



US Options FIX Specification

Version 1.9.0

February 1, 2012

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1 Introduction

1.1 Overview

BATS members use a subset of the FIX 4.2 protocol for order entry and drop copies.

It is assumed that the reader is familiar with the FIX 4.2 protocol as described at <http://www.fixprotocol.org>. This document describes the differences between the BATS implementation and the FIX 4.2 standard.

Please refer to www.batstrading.com for updates and further information on BATS policies and procedures.

1.2 Hours of Operation

Refer to the web site for hours of operation.

All orders are live upon acceptance by BATS. Orders are rejected if they are received outside the hours BATS is available for trading. BATS does not have an opening or closing auction.

All orders remaining after the Extended Session will be cancelled automatically (execution reports will be delivered).

1.3 Data Types

All FIX timestamps are GMT as per the FIX standard. Members are expected to synchronize their clocks with an external time source.

Prices - Members should program their systems to allow execution prices to be returned with up to four decimals.

Example:

1.0010, 1.0001, 12.3456	Rejected – subpenny not allowed.
1.0000, 1.00, 12.3400, 12.34, etc.	Accepted – round penny (extra trailing zeroes are fine).

2 Protocol

2.1 Message Format

FIX messages are ASCII formatted. The member will be provided with a *SenderCompId* and *SenderSubId* that must be sent on every message. The *TargetCompId* for all messages the member sends will be "BATS". All messages the member receives will have the Sender and Target fields swapped.

2.2 Sequence Numbers

Sequence numbers, both inbound and outbound, will be reset to 1 each night during the down time.

Messages are processed in sequence order. Behind sequence messages (other than Sequence Reset – Reset) cause immediate logout. Ahead of sequence messages (other than a Resend Request) trigger a message recovery via a Resend Request.

2.3 Version Compatibility

BATS uses the FIX 4.2 session protocol.

3 Sessions

The following session messages are supported in both directions:

Message	Type	Comment
Logon	A	Begin session (or resume a broken session).
Heartbeat	0	
Test Request	1	
Resend Request	2	
Reject	3	Malformed message or improper session level handling.
Sequence Reset	4	Both Gap Fill (<i>GapFillFlag=Y</i>) and Reset.
Logout	5	Used to gracefully close session.

3.1 Connectivity

IP Address	Address to connect to.	Supplied by BATS.
TCP Port	Port to connect to.	Supplied by BATS.
SenderCompID	Sent in every FIX message to BATS.	Supplied by BATS.
SenderSubID	Sent in every FIX message to BATS.	Supplied by BATS.
TargetCompID	Sent in every FIX message to BATS.	"BATS"
TargetSubID	Sent in every FIX message to BATS.	"TEST" for test system. "PROD" for production.

For information on connectivity options to BATS, refer to the BATS US Equity/Options Connectivity Manual at:

http://www.batstrading.com/resources/membership/BATS_Connectivity_Manual.pdf

3.2 Logon

The logon must be the first message sent by the member after the TCP connection is established. EncryptMethod is ignored (FIX level encryption is not supported).

The IP Address of the member, the *SenderCompID*, *SenderSubID* and *TargetCompID* ("BATS") and *TargetSubID* ("TEST"/"PROD") will be validated. If validation fails the connection will be dropped without a reject (to avoid corrupting the members sequence in the case that the member merely mistakenly connected to the wrong port).

If connection is unexpectedly broken, upon reconnection the member may receive a login reply with a sequence number greater than expected. This means that in-flight messages were missed (likely important execution reports). The member should issue a Resend Request to retrieve the missed messages.

Similarly BATS will issue a Resend Request to the member for messages that it missed. The member may wish to send gap fill messages in place of new orders to avoid re-submission of potentially stale orders.

HeartbeatInterval must be specified by the member in the logon message. This value will be clamped between 5 and 300 seconds and returned in the logon reply message. We recommend using as low a value as the reliability and latency of your telecommunications channel will allow.

3.3 Heartbeat

A Heartbeat message should be sent if the agreed upon *HeartbeatInterval* has elapsed since the last message sent. If any message has been sent during the preceding *HeartbeatInterval* a Heartbeat message need not be sent.

3.4 Test Request

If a *HeartbeatInterval* + 1 seconds have elapsed since the last message received, a Test Request should be issued. If another *HeartbeatInterval* + 1 seconds go by without receiving a message the TCP connection should be dropped. This ensures that a broken TCP connection will be detected even if the TCP stack doesn't notice (this has been observed to happen in WAN environments, particularly when a VPN is involved).

3.5 Resend Request

A Resend Request message should be processed even if it is received ahead of sequence. Only after resending the requested range (all marked *PossDup="Y"*, including any gap fills) should Resend Request be issued in the opposite direction.

As discussed in the FIX 4.2 specification, it is possible to send an open or closed sequence range in a Resend Request (an open range uses sequence zero as the EndSeqNo). BATS will honor either type of request, but will always issue Resend Requests with a closed sequence range.

3.6 Reject

Session level rejects are used to indicate violations of the session protocol, or missing (or bogus) fields. These are to be expected during development and certification, while the member is being adapted for BATS, but should be extremely rare in production. Application layer rejects (like Order Reject and Cancel Reject) are normal.

3.7 Sequence Reset

Sequence Reset - Gap Fill messages (*GapFillFlag="Y"*) must be received in sequence. Any messages (including any Gap Fills) sent in response to a Resend Request should have *PossDup="Y"*.

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Sequence Reset - Reset (*GapFillFlag* not “Y”) is used only as a last resort, and always by human intervention, to allow an otherwise hopelessly confused session to be resumed. In these cases all chance at automatic message recovery are lost.

3.8 Logout

Either side may issue a logout to gracefully close the session. The side that issues the logout should process messages normally until it sees the logout reply, and then break the TCP connection. BATS will typically only request logout after the scheduled end of FIX session.

4 FIX Messages

4.1 Standard Message Header

Tag	Field Name	Description
8	<i>BeginString</i>	FIX.4.2 Must be first field in message.
9	<i>BodyLength</i>	Length of message following <i>BodyLength</i> field up to and including the delimiter preceding the <i>Checksum</i> field. Must be second field in message.
35	<i>MsgType</i>	Must be third field in message.
49	<i>SenderCompID</i>	ID of sender: Assigned by BATS for messages sent to BATS. (<i>TargetCompID</i> for messages from BATS)
50	<i>SenderSubID</i>	Sub ID of sender: Assigned by BATS for messages sent to BATS. (<i>TargetSubID</i> for messages from BATS)
56	<i>TargetCompID</i>	ID of destination: "BATS" for messages sent to BATS. (<i>SenderCompID</i> for messages from BATS)
57	<i>TargetSubID</i>	Sub ID of destination: "TEST" for messages sent to BATS test system. "PROD" for messages sent to BATS production system. (<i>SenderSubID</i> for messages from BATS)
34	<i>MsgSeqNum</i>	Sequential sequence number for session.
43	<i>PossDupFlag</i>	Indicates a message resent from the admin level (has a duplicate sequence number). Default is "N".
52	<i>SendingTime</i>	GMT date-time that message was sent.
122	<i>OrigSendingTime</i>	For messages with <i>PossDupFlag</i> ="Y", indicates time that message was first sent.
115	<i>OnBehalfOfCompId</i>	Identifies end-client on messages to BATS. Used to specify clearing information.
116	<i>OnBehalfOfSubID</i>	End-client sub identifier. 4 Characters alphanumeric, otherwise not validated. Recorded and returned in <i>DeliverToSubID</i> . Available via Drop.
128	<i>DeliverToCompId</i>	Identifies end-client on messages from BATS. Used to specify clearing information.

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129	<i>DeliverToSubID</i>	Returns <i>OnBehalfOfSubID</i> optionally sent by client.
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4.2 Standard Message Trailer

Tag	Field Name	Description
10	<i>Checksum</i>	Modulo 256 checksum of all characters in message up to and including the delimiter preceding the CheckSum field. Three digits with leading zeroes if necessary.

