



**SECURITIES INDUSTRY AUTOMATION CORPORATION**

**CQS**

**CONSOLIDATED QUOTATION SYSTEM**

**PARTICIPANT INPUT BINARY SPECIFICATION**

**December 16, 2022  
Version 2.6c**

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**VERSION HISTORY**

Version	Date	Description
1.0	July 1, 2016	Initial Document
1.1	September 15, 2016	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ New Dedicated Test Symbols</li> </ul>
1.2	February 21, 2017	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ ‘Message Length’ field in Message Header and field description</li> <li>▪ New ‘Auction Status Category Q Type A’ message and field descriptions</li> <li>▪ New ‘Auction Collar Price’ and ‘Number of Extension’ Error Codes</li> </ul> <u>Eliminated:</u> <ul style="list-style-type: none"> <li>▪ Administrative Message ‘Text Length’ field (Length is identified in Message Header)</li> </ul> <u>Modified:</u> <ul style="list-style-type: none"> <li>▪ ‘Block Pad Byte’ description to include binary representation</li> <li>▪ Order of field appearances in Message Header</li> <li>▪ ‘Reserved’ field length in Message Header</li> <li>▪ Length of Short Quote format</li> <li>▪ Minor edits/clarification throughout document/removed verbiage associated with eliminated functionality</li> <li>▪ Binary and ASCII Protocol Differences and Notes</li> </ul>
1.3	May 5, 2017	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ CBOE Stock Exchange, Inc. (CBSX) Participant ID ‘W’</li> </ul>
1.4	June 2, 2017	<u>Added:</u> <ul style="list-style-type: none"> <li>▪ New Dedicated Test Symbols: ZIEXT, ZEXIT, ZXIET &amp; 01V thru 12V</li> </ul>
1.5	August 28, 2017	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ Block Sequence Number rollover limited to occur after 999,999,999 (instead of 3,999,999,999) for a transitional period</li> <li>▪ From: NYSE MKT / To: NYSE American</li> </ul>
1.6	February 14, 2018	<u>Modified:</u> <ul style="list-style-type: none"> <li>▪ From: National Stock Exchange / To: NYSE National, Inc.</li> <li>▪ From: Bats EDGA Exchange / To: Cboe EDGA Exchange</li> <li>▪ From: Bats EDGX Exchange / To: Cboe EDGX Exchange</li> <li>▪ From: Bats BYX Exchange / To: Cboe BYX Exchange</li> <li>▪ From: Bats BZX Exchange / To: Cboe BZX Exchange</li> <li>▪ IEX status to Primary Listing Exchange</li> <li>▪ Security Status Indicator value ‘X’ From: Equipment Changeover / To: Operational</li> <li>▪ Description of Auction Status message</li> </ul> <u>Added:</u> <ul style="list-style-type: none"> <li>▪ Participant Reference Number requirements previously published in FAQ’S version 1.1, August 24, 2017 <a href="https://www.ctaplan.com/tech-specs">https://www.ctaplan.com/tech-specs</a> for easy reference</li> </ul>

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**VERSION HISTORY - Continued**

<b>Version</b>	<b>Date</b>	<b>Description</b>
1.7	May 8, 2018	<u>Modified:</u> <ul style="list-style-type: none"> <li>From: Financial Industry Regulatory Authority, Inc. (FINRA) / To: FINRA Alternative Display Facility (ADF)</li> </ul> <u>Eliminated:</u> <ul style="list-style-type: none"> <li>Binary and ASCII Protocol Differences and Notes</li> </ul>
1.8	July 17, 2019	<u>Added:</u> <ul style="list-style-type: none"> <li>New Dedicated Test Symbol: CTEST and MTEST</li> </ul>
1.9	October 25, 2019	<u>Modified:</u> <ul style="list-style-type: none"> <li>From: Chicago Stock Exchange / To: NYSE Chicago, Inc.</li> </ul>
2.0	December 4, 2019	<u>Added:</u> <ul style="list-style-type: none"> <li>New section “Error Handling” to describe system behavior for handling for various levels of rejects</li> <li>Trading Status (Category T Type S) message support over CQS</li> </ul> <u>Modified:</u> <ul style="list-style-type: none"> <li>Block Sequence Number limit to rollover occur after 4,294,967,295</li> <li>‘Data Transmission’ section regarding Incorrect Block handling to reject invalid blocks and disconnect participant line</li> <li>Description of ‘Participant Reference Number’ field usage for Control Messages</li> <li>Description of ‘Message ID’ field</li> <li>List of Reject Codes</li> <li>Description for Input Line Throttling</li> <li>Minor edits and clarifications throughout document</li> </ul> <u>Eliminated:</u> <ul style="list-style-type: none"> <li>Support for ‘Security Status Indicator’ codes via Quote Message for Halt, Resume, No Open/No Resume and Indications</li> <li>Appendix E describing Security Status Indicators</li> <li>Control Message ‘End of Participant Quoting (EOPQ) - Category C Type 7’</li> <li>Participant’s predesignated closing time configurations to publish closing quote on participant’s behalf</li> <li>Support for ‘Short Sale Restriction Indicator’ codes via Quote Message for Short Sale Restriction updates</li> <li>Usage of fields Bid Price and Offer Price in Quote message for submitting Price or Trading Range Indication</li> </ul>
2.1	January 24, 2020	<u>Modified:</u> <ul style="list-style-type: none"> <li>Line Integrity interval for message sent from CQS to Participant</li> <li>Timeout interval for input lines</li> </ul> <u>Eliminated:</u> <ul style="list-style-type: none"> <li>Value of 0 from Timestamp 1 field</li> </ul>

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**VERSION HISTORY - Continued**

<b>Version</b>	<b>Date</b>	<b>Description</b>
2.2	February 5, 2020	<u>Modified:</u> <ul style="list-style-type: none"><li>▪ ‘Start of Day’ - clarified that Line Integrity &amp; Sequence Information and Message Count Inquiry messages are accepted prior to Start of Day</li></ul>
2.3	March 27, 2020	<u>Eliminated:</u> <ul style="list-style-type: none"><li>▪ Bonds and Local Issues restriction on Short Quotes</li><li>▪ Zero Participant Reference Number validation for Control Message</li></ul>
2.4	April 09, 2020	<u>Modified:</u> <ul style="list-style-type: none"><li>▪ Clarified Line Integrity timeout interval description</li></ul>
2.5	May 15, 2020	<u>Added:</u> <ul style="list-style-type: none"><li>▪ MIAX Pearl Exchange, LLC (MIAX) Participant ID ‘H’</li><li>▪ Members Exchange, LLC (MEMX) Participant ID ‘U’</li><li>▪ Support for non-Regulatory halt reason codes for non-listing participants</li></ul>
2.5a	June 5, 2020	<u>Corrected:</u> <ul style="list-style-type: none"><li>▪ Description for Block Sequence number</li></ul>
2.5b	July 22, 2020	<u>Added:</u> <ul style="list-style-type: none"><li>▪ Throttling rate for input lines</li></ul>
2.6	August 14, 2020	<u>Added:</u> <ul style="list-style-type: none"><li>▪ New Regulatory Halt Reason Codes (A, C, E, F, N, O and V)</li></ul> <u>Modified:</u> <ul style="list-style-type: none"><li>▪ Renamed Regulatory Halt Reason Code D from News Dissemination to News Released</li></ul> <u>Eliminated:</u> <ul style="list-style-type: none"><li>▪ Unused codes for field ‘Security Status Indicator’ on Quote messages</li></ul>
2.6a	January 26, 2021	<u>Modified:</u> <ul style="list-style-type: none"><li>▪ Section for CQS Interface Method to clarify that Input Block Sequence can be reset to a higher sequence number</li><li>▪ Clarified that all Halt Reason Codes are currently active</li></ul>
2.6b	Oct 26, 2022	<u>Modified:</u> <ul style="list-style-type: none"><li>▪ Added section 1.3 to clarify system behavior during Failure Recovery</li></ul>
2.6c	Dec 16, 2022	<u>Modified:</u> <ul style="list-style-type: none"><li>▪ Corrected Symbol Suffix examples under Appendix H to include series U</li></ul>

# CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR PARTICIPANT INPUT BINARY SPECIFICATION

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## 1.0 INTRODUCTION

The Securities Industry Automation Corporation (SIAC) serves as the Processor for the Consolidated Quotation Plan from its inception on August 1, 1978. In fulfilling its role as the Processor, SIAC plans, develops, operates, and maintains the Consolidated Quotation System (CQS).

### 1.1 Background

CQS receives transactions generated by participating U.S. Stock Exchanges and the FINRA Alternative Display Facility (ADF). In addition, CQS calculates the National ‘Best Bid and Best Offer’ (NBBO) and identifies the FINRA ‘Best Bid and Best Offer’ (FBBO). CQS consolidates transactions that occurred on participating U.S. Stock Exchanges and the FINRA Alternative Display Facility (ADF) and disseminates this information via computer-to-computer linkages to the financial community in the U.S. and abroad.

Quote market data generated by each Participant and the FINRA Alternative Display Facility (ADF) is assembled in prescribed message formats and transmitted to the appropriate TCP/IP Processor address via the Participant’s private communications facility. As each block is received, it is transmitted simultaneously to all data recipients via their private communications facilities. Approved data recipients of the CQS service can redistribute CQS data worldwide to their customers as part of their individual services or use the data for their own purposes.

#### Note:

- It is recommended that Data Recipients subscribe to both the Consolidated Quotation System (CQS) and the Consolidated Tape System (CTS) in order to receive complete listed equity market data. Reference the CQS and CTS Specifications for further details at: [www.ctaplan.com](http://www.ctaplan.com).

### 1.2 Dual Site Redundancy

Computer systems that support the processing and dissemination of quote transactions are operational at primary and backup sites. The backup site provides recovery capability in the event of a disaster at the primary site. Through computerized communications equipment, CQS transaction data is disseminated from either the primary or backup site. The dual-site configuration provides system fold-over for a limited site disaster (system failure) or full site disaster (loss of facility).

In the event of a Primary Data Center failover to the Disaster Recovery site (Backup Data Center), all Participant input socket connections at the Primary Data Center will be **closed**. Participants should have an automated mechanism in place once a Participant’s Primary Data Center’s input sockets close, to ‘hunt’ for the Participant’s open input sockets at the Backup Data Center, and immediately establish input connectivity to either their primary or backup input connections (primary and backup connections are assigned the same port number however, the IP addresses are different) **within ten (10) minutes as per SEC requirement**.

### **1.3 Failure Recovery**

#### **1.3.1 NMS Publication Process Failure Recovery**

- In the event the Primary publication process encounters an unexpected state, data publication automatically switches to the Secondary publication process on the Primary Data Center
  - Data Subscribers may observe gaps on the affected output multicast lines. Any such gaps can be requested for retransmission
- In the event where both the Primary and Secondary publication processes encounter an unexpected state at the same time on the Primary Data Center, Pillar CTA initiates an automatic restart for both the processes in a recovery mode
  - There is no impact to the input Data Participants
  - Data publication is paused for the affected output line(s) and any input messages received while the process is being restarted are queued and published once the processes recover
  - Upon recovery, output block sequence for the affected line(s) is reset to a higher Block Sequence number. System transmits the Reset Block Sequence Number (Category C Type L) message and resumes data publication.
  - Security Symbol state including the LULD Price Bands and the NBBO state are recovered from prior to failure.
  - All Messages for the day can be requested for retransmission, including those that were received prior to, or, while the processes were being restarted.

#### **1.3.2 Input Gateway Failure and Recovery**

- In the event the Primary input Gateway connection encounters an unexpected state, Input Participants can reconnect to the Secondary (backup) input connection
- In the event the Input Gateway encounters an unexpected state affecting both the Primary and Secondary Input Connections for all the Data Participants, a restart of the Input Gateway can be initiated on the Primary Data Center.
  - Both Primary and Secondary Input connections are temporarily unavailable, affecting all Participants and Data Subscribers from inputting any data or requesting any retransmissions
  - Zero Quotes (Quote messages with Zero Price and Size) are published on the output lines on behalf of all participants across all symbols
  - Upon recovery, Input Block Sequence Number and PRN are recovered for each input line. Data Participants can reestablish connection and start submitting data. Data publication resumes.
  - There is no loss of data, all messages can be requested for retransmission.

#### **1.3.3 Primary Data Center Failure Recovery**

In the event that the Primary Data Center becomes unavailable, failover to the Disaster Recovery site (Backup Data Center) is initiated. However, if the DR site is also unavailable, then a Session Cold Restart on the Primary Data Center can be performed.

In case of a Session Cold Restart on the Primary Data Center:

- Both Primary and Secondary Input connections are temporarily unavailable, affecting all Participants and Data Subscribers from inputting any data or requesting any retransmissions



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- Upon restart:
  - Output block sequence for all the lines is reset to a higher Block Sequence number and System transmits the Reset Block Sequence Number (Category C Type L) message
  - Security symbol state including the LULD Price Bands is recovered. However, NBBO is not persisted.
  - Zero Quotes (Quote messages with Zero Price and Size) are published on behalf of all participants across all symbols
  - Input Lines are enabled and Data Publication Resumes
  - Messages prior to the Restart cannot be requested for Retransmission

## **1.4 Scope**

This specification defines the interface specification and message format requirements for Participants inputting into CQS.

