Cboe Titanium U.S. Options Auction Process

Version 1.1.31

August 10, 2026

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Introduction

The auctions on the Cboe Options (C1) and EDGX Options Exchanges are used to communicate execution and price improvement opportunities by delivering auction message information. This document describes relevant information for each of the auction types offered by the Cboe Exchanges.

Cboe Options Auction Information

Cboe Options auction data will be exposed on both the US Options Multicast PITCH feed and the US Options Auction Feed. Auction information will not be disseminated via OPRA.

Messaging

Auction Notification Messages

Auction Notification messages are used to disseminate details of an auction. Auctions will be available for a defined period of time known as the exposure period.

Auction Trade Messages

Auction Trade messages are used to disseminate executions resulting from an earlier **Auction Notification** message.

Auction Cancel Messages

Auction Cancel messages are used to disseminate the cancellation of an earlier **Auction Notification** message as a result of a user cancellation of the original order, a user modification request to change the price or increase the original order quantity, a fading of the NBBO, or a cancellation of any remaining order quantity from the original **Auction Notification** following the auction termination.

A user request to modify the order price or to increase the original order quantity will result in a cancellation of the auction followed by a new **Auction Notification** message. **Auction Cancel** messages will not be issued for order quantity decrements.

Cboe Options Auction Types and Paired /Cross Order Types

All auction types described below are available for single leg instruments and complex instruments. AIM, SAM, and SUM auction types are available for FLEX instruments. QCC, PCC, and RFC order types are not available for FLEX instruments.

AIM Auction

AIM auctions allow Members to facilitate their clients' (agency) order flow by broadcasting their orders on the Exchange for price improvement opportunity over the current market price. At the conclusion of the AIM Auction exposure interval, the agency order will trade against the specified contra party(s) or other responses to the auction.

Initiating AIM Orders

A Member may initiate an AIM auction by submitting a two-sided **New Order Cross** message using either FIX or BOE order entry. The two-sided order will contain symbol, price and quantity along with relevant clearing information for both the agency and contra sides. The initiating AIM Order must include the contra-side response(s) within the **New Order Cross** message. A maximum of ten (10) contra-parties will be accepted per order.

The Initiating Member may elect to Auto Match. If elected, the Initiating Member will be allocated the number of contracts equal to the aggregated size of all the orders and responses awarded at each price point. If a limit price is specified (optional), contracts will be matched up to and including their Auto Match limit price.

For *AutoMatch* options '1' and '2', if an AIM order with Auto-Match has an auction starting price violating NBBO-related rules, the auction starting price will be adjusted to either match the NBBO (for orders with stop price requirement at or better than NBBO) or improve the NBBO by one tick (for orders with stop price requirement at least one minimum increment better than NBBO) if:

- ***AutoMatch*** (FIX Tag 9040) = 1 (Market), OR
- ***AutoMatch*** = 2 (Limit), and if the Auto-Match Limit price is at the NBBO or better (for orders with stop price requirement at or better than NBBO) or at least one tick better than the NBBO (for orders with stop price requirement at least one minimum increment better than NBBO).

Members can optionally choose to reject the AIM auction rather than have the starting price adjusted to meet NBBO requirements using *AutoMatch* options '3' and '4':

- ***AutoMatch*** = 3 (Market). No starting price adjustment, OR
- ***AutoMatch*** = 4 (Limit). No starting price adjustment.

If the Initiating Member would prefer to surrender its execution entitlement completely, it may elect Last Priority. The system will attempt to honor the request in the allocation process but the Initiating Member will be required to fill the balance of the order, if any remains, after all eligible orders and responses are executed.

AIM orders can optionally include the ISO flag. If present, the initiating member has taken the responsibility of clearing all better-priced interest allowing the execution to occur through the NBBO, but not through the local book. The ISO instruction will be applied to the agency-side of the AIM Auction only.

AIM Response Orders

During the exposure period, other Exchange Members not directly included in the contra-side of a AIM Auction order may send a targeted response to the auction reflecting the responding Member's willingness to participate in that auction. Response orders must be entered on the opposite side of the auction order or they will be rejected. Responses will be capped by the agency side local BBO at the conclusion of the auction, or one minimum increment better than the agency side local BBO if it is represented by a Priority Customer on the Book. Individual responses will be capped at the size of the auction order while members submitting multiple responses will have the cap applied to their aggregate response size. Response orders will be acknowledged and held until the completion of the auction or until an early termination. All unexecuted responses will be canceled back after the completion of the auction.

At the conclusion of an auction response or exposure period, the Matching Engine will continue processing messages, including auction responses, for up to an additional 100ms (900ms on C1 only) to include auction responses that arrived at the Matching Engine NIC prior to the scheduled auction end time. The Matching Engine will immediately conclude the auction either upon processing all events arriving at the Matching Engine prior to the scheduled auction end time or upon elapse of the additional timer.

Response orders may be canceled or modified using the **Order Cancel Request** message or the **Order Cancel/Replace Request** message. As a result, Response orders may not be IOC.

Unrelated Orders

Liquidity resting on the book at the initiation of the auction and unrelated orders received during the auction exposure are also eligible to execute against the auctioned order but are not considered true responses and may have different fees associated with them. If a Member has both a resting order on the book and a response in the auction at the same price, the response is eligible for execution first.

Unrelated orders may also be canceled or modified.

Early Termination

An AIM auction will terminate naturally at the end of the exposure interval. In addition, the auction may terminate early under some circumstances. See Exchange rules for further details.

Matched Trade Prevention

Matched Trade Prevention instructions will not be applied to the AIM order ensuring that the AIM order will not be prevented due to a resting order. AIM Response Orders may only have the Cancel Newest instruction. This will prevent a respondent from executing against an order from the same firm.

Attribution

AIM orders may optionally be attributed to the four-character EFID, a four-character Client ID, or both the EFID and Client ID on the **Auction Notification** message.

Simultaneous AIM Auctions

Simultaneous AIM/C-AIM auctions for AIM/C-AIM orders of all sizes are allowed.

Contra-Side One Contract Guarantee

For AIM auctions where the remaining size of the agency order at the final auction price is one or two contracts, the contra-side will be entitled to at least one contract, assuming there are no customers at the final auction price. Customer orders will always trade before the contra receives their entitlement.

AIM Executions

The Initiating Member will receive its execution entitlement at the Final Auction Price after customer orders at that price are filled. If there are only two participants that will trade at the final auction price including the initiating member, the Initiating Member will receive 50% of the remaining order quantity, after customer interest. If there are more than 2 participants at the Final Auction Price including the initiating member, the Initiating Member will receive 40% of the remaining order quantity. The unexecuted remainder will trade pro-rata between the respondents with any balance filled by the Contra.

As an incentive to post tighter markets on the Exchange, execution priority will be granted to participants with orders at the NBBO at the time an auction is initiated ahead of other responses at the same price. This Priority Quoter benefit will be based upon the size of the participant's displayed quote. The balance of any response that is greater than the

displayed size will trade pro-rata with the remaining responses. Priority Quoter functionality is configurable by underlying symbol on the Exchange.