4.3 BATS Specific Fields

The following FIX fields are specific to BATS:

Tag	Field Name	Description
6655	<i>CorrectedSize</i>	Refer to definition in the Trade Cancel/Correct Section 4.5.3 for more details.
7692	<i>RiskReset</i>	Refer to definition in the New Order Single Section 4.4.1 for more details.
7693	<i>MassCancel</i>	Refer to the definition in the Order Cancel Request Section 4.4.2 for more details.
7694	<i>ContraCapacity</i>	Refer to definition in the Execution Report Section 4.5.1 for more details.
7928	<i>PreventMemberMatch</i>	Refer to definition in the New Order Single Section 4.4.1 for more details.
9303	<i>RoutingInst</i>	Refer to definition in the New Order Single Section 4.4.1 for more details.
9479	<i>DisplayIndicator</i>	Refer to definition in the New Order Single Section 4.4.1 for more details.
9617	<i>ModifySequence</i>	Refer to definition in the Execution Report Section 4.5.1 for more details.
9618	<i>MaxRemovePct</i>	Refer to definition in the New Order Single Section 4.4.1 for more details.
9619	<i>CancelOrigOnReject</i>	Refer to definition in the Order Cancel/Replace Section 4.4.3 for more details.
9620	<i>CorrectedPrice</i>	Refer to definition in the Trade Cancel/Correct Section 4.5.3 for more details.
9621	<i>ExchangeAccessFee</i>	Refer to definition in the Execution Report Section 4.5.1 for more details.

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9622	<i>DiscretionAmount</i>	Refer to definitions in the New Order Single Section 4.4.1 and Execution Report Section 4.5.1 for more details
9688	<i>OrigCompID</i>	Refer to definition in the Execution Report Section 4.5.1 for more details.
9689	<i>OrigSubID</i>	Refer to definition in the Execution Report Section 4.5.1 for more details.
9690	<i>WorkingPrice</i>	Refer to definition in the Execution Report Section 4.5.1 for more details.
9691	<i>InitialDisplayPrice</i>	Refer to definition in the Execution Report Section 4.5.1 for more details.
9730	<i>TradeLiquidityIndicator</i>	Refer to definitions in the Execution Report Section 4.5.1 and Trade Cancel/Correct Section 4.5.3 for more details.

4.4 Order Protocol – Member to BATS

4.4.1 New Order Single

Tag	Field Name	Description
35	Standard Message Header	<i>MsgType</i> ="D"
97	<i>PossResend</i>	<p>“N” (default) indicates a new order. “Y” indicates an application level resend and is NOT SUPPORTED.</p> <p>For reasons of economy, BATS does not track (in primary storage) the <i>ClOrdID</i> values of orders that are no longer live.</p> <p>For reasons of performance, BATS does not access secondary storage to enforce unique <i>ClOrdID</i> values against orders that are no longer live.</p> <p>Without full duplicate <i>ClOrdID</i> value enforcement, it is not possible to safely implement the full behavior specified in the FIX 4.2 Protocol for <i>PossResend</i>="Y".</p> <p>To remain economical, fast <i>and</i> safe, all New Order messages with <i>PossResend</i>="Y" will be simply ignored.</p>

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1	<i>Account</i>	<p>Optional. This field will be reflected back on execution reports associated with this order, and it will be passed through to the OCC in the optional data field.</p> <p>16 characters or less (ASCII 33-126)</p> <p>Available via FIX DROP on an opt-in basis at the port level. Not available via DROP.</p>
11	<i>ClOrdId</i>	<p>Day-unique ID chosen by client. 20 characters or less. Characters in ASCII range 33-126 are allowed, except for comma, semicolon, and pipe.</p> <p>If the <i>ClOrdId</i> matches a live order it will be rejected as duplicate (unless <i>PossResend</i>="Y", see above). Note: BATS only enforces the uniqueness of ClOrdID values among currently live orders. However we strongly recommend that you keep your ClOrdID values day unique.</p>
60	<i>TransactTime</i>	Time order initiated/released. Required by FIX 4.2 but not used by BATS.
77	<i>OpenClose</i>	<p>Indicates status of client position in the option. Open = "O" Close = "C"</p> <p>*Note that contracts which are limited to closing only transactions with an OpenClose value of "O" will be rejected with a message of "c: Close Only" in tag 58.</p>
167	<i>SecurityType</i>	Indicates the type of security OPT=Options
200	<i>MaturityMonth</i>	Indicates Maturity Month (YYYYMM)
205	<i>MaturityDay</i>	Expiration date day of the month Format: DD
201	<i>PutOrCall</i>	Put = "0" Call = "1"
202	<i>StrikePrice</i>	Strike Price for option 0 – 99999.999
55	<i>Symbol</i>	Symbol (upper case) Entire BATS format symbol

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54	<i>Side</i>	Buy = "1" Sell = "2"
38	<i>OrderQty</i>	Number of contracts for order, 1 to 999,999
111	<i>MaxFloor</i>	Portion of <i>OrderQty</i> to display. The balance is reserve. 0 displays entire quantity (Default). The displayed quantity of each order at a price level is decremented first. When displayed quantity is fully decremented it is reloaded up to <i>MaxFloor</i> from reserve. Ignored if order is IOC
40	<i>OrdType</i>	Market = "1" Limit = "2" Market implies <i>TimeInForce</i> of IOC.
44	<i>Price</i>	Limit Price. Order rejected if priced finer than the minimum trading increment for the option.
9622	<i>DiscretionAmount</i>	Discretion is implicitly added to bid prices and subtracted from offer prices. Order will be displayed at <i>Price</i> but can execute in discretionary range. A discretionary order will use the minimum amount of discretion necessary to achieve execution. <ul style="list-style-type: none"> ➤ Zero applies no discretion (Default). ➤ Max discretion to apply to Price (non-negative 0.00 to 99.99). ➤ Non-zero <i>DiscretionAmount</i> does not mix with IOC, Post-Only (9303 = P or Q) or directed orders (9303 = <i>destination</i>).
110	<i>MinQty</i>	Optional minimum* fill quantity for BATS-Only IOC orders. Ignored unless order is BATS-Only IOC Default is zero. *When removing liquidity limits the minimum total fill size, which may be made up of several consecutive smaller fills.
47	<i>Rule80A (aka OrderCapacity)</i>	The capacity for the order C = Customer F = Firm M = Market Maker U = Professional Customer

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59	<i>TimeInForce</i>	<p>“0” = DAY (Expires at end of market day.) “1” = GTC (Allowed, but treated same as Day.) “3” = IOC (Portion not filled immediately is cancelled. Market orders are implicitly IOC.) “6” = GTD (Expires at earlier of specified <i>ExpireTime</i> or end of market day.)</p>
126	<i>ExpireTime</i>	<p>Required for <i>TimeInForce</i> = “6” (GTD) orders, specifies the date-time (in GMT) that the order expires. Values may be specified at a millisecond level.</p>
18	<i>ExecInst</i>	<p>Single value only (with no trailing space) f = Intermarket Sweep (Directed or BATS) All other values are ignored.</p>
7692	<i>RiskReset</i>	<p>For use by members taking advantage of BATS Risk Management tools.</p> <p>When a resting order or inbound order is executed and a risk profile limit is reached for a specific OSI root, resting orders on the OSI root will be cancelled and inbound orders on the OSI root will be rejected until this tag is filled with the value “SYMBOL”.</p> <p>Once set, the risk profile associated with the underlying OSI Root on the order will be reset. All active OSI Root level rules for this OSI Root in the risk profile are reset at this time. Individual rules cannot be reset on their own.</p> <p>If a firm level rule is tripped, this tag can be filled with the value “FIRM” to reset all firm level rules. While this will reset firm level rules, it is possible that both firm and OSI Root level rules are currently tripped. Setting this field to “FIRM” will not clear OSI level rules and the order may still be rejected. To clear both OSI Root and firm level rules fill this tag the value “BOTH”. Note, “BOTH” will clear Firm level and the OSI Root rule associated with the underlying specified on the order.</p> <p>For more information, refer to the BATS US Options Risk Management Specification.</p>