## **1.5 Data Feed Reference Material**

### **Technical Specifications**

For Technical Specifications visit [www.ctaplan.com](http://www.ctaplan.com) - and select Tech Specs tab for the following:

- CQS Participant Input Specification
- CQS Multicast Output Specification
- CTS Participant Input Specification
- CTS Multicast Output Specification
- Common IP Multicast Distribution Network Specification
- Automated Retransmission Facility User Guide

### **Consolidated Tape Association (CTA) Announcements**

CTA Announcements including feed enhancements, traffic rates, etc. visit [www.ctaplan.com](http://www.ctaplan.com)

### **Future Data Feed Enhancements**

Future enhancements and/or modifications may require system changes for your firm. Please refer to the CTA Plan website [www.ctaplan.com](http://www.ctaplan.com) to obtain the latest CTA Notifications and Technical Specification documents. **To automatically receive these Notifications and System Alerts, subscribe at:** <https://www.ctaplan.com/subscribe>

### **Data Feed Related Resources**

For customers selecting to initiate ICE Global Network (IGN), formerly known as the Secure Financial Transaction Infrastructure (SFTI), connections to CQS:

- Submit a request at: <https://www.theice.com/contact-us/connectivity>
- Contact IGN Sales at: [clientnetworks@theice.com](mailto:clientnetworks@theice.com)
- For more information on IGN, including documentation such as Customer and Technical guides reach out to an IGN representative at: [iceglobalnetwork-info@theice.com](mailto:iceglobalnetwork-info@theice.com)

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## **2.0 GENERAL DESIGN OF DATA DISTRIBUTION NETWORK**

The CQS communications interface design utilizes the TCP/IP protocol.

### **2.1 TCP/IP Network Interface**

The requirements for the TCP/IP Network Interface are in the addendum to this document, 'TCP/IP for National Market System (NMS) Participant Input'. Participants may request to receive the CQS and TCP/IP Participant Input Specifications by sending an email message to [CQS-CTS-OPRA@siac.com](mailto:CQS-CTS-OPRA@siac.com).

### **2.2 TCP/IP Input Throttling**

Input messages for each line are read at a pre-assigned rate, currently 700 messages per rolling 10 milliseconds. A line is throttled when a participant exceeds the maximum number of messages allowed during the current time window. Throttled messages are queued and processed in time sequence as the message read rate allows.

### **3.0 CQS INTERFACE METHOD**

Any Participant may input to CQS over one or more logical TCP/IP connections. Each logical connection is considered as a complete independent entity. Participants with multiple input connections should ensure that all transactions for any one symbol (e.g., ABC) are sent over the same line throughout the day. Should transactions for the same symbol be sent simultaneously over separate connections, CQS would not guarantee the order of processing.

Each Participant is supplied with Primary Data Center IP addresses/ports (primary and backup) and Disaster Recovery site (Backup Data Center) IP addresses/ports primary and backup). Primary and backup connections are assigned the same port number however the IP addresses (primary and backup) are different.

In the event a Participant detects a failure of the primary host connection at the Primary Data Center, Participants will be required to establish a connection to the backup host connection which is running in parallel to the primary host at the Primary Data Center. In the event the Primary Data Center is unavailable, each Participant will be required to connect to the Disaster Recovery site (Backup Data Center) IP addresses/ports.

Once a Participant establishes a connection, SIAC recommends that the Participant system, prior to transmitting data, generate a Sequence Information and Message Count Inquiry message to obtain the last Block Sequence Number obtained by CQS. If there is a discrepancy in the sequence numbers wherein CQS expects a lower sequence number than what the Participant system is ready to send, the Participant system should re-send the messages in question, before generating any new messages.

Note: CQS can reset the Block Sequence number on input lines to a higher value if there are issues in sequence number handshake between a participant and CQS. Participant system shall be able to process the jump in next expected sequence number when reestablishing connection with CQS.

If a Participant is establishing connections to the Disaster Recovery site (Backup Data Center) input lines, or in instances of a CQS cold-start, Participants will be required to re-quote.

#### **3.1 General Design Considerations**

CQS receives and transmits variable length blocks having maximum lengths of 1000 bytes. The length includes a Block Header, Block Data and an optional Block Pad Byte.

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## 4.0 TRANSMISSION CHARACTERISTICS

### 4.1 Data Transmission

Data transmitted between the Participants and CQS is sent using TCP/IP. For a description of the TCP/IP segment, reference the addendum to this document, ‘TCP/IP for NMS Participant Input Interface Specification’. Participants may request to receive the TCP/IP Participant Input Interface Specifications by sending an email message to [CQS-CTS-OPRA@siac.com](mailto:CQS-CTS-OPRA@siac.com).

The CQS data is sent as a CQS Binary Block, and becomes the TCP/IP payload. Since TCP/IP is byte-stream, a CQS Binary Block boundary may not match the TCP segment boundary; for example, a single TCP segment may contain more than one CQS Binary Block or a CQS Binary Block can be spread between two TCP segments.

A Participant is required to send a Block Separator which will be used to determine the start of the CQS Binary Block. It is the Participant’s responsibility to create the correct CQS Binary Block structure. Incorrect Block Structure information (e.g., incorrectly formatted Block Header, invalid Block Data, etc.) will result in lost messages and blocks being rejected back to a Participant, possibly followed by a port level disconnect.

### 4.2 Block Separator

**Byte [2].** The Block Separator is a 2 byte sequence of Hex 0xA5 & 0x5A (offers better guarantees that the format will be identified correctly). The source of the Block Separator is both from a Participant to CQS and from CQS to a Participant. The Block Separator is not included in the block size it is independent of the Block. Every Block must be preceded by a Block Separator.

### 4.3 Binary Block Structure

A Block can have a maximum of 1,000 bytes inclusive of Block Separator, Block Header, Block Data and Block Pad Byte.

Block Structure	Length
Block Header	10
Block Data	Variable
Block Pad Byte (optional)	1

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#### **4.4 Block Data**

The Block Data consists of one or more CQS messages. A message consists of a Message Header, which is of fixed length and format and message data (body), which is variable in length and format. Category C – Control messages are each sent in their own individual block.

The Block Data structure is as follows:

