Cboe Europe

Binary Order Entry Specification

Version 2.0.47

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Contents

1 Introduction

1.1 Overview

This document describes Cboe Binary Order Entry (BOE), the Cboe Europe (hereafter, "Cboe") proprietary order entry protocol.

Where applicable, the terminology (e.g., time in force) used in this document is similar to that used by the FIX protocol to allow those familiar with FIX to more easily understand BOE. This document assumes the reader has basic knowledge of the FIX protocol.

BOE fulfills the following requirements:

- *CPU and memory efficiency.* Message encoding, decoding, and parsing are simpler to code and can be optimized to use less CPU and memory at runtime.
- *Application level simplicity.* State transitions are simple and unambiguous. They are easy to apply to a Participant's representation of an order.
- *Session level simplicity.* The session level protocol (login, sequencing, replay of missed messages, logout) is simple to understand.

Whilst Cboe has strived to preserve feature parity between FIX and BOE where possible, some features may only be available in one protocol or the other.

All binary values are in little Endian (used by Intel x86 processors), and *not* network byte order.

Each message is identified by a unique message type. Not all message types are used in all of the Cboe trading environments globally. A listing of the supported message types is provided in **List of Message Types** (§ 9, p. 107).

All communication is via standard TCP/IP.

1.2 Motivation for Version 2

BOE Version 1 has a number of fixed size parts of messages which, while envisioned to be large enough for future growth, have been unable to accomodate Cboe growth into new service offerings. Version 2 allows greater opportunity for future expansion by eliminating those problems.

Version 2's goals are as follows:

- *Return bitfield expansion.* Messages from Cboe to Participant no longer have a limited number of return bitfields. Participants may ignore newly added fields as before, but there is no longer a fixed limit to the number of possible fields returned.
- *Login message parameter groups.* In Version 2, the Login Request V2 message can have extendable parameter groups sent to modify behavior in a forward compatible manner.
- *Easy extension of messages from Participant to Cboe to support more bitfields.* In Version 1, messages such as New Order supported a fixed number of bitfields. In Version 2, New Order V2 requires that the number of entered bitfields be specified. This supports, in a backwards compatible way, addition of new bitfields in the future.
- *Easier addition of new messages.* In Version 1, the return bitfields for *all* messages had to be represented in the Login Request. Addition of messages meant changes to the fundamental structure of the Login Request. In Version 2, repeatable parameter groups are used to specify which bitfields are to be sent for different message type. This allows the Login Request V2 to accomodate new message types without fundamental changes to the message structure.

- *Simplification of documentation.* Cboe has reduced the complexity of this documentation to make BOE easier to understand.

If you are newly developing to the Cboe BOE, you should implement to Version 2 of the specification. Newly added features (e.g., new message fields) *may* be implemented only in Version 2. You may migrate to Version 2 at any point, but you will be *required* to migrate to Version 2 if and when you require use of such features.

To the extent possible, Version 2 has a similar "look and feel" to Version 1. Session-level concepts such as sequencing and heartbeats are identical. Only messages documented in Version 2 are supported on a connection established with a Login Request V2. Data type encoding remains identical. A design goal for the evolution to Version 2 was to make it possible to upgrade Version 1 code to support Version 2 with a minimal amount of development effort.

1.3 Data Types

The following data types are used by BOE. The size of some data types varies by message. All data types have default values of binary zero, in both Participant to Cboe and Cboe to Participant contexts.

- *Binary*: Little Endian byte order, unsigned binary value. The number of bytes used depends on the context.
  - One byte: `FE` $= 254$
  - Four bytes: `64 00 00 00` $= 100$
- *Signed Binary*: Little Endian byte order, signed two's complement, binary value. The number of bytes used depends on the context.
  - One byte: `DF` $= -33$
  - Four bytes: `64 00 00 00` $= +100$

- *Binary Price*: Little Endian byte order value, signed two's complement, eight bytes in size, with four implied decimal places. So, if the value is $123,400$, the actual value taking into account implied decimal places is 12.34.
  - `08 E2 01 00 00 00 00 00` $= 123,400/10000 = 12.34$

  For negative prices, if the value is $-123,400$, the actual value taking into account implied decimal places is -12.34.
  - `F8 1D FE FF FF FF FF FF` $= -123,400/10000 = -12.34$
- *Short Binary Price*: Little Endian byte order value, signed two's complement, four bytes in size, with four implied decimal places. So, if the value is $12,300$, the actual value taking into account implied decimal places is 1.23.
  - `78 E0 01 00` $= 123,000/10000 = 1.23$
- *Trade Price*: Little Endian byte order value, eight bytes in size, with seven implied decimal places. So, if the value is $123,400,000$, the actual value taking into account implied decimal places is 12.34.
  - `40 EF 5A 07 00 00 00 00` $= 123,400,000/10000000 = 12.34$
- *Signed Binary Fee*: Little Endian byte order value, signed two's complement, eight bytes in size, signed, with five implied decimal places. So, the value $-123,000$ is -1.23 after taking account for the five implied decimal places.
  - `88 1F FE FF FF FF FF FF` $= -123,000/100000 = -1.23$
- *Alpha*: Uppercase letters (A–Z) and lowercase letters (a–z) only. ASCII NUL (0x00) filled on the right, if necessary. The number of bytes used depends on the context.
- *Alphanumeric*: Uppercase letters (A–Z), lowercase letters (a–z) and numbers (0–9) only. ASCII NUL (0x00) filled on the right, if necessary.
- *Text*: Printable ASCII characters only. ASCII NUL (0x00) filled on the right, if necessary.
- *DateTime*: 8 bytes. The date and time, in UTC, represented as nanoseconds past the UNIX epoch (00:00:00 UTC on 1 January 1970). The nanoseconds portion is currently ignored and treated as 0 (i.e. the times are only accurate to microseconds) on input, and will always be set to 0 by Cboe in outgoing messages. However, Cboe may begin populating the nanoseconds portion at any time without warning.

  For example: 1,294,909,373,757,324,000 = `2011-01-13 09:02:53.757324 UTC`.
- *Date*: Little Endian byte order, unsigned binary value, 4 bytes in size. The YYYYMMDD expressed as an integer.

1.4 Optional Fields and Bitfields

Some messages such as NEW ORDER V2 and MODIFY ORDER V2 have a number of optional fields. A count and number of bitfields in the message specify which optional fields will be present at the end of the message. If a bit is set, the field will be present. Fields are appended to the end of the message. There is no implicit framing between the optional fields. In order to decode the optional fields, they *must* be appended in a particular order to the end of the message. The fields of the first bitfield are appended first, lowest order bit first. Next, the fields of the next bitfield are appended, lowest order bit first. This continues for all bitfields. While certain *reserved* bits within a defined bitfield are used within another Cboe market and will be ignored, bits that are reserved for future expansion must be set to 0 when noted in the bitfield description.

The size, data type, and values for each field are described in **List of Optional Fields** (§ 7, p. 94).

Note that the set of optional fields returned for each Cboe to Participant message type is determined at session login (using the LOGIN REQUEST V2 message); hence, the exact size and layout of each message received by the client application can be known in advance. Any requested optional field which is irrelevant in a particular context will still be present in the returned message, but with all bytes set to binary zero (0x00).

Each return message from Cboe to Participant indicates the optional fields which are present, even though the Participant indicated during login which optional fields are to be sent. The reason for the inclusion (and duplication) is so that each message can be interpreted on its own, without having to find the corresponding login request or response to know which optional fields are present. So, for example, in a log file, decoding a message requires only that single message.

Example messages are shown with each message type which should help to make this concept clear.

2 Session

2.1 Message Headers

Each message has a ten byte header. The two initial *StartOfMessage* bytes are present to aid in message reassembly for network capture purposes. The *MatchingUnit* field is only populated on sequenced non-session level messages sent from Cboe to the Participant. Messages from Participant to Cboe and all session level messages must always set this value to 0.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	Message type.
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH. **For session level traffic, the unit is set to 0.** **For messages from Participant to Cboe, the unit must be 0.**
SequenceNumber	6	4	Binary	The sequence number for this message. Messages from Cboe to Participant are sequenced distinctly per matching unit. Messages from Participant to Cboe are sequenced across all matching units with a single sequence stream. Participant can optionally send a 0 sequence number on all messages from Participant to Cboe. Cboe highly recommends Participant to send sequence number on all inbound messages.

2.2 Login, Replay and Sequencing

Session level messages, both inbound (Participant to Cboe) and outbound (Cboe to Participant) are unsequenced.

Inbound (Participant to Cboe) application messages are sequenced. Upon reconnection, Cboe informs the Participant of the last processed sequence number; the Participant *may* choose to resend any messages with sequence numbers greater than this value. A gap forward in the Participant's incoming sequence number is permitted at any time and is ignored by Cboe. Gaps backward in sequence number (including the same sequence number used twice) are never permitted and will always result in a LOGOUT message being sent and the connection being dropped.

Most (but not all) outbound (Cboe to Participant) application messages are monotonically sequenced per matching unit. Each message's documentation will indicate whether it is sequenced or unsequenced. While matching units on BOE correspond directly to matching units on Multicast PITCH, sequence numbers do not.

Upon reconnection, a Participant sends the last received sequence number per matching unit in a LOGIN REQUEST V2 message. Cboe will respond with any missed messages. However, when the LOGIN REQUEST V2 *NoUnspecifiedUnitReplay* flag is enabled, Cboe will exclude messages from unspecified matching units during replay. Cboe will send a REPLAY COMPLETE message when replay is finished. If there are no messages to replay,

a Replay Complete message will be sent immediately after a Login Response V2 message. Cboe will reject all orders during replay.

Assuming Participant has requested replay messages using a properly formatted Login Request V2 after a disconnect, any unacknowledged orders remaining with the Participant after the Replay Complete message is received should be assumed to be unknown to Cboe.

Unsequenced messages will not be included during replay.

A session is identified by the username and session sub-identifier (both supplied by Cboe). Only one concurrent connection per username and session sub-identifier is permitted.

If a login is rejected, an appropriate Login Response V2 message will be sent and the connection will be terminated.

2.3 Sequence Reset

A reset sequence operation is not available for Binary Order Entry. However, a Participant can send a Login Request message with *NoUnspecifiedUnitReplay* field enabled, and *NumberOfUnits* field set to zero. Then, upon receiving a Login Response V2 message from Cboe, the Participant can use the field *LastReceivedSequenceNumber* as the sequence starting point for sending future messages.

2.4 Heartbeats

Client Heartbeat messages are sent from Participant to Cboe and Server Heartbeat messages are sent from Cboe to Participant if no other data has been sent in that direction for one second. Like other session level messages, heartbeats from Cboe to the Participant do *not* increment the sequence number. If Cboe receives no inbound data or heartbeats for five seconds, a Logout message will be sent and the connection will be terminated. **Participants are encouraged to have a one second heartbeat interval and to perform similar connection staleness logic.**

2.5 Logging Out

To gracefully log out of a session, a Logout Request message should be sent by the Participant. Cboe will finish sending any queued data for that port and will then respond with its own Logout message and close the connection. After receipt of a Logout Request message, Cboe will ignore all other inbound (Participant to Cboe) messages except for Client Heartbeat.

3 Session Messages

3.1 Participant to Cboe

3.1.1 Login Request V2

A Login Request V2 message must be sent as the first message upon connection.

A number of repeating parameter groups, some of which may be required, are sent at the end of the message. Ordering of parameter groups is not important. New parameter groups may be added in the future with no notice.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x37
MatchingUnit	5	1	Binary	Always 0 for inbound (Participant to Cboe) messages.
SequenceNumber	6	4	Binary	Always 0 for session level messages.
SessionSubID	10	4	Alphanumeric	Session Sub ID supplied by Cboe.
Username	14	4	Alphanumeric	Username supplied by Cboe.
Password	18	10	Alphanumeric	Password supplied by Cboe.
NumberOfParam Groups	28	1	Binary	A number, n (possibly 0), of parameter groups to follow.
ParamGroup$_1$				First parameter group.
⋮				
ParamGroup$_n$				Last parameter group.

Unit Sequences Parameter Group

This parameter group includes the last consumed sequence number per matching unit received by the Participant. Cboe uses these sequence numbers to determine what outbound (Cboe to Participant) traffic, if any, was missed by the Participant. If this parameter group is not sent, it's assumed the Participant has not received any messages (e.g., start of day).

The Participant does *not* need to include a sequence number for a unit if they have never received messages from it. For example, if the Participant has received responses from units 1, 3, and 4, the Login Request V2 message need not include unit 2. If the Participant wishes to send a value for unit 2 anyway, 0 would be the only allowed value.

Only one instance of this parameter group may be included.

Field	Offset	Length	Data Type	Description
ParamGroupLength	0	2	Binary	Number of bytes for the parameter group, including this field.
ParamGroupType	2	1	Binary	0x80
NoUnspecified UnitReplay	3	1	Binary	Flag indicating whether to replay missed outgoing (Cboe to Participant) messages for unspecified units. 0x00 = False (Replay Unspecified Units) 0x01 = True (Suppress Unspecified Units Replay)

NumberOfUnits	4	1	Binary	A number, n (possibly 0), of unit/sequence pairs to follow, one per unit from which the Participant has received messages.
$\quad$ *UnitNumber*$_1$		1	Binary	A unit number.
$\quad$ *UnitSequence*$_1$		4	Binary	Last received sequence number for the unit.
$\quad \vdots$				
$\quad$ *UnitNumber*$_n$		1	Binary	A unit number.
$\quad$ *UnitSequence*$_n$		4	Binary	Last received sequence number for the unit.

Return Bitfields Parameter Group

This parameter group, which may be repeated, indicates which attributes of a message will be returned by Cboe for the remainder of the session. This allows Participants to tailor the echoed results to the needs of their system without paying for bandwidth or processing they do not need.

Listing of the return bitfields which are permitted per message is contained in **Return Bitfields Per Message** (§ 6, p. 55).

Field	Offset	Length	Data Type	Description
ParamGroupLength	0	2	Binary	Number of bytes for the parameter group, including this field.
ParamGroupType	2	1	Binary	`0x81`
MessageType	3	1	Binary	Return message type for which the bitfields are being specified (e.g., `0x25` for an ORDER ACKNOWLEDGMENT V2 message)
NumberOfReturn Bitfields	4	1	Binary	Number of bitfields to follow.
ReturnBitfield$_1$	5	1	Binary	Bitfield identifying fields to return.
$\quad \vdots$				
ReturnBitfield$_n$		1	Binary	Last bitfield.

Example Login Request V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes.
MessageLength	43 00	67 bytes
MessageType	37	Login Request V2
MatchingUnit	00	Always 0 for inbound messages
SequenceNumber	00 00 00 00	Always 0 for session level messages
SessionSubID	30 30 30 31	0001
Username	54 45 53 54	TEST
Password	54 45 53 54 49 4E 47 00 00 00	TESTING
NumberOfParam Groups	03	3 parameter groups
ParamGroupLength	14 00	20 bytes for this parameter group
ParamGroupType	80	0x80 = Unit Sequences
NoUnspecified UnitReplay	01	True (replay only specified units)
NumberOfUnits	03	Three unit/sequence pairs to follow;
$UnitNumber_1$	01	Unit 1
$UnitSequence_1$	4A BB 01 00	Last received sequence of 113,482
$UnitNumber_2$	02	Unit 2
$UnitSequence_2$	00 00 00 00	Last received sequence of 0
$UnitNumber_3$	04	Unit 4
$UnitSequence_3$	79 A1 00 00	Last received sequence of 41,337
ParamGroupLength	08 00	8 bytes for this parameter group
ParamGroupType	81	0x81 = Return Bitfields
MessageType	25	0x25 = Order Acknowledgment V2
NumberOfReturn Bitfields	03	3 bitfields to follow
$ReturnBitfield_1$	00	No bitfields from byte 1
$ReturnBitfield_2$	41	*Symbol*, *Capacity*
$ReturnBitfield_3$	05	*Account*, *ClearingAccount*
ParamGroupLength	0C 00	12 bytes for this parameter group
ParamGroupType	81	0x81 = Return Bitfields
MessageType	2C	0x2C = Order Execution V2
NumberOfReturn Bitfields	07	7 bitfields to follow
$ReturnBitfield_1$	00	No bitfields from byte 1
$ReturnBitfield_2$	41	*Symbol*, *Capacity*
$ReturnBitfield_3$	07	*Account*, *ClearingFirm*, *ClearingAccount*
$ReturnBitfield_4$	00	No bitfields from byte 4
$ReturnBitfield_5$	40	*BaseLiquidityIndicator*
$ReturnBitfield_6$	00	No bitfields from byte 6
$ReturnBitfield_7$	01	*SubLiquidityIndicator*

3.1.2 Logout Request

To end the session, the Participant should send a LOGOUT REQUEST message. Cboe will finish sending any queued data and finally respond with a LOGOUT message and close the connection.

