



SECURITIES INDUSTRY AUTOMATION CORPORATION

CQS

CONSOLIDATED QUOTATION SYSTEM

**PARTICIPANT COMMUNICATIONS
INTERFACE SPECIFICATION**

June 2, 2017
Version 28

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

TABLE OF CONTENTS

SUMMARY OF CHANGES.....	6
1.0 INTRODUCTION	12
1.1 CONSOLIDATED QUOTATION SYSTEM.....	12
1.2 DUAL SITE REDUNDANCY	13
2.0 TRANSFER CONTROL PROTOCOL/INTERNET PROTOCOL (TCP/IP) COMMUNICATIONS	14
2.1 INTRODUCTION	14
2.2 TCP/IP DYNAMIC INPUT THROTTLING.....	14
3.0 SIAC CQS INTERFACE METHOD	15
3.1 INTRODUCTION	15
3.2 GENERAL DESIGN CONSIDERATIONS	16
3.3 BASIC REQUIREMENTS	16
4.0 TRANSMISSION CHARACTERISTICS.....	18
4.1 TRANSMISSION BLOCK	18
4.2 TCP/IP HEADER	18
4.3 BLOCK LENGTH HEADER	19
4.4 BLOCK HEADER.....	19
4.5 EXPANDED MESSAGE HEADER	20
4.5.1 MESSAGE CATEGORY.....	21
4.5.2 MESSAGE TYPE	22
4.5.3 ORIGINATING PARTICIPANT ID	24
4.5.4 DESTINATION PARTICIPANT ID	25
4.5.5 MESSAGE SEQUENCE NUMBER (MSN).....	26
4.5.6 MESSAGE STATUS.....	27
4.5.7 MESSAGE HEADER IDENTIFIER.....	27
4.5.8 RESERVED.....	27
4.5.9 REGIONAL REFERENCE NUMBER (RRN)	28
4.6.0 TIMESTAMP 1	29
4.6.1 TIMESTAMP 2	29
5.0 MESSAGE FORMATS.....	31
5.1 CATEGORY A TYPE C - FINRA CLOSE	31
5.2 LONG QUOTE.....	32
5.3 CATEGORY A TYPE H - ADMINISTRATIVE UNFORMATTED.....	34
5.4 SHORT QUOTE.....	35
5.5 CATEGORY A TYPE O - FINRA OPEN	37
5.6 CATEGORY A TYPE R - REJECTION/WARNING MESSAGE	38

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

TABLE OF CONTENTS

6.0	CONTROL MESSAGES – CATEGORY C	40
6.1	CATEGORY C - CONTROL MESSAGE DESCRIPTION	40
6.2	CONTROL MESSAGES CONSISTING OF MESSAGE HEADER ONLY	40
6.3	CATEGORY C TYPE A - ACTIVATE PARTICIPANT BBO CALCULATION	41
6.4	CATEGORY C TYPE E - END OF PARTICIPANT BBO CALCULATION	41
6.5	CATEGORY C TYPE 4 –LINE INTEGRITY PARTICIPANT TO CQS.....	41
6.6	CATEGORY C TYPE 6 – START OF DAY	42
6.7	CATEGORY C TYPE 7 – END OF PARTICIPANT REPORTING (EOPR)	42
6.8	CONTROL MESSAGES CONSISTING OF MESSAGE HEADER AND MESSAGE TEXT.....	43
6.9	CATEGORY C TYPE I - SEQUENCE INQUIRY	43
6.10	CATEGORY C TYPE N - SEQUENCE INFORMATION	44
6.11	CATEGORY C TYPE 4 – LINE INTEGRITY — CQS TO PARTICIPANT.....	45
6.12	CATEGORY C TYPE 5 - TEST	46
7.0	FIELD DESCRIPTIONS	47
	BID PRICE	47
	BID PRICE DENOMINATOR INDICATOR	47
	BID SIZE	47
	BID WHOLE PRICE	48
	OFFER SIZE	50
	OFFER WHOLE PRICE	50
	APPENDIX A: DUAL SITE CONFIGURATION	57
	APPENDIX B: GLOSSARY.....	58
	APPENDIX C: FINRA OPEN / FINRA CLOSED.....	62
	APPENDIX D: QUOTE CONDITIONS	63
	APPENDIX E: NATIONAL AND FINRA BEST BID AND OFFER OVERVIEW	71
	APPENDIX F: CQS CLOSING ROUTINE.....	73
	APPENDIX G: ALLOWABLE SYMBOL SUFFIXES FOR CQS QUOTES*	74
	APPENDIX H: TEMPORARY SUFFIX REPRESENTATION.....	78
	APPENDIX I: INPUT ERROR CONDITIONS	79
	APPENDIX J - ASCII PRINTABLE CHARACTER BASE 95 (32-126 INCLUSIVE)	81