Block Data Structure
Message 1 Data
Message 2 Data
~~~
Message N Data

#### **4.5 Block Pad Byte**

**Byte.** Unsigned integer contains binary zero (Hex 0x00). Only used when the size of a Block consists of an odd number of bytes. In instances of odd number of bytes, the Block Pad Byte is added to the Block to ensure the Block is an even number of bytes.

#### **4.6 Data Type**

The following data types are used by CQS:

Type	Value
<b>NUMERIC – Big-Endian (Network Byte Order)</b>	
byte	Big-Endian Unsigned 1 Byte Integer
short	Big-Endian Unsigned 2 Byte Integer
integer	Big-Endian Unsigned 4 Byte Integer
long	Big-Endian Unsigned 8 Byte Integer
<b>ALPHA/ALPHANUMERIC/SPECIAL/PRINTABLE</b>	
char	Single printable ASCII character
char [ ]	Fixed length printable ASCII characters
varchar [ ]	Variable length printable ASCII characters

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### 4.6.1 Numeric Types

1. All numeric fields will be in Big-Endian (Network Byte Order) format
2. Numeric types (byte, short, integer and long) represent sequence numbers, timestamps, prices and sizes
3. Prices represented by short fields have implied 2 decimal places
4. Prices represented by long fields have implied 6 decimal places
5. Any numeric value that is unused or does not apply to a given message type has a value set to 0

The maximum range values for the numeric fields are as follows:

- 1 byte unsigned integer: 0 – 255 (byte)
- 2 byte unsigned integer: 0 – 65,535 (short)
- 4 byte unsigned integer: 0 – 4,294,967,295 (integer)
- 8 byte unsigned integer: 0 – 18,446,744,073,709,551,615 (long)

Select values represented as 2's complement, will have signed integers with the following range:

8 byte signed integer: -9,223,372,036,854,775,808 to +9,223,372,036,854,775,807 (signed long)

### 4.6.2 Alpha/Alphanumeric/Special/Printable Types

1. ASCII printable character codes 32 – 126
2. Left justified and padded on the right with spaces for fixed length fields

### 4.7 Block Header

Field	Length	Type
Version	1	Byte
Block Size	2	Short
Block Sequence Number	4	Integer
Messages In Block	1	Byte
Block Checksum	2	Short
<b>Total Length</b>	<b>10</b>	

#### 4.7.1 Version

**Byte.** Indicates the CQS binary protocol version and allows for Block Header, Message Header and Message formats to be updated while still supporting previous versions of headers/message formats during transition. Version value is set to 0 for first/initial version.

#### 4.7.2 Block Size

**Short.** Indicate the size in bytes of the entire transmission block.

### **4.7.3 Block Sequence Number**

**Integer.** All transmission blocks are assigned a sequential Block Sequence Number. On a per line basis, the Block Sequence Number on the lines are reset at the start of each day, and incremented by one each time a Block is transmitted, with the following conditions:

- CQS expects a one (1) as first Block Sequence Number.
- All Blocks containing Sequence Information and Message Count Inquiry message (Category C Type I) should have a Block Sequence Number set to zero.
- The Block Sequence Number field is not incremented for Participant to CTS Line Integrity (Category C Type T) messages
- On every connection and reconnection, SIAC recommends a Participant input a Sequence Information and Message Count Inquiry message (Category C Type I) to synchronize with the expected sequence number.
- If a Participant inputs a Sequence Information and Message Count Inquiry message (Category C Type I), CQS will respond with a Sequence Information and Message Count Response (Category C Type N) message with the 'Current Block Sequence Number' field populated with the next expected Block Sequence Number from the Participant, the 'Last Participant Reference Number Received' field populated with the last Participant Reference Number from the Participant and the count of messages received on an individual line since startup. Message count does not include Line Integrity messages or Sequence Information and Message Count Inquiry messages.
- When the Block Sequence Number reaches 4,294,967,295, the next expected value is zero

### **4.7.4 Messages in Block**

**Byte.** The number of messages contained in the block data.

### **4.7.5 Block Checksum**

**Short.** Lower 2 bytes of the 4 byte sum of all the bytes in the block, excluding this Block Checksum field.



## **4.8 Error Handling**

It is the Participant's responsibility to submit syntactically correct messages. Any message block with invalid structure or incorrect data will elicit a Rejection response with an error code matching the first error encountered in the processing. There are various levels of validations performed on the input messages as follows:

1. Any incorrectly formatted message block results in the block being rejected back to the Participant, immediately followed by a port level disconnect. The Block Sequence number is not incremented in this case since it cannot be ascertained whether any part of the message block is valid. Syntax errors include:
  - Incorrect Block Header information, e.g. wrong version, Block Size or number of messages contained in the block
  - Invalid Block Structure, e.g. a Block containing more than one control message,
  - Syntactically invalid data, e.g. a non-printable ASCII character
  - Unrecognized Message Category/Type
  - Incorrect Message Length for the Message Category/Type
2. Incorrect Session Level information results in the entire message block or an individual message being rejected back to the participant. For each connection, upon breaching a maximum number of session level rejects, the input port is disconnected followed by a Denial of Service. Any attempt to connect to the target port is denied until the Denial of Service timer expires. The default threshold is 100 session level rejects triggering a Denial of Service for a minimum of 60 seconds. Session Layer Rejects include:
  - Block header validation failure due to lower than expected Block Sequence Number - The Block Sequence Number is not incremented in this case as the entire block is rejected
  - Message Header validation failure due to invalid Participant ID, Timestamp or 'Message ID' - Each incorrect message is rejected individually and the Block Sequence number is incremented.
3. Incorrect data in the Message Body as per the Field Description or incorrect messages based off of the symbol state are treated as Application Level Rejects. The Block Sequence Number is incremented and the Input connection is not affected by such rejects

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## **5.0 MESSAGE HEADER**

The Message Header uniquely identifies the Message Category and Message Type of each message within a Block. The Message Header can represent an entire message or appears before the Message body segment in each message transmitted. The Message Header contains the following bytes and conforms in all cases to the following data fields:

<b>Field Name</b>	<b>Length</b>	<b>Type</b>
Message Length	2	Short
Message Category	1	Char
Message Type	1	Char
Participant ID	1	Char
Timestamp 1	8	2 x Integer
Message ID	1	Byte
Reserved	4	TBD
Participant Reference Number	8	Signed Long
<b>Total Length</b>	<b>26</b>	

### **5.1 Message Length**

**Short.** The Message Length identifies the total message length inclusive of the Message Header and Message Body.

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## 5.2 Message Category and Message Type Table

Message Category	Message Type	Message Source*	Value
<b>Administrative</b>			
A	R	CQS	Rejection
A	W	CQS	Warning
<b>Control</b>			
C	A	CQS	Start of Day
C	C	Participant	FINRA Close
C	I	Participant	Sequence Information and Message Count Inquiry
C	N	CQS	Sequence Information and Message Count Response
C	O	Participant	FINRA Open
C	T	Part. & CQS	Line Integrity
C	Z	CQS	End of Day
C	5	Part. & CQS	Test
<b>Quote</b>			
Q	A	Participant	Auction Status
Q	L	Participant	Long Quote
Q	Q	Participant	Short Quote
Q	S	Participant	Special Long Quote (FINRA ADF) with BBO Information
<b>Trade</b>			
T	S	Part. & CQS	Trading Status

\* The *source* of the message can originate from either a **Participant (Part.)** or from the **CQS** Processor.

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### 5.2.1 Message Category

**Char.** The Message Category represents the message classification. Refer to Message Category and Message Type Table *section 5.2*.

### 5.2.2 Message Type

**Char.** The Message Type together with the Message Category identifies the message. Refer to Message Category and Message Type Table *section 5.2*.

### 5.3 Participant ID

**Char.** Participant ID identifies the Participant or Processor that generated the message.

Code	Value
A	NYSE American, LLC (NYSE American)
B	NASDAQ OMX BX, Inc. (NASDAQ OMX BX)
C	NYSE National, Inc. (NYSE National)
D	FINRA Alternative Display Facility (ADF)
H	MIAX Pearl Exchange, LLC (MIAX)
I	International Securities Exchange, LLC (ISE)
J	Cboe EDGA Exchange, Inc. (Cboe EDGA)
K	Cboe EDGX Exchange, Inc. (Cboe EDGX)
L	Long-Term Stock Exchange, Inc. (LTSE)
M	NYSE Chicago, Inc. (NYSE Chicago)
N	New York Stock Exchange, LLC (NYSE)
P	NYSE Arca, Inc. (NYSE Arca)
S	Consolidated Quotation System
T	NASDAQ Stock Market, LLC (NASDAQ)
U	Members Exchange, LLC (MEMX)
V	Investors' Exchange, LLC. (IEX)
W	CBOE Stock Exchange, Inc. (CBSX)
X	NASDAQ OMX PSX, Inc. (NASDAQ OMX PSX)
Y	Cboe BYX Exchange, Inc. (Cboe BYX)
Z	Cboe BZX Exchange, Inc. (Cboe BZX)

## 5.4 Timestamp 1

**2 x Integer (pair of integers).** Timestamp 1 is a Participant-provided timestamp representing the number of nanoseconds since Epoch. The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315). For any messages generated by CQS, e.g., messages generated on behalf of a Participant, Administrative messages and Control messages, the Timestamp 1 field will be set to Zero.

- **If from an Exchange: Timestamp 1** must be populated and denotes the time where the quote bid price and/or the offer price for a security is designated with an Exchange's Matching Engine Publication timestamp. Exchanges use a clock sync methodology ensuring that timestamps are accurate within tolerances of 100 microseconds or less. Exchanges shall provide the timestamp in terms of nanoseconds since Epoch.
- **If from the FINRA Alternative Display Facility (ADF): Timestamp 1** must be populated and denotes the time of the quote bid price and/or the offer price for a security that a FINRA member reports to the FINRA Alternative Display Facility. FINRA shall provide such times to the Processor in nanoseconds since Epoch.

## 5.5 Participant Reference Number

**Signed Long.** Optionally set to Zero. Only zero and positive Participant Reference Numbers are allowed (negative Participant Reference Numbers will be rejected).

**Note:** As previously published in FAQ'S version 1.1, August 24, 2017 and posted at <https://www.ctaplan.com/tech-specs> under CQS-CTS Binary Specifications), SIAC requires Participants continue to use their ASCII Regional Reference Number (RRN) production population convention when populating the Binary Participant Reference Number (PRN) field. Participants should construct a 6 byte ASCII Regional Reference Number (RRN) and perform a byte-copy of those 6 characters to the lower-significant 6 bytes of the 8 byte PRN field and fill the upper-significant two bytes of the PRN to binary 0s.

RRN/PRN Input Example:

**ASCII RRN:**

1	2	3	A	b	C
---	---	---	---	---	---

**New Binary PRN:**

0	0	1	2	3	A	b	C
---	---	---	---	---	---	---	---

PRN Validation:

- Participant Reference Numbers that do not conform to the ASCII 'Regional Reference Number' data format range requirements in the last six characters **will be rejected**.

## 5.6 Message ID

**Byte.** The Message ID identifies the individual message within the block beginning with number one (1). The Message ID for subsequent messages within a block should be incremented.

## 5.7 Reserved

Space filled. Field is **Reserved for Future Use to be determined (TBD)**.

## **6.0 MESSAGE FORMATS**

The Message Category and Message Type identify the Message and determine the format of the body. Message formats are fixed field formats (with the exception of Administrative and some Control messages which have unformatted text).

All message formats, except for Category A Type H Unformatted (free form text) messages, have fixed field which is determined by reading the Message Header and Message Body.

If the Participant input fails any of the Block Header, Message Category and Message Body validations, a reject message is returned to the Participant on the line from which the original message was sent.

A field description is provided as part of the Block Header format, Message Header format, Message Body or in the **Field Descriptions** section of this document.

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## **6.1 Administrative Messages – Category A**

The Administrative Category A message is sent from CQS to a Participant.

### **6.1.1 Rejection – Category A Type R**

If CQS receives an invalid Block structure, the invalid Block structure will be rejected. If the Block Header contains invalid data, the Block will be rejected. After CQS receives a message, CQS validates the message and will process if valid and reject if invalid. All blocks or message types can elicit a Rejection response from CQS.

The Rejection message is used for all errors to notify a Participant that CQS has found an error either in the Block Header, Message Header or Message body (e.g., an invalid Price) in a Participant Input message.

Field Name	Length	Type
Error Code	1	Byte
Block Sequence Number	4	Integer
Participant Reference Number	8	Signed Long
Message ID	1	Byte
<b>Total Length</b>	<b>14</b>	

### **6.1.2 Warning – Category A Type W**

The Warning message is sent from CQS to a Participant in response to a Block Sequence Number Gap. The Block will still be processed by CQS.

Field Name	Length	Type
Previous Block Sequence Number	4	Integer
Previous Participant Reference Number	8	Signed Long
<b>Total Length</b>	<b>12</b>	

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## **6.2 Control Messages – Category C**

Control messages are used to report specific system events. The source of a Control message can originate from either a Participant or from the CQS Processor. Control message formats fall into two categories:

- Those consisting of a Message Header only
- Those consisting of a Message Header and Message Body

Only one Control message is transmitted in a block and no other messages appear in that block. Block containing another message along with a control message is treated as incorrectly formatted block.

### **A. Control Messages consisting of Message Header Only**

Message Category	Message Type	Value
C	A	Start Of Day
C	C	FINRA Close
C	I	Sequence Information and Message Count Inquiry
C	O	FINRA Open
C	T	Line Integrity
C	Z	End of Day

### **B. Control Messages Consisting of Message Header and Message Body**

Message Category	Message Type	Value
C	N	Sequence Information and Message Count Response
C	5	Test