AIM Auction executions will begin with the best price and conclude with the Final Auction Price where the remaining auction volume will be executed.

AIM Examples

Table 1. AIM Example: Standard Allocation

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .95 X 1.03	Agency Side: Buy 100 @ 1.02 AIM Contra Side: Sell 100 @ 1.02 ***Expose Order***	Other Responses: Sell 10 @ 1.00 MM1 Sell 20 @ 1.01 MM2 Sell 50 @ 1.02 BD1 Sell 40 @ 1.02 BD2	Trade: 10 @ 1.00 MM1 20 @ 1.01 MM2 28 @ 1.02 Contra 23 @ 1.02 BD1 19 @ 1.02 BD2 Cancel: 72 @ 1.02 Contra 27 @ 1.02 BD1 21 @ 1.02 BD2

Example 1) Standard Allocation: An AIM Order is entered and exposed. Responses are received at multiple prices. The Contra-Allocation of 40% of the remaining order quantity occurs after better-priced responses are allocated. The remainder trades pro-rata at the Final Auction Price. Unexecuted responses and contra interest are canceled at the conclusion of the auction.

Table 2. AIM Example: Parity Allocation

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .95 X 1.03	Agency Side: Buy 100 @ 1.02 AIM Contra Side: Sell 100 @ 1.02 ***Expose Order***	Other Responses: Sell 100 @ 1.02 MM1	Trade: 50 @ 1.02 Contra 50 @ 1.02 MM1 Cancel: 50 @ 1.02 MM1 50 @ 1.02 Contra

Example 2) Parity Allocation: AIM order is entered and exposed. Only one response is received. The Contra-Allocation at the Final Auction Price is 50% to remain on parity with the response.

Table 3. AIM Example: Customer Priority

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .95 X 1.03 (10) CUST on Offer Sell 10 @ 1.03	Agency Side: Buy 100 @ 1.03 AIM Contra Side: Sell 100 @ 1.03 ***Expose Order***	Other Responses: Sell 50 @ 1.03 MM1 Sell 20 @ 1.03 MM2	Trade: 10 @ 1.03 CUST 36 @ 1.03 Contra 39 @ 1.03 MM1 15 @ 1.03 MM2 Cancel: 64 @ 1.03 Contra 11 @ 1.03 MM1 5 @ 1.03 MM2

Example 3) Customer Priority: A customer capacity order on the offer has priority and receives a fill ahead of all non-customer responses at the same price and before the Initiating Member receives its 40% allocation.

Table 4. AIM Example: Auto Match

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .95 X 1.03	Agency Side: Buy 100 @ 1.02 AIM Contra Side: Sell 100 @ 1.02 Auto Match Limit 1.01 ***Expose Order***	Other Responses: Sell 10 @ 1.00 MM2 Sell 10 @ 1.01 MM1 Sell 20 @ 1.02 BD1 Sell 30 @ 1.02 BD2	Trade: 10 @ 1.00 MM2 10 @ 1.01 MM1 10 @ 1.01 Contra (Auto Match) 28 @ 1.02 Contra (40% entitlement) 17 @ 1.02 BD1 25 @ 1.02 BD2 Cancel: 62 @ 1.02 Contra 3 @ 1.02 BD1 5 @ 1.02 BD2

Example 4) Auto Match: AIM order is entered with the Auto Match option elected and a limit price is specified so Auto Match will apply to limited price level responses. The contra will match each contract allocated at the better prices up to and including its limit. The Contra-Allocation of 40% of the remaining order quantity occurs after better-priced responses are allocated.

Table 5. AIM Example: Auto Match

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .97 X 1.03	Agency Side: Buy 100 @ 1.04 AIM ***(Offer had been at 1.04 when this order was sent, but the market changed while the order was in flight)*** Contra Side: Sell 100 @ 1.04 Auto-Match Limit price 1.01 ***Expose Order***	Other Responses: Sell 10 @ 1.00 MM2 Sell 10 @ 1.01 MM1 Sell 20 @ 1.02 BD1 Sell 30 @ 1.02 BD2	Trade: 10 @ 1.00 MM2 10 @ 1.01 MM1 10 @ 1.01 Contra (Auto Match) 28 @ 1.02 Contra (40% entitlement) 17 @ 1.02 BD1 25 @ 1.02 BD2 Cancel: 62 @ 1.02 Contra 3 @ 1.02 BD1 5 @ 1.02 BD2

Example 5) Auto Match: AIM order is entered with a starting price (1.04) outside the NBBO upon arrival (due to the market changing while the order was in flight). The Auto Match option is included and a limit price is specified so Auto Match applies to limited price level responses. Rather than rejecting the order because the starting price is outside the NBBO, the NBBO price will be used as the starting price. The contra matches each contract allocated at the better prices up to and including its limit. The Contra-Allocation of 40% of the remaining order quantity occurs after better-priced responses are allocated.

Table 6. AIM Example: Last Priority

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .95 X 1.03	Agency Side: Buy 100 @ 1.02 AIM Contra Side: Sell 100 @ 1.02 Last Priority ***Expose Order***	Other Responses: Sell 100 @ 1.02 MM1 Sell 100 @ 1.02 MM2	Trade: 50 @ 1.02 MM1 50 @ 1.02 MM2 Cancel: 100 @ 1.02 Contra 50 @ 1.02 MM1 50 @ 1.02 MM2

Example 6) Last Priority: Initiating Member has requested Last Priority. Responses received are greater than the size of the exposed order. The Contra's request for Last Priority is honored and the allocations are given to others.

Table 7. AIM Example: Priority Quoter

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .97 X 1.03 (20) MM1 quote at 1.03 for 20 contracts MM3 is not @ 1.03	Agency Side: Buy 100 @ 1.02 AIM Contra Side: Sell 100 @ 1.02 ***Expose Order***	Other Responses: Sell 50 @ 1.02 MM1 Sell 50 @ 1.02 MM3	Trade: 40 @ 1.02 Contra 20 @ 1.02 MM1 (Priority Quoter) 15 @ 1.02 MM1 (pro-rata remainder of response) 25 @ 1.02 MM3 (response) Summary of Trades: 40 @ 1.02 Contra 35 @ 1.02 MM1 25 @ 1.02 MM3 Cancel: 60 @ 1.02 Contra 15 @ 1.02 MM1 25 @ 1.02 MM2

Example 7) Priority Quoter status is configured: The Priority Quoter (MM1) participates in the execution after the contra and ahead of non-priority responses at the same price. The priority allocation is equal to the size of the displayed quote at the NBBO. The remainder of the response is eligible to trade pro-rata with other non-priority responses (MM3). Execution priority will be CUST, Contra, Priority MMs, others (Balance of Priority Quoters, Non-Priority MMs, BDs).