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

PAGE(S)	DESCRIPTION
VERSION #1 - OCTOBER 31, 1997	
All	Baseline Document and Revision of Corporate Bond Suffixes (Appendix G)
VERSION #2 - February 26, 1999	
All footers	Date revised to February 26, 1999.
10	Consolidated Quote System: replaced reference of High Speed Line output speed with IP Multicast Network reference.
12, 13, 16, 17, 18	Deleted Bi-sync Communications references and characteristics; replaced with TCP/IP Communications references and characteristics.
12	TCP/IP Input Throttling: added description of Static and Dynamic Throttling
30	General Design Considerations: added reference of additional 4 bytes to maximum message lengths (304 bytes and 1004 bytes, reflecting new Block Length Header) for TCP/IP
16, 17, 18, 19	General Message Format: added TCP/IP and Block Length headers; added pad character for odd number block length.
17	Message Description: added Block Length header description.
28	Long Quote Message: renamed the 'Cancel Indicator' field to 'Cancel/Correction Indicator' for Category A, Type D, Equity Long Quote, Category A, Type E, Local Issue Long Quote, and Category A, Type F, Bond Long Quote
47, 48, 49	Field Descriptions: added code 'C' to Cancel/Correction Indicator of Long Quote message to represent a corrected Price Indication; added references for canceling a Price Indication and a Trading Range Indication
53	Field Descriptions: added Note #2 to the Security Symbol description reflecting the use of the '.TEST' intraday test symbol
69	National and NASDAQ Best Bid and Offer Overview: added note regarding duplicate BBO processing
75	Allowable Symbol Suffixes for CQS Quotes: added '.TEST' as a suffix to represent an intraday test symbol

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

PAGE(S)	DESCRIPTION
VERSION #3 - July 17, 2000	
All footers	Date revised to July 17, 2000.
15	Modified USA Standard Code for Information Interchange: Modified text in Hex '2E' value to be "LTRS DOT"; modified text in Hex '2F' value to be "FIGS DOT".
31	Message Formats: Category A, Type Q – modified field restriction 'e' for the Equity Short Quote to reflect expansion of the Market Condition field to accept NASD 'CAES' quotes for a locked or crossed market
48	Field Descriptions: Market Condition – modified field description to include crossed or locked NASD quotes with a 'CAES' Market Maker ID
50	Field Descriptions: Price Denominator Indicator – modified field description to reflect the field as requiring a valid 'price denominator code' value if a Short Quote is a 'zero quote', or a 'zero-filled' value if the 'zero quote' is a Long Quote
56	Glossary: modified definitions for 'crossed market' and 'locked market' to reflect the inclusion of NASD quotes with a 'CAES' Market Maker ID
73	Allowable Suffixes for CQS: added new index suffixes to reflect Amex Index Shares (CTS only)
VERSION #4 - November 12, 2001	
All footers	Date revised to November 12, 2001
10	Consolidated Quote System: Added: The Island, ECN
27	Block Header, Category C/Type E, Category C/Type 7, Category C Type 5: Added new field descriptions for The Island, ECN
23, 24	Originating and Destination Participant ID: Added: The Island, ECN as a new Participant
VERSION #5 - April 29, 2002	
ALL	Modified references from Nasdaq to NASD where applicable
10	Consolidated Quote System: Added NASD
19	Participant ID: Added "ND" for NASD
19, 23, 27, 33, 39, 46	Originating Participant ID: Added "ND" for NASD
24, 36, 37	Destination Participant ID: Added "ND" for NASD