A Participant may simply close the connection without logging out, but may lose any queued messages by doing so.

LOGOUT REQUEST remains unchanged between Versions 1 and 2.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x02
MatchingUnit	5	1	Binary	Always 0 for inbound (Participant to Cboe) messages.
SequenceNumber	6	4	Binary	Always 0 for session level messages.

Example Logout Request Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes.
MessageLength	08 00	8 bytes
MessageType	02	Logout Request
MatchingUnit	00	Always 0 for inbound messages
SequenceNumber	00 00 00 00	Always 0 for session level messages

3.1.3 Client Heartbeat

See **Heartbeats** (§ 2.4, p. 9) for more information about heartbeats and the session level protocol.

Client Heartbeat remains unchanged between Versions 1 and 2.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x03
MatchingUnit	5	1	Binary	Always 0 for inbound (Participant to Cboe) messages.
SequenceNumber	6	4	Binary	Always 0 for session level messages.

Example Client Heartbeat Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes.
MessageLength	08 00	8 bytes
MessageType	03	Client Heartbeat
MatchingUnit	00	Always 0 for inbound messages
SequenceNumber	00 00 00 00	Always 0 for session level messages

3.2 Cboe to Participant

3.2.1 Login Response V2

A LOGIN RESPONSE V2 message is sent in response to a LOGIN REQUEST V2 message. On a successful login, the *LoginResponseStatus* will be set to `A`. On a failed login, *LoginResponseStatus* will be set to a value other than `A`, and *LoginResponseText* will be set to an appropriate failure description.

Cboe will verify Return Bitfields at login time. If the Return Bitfields in a Return Bitfields Parameter Group are invalid, *LoginResponseStatus* will be set to `F`, and *LoginResponseText* will include a description of which byte and bit are invalid. This is done to ensure that reserved fields are not used, and only options that apply to the local market are set. See **Return Bitfields Per Message** (§ 6, p. 55) for additional information.

Note that two sets of sequence numbers are available on the LOGIN RESPONSE V2. The set of sequence numbers in the body are the actual Cboe to Participant sequence numbers indicating the highest sequence numbers available per matching unit. If specified during login, the Unit Sequences Parameter Group will also be returned which is an echo of the sequence numbers the Participant presented during login as the highest received. If these are different, it indicates a gap which will be filled by Cboe.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x24`
MatchingUnit	5	1	Binary	Always 0 for session level messages.
SequenceNumber	6	4	Binary	Always 0 for session level messages.
LoginResponse Status	10	1	Alphanumeric	Accepted, or the reason for the rejection. `A` = Login Accepted `N` = Not authorized (invalid username/password) `D` = Session is disabled `B` = Session in use `S` = Invalid session `Q` = Sequence ahead in Login message `I` = Invalid unit given in Login message `F` = Invalid return bitfield in login message `M` = Invalid Login Request message structure
LoginResponse Text	11	60	Text	Human-readable text with additional information about the reason for rejection. For successful logins, this is empty. ASCII NUL (0x00) filled on the right, if necessary.
NoUnspecified UnitReplay	71	1	Binary	Echoed back from the original LOGIN REQUEST V2 message.
LastReceived SequenceNumber	72	4	Binary	Last inbound (Participant to Cboe) message sequence number processed by Cboe.
NumberOfUnits	76	1	Binary	A number, n, of unit/sequence pairs to follow, one per unit. A pair for every unit will be sent, even if no messages have been sent to this port today. For unsuccessful logins, this will be 0.
UnitNumber$_1$		1	Binary	A unit number.
UnitSequence$_1$		4	Binary	Highest available Cboe to Participant sequence number for the unit.
⋮				

UnitNumber$_n$		1	Binary	A unit number.
UnitSequence$_n$		4	Binary	Highest available Cboe to Participant sequence number for the unit.
NumberOfParam Groups		1	Binary	Echoed back from the original LOGIN REQUEST V2 message.
ParamGroup$_1$				Echoed back from the original LOGIN REQUEST V2 message.
⋮				
ParamGroup$_n$				Echoed back from the original LOGIN REQUEST V2 message.

Example Login Response V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes.
MessageLength	88 00	136 bytes
MessageType	24	Login Response V2
MatchingUnit	00	Always 0 for session messages
SequenceNumber	00 00 00 00	Always 0 for session level messages
LoginResponseStatus	41	A = Login Accepted
LoginResponseText	41 63 63 65 70 74 65 64 00 00	Accepted
	00 00 00 00 00 00 00 00 00 00	(padding)
	00 00 00 00 00 00 00 00 00 00	(padding)
	00 00 00 00 00 00 00 00 00 00	(padding)
	00 00 00 00 00 00 00 00 00 00	(padding)
	00 00 00 00 00 00 00 00 00 00	(padding)
NoUnspecified UnitReplay	01	True (replay only specified units)
Last Received Sequence Number	54 4A 02 00	Last sequence Cboe received of 150,100
NumberOfUnits	04	Four unit/sequence pairs to follow.
UnitNumber$_1$	01	Unit 1
UnitSequence$_1$	4A BB 01 00	Actual last sequence of 113,482
UnitNumber$_2$	02	Unit 2
UnitSequence$_2$	00 00 00 00	Actual last sequence of 0
UnitNumber$_3$	03	Unit 3
UnitSequence$_3$	00 00 00 00	Actual last sequence of 0
UnitNumber$_4$	04	Unit 4
UnitSequence$_4$	79 A1 00 00	Actual last sequence of 41,337
NumberOfParam Groups	03	3 parameter groups
ParamGroupLength	14 00	20 bytes for this parameter group
ParamGroupType	80	0x80 = Unit Sequences
NoUnspecified UnitReplay	01	True (replay unspecified units)
NumberOfUnits	03	Three unit/sequence pairs to follow
UnitNumber$_1$	01	Unit 1
UnitSequence$_1$	4A BB 01 00	Last received sequence of 113,482
UnitNumber$_2$	02	Unit 2
UnitSequence$_2$	00 00 00 00	Last received sequence of 0
UnitNumber$_3$	04	Unit 4
UnitSequence$_3$	79 A1 00 00	Last received sequence of 41,337
ParamGroupLength	08 00	8 bytes for this parameter group

ParamGroupType	81	0x81 = Return Bitfields
MessageType	25	0x25 = Order Acknowledgment V2
NumberOfReturn Bitfields	03	3 bitfields to follow
$ReturnBitfield_1$	00	No bitfields from byte 1
$ReturnBitfield_2$	41	*Symbol*, *Capacity*
$ReturnBitfield_3$	05	*Account*, *ClearingAccount*
ParamGroupLength	0C 00	12 bytes for this parameter group
ParamGroupType	81	0x81 = Return Bitfields
MessageType	2C	0x2C = Order Execution V2
NumberOfReturn Bitfields	07	7 bitfields to follow
$ReturnBitfield_1$	00	No bitfields from byte 1
$ReturnBitfield_2$	41	*Symbol*, *Capacity*
$ReturnBitfield_3$	07	*Account*, *ClearingFirm*, *ClearingAccount*
$ReturnBitfield_4$	00	No bitfields from byte 4
$ReturnBitfield_5$	40	*BaseLiquidityIndicator*
$ReturnBitfield_6$	00	No bitfields from byte 6
$ReturnBitfield_7$	01	*SubLiquidityIndicator*

3.2.2 Logout

A LOGOUT is usually sent in response to a LOGOUT REQUEST. Any queued data is transmitted, a LOGOUT is sent, and Cboe will close the connection. However, a LOGOUT may also be sent if the Participant violates the protocol specification (e.g., by moving backwards in sequence number).

The LOGOUT contains the last transmitted sequence number for each unit, allowing the Participant to check that their last received sequence number matches.

LOGOUT remains unchanged between Versions 1 and 2.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x08
MatchingUnit	5	1	Binary	Always 0 for session level messages.
SequenceNumber	6	4	Binary	Always 0 for session level messages.
LogoutReason	10	1	Alphanumeric	The reason why the LOGOUT message was sent. U = User Requested E = End of Day A = Administrative ! = Protocol Violation
LogoutReason Text	11	60	Text	Human-readable text with additional information about the reason for logout. Particularly useful if *LogoutReason* = ! (Protocol Violation).
LastReceived SequenceNumber	71	4	Binary	Last inbound (Participant to Cboe) message sequence number processed by Cboe.
NumberOfUnits	75	1	Binary	A number, n (possibly 0), of unit/sequence pairs to follow, one per unit from which the client has received messages.

UnitNumber$_1$		1	Binary	A unit number.
UnitSequence$_1$		4	Binary	Highest available sequence number for the unit.
⋮				
UnitNumber$_n$		1	Binary	A unit number.
UnitSequence$_n$		4	Binary	Highest available sequence number for the unit.

Example Logout Message:

Field Name	Hexadecimal	Notes
StartOfMessage	`BA BA`	Start of message bytes.
MessageLength	`55 00`	85 bytes
MessageType	`08`	Logout
MatchingUnit	`00`	Always 0 for session level messages
SequenceNumber	`00 00 00 00`	Always 0 for session level messages
LogoutReason	`55`	`U` = User Requested
LogoutReason	`55 73 65 72 00 00 00 00 00 00`	`User`
Text	`00 00 00 00 00 00 00 00 00 00`	
	`00 00 00 00 00 00 00 00 00 00`	
	`00 00 00 00 00 00 00 00 00 00`	
	`00 00 00 00 00 00 00 00 00 00`	
	`00 00 00 00 00 00 00 00 00 00`	
LastReceived SequenceNumber	`54 5A 02 00`	Last Cboe received sequence of 150,100
NumberOfUnits	`03`	Three unit/sequence pairs to follow.
UnitNumber$_1$	`01`	Unit 1
UnitSequence$_1$	`4A BB 01 00`	Last sent sequence of 113,482
UnitNumber$_2$	`02`	Unit 2
UnitSequence$_2$	`00 00 00 00`	Last sent sequence of 0
UnitNumber$_3$	`04`	Unit 4
UnitSequence$_3$	`79 A1 00 00`	Last sent sequence of 41,337

3.2.3 Server Heartbeat

See **Heartbeats** (§ 2.4, p. 9) for more information about heartbeats and the session level protocol.

SERVER HEARTBEAT remains unchanged between Versions 1 and 2.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x09`
MatchingUnit	5	1	Binary	Always 0 for session level messages.
SequenceNumber	6	4	Binary	Always 0 for session level messages.

Example Server Heartbeat Message:

Field Name	Hexadecimal	Notes
StartOfMessage	`BA BA`	Start of message bytes.
MessageLength	`08 00`	8 bytes
MessageType	`09`	Server Heartbeat
MatchingUnit	`00`	Always 0 for session level messages

SequenceNumber	00 00 00 00	Always 0 for session level messages

3.2.4 Replay Complete

See **Login, Replay and Sequencing** (§ 2.2, p. 8) for more information on Login, sequencing and replay. Replay Complete remains unchanged between Versions 1 and 2.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x13
MatchingUnit	5	1	Binary	Always 0 for session level messages.
SequenceNumber	6	4	Binary	Always 0 for session level messages.

Example Replay Complete Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes.
MessageLength	08 00	8 bytes
MessageType	13	Replay Complete
MatchingUnit	00	Always 0 for session level messages
SequenceNumber	00 00 00 00	Always 0 for session level messages

4 Application Messages

4.1 Participant to Cboe

4.1.1 New Order V2

A NEW ORDER V2 message consists of a number of required fields followed by a number of optional fields. The optional fields used are specified by setting bits in the *NewOrderBitfields*. Fields must be appended at the end of the message, starting with the lowest order enabled bit in the first bitfield first.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x38`
MatchingUnit	5	1	Binary	Always 0 for inbound (Participant to Cboe) messages.
SequenceNumber	6	4	Binary	The sequence number for this message.
ClOrdID	10	20	Text	Corresponds to *ClOrdID* (11) in Cboe FIX. Day-unique ID chosen by the client. Characters in the ASCII range 33–126 are allowed, except for comma, semicolon, and pipe. If the ClOrdID matches a live order, the order will be rejected as duplicate. **Note: Cboe only enforces uniqueness of ClOrdID values among currently live orders. However, we strongly recommend that you keep your ClOrdID values day-unique.**
Side	30	1	Alphanumeric	Corresponds to *Side* (54) in Cboe FIX. `1` = Buy `2` = Sell `5` = Sell Short `6` = Sell Short Exempt `H` = Sell Undisclosed
OrderQty	31	4	Binary	Corresponds to *OrderQty* (38) in Cboe FIX. Order quantity. System limit is 99,999,999 shares.
NumberOf NewOrder Bitfields	35	1	Binary	Bitfield identifying which bitfields are set. Field values must be appended to the end of the message.
$NewOrderBitfield_1$	36	1	Binary	Bitfield identifying fields to follow.
⋮				
$NewOrderBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Required Order Attributes:

The following are required to be sent on new orders:

- some form of symbology (see **Symbology** below); and,

- a *Price* only (limit orders) or a *Price* and/or *OrdType* (limit, market, or peg orders.)

All other values have defaults. See the table in **List of Optional Fields** (§ 7, p. 94) for additional information about each optional field, including its default value.

Symbology:

Cboe accepts three symbologies: Uniform Symbology, RIC, and ISIN. Different symbologies may be used on different orders, but it is recommended that Participants use the same symbology for all orders.

If using Uniform Symbology to identify a stock, the Participant:

- **must** set *Symbol* to the Uniform Symbology symbol;
- *may optionally* set the *SecurityExchange*; and,
- *may optionally* set the *Currency*.

If using ISIN to identify a stock, the Participant:

- **must** set *IDSource* to ISIN (4);
- **must** set *SecurityID* to the ISIN;
- **must** set *SecurityExchange* to note the market in which the ISIN trades;
- **must** set the *Currency* field to identify the currency in which the stock is traded; and,
- *may optionally* set the *Symbol* to the Uniform Symbology symbol or to the *SecurityID*.

If using RIC to identify a stock, the Participant:

- **must** set *IDSource* to RIC (5);
- **must** set *SecurityID* to the RIC;
- *may optionally* set the *SecurityExchange*;
- *may optionally* set the *Currency* field; and,
- *may optionally* set the *Symbol* to the Uniform Symbology symbol or to the *SecurityID*.

When specifying an optional value as noted above, the value specified must match the value in Cboe symbol database. Otherwise, the order will be rejected.

MiFID II Short Code Identifier Ranges

Cboe supports six separate ranges of short codes listed below. A range is provided for each valid combination of id and qualified role.

- *ClientID* and *ClientQualifiedRole* = Natural Person (24)
- *ClientID* and *ClientQualifiedRole* = Firm or LEI (23)
- *InvestorID* and *InvestorQualifiedRole* = Natural Person (24)
- *InvestorID* and *InvestorQualifiedRole* = Algorithm (22)
- *ExecutorID* and *ExecutorQualifiedRole* = Natural Person (24)
- *ExecutorID* and *ExecutorQualifiedRole* = Algorithm (22)

Each range is four bytes in length. Participants can use numbers 4 through to 4,294,967,295 as short codes. Values 0, 1, 2 and 3 are reserved.

MiFID II Mandatory Fields

Whilst *AlgorithmicIndicator* (for orders only), *Capacity*, *ClientID*, *ClientQualifiedRole*, *ExecutorID*, *ExecutorQualifiedRole*, *InvestorID*, *InvestorQualifiedRole*, *LiquidityProvision* and *OrderOrigination* are optional from a BOE bitfield perspective, correctly providing data associated with these fields may be mandatory from a MiFID II regulatory perspective. Participants should assess which of these fields are required on each order according to the Cboe Rulebook and their MiFID II obligations.

