execution venue for the order. See Appendix D for the Exchange Codes. |
| Type | 1 | Alpha Numeric | ✓ | T – Trade based risk mitigation V – Volume based risk mitigation P – Percentage of orders risk mitigation |
| Status | 1 | Alpha Numeric | ✓ | D – Cancel All Open Orders and Disable Order Entry for the Underlying Symbol (due to user request) B – Underlying Symbol Breached Risk Mitigation and Order Entry Disabled (due to execution activity) |
| Filler | 7 | | ✓ | |
| Message Terminator | 1 | Alpha | ✓ | ASCII new line character: “\n” |
| Total | 40 | | | |

7 NYSE Arca Equities Order Types

**For information on functional changes to order types for symbols migrated to Pillar, please visit:

<https://www.nyse.com/pillar>

| Order Type | Fields and Values | Description | Available Sessions |
|--|---------------------------------------|---|------------------------|
| Market Order | OrdType = 1 | An order to buy or sell that is to be executed at the best price obtainable. Bound by the NBBO. | Market Auction Core |
| Limit Order | OrdType = 2 | An order to buy or sell at a specified price or better. A marketable limit order is a limit order to buy (sell) at or above (below) the protected best offer (bid) for the security. | All sessions |
| PNP (post no preference)** | OrdType = 2 ExecInst = 6 | A limit order to buy or sell that is to be executed in whole or in part on NYSE Arca. The portion not executed is posted in the Book without routing any portion of the order to another market center. PNP Orders that lock or cross the market will be rejected. **Note: for symbols migrated to Pillar, both PNP and PNP Blind orders will be converted to the same order type upon entry, and will both behave like PNP Blind orders. For information on functional changes to order types for symbols migrated to Pillar, please visit: https://www.nyse.com/pillar | All sessions |
| IOC (Immediate Or Cancel) | OrdType = 2 TimeInForce = 3 | A limit order that is to be executed in whole or in part on NYSE Arca as soon as the order is received. Any residual balance is cancelled. IOC orders may not trade through protected quotes. | All sessions |
| Inside Limit | OrdType = 7 | Marketable inside limit orders will be matched within the Book at the best obtainable price or routed to the market participants at the NBBO. Any residual volume will not be routed to the next price level until all quotes at the current best bid or offer are exhausted. Non-marketable inside limit orders will be posted in the Book at the limit price. **Note: Inside Limit orders may not be entered with TIF of IOC (59 = 3). Inside Limit NOW orders, however, must have TIF of IOC. | All sessions |
| Reserve Order *Must use New Order Variant 3 (Verbose) | OrdType = 2 MaxFloor = (show size) | A limit order that replenishes the displayed order size as executions are received, up to the total order quantity; away markets are routed at their quoted size or larger (if applicable) when hitting the bid or taking the offer. Reserve orders look only at protected | All sessions |

| Order Type | Fields and Values | Description | Available Sessions |
|--|---|---|--------------------|
| | | quotes. **Note: Reserve orders may not be entered with a TIF of IOC (59 = 3). **Note: For symbols migrated to Pillar, MaxFloor may only be entered with round lot values. | |
| Passive Liquidity (PL) | OrdType = 7 ExecInst = 5 | An undisplayed limit order that resides in the NYSE Arca limit order book. All displayed orders at the same price as a PL order will have priority over a PL order unless the PL order is priced more aggressively. The PL order will not trade through a protected quote. | All sessions |
| Midpoint Passive Liquidity (MPL) Order | <p><u>MPL Order</u> OrdType = 2 ExecInst = M MinQty = the minimum qty desired on each fill. (Optional) ProactivelyLocked (Optional)= Y (Non-display remove liquidity)</p> <p><u>MPL ALO Order</u> OrdType = 2 ExecInst = M ExtendedExecInst = A ProactivelyLocked (Optional)= Y (Non-display remove liquidity)</p> <p><u>MPL IOC Order</u> OrdType = 2 ExecInst = M TimeInForce = 3 Qty = (Minimum of 100)</p> | <p>The MPL order is an undisplayed limit order that is priced at the midpoint of the Protected Best Bid and Offer (PBBO). MPL orders will generally interact with all order types including contra MPLs excluding: cross or directed orders. MPL orders will be entered as a limit order but are executable only at the midpoint of the NBBO. MPLs will not execute if the market is locked/crossed.</p> <p>MPL Orders may also be entered with a Minimum Execution Size condition, though this is not required. MPL orders always execute at the midpoint and do not receive price improvement.</p> <p>MPL IOC orders will execute only at the midpoint of the protected best bid or offer (PBBO), Any portion of the MPL IOC that is not executed will be immediately cancelled back to the customer. MPL IOCs require a minimum order entry size of 100 shares, but may be executed in odd-lot volumes. Unlike an MPL order, customers may not specify a minimum executable size for an MPL IOC. If the market is locked or crossed, the MPL IOC will cancel.</p> <p>If you do not want your orders to interact with MidPoint Passive Liquidity orders send ExtendedExecInst = 0 on your new order message (only available for non-MPL).</p> | All sessions |
| NOW order | OrdType = 2 TimeInForce = 3 ExecInst = 1 | A limitorder that is executed in whole or in part that will be routed to one or more NOW recipients (those venues that respond immediately with a fill or a cancel) that are protected quotes for immediate execution if the order cannot be executed on NYSE Arca. Orders are immediately canceled if not executed at the quoted price or better. Customers may use the NOW Order for accessing IOI undisplayed liquidity venues. | All sessions |

