

O*U*C*H
Version 4.2
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1 Overview

NASDAQ accepts limit orders from system participants and executes matching orders when possible. Non-matching orders may be added to the NASDAQ Limit Order Book, a database of available limit orders, where they wait to be matched in price-time priority.

OUCH is a simple protocol that allows NASDAQ participants to enter, replace, and cancel orders and receive executions. It is intended to allow participants and their software developers to integrate NASDAQ into their proprietary trading systems or to build custom front ends.

OUCH only provides a method for participants to send orders to NASDAQ and receive updates on those orders entered. For information about all orders entered into and executed on the NASDAQ book, refer to the ITCH protocol (available separately).

OUCH is the low-level native protocol for connecting to NASDAQ. It is designed to offer the maximum possible performance at the cost of flexibility and ease of use. For applications that do not require this extreme level of performance, NASDAQ offers other, more standard interfaces that may be more suitable and easier to develop to.

1.1 Architecture

The OUCH protocol is composed of logical messages passed between the OUCH host and the client application. Each message type has a fixed message length.

All messages sent from the OUCH host to the client are assumed to be sequenced, and their delivery must be guaranteed by some lower level protocol. The SoupBinTCP and UFO (available separately) are the typical lower level protocols used to guarantee the delivery and sequencing of OUCH messages sent from the host to the client.

Messages sent from the OUCH client to the host are inherently non-guaranteed, even if they are carried by a lower level protocol that guarantees delivery (like TCP/IP sockets). Therefore, all host-bound messages are designed so that they can be benignly resent for robust recovery from connection and application failures.

Each physical OUCH host port is bound to a NASDAQ-assigned logical OUCH Account. On a given day, every order entered on OUCH is uniquely identified by the combination of the logical OUCH Account and the participant-created Token field.

1.2 Data Types

All integer fields are unsigned big-endian (network byte order) binary encoded numbers.

Alpha fields are left-justified and padded on the right with spaces.

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

Token fields are alphanumeric. All letters and numbers are allowed, as well as spaces. Tokens must be day unique per OUCH account. Tokens are case sensitive.

Prices are integer fields. When converted to a decimal format, prices are in fixed point format with 6 whole number places followed by 4 decimal digits. The maximum price in OUCH 4.2 is \$199,999.9900 (decimal, 7735939C hex). When entering market orders for a cross, use the special price of \$214,748.3647 (decimal, 7FFFFFFF hex).

Time in Force fields are also integer fields. Time in force specifies how many seconds the order should live. This allows participants to control when an order expires. Special values for Time in Force are listed below. Values larger than 99,999 is considered invalid and orders will only be open during system hours.

| Special Values for Time in Force | |
|---|--|
| Value | Explanation |
| 0 (0 hex) | Immediate or cancel — If no match for the order is available at the moment the order is accepted, any unexecuted shares in the order are immediately canceled. |
| 99998 (1869E hex) | Market Hours — Indicates that the order should live until the market close on the primary market for the security |
| 99999 (1869F hex) | System Hours — Indicates that the order should live until the end of the NASDAQ trading day |

1.3 Fault Redundancy

A single OUCH Account can be bound to multiple physical OUCH machines. These OUCH machines then act as mirrors of each other for fault redundancy. In this configuration, both machines are able to accept orders and cancel requests, and any outbound messages would be simultaneously generated by both physical OUCH hosts.

1.4 Service Bureau Configuration

A single OUCH Account can accept orders from one or more firms, allowing a service bureau configuration. The service bureau OUCH Account must be specifically authorized to enter trades on behalf of each represented participant with a NASDAQ Service Bureau Agreement, available separately. Once an agreement has been submitted, the OUCH Account set up as the service bureau may enter orders for the represented firm by putting the represented firm's Market Maker Identifier in the Firm field upon order entry.

2 Inbound Messages

Inbound messages are sent from the participant's application to the OUCH host. They are not sequenced. All Inbound Messages may be repeated benignly. This gives the client the ability to re-send any Inbound message if it is uncertain whether NASDAQ received it in the case of a connection loss or an application error.

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

The idea of benign inbound message retransmission with end-to-end acknowledgement is fundamental to NASDAQ's fail-over redundancy. If your connection ever fails, there is no way for you to know if pending messages actually made it over the link before the failure. A robust OUCH client can safely re-send any pending messages over a mirrored link without worrying about generating duplicates. This applies to NASDAQ's disaster fail over capability as well; if NASDAQ ever needs to fail over to the backup site, some messages sent at the moment of the failure may be lost. A robust application can simply re-send the pending messages, making the fail over seamless to the end user.

All inbound messages on an OUCH port are processed sequentially. This guarantees that if two orders are entered consecutively on the same connection, the first order entered will always be accepted first.

2.1 Enter Order Message

The Enter Order Message lets you enter a new order into NASDAQ.