Example New Order V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes.
MessageLength	4A 00	74 bytes
MessageType	38	New Order V2
MatchingUnit	00	Always 0 for inbound messages
SequenceNumber	64 00 00 00	Sequence number 100
ClOrdID	41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC123
Side	31	Buy
OrderQty	E8 03 00 00	1,000 shares
NumberOfNewOrder Bitfields	03	3 bitfields to follow
NewOrderBitfield1	04	*Price*
NewOrderBitfield2	C1	*Symbol*, *Capacity*, *RoutingInst*
NewOrderBitfield3	01	*Account*
Price	44 D6 12 00 00 00 00 00	123.4500
Symbol	56 4F 44 6C 00 00 00 00	VOD1
Capacity	50	P = Principal
RoutingInst	52 00 00 00	R = Routable
Account	44 45 46 47 00 00 00 00 00 00 00 00 00 00	DEFG

4.1.2 Cancel Order V2

Request to cancel an order using the *ClOrdID* from a previous order.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x39
MatchingUnit	5	1	Binary	Always 0 for inbound (Participant to Cboe) messages.
SequenceNumber	6	4	Binary	The sequence number for this message.
OrigClOrdID	10	20	Text	Corresponds to *OrigClOrdID* (41) in Cboe FIX. *ClOrdID* of the order to cancel.
NumberOf CancelOrder Bitfields	30	1	Binary	Bitfield identifying bitfields which are set. May be 0. Field values must be appended to the end of the message.
CancelOrder Bitfield$_1$	31	1	Binary	Bitfield identifying fields to follow. Only present if *NumberOfCancelOrderBitfields* is non-zero.
⋮				
CancelOrder Bitfield$_n$		1	Binary	Last bitfield.
Optional fields...				

Example Cancel Order V2 Message:

Field Name	Hexadecimal	Notes

StartOfMessage	BA BA	Start of message bytes
MessageLength	22 00	34 bytes
MessageType	39	Cancel Order V2
MatchingUnit	00	Always 0 for inbound messages
SequenceNumber	64 00 00 00	Sequence Number 100
OrigClOrdID	41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC123
NumberOfCancel OrderBitfields	01	1 bitfield to follow
CancelOrder Bitfield1	01	*ClearingFirm*
ClearingFirm	54 45 53 54	TEST

4.1.3 Modify Order V2

Request to modify an order. The order attributes to be modified are selected using *NumberOfModifyBitfields* and some number of bitfields to follow.

Only *Price*, *OrderQty* and *OrdType* may be adjusted. Any change in *Price* or increase in *OrderQty* will result in the order losing its time priority. *OrdType* may be adjusted from Limit to Market (but not from Limit to Peg or Peg to Limit).

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 modification request overlaps partial fills for the current order, leaving the Participant in total control of the share exposure of the order.

A Modify Order V2 should not be issued until the Order Acknowledgement V2 for the previous New Order V2 or Order Modified message for the previous Modify Order V2 has been received. The BOE handler will reject a new Modify Order V2 if it has not been accepted or it has not seen the result of the prior modification from the Matching Engine. However, Modify Order V2 requests that merely reduce *OrderQty* *may* be overlapped if the existing *ClOrdID* is reused, as long as the trading identifer has not been opted-in to daily limit trading risk controls. This is the only case where reuse of the *ClOrdID* is allowed.

OrderQty must be present on all Modify Order V2 requests. Messages sent without *OrderQty* will be rejected. To maintain compatibility with Version 1 Modify Order messages, this field remains in the optional block.

Price must be present on all Modify Order V2 requests. Messages sent without *Price* will be rejected. If the modification is from a limit to a market order the price will be disregarded. To maintain compatibility with Version 1 Modify Order messages, this field remains in the optional block.

ClearingFirm is required for service bureau ports.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x3A
MatchingUnit	5	1	Binary	Always 0 for inbound (Participant to Cboe) messages.
SequenceNumber	6	4	Binary	The sequence number for this message.
ClOrdID	10	20	Text	New *ClOrdID* for this order.

OrigClOrdID	30	20	Text	Corresponds to *OrigClOrdID* (41) in Cboe FIX. *ClOrdID* of the order to replace. In the case of multiple changes to a single order, this will be the *ClOrdID* of the most recently accepted change.
NumberOf ModifyOrder Bitfields	50	1	Binary	Bitfield identifying bitfields which are set. May be 0. Field values must be appended to the end of the message.
ModifyOrder Bitfield$_1$	51	1	Binary	Bitfield identifying fields to follow.
$\vdots$				
ModifyOrder Bitfield$_n$		1	Binary	Last bitfield.
Optional fields...				

Example Modify Order V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes
MessageLength	3E 00	62 bytes
MessageType	3A	Modify Order V2
MatchingUnit	00	Always 0 for inbound messages
SequenceNumber	64 00 00 00	Sequence Number 100
ClOrdID	41 42 43 31 32 34 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC124
OrigClOrdID	41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC123
NumberOfModify OrderBitfields	01	1 bitfield to follow
ModifyOrder Bitfield1	0C	*OrderQty*, *Price*
OrderQty	E0 2E 00 00	12,000 shares
Price	08 E2 01 00 00 00 00 00	12.34

4.1.4 Purge Orders V2

Request to cancel a group of orders across all the firm's sessions. A purge request requires populating the *MassCancelInst* field and specifying the *ClearingFirm* field (or configure port attribute 'Default Executing Firm ID').

Optionally the *Symbol* field or a set of *CustomGroupID* values may be used as a filter.

If both *Symbol* and a list of *CustomGroupID* values are specified, the PURGE ORDERS V2 request will be rejected.

Specify the *MassCancelLockout* optional field to request subsequent rejection of new orders based on the level of the *MassCancelInst* (i.e., Firm level, Symbol level, or Custom Group Id level)

Optionally specify *MassCancelId* if the Acknowledgement Style is set to S or B.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x47
MatchingUnit	5	1	Binary	Always 0 for inbound (Participant to Cboe) messages.
SequenceNumber	6	4	Binary	The sequence number for this message.
NumberOf PurgeOrders Bitfields	11	1	Binary	Bitfield identifying bitfields which are set. May be 0. Field values must be appended to the end of the message.
PurgeOrders $Bitfield_1$	12	1	Binary	Bitfield identifying fields to follow. Only present if *NumberOfPurgeOrdersBitfields* is non-zero.
⋮				
PurgeOrders $Bitfield_n$		1	Binary	Last bitfield.
CustomGroupIDCnt		1	Binary	Number of repeating *CustomGroupID* included in this message.

CustomGroupID$_1$		2	Binary	First *CustomGroupID*. Only present if *CustomGroupIDCnt* is non-zero.
⋮				
CustomGroupID$_n$		2	Binary	Last *CustomGroupID*.
Optional fields...				

Example Purge Orders V2 Message with CustomGroupID:

Field Name	Hexadecimal	Notes
StartOfMessage	`BA BA`	Start of message bytes
MessageLength	`29 00`	41 bytes
MessageType	`47`	Purge Orders V2
MatchingUnit	`00`	Always 0 for inbound messages
SequenceNumber	`64 00 00 00`	Sequence Number 100
NumberOfPurge OrderBitfields	`01`	1 bitfield to follow
PurgeOrders Bitfield1	`A8`	*ClearingFirm*, *MassCancelLockout*, *MassCancelInst* *MassCancelID*
CustomGroupIDCnt	`02`	2 *CustomGroupID* to follow
CustomGroupID$_1$	`BF BE`	first *CustomGroupID* of 48831
CustomGroupID$_2$	`C0 BE`	second *CustomGroupID* of 48832
ClearingFirm	`54 45 53 54`	`TEST`
MassCancelLockout	`31`	1 = lockout
MassCancelInst	`34`	4 = clearing firm match, single ack
MassCancelID	`41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00`	`ABC123`

4.1.5 Trade Capture Report V2

The Trade Capture Report V2 is used to submit a Negotiated Trade. The report must contain both sides of the trade (*NoSides* = 2).

The model supported is as described in the FIX 5.0 (SP2) specification in the Two-Party Reporting workflow diagram of the Trade Capture Reporting section.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x3C`
MatchingUnit	5	1	Binary	Always 0 for inbound (Participant to Cboe) messages.
SequenceNumber	6	4	Binary	The sequence number for this message.

TradeReportID	10	20	Text	Corresponds to *TradeReportID* (571) in Cboe FIX. Day-unique ID chosen by client. Cboe will enforce port level day-uniqueness. 20 characters or less. Characters in ASCII range 33–126 are allowed, except for comma, semicolon, and pipe. If the *TradeReportID* matches a live trade report (one that has been acked, but not confirmed or declined), it will be rejected as duplicate.
LastShares	30	4	Binary	Corresponds to *LastShares* (32) in Cboe FIX. Executed share quantity. If the LargeSize optional field is specified, that value holds precedance over this field.
LastPx	34	8	Trade Price	Corresponds to *LastPx* (31) in Cboe FIX. Price of this fill.
NumberOf TradeCapture ReportBitfields	42	1	Binary	Bitfield identifying bitfields which are set. Field values must be appended to the end of the message.
TradeCapture ReportBitfield$_1$		1	Binary	Bitfield identifying fields to follow.
⋮				
TradeCapture ReportBitfield$_n$		1	Binary	Last bitfield.
NoSides		1	Binary	Corresponds to *NoSides* (552) in Cboe FIX. Indicates the number of repeating groups to follow. Must be 2.

Repeating Group *TrdCapRptSideGrp* must occur the number of times specified in *NoSides*. Only *Side* and *PartyID* are mandatory. Each field occurs in each group, in order as shown below. Optional fields should occur only if corresponding bits in bitfields are set.

Side	1	Alphanumeric	Corresponds to *Side* (54) in Cboe FIX. 1 = Buy 2 = Sell 5 = Sell Short 6 = Sell Short Exempt H = Sell Undisclosed
Capacity	1	Alpha	Corresponds to *OrderCapacity* (47) in Cboe FIX. (Orders). Corresponds to *LastCapacity* (29) in Cboe FIX. (Executions). A = Agency (maps to 'AOTC') P = Principal (maps to 'DEAL') R = Riskless Principal (maps to 'MTCH')
PartyID	4	Alpha	Corresponds to *PartyID* (448) in Cboe FIX. The end-client responsible for the trade. Must be an identifier (4 uppercase letters) known to Cboe.
Account	16	Text	Corresponds to *Account* (1) in Cboe FIX. Contains the *Account* specified on this leg on the trade capture, if any. Reflected back on trade capture report confirmations. Allowed characters are alphanumeric and colon. **If configured by Cboe:** values may be communicated to EMCF to indicate allocate to a house or client account. If the account begins with H:, allocate to house account. If the account begins with C:, allocate to client account. Non-prefixed or absent accounts would be allocated to house account.
PartyRole	1	Alphanumeric	Corresponds to *PartyRole* (452) in Cboe FIX. Contains the *PartyRole* specified on this leg on the trade capture, if any. Reflected back on trade capture report confirmations. 1 = ExecutingFirm (default) (if used, must be set on both sides. Is not permitted for bilateral trades) 2 = EnteringFirm (the party reporting the trade. Should not be used for the second leg) 3 = ContraFirm (the party the trade is alleged against)

Optional fields...				Optional fields as set in the bitmap. Note, optional fields that occur in the repeating groups appear above, repeating per group, not within this block.

Example Trade Capture Report V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes
MessageLength	4D 00	77 bytes
MessageType	3C	Trade Capture Report V2
MatchingUnit	00	Always 0 for inbound messages
SequenceNumber	64 00 00 00	Sequence number 100
TradeReportID	31 34 32 39 30 39 38 34 38 39 35 38 37 33 33 32 00 00 00 00	1429098489587332
LastShares	46 00 00 00	70 shares
LastPx	40 F9 A1 6A 00 00 00 00	$1789000000 = 178.9000000$
NumberOf TradeCaptureReport Bitfields	04	4 bitfields to follow
$Bitfield_1$	01	*Symbol*
$Bitfield_2$	B5	*Capacity*, *TransactionCategory*, *PartyRole*, *TradeReportTransType*, *VenueType*
$Bitfield_3$	A2	*MatchType*, *TradePublishIndicator*, *ExecutionMethod*
$Bitfield_4$	43	*TradeReportType*, *TradeHandlingInstruction*, *OrderCategory*
NoSides	02	2 repeating groups to follow
Side	31	Buy
Capacity	50	Principal
PartyID	54 45 53 54	TEST
PartyRole	31	ExecutingFirm
Side	32	Sell
Capacity	50	Principal
PartyID	54 45 53 54	TEST
PartyRole	31	ExecutingFirm
Symbol	56 4F 44 6C 00 00 00 00	VOD1
TransactionCategory	50	P = Regular Trade
TradeReportTransType	00	0 = New
VenueType	4F	O = Off Book
MatchType	03	3 = Trade Reporting (On-Exchange)
TradePublishIndicator	01	1 = Publish trade
ExecutionMethod	55	U = Unspecified
TradeReportType	00	0 = Submit
TradeHandlingInstr	01	1 = Two-Party Report
OrderCategory	03	3 = Privately Negotiated Trade

4.2 Cboe to Participant

4.2.1 Order Acknowledgment V2

ORDER ACKNOWLEDGMENT V2 messages are sent in response to a NEW ORDER V2 message. The message corresponds to a FIX Execution Report with *ExecType* (150) = 0 (New).

Per the instructions given in a Return Bitfields Parameter Group on the LOGIN REQUEST V2 (§ 3.1.1, p. 11), optional fields may be appended to echo back information provided in the original NEW ORDER V2 message. Fields which have been requested to be echoed back but which were not filled in will still be sent, but filled with binary zero (0x00).

Permitted return bits are described in § 6.1, p. 55.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x25
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
ClOrdID	18	20	Text	Echoed back from the original order.
OrderID	38	8	Binary	Corresponds to *OrderID* (37) in Cboe FIX. Order identifier supplied by Cboe. This identifier corresponds to the identifiers used in Cboe market data products.
ReservedInternal	46	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	47	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	48	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Example Order Acknowledgment V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes.
MessageLength	4D 00	77 bytes
MessageType	25	Order Acknowledgment V2
MatchingUnit	03	Matching Unit 3
SequenceNumber	64 00 00 00	Sequence number 100
TransactionTime	E0 FA 20 F7 36 71 F8 11	1,294,909,373,757,324,000
ClOrdID	41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC123
OrderID	05 10 1E B7 5E 39 2F 02	171WC1000005 (base 36)
ReservedInternal	00	Ignore
NumberOfReturn Bitfields	03	3 bitfields to follow

ReturnBitfield$_1$	00	No bitfields from byte 1
ReturnBitfield$_2$	41	*Symbol*, *Capacity*
ReturnBitfield$_3$	05	*Account*, *ClearingAccount*
Symbol	56 4F 44 6C 00 00 00 00	VOD1
Capacity	50	0x50 = P = Principal
Account	41 42 43 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC
ClearingAccount	00 00 00 00	(empty)

Example Minimal Order Acknowledgment V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes.
MessageLength	2E 00	46 bytes
MessageType	25	Order Acknowledgment V2
MatchingUnit	03	Matching Unit 3
SequenceNumber	64 00 00 00	Sequence number 100
TransactionTime	E0 FA 20 F7 36 71 F8 11	1,294,909,373,757,324,000
ClOrdID	41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC123
OrderID	05 10 1E B7 5E 39 2F 02	171WC1000005 (base 36)
ReservedInternal	00	Ignore
NumberOfReturn Bitfields	00	No bitfields to follow

4.2.2 Order Rejected V2

Order Rejected V2 messages are sent in response to a New Order V2 which must be rejected. This message corresponds to a FIX Execution Report with *ExecType* (150) = 8 (Rejected). Order Rejected V2 messages are unsequenced.

Permitted return bits are described in § 6.2, p. 58.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x26
MatchingUnit	5	1	Binary	Unsequenced application message. Matching unit will be set to 0.
SequenceNumber	6	4	Binary	Unsequenced application message. Sequence number will be set to 0.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
ClOrdID	18	20	Text	Echoed back from the original order.
OrderRejectReason	38	1	Text	Reason for an order rejection. See **Reason Codes** (§ 8, p. 106) for a list of possible reasons.
Text	39	60	Text	Human readable text with more information about the reject reason.

ReservedInternal	99	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	100	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	101	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Example Order Rejected V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes
MessageLength	76 00	118 bytes
MessageType	26	Order Rejected V2
MatchingUnit	00	Unsequenced Message, unit = 0
SequenceNumber	00 00 00 00	Unsequenced Message, sequence = 0
TransactionTime	E0 FA 20 F7 36 71 F8 11	1,294,909,373,757,324,000
ClOrdID	41 42 43 31 32 33 00 00 00 00	ABC123
	00 00 00 00 00 00 00 00 00 00	
OrderRejectReason	44	D
Text	44 75 70 6C 69 63 61 74 65 20	Duplicate ClOrdID
	43 6C 4F 72 64 49 44 00 00 00	
	00 00 00 00 00 00 00 00 00 00	
	00 00 00 00 00 00 00 00 00 00	
	00 00 00 00 00 00 00 00 00 00	
	00 00 00 00 00 00 00 00 00 00	
ReservedInternal	00	Ignore
NumberOfReturn Bitfields	03	3 bitfields to follow
$ReturnBitfield_1$	00	No bitfields from byte 1
$ReturnBitfield_2$	01	*Symbol*
$ReturnBitfield_3$	06	*ClearingFirm*, *ClearingAccount*
Symbol	56 4F 44 6C 00 00 00 00	VOD1
ClearingFirm	54 45 53 54	TEST
ClearingAccount	00 00 00 00	(empty)

4.2.3 Order Modified V2

Order Modified V2 messages are sent in response to a Modify Request V2 to indicate that the order has been successfully modified.