| Order Type | Fields and Values | Description | Available Sessions |
|--|--|--|--------------------|
| ISO Intermarket Sweep Order (available under RegNMS) | ISO Flag = 'Y' Plus additional parameters on the next column. | ISO Modifier —Under Reg NMS, clients may send ARCA an instruction to trade only with the ARCA book and ignore all away market quotes (including Protected Quotes). This is known as the Intermarket Sweep Order (ISO) <ul style="list-style-type: none"> ISO PNP IOC (TimeInForce = 3, ExecInst = 6) – Sweep the ARCA Book to the price, cancel any remaining balance, and ignore all external quotes. ISO PNP (ExecInst = 6) - Sweep the ARCA Book to the price, <i>Post</i> any remaining balance, and ignore all external quotes. ISO Orders will interact with all resting orders except Tracking Orders. ISO Orders are never routed out. | All sessions |
| Trade-at Intermarket Sweep Order (Trade-at ISO) | OrdType = 2 (Limit) TimeInForce = 3 (IOC) ExecInst = 'y' (lowercase y; Trade-at ISO) ISO Flag = 'Y' (ISO) | An immediate or cancel limit order that trades at NYSE Arca Equities only, and may trade against undisplayed liquidity at a price equal to the limit price of the inbound Trade-at ISO order. The Exchange may rely on the order sender to have satisfied all Protected Quotations better than or equal to the limit price of the Trade-at ISO order. | All sessions |
| Discretionary Order *Must use New Order Variant 3 (Verbose) **Not Available for Pillar Phase I | OrdType = 2 DiscretionInst = 0 ProactiveDiscretionIndicator = 1 DiscretionOffset = offset from displayed price. Positive for buy, negative for sell. | An order with two price components — a display price and a discretionary price — that is displayed at your specified price, not your discretionary price. When a bid or offer appears at or within your discretionary price range, your order will be matched on NYSE Arca or proactively routed externally to protected quotes. | All sessions |
| Market Peg *Must use New Order Variant 3 (Verbose) | OrdType = P ExecInst = P (market peg) PegDifference = offset to market (required) | An order with a price that will track the national best bid or offer. Pegged orders may also make use of offsets from the same side bid/offer or offsets from the contra side (peg buy offset from offer). The order is displayed in the ArcaEx Book | Core |
| Primary Peg *Must use New Order Variant 3 (Verbose) | OrdType = P ExecInst = R (primary peg) PegDifference = offset to market (not required)** **PegDifference will not be available on Primary Peg orders for Pillar, and if sent will be rejected | An order with a price that will track the national best bid or offer. Pegged orders may also make use of offsets from the same side bid/offer or offsets from the contra side (peg buy offset from offer). The order is displayed in the ArcaEx Book | Core |

| Order Type | Fields and Values | Description | Available Sessions |
|--|---|---|--------------------|
| Tracking Order | OrdType = 2 ExecInst = d *Optional - MinQty = share qty accepted to fill order * Must use New Order Variant 3 (Verbose) if using the MinQty option. | A tracking limit order is an undisplayed, priced round lot that is eligible for execution in the tracking order process against orders equal to or less than the aggregate size of the order if interest is available at that price. Orders may be entered at any price. Orders will only execute at the NBBO. Incoming ISO orders will not interact with tracking orders. | Core |
| Primary On Open order (POO order) *Must use New Order Variant 3 (Verbose) | OrdType = 1 (Market) ExecBroker = POO | A market order sent before the open that does not interact with the Arca Book. This order is sent to the primary exchange that the security is traded on. | Core |
| Primary Open + Order (PO+ order) | <p>PO+ OrdType = 1 or 2 ExtendedExecInst = P</p> <p>PO+ MOC OrdType = 1 TimeInForce = 7 ExtendedExecInst = P</p> <p>PO+ LOC OrdType = 2 TimeInForce = 7 ExtendedExecInst = P</p> | A market or limit order that is different from the original Primary On Open (POO) order type in that it will route to the primary market all day. The primary markets are identified as NYSE (N), Amex (A,) and NASDAQ (Q). PO+ MOC/LOC will be routed to the primary exchange as an on close order. | Core |
| Primary Open + Ship Order (PO+S order) | OrdType = 1 or 2 ExtendedExecInst = p | A limit order that will route to the primary market all day (Same as PO+), but will not be sent with the DNS (Do Not Ship) Instruction on NYSE Listed Symbols. The order will be eligible for routing away at the NYSE. This order type is only for NYSE and NYSE Amex Listed symbols. | Core |
| Add Liquidity Only (ALO) (Equities) | <p>PNP ALO Order OrdType = 2 ExecInst = 6 ExtendedExecInst = A</p> <p>PNP Blind ALO Order Order Type = 2 ExecInst = 6 ExtendedExecInst = A ExtendedPNP = B</p> <p>PNP ISO ALO Order* OrdType = 2 ExecInst = 6 ISO Flag = "Y" ExtendedExecInst = A</p> | The ALO Order is a limit order that is posted to the NYSE Arca book in order to add liquidity. The ALO Order is designed to assist traders in controlling their trading costs. By providing rather than removing liquidity, traders can limit or reduce take fees. The ALO order will be Day only, and may not be designated as IOC (Immediate or Cancel), Good Till Cancel (GTC) or Good Till Date (GTD). ALO Orders will be rejected where, at the time of entry: <ul style="list-style-type: none"> • The ALO is marketable • The ALO will lock or cross the market • The ALO order would interact with un-displayed orders on NYSE Arca | All sessions |

| Order Type | Fields and Values | Description | Available Sessions |
|--|--|--|---------------------|
| | | <p>PNP B ALO orders will reject if marketable vs. displayed or undisplayed on the NYSE Arca book upon entry.</p> <p>PNP ISO ALO Order Note: If this combination is used, the order will post to the Arca book if its marketable against away markets and will reject if the order is marketable against order(s) resting on the Arca book.</p> <p>**Note: PNP Blind ALO orders may not be entered as Reserve</p> <p>**Note: For symbols migrated to Pillar, PNP ALO, PNP Blind ALO, and PNP ISO ALO orders may not be entered as Reserve</p> | |
| <p>9:45am/3:55pm Order Types</p> | <p>OrdType = 2 (Limit) TimeInForce = 0 (Day) ExecInst = 7, 8, or 9</p> | <p>9:45am ET Designation—An indicator on a Day Limit order only instructing that upon receipt the order be sent directly to the primary until 9:45am.</p> <p>If the order is received after 9:45am, the designator is ignored and the order stays on NYSE Arca. Any unexecuted orders entered with the 9:45am designator are cancelled on the primary at 9:45am ET and returned to NYSE Arca for the remainder of the day.</p> <p>3:55 pm ET Designation - An indicator on a Day Limit order instructing that the order be cancelled on NYSE Arca at 3:55pm and placed as a day order on the Primary market.</p> <p>ExecInst = 7 – Primary until 9:45am ET then move to NYSE Arca</p> <p>ExecInst = 8 – NYSE Arca until 3:55pm ET then move to primary</p> <p>ExecInst = 9 – Primary until 9:45am ET, then move to NYSE Arca And NYSE Arca until 3:55pm ET, then move to the primary.</p> <p>Orders other than straight Day/Limit with ExecInst of 7, 8, or 9 will be rejected.</p> | <p>Core</p> |
| <p>Fill Or Kill</p> <p>**Not Available for Pillar Phase I</p> | <p>OrdType = 2 (Limit) TimeInForce = 4 (FOK)</p> | <p>A limit order that is to be executed in full as soon as the order is received. If execution is not possible, the entire order will be immediately cancelled. FOK orders will not route away from NYSE Arca to other market centers.</p> | <p>All sessions</p> |