Table 8. AIM Example: AIM ISO

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .97 X 1.04 (10 Cust)	Agency Side: Buy 50 @ 1.04 AIM ISO Contra Side: Sell 50 @ 1.04 ***Expose Order***	Other Responses: Sell 20 @ 1.02 MM1 Sell 20 @ 1.02 MM2	Trade: 20 @ 1.02 MM1 20 @ 1.02 MM2 10 @ 1.04 Cust Cancel: 50 @ 1.02 Contra

Example 8) AIM ISO: AIM order is sent as ISO. There are no ABBO entry price checks and can trade through the ABBO but must still be at or better than the local BBO. AIM price is equal to local BBO. AIM is accepted and trades with responses and resting Customers at the best price.

Table 9. AIM Example: AIM with Reserve

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .95 X 1.03 (15) Sell 10 @ 1.03 Cust1 (Reserve of 20) Sell 5 @ 1.03 Cust2	Agency Side: Buy 100 @ 1.03 AIM Contra Side: Sell 100 @ 1.03 ***Expose Order***	Other Responses: Sell 60 @ 1.03 MM1 Incoming Orders: Sell 15 @ 1.03 Cust3 (Reserve of 20)	Trade: 10 @ 1.03 Cust1 Display 5 @ 1.03 Cust2 Display 15 @ 1.03 Cust3 Display 35 @ 1.03 Contra 35@ 1.03 MM1 Cancel: 65 @ 1.03 Contra 25 @ 1.02 MM1

Example 9) AIM with Reserve: Customer order with reserve quantity resting on the book. One auction response is received and a customer same priced incoming order with reserve quantity is received. Customer orders will trade in time priority at the same price.

Table 10. AIM Example: AIM with Reserve and Last Priority

Market	Order	Responses	Result/Allocations
NBBO .97 X 1.03 Cboe BBO .95 X 1.02 (15) Sell 10 @ 1.02 Cust1 (Reserve of 20) Sell 5 @ 1.02 Cust2	Agency Side: Buy 100 @ 1.02 AIM Contra Side: Sell 100 @ 1.02 Last Priority ***Expose Order***	Other Responses: Sell 60 @ 1.02 MM1	Trade: 10 @ 1.02 Cust1 Display 5 @ 1.02 Cust2 Display 60 @ 1.02 MM1 20 @ 1.02 Cust1 Reserve 5 @ 1.02 Contra Cancel: 95 @ 1.02 Contra

Example 10) AIM with Reserve and Last Priority: Customer order with reserve quantity resting on the book. One auction response is received. Auction will trade with displayed customer interest on the book, then non-customer responses and orders, and then any customer and non-customer reserve orders and the initial contra at the final auction price.

Sweep & AIM

Sweep & AIM Auctions allow Members to facilitate their clients' (agency) order flow by broadcasting their orders on the Exchange for price improvement opportunity, while sweeping any better priced quotes at local and away markets. The Exchange will sweep better-priced displayed away quotes and better-priced local interest before the AIM auction is initiated.

Sweep & AIM Examples

Table 1. Sweep & AIM Example 1

Market	Order	Responses	Result/Allocations
NBBO 1.20 X 1.30 BZX @ 1.30 (10) ISE @ 1.30 (10) MIAX @ 1.31 (10) ARCA @ 1.31 (10) PHLX @ 1.32 (10) Cboe BBO 1.20 X 1.35	Agency Side: Buy 100 @ 1.32 Sweep & AIM Contra Side: Sell 100 @ 1.32 ***Expose Order***	Other Responses: None	Sweep: BZX 10 @ 1.30 ISE 10 @ 1.30 MIAX 10 @ 1.31 ARCA 10 @ 1.31 AIM ISO (60): 60 vs. Contra @ 1.32 Cancel: 40 Contra

Example 1) Sweep & AIM received for 100 contracts through away markets only, all away routed orders complete filled. Only better priced away markets are swept.

Table 2. Sweep & AIM Example 2

Market	Order	Responses	Result/Allocations
NBBO 1.20 X 1.30 BZX @ 1.30 (10) ISE @ 1.30 (10) MIAX @ 1.31 (10) ARCA @ 1.31 (10) PHLX @ 1.40 (50) Cboe BBO 1.20 X 1.35 (10) Next Offer 10 @ 1.40 (Cust)	Agency Side: Buy 100 @ 1.40 Sweep AIM Contra Side: Sell 100 @ 1.40 ***Expose Order***	Other Responses: None	Sweep: BZX 10 @ 1.30 ISE 10 @ 1.30 MIAX 10 @ 1.31 ARCA 10 @ 1.31 Local 10 @ 1.35 AIM ISO (50): 10 vs. Cust @ 1.40 40 vs. Contra @ 1.40 Cancel: 60 Contra

Example 2) Sweep & AIM received for 100 contracts through the away and local book, all away routed orders complete filled. One price level on local book swept.

Table 3. Sweep & AIM Example 3

Market	Order	Responses	Result/Allocations
NBBO 1.20 X 1.30 BZX @ 1.30 (10) ISE @ 1.30 (10) MIAX @ 1.31 (10) ARCA @ 1.31 (10) PHLX @ 1.40 (50) Cboe BBO 1.20 X 1.35 (10) Next Offer 10 @ 1.40 BD1	Agency Side: Buy 100 @ 1.40 Sweep AIM Contra Side: Sell 100 @ 1.40 ***Expose Order***	Other Responses: 100 @ 1.40 MM1 Response capped at 60.	Sweep: BZX 10 @ 1.30 ISE 10 @ 1.30 MIAX 10 @ 1.31 ARCA 10 @ 1.31 Local 10 @ 1.35 40 filled, 10 unfilled during exposure. AIM ISO (60): 24 vs. Contra @ 1.40 31 vs. MM1 @ 1.40 5 vs. BD1 @ 1.40 Cancel: 76 Contra 69 MM1

Example 3) Sweep & AIM received for 100 contracts through the away and local book, unfilled order received back during exposure. One price level on local book swept, one Response received.

Solicitation Auction Mechanism (SAM)

SAM Auctions allow Members to facilitate their clients' (agency) order flow by broadcasting their orders on the Exchange for price improvement opportunity over the current market price. At the conclusion of the SAM Auction exposure interval, the agency order will trade against the specified contra party(s) or other responses to the auction. SAM Auctions must be for 500 contracts or more.

Initiating SAM Orders

A Member may initiate a SAM Auction by submitting a two-sided **New Order Cross** message using either FIX or BOE order entry. The two-sided order will contain symbol, price and quantity along with relevant clearing information for both the agency and contra sides. A maximum of ten (10) contra-parties will be accepted per order. The contra-side can be any order capacity, unless the contra-side EFID is the same as the agency-side EFID. In that case, the contra capacity cannot be Firm.

Auto Match and Last Priority are not available for SAM Auctions.

SAM orders can optionally include the ISO flag. If present, the initiating member has taken the responsibility of clearing all better-priced interest allowing the execution to occur through the NBBO, but not through the local book. The ISO instruction will be applied to the agency-side of the SAM Auction only.

SAM Response Orders

During the exposure period, other Exchange Members not directly included in the contra-side of a SAM Auction order may send a targeted response to the auction which reflects the responding Member's willingness to participate in that auction. Response orders must be entered on the opposite side of the auction order or they will be rejected. Responses priced more aggressive than the opposite side of the NBBO at the time the auction was created will be capped at the NBBO. Individual responses will be capped at the size of the auction order while members submitting multiple responses will have the cap applied to their aggregate response size. Response orders will be acknowledged and held until the completion of the auction or until an early termination. All unexecuted responses will be canceled back after the completion of the auction.