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

PAGE(S)	DESCRIPTION
VERSION #6 - April 11, 2003	
ALL	Replaced all references to Network 'B' with Network 'F'
ALL	Replaced "Nasdaq Closed" with "Nasdaq Close"
11	Added header and bullet – "Dual Site Redundancy"
12	Introduction – updated from T1 and T3 to Ethernet circuits
12	TCP/IP Dynamic Input Throttling – updated description
13	Introduction – added "In the event of a TCP/IP socket connection interruption and re-establishment, SIAC recommends that the Participant system, prior to transmitting data, generate a sequence inquiry message to obtain the last sequence number obtained by CTS".
16, 17	Renamed 4.1 header to "Transmission Block", Added 4.2 header –"TCP/IP Header" and 4.3 header "Block Length Header"
20	Updated description: Message Header
25	Message Sequence Number: Updated description (from CQS FRS)
28	Updated description: Long Quote
30	Administrative Unformatted (free form text): Replaced 300 characters with 304 characters (located in description). Replaced 'n' with 'v' (located in field length)
31	Short Quote: Updated message description
18, 27	Nasdaq CAES Wipeout & NASD NAQS Wipeout: Updated description
37, 38, 39, 41, 42, 43, 44	Updated all message descriptions (based on CQS FRS)
39, 40, 41, 42	EOPR, Sequence Inquiry & Sequence Information: Updated message description (based on CQS FRS)
47	Reserved: Replaced 'N' with 'Variable'
72	Suffix Table: Updated dot representation to a slash
VERSION #7 - March 22, 2005	
51, 52, 58, 63, 64, 66 & 67	Redefined: Quote Conditions: 'A' - Slow Quote on the Offer Side; 'B' - Slow Quote on the Bid Side; and 'H' - Slow Quote on the Bid and Offer
69	Added: "The exception is for the NYSE Arca SM BBO calculations, which start at 8:00 a.m. ET."
70	Deleted paragraphs titled: 'Trade Range Indication Quotes' and 'Opening Delays and Trading Halts' Revised paragraph titled: 'Participant Overall Halt in Trading'

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

PAGE(S)	DESCRIPTION
VERSION #8 - March 13, 2006	
10, 19, 23, 24, 36, 37, 39, 46	Revised: Participant Code Value from Cincinnati Stock Exchange to National Stock Exchange
10, 19, 23, 24, 36, 37, 39, 46	<ul style="list-style-type: none"> Added New Participant: International Securities Exchange Deleted Participant: The Island, ECN Revised Participant ID 'IS' <ul style="list-style-type: none"> From: The Island, ECN To: International Securities Exchange (ISE)
VERSION #9 - May 02, 2006	
52, 62, 63, 64, 67	Added Quote Condition codes 'E', 'F', 'U' and 'W'.
51, 52, 58, 63, 64, 66, 67	<p>Redefined: Existing Quote Condition Codes and Values:</p> <ul style="list-style-type: none"> Code 'E' from 'Order Influx' to 'Slow Quote Due to an LRP or Gap Quote on the Bid Side'. Code 'F' from 'Fast Trading' to 'Slow Quote Due to an LRP or Gap Quote on the Offer Side'. Code 'T' from 'Reserved (PHLX)' to 'Resume'. (During Interim Migration Period – TBD) - Code 'U' will continue to be defined as 'Resume'. (After Interim Migration Period) - Code 'U' redefined from 'Resume' to Slow Quote Due to LRP or Gap Quote on Both Bid and Offer Sides. <p>Added: New Quote Condition Code and Value:</p> <ul style="list-style-type: none"> Code 'W' to Slow Quote Due to Set Slow List on Both the Bid and Offer Sides.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