Each new order must have an Order Token that is unique for that day and that logical OUCH account. If you send a valid order, you should receive an acknowledgement as an Accepted Message or an Atomically Accepted and Canceled Message. If you send an Enter Order Message with a previously used Order Token, the new order will be ignored.

| Enter Order Message | | | | |
|----------------------------|---------------|------------|--------------|--|
| Name | Offset | Len | Value | Notes |
| Type | 0 | 1 | "O" | Identifies this message as Enter Order Message type |
| Order Token | 1 | 14 | Token | As described above in Data Types. You can put any information you like. Token must be day-unique for each OUCH account. |
| Buy/Sell Indicator | 15 | 1 | Alpha | "B" = buy order "S" = sell order "T" = sell short, client affirms ability to borrow securities in good deliverable form for delivery within three business days "E" = sell short exempt, client affirms ability to borrow securities in good deliverable form for delivery within three business days |
| Shares | 16 | 4 | Integer | Total number of shares. Must be greater than zero and less than 1,000,000 |
| Stock | 20 | 8 | Alpha | Stock Symbol |
| Price | 28 | 4 | Integer | The price of the order. Please refer to the section in Data Types for more clarification. |
| Time in Force | 32 | 4 | Integer | The number of seconds that this order should live before being automatically canceled. |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| | | | | |
|-------------------------------|----|---|---------|--|
| | | | | Special values for Time in Force are listed in Data Types above. |
| Firm | 36 | 4 | Alpha | This field should contain all caps. Firm Identifier for the order entry firm. One logical OUCH Account can potentially enter orders for multiple firms in a Service Bureau configuration. If this field is blank-filled, the default firm for the OUCH Account will be used. |
| Display | 40 | 1 | Alpha | "A" = Attributable-Price to Display "Y" = Anonymous-Price to Comply "N" = Non-Display "P" = Post-Only "I" = Imbalance-Only (for opening and closing cross only) "M" = Mid-Point Peg "W" = Mid-Point Peg Post Only "L" = Post-Only and Attributable - Price to Display "O" = Retail Order Type 1 "T" = Retail Order Type 2 "Q" = Retail Price Improvement Order "m" = Mid-Point Peg and Mid-Point Trade Now "n" = Non-Display and Mid-Point Trade Now |
| Capacity | 41 | 1 | Alpha | Values other than "A", "P", or "R" will be converted to "O" = Other "A" = agency "P" = principal "R" = riskless |
| Intermarket Sweep Eligibility | 42 | 1 | Alpha | "Y" = eligible "N" = not eligible "y" = Trade-at Intermarket Sweep Order |
| Minimum Quantity | 43 | 4 | Integer | Specifies the minimum acceptable quantity to execute |
| Cross Type | 47 | 1 | Alpha | "N" = No cross (continuous market) "O" = Opening cross "C" = Closing cross "H" = Halt/IPO cross (Must be market price, refer to Prices in Data Types) "S" = Supplemental Order "R" = Retail "E" = Extended Life |
| Customer Type | 48 | 1 | Alpha | Indicates if the order is a retail designated order (optional field) "R" = Retail designated order "N" = Not a retail designated order <space> = use the default configured on the port for your firm |

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2.2 Replace Order Message

The Replace Order Message allows you to alter most of the attributes of an order in a single message. This is more efficient than canceling an existing order and immediately succeeding it with a new order. Replacing an order always gives it a new timestamp for its time priority on the book. If you wish you simply partially cancel an order and retain its time priority, send a Cancel Order Message instead.

There are two Order Tokens in the Replace Order Message. The first must be filled out with the Order Token of the existing order; the second must be a new Order Token for the replacement. The replacement Order Token must be unique in the same way as Order Tokens are in the Enter Order Message, and replacement Order Tokens may not be the same as Tokens sent in Enter Order Messages. Any replacement Order Token that has already been used in another Enter Order Message or Replace Order Message will be ignored.

NASDAQ may respond to the Replace Order Message in several ways:

- 1) If the order for the existing Order Token is no longer live or if the replacement Order Token was already used, the replacement will be silently ignored.
- 2) If the order for the existing Order Token is live but the details of the replace are invalid (e.g.: new Shares \geq 1,000,000), a Canceled Order Message will take the existing order out of the book. The replacement Order Token will not be consumed, and may be reused in this case.
- 3) If the order for the existing Order Token is live but the existing order cannot be canceled (e.g.: the existing Order is a cross order in the late period), there will be a Reject Message. This reject message denotes that no change has occurred to the existing order; the existing order remains fully intact with its original instructions. The Reject Message consumes the replacement Order Token, so the replacement Order Token may not be reused.
- 4) If the order for the existing Order Token is live and can be replaced, you will receive either a Replaced Message or an Atomically Replaced and Canceled Message.

Replace Order Messages may be chained together, so that a single order is replaced over and over again. There is no limit to the number of replaces; however no single order/replace chain may execute more than 999,999 shares cumulatively.

The Shares on the replace denote the total number of shares liable for the whole chain. Here is an example:

Enter Order Message for 500 shares
Accepted Message for 500 shares
Executed Message for 100 shares

At this point, you decide to replace the order. If you want to be exposed for

- a) the remaining 400 shares, send the Replace Order Message with 500 Shares. This 500 equals the 400 exposed plus the 100 previously executed.
- b) a new 500 shares, send the Replace Order Message with 600 Shares. This 600 equals the 500 new shares plus the 100 previously executed.