| Order Type | Fields and Values | Description | Available Sessions |
|--|--|--|--------------------|
| Post No Preference Blind (PNP B) Order | <u>PNP Blind Order</u> Order Type = 2 ExecInst = 6 ExtendedPNP = B | The PNP B order is an PNP Order that if, at the time of entry, would lock or cross the protected quotation of an external market, will be priced to the current PBO (for bids) or to the current PBB (for offers) and displayed one minimum price variation below the current PBO (for bids) or above the current PBB (for offers). If the PBO (PBB) re-prices higher (lower), a PNP Blind order to buy (sell) is re-priced to the updated PBO (PBB) and re-displayed one MPV below (above) the updated PBO (PBB) until it reaches its limit price. If the PBO (PBB) re-prices to be equal to or lower (higher) than the last displayed price of a PNP Blind order to buy (sell), the PNP Blind order remains priced and displayed at its last displayed price. If the PBB changes such that a PNP Blind order would not lock or cross the PBB of an external market, the order will be displayed as a PNP limit order | All sessions |

NYSE Arca Equities Auction Order Types

The below order types are for NYSE Arca Primary Listed Symbols and all Non-Primary ETF Symbols only.

| Order Type | Fields and Values | Description | Available Sessions |
|----------------------------|---|---|--------------------|
| Market On Open (MOO) Order | OrdType = 1 (Market) TimeInForce = 2 | A market order that is to be executed only during the opening auction for the issue. If all or part of the order is not executed during the opening auction, the balance is cancelled. If this order type is sent in after the opening auction it will reject. <u>For NYSE Arca Primaries and all Non-Primary ETFs only</u> | Opening Auction |
| Limit On Open (LOO) Order | OrdType = 2 (Limit) TimeInForce = 2 | A limit order that is to be executed only during the opening auction for the issue. If all or part of the order is not executed during the opening auction, the balance is cancelled. If this order type is sent in after the opening auction it will reject. <u>For NYSE Arca Primaries and all Non-Primary ETFs only</u> | Opening Auction |
| Market On Close (MOC) | OrdType = 1 TimeInForce = 7 | A market order that is to be executed only during the closing auction. <u>For NYSE Arca Primaries and all Non-Primary ETFs only</u> | Late Auction |

| NYSE Arca Equities Auction Order Types | | | |
|---|--------------------------------|---|---------------------------|
| The below order types are for NYSE Arca Primary Listed Symbols and all Non-Primary ETF Symbols only. | | | |
| Order Type | Fields and Values | Description | Available Sessions |
| Limit on Close (LOC) | OrdType = 2 TimeInForce = 7 | A limit price order that is to be executed only during the closing auction. For NYSE Arca Primaries and all Non-Primary ETFs only | Late Auction |

| NYSE Arca Equities Market Maker Order Types | | | |
|---|--------------------------|--|---------------------------|
| The below order types are only for registered Market makers or firms that have agreements with market makers. If the below order types are entered by non-market makers or firms that don't have an agreement with a market maker they will be rejected. | | | |
| Order Type | Fields and Values | Description | Available Sessions |
| "q" order market maker quote order | OrdType = q | NYSE Arca rules require registered market makers to maintain two – sided quotes in all symbols that they are registered to make markets in. The q order is used to enter the two sided market. A buy and sell order must be entered. Cannot be odd-lot sized. | Core |
| carry over q orders | ArcaEx system generated | In order for Market Makers to maintain their two sided quotes NYSE Arca can submit q orders on behalf of the MarketMakers | Core |

| NYSE Arca Equities Retail Order Types | | | |
|--|--------------------------------|---|---------------------------|
| Order Type | Fields and Values | Description | Available Sessions |
| Retail Order Type 1 (IOC) | OrdType = 2 TimeInForce = 8 | A limit order eligible to trade against Retail Price Improvement ("RPI") orders and non-displayed orders at prices superior to the PBBO. Any unfilled shares will be canceled back to the submitting party. | Core |

| NYSE Arca Equities Retail Order Types | | | |
|--|---|---|---------------------------|
| Order Type | Fields and Values | Description | Available Sessions |
| Retail Order Type 2 (IOC) | OrdType = 2 TimelnForce = 9 | A limit order eligible to trade against RPI orders, non-displayed orders priced better than the PBBO, and other trading orders on the NYSE ArcaBook priced at or better than the PBBO. Any unfilled shares will be canceled back to the submitting party. | Core |
| Retail Order Type 2 (DAY) | OrdType = 2 TimelnForce = A | A limit order eligible to trade against RPI orders, non-displayed orders priced better than the PBBO, and other trading orders on the NYSE ArcaBook priced at or better than the PBBO. After it interacts with RPI interest and non-displayed interest, it will interact with the NYSE ARCA book and/or will route to NMS Protected Quotations with any unfilled balance posting on the NYSE ARCA book. | Core |
| Retail Order Type 2 (MKT) | OrdType = 1 TimelnForce = A | A market order eligible to trade against RPI orders, non-displayed orders priced better than the PBBO, and other orders on the NYSE ArcaBook priced at or better than the PBBO. Any remaining portion of the Retail Order will function as a Market Order and will route to NMS Protected Quotations. | Core |
| Passive Liquidity RPI | OrdType = 7 Execlnst = 5 ExtendedExeclnst = R | A non-displayed order of any size, priced better than the PBBO when entered. | Core |
| MidPoint Passive Liquidity RPI | OrdType = 2 Execlnst = M MinQty = 100 or greater (Optional) ExtendedExeclnst = R | An RPI order that pegs to the midpoint of the PBBO, and trades at the midpoint exclusively with Retail Orders. Minimum order size for the MPL RPI order is 100 shares. | Core |

