

O\*U\*C\*H  
**Version 2.0A**  
*Updated May\_8, 2008*

## **1 Overview**

NASDAQ accepts limit orders from system subscribers 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 subscribers to enter orders, cancel existing orders, and receive executions. It is intended to allow subscribers and their software developers to integrate NASDAQ into their proprietary trading systems or build custom front ends.

OUCH only provides a method for subscribers 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 are composed of non-control ASCII bytes.

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 SoupTCP (available separately) is typically 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 an 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 subscriber created Token field.

### **1.2 Data Types**

Numeric fields are a string of ASCII coded digits, right justified and zero filled on the left.

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

Prices are given in decimal format with 6 whole number places followed by 4

decimal digits. The whole number portion is padded on the left with zeros; the decimal portion is padded on the right with zeros. The decimal point is implied by position; it does not appear inside the price field. The maximum valid price value on NASDAQ is \$~~199200~~,~~999000~~.00. Timestamp fields are given in milliseconds past midnight Eastern Time.

### 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 subscriber with an 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 Outbound Sequenced Messages

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

### 2.1 System Event Messages

System Event Messages signal events that affect the entire NASDAQ system

System Event Message				
Name	Offset	Len	Value	Notes
Time Stamp	0	8	Timestamp	See Data Types above.
Message Type	8	1	"S"	System Event Message identifier.
Event Code	9	1	Alpha	See Event Codes below.

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 will not accept any new orders in this session. There will not be any more executions during this session, however it is still possible to receive Broken Trade Messages and Canceled Order Messages.

## 2.2 Order Messages

Order messages inform you about each event in the lifetime of your orders.

### 2.2.1.1 Accepted Order Message

An Accepted Order Message acknowledges the receipt and acceptance of a valid Enter Order Message. The data fields from the Enter Order Message are echoed back in the Order Accepted Message. Note that the accepted values may differ from the entered values for some fields. You will always receive an Accepted Order Message for an order before you get any Canceled Order Messages or Executed Order Messages for the order.

Accepted Order Message				
Name	Offset	Len	Value	Notes
Time Stamp	0	8	Numeric	Timestamp.
Message Type	8	1	"A"	Accept Order Message Identifier.
Token	9	14	Alpha-Numeric	The order Token field as entered.
Buy/Sell Indicator	23	1	Alpha	Buy/sell indicator as entered.
Shares	24	6	Numeric	Total number of shares accepted. Note that the accepted shares could potentially be different than the number entered if the stock trades in round lots only, and a mixed lot was entered.
Stock	30	6	Alpha	Stock symbol as entered.
Price	36	10	Price	The accepted limit price of the order. Note that the accepted price could potentially be different than the entered price if the order was repriced by NASDAQ on entry. The accepted price will always be better than or equal to the entered.
Time in Force	46	5	Numeric	The accepted Time in Force of the order. 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	51	4	Alpha	The accepted firm for the order. Note that if the firm was left blank on entry, the default firm for the OUCH account will appear here.
Display	55	1	Alpha	The display type for the order <del>as entered</del> . <u>"A" = Attributable - Price to Display</u> <u>"Y" = Anonymous - Price to Comply</u> <u>"N" = Non-Display</u> <u>"Z" = Entered as displayed but changed to non-displayed (Priced to comply)</u>
Order Reference Number	56	9	Numeric	The day-unique Order Reference Number assigned by NASDAQ this order.
Capacity	65	1	Alpha	The capacity specified on the order.

### 2.2.1.2 Canceled Order Message

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

Note that a Cancel Order Message does not necessarily mean the entire order is dead; some portion of the order may still be alive.