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7928	<i>PreventMemberMatch</i>	<p>BATS Match Trade Prevention: 2 characters (not space separated):</p> <p>1st character – MTP Modifier: N=Cancel Newest O = Cancel Oldest B = Cancel Both D = Decrement Larger / Cancel Smaller d = Same as (D) above, but only decrement LeavesQty. Do not restate OrdQty.</p> <p>2nd character – Unique ID Level: F = Prevent Match at BATS Exchange Member level M = Prevent Match at MPID Level</p> <p>The Unique ID level (character 2) of both orders must match to prevent a trade.</p> <p>The MTP Modifier (character 1) of the inbound order will be honored, except that if the inbound order specifies Decrement and the resting order does not, and the resting order is larger, then both orders will be cancelled. This exception is to protect the order-entry software for the resting order from receiving an unexpected restatement message. If order-entry software is prepared to handle unexpected restatement messages, this exception may be overridden at the port level by requesting “Allow MTP Decrement Override” functionality.</p> <p>Users of MTP Modifier D or d AND users of Allow MTP Override functionality must be prepared to receive a FIX Restatement (ExecReport with ExecType = D) that includes both OrdQty and LeavesQty.</p>
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9303	<i>RoutingInst</i>	<p>This tag supports up to 3 characters as follows:</p> <p>1st character: Specifies the target destination. 2nd character: Used to enable/disable Re-Route. 3rd character: Specifies the routing strategy.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9ead3;"> <th style="text-align: left;">1st Character</th> <th style="text-align: left;">Destination</th> </tr> </thead> <tbody> <tr><td>A</td><td>NYSE ARCA</td></tr> <tr><td>B</td><td>BATS Only</td></tr> <tr><td>C</td><td>BATS Only WAIT order. Will cause the order to wait 1 second before processing.</td></tr> <tr><td>E</td><td>ISE</td></tr> <tr><td>H</td><td>C2</td></tr> <tr><td>K</td><td>Boston Options Exchange</td></tr> <tr><td>N</td><td>NASDAQ</td></tr> <tr><td>P</td><td>BATS Only Post Only (<i>will reject rather than remove liquidity</i>)</td></tr> <tr><td>Q</td><td>BATS Only Post Only At Limit (<i>remove contracts that improve upon limit price and up to MaxRemovePct of remaining OrdQty at limit price</i>)</td></tr> <tr><td>R (default)</td><td>All Visible Markets</td></tr> <tr><td>U</td><td>NYSE AMEX</td></tr> <tr><td>W</td><td>CBOE</td></tr> <tr><td>X</td><td>Philadelphia</td></tr> </tbody> </table> <p>Post Only does not mix with <i>TimeInForce=IOC</i>.</p> <p>2nd and 3rd characters are only applicable when the 1st character is 'R'.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9ead3;"> <th style="text-align: left;">2nd Character</th> <th style="text-align: left;">Re-Route on Lock/Cross</th> </tr> </thead> <tbody> <tr><td>L</td><td>Yes. Allow for use of CYCLE or Parallel strategy up to limit or discretion price on entry and allow for re-route via CYCLE or Parallel strategy after the order has booked <i>only if another market locks or crosses the limit or discretion price.</i></td></tr> <tr><td>N (default)</td><td>Do not Re-Route</td></tr> </tbody> </table>	1 st Character	Destination	A	NYSE ARCA	B	BATS Only	C	BATS Only WAIT order. Will cause the order to wait 1 second before processing.	E	ISE	H	C2	K	Boston Options Exchange	N	NASDAQ	P	BATS Only Post Only (<i>will reject rather than remove liquidity</i>)	Q	BATS Only Post Only At Limit (<i>remove contracts that improve upon limit price and up to MaxRemovePct of remaining OrdQty at limit price</i>)	R (default)	All Visible Markets	U	NYSE AMEX	W	CBOE	X	Philadelphia	2 nd Character	Re-Route on Lock/Cross	L	Yes. Allow for use of CYCLE or Parallel strategy up to limit or discretion price on entry and allow for re-route via CYCLE or Parallel strategy after the order has booked <i>only if another market locks or crosses the limit or discretion price.</i>	N (default)	Do not Re-Route
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C	CYCLE																																																	
D (default)	Parallel-D																																																	
2	Parallel-2D																																																	
RoutingInst (9303) 1st Char.	Destination	ExecInst (18) not present	ExecInst (18) f																																															
A	NYSE ARCA	OK	OK																																															
B	BATS Only	OK	OK																																															
C	BATS Only WAIT	OK	OK																																															
E	ISE	OK	OK																																															
H	C2	OK	OK																																															
K	Boston	OK	OK																																															
N	NASDAQ	OK	OK																																															
P	BATS Only Post Only (<i>will reject rather than remove liquidity</i>)	OK	OK																																															
Q	BATS Only PostOnlyAtLimit	OK	OK																																															

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<p>9303 (cont.)</p>	<p><i>RoutingInst</i> (cont.)</p>		<p><i>Will remove contracts that improve upon the limit price, and up to MaxRemovePct of remaining OrdQty at the limit price</i></p>		
		R	All Visible Markets	OK	REJ
		U	NYSE AMEX	OK	OK
		W	CBOE	OK	OK
		X	Philadelphia	OK	OK
		<p>If Execlnst(18)=f and the order is directed to a market center, the order is sent to the market center as a directed ISO and does not interact with the BATS book. If the order is BATS Only (9303=B) and Execlnst(18)=f, the order is treated as an ISO on the BATS book.</p>			

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9479	<i>DisplayIndicator</i>	<p>V: (Default) As determined by port level setting (defaults to S).</p> <p>S: Display-Price Sliding (this is to override an opt-out of Display-Price Sliding at the port level).</p> <p>L: Display-Price Sliding, but reject if order <i>crosses</i> NBBO on entry.</p> <p>M: Multiple Display-Price Sliding – <i>effective pending SEC Approval</i></p> <p>R: Reject the order if it cannot be booked and displayed without adjustment.</p> <p>N: NoRescrapeAtLimit</p> <p>Display-Price Sliding: If the limit price of the unexecuted remainder of a day order does not lock or cross the NBBO then BATS books it as is. If the limit price does lock or cross the market BATS offers Display-Price Sliding.</p> <p>Display-Price Sliding permanently adjusts the booked price on entry to the strongest price that does not cross the NBBO. It will temporarily adjust the displayed price to the strongest price that does not lock the NBBO. When the NBBO widens, the display price will be readjusted to the booked price. The display price may be temporarily weaker than the booked price.</p> <p>Multiple Display-Price Sliding does not permanently adjust the booked price on entry, but allows for Display-Price slid orders to continue to have their display and booked prices adjusted towards their original limit price based on changes to the prevailing NBBO.</p> <p>NoRescrapeAtLimit: Applicable only to Fully Routable IOC orders (9303=R and 59=3). After walking the price down to the limit, there will be no final scrape at BATS and the cancel code will state “X: Expired” rather than “N: No Liquidity”.</p>
439	<i>ClearingFirm</i>	<p>CMTA Number of the firm that will clear the trade. Must be supplied for CMTA orders and left unspecified for non-CMTA orders.</p>

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440	<i>ClearingAccount</i>	<p>Supplemental identifier (optional) When the <i>OrderCapacity</i> tag is set to a value of 'M' for Market Maker this field should be filled with desired market maker ID. When using CMTA, this value is the Market Maker ID for the CMTA member instead of the BATS member executing the trade. This field will be sent to the OCC and may be up to 4 alphanumeric characters.</p> <p>If the <i>OrderCapacity</i> tag is set to something besides Market Maker this field can be blank or filled out with an optional 4 character string that is passed through to the OCC.</p> <p>This field is Recorded and returned in execution reports. Available via FIX Drop.</p>
9618	<i>MaxRemovePct</i>	<p>For PostOnlyAtLimit (9303=Q) what percentage of the order quantity which remains after price improvement may be removed at the limit price.</p> <p><u>Integer 0-100</u> 0 = Don't remove any contracts at limit price. 100 = Remove any amount at limit price.</p>
	Standard Message Trailer	

4.4.1.1 Re-Route Orders

The following conventions are used when assigning liquidity add/remove status on fills that involve discretion or Re-Route:

- An IOC order is always charged the remove fee. Whatever order it hits always gets the provider rebate.
- A non IOC order that hits a discretionary order at other than its display price gets the provider rebate. The resting discretion order is charged the remove fee.
- A discretion order that hits a resting discretion order gets the provider rebate. The resting discretion order is charged the remove fee, but uses the minimum necessary amount of reserve.
- An inbound "add liquidity only" order may execute against a discretionary order at its displayed price. In this case the "add liquidity only" order gets the provider rebate and the resting discretionary order pays the remove fee.
- In event an inbound "add liquidity only" order executes against a resting Re-Route order, the "add liquidity only" order will receive the provider rebate and the Re-Route order will pay the remove fee.

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4.4.2 Order Cancel Request

Tag	Field Name	Description
35	Standard Message Header	<i>MsgType</i> ="F"
97	<i>PossResend</i>	"Y" Indicates an application level unsolicited resend. If <i>CIOrdID</i> has not yet been seen, the cancel is treated as normal. If <i>CIOrdID</i> already exists, the resent cancel is ignored. "N" (default) indicates a new cancel.
11	<i>CIOrdID</i>	Day-unique cancel ID chosen by member. 20 characters or less. Characters in ASCII range 33-126 are allowed, except for comma, semicolon, and pipe. Duplicate order <i>CIOrdIDs</i> will be rejected (or ignored if <i>PossResend</i> ="Y").
41	<i>OrigCIOrdID</i>	<i>CIOrdID</i> of the order to cancel.
37	<i>OrderID</i>	<i>OrderID</i> supplied by BATS on the order acknowledgement. (Optional but recommended for performance).
60	<i>TransactTime</i>	Time cancel initiated/released. Required by FIX 4.2 but not used by BATS.
55	<i>Symbol</i>	Symbol (upper case). Must match original order.
77	<i>OpenClose</i>	Open/Close position indicator Open = "O" Close = "C"
200	<i>MaturityMonthYear</i>	Maturity Month
205	<i>MaturityDay</i>	Expiration date day of month Format: DD
201	<i>PutOrCall</i>	Put = "0" Call = "1"
202	<i>StrikePrice</i>	Strike Price for option 0 – 99999.999
54	<i>Side</i>	Buy = "1" Sell = "2"
38	<i>OrderQty</i>	Number of contracts for order. Must match original order.