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

This may seem a bit confusing at first, but it inhibits the risk of double-liability throughout the order/replace chain.

| Replace Order Message | | | | |
|-------------------------------|---------------|------------|--------------|--|
| Name | Offset | Len | Value | Notes |
| Type | 0 | 1 | "U" | Identifies this message as Replace Order Message type |
| Existing Order Token | 1 | 14 | Token | This must be filled out with the exact Order Token sent on the Enter Order Message or last Replace Order Message. |
| Replacement Order Token | 15 | 14 | Token | As described above in Data Types. You can put any information you like. Token must be day-unique for each OUCH account. |
| Shares | 29 | 4 | Integer | Total number of shares liable, inclusive of previous executions and Self Match Prevention <i>decremented</i> shares on this order chain. Must be greater than zero and less than 1,000,000 |
| Price | 33 | 4 | Integer | The price of the replacement order. Please refer to the section in Data Types for more clarification. |
| Time in Force | 37 | 4 | Integer | The number of seconds that this replacement should live before being automatically canceled. Special values for Time in Force are listed in Data Types above. |
| Display | 41 | 1 | Alpha | "A" = Attributable-Price to Display "Y" = Anonymous-Price to Comply "N" = Non-Display "P" = Post-Only "I" = Imbalance-Only (for opening and closing cross only) "M" = Mid-Point Peg "W" = Mid-Point Peg Post Only "L" = Post-Only and Attributable - Price to Display "O" = Retail Order Type 1 "T" = Retail Order Type 2 "Q" = Retail Price Improvement Order "m" = Mid-Point Peg and Mid-Point Trade Now "n" = Non-Display and Mid-Point Trade Now |
| Intermarket Sweep Eligibility | 42 | 1 | Alpha | "Y" = eligible "N" = not eligible "y" = Trade-at Intermarket Sweep Order |
| Minimum Quantity | 43 | 4 | Integer | Specifies the minimum acceptable quantity to execute |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

2.3 Cancel Order Message

The Cancel Order Message is used to request that an order be canceled or reduced. In the Cancel Order Message, you must specify the new "intended order size" for the order. The "intended order size" is the maximum number of shares that can be executed in total after the cancel is applied.

To cancel the entire balance of an order, you would enter a Cancel Order Message with a Shares field of zero.

| Cancel Order Message | | | | |
|----------------------|--------|-----|---------|--|
| Name | Offset | Len | Value | Notes |
| Type | 0 | 1 | "X" | Cancel Order Message |
| Order Token | 1 | 14 | Token | The Order Token as was originally transmitted in an Enter Order Message |
| Shares | 15 | 4 | Integer | This is the new intended order size. This limits the maximum number of shares that can potentially be executed in total after the cancel is applied. Entering a zero here will cancel any remaining open shares on this order. |

Note that the only acknowledgement to a Cancel Order Message is the resulting Canceled Order Message. There is no "too late to cancel" message since by the time you received it, you would already have gotten the execution. Superfluous Cancel Order Messages are silently ignored.

2.4 Modify Order Message

The Modify Order Message is used to request modifications that will not affect order priority on the book unless the share amount is increased. Since priority of the order does not change (exception noted), allowed modifications are restricted to only the ones specified in the message details below.

| Modify Order Message | | | | |
|----------------------|--------|-----|---------|--|
| Name | Offset | Len | Value | Notes |
| Type | 0 | 1 | "M" | Modify Order Message |
| Order Token | 1 | 14 | Token | The Order Token as was originally transmitted in an Enter Order Message |
| Buy/Sell Indicator | 15 | 1 | Alpha | Only following transitions allowed: S->T, S->E, E->T, E->S, T->E, T->S |
| Shares | 16 | 4 | Integer | Total number of shares liable, inclusive of previous executions and Self Match Prevention <i>decremented</i> shares on this order chain. Must be greater than zero and less than 1,000,000 |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

2.5 Trade Now Message

The Trade Now Message is used to request that an order remove against any available shares of locking contra-side orders. Usage of the Trade Now Message will not affect order priority on the book

| Trade Now Message | | | | |
|-------------------|--------|-----|-------|---|
| Name | Offset | Len | Value | Notes |
| Type | 0 | 1 | "N" | Trade Now Message |
| Order Token | 1 | 14 | Token | The Order Token as was originally transmitted in an Enter Order Message |

3 Outbound Sequenced Messages

Outbound messages are generated by the OUCH host port and received by your client application.

3.1 System Event Message

System Event Messages signal events that affect the entire NASDAQ system:

| System Event Message | | | | |
|----------------------|--------|-----|---------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "S" | System Event Message identifier |
| Timestamp | 1 | 8 | Integer | Timestamp - reflected as the number of nanoseconds past midnight. |
| Event Code | 9 | 1 | Alpha | See Event Codes below. |

3.2 System Event Codes

| System Event Codes | |
|--------------------|--|
| Code | Explanation |
| "S" | Start of Day – This is always the first message each day. It indicates that NASDAQ is open and ready to start accepting orders. |
| "E" | End of Day – This indicates that NASDAQ is now closed and will not accept any new orders or replaces in this session. There will be no further executions during this session; however, it is still possible to receive Broken Trade Messages and Canceled Order Messages |

3.3 Accepted Message

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

This message acknowledges the receipt and acceptance of a valid Enter Order Message. The data fields from the Enter Order Message are echoed back in this message. Note that the accepted values may differ from the entered values for some fields.