PAGE(S)	DESCRIPTION
VERSION #10 - December 21, 2006	
All	-Deleted all references to "As of NASD/Nasdaq Separation"
	-Renamed Pacific Exchange, Inc. to NYSE Arca SM
	-Replaced "NULL" filled with "SPACE" filled
	-Revised "Reserved" field format from Numeric to Alphanumeric
19, 27, 28, 33, 34, 35,36, 37, 38, 39 , 47	-Eliminated "Priority" field from Message Header – re-allocated the one-byte to the adjacent "Reserved" field
75	-Eliminated Category C Type 8 End of Day control message
	-Eliminated Cancel/Correction Indicator field – converted to Reserved field
	-Eliminated Bankruptcy-Thousands Digit Indicator field – converted to Reserved field
	-Added ".TEST" symbol clarifier: .TEST cannot be used with a symbol that is in the database
VERSION #10- March 02, 2007	
10, 19, 23, 24, 36, 37, 39, 46	Renamed: Chicago Board Options Exchange (CBOE) to CBOE Stock Exchange (CBSX)
VERSION #10- March 23, 2007	
18, 27	Deleted: Category A, Type P – 'NASD NAQS Wipe-Out' control message (no longer applicable)
25, 40, 41, 56, 69, 69	Deleted: All references to "NAQS" Market Maker ID (no longer applicable)
VERSION #11- June 25, 2007	
51, 59, 64 & 67	Added: New code 'Y' to Quote Condition field to denote Sub-Penny Trading
VERSION #12- March 27, 2008	
10, 19, 23, 24, 36, 37, 39, 46	Added: New CQS Participant 'BATS Trading' <ul style="list-style-type: none"> • New Block Header Participant ID - 'ZB' • New Originating Participant ID - 'ZB' • New Destination Participant ID - 'ZB'
VERSION #13- September 17, 2009	
All	Revised: Participant ID Value <ul style="list-style-type: none"> • From: American Stock Exchange To: NYSE AMEX • From: Boston Stock Exchange To: NASDAQ OMX BX • From: National Association of Securities Dealers, Inc. (NASD) To: FINRA • From: Philadelphia Stock Exchange To: NASDAQ OMX PHLX

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

PAGE(S)	DESCRIPTION
VERSION #13- September 17, 2009 - continued	
10, 19, 23, 24, 36, 37, 39, 46	Added New Participant Direct Edge A: <ul style="list-style-type: none"> • New Participant ID 'JA' • New Block Header Participant ID 'JA' • New Originating Participant ID 'JA' • New Destination Participant ID 'JA'
10, 19, 23, 24, 36, 37, 39, 46	Added New Participant Direct Edge X: <ul style="list-style-type: none"> • New Participant ID 'KX' • New Block Header Participant ID 'KX' • New Originating Participant ID 'KX' • New Destination Participant ID 'KX'
10, 19, 23, 24, 36, 37, 39, 46	Added New Participant BATS Y-Exchange: <ul style="list-style-type: none"> • New Participant ID 'YB' • New Block Header Participant ID 'YB' • New Originating Participant ID 'YB' • New Destination Participant ID 'YB'
10, 23, 24	Revised: Participant Name From: BATS Trading To: BATS Exchange, Inc.
VERSION #14 – May 11, 2010	
10, 19, 23, 24, 36, 37, 39, 46	Revised: Participant Name From: NASDAQ OMX PHLX To: NASDAQ OMX PSX
13	Revised: Text pertaining to the number of IP addresses supplied
21, 35, 43	Added : New Category C, Type 4 Participant to CQS Line Integrity message
53, 75	Added: Notation pertaining to use of .TEST suffix
VERSION #15 – May 24, 2010	
51, 59, 64, 66	Redefined Quote Condition Code 'M' (Regulatory Halt Reason): From: Additional Information To: Volatility Trading Pause Redefined Quote Condition Code 'Q': From: Additional Information – Due to Related Security To: Undefined
VERSION #16 – July 09, 2010	
29, 54, 59, 77	Added: New Short Sale Restriction Indicator field in Long Quote message Added: New Short Sale Restriction Indicator field Added: New Short Sale Restriction to Field Descriptions and Glossary Added: New Input Error Code - Invalid Short Sale Restriction Indicator

