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## **CBOE Application Programming Interface**

### **CBOE FIX 4.2 Version 4.1 - Release Notes**

Provides an overview of the updates and changes to the FIX 4.2 with this version release.

## ***CBOE PROPRIETARY INFORMATION***

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Document #[FIX-00]

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## **Front Matter**

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Questions regarding this document can be directed to The Chicago Board Options Exchange at 312.786.7300 or via e-mail: [api@cboe.com](mailto:api@cboe.com).

The latest version of this document can be found at the CBOE web site <http://systems.cboe.com>.

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## Overview

Release notes for the FIX 4.2 API, Version 4.1, were initially published on September 8, 2006. Version 4.1 supports new order types for CBOE's Stock system. Since the initial publication, the mapping of the FIX fields for the new order types has changed.

Documentation changes are detailed in the sections below. Invalid values from the previous release notes are marked as ~~striketrough~~ text in red font. Your feedback or questions regarding this document should be sent to [API@cboe.com](mailto:API@cboe.com).

## V4.1 Highlights

Several new contingency order types are introduced in this release for the CBOE Stock system. The "New Order Single Message (MsgType=D)" in FIX has been updated to include the following contingency types.

### ~~INTERMARKET\_SWEEP=Q~~

#### (1) INTERMARKET\_SWEEP

Intermarket Sweep Orders (ISO) will be implemented in the RegNMS release of the Stock system, which is scheduled for October 2006. Intermarket Sweep Orders are treated as IOC orders but will trade against the book without regard to the NBBO. Trades executed as a result of these orders are exempted from RegNMS trade-through rules. ISO orders may only be sent if the sender has simultaneously sent orders to any other markets with protected quotes priced better than the limit price on the ISO.

##### Fix tags and values:

*TimeInForce* - [Tag 59] = ~~3 (Immediate or Cancel)~~ For ISOs, this tag is interpreted as IOC

*OrdType* - [Tag 40] = 2 (Limit)

*ExecInst* - [Tag 18] = f (Intermarket Sweep – this is a new value)

### ~~RESERVE=R~~

#### (2) RESERVE

Reserve orders are a new feature added in Stock Hybrid, which is scheduled for implementation in January 2007. A reserve order has two quantities associated with it, order quantity and display quantity. Only the display quantity is visible as CBOE's book. The remaining quantity (order quantity - display quantity) is available to trade but not visible.

##### Fix tags and values:

*MaxFloor* - [Tag 111] = Maximum Volume to be displayed. (If this is > 0, it is a reserve order).

In addition, new cross orders have been added to support the Stock Hybrid system. In all cases, the matching orders (if not arriving as a pair) have to arrive within a specified time otherwise the original cross order will be cancelled.

Firms can send 'Cross' orders as a pair via the OrderList message, *New Order – List* (*MsgType=E*) or as two single orders via the *New Order Single Message* (*MsgType=D*). When two single orders are used, the second crossing order must be received within a certain time interval of receiving the first crossing order. There can only be one resting CROSS order for a particular product. Further, a cross order can only trade with another cross order of the same contingency type – i.e. a 'MIDPOINT\_CROSS' will only trade with another 'MIDPOINT\_CROSS' that has the same price, but opposite side.

- ➔ Condition for cross order to trade: Same contingency, productKey & price; opposite side.
- ➔ Exception: AUTOLINK\_CROSS trades with AUTOLINK\_CROSS\_MATCH.

Below is a brief description of each cross type.

### **MIDPOINT\_CROSS=S**

#### **(3) MIDPOINT\_CROSS**

Mid Point cross: These two orders can arrive as a pair (together) or one after the other. In either case they will need the same contingency. A mid-point-cross trades at the middle of current NBBO and will trade at ½ cent increments. Both orders must be for the same size.

##### **Fix tags and values:**

*OrdType – [Tag 40] = 1 (Market)*

*Side – [Tag 54] = 1 (Buy); 2 (Sell)*

*ExecInst – [Tag 18] = B (OK to Cross) ➔ MIDPOINT\_CROSS = Market + OK To Cross*

### **CROSS=T**

#### **(4) CROSS**

These two orders can arrive as a pair (together) or one after the other. In either case they will need the same contingency. If they are for the same price and size they will trade against each other immediately as long as the price is at or within CBOE's quote and the NBBO. If the trade price is equal to the CBOE's best market and the market includes public customer orders, the cross order must be: X shares or more; be for a dollar amount greater than or equal to \$Y; and larger than any public customer interest at that price. Both orders must be for the same price and size and neither order will execute unless both orders are received.