At the conclusion of an auction response or exposure period, the Matching Engine will continue processing messages, including auction responses, for up to an additional 100ms (900ms on C1 only) to include auction responses that arrived at the Matching Engine NIC prior to the scheduled auction end time. The Matching Engine will immediately conclude the

auction either upon processing all events arriving at the Matching Engine prior to the scheduled auction end time or upon elapse of the additional timer.

Response orders may be canceled or modified using the **Order Cancel Request** message or the **Order Cancel/Replace Request** message. As a result, Response orders may not be IOC.

Unrelated Orders

AIM unrelated orders rules will also apply to SAM Auctions.

Early Termination

SAM Auctions will terminate naturally at the end of the exposure interval. In addition, the auction may terminate early under some circumstances. See Exchange rules for further details.

Matched Trade Prevention

AIM Matched Trade Prevention rules will also apply to SAM Auctions.

SAM Executions

Depending on responses and unrelated orders received, the agency-side will either 1) trade with price-improved responses, better priced unrelated orders, and any customer orders at the auction price, 2) trade fully against the contra-side, or 3) be canceled in its entirety. SAM Auctions will be canceled without execution if there is an incoming Customer order on the opposite side of the agency order at the same price and there is insufficient quantity in price-improved responses, better priced unrelated orders and customer quantity to fully fill the agency-side. SAM Auctions will also be canceled without execution if a price-improved unrelated order is received and there is insufficient quantity in price-improved responses and better priced unrelated orders to fully fill the agency-side.

If the size of price-improved responses and better priced unrelated orders exceeds the SAM Auction size, the normal pro-rata allocation rules will apply.

SAM Examples

Table 1. SAM Example 1

Market	Order	Responses	Result/Allocations
NBBO 1.24 X 1.28 Cboe BBO 1.24 X 1.28	Agency Side: Buy 1000 @ 1.28 SAM Contra Side: Sell 1000 @ 1.28 ***Expose Order***	Other Responses: No Responses received	Trade: 1000 @ 1.28 Contra

Example 1) No responses received. Executes at Solicitation Order Price vs Contra after exposure.

Table 2. SAM Example 2

Market	Order	Responses	Result/Allocations
NBBO 1.24 X 1.28 Cboe BBO 1.24 X 1.28	Agency Side: Buy 1000 @ 1.26 SAM Contra Side: Sell 1000 @ 1.26 ***Expose Order***	Other Responses: Sell 300 @ 1.25 BD1 Sell 400 @ 1.25 MM1	Trade: 1000 @ 1.26 Contra Cancel: 300 BD1 400 MM1

Example 2) There is insufficient size in price-improved responses to break up the trade. Agency side trades against the solicited side at limit auction price.

Table 3. SAM Example 3

Market	Order	Responses	Result/Allocations
NBBO 1.24 X 1.28 Cboe BBO 1.24 X 1.28	Agency Side: Buy 1000 @ 1.26 SAM Contra Side: Sell 1000 @ 1.26 ***Expose Order***	Other Responses: Sell 500 @ 1.25 BD1 Sell 500 @ 1.25 MM1	Trade: 500 @ 1.25 BD1 500 @ 1.25 MM1 Cancel: 1000 Contra

Example 3) There is sufficient size in price-improved responses to break up the trade. Agency side trades against the responses at improved price.

Table 4. SAM Example 4

Market	Order	Responses	Result/Allocations
NBBO 1.24 X 1.28 Cboe BBO 1.24 X 1.28	Agency Side: Buy 1000 @ 1.28 SAM Contra Side: Sell 1000 @ 1.28 ***Expose Order***	Other Responses: Sell 1000 @ 1.27 MM1 Sell 500 @ 1.27 MM2 Unrelated Incoming Order: Sell 500 @ 1.27 BD1	Trade: 500 @ 1.27 MM1 250 @ 1.27 MM2 250 @ 1.27 BD1 Cancel: 1000 Contra 500 MM1 250 MM2

Example 4) Incoming order at a better price on opposite side causes auction to early terminate. There is sufficient size including the orders and responses to execute the unsolicited order vs the responses/incoming order at the auction price.

Step-Up Mechanism (SUM)

Cboe SUM Auctions provide execution opportunity by exposing marketable orders prior to (1) routing to an away market, (2) canceling an order back or (3) booking the order on the Exchange. The period of time the SUM Auction order will be exposed is 50 ms. Cboe SUM Auctions are system-generated rather than Member-initiated. Member orders will initiate a SUM Auction if they are marketable against the NBBO and if the Member is configured to participate in SUM Auctions or the order bears explicit instructions to expose it.

Other Exchange Members can interact with SUM Auction Orders by entering regular marketable orders or Response Orders.

Regular marketable orders or Response Orders that satisfy all or part of a SUM Auction Order will execute immediately, while the remaining SUM Auction Order balance will continue to be exposed and eligible for execution until the exposure period is over or the SUM Auction terminates early.

Initiating SUM Orders

A Member may decide if its order is eligible to initiate a SUM Auction. By default, routable orders will be SUM eligible, while non-routable orders will not be SUM eligible unless otherwise instructed. Members may override these defaults on an order-by-order basis or configure alternative port level defaults by submitting a Modify Logical Port Request into the Cboe Customer Web Portal.

Orders will be eligible to initiate a SUM Auction prior to the order routing, canceling or posting to the book if identified with the following instructions:

Table 1. SUM Auction Eligibility

Fix Tag	Routable Order	Non-Routable Order
9370 AuctionID	Not Supplied	Not Supplied
9303 RoutingInst	R, RS, S, SS, X or XS	BS
9400 RoutStrategy	ROUT	N/A

Fix Tag	Routable Order	Non-Routable Order
18 ExecInst	G (All or None)	G (All or None)
Incompatible with:	ISO flag (ExecInst = f) TIF = FOK MinQty	ISO = (ExecInst =f) TIF = FOK MinQty

SUM Auctions Orders can be canceled at any time by the Member, resulting in the remaining unexecuted balance canceled back to the Member.

For C1 only, SUM orders can also be designated as All or None (AON) by setting ***ExecInst*** (tag 18) = G.

Responding to SUM Auction Orders

Members may respond to a SUM Auction with either a regular marketable order/quote or a Response Order. Response Orders must include the ***AuctionID*** (FIX Tag 9370) of the targeted SUM Auction and will only interact with the associated SUM Auction Order.