8 NYSE Arca Options Order Types

| Order Type | Fields and Values | Description | Available Sessions |
|---|---|---|------------------------|
| Market Order | OrdType = 1 | An order to buy or sell that is to be executed at the best price obtainable. | Market Auction Core |
| Limit Order | OrdType = 2 | An order to buy or sell at a specified price or better. A marketable limit order is a limit order to buy/sell at or above/below the consolidated best offer/bid for the security. | Core |
| PNP (post no preference) | OrdType = 2 ExecInst = 6 | A limit order to buy or sell that is to be executed in whole or in part on Arca Options. The portion not executed is posted in the ArcaEx Book without routing any portion of the order to another market center. PNP orders in listed stocks that would lock or cross the NBBO are cancelled. **Note: PNP orders may not be entered with Time in Force of GTC. **Note: PNP orders entered with Time in Force of IOC will be accepted, and will be handled as an IOC order – will never be posted to the book. | Core |
| Stop Order *Must use New Order Variant 3 (Verbose) | OrdType (40) = 3 (Stop) StopPx (99) = Stop Price | A Stop Order becomes an active Market Order when the stop price is reached. A Stop Order to buy is triggered when the option is bid on NYSE Arca Options or trades on NYSE Arca Options (or any exchange) at or above the specified stop price. A Stop Order to sell is activated when the option is offered on NYSE Arca Options or trades on NYSE Arca Options (or any exchange) at or below the specified stop price. Order execution is fully automated. | Core |
| Stop Limit Order *Must use New Order Variant 3 (Verbose) | OrdType (40) = 3 (Stop) Price (44) = Limit Price StopPx (99) = Stop Limit Price | A Stop Limit Order becomes an active Limit Order when the stop price is reached. A Stop Limit Order to buy is triggered when the option is bid or trades on NYSE Arca Options (or any exchange) at or above the specific stop price. A Stop Limit Order to sell becomes a Limit Order when the option is offered or trades on NYSE Arca Options (or any exchange) at or below the specified stop price. Order execution is fully automated. If the active limit order is not marketable it will post in the NYSE Arca Options Book. | Core |
| Reserve Order *Must use New Order Variant 3 (Verbose) | OrdType = 2 MaxFloor = (show size) | A reserve replenishes the displayed order size as executions are received, up to the total order quantity; away markets are routed at their quoted size or larger (if applicable) when hitting the bid or taking liquidity. | Core |

| Order Type | Fields and Values | Description | Available Sessions |
|---------------------------------------|--|---|--------------------|
| IOC (immediate Or Cancel) | OrdType = 2 TimelnForce = 3 | A limit order that is to be executed in whole or in part as soon as such order is received. The portion not so executed is to be treated as cancelled. IOC's only execute on ArcaEx and do not route. | Core |
| Opening Only Order – Market | OrdType = 1 (Market) TimelnForce = 2 TradingSessions = 2 | Opening Only – Market orders are orders that are executable only within an auction. If the order is not executed in the auction, the balance is cancelled. | Early Auction |
| Opening Only Order – Limit | OrdType = 2 (Limit) TimelnForce = 2 TradingSessions = 123 | Opening Only – Limit orders are orders that are executable only within an auction. The Opening Only Order – Limit is executable only during the <u>next</u> Auction following order entry (including Halt and IPO). If the order is not executed in the auction, the balance is cancelled. | Early Auction |
| NOW order | OrdType = 2 TimelnForce = 3 Execlnst = 1 | A limit order that is executed in whole or in part that will be routed to one or more NOW recipients (those venues that respond immediately with a fill or a cancel) for immediate execution if the order cannot be executed on ArcaEx. Orders are immediately canceled if not executed at the quoted price or better. | Core |
| ISO Intermarket Sweep Order (Options) | Execlnst = f (Lower Case F) ISO Flag = Y TimelnForce = 3 (IOC) | These orders execute against the fully displayed size of any Protected Bid or Offer (each exchange's best bid and best offer, or "BBO"). ISOs allow a large trade to fill against quotes priced worse than the NBBO while simultaneously meeting the requirement to sweep the top of the book at all eligible protected markets. A broker can sweep and then fill the remainder of an order, so long as simultaneous "ISO Orders" are sent out to trade against the protected quotes on away markets. ISO Orders will interact with all resting orders except Tracking Orders. ISO Orders are never routed out. | Core |
| Add Liquidity Only (ALO) (Options) | OrdType = 2 Execlnst = 6 ExtendedExeclnst = A | The ALO Order is a limit order that is posted to the NYSE Arca book in order to add liquidity. The ALO Order is designed to assist traders in controlling their trading costs. By providing rather than removing liquidity, traders can limit or reduce take fees. The ALO order will be Day only, and may not be designated as IOC (Immediate or Cancel), Good Till Cancel (GTC) or Good Till Date (GTD). ALO Orders will be rejected where, at the time of entry: - The ALO is marketable - The ALO will lock or cross the market | Core |

| Order Type | Fields and Values | Description | Available Sessions |
|--|---|---|--------------------|
| Fill Or Kill | OrdType = 2 (Limit) TimeInForce = 4 (FOK) | A limit order that will only fill if the entire order quantity can be matched immediately. If not the order will be cancelled back to the client. | Core |
| All or None | ExecInst = G | Order that will only fill if the entire order quantity can be matched. | Core |
| Post No Preference Blind (PNP B) Order | Order Type = 2 ExecInst = 6 ExtendedPNP = B | The PNP B order is an undisplayed limit order priced at or through the PBBO, with a tradable price set at the contra side of the PBBO. When the PBBO moves away from the price of the PNP B and the prices continue to overlap, the limit price of the PNP B will remain undisplayed and its tradable price will be adjusted to the contra side of the PBBO. When the PBBO moves away from the price of the PNP B and the prices no longer overlap, the PNP B shall convert to a displayed PNP limit order. When the PBBO moves into the price of the PNP B, the tradable price of the PNP B will be adjusted to the contra side of the PBBO. | Core |
| PNP+ Complex Order | OrdType = 2 ExecInst = M | <p>PNP+ Complex orders are designed to provide the sender price improvement over the leg markets at the time of execution. Upon receipt, our matching engine will validate the price of a PNP+ Complex order against the leg markets and if the order is marketable against these leg markets or would post to the book at a price less than one MPV (minimum price variation) away from all of the leg markets, the order will price back one MPV from the derived (net price) BBO and post to the complex order book.</p> <p>PNP+ Complex orders will track the screen markets to both better and worse prices, always maintaining a one MPV buffer.</p> <ul style="list-style-type: none"> • If leg markets improve so a resting PNP+ Complex order is marketable against the legs, the PNP+ Complex order will price back one MPV and repost. • If the leg markets worsen, the PNP+ Complex order will repost at the more aggressive price, up/down to the net debit or credit price of the order, always remaining one MVP distance from the leg markets. • If an incoming marketable contra side PNP+Complex order is received, it will immediately trade against the posted order, as long as the execution price is at least 1 MPV away from either side of the complex BBO. | -core |
| PNP Light Only Order | OrdType = 2 ExecInst = 6 ExtendedPNP = L | PNP LO orders are limit orders that do not route to away markets. Marketable incoming PNP LO orders will trade against any displayed interest and post remaining shares to the NYSE Arca book. PNP LO orders that lock or cross the National Best Bid and Offer (NBBO) will cancel back to the order sending firm. Incoming PNP LO orders will also cancel back to the order sending firm under the following | -core |