##### **Fix tags and values:**

*OrdType – [Tag 40] = 2 (Limit)*

*Price – [Tag 44] = Limit price is required*

*Side – [Tag 54] = 1 (Buy); 2 (Sell)*

*ExecInst – [Tag 18] = B (OK to Cross) ➔ CROSS = Limit + OK To Cross*

**~~TIED\_CROSS=U~~****(5) TIED\_CROSS (CURRENTLY UNSUPPORTED)**

Tied Cross: Similar to Cross orders except that they can trade even if they are same as the CBOE's current market. That is the trade price does not have to be better than CBOE's current market.

**Fix tags and values:**

*OrdType – [Tag 40] = 2 (Limit)*

*Price – [Tag 44] = Limit price is required*

*Side – [Tag 54] = 1 (Buy); 2 (Sell)*

*ExecInst – [Tag 18] = g*

**~~AUTOLINK\_CROSS=V~~****(6) AUTOLINK\_CROSS**

Auto Link Cross is an order that will be Autolinked if CBOE is not the NBBO and the order is tradable at other markets. If there is remaining quantity, then this order will trade against an AutoLink\_Cross\_Match order (see below). Autolink\_cross orders and autolink\_cross\_match orders can route in a single paired message or as two separate orders. Both orders must be for the same price but do not necessarily need to be for the same size. The autolink\_cross order will not execute unless an autolink\_cross\_match order is received.

**Fix tags and values:**

*OrdType – [Tag 40] = 2 (Limit)*

*Price – [Tag 44] = Limit price is required*

*Side – [Tag 54] = 1 (Buy); 2 (Sell)*

*ExecInst – [Tag 18] = h*

**~~AUTOLINK\_CROSS\_MATCH=W~~****(7) AUTOLINK\_CROSS\_MATCH**

Users have to submit two orders for AUTOLINK crosses. One is AUTOLINK\_CROSS and the second one is AUTOLINK\_CROSS\_MATCH. If away markets are better, then AUTOLINK\_CROSS will first sweep away markets and the CBOE book. If there is still quantity remaining, then it will trade against the AUTOLINK\_CROSS\_MATCH.

**Fix tags and values:**

*OrdType – [Tag 40] = 2 (Limit)*

*Price – [Tag 44] = Limit price is required*

*Side – [Tag 54] = 1 (Buy); 2 (Sell)*

*ExecInst – [Tag 18] = i*

## Order Rejects

If the CROSS order is rejected for any reason, the CMi ActivityReason will be mapped to FIX as Text [Tag 58] fields.

### CMi Activity Reasons

ActivityReason CROSS\_IN\_PROGRESS = 15;

ActivityReason NOT\_WITHIN\_NBBO = 16;

ActivityReason TRADE\_THROUGH\_CBOE = 17;

ActivityReason INSUFFICIENT\_CUSTOMER\_ORDER\_QUANTITY = 18;

ActivityReason INSUFFICIENT\_CROSS\_ORDER\_SIZE = 19;

ActivityReason INSUFFICIENT\_CROSS\_ORDER\_DOLLAR\_AMOUNT = 20

### Fix tags and values:

*Text – [Tag 58] = ActivityReason (from CMi)*

## Document Changes

### FIX-01

- No changes

### FIX-03a

- No changes

### FIX-03b (Including Tag Dictionary)

- Updated the Tag Dictionary to include the new Stock order types OrdType[tag 40]

#### **Stock:**

Intermarket Sweep = 2 (Limit)

Reserve = “Refer to MaxFloor [tag111]”

Midpoint Cross = 1 (Market)

Cross = 2 (Limit)

Tied Cross (currently unsupported) = 2 (Limit)



Autolink Cross = 2 (Limit)

Autolink Cross Match = 2 (Limit)

~~Used for Stock:~~

- ~~• Q=Intermarket Sweep~~
- ~~• R=Reserve~~
- ~~• S=Midpoint Cross~~
- ~~• T=Cross~~
- ~~• U=Tied Cross~~
- ~~• V=Autolink Cross~~
- ~~• W=Autolink Cross Match~~

### FIX-03c

- Changed “Preferred DPM” to read “Preferred Market Maker” throughout the document.
- Modified “Table 2 Order Contingency Types for each Trading Session” to include the Stock contingency types
- Added a new section “Creating and submitting Stock order types”. The section reads as follows:

Stock trading on CBOEdirect has introduced new order contingency types, Intermarket Sweep orders (ISO), Reserve orders and Cross orders. Firms can use the *FIX New Order- Single Message (MsgType=D)* to transmit ISO and Reserve orders.

#### Intermarket Sweep Order (ISO)

Intermarket Sweep Orders (ISO) will be implemented in the RegNMS release of the Stock system, which is scheduled for October 2006. Intermarket Sweep Orders are treated as IOC orders but will trade against the book without regard to the NBBO. Trades executed as a result of these orders are exempted from RegNMS trade-through rules. ISO orders may only be sent if the sender has simultaneously sent orders to any other markets with protected quotes priced better than the limit price on the ISO.