Regular marketable orders/quotes and Response Orders may be market orders or limit orders priced equal to or more aggressive than the SUM Auction Price. Example:

- NBBO: 1.00 x 1.01
- SUM Order: Buy @ 1.01
- Response Order: Sell @ 1.01 - marketable (trades)

Response Orders priced at or better than the NBBO Price that satisfy all or part of a SUM Auction Order will execute immediately, unless the SUM auction is AON. If the SUM is AON, response orders that do not satisfy the size contingency will be held to allow for aggregation with other response orders. If the aggregate quantity of the SUM AON responses and unrelated orders is insufficient to satisfy the size contingency the auction will be canceled. Response Orders priced less aggressive than the NBBO Price and equal to or more aggressive than the Auction Price will be held and continue to be eligible for execution until the SUM Auction Order fully executes, expires or terminates early. These held Response Orders may be canceled, modified or cancel replaced anytime.

Held Response Orders may become marketable if the NBBO updates during the exposure window. If multiple held Response Orders become marketable, existing allocation logic will be applied (See SUM Example 9).

Response Orders that are not fully executed against the targeted SUM Auction Order will be canceled back following the conclusion of the SUM Auction.

Regular marketable orders/quotes that do not execute against the SUM Auction Order will be processed according to the original order instructions by routing to an away market, canceling back, or posting to the book.

At the conclusion of an auction response or exposure period, the Matching Engine will continue processing messages, including auction responses, for up to an additional 100ms (900ms on C1 only) to include auction responses that arrived at the Matching Engine NIC prior to the scheduled auction end time. The Matching Engine will immediately conclude the auction either upon processing all events arriving at the Matching Engine prior to the scheduled auction end time or upon elapse of the additional timer.

Early Termination

A SUM order will terminate naturally at the end of the exposure interval. In addition, the auction may terminate early under some circumstances. See Exchange rules for further details.

Matched Trade Prevention

SUM eligible orders may have any of the five valid Match Trade Prevention instructions.

Response Orders may only have the Cancel Newest instruction. If both the inbound order and the Response Order bear MTP instructions, the Response Order will be canceled and the SUM Auction will continue.

Regular marketable orders participating in an auction upon arrival, may also have any of the 5 MTP instructions applied.

If an exposed SUM Auction Order having any MTP instruction would match against a regular marketable order also having any MTP instruction, the instruction on the regular marketable order will be observed. In this scenario, it is possible the SUM order will be canceled.

SUM Examples

T_n represents the time sequence of each event.

Table 1. SUM Example 1

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.30 (10) T_1	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1 Balance: Buy 10 @ 1.30 (A1) T_4	Response Orders: (FIRMA) Sell 5 @ 1.30 (A1) T_5 (FIRMB) Sell 5 @ 1.30 (A1) T_7	Trade: 10 @ 1.30 (A1) vs. book T_3 5 @ 1.30 (A1) vs. FIRMA T_6 5 @ 1.30 (A1) vs. FIRMB T_8

Example 1) After executing available size on Cboe, the remainder of the order is exposed. Execute the remaining size vs. responses as they arrive.

Table 2. SUM Example 2

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.30 (10) T_1	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1 Balance: Buy 10 @ 1.30 (A1) T_4	Response Orders: (FIRMA) Sell 5 @ 1.30 (A1) T_5	Trade: 10 @ 1.30 (A1) vs. book T_3 5 @ 1.30 (A1) vs. FIRMA T_6 Route: Buy 5 @ 1.30 (O1) T_7

Example 2) After executing the available size on Cboe, expose the remainder of the order. Execute some size vs. responses and route the balance.

Table 3. SUM Example 3

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.30 (10) T_1	Regular Order: Buy 20 @ 1.30 T_2 Expose O1 Balance: Buy 10 @ 1.30 (A1) T_4	No Responses	Trade: 10 @ 1.30 (A1) vs. book T_3 Route: 10 @ 1.30 T_5

Example 3) After executing the available size on Cboe, expose the remainder of the order. No responses are received: The remainder of the order is routed.

Table 4. SUM Example 4

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.35 T_1	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1: Buy 20 @ 1.30 (A1) T_3	No Responses	Route: Buy 20 @ 1.30 (O1) T_4

Example 4) Cboe is not at the NBBO when the order arrives so there is no liquidity on the book to interact with. Expose the entire order before routing. No responses: Route entire order size.

Table 5. SUM Example 5a

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.30 (10) T_1	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1 Balance: Buy 10 @ 1.30 (A1) T_4 Cancel received: (O1) T_7	Response Orders: (FIRMA) Sell 3 @ 1.29 (A1) T_5	Trade: 10 @ 1.30 (A1) vs. book T_3 3 @ 1.30 (A1) vs. FIRMA T_6 Auction Cancel: (A1) T_8 Cancel Order: Buy 7 @ 1.30 (A1) T_9

Example 5a) Cancel request received from Customer. If the order is in the midst of exposure, cancel any unexecuted remainder of the order.

Table 6. SUM Example 5b

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.30 (10) T_1	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1 Balance: Buy 10 @ 1.30 (A1) T_4 Cancel received: (O1) T_5	Response Orders: (FIRMA) Sell 3 @ 1.29 (A1) T_8	Trade: 10 @ 1.30 (A1) vs. book T_3 Auction Cancel: (A1) T_6 Cancel Order: Buy 10 @ 1.30 (O1) T_7 Cancel Late Response: Sell 3 @ 1.29 FIRMA T_9

Example 5b) Cancel request received from Customer. If the order is in the midst of exposure, cancel any unexecuted remainder of the order and unexecuted Responses. (Note: This conveys a race condition.)

Table 7. SUM Example 6

Market	Order	Responses	Result/Allocation
NBBO: 1.28 X 1.30 T_1 Cboe BBO: 1.28 X 1.30 (10) T_1 Cboe BBO Update: 1.28 X 1.31 T_4 NBBO Update: 1.28 X 1.31 T_8 Cboe BBO Update: (5) 1.30 X 1.31 T_{11} NBBO Update: 1.30 X 1.31 T_{12}	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1 Balance: Buy 10 @ 1.30 (A1) T_5	Response Orders: (FIRMA) Sell 5 @ 1.29 (A1) T_6	Trade: 10 @ 1.30 (A1) vs. book T_3 5 @ 1.30 (A1) vs. FIRMA T_7 Terminate Auction: (A1) T_9 Post Order: (O1) T_{10}

Example 6) Early Termination: NBBO Fades. An order partially executes against the book (The Cboe BBO updates based on our execution) and initiates an exposure auction for the balance of the order before routing. The exposed order then executes against a response. An NBBO update is received; the NBBO has faded and both Cboe BBO and NBBO are the same on the offer side. The auction early terminates. The remainder of the order is posted to the Cboe book and the Cboe quote is updated improving the NBBO.