Accepted Messages normally come before any Executed Messages or Canceled Messages for an order. However, when the Order State field of an Accepted Message is Order Dead ("D"), no additional messages will be received for that order. Order Dead means that the order was accepted and automatically canceled.

| Accepted Message | | | | |
|-------------------------|---------------|------------|--------------|--|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "A" | "A" - Accepted Message Identifier |
| Timestamp | 1 | 8 | Integer | Timestamp - reflected as the number of nanoseconds past midnight. |
| Order Token | 9 | 14 | Token | The Order Token field as entered |
| Buy/Sell Indicator | 23 | 1 | Alpha | Buy/Sell Indicator as entered |
| Shares | 24 | 4 | Integer | Total number of shares accepted |
| Stock | 28 | 8 | Alpha | Stock symbol as entered |
| Price | 36 | 4 | Integer | The accepted price of the order. Please note that the accepted price could potentially be different than the entered price if the order was re-priced by NASDAQ on entry. The accepted price will always be better than or equal to the entered price. |
| Time in Force | 40 | 4 | Integer | The accepted Time in Force of the order. Please note that the accepted Time in Force may potentially be different than the entered Time in Force. The accepted Time in Force will always be equal to or shorter in scope than the entered Time in Force. |
| Firm | 44 | 4 | Alpha | The accepted firm for the order. Please note that if the firm was left blank on entry, the default firm for the OUCH account will appear here. |
| Display | 48 | 1 | Alpha | The accepted display type for the order. "A" = Attributable - Price to Display "I" = Imbalance-Only "N" = Non-Display "Y" = Anonymous - Price to Comply "Z" = Entered as displayed but changed to non-displayed (Priced to comply) "M" = Mid-Point Peg "W" = Mid-Point Peg Post Only "L" = Post-Only and Attributable - Price to Display "O" = Retail Order Type 1 "T" = Retail Order Type 2 "Q" = Retail Price Improvement Order |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| | | | | |
|-------------------------------|----|---|---------------|--|
| | | | | "m" = Mid-Point Peg and Mid-Point Trade Now "n" = Non-Display and Mid-Point Trade Now |
| Order Reference Number | 49 | 8 | Integer | The day-unique Order Reference Number assigned by NASDAQ to this order |
| Capacity | 57 | 1 | Alpha | The capacity specified on the order |
| Intermarket Sweep Eligibility | 58 | 1 | Alpha | "Y" = eligible "N" = not eligible "y" = Trade-at Intermarket Sweep Order |
| Minimum Quantity | 59 | 4 | Integer | Minimum number of shares to execute on the replacement. |
| Cross Type | 63 | 1 | Alpha | The Cross Type as entered |
| Order State | 64 | 1 | Alpha | "L" = Order Live "D" = Order Dead |
| BBO Weight indicator | 65 | 1 | Alpha-numeric | "0" = 0-0.2% "1" = 0.2%-1% "2" = 1%-2% "3" = greater than 2% space = unspecified "S" = Sets the QBBO while joining the NBBO "N" = Improves the NBBO upon entry |

3.4 Replaced Message

This message acknowledges the receipt and acceptance of a valid Replace Order Message. The data fields from the Replace Order Message are echoed back in this message. Note that the accepted values may differ from the entered values for some fields. You will receive one and only one of these two for each replacement.

Like Accepted Messages, Replaced Messages use the Order State field to denote that a replace was accepted and then automatically canceled when the Order State is Order Dead ("D"). No further Executed Messages nor Canceled Messages will be received for the replaced order unless the Order State is not Order Dead.

The Shares field on the replace indicates how many shares were left exposed when the replacement completed. E.g.:

- Enter Order Message for 500 shares
- Accepted Message for 500 shares
- Executed Messages for 100 shares
- Replace Order Message for 500 shares
- Replaced Messages with 400 shares

The 400 shares in the Replace Message indicate that 400 shares exist on the book. This same scenario could happen if the execution was in flight back to you while the Replace Order Message was traveling to NASDAQ as follows:

- Enter Order Message for 500 shares
- Accepted Message for 500 shares
- Replace Order Message for 500 shares

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

Executed Messages for 100 shares on original order
 Replaced Messages with 400 shares

