Cboe Titanium U.S. Options Quoted Spread Book User Manual

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Contents

Introduction

Certain commonly traded SPX complex instruments, including box spreads, box swaps, and jelly rolls (combo rolls) are traded predominantly in open outcry for best execution and liquidity. One reason these complex instruments are traded in open outcry is because Market Makers (MM) cannot rest orders in SPX/SPXW complex instrument Complex Order Books (COBs) during Regular Trading Hours (RTH). As a result, displayed markets for electronic COBs are commonly derived from the synthetic best bid and offer derived from the constituent single leg option order books.

To facilitate electronic trading in commonly traded complex instruments, and to concentrate liquidity into a select set of Exchange-designated instruments, Cboe has created the Quoted Spread Book (QSB) service, which defines a subset of complex instruments for which MMs[1] are allowed to rest orders in the COB. Effective 08/18/25, MMs will also be able to introduce orders into QSB instruments using BOE **`Complex Quote Update`** and **`Complex Quote Update (Short)`** messages over BOE Bulk Quoting Ports.

Prior to QSB, all complex instruments traded on the Cboe Exchange were created in response to customer initiated complex instrument creation requests via the FIX and BOE order entry protocols. Using FIX, customers use a two-step instrument creation request in which a **`Security Definition Request`** message is sent, Cboe responds with the symbol id associated with the requested instrument, then the customer can enter orders using that symbol id. Customers using FIX can also use a one-step instrument creation process using a **`Long Form New Order Multileg`** message. Using BOE, customers use a two-step process that includes a **`New Complex Instrument`** message to create a complex symbol, the response to which is a **`Complex Instrument Accepted`** message containing the symbol id of the created instrument.

QSB introduces Exchange-designated complex instruments. Complex instruments designated by the Exchange with QSB are standard complex instruments that the Exchange ensures will exist for trading in RTH and provides symbol reference data prior to the beginning of RTH. Further, MMs are allowed to rest orders in the COB during Regular Trading Hours (RTH) for QSB designated complex instruments.

Market makers that quote QSB instruments and brokerage trading platforms that highlight QSB symbols[2] require access to the symbol ids and symbol reference data associated with QSB Exchange-designated complex symbols prior to the start of the RTH session. QSB symbol reference data is provided via two delivery mechanisms; 1) JSON formatted file download Cboe US Options Reference Data, and 2) a new **`Exchange Designated Complex Instrument Definition`** message disseminated on the Cboe US Options Complex Multicast PITCH and TOP data feeds.

The following sections provide detail on the two QSB symbol reference data delivery mechanisms followed by specification of the QSB instrument universe.

[1] Market Maker refers to capacities M and N. Further, appointments are not required to rest orders.

[2] Cboe is in discussions with brokerage trading platform vendors for creation of customer QSB complex instrument trading functionality including highlighted quoted complex instruments and custom trading screens where appropriate.

QSB Symbol Reference Data

Access to QSB symbol reference data is provided through file download from a URL accessible directly on the Cboe.com reference data page, or via Exchange Designated Complex Instrument Definition messages on the Cboe US Options Multicast PITCH and TOP market data feeds. For both delivery mechanisms, QSB symbol reference data are available starting at 7:00am ET.

Cboe.com Reference Data

Market maker and brokerage trading platforms requiring access to QSB symbol reference data prior to the start of RTH may download a JSON file using a URL on the Cboe US Options Reference Data page titled "Quoted Spread Book (JSON)". The JSON file format is outlined below:

Figure 1. QSB Symbol Reference Data JSON File Format


```
[
{
 "Complex Instrument Type": "QSB",
 "Complex Instrument Subtype": "BOX_SPREAD",
 “Symbols”:
 [
 {
 "Complex Instrument Id": "000u56",
 "Leg Count": "4",
 "Leg Data": [
  {
  "Leg Symbol": "000ab1",
  "Leg Ratio": "1.0",
  "OSI Symbol": "SPX 231117C04000000"
  },
  {
  "Leg Symbol": "000ab2",
  "Leg Ratio": "1.0",
  "OSI Symbol": "SPX 231117P05000000"
  },
  {
  "Leg Symbol": "000ab3",
  "Leg Ratio": "-1.0",
  "OSI Symbol": "SPX 231117C05000000"
  },
  {
  "Leg Symbol": "000ab4",
  "Leg Ratio": "-1.0",
  "OSI Symbol": "SPX 231117P04000000"
  }
 ]
 },
 ...
 ]
},
{
 "Complex Instrument Type": "QSB",
 "Complex Instrument Subtype": "BOX_SWAP",
 “Symbols”:
 [
 {
 ...
 }
 ]
```

```
},
{
 "Complex Instrument Type": "QSB",
 "Complex Instrument Subtype": "JELLY_ROLL",
 “Symbols”:
 [
 {
 ...
 }
 ]
}
]
```

The JSON file is a list comprises three dictionaries, one each associated with QSB type and BOX_SPREAD, BOX_SWAP, and JELLY_ROLL complex instrument subtypes. Within each dictionary is a list of the Symbols (i.e., distinct complex instruments of that type), each specifying the complex symbol id (i.e., Complex Instrument Id) and the leg metadata associated with each symbol id.