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

PAGE(S)	DESCRIPTION
VERSION #17 – December 10, 2010	
53	Added: New dedicated ‘Test’ symbols: <ul style="list-style-type: none"> • Network E: CBO and CBX • Network F: IBO and IGZ
VERSION #18 - October 11, 2011	
53	Added: New dedicated ‘Test’ symbols: Network F: ZBZX and ZTEST
28	Revised: From - FINRA Market Maker Geographical Location (2 bytes) To - Reserved Revised: From – FINRA Market Maker Desk Location (1 Byte) To: - Reserved
VERSION #19 - January 12, 2012	
28, 52	Added: New Retail Interest Indicator field to Long Quote Category A, Type D/E/F message
VERSION #20 - May 10, 2012	
10, 19, 23, 24, 36, 37, 39, 46, 53, 56	Revised: Participant name: From: NYSE AMEX Stock Exchange To: NYSE MKT Stock Market
VERSION #21 – June 27, 2012	
51, 64, 68	Added: New ‘Market-Wide Circuit Breaker’ codes 1, 2 and 3 to ‘Quote Condition’ field of Short Quote (Category A, Type Q) and Long Quote (Category A, Type D) messages.
57	Added the following to the Glossary: <ul style="list-style-type: none"> • Market-Wide Circuit Breaker Level 1 – 7% Decline • Market-Wide Circuit Breaker Level 2 – 13% Decline • Market-Wide Circuit Breaker Level 3 – 20% Decline
VERSION #21 – June 27, 2012	
51, 64, 68	Added: New ‘Market-Wide Circuit Breaker’ codes 1, 2 and 3 to ‘Quote Condition’ field of Short Quote (Category A, Type Q) and Long Quote (Category A, Type D) messages.
VERSION #21-A – December 4, 2012	
79	Error Code 36 - INVALID RETAIL INTEREST INDICATOR
VERSION #21a – February 3, 2014	
N/A	Note: FINRA reactivation-no functional changes required.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

VERSION #22 – October 31, 2014	
PAGE(S)	DESCRIPTION
20, 27, 29, 31-35, 37, 38, 42-45, 78, 80, 81	Added: <u>New</u> Expanded Message Header including the following: <ul style="list-style-type: none">• Modified Message Header Identifier• New Timestamp (represented in microseconds since midnight ET)) Added: New Error Code 16 denoting INVALID TIMESTAMP
VERSION #23 – February 4, 2015	
20, 27, 29, 31-35, 37-38, 42-45	Modified: <u>New Expanded</u> Message Header (increased from 27 Bytes to 33 Bytes) to include a second Timestamp (represented in microseconds since midnight ET) Updated: Total length of messages adjusted to include new Message Header length of 33 Bytes Updated: Old/New Message Header generated back to Participant description Revised: Effective Date from April 2015 to July 2015
VERSION #23a – April 22, 2015	
29-30	Added: Definitions for Timestamp 1 and Timestamp 2 fields of the <u>New Expanded</u> Message Header Revised: Effective Date from July 2015 to August 3, 2015
VERSION #24 – August 7, 2015	
51, 59, 65, 69	Added: New Quote Condition Code ‘4’ to denote ‘On Demand Intra-Day Auction’ Effective Date: October 5, 2015
VERSION #25 – September 10, 2015	
53	Added: New dedicated ‘Test’ symbol: Network F: ZTST