<b>Canceled Order Message</b>				
<b>Name</b>		<b>Len</b>	<b>Value</b>	<b>Notes</b>
Time Stamp	0	8	Numeric	Timestamp.
Message Type	8	1	"C"	Canceled Order Message.
Order Token	9	14	Alpha numeric	The order Token field as entered.
Decrement Shares	23	6	Numeric	The number of shares just decremented from the order. This number is incremental, not cumulative.
Reason	29	1	Alpha	The reason the order was reduced or canceled. See Cancel Order Reasons are specified below

<b>Cancel Order Reasons</b>	
<b>Reason</b>	<b>Explanation</b>
"U"	User requested cancel. Sent in response to a Cancel Request 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 non-executed 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 an NASDAQ supervisory terminal. This is usually in response to a subscriber request via telephone.
"D"	Downtick. This order was a short sale that cannot be executed because of a downtick in the stock.

### 2.2.1.3 Executed Order Message

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

<b>Executed Order Message</b>				
<b>Name</b>	<b>Offset</b>	<b>Len</b>	<b>Value</b>	<b>Notes</b>

Time Stamp	0	8	Numeric	Timestamp.
Message Type	8	1	"E"	Order Executed Message.
Order Token	9	14	Alpha numeric	The order Token field as entered.
Executed Shares	23	6	Numeric	Incremental number of shares executed.
Execution Price	29	10	Price	The price at which these shares were executed.
Liquidity Flag	39	1	Alpha	See Liquidity Flag Values table below.
MatchNumber	40	9	Numeric	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.

Liquidity Flags	
Flag	Value
A	Added
R	Removed
O	Opening Cross (billable)
M	Opening Cross (non-billable)
C	Closing Cross (billable)
L	Closing Cross (non-billable)
H	Halt/IPO Cross (billable)
K	Halt/IPO Cross (non-billable)
I	Intraday/Post-Market Cross
J	Non-displayed and added liquidity

#### 2.2.1.4 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 order/execution.

Broken Trade Message				
Name	Offset	Length	Value	Notes
Time Stamp	0	8	Numeric	Timestamp.
Message Type	8	1	"B"	Broken Trade Message.
Order Token	9	14	Alpha numeric	The order Token field as entered.
Match Number	23	9	Numeric	Match Number as transmitted in the preceding Executed Order Message.
Reason	32	1	Alpha	The reason the trade was broken. See Broken Trade Reasons table below.

<b>Broken Trade Reasons</b>	
<b>Reason</b>	<b>Explanation</b>
"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 an NASDAQ supervisory terminal.
"X"	External. The trade was broken by an external 3rd party.

### 2.2.1.5 Rejected Order Message

A Rejected Order Message may be sent in response to an Enter Order Message if the order cannot be accepted at this time. The reason for the rejection is given. No further actions are permitted on this order.

The Token of a rejected order cannot be re-used.

<b>Rejected Order Message</b>				
<b>Name</b>	<b>Offset</b>	<b>Length</b>	<b>Value</b>	<b>Notes</b>
Time Stamp	0	8	Numeric	Timestamp.
Message Type	8	1	"J"	Rejected Order Message
Order Token	9	14	Alpha-numeric	This is the order Token field as was transmitted with the order when entered.
Reason	23	1	Alpha	The reason the order was rejected. See Rejected Order Reasons below.

<b>Rejected Order Reasons</b>	
<b>Reason</b>	<b>Explanation</b>
"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 on the primary exchange 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 field. NASDAQ is not able to accept the requested display type in the requested stock due to regulatory restrictions.
"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.
"O"	Other. A reason not contemplated in this version of OUCH.
"X"	Invalid Price

### 3 Inbound Messages

Inbound messages are sent from the subscriber'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.

The idea of benign inbound message retransmission with end-to-end acknowledgement is fundamental to NASDAQ's fail-over redundancy. Should your connection ever fail, 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; should NASDAQ ever need 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.

#### 3.1 Enter Order Message

The Enter Order Message lets you enter a new order into NASDAQ. Each new order must have a Token that is unique to the day and that logical OUCH account. If you send a valid order, you should receive an Accepted Order Message. If you send an Enter Order Message with a previously used Token, the new order will be ignored.