| Order Type | Fields and Values | Description | Available Sessions |
|-----------------------------|--|--|--------------------|
| | | <p>conditions:</p> <p>If incoming PNP LO order is marketable against any non-displayed interest present in the NYSE Arca book, including resting PNP Blind (PNP B) orders and hidden portions of reserve orders. Once posted and disseminated, the PNP LO order will stand its ground, i.e. it will not route or cancel if locked/crossed by an away BBO.</p> | |
| Complex Order Auction (COA) | <p><u>New Order - Variant 4 Only</u> ExtendedExecInst = C</p> | <p>Any Complex Order marked for Complex Order Auction (COA) that meets COA parameters will generate an RFR (Request for Response) over XDP market data.</p> | -core |
| Complex Order RFQ response | <p>TimelnForce = 5 (GTX)</p> | <p>A Complex order to be used in response to a COA RFQ.</p> <p>The Complex Order marked for auction will trade with contra orders after the RFR ends in a pro rata auction. Contra orders sent in response to RFR can be marked with TimelnForce = 5 which will expire at the conclusion of the auction.</p> <p>GTX orders that are entered on the same side as the initiating COA will be rejected.</p> | -core |

9 NYSE AMEX Options Order Types

| Order Type | Fields and Values | Description | Available Sessions |
|---|---|--|--------------------|
| Market Order | OrdType = 1 (market) | An order to buy or sell that is to be executed at the best price obtainable. | Core |
| Limit Order | OrdType = 2 (limit) | An order to buy or sell at a specified price or better. A marketable limit order is a limit order to buy/sell at or above/below the consolidated best offer/bid for the security. | Core |
| PNP (post no preference) | OrdType = 2 Execlnst = 6 | <p>A limit order to buy or sell that is to be executed in whole or in part on NYSE Amex Options. The portion not executed is posted in the NYSE Amex Options Book without routing any portion of the order to another market center. PNP orders in listed options that would lock or cross the NBBO are cancelled. PNP orders in ETF Options are cancelled if they are priced more than 3 cents through the NBBO. Otherwise they are accepted but will not be displayed if they lock or cross the NBBO</p> <p>**Note: PNP orders may not be entered with Time in Force of GTC.</p> <p>**Note: PNP orders entered with Time in Force of IOC will be accepted, and will be handled as an IOC order – will never be posted to the book.</p> | Core |
| Stop Order *Must use New Order Variant 3 (Verbose) | OrdType (40) = 3 (Stop) StopPx (99) = Stop Price | A Stop Order becomes an active Market Order when the stop price is reached. A Stop Order to buy is triggered when the option is bid on NYSE Amex or trades on NYSE Amex (or any exchange) at or above the specified stop price. A Stop Order to sell is activated when the option is offered on NYSE Amex or trades on NYSE Amex (or any exchange) at or below the specified stop price. Order execution is fully automated. | Core |
| Stop Limit Order *Must use New Order Variant 3 (Verbose) | OrdType (40) = 3 (Stop) Price (44) = Limit Price StopPx (99) = Stop Limit Price | A Stop Limit Order becomes an active Limit Order when the stop price is reached. A Stop Limit Order to buy is triggered when the option is bid or trades on NYSE Amex (or any exchange) at or above the specific stop price. A Stop Limit Order to sell becomes a Limit Order when the option is offered or trades on NYSE Amex (or any exchange) at or below the specified stop price. Order execution is fully automated. If the active limit order is not marketable it will post in the NYSE Amex Book. | Core |
| IOC (immediate Or Cancel) | OrdType = 2 TimeInForce = 3 | A limit order that is to be executed in whole or in part as soon as such order is received. The portion not so executed is to be treated as cancelled. IOC's only execute on NYSE Amex Options and do not route. | Core |

| Order Type | Fields and Values | Description | Available Sessions |
|---|--|--|--------------------|
| Opening Only Order – Market (“Market On Open/MOO”) | OrdType = 1 (Market) TimeInForce = 2 TradingSessions = 2 | Opening Only – Market orders are orders that are executable only within an auction. If the order is not executed in the auction, the balance is cancelled. | Early Auction |
| Opening Only Order – Limit (“Limit On Open/LOO”) | OrdType = 2 (Limit) TimeInForce = 2 TradingSessions = 123 | Opening Only – Limit orders are orders that are executable only within an auction The Opening Only Order – Limit is executable only during the <u>next</u> Auction following order entry (including Halt and IPO). If the order is not executed in the auction, the balance is cancelled. | Early Auction |
| NOW order | OrdType = 2 TimeInForce = 3 ExecInst = 1 | A limit order that is executed in whole or in part that will be routed to one or more NOW recipients (those venues that respond immediately with a fill or a cancel) for immediate execution if the order cannot be executed on NYSE Amex Options. Orders are immediately canceled if not executed at the quoted price or better. | Core |
| Fill Or Kill | OrdType = 2 (Limit) TimeInForce = 4 (FOK) | A limit order that will only fill if the entire order quantity can be matched immediately. If not the order will be cancelled back to the client. | Core |
| All or None | ExecInst = G | Order that will only fill if the entire order quantity can be matched. | Core |
| ISO Intermarket Sweep Order (Options) | ExecInst = f (Lower Case F) ISO Flag = Y TimeInForce = 3 (IOC) | These orders execute against the fully displayed size of any Protected Bid or Offer (each exchange’s best bid and best offer, or “BBO”). ISOs allow a large trade to fill against quotes priced worse than the NBBO while simultaneously meeting the requirement to sweep the top of the book at all eligible protected markets. A broker can sweep and then fill the remainder of an order, so long as simultaneous “ISO Orders” are sent out to trade against the protected quotes on away markets. ISO Orders will interact with all resting orders except Tracking Orders. ISO Orders are never routed out. | Core |
| Post No Preference Blind (PNP B) Order | OrdType = 2 ExecInst = 6 ExtendedExecInst = B | The PNP B order is an PNP Order that if, at the time of entry, would lock or cross the protected quotation of an external market, will be priced to the current PBO (for bids) or to the current PBB (for offers) and displayed one minimum price variation below the current PBO (for bids) or above the current PBB (for offers). If the PBO (PBB) re-prices higher (lower), a PNP Blind order to buy (sell) is re-priced to the updated PBO (PBB) and re-displayed one MPV below (above) the updated PBO (PBB) until it reaches its limit price. If the PBO (PBB) re-prices to be equal to or lower (higher) than the last displayed price of a PNP Blind | Core |