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7693	<i>MassCancel</i>	<p>“1” = Cancel all orders for this session.</p> <p>“2” = Cancel all orders for this session that were used under the clearing relationship specified in tag 115 (<i>OnBehalfOfCompld</i>).</p> <p>“3” = Same as “1” except individual cancel acknowledgements will not be sent. Instead, a single execution report containing tag 7695 (<i>MassCancelID</i>) and tag 7696 (<i>CancelledOrderCount</i>) will be sent once all cancels have been processed.</p> <p>“4” = Same as “2” except individual cancel acknowledgements will not be sent. Instead, a single execution report containing tag 7695 (<i>MassCancelID</i>) and tag 7696 (<i>CancelledOrderCount</i>) will be sent once all cancels have been processed.</p> <p>Note that the absence of tag 115 can result in one of two behaviors. If a valid default for 115 exists and a value of 2 or 4 is placed in this tag, then the default for 115 is used. If no valid default exists, the mass cancel request is rejected.</p> <p>If tag 55 (<i>Symbol</i>) is included then the value must be a valid OSI Root (not BATS symbol name). By specifying tag 55, cancels will be limited to a single OSI Root.</p> <p>Tags 37, 41, 77, 200, 205, 201, 202, 54 and 38 will be ignored if the <i>MassCancel</i> tag has been defined.</p> <p><i>MassCancel</i> requests that contain tag 41 (<i>OrigClOrdID</i>) will be rejected.</p>
7695	<i>MassCancelID</i>	<p>Mass Cancel ID – This field will be echoed back in the resulting order execution report when tag 7693 (<i>MassCancel</i>) is set to 3 or 4.</p>
	Standard Message Trailer	

4.4.3 Order Cancel/Replace Request

Only *Price*, *OrderQty* and *OrdType* may be adjusted. Any change in *Price* or any increase in *OrderQty* will result in the order losing its time priority. *OrdType* may be adjusted from Limit to Market.

Other fields (including *ExecInst*) **will be ignored**, and the value from the original order will be re-used. In particular note that when a Day-ISO is modified the ISO designation is applied to the new order.

Changes in *OrderQty* result in an adjustment of the current order's *OrderQty*. The new *OrderQty* does **not** directly replace the current order's *LeavesQty*. Rather a delta is computed from the current *OrderQty* and the replacement *OrderQty*. This delta is then applied to the current *LeavesQty*. If the resulting *LeavesQty* is less than or equal to zero the order is cancelled. This results in safer behavior when the replace request overlaps partial fills for the current order, leaving the member in total control of the share exposure of the order.

MaxFloor is preserved from the original order and applied to the new size and price.

A Cancel/Replace should not be issued until the ack for the previous Cancel/Replace has been received for that order (or the New Order Ack for the first Cancel/Replace). The FIX handler will reject a new Cancel/Replace if it has not seen the prior Cancel/Replace from the Matching Engine.

Cancel/Replace requests that merely reduce *OrderQty* may be overlapped if the existing *CIOrdID* is re-used. This is the only case where re-use of the existing *CIOrdID* is allowed.

Tag	Field Name	Description
35	Standard Message Header	<i>MsgType</i> ="G"
97	<i>PossResend</i>	"Y" Indicates an application level resend. If the <i>CIOrdID</i> does not indicate an already pending cancel/replace, the cancel is treated as normal. If <i>CIOrdID</i> does indicate an already pending cancel/replace then the resent cancel/replace is ignored. "N" (default) indicates a new cancel.
1	<i>Account</i>	Ignored – value preserved from original order
11	<i>CIOrdId</i>	Day-unique ID chosen by member. 20 characters or less. Characters in ASCII range 33-126 are allowed, except for comma, semicolon, and pipe. Duplicate order <i>CIOrdIds</i> will be rejected (or ignored if <i>PossResend</i> ="Y").

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41	<i>OrigClOrdID</i>	<i>ClOrdID</i> of the order to replace. In the case of multiple changes to a single order, this will be the <i>ClOrdID</i> of the most recent accepted change.
37	<i>OrderId</i>	<i>OrderId</i> supplied by BATS on the order acknowledgement. In the case of multiple changes to a single order, this will be the <i>OrderId</i> from the most recent acknowledgement.
60	<i>TransactTime</i>	Time cancel/replace initiated/released.
55	<i>Symbol</i>	Ignored – value preserved from original order
77	<i>OpenClose</i>	Ignored – value preserved from original order
200	<i>MaturityMonth</i>	Ignored – value preserved from original order
205	<i>MaturityDay</i>	Ignored – value preserved from original order
201	<i>PutOrCall</i>	Ignored – value preserved from original order
202	<i>StrikePrice</i>	Ignored – value preserved from original order
54	<i>Side</i>	Must match original order.
38	<i>OrderQty</i>	Number of contracts for order. This will modify the <i>OrderQty</i> of the current order; it does not directly set the remaining quantity.
40	<i>OrdType</i>	Market="1", Limit="2" Optional: (defaults to original order if not sent). May replace Limit with Market, but otherwise must match original order (or not sent).
44	<i>Price</i>	Limit Price. Order rejected if priced finer than the minimum trading increment for the option.
18	<i>ExecInst</i>	Ignored – value preserved from original order
9619	<i>CancelOrigOnReject</i>	N = Leave original order alone. Y = Cancel original order if replacement fails (an unsolicited cancel report will be sent for original order in this case). Default is configurable per port (N if not configured).
	Standard Message Trailer	

4.5 Order Protocol – BATS to Member

4.5.1 Execution Report

Please note that Execution Reports with tag 150 (*ExecType*) = “M” are responses to Mass Cancel requests. Mass Cancel Execution Report are compact and will only carry fields as stated in the description of tag 150 (*ExecType*) that follows.

Tag	Field Name	Description
35	Standard Message Header	<i>MsgType</i> ="8"
52	<i>SendingTime</i>	GMT date-time that execution report was sent by BATS.
20	<i>ExecTransType</i>	“0” = New “1” = Cancel “2” = Correct “3” = Status
17	<i>ExecID</i>	Day-unique id of execution message. Will be zero for <i>ExecTransType</i> of Status (3).
18	<i>ExecInst</i>	<i>ExecInst</i> from order (if any)
19	<i>ExecRefID</i>	Only present when <i>ExecTransType</i> = Cancel (1) or Correct (2). Refers to the <i>ExecID</i> of the message being cancelled or corrected.

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150	<i>ExecType</i>	<p>Reason for this execution report: “0” = New (acknowledgement of new order) “1” = Partial Fill “2” = Fill “4” = Canceled “5” = Replaced “8” = Rejected “D” = Restated “M” = Mass Cancel Complete</p> <p>For Standard FIX Drop, only “1” or “2” will be sent and will always equal OrdStatus (tag 39). For Order by Order FIX Drop, all execution information will be sent. Refer to section 6.2.</p> <p>When responding to a mass cancel request, <i>ExecType</i> is set to a value of “M”. This indicates that the only tags present in this message are the following:</p> <ul style="list-style-type: none"> ➤ <i>Standard Message Header</i> (35) ➤ <i>SendingTime</i> (52) ➤ <i>ExecTransType</i> (20) ➤ <i>ExecType</i> (150) ➤ <i>MassCancelID</i> (7695) ➤ <i>CancelledOrderCount</i> (7696)
378	<i>ExecRestatementReason</i>	<p>Only present when 150=D 4 = State Change 5 = Reduction of OrdQty</p>
11	<i>ClOrdID</i>	<p><i>ClOrdID</i> of the order being accepted, executed or rejected. -or- <i>ClOrdID</i> of the cancel or replace request. -or- <i>ClOrdID</i> of the order subject to unsolicited cancel (<i>OrigClOrdID</i> will not be present).</p>
41	<i>OrigClOrdID</i>	<p><i>ClOrdID</i> of the order being cancelled or replaced (for a solicited cancel or cancel/replace, otherwise not present).</p>
37	<i>OrderID</i>	<p><i>OrderID</i> (supplied by BATS).</p>
382	<i>NoContraBrokers</i>	<p>Only present on trades. Always 1.</p>