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SUMMARY OF CHANGES

VERSION #26 – November 16, 2015

11, 18, 23 & 24	Added New Participant – The Investors’ Exchange (IEX): <ul style="list-style-type: none">• New Participant ID ‘VX’• New Block Header Participant ID ‘VX’• New Originating Participant ID ‘VX’• New Destination Participant ID ‘VX’
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VERSION #26a – April 20, 2016

12, 19, 24, 25 & 55	Revised ‘Participant Names’: <ul style="list-style-type: none">• From: BATS Exchange To: Bats BZX Exchange, Inc.• From: BATS Y Exchange To: Bats BYX Exchange, Inc.• From: Direct Edge A Stock Exchange To Bats EDGA Exchange, Inc.• From Direct Edge X Stock Exchange To: Bats EDGX Exchange, Inc.
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VERSION #27 – September 15, 2016

55	Added: New dedicated ‘Test’ symbols: <ul style="list-style-type: none">• Network E: NTEST (NYSE)• Network F: ATEST (NYSE MKT)• Network F: PTEST (NYSE ARCA)
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VERSION #28 – June 2, 2017

55	Added: New dedicated ‘Test’ symbols: <ul style="list-style-type: none">• Network F: ZIEXT, ZEXIT & ZXIET (IEX)
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**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

1.0 INTRODUCTION

The Securities Industry Automation Corporation (SIAC) has continuously served 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 CONSOLIDATED QUOTATION SYSTEM

CQS collects and processes all equity quotes in listed securities, local issues and bonds from all U.S. Stock Exchanges and the Financial Industry Regulatory Authority (FINRA). In addition, CQS calculates and identifies the National and FINRA "Best Bid and Offer" (highest bid and lowest offer). CQS Participant messages, input to the CQS processor, are validated, processed, recorded and merged to form the Multicast outputs. This information is made available via computer-to-computer linkages to the financial community in the U.S. and abroad.

As of the date of this specification, the following market centers are participating in the Consolidated Quotation System:

Bats BZX Exchange, Inc.
Bats BYX-Exchange, Inc.
Bats EDGA Exchange, Inc.
Bats EDGX Exchange, Inc.
CBOE Stock Exchange, Inc.
Chicago Stock Exchange, Inc.
Financial Industry Regulatory Authority
International Securities Exchange, Inc.
The Investors’ Exchange, LLC
NASDAQ OMX Stock Exchange, Inc.
NASDAQ OMX BX Stock Exchange, Inc.
NASDAQ OMX PSX Stock Exchange, Inc.
National Stock Exchange, Inc.
New York Stock Exchange, Inc.
NYSE MKT Stock Market
NYSE ArcaSM

CONSOLIDATED QUOTE SYSTEM, *continued*

The Consolidated Quotation Plan established the provision for the consolidation of quotes by the Securities Industry Automation Corporation (SIAC) Processor for dissemination to the users of this information. This data is transmitted to subscriber locations over the consolidated Multicast Line Internet Protocol (IP) Multicast Network.

1.2 DUAL SITE REDUNDANCY

Computer systems that support the processing and dissemination of consolidated quotes are operational at two Data Centers at physically and geographically diverse locations, thereby providing redundancy in the event of a disaster at either location. If a disaster should occur at one of the locations, all of the computer processing operations in support of quote reporting would be transferred to the surviving site. The dual-site configuration provides system fold-over for a limited site disaster (system failure) or full site disaster (loss of facility). A CQS dual site configuration is illustrated in [Appendix A](#).