#### **6.2.1 Start of Day – Category C Type A**

The Start of Day message consists of the **Message Header only** and is sent by CQS to a Participant to indicate CQS' readiness to accept data transmission from the Participant to which the message is transmitted. A Participant cannot initiate data transfer with CQS until receipt of this message, except for Line Integrity (Category C Type T) and Sequence Information and Message Count Inquiry (Category C Type I) messages.

#### **6.2.2 FINRA Close – Category C Type C**

The FINRA Close message consists of the **Message Header only** and is transmitted by FINRA to CQS to indicate the Close state of FINRA Market Maker(s). All FINRA Market Maker quotes must be in either an Open or Close state where Open implies current and Close implies not current.



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### **6.2.3 Sequence Information and Message Count Inquiry – Category C Type I**

The Sequence Information and Message Count Inquiry message consists of the **Message Header only**. Participants' computers and the CQS processor use the Sequence Information and Message Count Inquiry message to synchronize message sequence numbers. Upon receipt of this message, CQS transmits back to the inquiry processor a Sequence Information and Message Count Response Category C Type N message containing the sequence number of the next expected message and the count of messages received on an individual line since startup. Multiple lines for a single Participant are treated as independent lines with their own block sequence numbers. The Sequence Information and Message Count Inquiry message is transmitted in a separate message block containing only the Sequence Information and Message Count Inquiry message and must be sent with the Block Sequence Number field set to Zero.

### **6.2.4 Sequence Information and Message Count Response – Category C Type N**

The Sequence Information and Message Count Response message is generated by CQS to a Participant in response to a Sequence Information and Message Count Inquiry message. The Sequence Information and Message Count Response message is transmitted in a separate message block containing only the Sequence Information and Message Count Response message.

<b>Field Name</b>	<b>Length</b>	<b>Type</b>	<b>Value</b>
Current Block Sequence Number	4	Integer	Contains Next Expected Participant Block Sequence Number
Last Participant Reference Number	8	Signed Long	Contains Last Participant Reference Number Received
Message Count	8	Long	Contains the count of messages received on an individual line since startup. Message count does not include Line Integrity Messages or Sequence Information and Message Count Inquiry messages
<b>Total Length</b>	<b>20</b>		

**Note:**

- The Participant Reference Number that is returned is the Participant Reference Number received for the individual line on which the Sequence Information and Message Count Inquiry message was sent.

### **6.2.5 FINRA Open Category – C Type O**

The FINRA Open message consists of the **Message Header only** and is transmitted by FINRA to CQS. This message indicates the Open state of FINRA Market Maker(s). All FINRA Market Maker quotes must be in either an Open or Close state, whereby Open implies 'current' and Close implies not current.

### **6.2.6 Line Integrity Participant to CQS / CQS to Participant – Category C Type T**

#### **Line Integrity Participant to CQS:**

The **Participant to CQS** Category C Type T Line Integrity message consists of the **Message Header only** and is for optional use by a Participant. Line Integrity messages may be generated by a Participant to CQS at set intervals selected by a Participant.

A timeout duration of 10 seconds is defined for all input lines. A Participant is required to input messages with an idle time of no more than 5 seconds. Once connected, if a Participant does not input Category C Type T messages or any other data to CQS within the configured timeout interval, CQS will wait for additional time (typically 10 seconds) and if still no message is received, CQS will break the connection on the Participants' connected input line. This will allow the Participant to reconnect to their primary or backup input line (e.g., connection should be made to the backup input line if the disconnect was made to the primary, conversely, connection should be made to the primary input line if the disconnect was made to the backup input line).

The Message Header field descriptions will be the same as in this CQS Participant Input Specification, with the exception of the Block Sequence Number field which will be populated as follows:

- The Block Sequence Number field is not incremented for Participant to CQS Category C Type T Line Integrity messages. The Block Sequence Number field will contain the Block Sequence Number of the last original message generated by the Participant.

#### **Line Integrity CQS to Participant:**

The **CQS to Participant** Category C Type T Line Integrity message consists of the **Message Header only** and is generated by CQS to each Participant at 10 second intervals. CQS can commence sending Line Integrity messages to Participant once the Participant lines have been started and the Participant has established connections. Its primary function is to provide verification of line integrity during periods of inactivity.

Line Integrity messages generated by CQS to a Participant will have the Message Header Timestamp 1 field populated with the Line Integrity time. The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315).

#### **Note:**

- A Line Integrity message coming from a Participant to CQS is mutually exclusive from a Line Integrity message sent by CQS to a Participant (there is no correlation between the two Line Integrity message functionalities).

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### **6.2.7 End of Day – Category C Type Z**

The End of Day message consists of the **Message Header only** and is sent by CQS to a Participant to indicate that the Participant should not transmit any further messages to CQS. Messages received by CQS after the End of Day message has been transmitted will be rejected.

### **6.2.8 Test – Category C Type 5**

CQS or a Participant may generate a Test message at any time during the day. Its function is to exercise the line to verify transmission integrity. A Test message is transmitted as the only message in a block.

Field Name	Length	Type	Value
Data	256	Byte [ ]	All ASCII characters starting with hex 0 and ending hex FF, in sequential order.
<b>Total Length</b>	<b>256</b>		

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### **6.3 Quote Messages – Category Q**

#### **6.3.1 Auction Status – Category Q Type A**

The Auction Status message is used when a Participant in a CTA eligible security, Local Issue or a Bond requires Auction Information. Primary Listing Markets using an automated reopening will calculate Auction Collars, in compliance with rules around prices for re-opening, when applicable and will publish the Auction Status message. The initial Auction Collar will be published after the LULD Trading Pause. The ‘Number of Extensions’ field will reflect when a new Auction Status message has been published. The first Auction Collar extension, at the time of the LULD Trading Pause, will be set to zero (0) indicating the first Auction Status message and will increment by one (1) for each new Auction Status message sent during the LULD Trading Pause event.

<b>Field Name</b>	<b>Length</b>	<b>Type</b>
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Auction Collar Reference Price	8	Long
Auction Collar Upper Threshold Price	8	Long
Auction Collar Lower Threshold Price	8	Long
Number of Extensions	1	Byte
Reserved (for future use)	62	TBD
<b>Total Length</b>	<b>99</b>	

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### 6.3.2 Long Quote – Category Q Type L

The Long Quote message is used to report quote information for a CTA eligible Equity, Local Issue or Bond. This message should not be used to report trading suspensions in a security, price indications and trading range indications on the CQS input lines. The Long Quote message should be used by FINRA ADF only when either no FINRA BBO exists (FINRA BBO Indicator value ‘A’) or there is no FINRA BBO change (FINRA BBO Indicator value ‘B’) and will not be used to remove FINRA ADF from the NBBO.

Field Name	Length	Data Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Quote Condition	1	Char
Security Status Indicator	1	Char
Bid Price	8	Long
Bid Size	4	Integer
Offer Price	8	Long
Offer Size	4	Integer
Retail Interest Indicator	1	Char
Settlement Condition	1	Char
Market Condition	1	Char
FINRA Market Maker ID	4	Char [ ]
FINRA BBO Indicator	1	Char
Timestamp 2	8	2 x Integer
Short Sale Restriction Indicator	1	Char
<b>Total Length</b>	<b>55</b>	

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### 6.3.3 Short Quote – Category Q Type Q

The Short Quote message is used to report Bid and Offer quote information for a **CTA eligible Equity**, Local Issue or Bond if the quote meets all the criteria and message format requirements, otherwise Long Quote message is used.

The Short Quote has the following criteria:	
1.	Quote Condition is implied 'Regular' quote condition.
2.	Settlement Condition is implied regular way settlement.
3.	Market Condition is implied normal auction market.
4.	Quote is <u>not</u> from FINRA ADF.

Field Name	Length	Type
Security Symbol	5	Char [ ]
Bid Price	2	Short
Bid Size	2	Short
Offer Price	2	Short
Offer Size	2	Short
Reserved	2	TBD
<b>Total Length</b>	<b>15</b>	

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### 6.3.4 Special Long Quote (FINRA ADF) with FINRA FBBO Information – Category Q Type S

The Special Long Quote (FINRA ADF) with BBO Information message should **only be used by FINRA ADF** for CTA eligible Equity, Local Issue or Bond information to identify the FINRA Best Bid and Best Offer at the Bid and/or Offer side for their Market Makers inclusive of changes to any existing FINRA BBO. The FINRA Best Bid and Best Offer information will be used in the National Best Bid and Best Offer (NBBO) calculation.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Quote Condition	1	Char
Security Status Indicator	1	Char
Bid Price	8	Long
Bid Size	4	Integer
Offer Price	8	Long
Offer Size	4	Integer
Retail Interest Indicator	1	Char
Settlement Condition	1	Char
Market Condition	1	Char
FINRA Market Maker ID	4	Char [ ]
FINRA Best Bid Quote Condition	1	Char
FINRA Best Bid Price	8	Long
FINRA Best Bid Size	4	Integer
FINRA Best Bid Market Maker ID	4	Char [ ]
FINRA Best Offer Quote Condition	1	Char
FINRA Best Offer Price	8	Long
FINRA Best Offer Size	4	Integer
FINRA Best Offer Market Maker ID	4	Char [ ]
Timestamp 2	8	2 x Integer
Short Sale Restriction Indicator	1	Char
<b>Total Length</b>	<b>88</b>	

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## **6.4 Trade Messages – Category T**

### **6.4.1 Trading Status – Category T Type S**

Trading Status messages from a Participant are supported over input lines to both the CTS and the CQS system. The Trading Status message allows a Participant that is the listing exchange for CTA eligible Equity, Local Issue or Bond information to notify CQS of Trading Halts, Resumes, Indications, Imbalances, Short Sale Restriction Indicators and Limit Up-Limit Down Quote Midpoints. A non-listing exchange can enter a Trading Status message to notify non-regulatory Halts, Resumes, trading range indication (if the stock is not halted) and a price indication (if the stock is halted for either a regulatory or non-regulatory reason).

<b>Field Name</b>	<b>Length</b>	<b>Type</b>
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Last Price / Opening (Reopening) Quote Midpoint Price	8	Long
High Indication Price / Upper Limit Price Band	8	Long
Low Indication Price / Lower Limit Price Band	8	Long
Buy Volume	4	Integer
Sell Volume	4	Integer
Security Status	1	Char
Halt Reason	1	Char
Short Sale Restriction Indicator	1	Char
Trading Status ID	4	Integer
<b>Total Length</b>	<b>51</b>	

**Note:**

- The Trading Status message is applicable to the Listing Exchange of the issue designated by the symbol in **SECURITY SYMBOL** field. Only certain Trading Status messages received from non-Listing Exchanges are accepted: 1) halts for non-Regulatory halt reason (code I, X or Y) are accepted; 2) resume for non-Regulatory halt are accepted; 3) if a stock is not halted, only Trading Range Indications are accepted; 4) if a stock is halted, only Price Indications are accepted. All other Trading Status messages from non-Listing Markets are rejected back to the Participant.
- The 'Trading Status ID' field on Trading Status messages is used to perform a duplicate check. A Trading Status message with a duplicate 'Trading Status ID' is ignored. As such, the field must have a unique value for each subsequent Trading Status update per symbol.



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**Trading Status – Category T Type S (*continued*)**

- To achieve redundancy Participants should disseminate Trading Status Messages to both CTS and CQS.
  - All Trading status updates shall be submitted in respectively same sequence across CQS and CTS input line
  - The Participant must provide the same value for the ‘Trading Status ID’ field when publishing the same Trading Status update across both CTS and CQS input lines.
- If a Trading Status message for a Halt is received with either a Regulatory or a Non-Regulatory status, it will result in the BBO being recalculated excluding the Participant from the BBO if that Participant was part or all of the BBO
- CQS does not process Security Status updates for Trading Halts, Resumes and Indications received from participants via Long Quote messages
- The Trading Status (Category T Type S) message is not published on the multicast output lines. CQS publishes the Security Status updates for Halts, Resumes and Indications, etc. on the multicast output lines via the Long Quote message with the appropriate Security Status Indicator code as per the CQS Output Specifications

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**7.0 FIELD DESCRIPTIONS**

Field Name	Length	Description
Auction Collar Reference Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Auction Collar Reference Price represents the price used by the exchange to establish the Auction Collar.</p>
Auction Collar Lower Threshold Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>Represents the latest lower threshold price of the Auction Collar. The lower threshold price of the Auction Collar is the lowest price of the auction collar, if any.</p>
Auction Collar Upper Threshold Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>Represents the latest upper threshold price of the Auction Collar. The upper threshold price of the Auction Collar is the highest price of the auction collar, if any.</p>