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375	<i>ContraBroker</i>	Only present on trades. AMEX = Routed to NYSE AMEX ARCA = Routed to NYSE Arca BATS = Internally matched BOX = Routed to Boston CBOE = Routed to CBOE CTWO = Routed to C2 ISE = Routed to ISE NOMX = Routed to Nasdaq PHLX = Routed to Philadelphia
39	<i>OrdStatus</i>	State of order. "0" = New "1" = Partially Filled "2" = Filled "4" = Canceled "5" = Replaced "6" = Pending Cancel "8" = Rejected "A" = Pending Ack "E" = Pending Replace For Standard FIX Drop, only "1" or "2" will be sent and will always equal ExecType (tag 150). For Order by Order FIX Drop, all execution information will be sent. Refer to section 6.2.
103	<i>OrdRejReason</i>	Optional when <i>ExecType</i> is Rejected (8). "0" = Broker option "1" = Unknown symbol "2" = Exchange closed "3" = Order exceeds limit "5" = Unknown order "6" = Duplicate order "8" = Stale order
1	<i>Account</i>	Copied from order (available in FIX DROP, not available in DROP).
55	<i>Symbol</i>	Copied from order
167	<i>SecurityType</i>	Copied from order
77	<i>OpenClose</i>	Copied from order
200	<i>MaturityMonth</i>	Copied from order
205	<i>MaturityDay</i>	Copied from order

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201	<i>PutOrCall</i>	Copied from order
202	<i>StrikePrice</i>	Copied from order
54	<i>Side</i>	Copied from order.
38	<i>OrderQty</i>	Copied from order.
111	<i>MaxFloor</i>	Copied from order.
44	<i>Price</i>	Copied from order.
9622	<i>DiscretionAmount</i>	Copied from order.
59	<i>TimeInForce</i>	Copied from order.
126	<i>ExpireTime</i>	Copied from order if TimeInForce is GTD (6).
439	<i>ClearingFirm</i>	Copied from order if present.
440	<i>ClearingAccount</i>	Copied from order if present.
32	<i>LastShares</i>	Quantity of contracts traded on this fill (zero for non-fills). Must request opt-in at firm or port level for "Report MTP Fields" to receive this field on a MTP triggered cancel/restatement where both sides were either reduced or cancelled (i.e. inbound Cancel Both or Decrement). With MTP, the number of contracts that would have matched.
31	<i>LastPx</i>	Price of this fill (zero for non-fills). Must request opt-in at firm or port level for "Report MTP Fields" to receive this field on a MTP triggered cancel/restatement where both sides were either reduced or cancelled (i.e. inbound Cancel Both or Decrement). With MTP, the price at which LastShares would have matched.
151	<i>LeavesQty</i>	Quantity of contracts still open for further execution. Will be zero if order is dead, otherwise will be OrderQty-CumQty. Note: It is possible for LeavesQty to be zero when ExecType = 5 indicating that the order is dead.
14	<i>CumQty</i>	Cumulative quantity of contracts executed for this order.
6	<i>AvgPx</i>	Average price of executions for this order weighted by trade size. Zero if CumQty is zero.

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198	<i>SecondaryOrderID</i>	<p>Only present on MTP triggered cancel/restatement. BATS OrderId of contra side of prevented match.</p> <p>Must request opt-in at firm or port level for “Report MTP Fields” to receive this field.</p>
7694	<i>ContraCapacity</i>	<p>The capacity of the contra for this execution.</p> <p>C = Customer F = Firm M = Market Maker U = Professional Customer</p> <p>Must request opt-in to “Send Contra Capacity” at firm or port level receive this field.</p>

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9730	<i>TradeLiquidityIndicator</i>	<p>Present for fills (150=1 or 150=2):</p> <p><u>1st Character</u> A = trade added liquidity R = trade removed liquidity X = routed</p> <p><u>2nd Character</u> S = Execution from Order that Set the NBBO</p> <p>Must request opt-in (via the BATS Trade Desk) at firm or port level to receive the 2nd characters in this field. To allow for future expansion of this field, please ignore values with an unknown character in the 2nd position.</p> <p><u>MTP</u> For members that opt-in to Report MTP Fields functionality (at firm or port level), the A / R values may be presented on an MTP triggered cancel/restatement.</p> <p><u>State Change Tracking</u> For members that opt-in to State Change Tracking at the port level, order acks (150=0), modify acks (150=5) and restatements (150=D with 378=4) will carry 9730 messages defined as follows: A=Zero or more immediate partial remove fills followed by posting. R=Zero or more immediate partial remove fills followed by a cancel (or full fill). X=Zero or more immediate partial remove fills followed by routing.</p>
9621	<i>ExchangeAccessFee</i>	<p>Only present for fills. Access fee for this fill (up to 5 decimal places, negative for rebate).</p> <p><i>Note: Accuracy of FIX value may be subject to timely receipt of fee schedule updates from away markets. In cases where tiered benefits may apply and the specific fee/rebate is unknown, the most conservative value will be specified.</i></p>

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9690	<i>WorkingPrice</i>	Optional. Must be enabled at the firm or port level. Only present on Accepted or Replaced, and only when order is fully or partially booked. If <i>Price</i> had to be adjusted to a less aggressive value to avoid crossing the NBBO, the adjusted price will be reported here, otherwise equals <i>Price</i> .
9691	<i>InitialDisplayPrice</i>	Optional. Must be enabled at the firm or port level. Only present on Accepted or Replaced, and only when order is fully or partially booked. If order had to be temporarily displayed at a less aggressive value to avoid locking the NBBO, the initial displayed price will be reported here, otherwise equals <i>WorkingPrice</i> .
9617	<i>ModifySequence</i>	FIX Drop only. Base 36 number of times order has been replaced.
9688	<i>OrigCompID</i>	FIX Drop only. TargetCompID of original FIX exec report FIX Drop port must be configured to send this optional field.
9689	<i>OrigSubID</i>	FIX Drop only. TargetSubID of original FIX exec report FIX Drop port must be configured to send this optional field.
60	<i>TransactTime</i>	GMT date-time that transaction occurred.

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58	<i>Text</i>	<p>If present, indicates reason for reject or cancel. Format is one letter reason code followed by colon and space followed by free form text message. (e.g. "N: No Liquidity at price")</p> <p>Reason codes are one of the following:</p> <p>A = AdminD = Duplicate ClOrdId F = Could not reflect to consolidated quote (OPRA) H = Halted K = Order Rate Threshold Exceeded L = Order would lock or cross NBBO N = Ran out of liquidity to execute against O = ClOrdId doesn't match a known order P = Can't modify an order that is pending fill Q = Waiting for first trade R = Routing unavailable T = Fill would trade-through NBBO U = User requested V = Would Wash W = AddLiquidityOnly order would remove X = Order expired Y = Symbol not supported Z = Unforeseen reason c = Close Only f = RiskMgmtFirmLevel m = Market Access Risk Limit Exceeded o = Max Open Orders Count Exceeded s = RiskMgmtSymLevel</p>
7695	<i>MassCancelID</i>	Mass cancel ID. .
7696	<i>CancelledOrderCount</i>	Number of orders cancelled from a mass cancel request <i>MassCancelID</i> .
	<i>Standard Message Trailer</i>	

4.5.1.1 State Change Tracking

For members that wish to track the state of their routable orders, they may **opt-in** to the following functionality at the port level by contacting the BATS Trade Desk.

Order acks (150=0), modify acks (150=5) and restatements (150=D with 378=4) will carry 9730 (liquidity) as follows:

- A = Zero or more immediate partial remove fills followed by posting.
- R = Zero or more immediate partial remove fills followed by a cancel (or full fill).

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- X = Zero or more immediate partial remove fills followed by routing.

When an order returns from the router, a restatement will be generated with:

- 150 = D (Restated)
- 378 = 4 (State Change)
- 58 = A (Admin)
- 9730 = A, X or R (as defined in 4.5.1)
- Order details to match the order (OrdQty, Price, etc.)
- Cumulative execution details to match the current status (CumQty, LeavesQty, etc.)
- Current execution details zeroed (LastPx, LastShares, etc.)

4.5.2 Cancel Reject

Rejects a Cancel or Cancel/Replace request.

When a Cancel/Replace is rejected, by default the original order is left alive. A Cancel Reject should not be used as a sign that the original order has been cancelled. Even if the *CancelOrigOnReject = Y* option is being used a separate “unsolicited” cancel will be sent to close out the original order.