2.0 TRANSFER CONTROL PROTOCOL/INTERNET PROTOCOL (TCP/IP) COMMUNICATIONS

2.1 INTRODUCTION

To enable the delivery of data, a transfer control protocol is required that contains addressing and control information. CQS Communications Interface utilizes TCP/IP protocol, with Ethernet circuits. A full explanation of TCP/IP is beyond the scope of this document. The requirements for the TCP/IP interface are defined in the supplement to this document, 'TCP/IP for NMS Participant Input Interface Specification'. Participants may request to receive the CTS and TCP/IP Participant Input Specifications by sending an email message to CQS-CTS-OPRA@siac.com.

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

2.2 TCP/IP Dynamic Input Throttling

All Participants have pre-assigned input rate targets which are enforced through continuous input pacing by the CQS Processor. The input pacing rates are not fixed and can vary depending on changing traffic conditions. For example, if Participant "A" experiences a surge in traffic and requires more bandwidth than their present pacing rate allows, the CQS Processor will "borrow" bandwidth from excess system capacity if available.

3.0 SIAC CQS INTERFACE METHOD

3.1 INTRODUCTION

This chapter defines transmission, line discipline, message store and error recovery procedures necessary for computer-to-computer communications between the CQS system and Participant systems.

Any Participant may input to CQS over one or more logical TCP/IP connections. Each logical connection is considered as a complete independent entity. CQS will not attempt to correlate input coming in over these multiple inputs. 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 the input.

Error Recovery Techniques, such as communications hardware error detection and retries, allow a choice of user options, permitting the application modules to concern themselves with "higher" level error recovery: resetting the logical connection, resetting the channel, etc. **Each Participant is supplied with Primary Data Center IP addresses/ports and Disaster Recovery site (Backup Data Center) IP addresses/ports. 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 connected to the Disaster Recovery site (Backup Data Center) input lines, Participants will be required to re-quote.**

Restart considerations consist of getting the systems involved back into synchronization from the point of failure. All received records contain a sequence number, which provide checkpoints across both systems. In the event of a TCP/IP socket connection interruption and re-establishment, SIAC recommends that the Participant system, prior to transmitting data, generate a sequence inquiry message to obtain the last sequence number obtained by CQS. The sequence number of the last record sent and the last record received is maintained throughout the trading day. This ensures integrity of data and provides both systems with the ability to trap and discard duplicate data without updating on-line or historical files. However, sequence numbers do not increment indefinitely throughout the trading day. When the message sequence number reaches 999999, the next expected value is 000000.

3.2 GENERAL DESIGN CONSIDERATIONS

CQS receives and transmits variable length blocks having maximum lengths of 1004 characters. The length includes a Block Length Header, text and control characters. A Start of Text (STX) control character (x02) signifies the start of a block. The number of messages contained in a block is variable. A Unit Separation (US) control character (x1F) needed in multiple message blocks to signify the end of the preceding message but not the end of the block delimits the end of each message. The End of Text (ETX) control character (x03) signifies the end of the block.

The Block Length calculation includes the sum of the byte counts associated with the STX and ETX characters, the PAD character, if present, and the 4-byte Block Length header itself. Thus, the maximum length for a block from a Participant to CQS is increased from 1,000 to 1,004 bytes and the maximum length for a block from CQS to a Participant is increased from 300 to 304 bytes.

3.3 BASIC REQUIREMENTS

All transmissions are performed using the USASCII character set as specified in Figure 3-1.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIGURE 3-1