Note: You must opt-in to receiving LeavesQty in Order Modified V2 messages. In some cases, the last message to be received on an order's lifecycle will be an Order Modified V2 message. The way to know the order is no longer live is to inspect *LeavesQty*. An example of this would be modification of an order whilst an execution is being generated, resulting in the order being reduced to zero outstanding quantity. To maintain return structure compatibility with Participants with Version 1, this field remains in the optional block.

Permitted return bits are described in § 6.3, p. 61.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.

MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x27
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
ClOrdID	18	20	Text	Client order ID. This is the *ClOrdID* from the Modify Order message.
OrderID	38	8	Binary	Corresponds to *OrderID* (37) in Cboe FIX. The unique *OrderID*. Modifications do *not* change the *OrderID*.
ReservedInternal	46	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	47	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	48	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Example Order Modified V2 Message:

Field Name	**Hexadecimal**	**Notes**
StartOfMessage	BA BA	Start of message bytes
MessageLength	35 00	63 bytes
MessageType	27	Order Modified V2
MatchingUnit	03	Matching Unit 3
SequenceNumber	64 00 00 00	Sequence number 100
TransactionTime	E0 FA 20 F7 36 71 F8 11	1,294,909,373,757,324,000
ClOrdID	41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC123
OrderID	05 10 1E B7 5E 39 2F 02	171WC1000005 (base 36)
ReservedInternal	00	Ignore
NumberOfReturn Bitfields	05	5 bitfields to follow
$ReturnBitfield_1$	04	*Price*
$ReturnBitfield_2$	00	No fields from byte 2
$ReturnBitfield_3$	00	No fields from byte 3
$ReturnBitfield_4$	00	No fields from byte 4
$ReturnBitfield_5$	02	*LeavesQty*
Price	08 E2 01 00 00 00 00 00	12.34
LeavesQty	00 00 00 00	0 (order done)

4.2.4 Order Restated V2

Order V2 Restated messages are sent to inform the Participant that an order has been asynchronously modified for some reason without an explicit Modify Order V2 request having been sent.

Some example (non-exhaustive) reasons for ORDER RESTATED V2 messages being sent:

- A reserve (iceberg) order has been reloaded.
- An order's remaining quantity was decremented because of a prevented wash trade.
- A routed order has returned to rest on the book after matching liquidity on another market.

Participants should be prepared to accept and apply ORDER RESTATED V2 messages for any reason.

The return bitfields indicate the characteristics of the order which have changed. Optional fields will be present at the end of the message with the new values.

Note: You must opt-in to receiving *LeavesQty* in ORDER RESTATED V2 messages. In some cases, the last message to be received on an order's lifecycle will be an ORDER RESTATED V2 message. The way to know the order is no longer live is to inspect *LeavesQty*. An example of this would be restatement of an order in some cases due to *PreventParticipantMatch* being set to `d`. To maintain return structure compatibility with Participants with Version 1, this field remains in the optional block.

Permitted return bits are described in § 6.4, p. 64.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x28`
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
ClOrdID	18	20	Text	The *ClOrdID* is the identifier from the open order.
OrderID	38	8	Binary	Corresponds to *OrderID* (37) in Cboe FIX. The unique *OrderID*. For informational purposes only. Restatements do *not* change the *OrderID*.
RestatementReason	46	1	Alphanumeric	The reason for this Order Restated message. `R` = Reroute `X` = Locked in cross `W` = Wash `L` = Reload `Q` = Liquidity Updated Cboe reserves the right to add new values as necessary without prior notice.
ReservedInternal	47	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	48	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	49	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Example Order Restated V2 message for a reserve (iceberg) reload:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes
MessageLength	41 00	65 bytes
MessageType	28	Order Restated V2
MatchingUnit	03	Matching Unit 3
SequenceNumber	64 00 00 00	Sequence number 100
TransactionTime	E0 FA 20 F7 36 71 F8 11	1,294,909,373,757,324,000
ClOrdID	41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC123
OrderID	05 10 1E B7 5E 39 2F 02	171WC1000005 (base 36)
RestatementReason	4C	L = Reload
ReservedInternal	00	Ignore
NumberOfReturn Bitfields	06	6 bitfields to follow
$ReturnBitfield_1$	00	No fields from byte 1
$ReturnBitfield_2$	00	No fields from byte 2
$ReturnBitfield_3$	00	No fields from byte 3
$ReturnBitfield_4$	00	No fields from byte 4
$ReturnBitfield_5$	02	*LeavesQty*
$ReturnBitfield_6$	01	*SecondaryOrderId*
LeavesQty	64 00 00 00	100 shares
SecondaryOrderID	0A 10 1E B7 5E 39 2F 02	171WC100000A (base 36)

4.2.5 User Modify Rejected V2

User Modify Rejected V2 messages are sent in response to a Modify Order V2 for an order which cannot be modified. User Modify Rejected V2 messages are unsequenced.

This message corresponds to a FIX Execution Report with *MsgType* (35) = 9 (Order Cancel Reject) and *CxlRejResponseTo* (434) = 2 (Order Cancel/Replace Request).

Permitted return bits are described in § 6.5, p. 67.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x29
MatchingUnit	5	1	Binary	Unsequenced application message. Matching unit will be set to 0.
SequenceNumber	6	4	Binary	Unsequenced application message. Sequence number will be set to 0.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
ClOrdID	18	20	Text	The *ClOrdID* of the modify request which was rejected.
ModifyReject Reason	38	1	Text	Reason for a modify rejection. See **Reason Codes** (§ 8, p. 106) for a list of possible reasons.

Text	39	60	Text	Human readable text with more information about the reject reason.
ReservedInternal	99	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	100	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	101	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields. . .				

Example User Modify Rejected V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes
MessageLength	63 00	99 bytes
MessageType	29	User Modify Rejected V2
MatchingUnit	00	Unsequenced Message, unit = 0
SequenceNumber	00 00 00 00	Unsequenced Message, sequence = 0
TransactionTime	E0 FA 20 F7 36 71 F8 11	1,294,909,373,757,324,000
ClOrdID	41 42 43 31 32 33 00 00 00 00	ABC123
	00 00 00 00 00 00 00 00 00 00	
ModifyRejectReason	50	Pending Fill
Text	50 65 6E 64 69 6E 67 00 00 00	Pending
	00 00 00 00 00 00 00 00 00 00	
	00 00 00 00 00 00 00 00 00 00	
	00 00 00 00 00 00 00 00 00 00	
	00 00 00 00 00 00 00 00 00 00	
	00 00 00 00 00 00 00 00 00 00	
ReservedInternal	00	Ignore
NumberOfReturn Bitfields	00	No optional fields

4.2.6 Order Cancelled V2

An order has been cancelled.

Permitted return bits are described in § 6.6, p. 70.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x2A
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).

ClOrdID	18	20	Text	The order which was cancelled.
CancelReason	38	1	Text	Reason for the order cancellation. See **Reason Codes** (§ 8, p. 106) for a list of possible reasons.
ReservedInternal	39	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	40	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	41	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Example Order Cancelled V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	`BA BA`	Start of message bytes
MessageLength	`48 00`	72 bytes
MessageType	`2A`	Order Cancelled V2
MatchingUnit	`03`	Matching Unit 3
SequenceNumber	`64 00 00 00`	Sequence number 100
TransactionTime	`E0 FA 20 F7 36 71 F8 11`	1,294,909,373,757,324,000
ClOrdID	`41 42 43 31 32 33 00 00 00 00` `00 00 00 00 00 00 00 00 00 00`	`ABC123`
CancelReason	`55`	`U` = User Requested
ReservedInternal	`00`	Ignore
NumberOfReturn Bitfields	`05`	5 bitfields to follow
$ReturnBitfield_1$	`00`	No fields from byte 1
$ReturnBitfield_2$	`00`	No fields from byte 2
$ReturnBitfield_3$	`06`	*ClearingFirm*, *ClearingAccount*
$ReturnBitfield_4$	`00`	No fields from byte 2
$ReturnBitfield_5$	`01`	*OrigClOrdID*
ClearingFirm	`54 45 53 54`	`TEST`
ClearingAccount	`31 32 33 34`	`1234`
OrigClOrdID	`41 42 43 31 32 31 00 00 00 00` `00 00 00 00 00 00 00 00 00 00`	`ABC121`

4.2.7 Cancel Rejected V2

A Cancel Rejected V2 message is sent in response to a Cancel Order V2 message to indicate that the cancellation cannot occur. Cancel Rejected V2 messages are unsequenced.

Permitted return bitfields are described in § 6.7, p. 73.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x2B`
MatchingUnit	5	1	Binary	Unsequenced application message. Matching unit will be set to 0.

SequenceNumber	6	4	Binary	Unsequenced application message. Sequence number will be set to 0.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
ClOrdID	18	20	Text	The order whose cancel was rejected.
CancelReject Reason	38	1	Text	Reason for a cancel rejection. See **Reason Codes** (§ 8, p. 106) for a list of possible reasons.
Text	39	60	Text	Human readable text with more information about the reject reason.
ReservedInternal	99	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	100	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	101	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Example Cancel Rejected V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes
MessageLength	63 00	99 bytes
MessageType	2B	Cancel Rejected V2
MatchingUnit	00	Unsequenced Message, unit = 0
SequenceNumber	00 00 00 00	Unsequenced Message, sequence = 0
TransactionTime	E0 FA 20 F7 36 71 F8 11	1,294,909,373,757,324,000
ClOrdID	41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ABC123
CancelRejectReason	4A	J
Text	54 4F 4F 20 4C 41 54 45 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	TOO LATE
ReservedInternal	00	Ignore
NumberOfReturn Bitfields	00	No optional fields

4.2.8 Order Execution V2

An Order Execution V2 is sent for each fill on an order.

Version 2 removes the *AccessFee* field, but adds the optional *FeeCode* field. Rather than returning a monetary value indicating the rebate or charge for an execution, the *FeeCode* is an indication of a fee classification corresponding to an item on the venue's fee schedule.

Permitted return bitfields are described in § 6.8, p. 76.

Field	Offset	Length	Data Type	Description

StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x2C`
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
ClOrdID	18	20	Text	Order receiving the execution.
ExecID	38	8	Binary	Corresponds to *ExecID* (17) in Cboe FIX. Execution ID. Unique across all matching units on a given day. Note: ExecIDs will be represented on ODROP, FIXDROP and standard DROP ports as base 36 ASCII. Example conversion: **Decimal** / **Base 36** 28294005440239 / A1234B567 76335905726621 / R248BC23H 728557228187 / 09AP05V2Z
LastShares	46	4	Binary	Corresponds to *LastShares* (32) in Cboe FIX. Executed share quantity.
LastPx	50	8	Binary Price	Corresponds to *LastPx* (31) in Cboe FIX. Price of this fill.
LeavesQty	58	4	Binary	Corresponds to *LeavesQty* (151) in Cboe FIX. Quantity still open for further execution. If zero, the order is complete.
BaseLiquidity Indicator	62	1	Alphanumeric	Indicates whether the trade added or removed liquidity. `A` = Added Liquidity `R` = Removed Liquidity `X` = Routed to Another Market `C` = Auction Trade `S` = Self Match (opt-in)

SubLiquidity Indicator	63	1	Alphanumeric	Additional information about an execution. **Cboe may add additional values without notice. Participants must gracefully ignore unknown values.** ASCII NUL (0x00) = No Additional Information `D` = Cboe Dark Pool Execution `T` = Removed liquidity from the Cboe Dark Pool by IOC order `H` = Trade added hidden liquidity `I` = Trade added hidden liquidity that was price improved `K` = Add liquidity from Hidden Reserve (Iceberg) order `P` = Periodic Auction `C` = Cboe Closing Cross
ContraBroker	64	4	Alphanumeric	Corresponds to *ContraBroker* (375) in Cboe FIX. Indicates the market of execution. Markets are identified by their ISO Market Identification Code (MIC)[1][2]
ReservedInternal	68	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	69	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	70	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Example Order Execution V2 Message:

Field Name	**Hexadecimal**	**Notes**
StartOfMessage	`BA BA`	Start of message bytes
MessageLength	`53 00`	83 bytes
MessageType	`2C`	Order Execution V2
MatchingUnit	`03`	Matching Unit 3
SequenceNumber	`64 00 00 00`	Sequence number 100
TransactionTime	`E0 FA 20 F7 36 71 F8 11`	1,294,909,373,757,324,000
ClOrdID	`41 42 43 31 32 33 00 00 00 00` `00 00 00 00 00 00 00 00 00 00`	`ABC123`
ExecID	`01 F0 B7 D9 71 21 00 00`	`D19800001` (base 36)
LastShares	`64 00 00 00`	100 shares
LastPx	`08 E2 01 00 00 00 00 00`	12.34
LeavesQty	`00 00 00 00`	0 (order completed)
BaseLiquidityIndicator	`41`	`A` = Added
SubLiquidityIndicator	`00`	(unset)
ContraBroker	`42 41 54 53`	`BATS`
ReservedInternal	`00`	Ignore

[1] ISO 10383, see http://www.iso15022.org/MIC/homepageMIC.htm for details
[2] for historical reasons a local execution for an order entered into the BXE book is identified with a value of `BATS`

NumberOfReturn Bitfields	03	3 bitfields to follow
$ReturnBitfield_1$	00	No bitfields from byte 1
$ReturnBitfield_2$	00	No bitfields from byte 2
$ReturnBitfield_3$	46	*ClearingFirm*, *ClearingAccount*, *OrderQty*
ClearingFirm	54 45 53 54	TEST
ClearingAccount	31 32 33 43	1234
OrderQty	78 00 00 00	120 shares

4.2.9 Trade Cancel or Correct V2

Used to relay a trade which has been cancelled (busted) or corrected (price or size change only). The *CorrectedPrice* and optional *CorrectedSize* fields will be set to 0 for cancelled trades and to the new trade price and/or size for corrected trades. Trade Cancel or Correct V2 can be sent for same day as well as previous day trades.

Permitted return bitfields are described in § 6.9, p. 79.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x2D
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
ClOrdID	18	20	Text	*ClOrdID* of the order whose fill is being cancelled or corrected.
OrderID	38	8	Binary	Corresponds to *OrderID* (37) in Cboe FIX. Order whose fill is being cancelled or corrected.
ExecRefID	46	8	Binary	Corresponds to *ExecRefID* (19) in Cboe FIX. Refers to the *ExecID* (o)f the fill being cancelled or corrected.
Side	54	1	Alphanumeric	Side of the order.
BaseLiquidity Indicator	55	1	Alphanumeric	Indicates whether the trade added or removed liquidity. A = Added Liquidity R = Removed Liquidity X = Routed to Another Market C = Auction Trade S = Self Match (opt-in)
ClearingFirm	56	4	Alpha	Echoed back from the original order.
ClearingAccount	60	4	Text	Echoed back from the original order.
LastShares	64	4	Binary	Number of shares of the trade being cancelled.
LastPx	68	8	Binary Price	Price of the trade being cancelled.

CorrectedPrice	76	8	Binary Price	For trade corrections, this is the new trade price. For trade breaks, this is set to 0.
OrigTime	84	8	DateTime	Corresponds to *OrigTime* (42). The date and time of the original trade, in GMT.
ReservedInternal	92	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	93	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	94	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
Optional fields...				

Example Trade Cancel or Correct Message:

Field Name	Hexadecimal	Notes
StartOfMessage	`BA BA`	Start of message bytes
MessageLength	`6C 00`	108 bytes
MessageType	`2D`	Trade Cancel or Correct V2
MatchingUnit	`03`	Matching Unit 3
SequenceNumber	`64 00 00 00`	Sequence number 100
TransactionTime	`E0 FA 20 F7 36 71 F8 11`	1,294,909,373,757,234,000
ClOrdID	`41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00`	`ABC123`
OrderID	`05 10 1E B7 5E 39 2F 02`	`171WC1000005` (base 36)
ExecRefID	`01 F0 B7 D9 71 21 00 00`	`D19800001` (base 36)
Side	`31`	Buy
BaseLiquidity Indicator	`41`	`A` = Added
ClearingFirm	`54 45 53 54`	`TEST`
ClearingAccount	`00 00 00 00`	(empty)
LastShares	`C4 09 00 00`	2,500 shares
LastPx	`3A E2 01 00 00 00 00 00`	12.345
CorrectedPrice	`00 00 00 00 00 00 00 00`	0 (cancelled)
OrigTime	`E0 BA 75 95 15 4C EB 11`	1,291,209,373,757,324,000
ReservedInternal	`00`	Ignore
NumberOfReturn Bitfields	`04`	4 bitfields to follow
$ReturnBitfield_1$	`00`	No fields from byte 1
$ReturnBitfield_2$	`01`	*Symbol*
$ReturnBitfield_3$	`00`	No fields from byte 3
$ReturnBitfield_4$	`20`	*CorrectedSize*
Symbol	`56 4F 44 6C 00 00 00 00`	`VOD1`
CorrectedSize	`00 00 00 00`	0 (cancelled)

4.2.10 Purge Rejected V2

A Purge Rejected V2 message is sent in response to a Purge Orders V2 message to indicate that the mass cancellation cannot occur. Purge Rejected V2 messages are unsequenced.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.

MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x48
MatchingUnit	5	1	Binary	Unsequenced application message. Matching unit will be set to 0.
SequenceNumber	6	4	Binary	Unsequenced application message. Sequence number will be set to 0.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
PurgeReject Reason	18	1	Text	Reason for a purge rejection. See **Reason Codes** (§ 8, p. 106) for a list of possible reasons.
Text	19	60	Text	Human readable text with more information about the reject reason.
ReservedInternal	79	1	Binary	Reserved for Cboe internal use.

Example Purge Rejected V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	BA BA	Start of message bytes
MessageLength	4E 00	78 bytes
MessageType	48	Purge Rejected V2
MatchingUnit	00	Unsequenced Message, unit = 0
SequenceNumber	00 00 00 00	Unsequenced Message, sequence = 0
TransactionTime	E0 FA 20 F7 36 71 F8 11	1,294,909,373,757,324,000
PurgeRejectReason	41	A
Text	41 44 4D 49 4E 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	ADMIN
ReservedInternal	00	Ignore

4.2.11 Mass Cancel Acknowledgment V2

A Mass Cancel Acknowledgment is an unsequenced message sent when a Purge Orders V2 message requesting a mass cancellation has completed cancelling all individual orders.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be 0xBA 0xBA.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x36
MatchingUnit	5	1	Binary	Unsequenced application message. Matching unit will be set to 0.
SequenceNumber	6	4	Binary	Unsequenced application message. Sequence number will be set to 0.

TransactionTime	10	8	DateTime	The time in the order entry gateway when the final matching engine event was received to complete the mass cancel.
MassCancelID	18	20	Text	Copied from the *MassCancelID* passed on the original PURGE ORDERS V2. This field corresponds to *MassCancelID* (7695) in Cboe FIX.
CancelledOrder Count	38	4	Binary	Number of orders cancelled. This field corresponds to *CancelledOrderCount* (7696) in Cboe FIX.
ReservedInternal	42	1	Binary	Reserved for Cboe internal use.

Example Mass Cancel Acknowledgment V2 Message:

Field Name	Hexadecimal	Notes
StartOfMessage	`BA BA`	Start of message bytes
MessageLength	`29 00`	41 bytes
MessageType	`36`	Mass Cancel Acknowledgment
MatchingUnit	`00`	Unsequenced Message, unit = 0
SequenceNumber	`00 00 00 00`	Unsequenced Message, sequence = 0
TransactionTime	`E0 FA 20 F7 36 71 F8 11`	1,294,909,373,757,324,000
MassCancelID	`41 42 43 31 32 33 00 00 00 00 00 00 00 00 00 00 00 00 00 00`	`ABC123`
CancelledOrderCount	`63 00 00 00`	99 orders were cancelled
ReservedInternal	`00`	Ignore

4.2.12 Trade Capture Report Acknowledgment V2

The TRADE CAPTURE REPORT ACKNOWLEDGMENT V2 is sent by Cboe to acknowledge the receipt of a TRADE CAPTURE REPORT V2. It is a technical-level ack. The Trade is not considered to have fully succeeded until a TRADE CAPTURE CONFIRM V2 is sent.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x30
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
TradeReportID	18	20	Text	Corresponds to *TradeReportID* (571) in Cboe FIX. Contains the *TradeReportID* (571) of the original trade capture report to which this message relates
ReservedInternal	38	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	39	1	Binary	Number of bitfields to follow.

ReturnBitfield$_1$	40	1	Binary	Bitfield identifying fields to return.
⋮				
ReturnBitfield$_n$		1	Binary	Last bitfield.
NoSides		1	Binary	Corresponds to *NoSides* (552) in Cboe FIX. Indicates the number of repeating groups to follow. Must be 2.

Repeating Group *TrdCapAckSideGrp* must occur the number of times specified in *NoSides*. All fields are optional. Each field occurs in each group, in bitfield order as shown below, if its corresponding bit in the bitfields bit is set.

Side	1	Alphanumeric	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Capacity	1	Alpha	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Account	16	Text	Echoed back from the original TRADE CAPTURE REPORT V2 message.
PartyID	4	Alpha	Echoed back from the original TRADE CAPTURE REPORT V2 message.
PartyRole	1	Alphanumeric	Echoed back from the original TRADE CAPTURE REPORT V2 message.

Optional fields...				Optional fields as set in the bitmap. Note, optional fields that occur in the repeating groups appear above, repeating per group, not within this block.

4.2.13 Trade Capture Report Reject V2

The TRADE CAPTURE REPORT REJECT V2 is sent by Cboe in response to a TRADE CAPTURE REPORT V2. TRADE CAPTURE REPORT REJECT V2 messages are unsequenced.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x31`
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
TradeReportID	18	20	Text	Corresponds to *TradeReportID* (571) in Cboe FIX. Contains the *TradeReportID* (571) of the original trade capture report to which this message relates

Reason	38	1	Text	Reason for a TRADE CAPTURE REPORT reject or decline. See **Reason Codes** (§ 8, p. 106) for a list of possible reasons.
Text	39	60	Text	Human readable text with more information about the reject reason.
ReservedInternal	99	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	100	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	101	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
NoSides		1	Binary	Corresponds to *NoSides* (552) in Cboe FIX. Indicates the number of repeating groups to follow. Must be 2.

Repeating Group *TrdCapAckSideGrp* must occur the number of times specified in *NoSides*. All fields are optional. Each field occurs in each group, in bitfield order as shown below, if its corresponding bit in the bitfields bit is set.

Side	1	Alphanumeric	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Capacity	1	Alpha	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Account	16	Text	Echoed back from the original TRADE CAPTURE REPORT V2 message.
PartyID	4	Alpha	Echoed back from the original TRADE CAPTURE REPORT V2 message.
PartyRole	1	Alphanumeric	Echoed back from the original TRADE CAPTURE REPORT V2 message.

Optional fields...				Optional fields as set in the bitmap. Note, optional fields that occur in the repeating groups appear above, repeating per group, not within this block.

4.2.14 Trade Capture Confirm V2

The TRADE CAPTURE CONFIRM V2 is sent from Cboe to the participant in order to confirm that a TRADE CAPTURE REPORT V2 has been fully processed. It is a business-level confirmation as distinct from the technology level acknowledgment sent as a TRADE CAPTURE REPORT ACKNOWLEDGMENT V2.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	0x32
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.

SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).
TradeReportID	18	20	Text	Corresponds to *TradeReportID* (571) in Cboe FIX. Unique identifier for the trade report confirm as provided by Cboe
TradeReportRefID	38	20	Text	Corresponds to *TradeReportRefID* (572) in Cboe FIX. Contains the *TradeReportID* (571) of the original trade capture report to which this message relates
TradeID	58	8	Binary	Corresponds to *TradeID* (1003) in FIX. An ID allocated by Cboe in response to a trade capture report, identifying a particular trade. These are present in the PITCH Off-Book Trade messages, and are guaranteed unique for a minimum of 7 calendar days from the original report.
LastShares	66	4	Binary	Corresponds to *LastShares* (32) in Cboe FIX. Executed share quantity. If the LargeSize optional field is specified, that value holds precedance over this field.
LastPx	70	8	Trade Price	Corresponds to *LastPx* (31) in Cboe FIX. Price of this fill.
ContraBroker	78	4	Alphanumeric	Corresponds to *ContraBroker* (375) in Cboe FIX. Indicates the market of execution. [3]
ReservedInternal	82	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	83	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	84	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
NoSides		1	Binary	Corresponds to *NoSides* (552) in Cboe FIX. Indicates the number of repeating groups to follow. Must be 2.

[3] for historical reasons a local execution for an order entered into the BXE book is identified with a value of `BATS`

Repeating Group *TrdCapAckSideGrp* must occur the number of times specified in *NoSides*. All fields are optional. Each field occurs in each group, in bitfield order as shown below, if its corresponding bit in the bitfields bit is set. The order of sides may be adjusted from that submitted.

Side	1	Alphanumeric	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Capacity	1	Alpha	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Account	16	Text	Echoed back from the original TRADE CAPTURE REPORT V2 message.
PartyID	4	Alpha	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Central Counterparty	1	Alpha	The CCP handling the trade `E` = European Multilateral Clearing Facility `L` = LCH.Clearnet `X` = SIX x-clear `C` = EuroCCP `N` = None - Clearing Suppressed for self match.
PartyRole	1	Alphanumeric	Echoed back from the original TRADE CAPTURE REPORT V2 message.
FeeCode	2	Alphanumeric	Indicates fee associated with an execution. Fee codes are published in the pricing schedule. New fee codes may be sent with little to no notice. Participants are encouraged to code their systems to accept unknown fee codes.

Optional fields...				Optional fields as set in the bitmap. Note, optional fields that occur in the repeating groups appear above, repeating per group, not within this block.

4.2.15 Trade Capture Report Decline V2

The TRADE CAPTURE DECLINE V2 is sent from Cboe to the participant in order to decline a TRADE CAPTURE REPORT V2. It is a business-level reject as distinct from the technology level acknowledgment sent as a TRADE CAPTURE REPORT ACKNOWLEDGMENT V2.

Field	Offset	Length	Data Type	Description
StartOfMessage	0	2	Binary	Must be `0xBA 0xBA`.
MessageLength	2	2	Binary	Number of bytes for the message, including this field but not including the two bytes for the *StartOfMessage* field.
MessageType	4	1	Binary	`0x33`
MatchingUnit	5	1	Binary	The matching unit which created this message. Matching units in BOE correspond to matching units on Multicast PITCH.
SequenceNumber	6	4	Binary	The sequence number for this message. Distinct per matching unit.
TransactionTime	10	8	DateTime	The time the event occurred in the Cboe matching engine (not the time the message was sent).

TradeReportID	18	20	Text	Corresponds to *TradeReportID* (571) in Cboe FIX. Unique identifier for the trade report confirm as provided by Cboe
TradeReportRefID	38	20	Text	Corresponds to *TradeReportRefID* (572) in Cboe FIX. Contains the *TradeReportID* (571) of the original trade capture report to which this message relates
TradeID	58	8	Binary	Corresponds to *TradeID* (1003) in FIX. An ID allocated by Cboe in response to a trade capture report, identifying a particular trade. These are present in the PITCH Off-Book Trade messages, and are guaranteed unique for a minimum of 7 calendar days from the original report.
LastShares	66	4	Binary	Corresponds to *LastShares* (32) in Cboe FIX. Executed share quantity. If the LargeSize optional field is specified, that value holds precedance over this field.
LastPx	70	8	Trade Price	Corresponds to *LastPx* (31) in Cboe FIX. Price of this fill.
ContraBroker	78	4	Alphanumeric	Corresponds to *ContraBroker* (375) in Cboe FIX. Indicates the market of execution. [4]
Reason	82	1	Text	Reason for a TRADE CAPTURE REPORT reject or decline. See **Reason Codes** (§ 8, p. 106) for a list of possible reasons.
Text	83	60	Text	Human readable text with more information about the reject reason.
ReservedInternal	143	1	Binary	Reserved for Cboe internal use.
NumberOfReturn Bitfields	144	1	Binary	Number of bitfields to follow.
$ReturnBitfield_1$	145	1	Binary	Bitfield identifying fields to return.
⋮				
$ReturnBitfield_n$		1	Binary	Last bitfield.
NoSides		1	Binary	Corresponds to *NoSides* (552) in Cboe FIX. Indicates the number of repeating groups to follow. Must be 2.

[4] for historical reasons a local execution for an order entered into the BXE book is identified with a value of `BATS`

Repeating Group *TrdCapAckSideGrp* must occur the number of times specified in *NoSides*. All fields are optional. Each field occurs in each group, in bitfield order as shown below, if its corresponding bit in the bitfields bit is set. The order of sides may be adjusted from that submitted.

Side	1	Alphanumeric	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Capacity	1	Alpha	Echoed back from the original TRADE CAPTURE REPORT V2 message.
Account	16	Text	Echoed back from the original TRADE CAPTURE REPORT V2 message.
PartyID	4	Alpha	Echoed back from the original TRADE CAPTURE REPORT V2 message.
PartyRole	1	Alphanumeric	Echoed back from the original TRADE CAPTURE REPORT V2 message.

Optional fields...				Optional fields as set in the bitmap. Note, optional fields that occur in the repeating groups appear above, repeating per group, not within this block.

5 Input Bitfields Per Message

Legend:

• Indicates that the field can be requested for a message
– Indicates that the field cannot be requested for a message

5.1 New Order V2

Byte	Bit	Field	
1	1	*ClearingFirm*	•
	2	*ClearingAccount*	•
	4	*Price*	•
	8	*ExecInst*	•
	16	*OrdType*	•
	32	*TimeInForce*	•
	64	*MinQty*	•
	128	*MaxFloor*	•
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*RoutingInst*	•
3	1	*Account*	•
	2	*DisplayIndicator*	•
	4	*MaxRemovePct*	–
	8	*DiscretionAmount*	–
	16	*PegDifference*	•
	32	*PreventParticipantMatch*	•
	64	*LocateRequired*	–
	128	*ExpireTime*	•
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*RiskReset*	•
	16	*OpenClose*	–
	32	*CMTANumber*	–
	64	*TargetPartyID*	–
	128	*LiquidityProvision*	•
5	1	*Reserved*	–
	2	*AttributedQuote*	–
	4	*BookingType*	–
	8	*ExtExecInst*	–
	16	*ClientID*	•
	32	*InvestorID*	•
	64	*ExecutorID*	•
	128	*OrderOrigination*	•

continued. . .

Byte	Bit	Field	
6	1	*DisplayRange*	–
	2	*StopPx*	–
	4	*RoutStrategy*	–
	8	*RouteDeliveryMethod*	–
	16	*ExDestination*	–
	32	*EchoText*	–
	64	*AuctionId*	–
	128	*RoutingFirmID*	–
7	1	*AlgorithmicIndicator*	•
	2	*CustomGroupId*	–
	4	*ClientQualifiedRole*	•
	8	*InvestorQualifiedRole*	•
	16	*ExecutorQualifiedRole*	•
	32	*CtiCode*	–
	64	*ManualOrderIndicator*	–
	128	*OperatorId*	–
8	1	*QuoteRoomID*	–
	2	*SIIndicator*	–
	4	*Reserved*	–
	8	*Reserved*	–
	16	*Reserved*	–
	32	*Reserved*	–
	64	*Reserved*	–
	128	*Reserved*	–

5.2 Cancel Order V2

Byte	Bit	Field	
1	1	*ClearingFirm*	•
	2	*MassCancelLockout*	–
	4	*MassCancel*	–
	8	*OsiRoot*	–
	16	*MassCancelId*	–
	32	*RoutingFirmID*	–
	64	*ManualOrderIndicator*	–
	128	*OperatorId*	–
2	1	*MassCancelInst*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*(Reserved)*	–
	32	*(Reserved)*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

ClearingFirm is required for service bureau ports.

5.3 Modify Order V2

Byte	Bit	Field	
1	1	*ClearingFirm*	•
	2	*Reserved*	–
	4	*OrderQty*	⋆
	8	*Price*	⋆
	16	*OrdType*	•
	32	*CancelOrigOnReject*	•
	64	*ExecInst*	•
	128	*Side*	–
2	1	*MaxFloor*	–
	2	*StopPx*	–
	4	*RoutingFirmID*	–
	8	*ManualOrderIndicator*	–
	16	*OperatorId*	–
	32	*Reserved*	–
	64	*Reserved*	–
	128	*Reserved*	–

⋆ Both *OrderQty* and *Price* must be present on all MODIFY ORDER V2 requests. Messages sent without both fields will be rejected. To maintain compatibility with Version 1 MODIFY ORDER messages, this field remains in the optional block.

ClearingFirm is required for service bureau ports.