Tag	Field Name	Description
35	Standard Message Header	<i>MsgType="9"</i>
11	<i>CIOrdID</i>	<i>CIOrdID</i> from the Cancel or Cancel/Replace request.
41	<i>OrigCIOrdID</i>	<i>CIOrdID</i> of the order that failed to be cancelled or replaced.
37	<i>OrderId</i>	<i>OrderId</i> of order that failed to be cancelled or replaced. "NONE" if <i>CxlRejReason</i> is Unknown (1).
39	<i>OrdStatus</i>	<i>OrdStatus</i> of order that failed to be cancelled or replaced.
1	<i>Account</i>	Copied from Cancel or Cancel/Replace request.
434	<i>CxlRejResponseTo</i>	"1" = Cancel "2" = Cancel/Replace

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102	<i>CxlRejReason</i>	<p>“0” = Too late to cancel. “1” = Unknown order. “3” = Already pending cancel or pending replace.</p> <p>Optional This field will not be reflected back on risk rejects.</p>
58	<i>Text</i>	Free form text message.
7695	<i>MassCancelID</i>	<i>MassCancelID</i> from an Cancel request where <i>MassCancel</i> is set.
	Standard Message Trailer	

4.5.3 Trade Cancel/Correct

Sends a trade/cancel or correct message for trade breaks and adjustments.

Trade Cancel/Correct (UCC) is an optional message that must be enabled at the port level. It may be enabled for current-day only or for all cancels and corrections. Only the price of a trade may be corrected, all other details remain the same. Trade cancels and corrections do not alter live order state.

Tag	Field Name	Description
35	Standard Message Header	<i>MsgType</i> ="UCC"
20	<i>ExecTransType</i>	"1" = Trade Cancel "2" = Trade Correct
17	<i>ExecID</i>	Day-unique id of execution message.
19	<i>ExecRefID</i>	Refers to the <i>ExecID</i> of the message being cancelled or corrected.
37	<i>OrderId</i>	<i>OrderId</i> of the original trade being cancelled/corrected.
11	<i>ClOrdID</i>	<i>ClOrdID</i> of the original trade being cancelled/corrected.
55	<i>Symbol</i>	Copied from original trade being cancelled/corrected.
77	<i>OpenClose</i>	Copied from original trade being cancelled/corrected.
200	<i>MaturityMonth</i>	Copied from original trade being cancelled/corrected.
205	<i>MaturityDay</i>	Copied from original trade being cancelled/corrected.
201	<i>PutOrCall</i>	Copied from original trade being cancelled/corrected.
202	<i>StrikePrice</i>	Copied from original trade being cancelled/corrected.
54	<i>Side</i>	Copied from original trade being cancelled/corrected.
9730	<i>TradeLiquidityIndicator</i>	Copied from original trade being cancelled/corrected.
439	<i>ClearingFirm</i>	Copied from original trade being cancelled/corrected (if present).
440	<i>ClearingAccount</i>	Copied from original trade being cancelled/corrected (if present).
9620	<i>CorrectedPrice</i>	Only for Trade Corrects. Corrected price.
6655	<i>CorrectedSize</i>	Only for Trade Corrects. Corrected size
32	<i>LastShares</i>	Quantity of contracts on the original trade being cancelled/corrected.
31	<i>LastPx</i>	Price on the original trade being cancelled/corrected.

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42	<i>OrigTime</i>	GMT date-time of original trade.
60	<i>TransactTime</i>	GMT date-time of cancel/correct.

5 Implementation Issues

5.1 Automatic Cancel on Disconnect or Malfunction

All open orders for a member will be cancelled automatically if no messages have been received from the member for two heartbeat intervals. This is done to prevent orders from being stuck in an unknown state in the event of telecommunications failure. Members should choose their heartbeat interval carefully based on the latency and reliability of their telecommunications channel. The minimum supported interval is 5 seconds, and this is also the recommended interval if the latency and reliability of your telecommunications channel support it. Execution reports for the automatically cancelled orders are available upon reconnection. Members are responsible for rerouting orders to other market centers based on their business needs. This should be rare, but all open orders may also be cancelled in the event of a complete or partial system malfunction.

5.2 Access Fees Returned on Execution Reports

The access fee associated with each fill is calculated to 5 decimals and returned on each execution report. Negative numbers indicate liquidity rebates. Members should program their systems to read, validate, and pass along this field in order to avoid making software changes to their systems when the BATS fee schedule changes. The sum of the access fees received during a month should equal the access fee charged or rebated on a member's monthly bill, rounded to the nearest penny.

5.3 Service Bureau Configuration

Service Bureaus require special configuration. *OnBehalfOfCompld* should be set for Order, Cancel and Cancel/Replace messages sent to BATS. Orders with an unknown *OnBehalfOfCompld* will be rejected. *ClOrdId* values are required to be unique only within a given *OnBehalfOfCompld*. Execution Report and Cancel Reject messages sent by BATS will have the *DeliverToCompld* set. **Orders must be cancelled or replaced using the same *OnBehalfOfCompld* as was sent on the Order.**

5.4 Common Session Level Issues

BATS uses FIX 4.2 as specified by the FPL document **Version 4.2 (with Errata 20010501)** with business level extensions described in our own FIX spec. The session level of the FPL spec is followed as closely as possible.

The version with errata cleared up **many** ambiguities with session level present in the earlier Version 4.2 (March 1, 2000).

Important notes direct from the public FPL spec (**blue lines are anchor locations in the FPL document, bold emphasis is from original spec, purple emphasis added by BATS, green notes added by BATS**) :

5.4.1 **FINANCIAL INFORMATION EXCHANGE PROTOCOL / FIX MESSAGE FORMAT AND DELIVERY / Ordered Message Processing**

The FIX protocol assumes complete ordered delivery of messages between parties. Implementers should consider this when designing message gap fill processes. Two options exist for dealing with gaps, **either request all messages subsequent to the last message received or ask for the specific message missed while maintaining an ordered list of all newer messages**. For example, if the receiver misses the second of five messages, the application **could ignore messages 3 through 5 and generate a resend request for messages 2 through 5, or, preferably 2 through 0 (where 0 represents infinity)**. Another option would involve saving messages 3 through 5 and resending only message 2. **In both cases, messages 3 through 5 should not be processed before message 2.**

5.4.2 FINANCIAL INFORMATION EXCHANGE PROTOCOL / SESSION PROTOCOL / Logon

After the initiator has been authenticated, the acceptor will respond **immediately** with a confirming *Logon* message.

5.4.3 FINANCIAL INFORMATION EXCHANGE PROTOCOL / SESSION PROTOCOL / Message Recovery

When the incoming sequence number does not match the expected number corrective processing is required. Note that the *SeqReset-Reset* message (**[BATS: this refers only to GapFillFlag=No 123=N]**) to be used only to recover from a disaster scenario vs. normal resend request processing) is an exception to this rule as it should be processed without regards to its *MsgSeqNum*. **If the incoming message has a sequence number less than expected and the PossDupFlag is not set, it indicates a serious error. It is strongly recommended that the session be terminated and manual intervention be initiated.** If the **incoming sequence number is greater than expected, it indicates that messages were missed and retransmission of the messages is requested via the Resend Request** (see the earlier section, *Ordered Message Processing*).

...

If there are consecutive administrative messages to be resent, **it is suggested that only one SeqReset-GapFill message be sent in their place**. The sequence number of the *SeqReset-GapFill* message is the next expected outbound sequence number. **The NewSeqNo field of the GapFill message contains the sequence number of the highest administrative message in this group plus 1**. For example, during a Resend operation there are 7 sequential administrative messages waiting to be resent. They start with sequence number 9 and end with sequence number 15. Instead of transmitting 7 Gap Fill messages (which is perfectly legal, but not network friendly), a *SeqReset-GapFill* message may be sent. **The sequence number of the Gap Fill message is set to 9 because the remote side is expecting that as the next sequence number**. The *NewSeqNo* field of the GapFill message contains the number 16, because that will be the sequence number of the next message to be transmitted.

Sequence number checking is a vital part of FIX session management. However, a discrepancy in the sequence number stream is **handled differently for certain classes of FIX messages**.

The table below lists the actions to be taken when the incoming sequence number is greater than the expected incoming sequence number.

NOTE: In *ALL* cases except the Sequence Reset - Reset message, the FIX session should be terminated if the incoming sequence number is less than expected and the PossDupFlag is not set. A Logout message with some descriptive text should be sent to the other side before closing the session.

Response by Message Type

Message Type	Action to Be Taken on Sequence # Mismatch
Logon	Must always be the first message transmitted. Authenticate and accept the connection. After sending a Logon confirmation back, send a ResendRequest if a message gap was detected in the Logon sequence number.

....