Name	Offset	Length	Value	Notes
Type	0	1	"O"	Identifies this message an Enter Order Message type.
Order Token	1	14	Alpha numeric	This is a freeform alphanumeric field. You can put any information you like. Token must be day unique for each OUCH account. Token is case sensitive, but mixing upper- and lower-case Tokens is not recommended.
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" = <u>sell short, client affirms ability to borrow securities in good deliverable form for</u>

				<p><del>delivery within three business days</del> <del>sell short exempt, you are an SEC registered broker-dealer, a registered or qualified market-maker in the securities being sold and selling the securities in connection with bona fide market making, or selling such securities in connection with transactions resulting in fully hedged or arbitrated positions</del></p> <p>"U" = short sale, client unable to affirm delivery of securities within three business days</p>
Shares	16	6	Numeric	Total number of shares entered. Must be greater than zero.
Stock	22	6	Alpha	Stock Symbol.
Price	28	10	Price	The limit price of the order. The price is a 6 digit whole number portion followed by a 4 digit decimal portion. The whole number part should be left padded with zeros and the decimal part must be right filled with zeros. Must be greater than zero.
Time in Force	38	5	Numeric	The number of seconds that this order should live before being timed automatically canceled. Special values for Time in Force are listed below.
Firm	43	4	Alpha	This field should contain the 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	47	1	Alpha	<p>"A" = Attributable_-Price to Display</p> <p>"Y" = Anonymous_-Price to <u>Comply</u>Display</p> <p><del>"C" = Anonymous-Price to Comply-</del></p> <p>"N" = Non-Display</p>
Capacity	48	1	Alpha	Can be "P" for principal, "A" for agency, or "R" for riskless. For reporting purposes only.

Special Values for Time in Force	
Value	Explanation
0	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	Market Day. Indicates that the order should live until the market close on the primary market for the security.
99999	NASDAQ Day. Indicates that the order should live until the end of the NASDAQ trading day.

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### 3.2 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	Length	Value	Notes
Type	0	1	"X"	A single byte identifying this message as a Cancel Order Message.
Order Token	1	14	Alpha numeric	The Order Token as was originally transmitted in an Enter Order Message.
Shares	15	6	Numeric	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.

## 4 Support

~~Sample OUCH conversations, OUCH Notes, the OUCH FAQ, and sample OUCH Java classes are available on the NASDAQ web site.~~

If you have any questions or comments about this specification, just E-mail to [tradingservices@nasdaqomx.com](mailto:tradingservices@nasdaqomx.com) or [devsupport@nasdaq.com](mailto:devsupport@nasdaq.com). We also welcome any suggestions for new features or improvements.

## 5 Revision History

### 5.1 Version 0.3 - 8/4/97

5.1.1 Initial dissemination to a select few developers.

### 5.2 Version 0.4 - 9/15/97

5.2.1 Miscellaneous spelling and format fixes.

5.2.2 Changed all references to an OUCH port to OUCH machine; there was too much confusion with OUCH ports and TCP/IP port numbers.

5.2.3 Added to Section 4.0 to make it clear that Inbound Messages are not sequenced, they can and should be resent if necessary.

5.2.4 Made the Reject Order and Reject Cancel messages un-sequenced. This makes more sense conceptually especially when dealing with mirrored machines. A rejected order (or cancel) was never accepted by INET; it has no reference number and should not have a sequence number either. If one machine of a mirrored pair enters an order that is rejected, the other machine will get no messages about the rejected order. This makes sense because the rejected order did not affect the state of either machine in any way. It is as if rejected orders never existed from INET's point of view. You can re-send a rejected order as many times as you like and you will keep getting identical reject messages back.

5.2.5 Added Debug Messages to help people see what was going on. These also make it very nice if you Telnet into an OUCH machine because you can see what's going on.

5.2.6 Added a line feed at the end of all outbound messages. If you've already coded to just returns, you can just ignore out any line feeds. I ignore them on incoming messages, so needn't send them either. I know it wastes a little bandwidth, but it's worth it. Now people can use line based functions to read and parse the stream and everything looks so nice and neat when you telnet into an OUCH port. It's all about aesthetic, man.