5.4 Purge Orders V2

Byte	Bit	Field	
1	1	*ClearingFirm*	•
	2	*MassCancelLockout*	–
	4	*MassCancelInst*	•
	8	*OsiRoot*	–
	16	*MassCancelId*	•
	32	*RoutingFirmID*	–
	64	*ManualOrderIndicator*	–
	128	*OperatorId*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Reserved*	–
	128	*Reserved*	–

ClearingFirm is required for service bureau ports.

5.5 Trade Capture Report V2

Byte	Bit	Field	
1	1	*Symbol*	•
	2	*Reserved*	–
	4	*Currency*	•
	8	*IDSource*	•
	16	*SecurityID*	•
	32	*Security Exchange*	•
	64	*ExecInst*	•
	128	*Reserved*	–
2	1	*Capacity*	•
	2	*Account*	•
	4	*TransactionCategory*	•
	8	*TradeTime*	•
	16	*PartyRole*	•
	32	*TradeReportTransType*	•
	64	*TradeID*	•
	128	*VenueType*	•
3	1	*TradingSessionSubId*	•
	2	*MatchType*	•
	4	*TrdSubType*	•
	8	*SecondaryTrdType*	•
	16	*TradePriceCondition*	•
	32	*TradePublishIndicator*	•
	64	*LargeSize*	•
	128	*ExecutionMethod*	•
4	1	*TradeReportType*	•
	2	*TradeHandlingInstruction*	•
	4	*TradeLinkID*	•
	8	*TradeReportRefID*	•
	16	*GrossTradeAmt*	•
	32	*Tolerance*	•
	64	*OrderCategory*	•
	128	*SettlementPrice*	•
5	1	*SettlementDate*	•
	2	*PriceFormation*	•
	4	*AlgorithmicIndicator*	•
	8	*WaiverType*	–
	16	*DeferralReason*	–
	32	*SettlementCurrency*	•
	64	*SettlementLocation*	•
	32	*Reserved*	–
	64	*Reserved*	–
	128	*Reserved*	–

The optional *ExecInst* (if set) has only one valid value:

`M` = Midpoint Peg (peg to midpoint of local book only)

6 Return Bitfields Per Message

Legend:

• Indicates that the field can be requested for a message
– Indicates that the field cannot be requested for a message

6.1 Order Acknowledgment V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	•
	4	*Price*	•
	8	*ExecInst*	•
	16	*OrdType*	•
	32	*TimeInForce*	•
	64	*MinQty*	•
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	•
	8	*DisplayIndicator*	•
	16	*MaxFloor*	•
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	•
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	•
	2	*LeavesQty*	•
	4	*LastShares*	•
	8	*LastPrice*	•
	16	*DisplayPrice*	•
	32	*WorkingPrice*	•
	64	*BaseLiquidityIndicator*	•
	128	*ExpireTime*	•

continued. . .

Byte	Bit	Field	
6	1	*SecondaryOrderId*	•
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	•
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	•
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	•
11	1	*ClientID*	•
	2	*InvestorID*	•
	4	*ExecutorID*	•
	8	*OrderOrigination*	•
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	•
	128	*ExecutorQualifiedRole*	•

continued. . .

Byte	Bit	Field	
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.2 Order Rejected V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	•
	4	*Price*	•
	8	*ExecInst*	•
	16	*OrdType*	•
	32	*TimeInForce*	•
	64	*MinQty*	•
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	•
	8	*DisplayIndicator*	•
	16	*MaxFloor*	•
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	•
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	•
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–

continued...

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	•
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	–
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	•
11	1	*ClientID*	•
	2	*InvestorID*	•
	4	*ExecutorID*	•
	8	*OrderOrigination*	•
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	•
	128	*ExecutorQualifiedRole*	•
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.3 Order Modified V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	•
	4	*Price*	•
	8	*ExecInst*	•
	16	*OrdType*	•
	32	*TimeInForce*	•
	64	*MinQty*	•
	128	*MaxRemovePct*	–
2	1	*Symbol*	–
	2	*SymbolSfx*	–
	4	*Currency*	–
	8	*IdSource*	–
	16	*SecurityId*	–
	32	*SecurityExchange*	–
	64	*Capacity*	–
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	•
	8	*DisplayIndicator*	•
	16	*MaxFloor*	•
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	•
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	•
	2	*LeavesQty*	•
	4	*LastShares*	•
	8	*LastPrice*	•
	16	*DisplayPrice*	•
	32	*WorkingPrice*	•
	64	*BaseLiquidityIndicator*	•
	128	*ExpireTime*	•
6	1	*SecondaryOrderId*	•
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–

continued. . .

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	•
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	•
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	•
11	1	*ClientID*	•
	2	*InvestorID*	•
	4	*ExecutorID*	•
	8	*OrderOrigination*	•
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	•
	128	*ExecutorQualifiedRole*	•
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.4 Order Restated V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	•
	4	*Price*	•
	8	*ExecInst*	•
	16	*OrdType*	•
	32	*TimeInForce*	•
	64	*MinQty*	•
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	•
	8	*DisplayIndicator*	•
	16	*MaxFloor*	•
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	•
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	•
	2	*LeavesQty*	•
	4	*LastShares*	•
	8	*LastPrice*	•
	16	*DisplayPrice*	•
	32	*WorkingPrice*	•
	64	*BaseLiquidityIndicator*	•
	128	*ExpireTime*	•
6	1	*SecondaryOrderId*	•
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–

continued. . .

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	•
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	•
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	•
11	1	*ClientID*	•
	2	*InvestorID*	•
	4	*ExecutorID*	•
	8	*OrderOrigination*	•
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	•
	128	*ExecutorQualifiedRole*	•
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.5 User Modify Rejected V2

Byte	Bit	Field	
1	1	*Side*	–
	2	*PegDifference*	–
	4	*Price*	–
	8	*ExecInst*	–
	16	*OrdType*	–
	32	*TimeInForce*	–
	64	*MinQty*	–
	128	*MaxRemovePct*	–
2	1	*Symbol*	–
	2	*SymbolSfx*	–
	4	*Currency*	–
	8	*IdSource*	–
	16	*SecurityId*	–
	32	*SecurityExchange*	–
	64	*Capacity*	–
	128	*(Reserved)*	–
3	1	*Account*	–
	2	*ClearingFirm*	–
	4	*ClearingAccount*	–
	8	*DisplayIndicator*	–
	16	*MaxFloor*	–
	32	*DiscretionAmount*	–
	64	*OrderQty*	–
	128	*PreventParticipantMatch*	–
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	–
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–

continued...

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	–
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	–
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	–
11	1	*ClientID*	–
	2	*InvestorID*	–
	4	*ExecutorID*	–
	8	*OrderOrigination*	–
	16	*AlgorithmicIndicator*	–
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	–
	128	*ExecutorQualifiedRole*	–
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.6 Order Cancelled V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	•
	4	*Price*	•
	8	*ExecInst*	•
	16	*OrdType*	•
	32	*TimeInForce*	•
	64	*MinQty*	•
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	•
	8	*DisplayIndicator*	•
	16	*MaxFloor*	•
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	•
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	•
	2	*LeavesQty*	•
	4	*LastShares*	•
	8	*LastPrice*	•
	16	*DisplayPrice*	•
	32	*WorkingPrice*	•
	64	*BaseLiquidityIndicator*	•
	128	*ExpireTime*	•
6	1	*SecondaryOrderId*	•
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–

continued. . .

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	•
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	•
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	•
11	1	*ClientID*	•
	2	*InvestorID*	•
	4	*ExecutorID*	•
	8	*OrderOrigination*	•
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	•
	128	*ExecutorQualifiedRole*	•
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.7 Cancel Rejected V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	•
	4	*Price*	•
	8	*ExecInst*	•
	16	*OrdType*	•
	32	*TimeInForce*	•
	64	*MinQty*	•
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	–
	2	*ClearingFirm*	–
	4	*ClearingAccount*	–
	8	*DisplayIndicator*	–
	16	*MaxFloor*	–
	32	*DiscretionAmount*	–
	64	*OrderQty*	–
	128	*PreventParticipantMatch*	–
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	–
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–

continued. . .

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	•
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	•
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	•
11	1	*ClientID*	•
	2	*InvestorID*	•
	4	*ExecutorID*	•
	8	*OrderOrigination*	•
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	•
	128	*ExecutorQualifiedRole*	•
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.8 Order Execution V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	•
	4	*Price*	•
	8	*ExecInst*	•
	16	*OrdType*	•
	32	*TimeInForce*	•
	64	*MinQty*	•
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	•
	8	*DisplayIndicator*	•
	16	*MaxFloor*	•
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	•
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	•
	2	*CCP*	•
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–

continued. . .

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	•
8	1	*FeeCode*	•
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	•
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	•
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	•
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	•
11	1	*ClientID*	•
	2	*InvestorID*	•
	4	*ExecutorID*	•
	8	*OrderOrigination*	•
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	•
	128	*ExecutorQualifiedRole*	•
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.9 Trade Cancel or Correct V2

Byte	Bit	Field	
1	1	*Side*	–
	2	*PegDifference*	–
	4	*Price*	–
	8	*ExecInst*	–
	16	*OrdType*	–
	32	*TimeInForce*	–
	64	*MinQty*	–
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	–
	2	*ClearingFirm*	–
	4	*ClearingAccount*	–
	8	*DisplayIndicator*	–
	16	*MaxFloor*	–
	32	*DiscretionAmount*	–
	64	*OrderQty*	–
	128	*PreventParticipantMatch*	–
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	•
	64	*PartyID*	–
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	–
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	–

continued...

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	–
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	•
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	–
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	–
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	–
	128	*ClientQualifiedRole*	–
11	1	*ClientID*	–
	2	*InvestorID*	–
	4	*ExecutorID*	–
	8	*OrderOrigination*	–
	16	*AlgorithmicIndicator*	–
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	–
	128	*ExecutorQualifiedRole*	–
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.10 Trade Capture Report Acknowledgment V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	–
	4	*Price*	–
	8	*ExecInst*	–
	16	*OrdType*	–
	32	*TimeInForce*	–
	64	*MinQty*	–
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	–
	8	*DisplayIndicator*	–
	16	*MaxFloor*	–
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	–
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	•
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	–
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	•

continued. . .

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	•
	4	*TradePublishIndReturn*	–
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	•
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	•
	16	*LiquidityProvision*	–
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	–
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	•
	128	*ClientQualifiedRole*	–
11	1	*ClientID*	–
	2	*InvestorID*	–
	4	*ExecutorID*	–
	8	*OrderOrigination*	–
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	–
	128	*ExecutorQualifiedRole*	–
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.11 Trade Capture Report Reject V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	–
	4	*Price*	–
	8	*ExecInst*	–
	16	*OrdType*	–
	32	*TimeInForce*	–
	64	*MinQty*	–
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	–
	8	*DisplayIndicator*	–
	16	*MaxFloor*	–
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	–
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	•
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	–
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	•

continued...

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	•
	4	*TradePublishIndReturn*	•
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	–
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	–
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	•
	128	*ClientQualifiedRole*	–
11	1	*ClientID*	–
	2	*InvestorID*	–
	4	*ExecutorID*	–
	8	*OrderOrigination*	–
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	–
	128	*ExecutorQualifiedRole*	–
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.12 Trade Capture Confirm V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	–
	4	*Price*	–
	8	*ExecInst*	–
	16	*OrdType*	–
	32	*TimeInForce*	–
	64	*MinQty*	–
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	–
	8	*DisplayIndicator*	–
	16	*MaxFloor*	–
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	–
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	•
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	–
	2	*CCP*	•
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	•

continued. . .

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	•
	4	*TradePublishIndReturn*	•
	8	*Text*	•
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	•
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	•
	16	*LiquidityProvision*	–
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	•
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	•
	128	*ClientQualifiedRole*	–
11	1	*ClientID*	–
	2	*InvestorID*	–
	4	*ExecutorID*	–
	8	*OrderOrigination*	–
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	•
	64	*InvestorQualifiedRole*	–
	128	*ExecutorQualifiedRole*	–
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	•
	32	*ReportTime*	•
	64	*(Reserved)*	–
	128	*(Reserved)*	–

6.13 Trade Capture Report Decline V2

Byte	Bit	Field	
1	1	*Side*	•
	2	*PegDifference*	–
	4	*Price*	–
	8	*ExecInst*	–
	16	*OrdType*	–
	32	*TimeInForce*	–
	64	*MinQty*	–
	128	*MaxRemovePct*	–
2	1	*Symbol*	•
	2	*SymbolSfx*	–
	4	*Currency*	•
	8	*IdSource*	•
	16	*SecurityId*	•
	32	*SecurityExchange*	•
	64	*Capacity*	•
	128	*(Reserved)*	–
3	1	*Account*	•
	2	*ClearingFirm*	•
	4	*ClearingAccount*	–
	8	*DisplayIndicator*	–
	16	*MaxFloor*	–
	32	*DiscretionAmount*	–
	64	*OrderQty*	•
	128	*PreventParticipantMatch*	–
4	1	*MaturityDate*	–
	2	*StrikePrice*	–
	4	*PutOrCall*	–
	8	*OpenClose*	–
	16	*ClOrdIdBatch*	–
	32	*CorrectedSize*	–
	64	*PartyID*	•
	128	*AccessFee*	–
5	1	*OrigClOrdId*	–
	2	*LeavesQty*	–
	4	*LastShares*	–
	8	*LastPrice*	–
	16	*DisplayPrice*	–
	32	*WorkingPrice*	–
	64	*BaseLiquidityIndicator*	–
	128	*ExpireTime*	–
6	1	*SecondaryOrderId*	–
	2	*CCP*	–
	4	*ContraCapacity*	–
	8	*AttributedQuote*	–
	16	*ExtExecInst*	–
	32	*BulkOrderIds*	–
	64	*BulkRejectReasons*	–
	128	*PartyRole*	•

continued...

Byte	Bit	Field	
7	1	*SubLiquidityIndicator*	–
	2	*TradeReportTypeReturn*	•
	4	*TradePublishIndReturn*	•
	8	*Text*	–
	16	*Bid*	–
	32	*Offer*	–
	64	*LargeSize*	–
	128	*LastMkt*	–
8	1	*FeeCode*	–
	2	*EchoText*	–
	4	*StopPx*	–
	8	*RoutingInst*	–
	16	*RoutStrategy*	–
	32	*RouteDeliveryMethod*	–
	64	*ExDestination*	–
	128	*TradeReportRefID*	–
9	1	*MarketingFeeCode*	–
	2	*TargetPartyID*	–
	4	*AuctionId*	–
	8	*OrderCategory*	–
	16	*LiquidityProvision*	–
	32	*CmtaNumber*	–
	64	*CrossType*	–
	128	*CrossPrioritization*	–
10	1	*CrossId*	–
	2	*AllocQty*	–
	4	*GiveUpFirmID*	–
	8	*RoutingFirmID*	–
	16	*WaiverType*	–
	32	*CrossExclusionIndicator*	–
	64	*PriceFormation*	•
	128	*ClientQualifiedRole*	–
11	1	*ClientID*	–
	2	*InvestorID*	–
	4	*ExecutorID*	–
	8	*OrderOrigination*	–
	16	*AlgorithmicIndicator*	•
	32	*DeferralReason*	–
	64	*InvestorQualifiedRole*	–
	128	*ExecutorQualifiedRole*	–
12	1	*CtiCode*	–
	2	*ManualOrderIndicator*	–
	4	*OperatorId*	–
	8	*TradeDate*	–
	16	*VariancePrice*	–
	32	*VarianceSize*	–
	64	*OrigSymbolID*	–
	128	*OrigTASPrice*	–

continued. . .

Byte	Bit	Field	
13	1	*CumQty*	–
	2	*DayOrderQty*	–
	4	*DayCumQty*	–
	8	*AvgPx*	–
	16	*DayAvgPx*	–
	32	*PendingStatus*	–
	64	*DrillThruProtection*	–
	128	*MultilegReportingType*	–
14	1	*LegCFICode*	–
	2	*LegMaturityDate*	–
	4	*LegStrikePrice*	–
	8	*QuoteRoomID*	–
	16	*SecondaryExecId*	–
	32	*UserRequestID*	–
	64	*Username*	–
	128	*UserStatus*	–
15	1	*TradeReportingIndicator*	–
	2	*(Reserved)*	–
	4	*(Reserved)*	–
	8	*(Reserved)*	–
	16	*TradePublishInd*	–
	32	*ReportTime*	–
	64	*(Reserved)*	–
	128	*(Reserved)*	–

7 List of Optional Fields

The following are descriptions of optional fields which may be sent or received.