5.4.4 FINANCIAL INFORMATION EXCHANGE PROTOCOL / ADMINISTRATIVE MESSAGES / Resend Request

Note: the **sending application may wish to consider the message type when resending messages**; e.g. if a new order is in the resend series and a significant time period has elapsed since its original inception, the sender may not wish to retransmit the order given the potential for changed market conditions. (The Sequence Reset-GapFill message is used to skip messages that a sender does not wish to resend.)

5.4.5 FINANCIAL INFORMATION EXCHANGE PROTOCOL / ADMINISTRATIVE MESSAGES / Sequence Reset (Gap Fill)

The sequence reset message is used by the sending application to reset the incoming sequence number on the opposing side. **This message has two modes: "Sequence Reset-Gap Fill" when GapFillFlag is 'Y' and "Sequence Reset-Reset" when GapFillFlag is N or not present.** The "Sequence Reset-Reset" mode should **ONLY** be used to recover from a disaster situation which cannot be otherwise recovered via "Gap Fill" mode. The sequence reset message can be used in the following situations:

- During normal resend processing, the sending application may choose not to send a message (e.g. an aged order). The Sequence Reset – Gap Fill is used to mark the place of that message.
- During normal resend processing, a number of **administrative messages are not resent, the Sequence Reset – Gap Fill message is used to fill the sequence gap created.**

...

The sending application will initiate the sequence reset. **The message in all situations specifies NewSeqNo to reset as the value of the next sequence number immediately following the messages and/or sequence numbers being skipped.**

...

If the GapFillFlag field is present (and equal to Y), the MsgSeqNum should conform to standard message sequencing rules (i.e. the MsgSeqNum of the Sequence Reset-GapFill message **should represent the beginning MsgSeqNum in the GapFill range** because the remote side is expecting that next message).

The sequence reset can only increase the sequence number. If a sequence reset is received attempting to decrease the next expected sequence number the message should be rejected and treated as a serious error. It is possible to have multiple ResendRequests issued in a row (i.e. 5 to 10 followed by 5 to 11). **If sequence number 8, 10, and 11 represent application messages while the 5-7 and 9 represent administrative messages**, the series of messages as result of the Resend Request may appear as **SeqReset-GapFill with NewSeqNo of 8, message 8, SeqReset-GapFill with NewSeqNo of 10, and message 10**. This could then followed by SeqReset-GapFill with NewSeqNo of 8, message 8, SeqReset-GapFill with NewSeqNo of 10, message 10, and message 11. One must be careful to ignore the duplicate SeqReset-GapFill which is attempting to lower the next expected sequence number. This can be detected by checking to see if its MsgSeqNum is less than expected. If so, the SeqReset-GapFill is a duplicate and should be discarded.

6 FIX DROP

BATS offers two types of FIX Drop ports (Standard FIX Drop and Order by Order FIX Drop). Both port types do not accept orders. Their purpose is to provide real time information about order flow. They may be configured to send order flow based on various combinations of information relating to specific member firms, clearing MPIDS and/or sessions. With proper authorization (e.g. clearing or sponsored relationships), a single FIX Drop session can be used to obtain information about multiple members.

6.1 Standard FIX Drop

Standard FIX Drop ports only send execution information (i.e. execution reports where ExecType (tag 150) is Partially Filled (1) or Filled (2)).

6.2 Order by Order FIX Drop

Order by Order FIX Drop ports are designed to send more than execution information.

All order message types are supported including, but not limited to Acknowledgements (tag 150=0), Partially Filled (tag 150=1), Filled (tag 150=2), Cancelled (tag 150=4), Replaced (tag 150=5), Rejected (tag 150=8), Order Cancel Rejects (tag 35=9) and optionally (if configured at the port level) Trade Breaks (tag 35=UCC). If the Rejects/Cancel are due to incomplete clearing information, they may be unavailable on Order by Order FIX Drop ports.

Users of Order by Order FIX Drop must always be prepared to receive new/unknown FIX tag and FIX tag values for BOE/FIX ports being monitored. **BATS reserves the right to add new FIX tags and to update values distributed on Order by Order FIX Drop with no notice.**

6.3 FIX Drop Port Attributes

Unless specified, both types of FIX Drop ports can be configured with the following features:

Attribute	Default	Description
Send Trade Breaks	No	Enables Trade Break Messages (35=UCC). Please note that enabling trade breaks on Order by Order FIX Drop port will be dependent on enabling trade breaks on corresponding BOE and/or FIX order entry ports.
Unique Wash Execution Ids	No	Reports unique values for ExecId (FIX Tag 17) for wash trades.
Concatenate Compld and SubId	No	Requires all FIX traffic to contain concatenated (combined) Comp and Sub Id's.
Send OrigCompID/OrigSubID	No	Send OrigCompID (FIX Tag 9688) and OrigSubID (FIX Tag 9689).
Send Account	No	Send Account (FIX Tag 1).
Copy ClearingFirm to Account	No	Set Account (FIX Tag 1) equal to ClearingFirm (FIX Tag 439).
Send 2 nd Liquidity Character	No	Sends the second character in TradeLiquidityIndicator (FIX Tag 9730).
Send OrdType	No	Send OrdType (FIX Tag 40). Standard FIX Drop only. Order by Order FIX Drop will receive FIX Tag 40 based on FIX order entry port attribute "Echo Tag 40 on Ack".
Send RoutingInst	No	Send RoutingInst (FIX Tag 9303). Order by Order FIX Drop only.
Send Contra Capacity	No	Send ContraCapacity (FIX Tag 7694). Order by Order FIX Drop only. For FIX order entry ports, "Send Contra Capacity" must be set on the respective FIX ports in order for this field to be populated.

7 FIX Port Attributes

The table below lists FIX port attributes that are configurable on the port or firm level. Changes to these attributes can be made by sending a written request to tradedesk@batstrading.com.

Attribute	Default	Description
Allowed Executing Firm Id(s)*	All Executing Firm Ids	Executing Firm Id(s) allowed for trading on port.
Default Executing Firm Id	None	Default Executing Firm Id to use if none is sent on New Order.
Allow ISO*	Yes	Allows or disallows ISO orders.
Allow Directed ISO*	Yes	Allows or disallows ISO orders directed to other market centers.
Default Routing Instruction†	“RND”	Specifies a default value for Tag 9303 (RoutingInst).
Maximum Order Size*	25,000	Maximum number of contracts allowed per order.
Maximum Order Dollar Value*	Unlimited	Maximum order dollar value per order.
Default Price Sliding†	“S”	Default price sliding behavior. See Tag 9479 (DisplayIndicator).
Cancel on Disconnect	Yes	Cancels all open orders upon session disconnect.
Send Trade Breaks^	No	Enables Trade Break Messages (35=UCC).
Default MTP Value**†	None	Specifies Default value for Tag 7928 (PreventMemberMatch).
Report MTP Fields**^	No	Enables Tag 31 (LastPx), 32 (LeavesQty) and 198 (SecondaryOrderId) on Execution Reports caused by MTP.
Allow MTP Decrement Override**^	No	Overrides the exception that requires both the resting and inbound order to be marked as “Decrement”.
Allow Sponsored Participant MTP Control**^	No	Allows Sponsored Participant to override port default for MTP by using Tag 7928 (PreventMemberMatch) on order-level.
Concatenate Compld and Subld	No	Requires all FIX traffic to contain concatenated (combined) Comp and Sub Id’s.
Cancel on Reject†	No	Cancels an order upon a cancel or modify reject for that order.
Report Working Price	No	Reports Tags 9690 (WorkingPrice) and 9691 (InitialDisplayPrice).
Unique Wash Execution Ids	No	Reports unique values for Tag 17 (ExecId) for wash trades.
Enable State Change Tracking^	No	Allows for tracking of the state of routable orders. See Section 4.5.1.1 (State Change Tracking) for more information.