### **5.3 Version 0.5 - 9/17/97**

5.3.1 Changed the Reason field on the Broken Trade Message. It is now 4 long rather than 8 and the Reason Specifiers have been condensed. I did this to be more consistent with the Reduce Order Reasons. I also reduced the length of the reason field on the Reject Cancel Message.

5.3.2 Added the legend that "malformed numbers produce undefined results" under Architecture. For now, I do a standard atoi() type conversion so trailing spaces are tolerated, but that may change in the future.

5.3.3 Added a new Reject Order Reason "THRESHOLD" that indicates the number of shares in this order exceeds the preset threshold for this Account.

5.3.4 Made the Firm Field in the Enter Order message mandatory. Before you could leave this field blank and you would get the default firm for this Account. This way is a double check to make certain that you are entering the right orders in the firm on the right account. If this is a problem, I can override it from here, but your software should know what firm its entering orders for.

5.3.5 Added Current Restrictions section to detail the limitations of the current OUCH software revision.

5.3.6 Added word "incremental" to the description of the Executed Shares field of the Executed Order message to make it clear that this is the number of shares just executed,

not the cumulative number of shares executed.

5.3.7 Removed the paragraph that said that you could send a Rewind Request Message with a sequence number of zero. This didn't add any functionality above requesting a rewind to Sequence Number 1, so I took it out. This way we'll have zero for a special use in the future.

5.3.8 Corrected the word "Login" to "Logout" on Logout Message table legend.

#### **5.4 Version 1.0 - 11/10/97**

5.4.1 Changed the behavior of the Cancel Order Message. Before you sent the number of shares to cancel, now you must send the number of shares you want to have remaining after the cancel. Sending zero shares cancels the entire open order. This is much better because you can now send the cancel message multiple times with the same effect, where before each cancel message would have cumulatively canceled more shares.

5.4.2 Corrected the header on the Cancel Order Message table.

5.4.3 Added a few paragraphs clarifying retransmissions in the description of Un-Sequenced Inbound Messages.

5.4.4 Removed the "LOCKED" Order Reject Reason. Locking orders are now passed to the INET execution engine to give them the opportunity to execute against existing orders. If the locking order is not executed, you will get a Canceled Order Message back immediately with a reason of "#LCK".

5.4.5 Added "#LCK" reason to Canceled Order Message. See above.

5.4.6 Added a sentence to the description of the Logout Request Message saying that the OUCH machine will close your TCP/IP connection.

5.4.7 Added a few lines to the description of the Rewind Request Message.

#### **5.5 Version 1.01 - December 2, 1997**

5.5.1 Added a line to the Login Message description saying that you only get 30 seconds to log in once you have established a connection.

5.5.2 Corrected the description of the Sequence Number field in the Heart Beat Message to indicate that you get the next *expected* sequence number.

5.5.3 Deleted Known Restriction 9.5. OUCH now handles locking and crossing orders perfectly.

5.5.4 Added a line to the description of the #LCK Order Reject Reason describing the fact that you can now freely lock or cross the primary market outside normal market hours.

5.5.5 NO DOCUMENT CHANGE: OUCH will now actually pass the #LCK Order Reject Reason when appropriate. While this Reason was in the spec previously, I filtered it out so it never actually appeared in the protocol.

5.5.6 NO DOCUMENT CHANGE: OUCH now logs the IP address and socket number of the connection source in it's log file.

## **5.6 Version 1.02 - January 26, 1998**

5.6.1 Changed the "Displayed" field in the Enter Order Message to "Display" and added the value "S" for new subscriber only orders.

5.6.2 Changed the "Displayed" field in the Order Accept Message to "Display" and added the value "S" for new subscriber only orders.

5.6.3 Added a description line for Subscriber Only orders in the section describing Minimums & Hidden Orders.

5.6.4 Modified the description of the "DISPLAY" reject reason in the Order Reject Message to account for the new "S" value. The "S" indicates a subscriber only order.

5.6.5 Removed the restriction on placing hidden orders from the Current Restrictions list. You can now use hidden orders.