Field	Length	Data Type	Description
Account	16	Text	Corresponds to *Account* (1) in Cboe FIX. Reflected back on execution reports associated with this order. May be made available in the Participant's clearing file. Allowed characters are alphanumeric and colon. **If configured by Cboe:** values may be communicated to EMCF to indicate allocate to a house or client account. If the account begins with `H:`, allocate to house account. If the account begins with `C:`, allocate to client account. Non-prefixed or absent accounts would be allocated to house account. Capacity is no longer used to determine which CCP account to use.
Algorithmic Indicator	1	Text	For orders and executions, this corresponds to *OrderAttributeTypes* (8015) = 4 in Cboe FIX. For Trade Capture Report, this corresponds to *AlgorithmicTradeIndicator* (2667) in Cboe FIX. Indicates that the order (or the reported trade in a Trade Capture Report) was placed as a result of an investment firm engaging in algorithmic trading. `N` = No algorithm was involved (default). `Y` = Algorithm was involved (ALGO).
BaseLiquidity Indicator	1	Alphanumeric	Indicates whether the trade added or removed liquidity. `A` = Added Liquidity `R` = Removed Liquidity `X` = Routed to Another Market `C` = Auction Trade `S` = Self Match (opt-in)
BookingType	1	Alphanumeric	Corresponds to *BookingType* (775) in Cboe FIX. Used to identify CFD orders. `0` = Regular Booking `1` = CFD (Contract For Difference)
CancelOrig OnReject	1	Alpha	Corresponds to *CancelOrigOnReject* (9619) in Cboe FIX. Indicates handling of original order on failure to modify. `N` = Leave original order alone. `Y` = Cancel original order if modification fails.
Capacity	1	Alpha	Corresponds to *OrderCapacity* (47) in Cboe FIX. (Orders). Corresponds to *LastCapacity* (29) in Cboe FIX. (Executions). `A` = Agency (maps to 'AOTC') `P` = Principal (maps to 'DEAL') `R` = Riskless Principal (maps to 'MTCH')

Central Counterparty	1	Alpha	The CCP handling the trade `E` = European Multilateral Clearing Facility `L` = LCH.Clearnet `X` = SIX x-clear `C` = EuroCCP `N` = None - Clearing Suppressed for self match.
ClearingAccount	4	Text	Corresponds to *OnBehalfOfSubID* (116) and *ClearingAccount* (440) in Cboe FIX. Supplemental identifier. Recorded and made available in execution reports. Available via Drop.
ClearingFirm	4	Alpha	Corresponds to *OnBehalfOfCompID* (115) and *ClearingFirm* (439) in Cboe FIX. Firm that will clear the trade. If empty (all binary zero), a default will be used (only permitted on non-service bureau accounts).
ClientID	4	Binary	The short code representing the client behind the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. The value must be between 0 and 4,294,967,295. For clients, the following values are reserved for applicable use: `0` = NONE (No Client for this order) `1` = AGGR (An aggregation of multiple client orders) `2` = PNAL (Clients are pending allocation)
ClientQualifiedRole	1	Binary	Required whenever a `ClientID` is specified. Valid values are: `0` = None - Only applicable if using a reserved value for `ClientID` `23` = Firm or legal entity (LEI) `24` = Natural person
CorrectedSize	4	Binary	Corresponds to *CorrectedSize* (6655) in Cboe FIX. Number of shares after trade adjustment.
Currency	3	Alpha	Corresponds to *Currency* (15) in Cboe FIX. ISO currency. Required if *IDSource* is set to `4` (ISIN).
DeferralReason	1	Alphanumeric	Corresponds to *TrdRegPublicationReasons* (8013) in FIX. It indicates the deferral reason for the trade. This is only supported in return messages from Cboe to Participants. The following values are valid: `-` = No Deferral Reason `6` = Deferral for Large In Scale (LRGS)
DisplayIndicator	1	Alphanumeric	Corresponds to *DisplayIndicator* (9479) in Cboe FIX. `X` = Displayed Order `I` = Invisible Invisible orders must meet the MiFID ESMA requirements for Large in Scale (LIS) unless routed to the Cboe Dark Book.

DisplayPrice	8	Binary Price	Only present when order is fully or partially booked. If the order has to be displayed at a less aggressive price for some reason, then that price will be reported here, otherwise equals price. Present for hidden orders, indicating the price the order would have been displayed at.
ExecInst	1	Text	Corresponds to *ExecInst* (18) in Cboe FIX. P = Market Peg (peg buy to PBBO offer, peg sell to PBBO bid) R = Primary Peg (peg buy to PBBO bid, peg sell to PBBO offer) M = Midpoint (peg to PBBO midpoint) L = Alternate Midpoint (less aggressive of midpoint and 1 tick inside PBBO) **for Periodic Auction Orders:**[5] M = Midpoint (peg to Cboe EBBO midpoint) G = Guarded Midpoint (peg to Cboe EBBO midpoint but suspend order if primary market quote becomes one-sided or disappears) ASCII NUL (0x00) = no special handling Default = ASCII NUL (0x00)
ExecutionMethod	1	Alpha	Corresponds to *ExecutionMethod* (2405) in FIX. Optional. Is used by the participant to indicate the method by which the trade was executed. This field corresponds to the proposed MMT Level 3.7 (Offbook Automated Liquidity Indicator). The following values are valid: A = Automated M = Manual U = Unspecified (default)
ExecutorID	4	Binary	The short code representing the execution decision maker of the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. The value must be between 0 and 4,294,967,295. For executing decision makers, the following value is reserved for applicable use: 3 = NORE (Timing and location of the execution determined by the client of the Participant)

[5] RoutingInst=BP

ExecutorQualifiedRole	1	Binary	Required whenever an `ExecutorID` is specified. Valid values are: `0` = None - Only applicable if using a reserved value for `ExecutorID` 22 = Algorithm 24 = Natural person
ExpireTime	8	DateTime	Corresponds to *ExpireTime* (126) in FIX. Required for *TimeInForce* = 6 orders, specifies the date-time (in UTC) that the order expires.
FeeCode	2	Alphanumeric	Indicates fee associated with an execution. Fee codes are published in the pricing schedule. New fee codes may be sent with little to no notice. Participants are encouraged to code their systems to accept unknown fee codes.
GrossTradeAmt	8	Binary Price	Total amount traded, expressed in units of currency.
IDSource	1	Alphanumeric	Corresponds to *IDSource* (22) in Cboe FIX. `4` = ISIN `5` = RIC
InvestorID	4	Binary	The short code representing the investment decision maker of the order. Data corresponding to this short code must have been previously supplied, or will be supplied by the end of the calendar day, per our Rules. The value must be between 0 and 4,294,967,295.
InvestorQualifiedRole	1	Binary	Required whenever an `InvestorID` is specified. Valid values are: 22 = Algorithm 24 = Natural person
LargeSize	8	Binary	Number of shares relevant for the trade. Used when size exceeds the capabilities of 32-bit. System limit is 99,999,999,999.
LastMkt	4	Alphanumeric	Corresponds to *LastMkt* (30) in Cboe FIX. Segment MIC of this fill.
LastPx	8	Binary Price	Corresponds to *LastPx* (31) in Cboe FIX. Price of this fill.
LastShares	4	Binary	Corresponds to *LastShares* (32) in Cboe FIX. Executed share quantity. If the LargeSize optional field is specified, that value holds precedance over this field.
LiquidityProvision	1	Text	Corresponds to *OrderAttributeTypes* (8015) = 2 in Cboe FIX. This flag is used to indicate whether the order is related to any sort of liquidity provision activity, as defined by MiFID II. This flag is mandatory for orders which are part of a liquidity provision activity. `N` = Not Liquidity Provision (default) `Y` = Liquidity Provision

LeavesQty	4	Binary	Corresponds to *LeavesQty* (151) in Cboe FIX. Quantity still open for further execution. If zero, the order is complete.
MatchType	1	Binary	Corresponds to *MatchType* (574) in FIX. The following values are valid: 3 = Trade Reporting (On-Exchange)
MassCancelID	20	Text	Copied from the *MassCancelID* passed on the original PURGE ORDERS V2. This field corresponds to *MassCancelID* (7695) in Cboe FIX.
MassCancelInst	16	Text	Corresponds to *MassCancelInst* (7700) in Cboe FIX. Used for specification of PURGE ORDERS V2 functionality. At least one character must be provided (Clearing Firm filter). Contiguous characters must be specified up to total length. Truncated/unspecified characters will default to values indicated (D) below. **1st character: ClearingFirm filter** A = No filtering by clearing firm relationship is performed F = All orders that were under the clearing relationship specified in *ClearingFirm*. If specified and *ClearingFirm* not provided, the Mass Cancel or Purge request will be rejected. **2nd character: Acknowledgement Style** M = (D) ORDER CANCELLED V2 messages are sent for each cancelled order. If M is sent and the *MassCancelId* optional field is specified, the *MassCancelId* value is ignored. S = A single MASS CANCEL ACKNOWLEDGEMENT V2 message is sent once all cancels have been processed. The *MassCancelId* optional field must be specified or the Mass Cancel or Purge request will be rejected. B = Both individual ORDER CANCELLED V2 and MASS CANCEL ACKNOWLEDGEMENT V2 messages will be sent. Also requires the *MassCancelId* optional field to be specified or the Mass Cancel or Purge request will be rejected. **3rd character: Lockout instruction** N = (D) No lockout L = Lockout until corresponding *RiskReset* received. Lockout can be used only with Clearing Firm filter set to F, otherwise the Mass Cancel or Purge request will be rejected. A self-imposed lockout can be release using the *RiskReset* field of the NEW ORDER V2 message.

MaxFloor	4	Binary	Corresponds to *MaxFloor* (111) in Cboe FIX. Portion of *OrderQty* to display. The balance is reserve. 0 displays the entire quantity. The displayed quantity of each order at a price level is decremented first. When displayed quantity is fully decremented, it is reloaded up to *MaxFloor* from reserve. Default = 0
MinQty	4	Binary	Corresponds to *MinQty* (110) in Cboe FIX. Minimum fill quantity for Book Only hidden, Cboe Dark Pool, Cboe Periodic Auction Book, Cboe Closing Cross or IOC orders which only interact with liquidity on the target book. Rejected for Dark, Lit and Dark Lit Sweep Order Types. Ignored for other orders. On entry and user modification, the behaviour is configurable on the port and can apply to the **total** fill size, which may be made up of several **consecutive** smaller fills.
OrderCategory	1	Binary	This field corresponds to the MMT Level 3.2 field 'Negotiated Transaction Indicator', and is used by the participant to indicate that the trade was a Negotiated Transaction as per the Cboe Rules. For all trade reports reported on-exchange, the value must be 3. 0 = Not a Negotiated Trade 3 = Privately Negotiated Trade On return fields, this field indicates whether Cboe deems the trade as utilising the Negotiated Transaction waiver under MiFID.
OrderOrigination	1	Text	Corresponds to *OrderOrigination* (1724) in Cboe FIX. 5 = (DEA). Indicates DEA activity (as deemed by MiFID II) is involved in this order. 0 = Non-DEA. (default) Other values are unsupported and will be rejected.
OrderQty	4	Binary	Corresponds to *OrderQty* (38) in Cboe FIX. Order quantity. System limit is 99,999,999 shares.
OrdType	1	Alphanumeric	Corresponds to *OrdType* (40) in Cboe FIX. 1 = Market 2 = Limit (default) P = Pegged Pegged requires *ExecInst* be set to L, M, P, or R.
OrigClOrdID	20	Text	Corresponds to *OrigClOrdID* (41) in Cboe FIX.

PegDifference	8	Signed Binary Price	Corresponds to *PegDifference* (211) in Cboe FIX. **Optional signed** value up to four decimal places[6] is **added** to the result of peg calculation. Must be ≥ 0 for sell orders. Must be ≤ 0 for buy orders.
PreventParticipant Match	3	Alpha	Corresponds to *PreventParticipantMatch* (7928) in Cboe FIX. Three characters: 1^{st} character - PTP 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 *OrderQty*. 2^{nd} character - Unique ID Level: `N` = Do not prevent (Default value if not specified) `F` = Prevent Match at Participant Level `M` = Prevent Match at Trading Firm Level `P` = Prevent Match at Port Owner Level 3^{rd} character - Trading Group ID (optional): Member specified alphanumeric value 0-9, A-Z, or a-z. The Unique ID level (character 2) of both orders must match to prevent a trade. If specified on both orders, Trading Group ID (character 3) must match to prevent a trade. The PTP Modifier (character 1) of the inbound order will be honored, except that if the inbound order specified 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. May not be used in conjunction with Cross Flag.
PriceFormation	1	Alphanumeric	Optional. Indicates the price formation attribute of the trade, and corresponds to MMT v3 Level 3.2 and 3.8 For MMT Level 3.2 'Negotiation Indicator', supported values are: 3 = Negotiated Trade Subject to Conditions Other Than The Current Market Price (PRIC) For MMT Level 3.8 'Contribution to Price Formation or the Price Discovery Process', supported values are: Not specified or `P` = Plain-Vanilla Trade `T` = Non-Price Forming Trade (NPFT)

[6] *PegDifference* is rounded (down for buy, up for sell) to fit the tick size.

Price	8	Binary Price	Corresponds to *Price* (44) in Cboe FIX. Limit price. Four implied decimal places. Required for limit orders (*OrdType* = 2). If specified on a new market order (*OrdType* = 1), the order will be rejected. This field is also used to specify an optional cap price for pegged orders.
ReportTime	8	DateTime	Corresponds to *RptTime* (7570) in FIX. Optional. Indicates the time at which a deferred trade report will be automatically published.
RiskReset	8	Text	Corresponds to *RiskReset* (7692) in Cboe FIX. **Single Character Values**: S = Symbol level lockout reset F = Clearing firm level lockout reset C = CustomGroupID lockout reset Values may be combined together to allow for resets of multiple self-imposed lockouts in a single message. For example, FS, SC, FC, and SFC are all acceptable values.
RoutingInst	4	Text	Corresponds to *RoutingInst* (9303) in Cboe FIX. Up-to 2 characters: B = Cboe Only (default) P = Cboe Only — Post Only (will reject rather than remove visible liquidity) U = Dark Sweep (interbook) u = Dark Lit (best price) W = Lit Sweep (interbook, best price) X = Lit Sweep (interbook, sequential) BD = Cboe Dark Book Only (hidden midpoint peg orders only) BA = Cboe Automatic Dark Routed (routes to Cboe Integrated Book if order is Large In Scale (LIS) or is not a midpoint order, otherwise routes midpoint non-LIS orders to Cboe Dark Book) BP = Cboe Periodic Auction book BU = Cboe Closing Cross Post Only does not mix with TimeInForce = 3 (IOC). If a RoutingInst is not specified a default value of B is implied (Cboe Only).
RptTime	8	DateTime	DEPRECATED. Corresponds to *RptTime* (7570) in FIX. Optional. Indicates the time at which a deferred trade report will be automatically published.

SecondaryOrderID	8	Binary	Corresponds to *SecondaryOrderID* (198) in Cboe FIX. Denotes an alternative *OrderID* which is present on Cboe market data feeds (for example, to hide that a reserve (iceberg) order has reloaded). Or, *OrderID* of the contra side of a prevented match.
Side	1	Alphanumeric	Corresponds to *Side* (54) in Cboe FIX. 1 = Buy 2 = Sell 5 = Sell Short 6 = Sell Short Exempt H = Sell Undisclosed
SecondaryTrdType	1	Binary	Corresponds to *SecondaryTrdType* (855) in FIX. The following values are valid: 64 = Benchmark Trade
SecurityExchange	4	Alphanumeric	Corresponds to *SecurityExchange* (207) in Cboe FIX. Required if *IDSource* is set to 4 (ISIN).
SecurityID	16	Text	Corresponds to *SecurityID* (48) in Cboe FIX. ISIN, or RIC if *IDSource* is set.
SettlementCurrency	3	Alpha	Currency in which the trade should settle. Must be USD or EUR. If used, settlement price must be specified.
SettlementDate	8	DateTime	Used to specify the date on which the trade is desired to settle. Note, the actual settlement date may be varied by the central counterparties (CCPs) due to operational requirements (eg. for symbols in a conditional trading status). May only be specified on a new trade report. SettlementDate can't be specified if TradeHandlingInstr = 2 (One Party Report for Matching).
SettlementLocation	2	Alpha	Location at which the trade should settle. Must be EB (Euroclear Bank)
SettlementPrice	8	Trade Price	Price at which the trade should settle at. If specified, any risk controls will be applied against this price.
SubLiquidity Indicator	1	Alphanumeric	Additional information about an execution. **Cboe may add additional values without notice. Participants must gracefully ignore unknown values.** ASCII NUL (0x00) = No Additional Information D = Cboe Dark Pool Execution T = Removed liquidity from the Cboe Dark Pool by IOC order H = Trade added hidden liquidity I = Trade added hidden liquidity that was price improved K = Add liquidity from Hidden Reserve (Iceberg) order P = Periodic Auction C = Cboe Closing Cross
Symbol	8	Alphanumeric	Corresponds to *Symbol* (55) in Cboe FIX. Uniform symbology identifier for the instrument.