The JSON element names "Complex Instrument Id", "Leg Count", "Leg Symbol", and "Leg Ratio" are chosen specifically to align with the fields of the **`Complex Instrument Definition Expanded`** message from the Cboe US Options Complex Options PITCH and TOP data feeds. The "OSI Symbol" element associated with each leg is provided for convenience.. The JSON file for QSB on the Cboe website is used to identify the complex instrument id subset that corresponds to QSB instruments for which Market Makers are allowed to rest orders in the COB.

A similar link labeled "HTML" is provided on the same Cboe Reference Data web page for access a formatted display of the QSB symbols on a trading date. The HTML presentation is typically used by MM and platform vendor development, QA and operations staff as necessary for development and validation.

Exchange Designated Complex Instrument Definition Message

Market makers and brokerage trading platform vendors may access QSB symbol reference data by processing the **`Exchange Designated Complex Instrument Definition`** (EDCID) message on the Cboe US Options Complex PITCH and TOP market data feeds.

The EDCID message is disseminated in addition to the **`Complex Instrument Definition Expanded`** message for the QSB complex instruments. In other words, the EDCID message is supplementary information that provides and mapping of the Cboe Exchange complex instruments that are QSB instruments and their group associations (i.e., QSB BOX_SPREAD, QSB BOX_SWAP and QSB JELLY_ROLL).

EDCID messages are available on Complex PITCH and TOP market data feeds in a background loop throughout the trading day. In addition, EDCID messages will appear in the Complex PITCH and TOP Spin Request and Instrument Definition Request output.

See the Cboe US Options Complex PITCH and TOP market data feed specifications for detail on the new EDCID message.

QSB Instrument Type Detail

The following sections detail the algorithmic creation of QSB instrument by type for Box Spreads, Box Swaps and Jelly Rolls on each trading date.

QSB Box Spread

QSB Box Spreads are created each trading date using strikes spaced 1000 apart (i.e., $100,000 notional) on the first four serial, the first three quarterly, and the first three December standard SPX expirations. By convention, Buying a QSB Box Spread is buying the low-strike Call, selling the high-strike Call, selling the low-strike Put, and buying the high-strike Put. The QSB Box Spread Expirations figure below illustrates the QSB Box Spreads created each trading date.

The EDCID message EDCI Type value for QSB Box Spreads is "QSB" and the EDCI Subtype value is "BOX_SPREAD".

Figure 2. QSB Box Spread Expirations

Serial-1	Serial-2	Serial-3	Serial-4	Qtr-1	Qtr-2	Qtr-3	Dec-1	Dec-2	Dec-3
X	X	X	X	X	X	X	X	X	X

Note - On dates where two expirations are identical, only one spread is created

QSB Box Swap

QSB Box Swaps are used for rolling expirations of standard SPX expiration Box Spreads to forward standard SPX expirations. By convention, buying a QSB Box Swap is rolling a long Box Spread forward in time (i.e., selling the earlier expiration and buying the later expiration. Figure 3 below illustrates the QSB Box Swap roll expirations pairs.

The EDCID message EDCI Type value for QSB Box Swaps is "QSB" and the EDCI Subtype value is "BOX_SWAP".

Figure 3. QSB Box Swap Expirations

FROM EXPIRY \ TO EXPIRY	Serial-2	Serial-3	Serial-4	Qtr-1	Qtr-2	Qtr-3	Dec-1	Dec-2	Dec-3
Serial-1	X	X	X	X	X	X			
Serial-2		X	X	X	X	X			
Serial-3			X		X	X			
Serial-4					X	X			
Qtr-1		X	X		X	X	X	X	X
Qtr-2						X			

Note - On dates where the From and To expiry are identical, no associated spread is created

The shaded expiration pairs in Figure 3 above are pairs in which the time order of the pair may switch over time. For example, there are times when the first serial contract (Serial-1) expiration is before the first quarterly expiration (Qtr-1) and times when it is after. The gray background expiration pairs indicated in Figure 3 will flip the FROM and TO expirations to maintain the convention that buying the Box Swap rolls a long Box Spread forward in time.