## **5.7 Version 1.03 – November 23, 1998**

5.7.1 Changed the name of the field in the Enter Order Message and Accept

Order Message from "Principal/Agency" to "Capacity".

5.7.2 Added a new value to the Capacity field (previously the "Principal/Agency" field) in the Enter Order Message and Accept Order Message. The new value "R" lets firms enter trades in a riskless capacity for trade reporting.

5.7.3 Changed Immediate Or Cancel orders that would lock/cross to correctly return a reason of "#IOC" if they do not execute. Before they returned the reason "#LCK" even though they were Immediate or Cancel orders so they could not have locked the market.

5.7.4 Miscellaneous spelling and wording changes.

## **5.8 Version 1.04 – December 12, 1999**

Version 1.04 is a minor release necessitated to support listed and after hours trading on INET. Since these changes only affect reason code specifiers they should not require any code changes to client software. Furthermore, you'll never even see these changes unless you try and enter an order in a listed security or the extended trading session.

5.8.1 Added "DOWNTICK" as a reason specifier to the Rejected Order Message to allow INET to accept short sales in listed securities in compliance to exchange short sale rules.

5.8.2 Added "#DNT" as a reason specifier to the Cancel Order Message to allow INET to cancel open short sell orders in listed securities when required to comply with exchange short sale rules.

5.8.3 Added "NOQSR" as a reason specifier to the Rejected Order Message to allow INET

to reject orders entered after by firms that clear using ACT at a time when NASDAQ's ACT System is not available.

5.8.4 Added "MASTER" as a reason specifier to the Rejected Order Message to allow INET to reject orders if the INET's internal security master system is not available. Hopefully subscribers will never see this reason specifier.

5.8.5 Changed the incorrect behavior for orders entered with a time in force of 99998 after the close of the primary market. In previous versions, orders entered with a time in force of 99998 after the close of the primary market were incorrectly accepted as regular day (99999) orders. These orders will be accepted as an IOC.

### ***5.9 Version 1.05 – June 19, 2000***

5.9.1 Added support for the INET Trade Reporting Service Bureau. This allows subscribers to use INET's ACT trade reporting infrastructure to report listed and NASDAQ trades to the tape.

5.9.2 Removed the implementation notes and a few spelling changes. Updated all email addresses to island.com rather than isld.com and removed all personal references.

5.9.3 Added Match Number to the end of the Execution and Break messages. This finally makes it possible to really implement breaks correctly. It's also nice to know the Match Number for a trade because it can be cross referenced to ITCH and to the clearing contract sheets.

### ***5.10 Version 2.00 – March 7, 2002***

5.10.1 Separated out the OUCH application protocol from the transport protocol. The OUCH spec now only describes the OUCH application messages, not how they are transferred between the client and the server. This opens up OUCH to new transport protocols and brings OUCH in line with ITCH. It is expected that OUCH (like ITCH) will typically be used over the SoupTCP protocol when running in real-time over an IP connection.

5.10.2 OUCH is now explicitly synchronous. Each request from the client is processed individually. This removes the requirement for OUCH clients to detect and retransmit dropped messages. It also guarantees that all requests will be processed in order.

5.10.3 All numeric fields are now padded on the left with zeros rather than spaces. This makes formatting and parsing simpler and hopefully will improve the compressibility of the stream.

5.10.4 Price fields are now much shorter and the decimal point is implied rather than explicitly present in the data. This should reduce bandwidth, speed up message creation and parsing, and makes it possible to efficiently store prices in a single 32 bit unsigned integer.

5.10.5 Share fields are now much shorter. Again, this should speed things up and make it possible to efficiently store share values in 32 bit integers.

5.10.6 OUCH will now terminate an active connection if it receives a malformed or illegal message. The idea here is that any program that is corrupt to the point of sending malformed messages is not fit enough to rationally deal with a message informing it of

the corruption. The safest thing to do is to terminate before something bad happens.