TimeInForce	1	Alphanumeric	Corresponds to *TimeInForce* (59) in FIX. 0 = Day 1 = GTC (allowed, but treated as Day) 2 = At The Open 3 = IOC (Portion not filled immediately is cancelled. Market orders are implicitly IOC.) 6 = GTD (expires at earlier of specified *ExpireTime* or end of day) 7 = At The Close 8 = Good For Auction (only valid if *RoutingInst*=BP or BU)
Tolerance	2	Binary	Maximum allowed delta (in terms of consideration, expressed in the traded currency), that the trade is prepared to match against counterparty.
TradeHandling Instruction	1	Binary	Used to specify the trade reporting model used. 1 (Two-Party Report) 2 (One Party Report for Matching)
TradeID	8	Binary	Corresponds to *TradeID* (1003) in FIX. Optional. Is used by the participant to specify the previously reported trade that the report sent refers to.
TradeLinkID	1	Alpha	Third Party Trade Identifier used for optional matching with counterparty. 30 characters or less. Characters in ASCII range 33–126 are allowed, except for comma, semicolon, and pipe.
TradePrice Condition	1	Binary	Corresponds to *TradePriceCondition* (1390) in FIX. The following values are valid: 0 = Cum Dividend (deprecated) 2 = Ex Dividend (deprecated) 13 = Special Dividend (SDIV)
TradePublish Indicator	1	Binary	DEPRECATED. Corresponds to *TradePublishIndicator* (1390) in FIX. Optional. Is used by the participant to request that the publication be delayed. The following values are valid: 0 = Do not publish. Deprecated from 4th December 2017 in Certification and 2nd January 2018 in Production. Any requests to publish a trade using this indicator will not be honoured and will instead be published immediately. 1 = Publish trade 2 = Deferred publication In order for RTS 1 based instruments to be considered for a deferral, *Capacity* = P (maps to 'DEAL') must be set. For RTS 1 and RTS 2 instruments, delayed publication/deferrals are ignored if the trade does not qualify for delayed publication.

TradePublishInd	1	Binary	Corresponds to *TradePublishIndicator* (1390) in FIX. Optional. Is used by the participant to request that the publication be delayed. The following values are valid: 0 = Do not publish. Deprecated from 4th December 2017 in Certification and 2nd January 2018 in Production. Any requests to publish a trade using this indicator will not be honoured and will instead be published immediately. 1 = Publish trade 2 = Deferred publication In order for RTS 1 based instruments to be considered for a deferral, *Capacity* = P (maps to 'DEAL') must be set. For RTS 1 and RTS 2 instruments, delayed publication/deferrals are ignored if the trade does not qualify for delayed publication.
TradeReportRefID	20	Text	Contains the *TradeReportRefID* of the trade capture report ack that should now be withdrawn
TradeReport TransType	1	Binary	Corresponds to *TradeReportTransType* (487) in FIX. Optional. Specifies the transaction type of the report sent via Trade Capture Report. The following values are valid: 0 = New 1 = Cancel 2 = Replace 3 = Release
TradeReport Type	1	Binary	This field controls pending state of the trade report. 0 = (Submit) for all new trade reports 6 = (Trade Report Cancel) to cancel any acknowledged, but not confirmed trade reports entered where *TradeHandlingInstruction* = 2
TradeReport TypeReturn	2	Binary	When requested, both *TradeReportTransType* and *TradeReportType* will be returned.
TradeTime	8	DateTime	Corresponds to *TransactTime* (60) and *TradeDate* (75) in FIX. Optional, for new trade reports. Cancel/amend/releases require the original time of the trade. Specifies the date and time at which the trade was arranged. This field defaults to the time at which the message is received, when defaulting is allowed.

TradingSession SubId	1	Binary	Corresponds to *TradingSessionSubId* (625) in FIX. The following values are valid: 2 = Scheduled Opening Auction 4 = Scheduled Closing Auction 6 = Scheduled Intraday Auction 8 = Unspecified Auction 9 = Unscheduled Auction 3 = Continuous Trading 5 = Post Trading 10 = Out of Main Session Trading
Transaction Category	1	Alphanumeric	Corresponds to *TrdType* (828) in FIX. Optional. Specifies the type or category of the trade being reported in a Trade Capture Report. At this time, only the following values are valid: P = Regular Trade (aka Plain-Vanilla Trade) D = Dark Trade
TrdSubType	1	Binary	Corresponds to *TrdSubType* (829) in FIX. Optional. The following values are valid: 37 = Agency Cross trade
VenueType	1	Alphanumeric	Corresponds to *VenueType* (1430) in FIX. The following values are valid: O = Off Book
WaiverType	1	Alphanumeric	Corresponds to *TrdRegPublicationReasons* (8013) in FIX. It indicates the Negotiation or Pre-Trade Transparency Waiver derived by Cboe. This is only supported in return messages from Cboe to Participant. For Order Execution v2 messages, all the values are valid. For Trade Capture Confirm v2 messages, all the Negotiated Trade values, and RFPT are valid. The following values are valid: - = No Waiver Type 0 = Negotiated Trade in Liquid Instrument (NLIQ) 1 = Negotiated Trade in Illiquid Instrument (OILQ) 2 = Negotiated Trade Subject to Conidtions Other Than the Current Market Price (PRIC) 3 = Reference Price (Dark Book) (RFPT) (Pre-Trade Transparency Waiver) A = Order Management Facility (Iceberg) (Pre-Trade Transparency Waiver) 9 = Large In Scale (Pre-Trade Transparency Waiver)
WorkingPrice	8	Binary Price	Only present when order is fully or partially booked. If price had to be adjusted to a less aggressive value for some reason, then the adjusted price will be reported here, otherwise equals price.

8 Reason Codes

The following is a list of all reason codes used. These reason codes are used in a variety of contexts (order cancellations, order rejections, modify rejections, etc.). All reasons are not valid in all contexts. Cboe may add additional reason codes without notice. Members must gracefully ignore unknown values.

`A` = Admin
`D` = Duplicate Identifier (e.g., *ClOrdID*)
`H` = Halted
`I` = Incorrect Data Center
`J` = Too late to cancel
`K` = Order Rate Threshold Exceeded
`k` = Pending periodic auction (BXE and DXE only)
`L` = Price Exceeds Cross Range
`M` = Liquidity Available Exceeds Order Size
`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` = Routing Order Would Trade Through an Away Destination
`U` = User Requested
`V` = Would Wash
`W` = Add Liquidity Only Order Would Remove
`X` = Order Expired
`Y` = Symbol Not Supported
`Z` = Unforeseen Reason
`l` = Large in Scale
`m` = Market Access Risk Limit Exceeded
`o` = Max Open Orders Count Exceeded
`p` = Static Collar Breach
`r` = Reserve Reload
`s` = Risk Management Symbol Level
`x` = Crossed Market
`v` = MiFID II Double Cap related
`y` = Order Received by Cboe During Replay

9 List of Message Types

9.1 Participant to Cboe

Message Name	Level	Type	Sequenced
Login Request V2	Session	0x37	No
Logout Request	Session	0x02	No
Client Heartbeat	Session	0x03	No
New Order V2	Application	0x38	Yes
Cancel Order V2	Application	0x39	Yes
Modify Order V2	Application	0x3A	Yes
Trade Capture Report V2	Application	0x3C	Yes
Purge Orders V2	Application	0x47	Yes

9.2 Cboe to Participant

Message Name	Level	Type	Sequenced
Login Response V2	Session	0x24	No
Logout	Session	0x08	No
Server Heartbeat	Session	0x09	No
Replay Complete	Session	0x13	No
Order Acknowledgment V2	Application	0x25	Yes
Order Rejected V2	Application	0x26	No
Order Modified V2	Application	0x27	Yes
Order Restated V2	Application	0x28	Yes
User Modify Rejected V2	Application	0x29	No
Order Cancelled V2	Application	0x2A	Yes
Cancel Rejected V2	Application	0x2B	No
Order Execution V2	Application	0x2C	Yes
Trade Cancel or Correct V2	Application	0x2D	Yes
Trade Capture Report Accept V2	Application	0x30	Yes
Trade Capture Report Reject V2	Application	0x31	No
Trade Capture Report Confirm V2	Application	0x32	Yes
Trade Capture Report Decline V2	Application	0x33	Yes
Purge Rejected V2	Application	0x48	No
Mass Cancel Acknowledgment V2	Application	0x36	No

10 Port Attributes

The table below lists BOE port attributes that are configurable on the port or firm level. Changes to these attributes can be made by contacting the Cboe Trade Desk.

Attribute	Default	Description
Allowed Clearing Executing Firm ID(s)*	All MPIDs	Executing Firm ID(s) allowed for trading on the port.
Allowed Trade Reporting Firm ID(s)*	No MPIDs	Executing Firm ID(s) allowed for trade reporting on the port.
Cancel on Disconnect	Option 1	Cboe offers two options for cancelling orders as a result of a session disconnect: 1. Cancel all open orders (continuous book and on-open, on-close and periodic auction orders). 2. Do not cancel any open orders.
Send Trade Breaks^	No	Enables sending of TRADE CANCEL OR CORRECT V2 messages.
Default MTP Value*^†	None	Specifies default value for *PreventParticipantMatch*.
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 match trade prevention by using *PreventMatch* on the order level.
Cancel on Reject†	No	Cancels an order upon a cancel or modify reject.
Cancel on Halt	No	Cancel open orders for a symbol upon a halt.
Reject Orders on DROP Port Disconnect*	No	Allows Participant/Sponsoring Firms to associate DROP port(s) to order entry port(s). If all associated DROP ports experience disconnection, new orders will be rejected until at least one DROP port session has been reestablished.
Reject Orders on DROP Port Disconnect*	30 seconds	Only applicable if "Reject Orders on DROP Port Disconnect" has been enabled. When the last associated DROP port has disconnected, begin rejecting orders on the associated order entry port(s) if a DROP session has not been reestablished within this timeout. Minimum value allowed is 0 seconds.
Cancel Open Orders on DROP Port Disconnect*	No	Only applicable if "Reject Orders on DROP Port Disconnect" has been enabled. When the last associated DROP port has disconnected, cancel all associated open orders.
Send Peg Restatements	Option 1	Send restatements for Peg order movements. 1. No Peg restatements (default). 2. Market Maker Peg orders only. 3. All Peg orders except Market Maker Peg orders. 4. All Peg orders.

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

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

^Requires certification.

11 Support

Please email questions or comments regarding this specification to `tradedeskeurope@cboe.com`.

Revision History

Oct 14, 2019	Version 2.0.47 Clarified usage of field TradeHandlingInstr in conjunction with SettlementDate.
May 31, 2019	Version 2.0.46 Add DXE environment. Add Cboe Closing Cross.
February 13, 2019	Version 2.0.45 Hidden Reserve (K) added to *SubLiquidityIndicator*.
January 14, 2019	Version 2.0.44 Removed references to external routing.
November 15, 2018	Version 2.0.43 Update *TradeReportID* (571) description.
November 14, 2018	Version 2.0.42 Support for Purge Orders v2.
September 28, 2018	Version 2.0.41 Cboe will enforce port level day-uniqueness for *TradeReportID*.
August 13, 2018	Version 2.0.40 Added pending periodic auction (k) reject reason.
July 24, 2018	Version 2.0.39 Added description for *TradeReportReturnType* in ROB7.
May 09, 2018	Version 2.0.38 Added *TradePublishInd* and *ReportTime* to ROB15. These should be used instead of the now deprecated *TradePublishIndReturn* from ROB7.
April 30, 2018	Version 2.0.37 Updated return bitfields.
March 26, 2018	Version 2.0.36 Updated text for *MinQty*.
November 27, 2017	Version 2.0.35 Deprecated use of *TradePublishIndicator*=0 (Do Not Publish).
November 24, 2017	Version 2.0.34 Updated definition of reserved value '3' in *ExecutorID*
September 20, 2017	Version 2.0.33 Removed support for ILQD and SIZE which are only applicable to RTS 2 instruments from *DeferralReason*. *DeferralReason* was made an input bitfield in TRADE CAPTURE REPORT V2 when the Q4 2017 release was announced; no longer necessary due to removing support for SIZE.
July 19, 2017	Version 2.0.32 MMT v3.04 support for Q4 2017 release.
July 10, 2017	Version 2.0.31 Added *FeeCode* to repeating group on TRADE CAPTURE CONFIRM V2 messages.
June 6, 2017	Version 2.0.30 Correction to valid values for *BaseLiquidityIndicator*.
June 2, 2017	Version 2.0.29 Corrected description for *TransactionCategory*. Driving MMT v3 'RPRI' on market data is not valid on-exchange.
May 24, 2017	Version 2.0.28 Corrected description for *PriceFormation* and value to drive MMT v3 'PRIC' on market data.
May 3, 2017	Version 2.0.27 Clarified valid values for *OrderOrigination*.

April 25, 2017	Version 2.0.26 Clarify use of None for QualifiedRole fields. *StopPx* is now disallowed on all message types. Renamed *PreventMatch* to *PreventParticipantMatch* in NEW ORDER V2. Note that *SubLiquidityIndicator* can be requested on ORDER EXECUTION V2 messages (even though it's present in the message body and is extraneous).
March 20, 2017	Version 2.0.25 Correction to valid values range for Short Code. Confirmation of WaiverType values.
March 2, 2017	Version 2.0.24 Add new field type *Date*
February 16, 2017	Version 2.0.23 Update Return Bitfields for ORDER EXECUTION V2 to include PartyQualifiedRoles. Also moved the PartyQualifiedRoles from byte 12, to 10 and 11 for ORDER ACKNOWLEDGEMENT V2.
February 9, 2017	Version 2.0.22 Review feedback for Order Record Keeping and MMT v3
February 1, 2017	Version 2.0.21 Support for MMT v3
December 2, 2016	Version 2.0.20 *MaxFloor* update for MODIFY ORDER V2
November 8, 2016	Version 2.0.19 Update for Order Enrichment Fields.
October 25, 2016	Version 2.0.18 Update description for MODIFY ORDER V2
August 22, 2016	Version 2.0.17 Support for MiFID II Record Keeping fields.
August 11, 2016	Version 2.0.16 Update values for PartyIDSource tags and other minor corrections.
August 4, 2016	Version 2.0.15 Update field length for GrossTradeAmt
July 11, 2016	Version 2.0.14 Clarify PreventParticipantMatch values. Clarify MatchType values
April 29, 2016	Version 2.0.13 Remove 'Effective' notes related to Q2 2016 release.
March 7, 2016	Version 2.0.12 Reinstate "Large in Scale" and "Reserve Reload" reject reason codes, that had been accidentally removed.
February 19, 2016	Version 2.0.11 Updated for new branding.
January 8, 2016	Version 2.0.10 Removed support for Post Only At Limit. Added MiFID II Double Cap reject reason code. Added Order Category optional return bitfield.
December 1, 2015	Version 2.0.9 For TRADE CAPTURE REPORT V2, clarified that TradeTime is only optional for new trades.
October 8, 2015	Version 2.0.8 Removed BaseLiquidityIndicator value P. Added SubLiquidityIndicator value P.
June 13, 2015	Version 2.0.7 Added 5th input bitfield for TRADE CAPTURE REPORT V2. Added support for specifying Settlement dates and prices. Added support for *LastMkt* in ORDER EXECUTION V2 and TRADE CANCEL OR CORRECT V2. Added support for obtaining the last market of execution.

June 12, 2015	Version 2.0.6 Added detail about Port Owner participant trade prevention.
May 28, 2015	Version 2.0.5 Added an example for TRADE CAPTURE REPORT V2 and clarified description of *TrdCapRptSideGrp*.
April 16, 2015	Version 2.0.4 Corrected various instances where MBBO was incorrectly referenced instead of PBBO.
April 14, 2015	Version 2.0.3 Clarification of *MinQty* (110) behaviour following "Minimum Execution Size" (MES) changes.
March 13, 2015	Version 2.0.2 Added TradeReportRefID to ROB8.
March 12, 2015	Version 2.0.1 Added ETR Matching fields in TCRB4.
February 10, 2015	Version 2.0.0 First Version 2 release.