Table 8. SUM Example 7a

Market	Order	Responses	Result/Allocation
NBBO: 1.28 X 1.30 T_1 Cboe BBO: 1.28 X 1.30 (10) T_1 Cboe BBO Update: 1.28 X 1.31 T_4	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1 Balance: Buy 10 @ 1.30 (A1) T_5 Regular Order: Buy 10 @ 1.30 (O2) T_8 Expose O2: (A2) T_9	Response Orders: (FIRMA) Sell 5 @ 1.29 (A1) T_6 (FIRMB) Sell 10 @ 1.30 (A1) T_{10}	Trade: 10 @ 1.30 (A1) vs. book T_3 5 @ 1.30 (A1) vs. FIRMA T_7 5 @ 1.30 (A1) vs. FIRMB T_{11} Cancel : Sell 5 @ 1.30 (FIRMB) T_{12} Exposure Expired: Buy 10 @ 1.30 (A2) T_{13}

Example 7a) Parallel Exposures. Auction responses are not eligible to participate in parallel SUM Auction events. The initial order to buy 20 @ 1.30 partially executes against the book (10). The balance of the order is exposed and trades against the first Response. A Regular Order is received to buy 10 at the auction price. A second SUM Auction (A2) is started for that order. A second Response is received (FIRMB) targeting (A1) which trades against the remaining quantity of the initial order leaving 5 contracts remaining on the FIRMB response. The balance of the Response by FIRMB is canceled even though it is executable against the Regular Order exposed in (A2).

Table 9. SUM Example 7b

Market	Order	Responses	Result/Allocation
NBBO: 1.28 X 1.32 T_1 Cboe BBO: 1.26 X 1.34 T_1	Regular Order: Buy 5 @ 1.32 (O1) T_2 Expose O1: (A1) T_3 Regular Order: Buy 10 @ 1.33 (O2) T_4 Expose O2: (A2) T_5	Regular Order: (FIRMA) Sell 15 @ 1.29 (O3) T_6 Response Order: (FIRMB) Sell 10 @ 1.29 (A2) T_9	Trade: 5 @ 1.32 (A1) vs. FIRMA T_7 10 @ 1.32 (A2) vs. FIRMA T_8 Cancel : Sell 10 @ 1.29 (FIRMB) T_{10}

Example 7b) Two SUM Auctions will be started based on the arrival of 2 Regular buy orders neither of which can be executed at our BBO. Regular orders, unlike Response Orders, are eligible to trade in parallel SUM Auctions. A third Regular order (O3) is received on the opposite side of the exposed orders that can be executed against both SUM Auctions. The earlier SUM Auction (A1) will be completed first with the remainder applied to the second SUM Auction (A2). FIRMB's response cancels upon entry with the second auction (A2) having fully executed with FIRMA.

Table 10. SUM Example 7c

Market	Order	Responses	Result/Allocation
NBBO: 1.28 X 1.30 T_1 Cboe BBO: 1.27 X 1.31 T_1	Regular Order: Buy 10 @ 1.30 (O1) T_2 Expose O1: (A1) T_3 Regular Order: Buy 5 @ 1.30 (O2) T_4 Expose O2: (A2) T_5 Expose O3 balance: Sell 5 @ 1.28 (A3) T_9	Regular Order: (FIRMA) Sell 20 @ 1.28 (O3) T_6	Trades: 10 @ 1.30 (A1) vs. FIRMA T_7 5 @ 1.30 (A2) vs. FIRMA T_8

Example 7c) Parallel SUM Auctions: Regular Orders are eligible to participate in parallel SUM Auctions. Two separate orders are entered to buy at 1.30. Each one initiates its own SUM Auction. FIRMA sends a Regular sell order (not marked with a particular Auction ID) that partially executes in SUM (A1). Part of the unexecuted balance of the regular order can execute in the parallel SUM Auction (A2). The remainder will initiate its own SUM Auction, (A3) as the NBBO bid is higher than the Cboe Best Bid.

Table 11. SUM Example 8a

Market	Order	Responses	Result/Allocation
NBBO: 1.00 X 1.10 T_1 Cboe BBO: 1.00 X 1.20 T_1 Cboe BBO Update: 1.00 X 1.19 (50) T_7 NBBO Update: 1.00 X 1.19 T_8 Cboe BBO Update: 1.00 X 1.19 (30) T_{11}	Regular Order: Buy 100 @ 1.20 (O1) T_2 Expose O1: (A1) T_3	Response Orders: (BD1) Sell 100 @ 1.19 (A1) T_4 (MM2) Sell 100 @ 1.19 (A1) T_5 Regular Order: (MM1) Sell 50 @ 1.19 (O2) T_6	Trades: T_9 40 @ 1.19 (A1) vs. BD1 40 @ 1.19 (A1) vs. MM2 20 @ 1.19 (A1) vs. MM1 Cancel: T_{10} 60 @ 1.19 BD1 60 @ 1.19 MM2

Example 8a) When Responses are received that are not immediately executable against an exposed order (as is the case with BD1 and MM2 responses below), the responses are held until they either become executable or the end of the exposure period. In this scenario, the NBBO moves allowing the responses to trade.

Table 12. SUM Example 8b

Market	Order	Responses	Result/Allocation
NBBO: 1.00 X 1.10 T_1 Cboe BBO: 1.00 X 1.20 T_1 Cboe BBO Update: 1.00 X 1.18 (20) T_7 Cboe BBO Update: 1.00 X 1.18 (30) T_9 NBBO Update: 1.00 X 1.18 T_{10} Cboe BBO: 1.00 X 1.20 T_{12}	Regular Order: Buy 100 @ 1.20 (O1) T_2 Expose O1: (A1) T_3	Response Orders: (BD1) Sell 100 @ 1.19 (A1) T_4 (MM2) Sell 30 @ 1.18 (A1) T_5 Regular Orders: (MM1) Sell 20 @ 1.18 (O2) T_6 (CUST) Sell 10 @ 1.18 (O3) T_8	Trade: T_{11} 10 @ 1.18 (A1) vs CUST 30 @ 1.18 (A1) vs MM2 20 @ 1.18 (A1) vs MM1 Exposure Ended: (A1) T_{13} Route O1 balance: Buy 40 @ 1.18 (O1) T_{14} Cancel: 100 @ 1.19 BD1 T_{15}

Example 8b) One of the responses received cannot execute against the SUM Auction order as it is outside of the updated NBBO. At the end of the exposure period, the Response Order is canceled and the unexecuted balance of the SUM Auction order is eligible to route out. When the NBBO updates, eligible Responses and Regular Orders trade against the SUM Auction order. With an unexecuted balance, the SUM Auction continues to its natural end. The remaining contracts of the SUM Auction order are routed out.

Table 13. SUM Example 9a

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.30 (10) T_1 Cboe BBO: T_4 1.24 X 1.31 Cboe BBO: T_8 1.29 X 1.31	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1: Buy 10 @ 1.30 (A1) T_5 Modify O1 Received: Buy 25 @ 1.29 (O2) T_6	No Responses	Trade: 10 @ 1.30 (A1) vs. book T_3 Cancel Auction (A1) T_7

Example 9a) A SUM Auction order is modified and canceled due to a modification of the price and increased order quantity. A new auction is not initiated due to O2 no longer being marketable against the NBBO. The auction is terminated and the Cboe BBO is updated.

Table 14. SUM Example 9b

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.30 (10) T_1 Cboe BBO: 1.24 X 1.31 T_4	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1: Buy 10 @ 1.30 (A1) T_5 Modify O1 Received: Buy 25 @ 1.30 (O2) T_6 Expose Modified Order: Buy 15 @ 1.30 (A2) T_8	No Responses	Trade: 10 @ 1.30 (A1) vs. book T_3 Cancel Auction: (A1) T_7 Exposure Expired: Buy 15 @ 1.30 (A2) T_9

Example 9b) A SUM Auction order is modified and canceled due to a modification of an increased order quantity. The modified order (O2) remains marketable against the NBBO resulting in a new auction being initiated. The original auction (A1) is terminated. The new order is exposed (A2) and the timer is refreshed.