| Order Type | Fields and Values | Description | Available Sessions |
|-----------------------------|--|---|--------------------|
| | | order to buy (sell), the PNP Blind order remains priced and displayed at its last displayed price. If the PBBO changes such that a PNP Blind order would not lock or cross the PBBO of an external market, the order will be displayed as a PNP limit order | |
| Complex Order Auction (COA) | New Order - Variant 4 Only ExtendedExecInst = C | Any Complex Order marked for Complex Order Auction (COA) that meets COA parameters will generate an RFR (Request for Response) over XDP market data. | -core |
| Complex Order RFQ response | TimeInForce = 5 (GTX) | <p>A Complex order to be used in response to a COA RFQ. The Complex Order marked for auction will trade with contra orders after the RFR ends in a pro rata auction. Contra orders sent in response to RFR can be marked with TimeInForce = 5 which will expire at the conclusion of the auction.</p> <p>GTX orders that are entered on the same side as the initiating COA will be rejected.</p> | -core |
| Directed Order | OrdType = 2 DeliverToCompID = MMID or ATPID of the MarketMaker | Directed orders are orders sent by Order Sending firms. These orders are designed to interact with quotes and orders that are entered by Market Makers. Firms that enter directed orders can specify the MMID or ATPID of the market maker that they would like to deliver their directed order to in the DeliverToCompID field. | Core |

Appendix A: Liquidity Indicator Values and Definitions (Equities)

| Description | LiquidityIndicator Field | LastMkt Field |
|--|--------------------------|---------------|
| Add on Tape A | A | PA |
| Add on Tape B | A | PB |
| Add on Tape C | A | PC |
| Add Blind on Tape A | B | PA |
| Add Blind on Tape B | B | PB |
| Add Blind on Tape C | B | PC |
| Tape A Execution -Routed to NYSE or AMEX where the order participated in the opening or re-opening | C | PA |
| Tape B Execution -Routed to NYSE or AMEX where the order participated in the opening or re-opening | C | PB |
| Tape C Execution -Routed to NYSE or AMEX where the order participated in the opening or re-opening | C | PC |
| Add on Tape A- Sub Dollar | D | PA |
| Add on Tape B- Sub Dollar | D | PB |
| Add on Tape C- Sub Dollar | D | PC |
| Removing on Tape A - Sub Dollar | E | PA |
| Removing on Tape B - Sub Dollar | E | PB |
| Removing on Tape C - Sub Dollar | E | PC |
| Tape A Execution -Routed to NYSE or AMEX where the order was liquidity adding at NYSE or AMEX. | F | PA |
| Tape B Execution -Routed to NYSE or AMEX where the order was liquidity adding at NYSE or AMEX | F | PB |
| Tape C Execution -Routed to NYSE or AMEX where the order was liquidity adding at NYSE or AMEX | F | PC |
| Tape A Execution -Limit - Auction (LOO) - Executed in Opening, Market or Halt Auction on ARCA | G | PA |
| Tape B Execution -Limit - Auction (LOO) - Executed in Opening, Market or Halt Auction on ARCA | G | PB |
| Tape C Execution -Limit - Auction (LOO) - Executed in Opening, Market or Halt Auction on ARCA | G | PC |
| Tape A Execution -Market - Auction (MOO) - Executed in Opening, Market or Halt Auction on ARCA | G | PA |
| Tape B Execution -Market - Auction (MOO) - Executed in Opening, Market or Halt Auction on ARCA | G | PB |
| Tape C Execution -Market - Auction (MOO) - Executed in Opening, Market or Halt Auction on ARCA | G | PC |
| Routed on Tape A - Sub Dollar | H | PA |
| Routed on Tape B - Sub Dollar | H | PB |
| Routed on Tape C - Sub Dollar | H | PC |
| Add on Tape A- Retail | I | PA |

| Description | LiquidityIndicator Field | LastMkt Field |
|---|--------------------------|---------------|
| Add on Tape B- Retail | I | PB |
| Add on Tape C- Retail | I | PC |
| Tape A Execution – Tracking Order | J | PA |
| Tape B Execution - Tracking Order | J | PB |
| Tape C Execution - Tracking Order | J | PC |
| Removing on Tape A - Retail | K | PA |
| Removing on Tape B - Retail | K | PB |
| Removing on Tape C - Retail | K | PC |
| Removing on Tape A - MPL Order | L | PA |
| Removing on Tape B - MPL Order | L | PB |
| Removing on Tape C - MPL Order | L | PC |
| Add on Tape A -MPL Order | M | PA |
| Add on Tape B -MPL Order | M | PB |
| Add on Tape C -MPL Order | M | PC |
| Tape A Execution - Routed to NYSE or AMEX where the order was liquidity taking at NYSE or AMEX or 3:55 Order Routed to NYSE or AMEX-Regardless of Adding, Taking, Re-Routing or Auction | N | PA |
| Tape B Execution - Routed to NYSE or AMEX where the order was liquidity taking at NYSE or AMEX or 3:55 Order Routed to NYSE or AMEX-Regardless of Adding, Taking, Re-Routing or Auction | N | PB |
| Tape C Execution - Routed to NYSE or AMEX where the order was liquidity taking at NYSE or AMEX or 3:55 Order Routed to NYSE or AMEX-Regardless of Adding, Taking, Re-Routing or Auction | N | PC |
| Neutral on Tape A | O | PA |
| Neutral on Tape B | O | PB |
| Neutral on Tape C | O | PC |
| Removing on Tape A | R | PA |
| Removing on Tape B | R | PB |
| Removing on Tape C | R | PC |
| Tape A Execution - Set new Arca BBO and Adding Liquidity - ARCA | S | PA |
| Tape B Execution - Set new Arca BBO and Adding Liquidity - ARCA | S | PB |
| Tape C Execution - Set new Arca BBO and Adding Liquidity - ARCA | S | PC |
| Tape A Execution - MOC/LOC - On NYSE | U | PA |
| Tape B Execution - MOC/LOC - On NYSE | U | PB |
| Tape C Execution - MOC/LOC - On NYSE | U | PC |
| Tape A Execution - Routed to NYSE or AMEX where the order was re-routed to an external market and filled | W | PA |
| Tape B Execution - Routed to NYSE or AMEX where the order was re-routed to an external market and filled | W | PB |
| Tape C Execution - Routed to NYSE or AMEX where the order was re-routed to an external market and filled | W | PC |
| Tape A - Execution - Routed | X | PA |
| Tape B - Execution - Routed | X | PB |