| Replaced Message | | | | |
|-------------------------|---------------|------------|---------------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "U" | "U" – Replaced Message Identifier |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight. |
| Replacement Order Token | 9 | 14 | Alpha-numeric | The Replacement Order Token field as entered |
| Buy/Sell Indicator | 23 | 1 | Alpha | Buy/sell indicator as entered on the original order in the chain |
| Shares | 24 | 4 | Integer | Total number of shares outstanding |
| Stock | 28 | 8 | Alpha | Stock symbol as entered on the original |
| Price | 36 | 4 | Integer | The accepted price of the replacement. Please note that the accepted price could potentially be different than the entered price if the order was re-priced by NASDAQ on entry. The accepted price will always be better than or equal to the entered. |
| Time in Force | 40 | 4 | Integer | The accepted Time in Force of the replacement. Please note that the accepted Time in Force may potentially be different than the entered Time in Force. The accepted Time in Force will always be equal to or shorter in scope than the entered Time in Force. |
| Firm | 44 | 4 | Alpha | The accepted firm for the original order. |
| Display | 48 | 1 | Alpha | The accepted display type for the order. "A" = Attributable - Price to Display "I" = Imbalance-Only "N" = Non-Display "Y" = Anonymous - Price to Comply "Z" = Entered as displayed but changed to non-displayed (Priced to comply) "M" = Mid-Point Peg "W" = Mid-Point peg post only "O" = Retail Order Type 1 "T" = Retail Order Type 2 "Q" = Retail Price Improvement Order "m" = Mid-Point Peg and Mid-Point Trade Now "n" = Non-Display and Mid-Point Trade Now |
| Order Reference Number | 49 | 8 | Integer | The day-unique Order Reference Number assigned by NASDAQ to this order |
| Capacity | 57 | 1 | Alpha | The Capacity of original order. |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| | | | | |
|-------------------------------|----|----|---------------|--|
| Intermarket Sweep Eligibility | 58 | 1 | Alpha | "Y" = eligible "N" = not eligible "y" = Trade-at Intermarket Sweep Order |
| Minimum Quantity | 59 | 4 | Integer | Minimum number of shares to execute on the replacement. |
| Cross Type | 63 | 1 | Alpha | The Cross Type of the replacement |
| Order State | 64 | 1 | Alpha | "L" = Order Live "D" = Order Dead |
| Previous Order Token | 65 | 14 | Token | The Order Token of the order that was replaced |
| BBO Weight indicator | 79 | 1 | Alpha-numeric | "0" = 0-0.2% "1" = 0.2%-1% "2" = 1%-2% "3" = greater than 2% space = unspecified "S" = Sets the QBBO while joining the NBBO "N" = Improves the NBBO upon entry |

3.5 Canceled Message

A Canceled Message informs you that an order has been reduced or canceled. This could be acknowledging a Cancel Order Message, or it could be the result of the order timing out or being canceled automatically.

Please note that a Canceled Message does not necessarily mean the entire order is dead; some portion of the order may still be alive.

| Canceled Message | | | | |
|------------------|--------|-----|---------|--|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "C" | Canceled Order Message |
| Timestamp | 1 | 8 | Integer | Timestamp - reflected as the number of nanoseconds past midnight. |
| Order Token | 9 | 14 | Token | The Order Token of the order being reduced |
| Decrement Shares | 23 | 4 | Integer | The number of shares just decremented from the order. This number is incremental, not cumulative. |
| Reason | 27 | 1 | Alpha | Reason the order was reduced or canceled. See currently supported Cancel Order Reasons below. Clients should anticipate additions to this list and thus support all capital letters of the English alphabet. |

3.5.1 Cancel Order Reasons

| Cancel Order Reasons |
|----------------------|
|----------------------|

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| Reason | Explanation |
|---------------|---|
| "U" | User requested cancel. Sent in response to a Cancel Order Message or a Replace Order Message |
| "I" | Immediate or Cancel order. This order was originally sent with a timeout of zero and no further matches were available on the book so the remaining unexecuted shares were immediately canceled |
| "T" | Timeout. The Time In Force for this order has expired |
| "S" | Supervisory. This order was manually canceled or reduced by a NASDAQ supervisory terminal. This is usually in response to a participant request via telephone. |
| "D" | This order cannot be executed because of a regulatory restriction (e.g.: trade through restrictions). |
| "Q" | Self Match Prevention. The order was cancelled because it would have executed with an existing order entered by the same MPID. |
| "Z" | System cancel. This order was cancelled by the system. |
| "C" | Cross canceled. Non-bookable cross orders that did not execute in the cross. |
| "K" | This order cannot be executed because of Market Collars |
| "H" | Halted. The on-open order was canceled because the symbol remained halted after the opening cross completed. |
| "X" | Open Protection. Orders that are cancelled as a result of the Opening Price Protection Threshold. |
| "E" | Closed. Any DAY order that was received after the closing cross is complete in a given symbol will receive this cancel reason. |
| "F" | Post Only Cancel. This Post Only order was cancelled because it would have been price slid for NMS. |
| "G" | Post Only Cancel. This Post Only order was cancelled because it would have been price slid due to a contra side displayed order on the book. |

3.6 AIQ Cancelled Message

| AIQ Cancelled Message | | | | |
|------------------------------|---------------|------------|--------------|--------------|
| Name | Offset | Len | Value | Notes |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| | | | | |
|---------------------------------|----|----|---------|---|
| Message Type | 0 | 1 | "D" | Canceled Order Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight. |
| Order Token | 9 | 14 | Token | The Order Token of the order being reduced |
| Decrement Shares | 23 | 4 | Integer | The number of shares just decremented from the order. This number is incremental, not cumulative. |
| Reason | 27 | 1 | "Q" | Reason the order was reduced or canceled. For AIQ Cancel message, this value will be "Q". |
| Quantity Prevented from Trading | 28 | 4 | Integer | Shares that would have executed if the trade would have occurred. Depending on AIQ type and the sizes of orders in question the value for this field could either be the same or different than the Decrement Shares field. For "Decrement both" they are always the same. For "Cancel oldest" they will be different if the incoming order is smaller than the resting order. |
| Execution price | 32 | 4 | Integer | Price at which the trade would have occurred |
| Liquidity flag | 36 | 1 | Alpha | Liquidity flag the order would have received |