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Bid Price	2 or 8	<p>2 Short. Short have implied 2 decimal places and a maximum price of \$655.35.</p> <p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p>The Bid Price represents the highest price a prospective buyer is prepared to pay at a particular time for a security.</p> <p><b>When the Bid Price and the Bid Size fields are all zeroes, it represents a 'No Bid' quote or a 'No Quote' (i.e., neither a Bid nor an Offer, which zeroes out the quote).</b></p>
Bid Size	2 or 4	<p>2 Short. Short have a maximum size of 65,535.</p> <p>4 Integer. Integer has a maximum size of 4,294,967,295.</p> <p>The Bid Size identifies the number of round-lots, for a security (e.g., 001 = one round-lot).</p> <p>Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are 1, 10, 25 or 50 share round-lots.</p> <p><b>When the Bid Size field is all zeroes, it represents a 'No Bid' quote or a 'No Quote' (i.e., neither a Bid nor an Offer, which zeroes out the quote).</b></p>
Buy Volume	4	<p>Integer. Integer has a maximum volume of 4,294,967,295. Optional set to zero.</p> <p>The Buy Volume represents the reported imbalance of buy orders without matching sell orders for the security for a Participant.</p>

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**FIELD DESCRIPTIONS**

Field Name	Length	Description								
FINRA BBO Indicator	1	<p>Char.</p> <p>For FINRA ADF, represents the FINRA BBO state of the FINRA ADF quote.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>FINRA BBO Indicator Not Applicable (used by Participants other than FINRA ADF)</td></tr><tr><td>A</td><td>No FINRA BBO Change</td></tr><tr><td>B</td><td>No FINRA BBO Exists</td></tr></table>	Code	Value	Space	FINRA BBO Indicator Not Applicable (used by Participants other than FINRA ADF)	A	No FINRA BBO Change	B	No FINRA BBO Exists
Code	Value									
Space	FINRA BBO Indicator Not Applicable (used by Participants other than FINRA ADF)									
A	No FINRA BBO Change									
B	No FINRA BBO Exists									
FINRA Best Bid Market Maker ID	4	<p>Char [4]. Left justified, space-filled.</p> <p>Represents the FINRA ADF provided FINRA Best Bid Market Maker identifier of the Market Maker that had the FINRA Best Bid (FBBO).</p>								
FINRA Best Bid Price	8	<p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p>Optional set to zero.</p> <p>Represents the FINRA ADF provided FINRA Best Bid Price that is the FINRA Best Bid (FBBO).</p>								
FINRA Best Bid Quote Condition	1	<p>Char. Space-filled.</p> <p>Represents the FINRA ADF provided FINRA Best Bid Quote Condition associated with the FINRA Best Bid Price that had the FINRA Best Bid (FBBO).</p>								
FINRA Best Bid Size	4	<p>4 Integer. Integer has a maximum size of 4,294,967,295.</p> <p>Optional set to zero.</p> <p>Represents the FINRA ADF provided FINRA Best Bid Size associated with the FINRA Best Bid Price that had the FINRA Best Bid (FBBO).</p> <p>Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are in 1, 10, 25 or 50 share round-lots.</p>								
FINRA Best Offer Price	8	<p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p>Optional set to zero.</p> <p>Represents the FINRA ADF provided Best FINRA Offer Price that is the FINRA Best Offer (FBBO).</p>								

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**FIELD DESCRIPTIONS**

Field Name	Length	Description										
FINRA Best Offer Size	4	<p>4 Integer. Integer has a maximum size of 4,294,967,295. Optional set to zero.</p> <p>Represents the FINRA ADF provided FINRA Best Offer Size associated with the FINRA Best Offer Price that had the FINRA Best Offer (FBBO).</p> <p>Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are in 1, 10, 25 or 50 share round-lots.</p>										
FINRA Best Offer Market Maker ID	4	<p>Char [4]. Left justified, space-filled.</p> <p>Represents the FINRA ADF provided FINRA Best Offer Market Maker identifier of the Market Maker that had the FINRA Best Offer (FBBO).</p>										
FINRA Best Offer Quote Condition	1	<p>Char. Space-filled.</p> <p>Represents the FINRA ADF provided FINRA Best Offer Quote Condition associated with the Best FINRA Offer Price that had the FINRA Best Offer (FBBO).</p>										
FINRA Market Maker ID (MMID)	4	<p>Char [4]. Left justified, space-filled.</p> <p>Contains the FINRA Market Maker ID of the quoting participant on FINRA's Alternative Display Facility (ADF) or the FINRA ADF Identifier 'FNRA'.</p>										
Instrument Type	1	<p>Char.</p> <p>Identifies the instrument type relevant to the quote.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>CTA Eligible Equity</td></tr><tr><td>1</td><td>Local Issue</td></tr><tr><td>2</td><td>Corporate Bond</td></tr><tr><td>3</td><td>Government Bond</td></tr></table> <p><b>Note:</b> Message is rejected if field value does not match the configured setting for the underlying symbol</p>	Code	Value	0	CTA Eligible Equity	1	Local Issue	2	Corporate Bond	3	Government Bond
Code	Value											
0	CTA Eligible Equity											
1	Local Issue											
2	Corporate Bond											
3	Government Bond											

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**FIELD DESCRIPTIONS**

Field Name	Length	Description																																																																								
Halt Reason	1	<div>Char.</div> <div>Denotes the reason for the Trading Halt.</div> <table><tr><th>Code</th><th>Value</th><th>Regulatory</th><th>Non Regulatory</th></tr><tr><td>Space</td><td>Halt Reason Not Applicable</td><td></td><td></td></tr><tr><td>A</td><td>Additional Information Requested</td><td>X</td><td></td></tr><tr><td>C</td><td>Regulatory Concern</td><td>X</td><td></td></tr><tr><td>D</td><td>News Released (formerly News Dissemination)</td><td>X</td><td></td></tr><tr><td>E</td><td>Merger Effective</td><td>X</td><td></td></tr><tr><td>F</td><td>ETF Component Prices Not Available</td><td>X</td><td></td></tr><tr><td>I</td><td>Order Imbalance</td><td></td><td>X</td></tr><tr><td>M</td><td>Limit Up-Limit Down (LULD) Trading Pause</td><td>X</td><td></td></tr><tr><td>N</td><td>Corporate Action</td><td>X</td><td></td></tr><tr><td>O</td><td>New Security Offering</td><td>X</td><td></td></tr><tr><td>P</td><td>News Pending</td><td>X</td><td></td></tr><tr><td>V</td><td>Intraday Indicative Value Not Available</td><td>X</td><td></td></tr><tr><td>X</td><td>Operational</td><td></td><td>X</td></tr><tr><td>Y</td><td>Sub-Penny Trading</td><td></td><td>X</td></tr><tr><td>1</td><td>Market-Wide Circuit Breaker Level 1 – Breached</td><td>X</td><td></td></tr><tr><td>2</td><td>Market-Wide Circuit Breaker Level 2 – Breached</td><td>X</td><td></td></tr><tr><td>3</td><td>Market-Wide Circuit Breaker Level 3 – Breached</td><td>X</td><td></td></tr></table>	Code	Value	Regulatory	Non Regulatory	Space	Halt Reason Not Applicable			A	Additional Information Requested	X		C	Regulatory Concern	X		D	News Released (formerly News Dissemination)	X		E	Merger Effective	X		F	ETF Component Prices Not Available	X		I	Order Imbalance		X	M	Limit Up-Limit Down (LULD) Trading Pause	X		N	Corporate Action	X		O	New Security Offering	X		P	News Pending	X		V	Intraday Indicative Value Not Available	X		X	Operational		X	Y	Sub-Penny Trading		X	1	Market-Wide Circuit Breaker Level 1 – Breached	X		2	Market-Wide Circuit Breaker Level 2 – Breached	X		3	Market-Wide Circuit Breaker Level 3 – Breached	X	
Code	Value	Regulatory	Non Regulatory																																																																							
Space	Halt Reason Not Applicable																																																																									
A	Additional Information Requested	X																																																																								
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V	Intraday Indicative Value Not Available	X																																																																								
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Y	Sub-Penny Trading		X																																																																							
1	Market-Wide Circuit Breaker Level 1 – Breached	X																																																																								
2	Market-Wide Circuit Breaker Level 2 – Breached	X																																																																								
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**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**FIELD DESCRIPTIONS**

Field Name	Length	Description
High Indication Price / Upper Limit Price Band	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The High Indication Price represents an approximation of what the high end ‘Offer’ price of a security’s trading range may be. It is used for a security that is not Trading Halted, i.e., Trading Range Indication or following a Trading Halt, i.e., Price Indication.</p> <p><b>Note:</b> For Government Bonds, the High Indication Price (i.e., Bid) could reflect a value that is greater than the Low Indication Price (i.e., Offer).</p> <p>The <b>Upper Limit Price Band</b> represents the Listing Exchange’s last effective LULD Price Band Price that triggered the preceding Limit State that led to the LULD Trading Pause. Used in conjunction with the ‘Security Status’ field set to ‘Trading Halt’ and the ‘Halt Reason’ field set to ‘Limit-Up-Limit Down (LULD) Trading Pause’. If Upper Limit Price Band is non-zero, the Lower Limit Price Band is zero.</p>
Last Price / Opening (Reopening) Quote Midpoint	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Last Price represents the last price for that security either on a Consolidated or an individual Participant basis at the time it is disseminated.</p> <p><b>Opening (Reopening) Quote Midpoint:</b> The Opening (Reopening) Quote Midpoint represents a listing exchange’s midpoint of a quote and is used when the listing exchange is Opening (Reopening) with a quote midpoint instead of a trade. Used in conjunction with ‘Security Status’ field code set to Limit Up-Limit Down Quote Midpoint, with the Opening (Reopening) Quote Midpoint value contained in the Last Price/Opening (Reopening) Quote Midpoint field.</p>

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**FIELD DESCRIPTIONS**

Field Name	Length	Description								
Low Indication Price / Lower Limit Price Band	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p>Optional set to zero.</p> <p>The <b>Low Indication Price</b> represents an approximation of what the low end “Bid” price of a security’s trading range may be. It is used for a security that is not Trading Halted, i.e., Trading Range Indication or following a Trading Halt, i.e., Price Indication.</p> <p><b>Note:</b> For Government Bonds, the High Indication Price (i.e., Bid) could reflect a value that is greater than the Low Indication Price (i.e., Offer).</p> <p>The <b>Lower Limit Price Band</b> represents the Listing Exchange’s last effective LULD Price Band Price that triggered the preceding Limit State that led to the LULD Trading Pause.</p> <p>Used in conjunction with the ‘Security Status’ field set to ‘Trading Halt’ and the ‘Halt Reason’ field set to ‘Limit-Up-Limit Down (LULD) Trading Pause’. If Lower Limit Price Band is non-zero, the Upper Limit Price Band is zero.</p>								
Market Condition	1	<p>Char.</p> <p>Identifies the market condition of a quote for a security. <b>Crossed Market</b> and <b>Locked Market</b> are only applicable to Government Bonds. In cases of a <b>Normal Auction Market</b>, the Bid Price must be less than the Offer Price. In cases of a <b>Crossed Market</b>, the Bid Price must be greater than the Offer Price. In cases of a <b>Locked Market</b>, the Bid Price must be equal to the Offer Price.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Normal Auction Market</td></tr><tr><td>A</td><td>Crossed Market</td></tr><tr><td>B</td><td>Locked Market</td></tr></table>	Code	Value	Space	Normal Auction Market	A	Crossed Market	B	Locked Market
Code	Value									
Space	Normal Auction Market									
A	Crossed Market									
B	Locked Market									
Number of Extensions	1	<p>Byte.</p> <p>Optional set to zero.</p> <p>Identifies the number of manual or automatic extensions the applicable auction has received. The first Auction Collar extension, at the time of the LULD Trading Pause, will be set to zero (0) indicating the first Auction Status message and will increment by one (1) for each new Auction Status message sent during the LULD Trading Pause event.</p>								



**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Offer Price	2 or 8	<p>2 Short. Short have implied 2 decimal places and a maximum price of \$655.35.</p> <p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615.</p> <p>The Offer Price represents the lowest price acceptable to a prospective seller at a particular time for a security.</p> <p><b>When the Offer Price and the Offer Size fields are all zeroes</b>, it represents a ‘No Offer’ quote or a ‘No Quote’ (i.e., neither a Bid nor an Offer; which zeroes out the quote).</p>
Offer Size	2 or 4	<p>2 Short. Short have a maximum size of 65,535.</p> <p>4 Integer. Integer has a maximum size of 4,294,967,295.</p> <p>The Offer Short Size identifies the number of round-lots for a security.</p> <p>Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000, etc.). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are 1, 10, 25 or 50 shares.</p> <p><b>When the Offer Size field is all zeroes</b>, it represents a ‘No Offer’ quote or a ‘No Quote’ (i.e., neither a Bid nor an Offer, which zeroes out the quote).</p>

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**FIELD DESCRIPTIONS**

Field Name	Length	Description																														
Quote Condition	1	<p>Char.</p> <p>Denotes a particular condition applicable to the quote. The Quote Condition is used to determine whether a quote qualifies for the Best Bid and Best Offer calculation. When the Quote Condition field is not provided, the Security Status Indicator field must be provided.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space*</td><td>Quote Condition Not Applicable When Quote Condition is space filled, the Security Status Indicator field must contain a value other than space.</td></tr><tr><td>A</td><td>Slow Quote on Offer Side (Eligible for BBO)</td></tr><tr><td>B</td><td>Slow Quote on Bid Side (Eligible for BBO)</td></tr><tr><td>C</td><td>Closing (Not eligible for BBO)</td></tr><tr><td>E</td><td>Slow Quote Due to LRP or Gap Quote on the Bid Side (ONLY OFFER SIDE is eligible for BBO)</td></tr><tr><td>F</td><td>Slow Quote Due to LRP or Gap Quote on the Offer Side (ONLY BID SIDE is eligible for BBO)</td></tr><tr><td>H</td><td>Slow Quote on the Bid and Offer Sides (Eligible for BBO)</td></tr><tr><td>L</td><td>Closed Market Maker (FINRA) (Not eligible for BBO)</td></tr><tr><td>N</td><td>Non-Firm Quote (Not eligible for BBO)</td></tr><tr><td>O</td><td>Opening Quote (Eligible for BBO)</td></tr><tr><td>R</td><td>Regular (Eligible for BBO)</td></tr><tr><td>U</td><td>Slow Quote Due to Liquidity Replenishment Point (LRP), or Gap Quote on Both the Bid and Offer Sides (Not eligible for BBO)</td></tr><tr><td>W</td><td>Slow Quote Due to Set Slow List on Both the Bid and Offer Sides (Eligible for BBO)</td></tr><tr><td>4</td><td>On Demand Intra-Day Auction (Not eligible for BBO)</td></tr></table> <p><b>Note:</b> Quote condition ‘Space’ is currently not supported since Security Status Indicator must be set to space</p>	Code	Value	Space*	Quote Condition Not Applicable When Quote Condition is space filled, the Security Status Indicator field must contain a value other than space.	A	Slow Quote on Offer Side (Eligible for BBO)	B	Slow Quote on Bid Side (Eligible for BBO)	C	Closing (Not eligible for BBO)	E	Slow Quote Due to LRP or Gap Quote on the Bid Side (ONLY OFFER SIDE is eligible for BBO)	F	Slow Quote Due to LRP or Gap Quote on the Offer Side (ONLY BID SIDE is eligible for BBO)	H	Slow Quote on the Bid and Offer Sides (Eligible for BBO)	L	Closed Market Maker (FINRA) (Not eligible for BBO)	N	Non-Firm Quote (Not eligible for BBO)	O	Opening Quote (Eligible for BBO)	R	Regular (Eligible for BBO)	U	Slow Quote Due to Liquidity Replenishment Point (LRP), or Gap Quote on Both the Bid and Offer Sides (Not eligible for BBO)	W	Slow Quote Due to Set Slow List on Both the Bid and Offer Sides (Eligible for BBO)	4	On Demand Intra-Day Auction (Not eligible for BBO)