5.10.7 Timestamps are now precise to the nearest millisecond.

5.10.8 The User has been folded into the Token field. The change is superficial since the new Token field is exactly as long as the combined old User and Token fields. You can still put your User information in the first 4 bytes of the Token field if you want.

5.10.9 The Minimum Shares field has been eliminated. This feature was very rarely used and not worth the overhead and complexity.

5.10.10 You can now leave the Firm field blank when entering an order to get the default firm for the account. This is handy for developers who support multiple firms since they will no longer need to configure the firm name in their system.

5.10.11 Cancels are now based on "Intended Order Size". This is a little more complicated than just specifying the number of "leaves Shares", but eliminates a race condition where an order is partially executed while you are canceling it. Specifying an "Intended Order Size" of zero will always cancel the entire order.

5.10.12 Cancel Reason Code is now just one character.

5.10.13 There is now a new value of "I" for the Liquidity Flag on executions. This reflects a new INET feature that makes executing against your own orders free of all INET fees.

5.10.14 Order Rejects are now sequenced messages. If you have mirrored OUCH ports, any Reject messages will come out on both ports. If you re-read through a day's worth of OUCH messages, you'll re-receive any Reject Messages that happened.

5.10.15 Order Rejects now consume the Token of the rejected order. This is necessary now that Order Reject Messages are sequenced otherwise you could be re-reading a stream of messages and potentially get a Reject followed by an Accept for the same Token.

5.10.16 Removed the Capacity indicator field from the Enter Order and Order Accepted Messages. INET's trade reporting systems no longer require this information.

5.10.17 The Rejected Order Reasons are now only one character long.

5.10.18 Removed the Minimum Increment field now that all markets have been fully decimalized.

5.10.19 Removed the "FYI" field from executions. This information is no longer useful because of changes in the marketplace.

5.10.20 Removed the Remaining Shares field from Execution Messages. This information was redundant.

5.10.21 Eliminated all Cancel Reject Messages. Cancels on unknown orders are now silently ignored.

### **5.11 Version 2.00 – April 11, 2002**

5.11.1 Corrected the description of price fields to reflect the fact that prices are padded on the left with leading zeros, not spaces.

5.11.2 Added two new liquidity flags so you can still tell if an execution added or removed liquidity even if the execution is free.

5.11.3 Changed the definition of Buy/Sell indicator of T and E to indicate that you have located the stock if required.

#### **5.12 Version 2.00 revised – February 20, 2004**

5.12.1 Replaced all references to Island with INET.

5.12.2 Added new codes for Short Sale with Affirmative Determination and Short Sale without Affirmative Determination

#### **5.13 Version 2.00 revised – July 19, 2004**

5.13.1 Due to change in handling HOLDERS, section 2.2.1.1, *Accepted Order Message, Shares* now returns *Shares Accepted*, not *Shares Entered*

#### **5.14 Version 2.00a released – April 10, 2006**

5.14.1 We have added the capacity for all orders placed on INET.

5.14.2 A new reject code has been added – 'X' – signifying an invalid price placed.

5.14.3 Order attribution has been added

#### **5.15 Version 2.00a revised – July 24, 2006**

5.15.1 Removed liquidity values "B" and "S"

#### **5.16 Version 2.00a revised – October 31, 2006**

5.16.1 Updated Liquidity Flag table to support single book.

#### **5.17 Version 2.0a revised – January 10, 2007**

5.17.1 Display Field: Updated values and added value of "C".

5.17.2 Replaced referenced to "INET" with "NASDAQ"

#### **5.18 Version 2.0a revised – October 5<sup>th</sup>, 2007**

5.18.1 Updated order message buy/sell indicator where "E" specifies sell short, client affirms ability to borrow securities in good deliverable form for delivery within three business days

5.18.2 Updated Liquidity Flags table

#### **5.19 Version 2.01a revised – March 14, 2008**

5.19.1 Removed display value "C"

5.19.2 New email address for support-related issues

5.19.3 Added display value "Z" to Accepted Order Message.

5.19.4 Added Liquidity Flag "J"

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