3.7 Executed Message

An Executed Order Message informs you that all or part of an order has been executed.

| Executed Message | | | | |
|------------------|--------|-----|---------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "E" | Order Executed Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight |
| Order Token | 9 | 14 | Token | The Order Token of the executing order |
| Executed Shares | 23 | 4 | Integer | Incremental number of shares executed |
| Execution Price | 27 | 4 | Integer | The price at which these shares were executed |
| Liquidity Flag | 31 | 1 | Alpha | See Liquidity Flag Values table below. |
| Match Number | 32 | 8 | Integer | Assigned by NASDAQ to each match executed. Each match consists of one buy |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| | | | | |
|--|--|--|--|---|
| | | | | and one sell. The matching buy and sell executions share the same match number. |
|--|--|--|--|---|

3.7.1 Liquidity Flag Values

| Liquidity Flags | |
|-----------------|---|
| Flag | Value |
| A | Added |
| R | Removed |
| O | Opening Cross |
| M | Opening Cross (imbalance-only) |
| C | Closing Cross |
| L | Closing Cross (imbalance-only) |
| H | Halt/IPO Cross |
| K | Halt Cross |
| J | Non-displayed adding liquidity |
| W | Added post-only |
| m | Removed liquidity at a midpoint |
| k | Added liquidity via a midpoint order |
| 0 | Supplemental Order Execution |
| 7 | Displayed, liquidity-adding order improves the NBBO |
| 8 | Displayed, liquidity-adding order sets the QBBO while joining the NBBO |
| d | Retail designated execution that removed liquidity |
| e | Retail designated execution that added displayed liquidity |
| f | Retail designated execution that added non-displayed liquidity |
| j | RPI (Retail Price Improving) order provides liquidity |
| r | Retail Order removes RPI liquidity |
| t | Retail Order removes price improving non-displayed liquidity other than RPI liquidity |
| 4 | Added displayed liquidity in a Group A symbol |
| 5 | Added non-displayed liquidity in a Group A symbol |
| 6 | Removed liquidity in a Group A symbol |
| g | Added non-displayed mid-point liquidity in a Group A symbol |
| n | Midpoint Extended Life Order execution |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

3.8 Broken Trade Message

A Broken Trade Message informs you that an execution has been broken. The trade is no longer good and will not clear. The reason for the break is given.

You will always get an Executed Order Message prior to getting a Broken Trade Message for a given execution.

| Broken Trade Message | | | | |
|----------------------|--------|-----|---------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "B" | Broken Trade Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight. |
| Order Token | 9 | 14 | Token | The Order Token of the order for which the given Match Number is being broken. |
| Match Number | 23 | 8 | Integer | Match Number as transmitted in the Executed Order Message being broken. |
| Reason | 31 | 1 | Alpha | The reason the trade was broken. See currently supported Broken Trade Reasons table below. Clients should anticipate additions to this list and thus support all capital letters of the English alphabet. |

3.8.1 Broken Trade Reasons

| Broken Trade Reasons | |
|----------------------|---|
| Reason | Explanation |
| "E" | Erroneous — The trade was deemed clearly erroneous. |
| "C" | Consent — The two parties mutually agreed to break the trade. |
| "S" | Supervisory — The trade was manually broken by a NASDAQ supervisory terminal. |
| "X" | External — The trade was broken by an external third party. |

3.9 Executed with Reference Price Message

An Executed Order Message informs you that all or part of an order has been executed.

| Executed with Reference Price Message | | | | |
|---------------------------------------|--------|-----|---------|--|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "G" | Order Executed with Reference Price Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| | | | | |
|----------------------|----|----|---------|---|
| Order Token | 9 | 14 | Token | The Order Token of the executing order |
| Executed Shares | 23 | 4 | Integer | Incremental number of shares executed |
| Execution Price | 27 | 4 | Integer | The price at which these shares were executed |
| Liquidity Flag | 31 | 1 | Alpha | See Liquidity Flag Values table below. |
| Match Number | 32 | 8 | Integer | Assigned by NASDAQ to each match executed. Each match consists of one buy and one sell. The matching buy and sell executions share the same match number. |
| Reference Price | 40 | 4 | Integer | The reference price associated with the execution |
| Reference Price Type | 44 | 1 | Alpha | Only value currently supported is: I = Intraday Indicative Value |

3.10 Trade Correction Message

An Executed Restatement Message informs you that there has been a change to an execution.

| Trade Correction Message | | | | |
|--------------------------|--------|-----|---------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "F" | Trade Correction Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight |
| Order Token | 9 | 14 | Token | The Order Token of the executing order |
| Executed Shares | 23 | 4 | Integer | Incremental number of shares executed |
| Execution Price | 27 | 4 | Integer | The price at which these shares were executed |
| Liquidity Flag | 31 | 1 | Alpha | See Liquidity Flag Values table below. |
| Match Number | 32 | 8 | Integer | Assigned by NASDAQ to each match executed. Each match consists of one buy and one sell. The matching buy and sell executions share the same match number. |
| Reason | 40 | 1 | Alpha | Only value currently allowed is: N = Adjusted to NAV |

3.11 Rejected Message

A Rejected Message may be sent in response to an Enter Order Message or Replace Order Message if the order or replace cannot be accepted at this time. The reason for the rejection is given.