Code	Value																															
Space*	Quote Condition Not Applicable When Quote Condition is space filled, the Security Status Indicator field must contain a value other than space.																															
A	Slow Quote on Offer Side (Eligible for BBO)																															
B	Slow Quote on Bid Side (Eligible for BBO)																															
C	Closing (Not eligible for BBO)																															
E	Slow Quote Due to LRP or Gap Quote on the Bid Side (ONLY OFFER SIDE is eligible for BBO)																															
F	Slow Quote Due to LRP or Gap Quote on the Offer Side (ONLY BID SIDE is eligible for BBO)																															
H	Slow Quote on the Bid and Offer Sides (Eligible for BBO)																															
L	Closed Market Maker (FINRA) (Not eligible for BBO)																															
N	Non-Firm Quote (Not eligible for BBO)																															
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4	On Demand Intra-Day Auction (Not eligible for BBO)																															

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**FIELD DESCRIPTIONS**

Field Name	Length	Description																																		
Reserved	Variable	Field is reserved for future use.																																		
Retail Interest Indicator	1	<div>Char.</div> <div>When Retail Price Improvement (RPI) interest is priced better than the Protected Best Bid or Offer (PBBO) by a minimum of \$0.001, an indication of interest on the Bid, Offer, or both the Bid and Offer will identify that interest will be eligible to interact with incoming Retail Order interest.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Retail Interest Not Applicable</td></tr><tr><td>A</td><td>Retail Interest on Bid Quote</td></tr><tr><td>B</td><td>Retail Interest on Offer Quote</td></tr><tr><td>C</td><td>Retail Interest on both the Bid and Offer Quotes</td></tr></table>	Code	Value	Space	Retail Interest Not Applicable	A	Retail Interest on Bid Quote	B	Retail Interest on Offer Quote	C	Retail Interest on both the Bid and Offer Quotes																								
Code	Value																																			
Space	Retail Interest Not Applicable																																			
A	Retail Interest on Bid Quote																																			
B	Retail Interest on Offer Quote																																			
C	Retail Interest on both the Bid and Offer Quotes																																			
Security Status	1	<div>Char.</div> <div>Represents the trading action on the Trading Status (Category T Type S) message</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Security Status Not Applicable</td></tr><tr><td>1*</td><td>Reserved</td></tr><tr><td>2</td><td>Trading Halt</td></tr><tr><td>3</td><td>Resume</td></tr><tr><td>4*</td><td>Reserved</td></tr><tr><td>5</td><td>Price Indication</td></tr><tr><td>6</td><td>Trading Range Indication</td></tr><tr><td>7</td><td>Market Imbalance Buy</td></tr><tr><td>8</td><td>Market Imbalance Sell</td></tr><tr><td>9</td><td>Market on Close Imbalance Buy</td></tr><tr><td>A</td><td>Market on Close Imbalance Sell</td></tr><tr><td>B*</td><td>Reserved</td></tr><tr><td>C</td><td>No Market Imbalance</td></tr><tr><td>D</td><td>No Market on Close Imbalance</td></tr><tr><td>E</td><td>Short Sale Restriction</td></tr><tr><td>F</td><td>Limit Up-Limit Down (LULD) Quote Midpoint</td></tr></table> <div>* Reserved Security Status Indicator codes are not supported</div>	Code	Value	Space	Security Status Not Applicable	1*	Reserved	2	Trading Halt	3	Resume	4*	Reserved	5	Price Indication	6	Trading Range Indication	7	Market Imbalance Buy	8	Market Imbalance Sell	9	Market on Close Imbalance Buy	A	Market on Close Imbalance Sell	B*	Reserved	C	No Market Imbalance	D	No Market on Close Imbalance	E	Short Sale Restriction	F	Limit Up-Limit Down (LULD) Quote Midpoint
Code	Value																																			
Space	Security Status Not Applicable																																			
1*	Reserved																																			
2	Trading Halt																																			
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4*	Reserved																																			
5	Price Indication																																			
6	Trading Range Indication																																			
7	Market Imbalance Buy																																			
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9	Market on Close Imbalance Buy																																			
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**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**FIELD DESCRIPTIONS**

Field Name	Length	Description				
Security Status Indicator	1	<p>Char.</p> <p>Security Status Indicator Codes in input Quote messages are not supported by CQS. An input Quote message with any Security Status Indicator Code except <i>Space</i> is rejected.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Security Status Indicator Not Applicable</td></tr></table> <p><b>Note 1:</b> For CQS, security status updates of Halts, Resumes, Price Indications and Trading Range Indications are only processed via the new Trading Status (Category T Type S) message. The Trading Status input message is supported by both CTS and CQS. Refer to applicable codes under the field description for ‘Security Status’ field</p> <p><b>Note 2:</b> Security Status Indicator codes are populated by the CQS on Quote messages published on the output lines (refer CQS Pillar Output Specification)</p>	Code	Value	Space	Security Status Indicator Not Applicable
Code	Value					
Space	Security Status Indicator Not Applicable					

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**FIELD DESCRIPTIONS**

Field Name	Length	Description																														
Security Symbol	5 or 11	<p>Char [5] or [11]. Left justified, space-filled.</p> <p>Contains the security symbol. Suffixes start with one of the following characters with no embedded spaces: (1) ASCII Period (.), (2) lower case p, (3) lower case ‘r’, or (4) lower case ‘w’.</p> <p><b>Note:</b> CQS will allow for a base or root symbol to consist of from one (1) up to six (6) characters with the remaining characters in the security symbol field available for possible suffixes.</p> <p><b>Identification of Test Data:</b> The purpose of a Test Message is to have a mechanism whereby end-to-end connectivity and functionality between the CQS Participant and Data Recipient can be tested prior to the opening or during normal operational hours.</p> <p>Messages with any of the dedicated test symbols will be included in Participant statistics (e.g., National BBO calculations), but will be excluded in quote counts, etc.</p> <p>Alphanumeric Test Symbols are reserved for future use.</p> <table><tr><th>Listing Exchange</th><th>Test Symbol</th></tr><tr><td rowspan="6">NYSE</td><td>CBO</td></tr><tr><td>CBX</td></tr><tr><td>CTEST</td></tr><tr><td>MTEST</td></tr><tr><td>NTEST</td></tr><tr><td>01N thru 12N</td></tr><tr><td rowspan="3">NYSE American</td><td>IBO</td></tr><tr><td>ATEST</td></tr><tr><td>01A thru 12A</td></tr><tr><td rowspan="6">NYSE Arca</td><td>IGZ</td></tr><tr><td>ZVV</td></tr><tr><td>ZZK</td></tr><tr><td>ZZZ</td></tr><tr><td>PTEST</td></tr><tr><td>01P thru 12P</td></tr><tr><td rowspan="4">Cboe BZX</td><td>ZBZX</td></tr><tr><td>ZTEST</td></tr><tr><td>ZTST</td></tr><tr><td>01Z thru 12Z</td></tr><tr><td rowspan="4">IEX</td><td>ZIEXT</td></tr><tr><td>ZEXIT</td></tr><tr><td>ZXIET</td></tr><tr><td>01V thru 12V</td></tr></table>	Listing Exchange	Test Symbol	NYSE	CBO	CBX	CTEST	MTEST	NTEST	01N thru 12N	NYSE American	IBO	ATEST	01A thru 12A	NYSE Arca	IGZ	ZVV	ZZK	ZZZ	PTEST	01P thru 12P	Cboe BZX	ZBZX	ZTEST	ZTST	01Z thru 12Z	IEX	ZIEXT	ZEXIT	ZXIET	01V thru 12V
Listing Exchange	Test Symbol																															
NYSE	CBO																															
	CBX																															
	CTEST																															
	MTEST																															
	NTEST																															
	01N thru 12N																															
NYSE American	IBO																															
	ATEST																															
	01A thru 12A																															
NYSE Arca	IGZ																															
	ZVV																															
	ZZK																															
	ZZZ																															
	PTEST																															
	01P thru 12P																															
Cboe BZX	ZBZX																															
	ZTEST																															
	ZTST																															
	01Z thru 12Z																															
IEX	ZIEXT																															
	ZEXIT																															
	ZXIET																															
	01V thru 12V																															

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**FIELD DESCRIPTIONS**

Field Name	Length	Description								
Sell Volume	4	Integer. Integer has a maximum volume of 4,294,967,295.  The Sell Volume represents the reported imbalance of sell orders without matching buy orders for the security for a Participant.								
Settlement Condition	1	Char.  Identifies the settlement condition for a security. <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Regular Way Settlement</td></tr><tr><td>A</td><td>Cash (only) Settlement</td></tr><tr><td>B</td><td>Next Day (only) Settlement</td></tr></table>	Code	Value	Space	Regular Way Settlement	A	Cash (only) Settlement	B	Next Day (only) Settlement
Code	Value									
Space	Regular Way Settlement									
A	Cash (only) Settlement									
B	Next Day (only) Settlement									

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**FIELD DESCRIPTIONS**

Field Name	Length	Description										
Short Sale Restriction Indicator	1	<p>Char.</p> <p>Identifies whether or not a Short Sale Restriction is in effect. Populated by the Primary Listing Exchange for a security, with the previous quote price.</p> <p><b>Day 1:</b> When a security’s price decreases by 10% or more from the previous day’s closing price, the primary listing market will generate a Quote message denoting ‘Short Sale Restriction Activated’.</p> <p><b>Day 2:</b> As the short sale restriction will remain in effect the day after activation, the primary listing market will generate a Quote message denoting ‘Short Sale Restriction Continued’ (anticipated prior to the primary listing market open). In the event a security’s price decreases by an additional 10% or more from the previous day’s closing price, the primary listing market will generate a Quote message denoting ‘Short Sale Restriction Activated’ (reverts to Day 1).</p> <p><b>Day 3:</b> As the short sale restriction is to be lifted at the end of Day 2, the primary listing market will generate a Trading Status message denoting ‘Short Sale Restriction Deactivated’ (anticipated prior to the primary listing market open).</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Short Sale Restriction Not Applicable</td></tr><tr><td>A*</td><td>Short Sale Restriction Activated</td></tr><tr><td>C*</td><td>Short Sale Restriction Continued</td></tr><tr><td>D*</td><td>Short Sale Restriction Deactivated</td></tr></table> <p><b>Note:</b> A Code specified for the Short Sale Restriction Indicator field on an input Long Quote Message is silently dropped. Participants must use Trading Status (Category T Type S) message to report Short Sale Restriction updates.</p>	Code	Value	Space	Short Sale Restriction Not Applicable	A*	Short Sale Restriction Activated	C*	Short Sale Restriction Continued	D*	Short Sale Restriction Deactivated
Code	Value											
Space	Short Sale Restriction Not Applicable											
A*	Short Sale Restriction Activated											
C*	Short Sale Restriction Continued											
D*	Short Sale Restriction Deactivated											

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

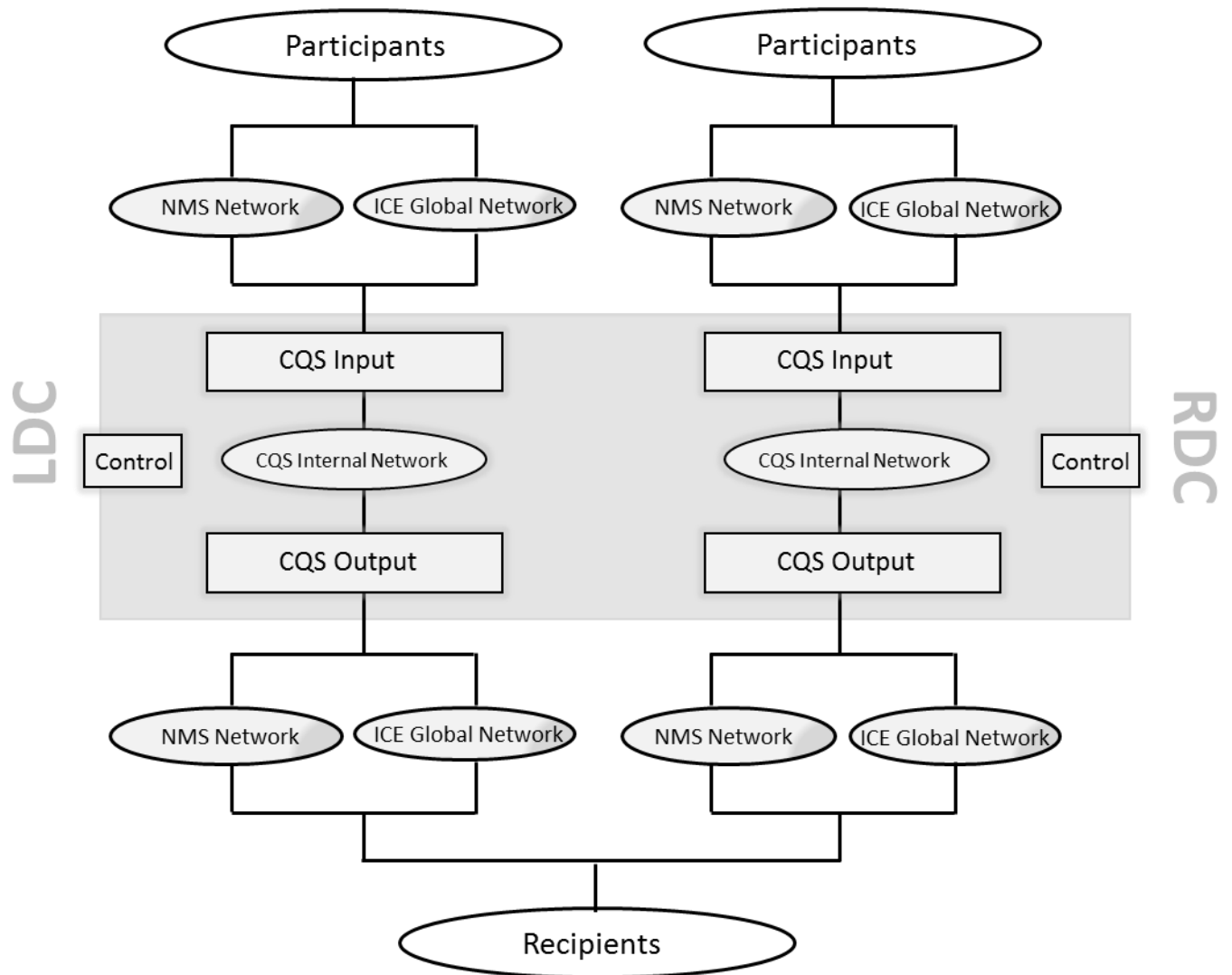
**FIELD DESCRIPTIONS**

Field Name	Length	Description
Timestamp 2	8	<p>2 x Integer (pair of Integers). Optional set to zero.</p> <p>Timestamp 2 is a FINRA Alternative Display Facility (ADF)-provided timestamp represented in terms of nanoseconds since Epoch. The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315). If Timestamp 2 is not provided, this field should be set to zero. For any messages generated by CQS, e.g., messages generated on behalf of a Participant, Administrative messages and Control messages, the Timestamp 2 field will be set to zero.</p> <ul style="list-style-type: none"> <li>▪ <b>If from an Exchange: Timestamp 2</b> field should be set to zero.</li> <li>▪ <b>If from the FINRA Alternative Display Facility (ADF):</b> <ul style="list-style-type: none"> <li>▪ <b>If the FINRA ADF</b> provides a proprietary feed of its quotation information, then FINRA will publish the time of the quotation as also published on the facility's proprietary feed. FINRA shall provide such times to the Processor in nanoseconds since Epoch.</li> <li>▪ <b>If the FINRA ADF</b> does <b>not</b> have a proprietary quotation feed then the Timestamp 2 field should be set to zero.</li> </ul> </li> </ul>
Trading Status ID	4	<p>Integer.</p> <p>Contains identifier for each unique Trading Status Message.</p> <p>'Trading Status ID' on Trading Status Messages must contain a non-Zero value.</p> <p>Note: This field is used to eliminate duplicate Trading Status message received over CQS and CTS input lines. For every new Trading Status update, participants must provide a unique value for 'Trading Status ID' field per symbol. Any Trading Status message for a symbol containing a duplicate 'Trading Status ID' is ignored. For the same Trading Status update published across CQS and CTS input lines, Participant shall provide same value for 'Trading Status ID'</p> <p>Note: There is no corresponding 'Trading Status ID' disseminated over the multicast feed.</p>



APPENDIX A: CQS CONFIGURATION

CQS CONFIGURATION



**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**APPENDIX B: GLOSSARY**

<b>Term</b>	<b>Description</b>
Below Continuing Listing Standards	A financial status designation pertaining to Tape ‘A’ and Tape ‘B’ listed securities. The status identifies a company, whose issue is listed on the New York Stock Exchange, the NYSE American Stock Market or on one of the participating U.S. Stock Exchanges, and has failed to meet established listings standards. The listing exchange will subsequently review the appropriateness of continuing to list the issue, and may decide to commence the process of delisting the issue.