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Send 2 nd Liquidity Character	No	Sends the second character in Tag 9730 (TradeLiquidityIndicator).
Decrement Remainder Only [^]	No	Enables “d” option for MTP. See Tag 7928 (PreventMemberMatch) for details.
Restate on Reload [^]	No	Generates FIX Restatement on reserve order reload with new PITCH Order Id in Tag 198.
Echo Tag 40 on Ack	No	Return Tag 40 (OrdType) value on FIX Ack. Note that this value will also be returned on Order by Order FIX DROP.
Echo Tag 47 on Ack	No	Return Tag 47 (Rule80A/OrderCapacity) value on FIX Ack. Note that this value will also be returned on Order by Order FIX DROP.
Microsecond Timestamp Granularity	No	Display microsecond level timestamp granularity for Tags 60 (TransactTime), 42 (OrigTime) and 52 (SendingTime). These tags default to millisecond granularity.
Fat Finger Protection*	None	Specifies a percentage based limit price tolerance where any orders entered with a limit price that is through the NBBO by an amount greater than or equal to the defined percentage will be rejected.
Reject Orders on DROP Port Disconnect*	No	Allows Member/Sponsoring Firms to associate a DROP port(s) to a FIX port(s). Once the association has been established and all DROP ports associated with a FIX port experience a session disconnect, reject orders on the FIX port until at least one of the DROP port sessions have been reestablished.
Reject Orders on DROP Port Timeout (s)*	30	Only applicable for sessions where “Reject Orders on DROP Port Disconnect” has been enabled. When the last associated DROP port for the order entry session has disconnected, the reject/cancel actions will be taken on the order entry session if an associated DROP port has not reestablished its connection in the defined time. Minimum value allowed is 20.
Cancel Open Orders on DROP Port Disconnect*	No	Only applicable for sessions where “Reject Orders on DROP Port Disconnect” has been enabled. If all DROP ports associated with a order entry port become disconnected, cancel all open orders on the order entry port.

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Notional Cutoff Aggregation Methods*		<p>Gross exposure = CBB + CBO + CEB + CEO.</p> <p>Net exposure = ABSOLUTE VALUE of [(CEO + CBO) – (CEB+CBB)]</p> <p>On a given port BATS will calculate and track four values as follows:</p> <ul style="list-style-type: none"> ➤ Cumulative Notional Booked Bid Value (CBB) – The sum of limit price * size for all buy limit orders on the book. ➤ Cumulative Notional Booked Offer Value (CBO) – The sum of limit price * size for all sell limit orders on the book. ➤ Cumulative Notional Executed Bid Value (CEB) – The sum of size * trade price on all executed buy orders. <p>Cumulative Notional Executed Offer Value (CEO) – The sum of size * trade price on all executed sell orders.</p>
Gross Daily Risk Limit Order Notional Cutoff*	None	Optional parameter that if specified will result in rejects for limit orders when gross exposure of limit orders exceeds this value. Whole dollar value not to exceed \$1B/port.
Gross Daily Risk Market Order Notional Cutoff*	None	Optional parameter that if specified will result in rejects for market orders when gross exposure of limit orders exceeds this value. Whole dollar value not to exceed \$1B/port.
Net Daily Risk Limit Order Notional Cutoff*	None	Optional parameter that if specified will result in rejects for limit orders when net exposure of limit orders exceeds this value. Whole dollar value not to exceed \$1B/port.
Net Daily Risk Market Order Notional Cutoff*	None	Optional parameter that if specified will result in rejects for market orders when net exposure of limit orders exceeds this value. Whole dollar value not to exceed \$1B/port.
Send Routing Instruction	No	Include Tag 9303 (RoutingInst) on Order by Order FIX Drop execution reports.
Send Contra Capacity	No	Include Tag 7694 (ContraCapacity) on execution reports.

* Sponsored Participants require written approval from Sponsors to update these settings on ports associated to a Sponsor's MPID.

† Port attribute can be overridden via FIX on an order by order basis.

^ Requires certification.

8 References

For more information on BATS Symbology, please refer to the BATS Symbology Reference document at http://www.batstrading.com/resources/membership/BATS_Symbology.pdf.

9 Support

Please e-mail questions or comments regarding this specification to tradedesk@batstrading.com.

Revision History

Document Version	Date	Description
0.1	09/17/09	Initial draft version.
1.0	10/05/09	Release 1.0 distributed.
1.0.1	10/08/09	Various minor updates.
1.1.0	10/28/09	New technical specification template and tag 115/128 info updates.
1.1.1	01/29/10	Added State Change Tracking. Removed 375=NYSE
1.1.2	02/04/10	Added Common Session Level Issues.
1.1.3	03/04/10	Corrected example for price data type. Corrected description for tag 116.
1.1.4	03/05/10	Updated description for tag 1 and 440.
1.1.5	05/14/10	Opt-in support added for MMTP Decrement method to work with other method types. Opt-in support added to allow Sponsored Participants to override port level MMTP settings on an order by order basis with approval of Sponsor.
1.2.0	08/06/10	Added FIX Drop section and updated DROP/FIX Drop references.
1.3.0	08/27/10	Updated 9303 definitions to match equity specification format. BATS Specific Fields section converted into a reference table.
1.4.0	09/15/10	Updated 9303 to add 3 rd character support for strategy definition (in support of Parallel routing strategies) that will be effective by 10/01/10. Corrected tag 375 (Contra) parameter for Nasdaq (NOMX). Replaced RECYCLE references with Re-Route.
1.4.1	09/28/10	Default routing strategy changing effective 10/01/10 to Parallel-D.
1.4.2	10/08/10	Added support for C2 in tag 9303.
1.4.3	10/11/10	Added tag 7692 (RiskReset).
1.4.4	10/27/10	Added support for C2 in tag 375.
1.4.5	11/04/10	Parallel T and Parallel 2D effective date noted.
1.4.6	11/08/10	Parallel T strategy reference removed.
1.4.7	12/08/10	Updated 9621 definition.

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1.4.8	12/20/10	Added 9730=S in 2 nd character position (optional feature).
1.4.9	12/21/10	Added MMTP reference for 7928=d.
1.5.0	12/28/10	Added Port Attributes section. Renamed MMTP to MTP.
1.5.1	01/14/11	Added tag 167 (SecurityType) to Execution Report
1.5.2	02/10/11	Added tag 6655 (CorrectedSize) to the Trade Cancel/Correct message type.
1.6.0	03/03/11	Removing 9622 DiscretionAmount effective 04/01/11.
1.6.1	03/25/11	Allow for opt-in of echoing Tag 47 (Rule80A/OrderCapacity) on FIX Ack effective 04/01/11.
1.6.2	04/01/11	Removal of 9622 DiscretionAmount postponed.
1.6.3	05/24/11	Added Microsecond Timestamp Granularity port attribute to allow for microsecond level timestamps for certain tags.
1.7.0	06/28/11	Added Mass Cancel effective 07/01/11. Added support for Firm level Risk Management rule Risk Resets effective 07/15/11.
1.7.1	07/12/11	Added Fat Finger Protection port attribute definition. Added some clarification to Mass Cancel definition.
1.7.2	07/22/11	Added Echo Tag 40 on Ack and Reject Orders on DROP Port Disconnect port attribute definition.
1.7.3	08/24/11	Added 9622 DiscretionAmount. Added additional DROP Port Disconnect port attribute definitions.
1.7.4	09/20/11	Added support for Professional Customer capacity (<i>effective date 11/01/11</i>). Added tag 58 value for Market Access Risk Limit cancel or reject.
1.7.5	11/07/11	Added Notional Cutoff Aggregation Method, Limit Order Notional Cutoff, and Market Order Notional Cutoff to Port Attributes section.
1.7.6	12/01/11	Added clarification to tag 102 usage with regard to Cancel Rejects messages.
1.7.7	12/08/11	Added Send Routing Instruction to Port Attributes section.
1.8.0	12/16/11	Updated FIX Drop Port Attributes section and renamed Port Attributes section FIX Port Attributes . Added Send Contra Capacity Instruction to FIX Port Attributes and FIX Drop Port Attributes section. Add tag 58 value "o = Max Open Orders Count Exceeded" as a reject reason code.

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1.8.1	12/21/11	Noted that BATS reserves the right to add new FIX tags and to update values distributed on Order by Order FIX Drop with no notice.
1.8.2	01/05/12	Added Multiple Display-Price Sliding (9479=M).
1.8.3	01/17/12	Added capability within Order Cancel Request message to specify a <i>MassCancel</i> (tag 7693) option that will limit cancel acknowledgements to a single Execution Report message. <i>Effective 1/27/12.</i>
1.8.4	01/18/12	Updated Multiple Display-Price Sliding <i>effective date</i> to <i>effective pending SEC Approval.</i>
1.8.5	01/19/12	Added capability to echo <i>MassCancelID</i> in <code>Cancel Reject</code> messages.
1.8.6	01/25/12	Correction to <i>MassCancel</i> (tag 7693) definition. <i>MassCancel</i> requests that contain tag 41 (<i>OrigClOrdID</i>) will be rejected. <i>ClOrdID</i> was noted incorrectly.
1.9.0	02/01/12	Added support for using either Net, Gross, <u>or a combination of both</u> Notional Cutoff Aggregation Methods to the Port Attributes section. <i>Effective 02/03/12.</i> Removed Notional Cutoff Aggregation Method attribute and added specific attributes for both Gross and Net Daily Risk Limit/Market Cutoffs. <i>Effective 02/03/12.</i>