| Description | LiquidityIndicator Field | LastMkt Field |
|--------------------------------------|--------------------------|---------------|
| Tape C - Execution - Routed | X | PC |
| Tape A Execution - MOC/LOC - On AMEX | Y | PA |
| Tape B Execution - MOC/LOC - On AMEX | Y | PB |
| Tape C Execution - MOC/LOC - On AMEX | Y | PC |
| Tape A Execution - MOC/LOC - On ARCA | Z | PA |
| Tape B Execution - MOC/LOC - On ARCA | Z | PB |
| Tape C Execution - MOC/LOC - On ARCA | Z | PC |

Appendix B: Liquidity Indicator Values and Definitions (Arca & Amex Options)

| Description | LiquidityIndicator Field | LastMkt Field |
|--|--------------------------|---------------|
| Execution - Added Liquidity (Arca Options) | A | PO |
| Execution - Removed Liquidity (Arca Options) | R | PO |
| Execution - Opening Auction – Neutral (Arca Options) | O | PO |
| Execution - Routed Away (Arca Options) | X | PO |
| Execution - Added Liquidity (AMEX Options) | A | AO |
| Execution - Removed Liquidity (AMEX Options) | R | AO |
| Execution - Opening Auction – Neutral (AMEX Options) | O | AO |
| Execution - Routed Away (AMEX Options) | X | AO |

Arca & Amex Options - Routed Away Market Definitions (Verbose Indicators) (Message 2, Variant 2)

| Description | LiquidityIndicator Field | ExecBroker Field | Away Market |
|--|--------------------------|------------------|--------------|
| Execution - Routed Away (Arca Options) | X | BOX | Boston OE |
| Execution - Routed Away (Arca Options) | X | CBO | CBOE |
| Execution - Routed Away (Arca Options) | X | ISX | ISE |
| Execution - Routed Away (Arca Options) | X | NDQ | Nasdaq |
| Execution - Routed Away (Arca Options) | X | PHO | Nasdaq PSX |
| Execution - Routed Away (Arca Options) | X | ASE | NYSE Amex |
| Execution - Routed Away (Arca Options) | X | BATS | BZX Options |
| Execution - Routed Away (Arca Options) | X | CB2 | CBOE (C2) |
| Execution - Routed Away (Arca Options) | X | NASD | Nasdaq BX |
| Execution - Routed Away (Arca Options) | X | MIAX | MIAX Options |
| Execution - Routed Away (Arca Options) | X | ISE2 | ISE Gemini |
| Execution - Routed Away (Arca Options) | X | EDGO | EDGX Options |
| Execution - Routed Away (Arca Options) | X | MRCY | ISE Mercury |

| Description | LiquidityIndicator Field | ExecBroker Field | Away Market |
|--|--------------------------|------------------|--------------|
| Execution - Routed Away (AMEX Options) | X | BOX | Boston OE |
| Execution - Routed Away (AMEX Options) | X | CBO | CBOE |
| Execution - Routed Away (AMEX Options) | X | ISX | ISE |
| Execution - Routed Away (AMEX Options) | X | NDQ | Nasdaq |
| Execution - Routed Away (AMEX Options) | X | PHO | Nasdaq PSX |
| Execution - Routed Away (AMEX Options) | X | NYO | NYSE Arca |
| Execution - Routed Away (AMEX Options) | X | BATS | BZX Options |
| Execution - Routed Away (AMEX Options) | X | CB2 | CBOE (C2) |
| Execution - Routed Away (AMEX Options) | X | NASD | Nasdaq BX |
| Execution - Routed Away (AMEX Options) | X | MIAX | MIAX Options |
| Execution - Routed Away (AMEX Options) | X | ISE2 | ISE Gemini |
| Execution - Routed Away (AMEX Options) | X | EDGO | EDGX Options |
| Execution - Routed Away (AMEX Options) | X | MRCY | ISE Mercury |

Appendix C: Reject Codes

| Reject Number | Name | Description |
|---------------|-------------------------------|--|
| 0 | Success | No Reject |
| 1 | System unavailable | The Trading System is not available. |
| 2 | Invalid Sequence Number | The Last Sequence Number in a Logon message is larger than expected. |
| 3 | Client Session Already Exists | A user attempted to login more than once and the existing client session is still active. Only one client session is supported per user. |
| 4 | Client Session Disabled | The user attempted to reconnect to a client session that has been disabled. |
| 5 | Connection Type | The configured connection type of a session does not match the port the client connects to. |
| 10 | Invalid IP Address | User is attempting to logon from a Source IP that is not permitted |

Appendix D: Exchange Destinations (ExDestination)

| ExDestination | Description |
|---------------|--------------------|
| 102 | NYSE Arca Equities |
| 103 | NYSE Arca Options |
| 104 | NYSE Amex Options |

Appendix E: Pillar Reason Codes

New Reason Codes Returned as Text on Outgoing Messages

Pillar will return a new set of event reason codes and descriptions as text (FIX Tag 58 or “Text” field in binary) on Execution Reports and Cancel Reject messages. These codes are provided by the matching engine and qualify the event that produced the message.