Cash (Only) Settlement	A security settling in cash all day on a participant or consolidated basis, such as a Common, Preferred or Right that is nearing expiration. Participants can elect to report different settlements in the same security during the day based on their own settlement requirements. For example, one participant can report quotes as cash (only) settlement while another participant can report quotes as regular or next day settlement.
Creations Suspended (For Exchange Traded Products)	A financial status designation used to denote the ability to create new shares of this Exchange Traded Product (ETP) has been temporarily suspended by the ETP Issuer. ETPs that are closed for Creations typically are allowed to continue trading on the listing market once the ETP Issuer publishes the press release.
Crossed Market	Indicates a Bid Price, which is greater than the Offer Price for a security for a quote. <b>(Only applicable to Bonds.)</b>
CTA Eligible Equity	Generally, any common stock, rights, long-term warrants or preferred stock which becomes registered on any national securities exchange or is admitted to unlisted trading privileges thereon and which at the time of such registration or at the commencement of such trading substantially meets the original listing requirements of the NYSE or the NYSE American Stock Market for such securities.
Ex-Distribution	Securities without the right to receive the forthcoming distribution of securities, which has been recently declared.
Ex-Dividend	Securities without the right to receive the forthcoming dividend, which has been recently declared.
Ex-Interest	Debt related securities without the right to receive the forthcoming interest, which has been recently declared.
Ex-Rights	Securities without the right to buy a company's securities at a discount from the prevailing market price, which was distributed until a particular date. Typically, after that date, the rights trade separately from the security itself.
Late Filing	A financial status designation pertaining to Tape ‘A’ and Tape ‘B’ issues (i.e. issues listed on the NYSE, the NYSE American Stock Market or on one of the participating U.S. Stock Exchanges). The status identifies a company, which has failed to meet established listings standards for filing its annual reports.

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**GLOSSARY**

<b>Term</b>	<b>Description</b>
Limit Up-Limit Down (LULD) Price Band	<p>The Limit Up-Limit Down Price Band represents a price range which is set at a percentage level above and below the average price of a security over the immediately preceding five (5) minute period. Price Bands prevail for a minimum of thirty (30) seconds. During a Limit State Price Bands will not be disseminated and will recommence when Limit State is terminated.</p> <p>For further details related to Limit Up-Limit Down, reference the following:  <a href="http://www.sec.gov/news/press/2011/2011-84.htm">http://www.sec.gov/news/press/2011/2011-84.htm</a></p> <p><b>Note1:</b> There are no sizes associated with LULD Price Bands.  <b>Note2:</b> ‘Limit Up-Limit Down’ Price Bands are republished every 30 seconds at clock time.</p>
Limit Up-Limit Down (LULD) Trading Pause	Denotes a five-minute regulatory trading halt (pause) for an individual security that does not exit a Limit State within 15 seconds.
Limit State	Indicates that a National Best Bid is equal to the Upper Limit Price Band, or that a National Best Offer is equal to the Lower Limit Price Band.
Liquidation (For Exchange Traded Products)	A financial status designation used to denote that the ETP Issuer announced the ETP will be liquidated and NYSE ARCA announced the date the ETP will be suspended from trading.
Local Issue	A Local Issue is an issue that does <b>not</b> meet the NYSE American Stock Market or NYSE listing requirements (is not CTA eligible) but is traded at one or more participating U.S. Stock Exchanges.
Locked Market	Indicates an identical Bid and Offer Price for a security for a quote. <b>(Only applicable to Bonds.)</b>
Market-Wide Circuit Breaker Level 1 – 7% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 7% decline level below its closing value on the previous trading day. A Level 1 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: before 3:25 p.m. ET – duration 15 minutes; at or after 3:25 p.m. ET – trading shall continue, unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.
Market-Wide Circuit Breaker Level 2 – 13% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 13% decline level below its closing value on the previous trading day. A Level 2 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: before 3:25 p.m. ET – duration 15 minutes; at or after 3:25 p.m. ET – trading shall continue, unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.
Market-Wide Circuit Breaker Level 3 – 20% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 20% decline level below its closing value on the previous trading day. A Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: at any time during regular trading hours, trading shall Halt and <b>not</b> Resume for the remainder of the trading day.

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**GLOSSARY**

<b>Term</b>	<b>Description</b>
Next Day (Only) Settlement	Same definition as cash (only) settlement except settlement is next day.
Non-Regulatory Trading Halt	A Trading Halt for a Participant due to Order Imbalance, Order Influx or Operational.
Normal Auction Market	Where the quote bid price is less than the offer price for a security for a Participant.
On Demand Intra-Day Auction	This quote condition is used to provide additional clarity to the CQS Participants and allow them to take part in an auction which will enhance liquidity in the marketplace. It is anticipated that this quote condition will be input into CQS by Participants with a zero bid price, zero bid size, zero offer price, and zero offer size and disseminated over the CQS multicast output lines.
Order Imbalance	Denotes a non-regulatory halt condition where there is a significant imbalance of buy or sell orders.
Operational	Denotes a non-regulatory Trading Halt. The ability to trade a security by a Participant is temporarily inhibited due to technical reasons.
Price Indication	Reflects an approximate price range of what a security's trading range (bid and offer prices) will be when trading resumes after a Trading Halt.
Redemptions Suspended (For Exchange Traded Products)	A financial status designation used to denote the ability to redeem shares of this ETP has been suspended by the ETP Issuer. ETPs that are closed for redemption will remain halted on the listing market.
Regular Way Settlement	The settlement date is within three (3) business days following the date of the transaction.

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**GLOSSARY**

<b>Term</b>	<b>Description</b>
Regulatory Halt - Additional Information Requested	Denotes a regulatory trading halt when the primary market has requested additional information from the issuer of the security. Trading is suspended until the primary market has received and reviewed the requested information.
Regulatory Halt - Corporate Action	Denotes a regulatory trading halt when the primary market determines a halt is necessary pending the outcome of a Corporate Action event. Trading is suspended until the results of the Corporate Action are confirmed and the security is suitable for trading.
Regulatory Halt - ETF Component Prices Not Available	Denotes a regulatory trading halt when a significant percentage of an ETF's weight is invested in components in which pricing is not available. Trading is suspended until the primary market determines that such condition no longer exists.
Regulatory Halt - Intraday Indicative Value Not Available	Denotes a regulatory trading halt when the Intraday Indicative Value of an ETF is not being disseminated or is being disseminated incorrectly. Trading is suspended until the primary market determines that such condition no longer exists.
Regulatory Halt - Merger Effective	Denotes a regulatory trading halt in connection with a security being suspended in connection with a merger. Trading is suspended indefinitely.
Regulatory Halt - New Security Offering	Denotes a regulatory trading halt in connection with a new security offering. Trading is suspended until the new security is admitted to trading on the primary listing exchange during the primary trading session.
Regulatory Halt - News Pending	Denotes a regulatory Trading Halt due to an expected news announcement, which may influence the security. A Trading Halt may be continued once the news has been disseminated.
Regulatory Halt - News Released	Denotes a regulatory trading halt when relevant news influencing the security is being disseminated. Trading is suspended until the primary market determines that an adequate time has passed to allow for full dissemination of the news into the market.
Regulatory Halt - Regulatory Concern	Denotes a regulatory trading halt due to an ongoing regulatory concern regarding the suitability of trading in a security. Trading is suspended until the primary market determines the security is suitable for trading.

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**GLOSSARY**

<b>Term</b>	<b>Description</b>
Republished Limit Up-Limit Down Price Band	Indicates that the Price Band being disseminated is a republication of the latest Price Band for a security.
Resume	This quote condition along with zero-filled bid, offer and size fields is used to indicate that trading for a Participant is no longer suspended in a security which had been Trading Halted.
Short Sale Restriction	A restriction designed to control short selling from further driving down the price of a security any day in which the price declines by 10% or more from the previous day's closing price. Once the Short Sale Restriction is activated, a Short Sale Restriction would be in effect in that security for the remainder of the day as well as the following day, unless deactivated.
Sub-Penny Trading	Indicates a non-regulatory Trading Halt for a security whose price may fall below \$1.05, possibly leading to a sub-penny execution.
Trading Halt	Temporary halt in trading in a particular security for a Participant.
Trading Range Indication	Denotes the probable trading range (Bid and Offer prices, no sizes) of a security that is <u>not</u> Trading Halted. The Trading Range Indication is used prior to or after the opening of a security.

### **APPENDIX C: FINRA OPEN / FINRA CLOSE**

The FINRA Open (Category C Type O) and FINRA Close (Category C Type C) messages are specified for transmission by FINRA to CQS to indicate the Open or Close state of FINRA Market Maker quotes. All FINRA Market Maker quotes must be in either an Open or Close state where Open implies current and Close implies not current.

Upon detection of a FINRA Open (Category C Type O) message received from FINRA, CQS shall assemble and transmit a FINRA Open message to the output Multicast line data recipients. FINRA can send multiple FINRA Open messages in a trading day. Upon detection of a FINRA Closed (Category C Type C) message received from FINRA, CQS shall assemble and transmit a FINRA Closed message to the output Multicast line data recipients.

Prior to receipt of the FINRA Open (Category C Type O) message, all quotes are to be indicated as Closed by FINRA. Upon receipt of the FINRA Open message, all individual Market Maker quotes that have been transmitted during the current day prior to receipt of the FINRA Open message should be indicated as Open by FINRA.

Upon receipt of the FINRA Closed (Category C Type C) message, all individual Market Maker quotes should be indicated as closed. FINRA can send multiple FINRA Closed messages in a trading day. After receipt of the FINRA Closed (Category C Type C) message, individual Market Maker quotes in either the Open or Close state may be transmitted in the FINRA Open (Category C Type O) with the state of the quote indicated in the Quote Condition field of the message text as one of the following:

- |          |   |                                   |
|----------|---|-----------------------------------|
| <b>R</b> | - | Regular (Open Market Maker Quote) |
| <b>L</b> | - | Closed Market Maker Quote         |

CQS Multicast line data recipients shall mark these quotes accordingly within their systems.



## **APPENDIX D: QUOTE CONDITIONS**

The Quote Condition determines whether a quote qualifies to be included in the calculation of the National BBO. The National BBO calculation is performed whenever a new qualifying quote with price and size filled Bid and/or Offer is received from a Participant. For quotes with BBO eligible quote conditions containing zero-filled price and size Bid and Offer information, the National BBO is recalculated excluding the Participant or FINRA Market Maker that transmitted the BBO eligible quote condition with zero-filled prices and sizes. .

The quote conditions may be viewed as belonging to two classes:

1. Those that qualify for inclusion in the National Best Bid & Offer (BBO) calculations.
2. Those that do not qualify for inclusion in the National Best Bid & Offer (BBO) calculations.

### **BBO Eligible Quotes**

#### **Quote Condition A – Slow Quote on the Offer Side**

This condition indicates that the current offer is in ‘Slow’ quote mode. While in this mode, auto-execution is not eligible on the Offer side and can be traded through pursuant to anticipated Regulation NMS requirements.

#### **Quote Condition B – Slow Quote on the Bid Side**

This condition indicates that the current bid is in ‘Slow’ quote mode. While in this mode, auto-execution is not eligible on the Bid side and can be traded through pursuant to anticipated Regulation NMS requirements.

#### **Quote Condition E – Slow Quote due to Liquidity Replenishment Point (LRP) or Gap Quote on the Bid Side - Only OFFER SIDE is eligible for BBO**

This quote condition is used to indicate that the current Bid is in ‘Slow’ quote mode due to a Liquidity Replenishment Point (LRP) or Gap Quote. While in this mode, auto-execution is not eligible, the quote is then considered Slow on the Bid side and can be traded through, as per Regulation NMS.

## APPENDIX D: QUOTE CONDITIONS

### **BBO Eligible Quotes**

#### **Quote Condition F - Slow Quote due to Liquidity Replenishment Point (LRP) or Gap Quote on the Offer Side - Only BID SIDE is eligible for BBO**

This quote condition is used to indicate that the current Offer is in Slow quote mode due to a Liquidity Replenishment Point (LRP) or Gap Quote. While in this mode, auto-execution is not eligible, the quote is then considered Slow on the Offer side and can be traded through, as per Regulation NMS.