The Order Token of a Rejected Message cannot be re-used.

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| Rejected Order Message | | | | |
|-------------------------------|---------------|------------|--------------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "J" | Rejected Order Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight |
| Order Token | 9 | 14 | Token | Order Token field as was entered. |
| Reason | 23 | 1 | Alpha | The reason the order was rejected. See currently supported Rejected Order Reasons below. Clients should anticipate additions to this list and thus support all capital letters of the English alphabet. |

3.11.1 Rejected Order Reasons

| Rejected Order Reasons | |
|-------------------------------|--|
| Reason | Explanation |
| "T" | Test Mode – This OUCH Account is configured for test mode and is not able to accept orders in non-TEST securities. |
| "H" | Halted – There is currently a trading halt so no orders can be accepted in this stock at this time. |
| "Z" | Shares exceeds configured safety threshold – The number of shares entered must be less than the safety threshold configured for this Account. The safety threshold can be added/updated through NASDAQ Subscriber Services . |
| "S" | Invalid stock – The stock field must be a valid issue, tradable on NASDAQ. |
| "D" | Invalid Display Type – Sent when Display Type Entered cannot be accepted in current circumstances and can't be simply converted to a valid Display Type. |
| "C" | NASDAQ is closed. |
| "L" | Requested firm not authorized for requested clearing type on this account – To authorize additional firms, use the NASDAQ Service Bureau Agreement . |
| "M" | Outside of permitted times for requested clearing type |
| "R" | This order is not allowed in this type of cross (stock or time restrictions). |
| "X" | Invalid price |
| "N" | Invalid Minimum Quantity |
| "O" | Other |
| "W" | Invalid Mid-point Post Only Price |
| "o" | There is no reference price in the first NOII dissemination and so no LOC orders can be accepted in this stock at this time |
| "q" | Midpoint Peg orders are not accepted in a crossed market |
| "u" | LOC Order priced more aggressively than the first NOII reference price |

3.11.2 PRM Rejected Order Reasons

| PRM Rejected Order Reasons |
|-----------------------------------|
|-----------------------------------|

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| Reason | Explanation |
|---------------|-------------------------------|
| "a" | Reject All enabled |
| "b" | Easy to Borrow (ETB) reject |
| "c" | Restricted symbol list reject |
| "d" | ISO order restriction |
| "e" | Odd lot order restriction |
| "f" | Mid-Point order restriction |
| "g" | Pre-Market order restriction |
| "h" | Post market order restriction |
| "i" | Short sale order restriction |
| "j" | On Open order restriction |
| "k" | On Close order restriction |
| "l" | Two sided quote reject |
| "m" | Exceeded shares limit |
| "n" | Exceeded dollar value limit |

3.12 Cancel Pending Message

A Cancel Pending Message is sent in response to a cancel request for a cross order during a pre-cross late period signifying that it cannot be canceled at this time, but any unexecuted portion of this order will automatically be canceled immediately after the cross completes.

This message will only be sent once for a given token. Duplicate cancel requests for the same token will be ignored by OUCH.

| Cancel Pending Message | | | | |
|-------------------------------|---------------|------------|--------------|--|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "P" | Cancel Pending Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight |
| Order Token | 9 | 14 | Token | Order Token for the order that has its cancel pending |

3.13 Cancel Reject Message

A Cancel Reject Message is sent in response to a partial cancel request (with non-zero "intended order size") for a cross order during a pre-cross late period signifying that it

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cannot be partially canceled at this time. No automatic cancel will be scheduled for this order. Clients could repeat their request for any unexecuted portion of the order after the cross completes.

This message will only be sent once for a given token. Duplicate cancel requests for the same token will be ignored by OUCH.

| Cancel Reject Message | | | | |
|------------------------------|---------------|------------|--------------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "I" | Cancel Reject Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight. |
| Order Token | 9 | 14 | Token | Order Token for the order that was cancel-rejected |

3.14 Order Priority Update Message

A Priority Update Message is sent whenever priority of the order has been changed by the system.

| Order Priority Update Message | | | | |
|--------------------------------------|---------------|------------|--------------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "T" | Order Priority Update Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight. |
| Order Token | 9 | 14 | Token | This is the order Token of the order whose priority has been updated |
| Price | 23 | 4 | Integer | The limit price of the order. |
| Display | 27 | 1 | Alpha | The display type for the order. "Y" = Anonymous - Price to Comply |
| Order Reference Number | 28 | 8 | Integer | The day-unique Order Reference Number assigned by NASDAQ to this order. As a result of the updated priority, a new order reference number will be assigned. |