Table 15. SUM Example 9c

Market	Order	Responses	Result/Allocation
NBBO: 1.26 X 1.30 T_1 Cboe BBO: 1.24 X 1.30 (10) T_1 Cboe BBO: 1.24 X 1.31 T_4	Regular Order: Buy 20 @ 1.30 (O1) T_2 Expose O1: Buy 10 @ 1.30 (A1) T_5 Modify O1 Received: Buy 15 @ 1.30 (O2) T_6	No Responses	Trade: 10 @ 1.30 (A1) vs. book T_3 Exposure Expired: Buy 5 @ 1.30 (A1) T_7 Route O1 balance: Buy 5 @ 1.30 (O1) T_8

Example 9c) A SUM Auction order is modified and not canceled due to a reduction in order quantity from the original quantity. The original auction (A1) remains active until the auction expires. After expiry, the order has a remainder of 5 contracts (modified order quantity of 15 minus 10 executed) to route away.

Table 16. SUM Example 10

Market	Order	Responses	Result/Allocation
NBBO: 1.00 X 1.20	Order 1: Sell 4 @ 1.20 AON Order 2: Buy 5 @ 1.20 AON Step up eligible	No Responses	Order 2 rests on book at 1.20, locks Order 1

Example 10) An AON order enters SUM.

Table 17. SUM Example 11

Market	Order	Responses	Result/Allocation
NBBO: 1.00 X 1.20	Order 1: Buy 5 @ 1.20 AON Step up eligible Order 2: Buy 5 @ 1.20 Step up eligible Order 3: Sell 5 @ 1.20 Unrelated order		Trade: Order 3 trades with Order 1 for 5 @1.20

Example 11) Concurrent SUM auctions are handled in time priority only. AON orders in SUM are not held in lower priority level than non-AON orders in SUM.

Table 18. SUM Example 12

Market	Order	Responses	Result/Allocation
NBBO: 1.00 X 1.20	Order 1: Buy 5 @ 1.20 AON Step up eligible	Order 2: Sell 4 @ 1.20 Step up eligible Order 3: Sell 1 @ 1.20 Unrelated order	Trade: Order 2 trades with Order 1 for 4 @1.20 Order 3 trades with Order 1 for 1 @1.20

Example 12) Aggregation of SUM AON responses meets entire AON quantity.

Qualified Contingent Cross (QCC)

A Qualified Contingent Cross represents an order comprised of an initiating order to buy (sell) at least 1,000 contracts that is identified as being part of a Qualified Contingent Trade (QCT), coupled with a contra-side order or orders totaling an equal number of contracts. QCC orders will execute upon arrival without exposure.

QCC orders are part of a multi-leg strategy that involves both an option leg and a stock component. EDGX Options only supports the Options-Only functionality where the option leg will trade at the prevailing rate in the standard tick, while the equity component could be traded on any Equities Exchange.

C1 Options supports the trading of both the Options leg and the equity leg of the QCC order. Please see the Cboe Titanium U.S. Options Complex Book Process for further details.

Initiating QCC Orders

A Member may initiate a QCC by submitting a two-sided **New Order Cross** message using either FIX or BOE order entry and identifying the ***CrossType*** as QCC The two-sided order will contain symbol, price and quantity along with relevant clearing information for both the agency and contra side(s) and optional routing broker details. The initiating QCC Order must include the contra-side response(s) within the QCC **New Order Cross** message. A maximum of ten (10) contra-parties will be accepted per order with a minimum total quantity of 1,000 contracts.

QCC Orders will be canceled or rejected rather than execute upon arrival if:

- There is a Priority Customer order resting on the order book at the execution price on either side.
- The limit price is outside the NBBO.
- The limit price is entered at an invalid tick increment.
- The Order Quantity is less than 1,000 contracts.
- The symbol has not been open for trading, is in a halt state or is received during pre-market queuing period.

Response Orders

There will be no responses to QCC orders since they will be executed immediately without exposure.

Matched Trade Prevention

Matched Trade Prevention instructions will not be applicable for QCC orders.

QCC Executions

QCC executions will execute immediately and in full as long as qualifying conditions are met. With QCC there is no order exposure, no response mechanism and no interaction with the order book.

Market Data

QCC orders will not be displayed on either the US Options Multicast PITCH feed, the US Options Auction Feed, or OPRA.

OPRA

Executions resulting from QCC orders will be reported to OPRA as a Regular Trade.

Cboe Feeds

Executions resulting from QCC orders will be reported to the US Options Multicast PITCH feed as a **Trade** Message.

Regulatory Impact and Member Reporting of Equity Trades

Members will be required to maintain books and records demonstrating the tie to their equity trades in the market with their QCC options trades executed on the C1 and EDGX Options Exchanges.

Members trading QCC will be required to upload a spreadsheet into the Cboe Customer Web Portal conveying the details of their trades. Members must supply to the Exchange both equity and options trade details in a manner to be conveyed to the Exchange using a method prescribed by the Exchange through Exchange memo.

In addition to the file upload, C1 Customers will be allowed to submit the equity leg execution information to Cboe in the **New Order Cross** message if the equity portion was executed away. Refer to the Cboe Titanium U.S. Options FIX Specification for further details.

QCC Examples

Table 1. QCC Example 1

Market	Order	Responses + Book	Result/Allocation
NBBO: 1.20 X 1.30 Cboe BBO: 1.15 X 1.35	QCC: Buy 600 XYZ Feb 25 C @ 1.30	N/A…No Exposure	Cancel Order: Order must be a minimum size (1000 contracts)

1) QCC order rejected: Size is less than the minimum size (assumed to be 1000).

Table 2. QCC Example 2

Market	Order	Responses + Book	Result/Allocation
NBBO: 1.20 X 1.30 Cboe BBO: 1.15 X 1.35	QCC: Buy 1000 XYZ Feb 25 C @ 1.35	N/A…No Exposure	Cancel Order: Order must be at or between the NBBO (1.20 - 1.30)

2) QCC order is rejected. Must be at or between the NBBO and the Cboe BBO.

Table 3. QCC Example 3

Market	Order	Responses + Book	Result/Allocation
NBBO: 1.20 X 1.30 Cboe BBO: 1.15 X 1.30 CUST 1: 200 @ 1.30 CUST 2: 300 @ 1.30	QCC: Buy 1000 XYZ Feb 25 C @ 1.30	N/A…No Exposure	Cancel Order: CUST order on the offer at the execution price.

3) QCC order is canceled due to customer orders on the book at the execution price.

Position Compression Cross (PCC) (C1 Only)

A Position Compression Cross (PCC) represents a paired order mechanism used for SPX/SPXW options electronic compression orders. PCC orders are used to reduce open positions in series of SPX/SPXW options.