#### **Quote Condition H - Slow Quote on the Bid and Offer Sides**

This condition indicates that the quote is a 'Slow' quote on both the Bid and Offer sides. While in this mode, auto-execution is not eligible on the Bid and Offer sides, and either or both sides can be traded through pursuant to anticipated Regulation NMS requirements.

#### **Quote Condition O - Opening Quote**

This condition can be disseminated to indicate that this quote was the opening quote for a security for that Participant.

#### **Quote Condition R - Regular (for FINRA - Market Maker Open)**

This condition is used for the majority of quotes to indicate a normal trading environment. It is also used by the FINRA Market Makers in place of Quote Condition 'O' to indicate the first quote of the day for a particular security. The condition may also be used when a Market Maker re-opens a security during the day.

#### **Quote Condition W – Slow Quote Due to Set Slow List on both Bid and Offer Sides**

This quote condition is used to indicate that the quote is a Slow Quote on both the Bid and Offer sides due to a Set Slow List that includes High Price securities. While in this mode, auto-execution is not eligible, the quote is then considered Slow on the Bid and Offer sides and either or both sides can be traded through, as per Regulation NMS.

## **APPENDIX D: QUOTE CONDITIONS**

### **BBO Ineligible Quotes**

#### **Quote Condition C - Closing Quote**

This condition can be disseminated to indicate that this quote was the last quote for a security for that Participant.

#### **Quote Condition L - Market Maker Quotes Closed (FINRA)**

This condition is disseminated by each individual FINRA Market Maker to signify either the last quote of the day or the premature close of an individual Market Maker for the day. In the latter case, the Market Maker can re-open by transmitting a quote accompanied by the Quote Condition R.

#### **Quote Condition N - Non-Firm Quote**

This quote condition suspends a Participant's firm quote obligation for a quote for a security.

#### **Quote Condition U - Slow Quote due to Liquidity Replenishment Point (LRP) or Gap Quote on both the Bid and Offer Sides**

This quote condition is used to indicate that the quote is a Slow Quote on both the Bid and Offer sides due to a Liquidity Replenishment Point (LRP) or Gap Quote. While in this mode, auto-execution is not eligible, the quote is then considered Slow on the Bid and Offer sides, and either or both sides can be traded through, as per Regulation NMS.

#### **Quote Condition 4 – On Demand Intra-Day Auction**

This quote condition is used to provide additional clarity to the industry participants and to allow participants to take part in an auction which will enhance liquidity in the marketplace.

## **APPENDIX F: NATIONAL BEST BID AND BEST OFFER OVERVIEW**

National Best Bid and Best Offer calculations are performed for each Market Center whenever a new qualifying quote is received after a Participant Market Open. If it is determined that the new quote has caused a new National BBO, the appropriate National BBO information is appended to the new quote. Appendages are **not** added if it is determined that the current quote does **not** affect the National BBO.

A new quote can be the entire new National BBO quote (both Bid and Offer). In addition, the National BBO **can** indicate a Crossed Market where the Bid price is higher than the Offer price or a Locked Market where both the Bid and the Offer prices are the same.

CQS generates a National BBO based on the following criteria in this order:

- **Price** - Exchanges with highest Bid and lowest Offers have overall priority.
- **Size** - Largest size takes precedence when multiple Exchanges submit the same Bid and/or Offer price.
- **Time** - Earliest time takes precedence when multiple Exchanges submit the same Bid and/or Offer price with the same size(s).

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**APPENDIX G: CQS CLOSING ROUTINE**

A Participant can individually close a security by sending in a closing quote to CQS. CQS disseminates this closing quote over the multicast line and appends a new BBO, excluding that Participant, if that Participant was part of the current BBO.

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**APPENDIX H: SYMBOL SUFFIX EXAMPLES**

	<b>Suffix</b>	<b>Description</b>
<b>A</b>	.A	Series (or Class) <b>A</b> - <i>Also</i> Series <b>B-Z</b>
	.A.CL	Series <b>A</b> Called - <i>Also</i> Series <b>B-Z</b>
	.A.CV	Series <b>A</b> Convertible - <i>Also</i> Series <b>B-Z</b>
	.Aw	Series <b>A</b> When Issued - <i>Also</i> Series <b>B-Z</b>
<b>C</b>	.CL	Called
	.CT	Certificates
	.CV	Convertible
	.CVR	Contingent Value Right
	.CV.CL	Convertible Called
<b>D</b>	.DP	Amount of most recent dividend to go ‘ex- distribution’
	.DV	Accumulated dividend per share net expenses, through and including the previous day’s close of trading
<b>E</b>	.EC	EMERGING COMPANY MARKETPLACE <sup>SM</sup>
	.EU	Estimated cash amount per creation unit
<b>F</b>	.F.N	Foreign News
<b>I</b>	.ID	Index – differentiates an index from a stock with the same root symbol
	.IV	Intra-Day Net Asset Value per share
<b>M</b>	.MN	Mini
<b>N</b>	.NV	Net Asset Value per share as at the close on the previous day’s close of trading
<b>P</b>	.PO	Percent Paid
	.PP	Partial Paid
	.PT.CL	Part Called
	p	Preferred
	pA	Preferred Series <b>A</b> - <i>Also</i> Series <b>B-Z</b>
	pA.CV	Preferred Series <b>A</b> Convertible - <i>Also</i> Series <b>B-Z</b>
	pA.CL	Preferred Series <b>A</b> Called - <i>Also</i> Series <b>B-Z</b>
	pAw	Preferred Series <b>A</b> When Issued - <i>Also</i> Series <b>B-Z</b>
	pw	Preferred When Issued
	p.CL	Preferred Called
	p.CV	Preferred Convertible
	p.CV.CL	Preferred Convertible Called
	p.WD	Preferred When Distributed
	pCA	Indicates Class <b>A</b> of a Second Category of Preferred - <i>Also</i> Class <b>B-K</b> and <b>M-S</b>

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

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**APPENDIX H: SYMBOL SUFFIX EXAMPLES**

	<b>Suffix</b>	<b>Description</b>
<b>R</b>	r	Rights
	rw	Rights When Issued
<b>S</b>	.SC	Small Corporate - Offering Registration
	.SD	Stamped
	.SM	Mini Settlement
	.SO	Current shares outstanding in thousands
	.SP	Special
	.SV	Settlement
<b>T</b>	.TC	Total cash amount per creation unit
	.TT	Tier II Securities
<b>U</b>	.U	Units – (A combination of securities composed of two or more warrants, common stocks, preferred stocks and/or bonds.)
<b>V</b>	.VR	Variable Common Right
<b>W</b>	.WD	When Distributed
	w	When Issued
	.WS	Warrants
	.W.WS	With Warrants
	.WS.A	Warrants Series <b>A</b> - <i>Also</i> Series <b>B-Z</b>
	.WSw	Warrants When Issued

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**APPENDIX I: INPUT ERROR CONDITIONS**

<b>Code</b>	<b>Description</b>	<b>Rejection Reason</b>
1	Invalid Version	Unsupported Block Version number
2	Invalid Block Size	Block Size is less than minimum (1) or more than maximum (1000) allowable length
3	Invalid Block Sequence Number	Duplicate Message - the current Block Sequence Number is less than or equal to that of the last message processed. The expected message Block Sequence Number is not incremented and the message is not accepted
4	Invalid Messages in Block	Messages in Block is less than minimum (1) or more than maximum allowable length
5	Invalid Block Checksum	Block Checksum does not match
6	Invalid Message Length	Message Length is incorrect
7	Invalid Message Block	Block is incorrectly formatted and cannot be fully processed
8	Invalid Message ID	Message ID of the first Message in the Block is not 1, or Message ID is not incremented for subsequent messages in same block
9	Reserved	N/A
10	Reserved	N/A
11	Invalid text length	Text length is beyond acceptable bounds for the message
12	Message not acceptable before market open or after market close time	Message sent outside acceptable timeframe, message sent before SOD disseminated or after Participant EOD sent
13	Invalid Message Category and Type	Unsupported Message Category and Message Type
14	Invalid Participant ID	Participant ID is not a supported value
15	Invalid Timestamp 1	Timestamp is not within the appropriate range, invalid date and time (Time is prior to or after the present date)
16	Invalid Participant Reference Number	Participant Reference Number is not within specified allowable ASCII character range
19	Invalid Auction Collar Price	Auction Collar Price is not a supported value
20	Invalid Number of Extensions	Number of Extensions is not a supported value
21	Invalid Quote Midpoint Price	Quote Midpoint Price zero, expecting non-zero
22	Message From Primary during Primary Market Halt	Primary Market Message is not acceptable during Primary Market Halt period
24	Reserved	N/A
25	Reserved	N/A
27	Invalid Buy Volume	Buy Volume is zero, expecting non-zero
30	Reserved	N/A
34	Reserved	N/A
35	Reserved	N/A



**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**APPENDIX I: INPUT ERROR CONDITONS**

<b>Code</b>	<b>Description</b>	<b>Rejection Reason</b>
40	Invalid Halt Reason	Halt Reason is not a supported value, or, Halt Reason specified while Security Status is not in Halt
41	Reserved	N/A
42	Reserved	N/A
43	Reserved	N/A
44	Invalid Participant for Trading Status Message	Trading Status Message from Participant that is not the Listing Exchange for the security symbol
45	Invalid Price Indication/Trading Range Indication	Price Indication received while security symbol is not Trading Halted, or, Trading Range Indication received while symbol is Trading Halted
46	Invalid High Indication Price	High Price not greater than Low Price on Price Indication
47	Invalid Trading Status ID	Trading status ID does not contain a non-Zero Integer value
48	Invalid High Indication Price	Invalid combination of Trading Pause and High Indication Price
49	Reserved	N/A
50	Reserved	N/A
53	Invalid Instrument Type	Instrument Type value is not a supported value
54	Invalid Last Price	Last Price is not a supported value
55	Invalid Opening (Reopening) Quote Midpoint Price	Opening (Reopening) Quote Midpoint Price received when not expecting to receive (e.g., eligible trade already received setting reference price).
56	Invalid Low Indication Price	Invalid combination of Trading Pause and Low Indication Price
57	Reserved	N/A
58	Reserved	N/A
59	Invalid Upper/Lower Limit Price Band	Only one of the Price bands can be non-zero on a LULD Trading Halt
60	Reserved	N/A
61	Reserved	N/A
63	Reserved	N/A
70	Reserved	N/A
71	Invalid Security Status	Security Status is not a supported value
73	Invalid Security Symbol	Unknown Security Symbol, either the security symbol and suffix are incorrect or no master record exists for the security symbol
74	Invalid Sell Volume	Sell Volume is zero, expecting non-zero
76	Invalid Short Sale Restriction Indicator	Short Sale Restriction Indicator is not a supported value
78	Invalid Timestamp 2	Timestamp is not within the appropriate range, invalid date and time (Time is prior to or after the present date)
83	Reserved	N/A
85	Unprintable ASCII Character	ASCII character not within 32-126 range
86	Reserved	N/A

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**APPENDIX I: INPUT ERROR CONDITONS**

<b>Code</b>	<b>Description</b>	<b>Rejection Reason</b>
87	Message Accepted From FINRA ADF Only	Message from Participant other than FINRA ADF
88	Invalid FINRA BBO Indicator	FINRA BBO Indicator is not a supported value
89	Invalid FINRA Best Bid Market Maker ID	FINRA MMID is not within ASCII valid character range 32-126
90	Invalid FINRA Best Offer Market Maker ID	FINRA MMID is not within ASCII valid character range 32-126
91	Invalid FINRA Market Maker ID	FINRA MMID is not within ASCII valid character range 32-126
92	Invalid FINRA Best Bid Quote Condition	Quote Condition is not a supported value
93	Invalid FINRA Best Offer Quote Condition	Quote Condition is not a supported value
94	Invalid Bid Price	Bid Price is zero, expecting non-zero
95	Invalid Bid Price	Bid Price is greater than Offer Price
96	Invalid Bid Size	Bid Size is zero vs. non-zero or Bid Size is non-zero vs. zero
97	Invalid Offer Price	Offer Price is zero, expecting non-zero
98	Invalid Offer Size	Offer Size is zero vs. non-zero or Offer Size is non-zero vs. zero
99	Invalid Market Condition	Market Condition is not a supported value
100	Invalid Quote Condition	Quote Condition is not a supported value
101	Invalid Retail Interest Indicator	Retail Interest Indicator is not a supported value
102	Invalid Settlement Condition	Settlement Condition is not a supported value
103	Invalid Security Status Indicator	Security Status Indicator must be space filled when Quote Condition is specified
104	Invalid Auction Collar Upper Threshold Price	Auction Collar Upper Threshold Price is not a supported value
105	Invalid Auction Collar Lower Threshold Price	Auction Collar Lower Threshold Price is not a supported value
106	Invalid FINRA Best Bid Price	FINRA Best Bid Price is zero, expecting non-zero
107	Invalid FINRA Best Bid Size	FINRA Best Bid Size is zero vs. non-zero or FINRA Best Bid Size is non-zero vs. zero
108	Invalid FINRA Best Offer Price	FINRA Best Offer Price is zero, expecting non-zero
109	Invalid FINRA Best Offer Size	FINRA Best Offer Size is zero vs. non-zero or FINRA Best Offer Size is non-zero vs. zero
111	Invalid LULD Eligibility	LULD Trading Halt or LULD Quote Midpoint received for stock that is not LULD eligible
199	Unspecified Error	Unspecified Error

**CONSOLIDATED QUOTATION SYSTEM (CQS) PILLAR  
PARTICIPANT INPUT BINARY SPECIFICATION**

**APPENDIX J: ASCII PRINTABLE TABLE (Character Code 32-126)**

ASCII	DEC	Description
<space>	32	Space
!	33	Exclamation
"	34	Double quotes
#	35	Number
\$	36	Dollar
%	37	Percent
&	38	Ampersand
'	39	Single Quote
(	40	Open Parenthesis
)	41	Close Parenthesis
*	42	Asterisk
+	43	Plus
,	44	Comma
-	45	Hyphen
.	46	Period
/	47	Slash or Divide
0	48	Zero
1	49	One
2	50	Two
3	51	Three
4	52	Four
5	53	Five
6	54	Six
7	55	Seven
8	56	Eight
9	57	Nine
:	58	Colon
;	59	Semicolon
<	60	Less than
=	61	Equals
>	62	Greater than
?	63	Question mark
@	64	At symbol
A	65	Uppercase A
B	66	Uppercase B
C	67	Uppercase C
D	68	Uppercase D
E	69	Uppercase E
F	70	Uppercase F
G	71	Uppercase G
H	72	Uppercase H
I	73	Uppercase I
J	74	Uppercase J
K	75	Uppercase K
L	76	Uppercase L
M	77	Uppercase M
N	78	Uppercase N
O	79	Uppercase O
P	80	Uppercase P

ASCII	DEC	Description
Q	81	Uppercase Q
R	82	Uppercase R
S	83	Uppercase S
T	84	Uppercase T
U	85	Uppercase U
V	86	Uppercase V
W	87	Uppercase W
X	88	Uppercase X
Y	89	Uppercase Y
Z	90	Uppercase Z
[	91	Opening bracket
\	92	Backslash
]	93	Closing bracket
^	94	Caret
_	95	Underscore
`	96	Grave accent
a	97	Lowercase a
b	98	Lowercase b
c	99	Lowercase c
d	100	Lowercase d
e	101	Lowercase e
f	102	Lowercase f
g	103	Lowercase g
h	104	Lowercase h
i	105	Lowercase i
j	106	Lowercase j
k	107	Lowercase k
l	108	Lowercase l
m	109	Lowercase m
n	110	Lowercase n
o	111	Lowercase o
p	112	Lowercase p
q	113	Lowercase q
r	114	Lowercase r
s	115	Lowercase s
t	116	Lowercase t
u	117	Lowercase u
v	118	Lowercase v
w	119	Lowercase w
x	120	Lowercase x
y	121	Lowercase y
z	122	Lowercase z
{	123	Opening Brace
	124	Vertical Bar
}	125	Closing Brace
~	126	Equivalency Sign-Tilde