#### Reserve

Reserve orders are a new feature added in Stock Hybrid, which is scheduled for implementation in January 2007. A reserve order has two quantities associated with it, order quantity and display quantity. Only the display quantity is visible as CBOE’s book. The remaining quantity (order quantity - display quantity) is available to trade but not visible.

Firms can send Cross orders as a pair using the *New Order – List (MsgType=E)* or as two single orders via the *New Order- Single Message (MsgType=D)*. When two single orders are used, the second crossing order must be received within a certain time interval of receiving the first crossing order. There can only be one resting Cross order for a particular product. Further, a cross order can only trade with another cross order of the same contingency type (i.e. a ‘MIDPOINT\_CROSS’ will only trade with another ‘MIDPOINT\_CROSS’ that has the same price, but opposite side). In all cases, the matching orders (if not arriving as a pair) have to arrive within a specified time otherwise the original cross order will be cancelled.

### Midpoint Cross

Mid Point cross: These two orders can arrive as a pair (together) or one after the other. In either case they will need the same contingency. A mid-point-cross trades at the middle of current NBBO and will trade at ½ cent increments. Both orders must be for the same size.

### Cross

These two orders can arrive as a pair (together) or one after the other. In either case they will need the same contingency. If they are for the same price and size they will trade against each other immediately as long as the price is at or within CBOE's quote and the NBBO. If the trade price is equal to the CBOE's best market and the market includes public customer orders, the cross order must be: X shares or more; be for a dollar amount greater than or equal to \$Y; and larger than any public customer interest at that price. Both orders must be for the same price and size and neither order will execute unless both orders are received.

### Tied Cross (CURRENTLY UNSUPPORTED)

Tied Cross: Similar to Cross orders except that they can trade even if they are same as the CBOE's current market. That is the trade price does not have to be better than CBOE's current market.

### Autolink Cross

Auto Link Cross is an order that will be Autolinked if CBOE is not the NBBO and the order is tradable at other markets. If there is remaining quantity, then this order will trade against an AutoLink\_Cross\_Match order (see below). Autolink\_cross orders and autolink\_cross\_match orders can route in a single paired message or as two separate orders. Both orders must be for the same price but do not necessarily need to be for the same size. The autolink\_cross order will not execute unless an autolink\_cross\_match order is received.

### Autolink Cross Match

Users have to submit two orders for AUTOLINK crosses. One is AUTOLINK\_CROSS and the second one is AUTOLINK\_CROSS\_MATCH. If away markets are better, then AUTOLINK\_CROSS will first sweep away markets and the CBOE book. If there is still quantity remaining, then it will trade against the AUTOLINK\_CROSS\_MATCH.

- Added a new tag "MaxFloor [tag111]" to the New Order Single Message (MsgType=D).

This tag is required for entering a Reserve order for Stock.

MaxFloor = Maximum Volume to be displayed. If the maximum volume is > 0, it is a Reserve order.

- Updated OrdType [tag 40] in the "New Order Single Message (MsgType=D)" to include the new order types for Stock:

#### Stock:

Intermarket Sweep = 2 (Limit)

Reserve = "Refer to MaxFloor [tag111]"

Midpoint Cross = 1 (Market)

Cross = 2 (Limit)

Tied Cross (currently unsupported) = 2 (Limit)

Autolink Cross = 2 (Limit)

Autolink Cross Match = 2 (Limit)

**Used for Stock:**

- ~~Q=Intermarket Sweep~~
- ~~R=Reserve~~
- ~~S=Midpoint Cross~~
- ~~T=Cross~~
- ~~U=Tied Cross~~
- ~~V=Autolink Cross~~
- ~~W Autolink Cross Match~~

### **FIX-03d**

- No changes

### **FIX-06**

- No changes

### **FIX-07**

- No changes

## **Test Plan Changes**

### **FIX Phase 2 Test Plans**

- No change.

#### **3a, Security Definition Test Plan**

- No change.

#### **3b, Market Data Test Plan**

- No change.

#### **3c, Quote Test Plan - Hybrid-ONE-CFE (includes 3j, Hybrid Sections and 3L, CFE Supplemental Tests)**

- No change.

**3e, W\_MAIN-ONE-CFE Order Test Plan (includes 3k, CFE Supplemental Tests)**

- No change.

**3f, Clearing Firm, Duplicate Message Test Plan**

- No change.

**3g, Strategy Quote Test Plan - ONE-CFE**

- No change.

**3i, W\_MAIN-ONE-CFE Strategy Order Test Plan**

- No change.

**3m, Stock Trading On CBOEdirect (STOC) Order Test Plan**

- No change.

**3n, Stock Trading On CBOEdirect (STOC) Quote Test Plan**

- No change.

**3o, Stock Trading On CBOEdirect (STOC) DPM Administrative Test Plan**

- No change.

**Phase 4 Test Plan**

- No change.