Initiating PCC Orders

A broker may initiate a PCC by submitting a two-sided **New Order Cross** message using either FIX or BOE order entry and identifying the ***CrossType*** as PCC. The two-sided order will contain symbol, price and quantity along with relevant clearing information for both the agency and contra side(s) and optional routing broker details. The minimum size for PCC orders is 1 (one).

A compression order may be comprised of all closing positions or a combination of opening and closing positions as long as the closing volume is equal to or greater than the opening volume for each user or contra.

The execution price must be at or inside the BBO and better than the price of any priority customer order resting on the book and must be at or inside the SBBO or better than the SBBO if there is a priority customer on any leg of the SBBO.

Response Orders

There will be no responses to PCC orders since they will be executed immediately without exposure.

Matched Trade Prevention

Matched Trade Prevention instructions will not be applicable for PCC orders.

PCC Executions

PCC executions will execute immediately and in full as long as the execution price is not at the same price as a Priority Customer order resting in the Book, and is at or between the NBBO. With PCC there is no order exposure, no response mechanism and no interaction with the order book.

Market Data

PCC orders will not be displayed on either the US Options Multicast PITCH feed, the US Options Auction Feed, or OPRA.

OPRA

Executions resulting from PCC orders will be reported to OPRA as a Regular Trade.

Cboe Feeds

Executions resulting from PCC orders will be reported to the US Options Multicast PITCH feed as a **Trade** Message.

References

References

For more information, please refer to the appropriate specification:

- Cboe Titanium U.S. Options FIX Specification
- Cboe Titanium U.S. Options BOE Specification
- Cboe Titanium U.S. Options BOEv3 Specification
- Cboe Titanium U.S. Options Auction Feed Specification
- Cboe Titanium U.S. Equities/Options Multicast Depth of Book (PITCH) Specification

Support

Please direct questions or comments regarding this document to tradedesk@cboe.com.

Revision History

Document Version	Date	Description
1.0.0	05/17/16	Initial draft version.
1.0.1	07/07/16	Updated SUM Auction exposure time.
1.0.2	08/01/16	Added support for BAM Auction functionality (available in EDGX Options Certification 10/11/16 and EDGX Options Production 11/11/16).
1.0.3	09/07/16	Updated SUM Auction exposure time.
1.0.4	01/25/17	Updated SUM early termination details. Updated BAM Auction Notification Message details. Noted that BAM Response orders may not be IOC. Added support for QCC Auction functionality (available in EDGX Options Certification 2/24/17 and EDGX Options Production 3/3/17).
1.0.5	10/17/17	Cboe branding/logo changes.
1.1.0	11/16/18	Added support for Cboe Options Exchange.
1.1.1	02/06/19	Added notes indicating change to BAM nomenclature and implementation of SAM for Feature Pack 5.
1.1.2	03/13/19	Clarified description of responses to SUM auction orders. Updated effective date for SAM to 04/29/19.
1.1.3	03/18/19	Added support for AON orders on EDGX available with C1 Feature Pack 6. Added additional SUM + AON examples.
1.1.4	06/28/19	Updated effective date for SAM on EDGX to TBD. Removed references to BAM as this auction functionality was harmonized with AIM on 03/21/19.
1.1.5	09/10/19	Added marketable quotes to section 4.3.2
1.1.6	01/17/20	Added note indicating effective date of SAM on EDGX is 2/3/20.
1.1.7	05/29/20	Updated section 4.1.8 for contra-side contract guarantees.
1.1.8	10/06/20	Added Position Compression Cross section (effective 10/28/20). (C1 Only)
1.1.9	03/25/21	Corrected statement about FLEX instruments as QCC and PCC are not available for FLEX instruments. Added notes identifying support for Curb session (effective TBD 09/27/21 Q3 2021) and extended GTH session (effective 11/21/21 effective Q4 2021).
1.1.10	05/13/21	Updated Curb session effective date to TBD 09/27/21.
1.1.11	06/15/21	Updated extended GTH session effective date to 11/21/21.
1.1.12	08/24/21	Updated Curb session effective date to TBD.
1.1.13	11/4/21	Removed references to Curb session as Auction messages will no longer be disseminated for Curb.
1.1.14	12/16/21	Updated hyperlinks to technical specifications.
1.1.15	06/09/23	Updated 4.1.1 with new Auto-Match AIM behavior (Effective 08/16/2307/19/23 on EDGX and 08/21/23 07/24/23 on C1).
1.1.16	06/29/23	Updated AIM and SAM auction responses with new behavior (effective 07/31/23 for C1 Unit 1, effective 08/07/23 for C1 all Units).
1.1.17	07/18/23	Updated new AIM Auto-Match behavior effective date to 08/16/23 on EDGX and 08/21/23 on C1.
1.1.18	10/12/23	Updated simultaneous AIM/C-AIM auction behavior to allow simultaneous auctions for AIM/C-AIM orders of fewer than 50 contracts (effective 11/01/23 on EDGX and 11/06/23 on C1).

Document Version	Date	Description
1.1.19	11/03/23	For SPX/SPXW, the AIM additional timer will be 100ms (C1 only) (effective 11/20/23).
1.1.20	12/20/23	Clarified that the additional timer is for all auction types.
1.1.21	07/22/24	Effective 08/26/24, GTH will be extended until 9:25 a.m. ET (C1 only).
1.1.22	11/19/24	Effective 12/06/24 on EDGX, at the conclusion of an auction response or exposure period, the Matching Engine will continue processing messages, including auction responses, for up to an additional 100ms. Effective 12/09/24, all C1 Matching Units will increase the additional timer to 100ms.
1.1.23	12/20/24	Effective 01/24/25 on EDGX and 01/27/25 on C1, AIM responses will be capped by the agency side local BBO at the conclusion of the auction, or one minimum increment better than the agency side local BBO if it is represented by a Priority Customer on the Book.
1.1.24	01/15/25	Updated with Cboe Titanium branding.
1.1.25	01/27/25	Effective 02/10/25, members can optionally choose to reject the AIM auction rather than have the starting price adjusted to meet NBBO requirements using *AutoMatch* options '3' and '4'.
1.1.26	04/29/25	For SPX/SPXW, the additional timer will be 900ms (C1 only) (effective 05/12/25).
1.1.27	01/29/26	Removed reference to "900ms on SPX/ SPXW matching units" from Responding to SUM Auction Orders and SAM Response Orders as SAM and SUM orders are not available on proprietary products.
1.1.28	04/15/26	Updated Cboe Options Auction Information to reflect planned expansion of C1 trading hours for select equity options, including the addition of a morning Global Trading Hours (GTH) session and afternoon Curb session, subject to regulatory review (effective ~~07/13/26~~ ~~08/17/26~~ TBD).
1.1.29	06/12/26	Updated planned expansion of C1 trading hours for select equity options to 08/17/26.
1.1.30	07/06/26	Noted the maximum additional time spent reading auction responses for all C1 only Matching Units is 900ms (effective 07/20/26).
1.1.31	08/10/26	Updated planned expansion of C1 trading hours for select equity options to TBD.