Format: Text (‘Text’ binary field) = ‘Rxxx: Description’

| <u>Reason Code</u> | <u>Description</u> | <u>Reason Code</u> | <u>Description</u> |
|--------------------|--------------------------|--------------------|---------------------------------|
| R000 | OK | R022 | Invalid TimeInForce |
| R001 | Invalid SenderCompID | R023 | Invalid Settlement Type |
| R002 | Invalid SenderSubID | R024 | Invalid FutSettDate |
| R003 | Invalid SendingTime | R025 | Invalid SymbolSfx |
| R004 | Invalid TargetCompID | R026 | Invalid Open/Close |
| R005 | Invalid TargetSubID | R027 | Invalid StopPx |
| R006 | Invalid OnBehalfOfCompID | R028 | Invalid Client ID |
| R007 | Invalid OnBehalfOfSubID | R029 | Invalid MinQty |
| R008 | Invalid DeliverToCompID | R030 | Invalid MaxFloor |
| R009 | Invalid DeliverToSubID | R031 | Invalid LocateReqd |
| R010 | Invalid Account | R032 | Invalid ExpireTime |
| R011 | Invalid ClOrdID | R033 | Invalid SecurityType |
| R012 | Invalid ExecInst | R034 | Invalid MaturityMonthYear |
| R013 | Invalid IDSource | R035 | Invalid PutOrCall |
| R014 | Invalid OrderQty | R036 | Invalid StrikePrice |
| R015 | Invalid OrdType | R037 | Invalid Covered/Uncovered |
| R016 | Invalid Price | R038 | Invalid Customer/Firm/Broker/MM |
| R017 | Invalid Order Capacity | R039 | Invalid MaturityDay |
| R018 | Invalid Security ID | R040 | Invalid PegDifference |
| R019 | Invalid Side | R041 | Invalid SellersDays |
| R020 | Invalid Symbol | R042 | Invalid TradingSessionID |
| R021 | Invalid Text | R043 | Invalid NoTradingSessions |

| Reason Code | Description | Reason Code | Description |
|-------------|---------------------------------|-------------|----------------------------------|
| R044 | Invalid DiscretionInst | R077 | System full (MENG_RATE_EXCEEDED) |
| R045 | Invalid DiscretionOffset | R078 | Throttle Reject |
| R046 | Invalid PriceType | R079 | Symbol Halted |
| R047 | Invalid ClearingFirm | R080 | No symbol permission |
| R048 | Invalid ClearingAccount | R081 | Price Too Far Outside |
| R049 | Invalid PartyID | R082 | MWCB Halt |
| R050 | Invalid Optional Data | R083 | Market Closed |
| R051 | Invalid CrossID | R084 | Symbol Closed |
| R052 | Invalid StrategyIndicator | R085 | LULD Cancel Instruction |
| R053 | Invalid TradeID | R086 | No Price Slide Inst During SSR |
| R054 | Invalid NoSelfTrade | R087 | Invalid StockLegGiveUp |
| R055 | Invalid CAPStrategy | R088 | Invalid NoLegs |
| R056 | Invalid SpecialOrdType | R089 | Invalid LegPositionEffect |
| R057 | Invalid RoutingInst | R090 | Invalid LegSymbol |
| R058 | Invalid OffsetPrice | R091 | Invalid LegCFICode |
| R059 | Invalid ExtendedExecInst | R092 | Invalid LegMaturityDate |
| R060 | Invalid IntroducingBadgeID | R093 | Invalid LegStrikePrice |
| R061 | Invalid BillTo | R094 | Invalid LegContractMultiplier |
| R062 | Invalid ParentFirmClOrdID | R095 | Invalid LegRatioQty |
| R063 | Invalid ParentFirmExchangeOrdID | R096 | Invalid LegSide |
| R064 | Invalid ParentFirm | R097 | Invalid LegRefID |
| R065 | Invalid Quote Type | R098 | Unsupported Order Type |
| R066 | Invalid DisplayInd | R099 | UROUT |
| R067 | Invalid PegInd | R100 | Primary Market Not Available |
| R068 | Invalid CeilingFloorPrice | R101 | No NBBO/PBBO for Peg |
| R069 | Invalid MinPegQty | R102 | No Market for Market Order |
| R070 | Invalid DiscPriceRng | R103 | Marketable Price |
| R071 | Invalid DiscMaxVol | R104 | Done for Day |
| R072 | Invalid DicsRouteInd | R105 | Credit Limit Violation |
| R073 | Invalid MinimumTriggerVol (MTV) | R106 | Cancel Remaining IOC |
| R074 | Invalid Attributed Quote | R107 | Too Late to Cancel |
| R075 | Invalid Proactive If Locked | R108 | InvalidPossResend |
| R076 | System not available | R109 | Cancel Pending |

| Reason Code | Description | Reason Code | Description |
|-------------|------------------------------------|-------------|-------------------------------------|
| R110 | Symbol already opened | R143 | Cancelled by Primary Market |
| R111 | Firm Bulk Cancel | R144 | Pending - Imbalance Freeze |
| R112 | OnBehalfOfCompID Blocked | R145 | No RLP Permission |
| R113 | ClearingFirm Blocked | R146 | Invalid Instruction for IOC's |
| R114 | Cancel/Replace Pending | R147 | System full (CG_RATE_EXCEEDED) |
| R115 | Modify Pending | R148 | Pending Cancel - Auction Running |
| R116 | Cannot Flip Imbalance | R149 | Pending Modify - Auction Running |
| R117 | Cannot Increase Imbalance | R150 | Pending Replace - Auction Running |
| R118 | Pending Cancel - Imbalance Freeze | R151 | Invld Inst for Pending Order |
| R119 | Pending Replace - Imbalance Freeze | R152 | SSH Price below NBB on ISO |
| R120 | Pending Modify - Imbalance Freeze | R153 | IOC Received while Auction Running |
| R121 | Pending Cancel - Routed Interest | R154 | Pending - Symbol Transition |
| R122 | Pending Replace - Routed Interest | R155 | Pending Cancel - Symbol Transition |
| R123 | Pending Modify - Routed Interest | R156 | Pending Modify - Symbol Transition |
| R124 | Pending - Auction Running | R157 | Pending Replace - Symbol Transition |
| R125 | Duplicative Order Check | R158 | Invalid For Trade At |
| R126 | Cancelled by Exchange | R900 | Invalid ProactiveDiscretionInd |
| R127 | New Order | R901 | Invalid ExtendedPNP |
| R128 | Fill | R902 | Invalid ExecBroker |
| R129 | Partial Fill | R903 | FastCancelRep Unsupported |
| R130 | Reduced | R904 | Pending Cancel |
| R131 | Replaced | R905 | Pending Replace |
| R132 | No Market for Cross | R906 | System full (CGA_RATE_EXCEEDED) |
| R133 | STP Cancel | R999 | Unknown Issue Encountered |
| R134 | Invalid PossDupe | | |
| R135 | TPID Blocked | | |
| R136 | Invalid Bulk Cancel | | |
| R137 | Pending Bulk Cancel | | |
| R138 | Symbol Not Open | | |
| R139 | Symbol Suspended | | |
| R140 | Symbol IPO Halt | | |
| R141 | Invld Inst During Imbalance Freeze | | |
| R142 | Invld Inst After Cutoff Time | | |