3.15 Order Modified Message

An Order Modified Message is sent in response to an order modify request.

| Order Modified Message | | | | |
|-------------------------------|---------------|------------|--------------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "M" | Order Modified Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight. |

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| | | | | |
|--------------------|----|----|---------|--|
| Order Token | 9 | 14 | Token | This is the order Token of the order that was modified |
| Buy/Sell Indicator | 23 | 1 | Alpha | Buy/sell indicator as entered. |
| Shares | 24 | 4 | Integer | Total number of shares outstanding |

3.16 Trade Now Message

The Trade Now Message is used to request that an order remove against any available shares of locking contra-side orders. Usage of the Trade Now Message will not affect order priority on the book

| Trade Now Message | | | | |
|-------------------|--------|-----|---------|---|
| Name | Offset | Len | Value | Notes |
| Message Type | 0 | 1 | "N" | Order Modified Message |
| Timestamp | 1 | 8 | Integer | Timestamp – reflected as the number of nanoseconds past midnight. |
| Order Token | 9 | 14 | Token | This is the order Token of the order that was modified |

4 Support

If you have any questions or comments about this specification, email tradingservices@nasdaq.com. We welcome suggestions for new features or improvements.

5 Revision History

| Revision | Date | Change |
|----------|------------|--|
| 4.2 | 04/25/2012 | Derived Version 4.2 from Version 4.1. Added the order modify message (incoming). Added the order modified message (outgoing) Added the order priority update message (outgoing) |
| 4.2 | 10/23/2012 | Added liquidity flag values "7", "8" Added BBO weighting indicator values "S", "N" Greyed out order modify message and added footer about new functionality Revised the order modify message to indicate loss of priority if shares are increased |
| 4.2 | 01/10/2013 | Added Customer type field to the enter order message Added liquidity flags "d", "e", "f" Clarified Quantity prevented from trading field. |
| 4.2 | 01/28/2013 | Added liquidity flags "6" |
| 4.2 | 02/05/2013 | Added Display values "O", "T", "Q" Added Cross type value "R" Added liquidity flags "j", "r", "t" Removed liquidity flag "W" |
| 4.2 | 02/25/2013 | Greyed out liquidity flags "d", "f" |
| 4.2 | 09/23/2013 | Added display values "W", "L" to acknowledgement message |

Functionality that is not available will be greyed out in the specifications. Any changes will be conveyed via the NASDAQ Head Trader Alerts or Technical Updates.

| | | |
|-----|------------|---|
| 4.2 | 06/09/2014 | Updated the formatting of the document to make more standardized across the specs |
| 4.2 | 12/09/2014 | Added "W" rejected order reason |
| 4.2 | 01/15/2015 | Added Liquidity flag values "0", "4", "5", "g" Modified the definitions of liquidity flag values "M", "L", "K" Added "C" cancelled order reason |
| 4.2 | 03/23/2015 | Added cancel reasons "E", "X" |
| 4.2 | 06/04/2015 | Added display value "W" |
| 4.2 | 06/08/2015 | Greyed out cancel order reasons "E", "X" |
| 4.2 | 06/23/2015 | Updated description for cancel reason "E" Removed cancel reason "X" |
| 4.2 | 08/03/2015 | Corrected section numbering for outbound messages |
| 4.2 | 12/23/2015 | Added cancel reasons "H", "K", "X" |
| 4.2 | 01/11/2016 | Revised description of Liquidity flag values "4", "5", "6", "g" Added Liquidity flag values "a", "x", "y" |
| 4.2 | 02/29/2016 | Added Liquidity flag values "b", "c", "h", "N" Revised description of Liquidity flag values "a", "x", "y" Added Executed with reference price order message Added Trade Correction order message |
| 4.2 | 07/18/2016 | Added intermarket sweep eligibility value "y" |
| 4.2 | 07/26/2016 | Added trade now messages (sections 2.5 and 3.16) |
| 4.2 | 10/28/2016 | Greyed out display values "O" "T" "Q" to enter order message, replace order message, accepted message and replaced message |
| 4.2 | 02/03/2017 | Changed offset of reference price field from 42 to 40. Changed offset of reference price type field from 46 to 44. |
| 4.2 | 05/02/2017 | Added cancel reason "F" and "G" |
| 4.2 | 07/20/2017 | Updated Trade now description Added reject reason code "o" |
| 4.2 | 09/26/2017 | Added "E" to cross type and "n" to liquidity flag to support Midpoint Extended Life Order |
| 4.2 | 09/28/2017 | Added value "Q" to rejected order reasons |
| 4.2 | 10/02/2017 | Revised reject value "Q" to "q" |
| 4.2 | 10/20/17 | Ungreyed reject value "q" |
| 4.2 | 03/01/2018 | Removed following liquidity flags: a, x, y, b, c, h and N |
| 4.2 | 03/15/2018 | Ungreyed cross type "E" and liquidity flag "n" |
| 4.2 | 04/11/2018 | Ungreyed Cancel order reason "E" |
| 4.2 | 07/06/2018 | Added reject reason code "u" |
| 4.2 | 12/7/18 | Added display type "m" and "n" |

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