The outlined cell in Figure 3 above indicates a singular expiration pair for which there are times within the calendar year when Qtr-1 and Dec-1 refer to the same contract expiration. During those times when Qtr-1 and Dec-1 resolve to the same contract expiration date, no associated contract spread is created.

QSB Jelly Roll

QSB Jelly Rolls are used for rolling combos (i.e., long Call and short Put at the same strike and expiration) from one expiration to another. Jelly Rolls are typically used for managing delta in portfolios of options positions. By convention buying a QSB Jelly Roll rolls a long combo from the earlier expiration to a later expiration (i.e., selling the earlier expiration combo and buying the later expiration combo). Figure 4 below illustrates the Jelly Roll expirations pairs.

The EDCID message EDCI Type value for QSB Jelly Rolls is "QSB" and the EDCI Subtype value is "JELLY_ROLL".

Figure 4. QSB Jelly Roll Expirations

TO EXPIRY

FROM EXPIRY	Tmr	Friday-1	Serial-1	Serial-2	Serial-3	Qtr-1	Qtr-2	Qtr-3
Today	WW	WW	WX			WX	WX	
Tmr						WX	WX	
Friday-1						WX	WX	
Serial-1						XX	XX	
Serial-2						XX	XX	
Serial-3							XX	XX
Qtr-1							XX	
Qtr-2								XX

Note - On dates where Tmr and/or Friday-1 are identical to Qtr-1, no associated spread is created

The expirations labeled Today and Tmr are the 0-DTE and 1-DTE expirations respectively. Note 0-DTE and 1-DTE options are technically weekly expiring SPXW contracts. Friday-1 is the next Friday expiring weekly SPXW contract. Serial-1, Serial-2 and Serial-3 are standard monthly SPX contract expirations that skip the quarterly March, June, September and December standard contract expiration. Lastly, Qtr-1, Qtr-2 and Qtr-3 are quarterly standard monthly SPX contract expirations in the set comprising March, June, September and December.

The cells in Figure 4 marked WW roll a weekly expiration combo to a weekly expiration combo forward in time. The cells marked WX roll a weekly expiration combo to a forward standard expiration combo. The cells marked XX roll a standard expiration combo to a forward standard expiration. These distinctions are significant as SPX-SPX complex order books are hosted on matching unit 33, SPXW-SPXW complex order books are hosted on matching unit 34, and the cross SPX-SPXW complex order books are hosted on matching unit 35.

The shaded expiration pairs in Figure 4 above are pairs in which the time order of the pair may switch over time. For example, there are times when the first serial expiration (Serial-1) is before the first quarterly expiration and times when it is after. The shaded expiration pairs will flip as appropriate to maintain the convention that buying a Jelly Roll is to roll a long combo position from the earlier to the later expiration.

The outlined cell in Figure 4 above indicates a two expiration pairs for which there are time within the calendar year when the pair refer to the same expiration date. The two are 1) when Tmr expiration date is the same as the Qtr-1 expiration date (i.e., the day before the expiration of the first quarterly contract), and 2) when the Friday-1 expiration date is the same as the Qtr-1 expiration date. On those specific dates, when the expiration dates comprising pair resolve to the same contract expiration, no associated contract spread is created.

Each trading date, an "Anchor Strike" is calculated by using the put-call parity implied forward price at the next Lead contract expiration rounded to the nearest $50. The Lead contract is defined as the next quarterly contract on a date advanced 9 days forward from the current date. In other words, the Lead contract in this context is the next quarterly control pre-rolled by 9 trading days.

For each Jelly Roll expiration combination shown in Figure 4 above, seven distinct Jelly Rolls are created as QSB instruments differing only by strike. The anchor strike comprises one of the seven. Three additional strikes above the anchor strike in increments of $50, and three additional strikes below the anchor strike in increments of $50 complete the seven.

Revision History

VERSION	DATE	DESCRIPTION
1.0.0	04/02/24	Initial version.
1.0.1	06/21/24	Minor correction made to figure 1.
1.0.2	01/22/25	Updated with Cboe Titanium branding.
1.0.3	07/02/25	Updated Introduction to indicate MMs will be able to use BOE **`Complex Quote Update`** and **`Complex Quote Update (Short)`** messages to quote QSB instruments over BOE Bulk Quoting Ports (effective 08/18/25).
1.0.4	07/21/25	Updated description of QSB Box Spread on page 8 and QSB Box Swap on page 9 instruments to indicate 1000 wide Box Spreads.