**MODIFIED USA STANDARD CODE
FOR INFORMATION INTERCHANGE**

b7						0	0	0	0	1	0	1	0	1	1	1	1
b6							0		0		1		1		0		1
b5								0		1		1		0		1	
Bits	b4	b3	b2	b1	Column Row	0	1	2	3	4	5	6	7				
	I	I	I	I													
	0	0	0	0	0	NUL	DLE	SP (SPACE)	0	@	P	'	Pr (p)				
	0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q				
	0	0	1	0	2	STX	DC2	"	2	B	R	b	r t (r)				
	0	0	1	1	3	ETX	DC3	#	3	C	S	c	s t (s)				
	0	1	0	0	4	EOT	DC4	\$	4	D	T	d	s s (t)				
	0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u				
	0	1	1	0	6	ACK	SYN	&	6	F	V	f	v				
	0	1	1	1	7	BEL	ETB	'	7	G	W	g	w I (w)				
	1	0	0	0	8	BS	CAN	(8	H	X	s	x				
	1	0	0	1	9	HT	EM)	9	I	Y	i	BEGIN ANNOUNCE (y)				
	1	0	1	0	10	LF	SUB	*	:	J	Z	j	END ANNOUNCE (z)				
	1	0	1	1	11	VT	ESC	+	;	K	1/4 (I)	k	1/2 ({)				
	1	1	0	0	12	FF	FS	,	<	L	\	l	1/8 (I)				
	1	1	0	1	13	CR	GS	—	=	M	3/4 (I)	m	7/8 ({)				
	1	1	1	0	14	SO	RS	LTRS DOT (.)	>	N	3/8 (^)	n	5/8 (~)				
	1	1	1	1	15	SI	US	FIGS DOT (/)	?	O	—	o	DEL				

The USA Standard Code for Information Interchange has been modified in the above table to conform to specific requirements of the Consolidated Quote System.

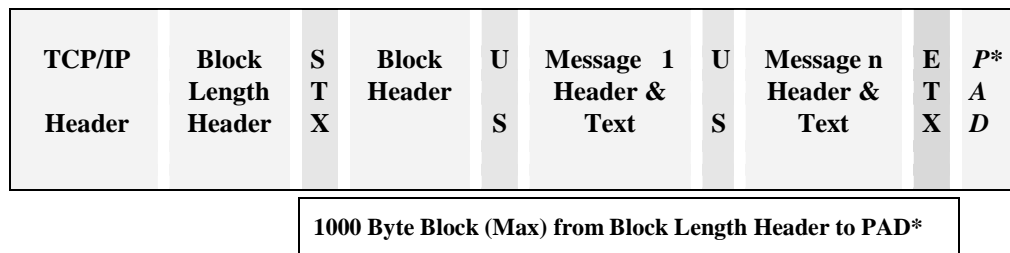
**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

4.0 TRANSMISSION CHARACTERISTICS

4.1 TRANSMISSION BLOCK

All data transmitted between the Participants and CQS are transmitted in blocks composed of a TCP/IP Header (TH), Block Length Header (BL), Block Header (BH) Message Header (which is of fixed length and format) and, with the exception of certain control multiple messages, message texts which are variable in length and format..

Only one type of transmission block is used for all types of messages. A message is a unit of data that can be processed by the receiving system independently of other data. A message may not span a block boundary.



Note: The CQS system requires that the length of the block be an “even” number. In the event that the length of the block is not an even number, a PAD character representation is required after the ETX. This should consist of a HEX ‘FF’ character.

USASCII filler characters are inserted, as required, in accordance with the following rules:

1. Zeroes (hex 30) are inserted in numeric fields. All numeric fields are Right Justified, as required.
2. Spaces (hex 20) are inserted in alphabetic, alphanumeric and alphanumeric/special character fields. All alphabetic, alphanumeric and alphanumeric/special character fields are left justified, as required.
3. Spaces (hex 20) are inserted in alphanumeric fields, except Price Denominator fields, which are zero-filled.

4.2 TCP/IP HEADER

The message format begins with a standard TCP/IP header (for a description of the TCP/IP header reference the supplement to this document, “TCP/IP for NMS Participant Input”) **Note:** The TCP/IP header is **not** returned to the application on reading the socket.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

4.3 BLOCK LENGTH HEADER

The Block Length Header indicates the length of the message, from Start of Text (STX) to the End of Text (ETX).

The Block Length field is a 4-byte binary (not ASCII) field. The byte ordering is left-to-right, meaning the left byte is the Most Significant byte and the right byte is the Least Significant byte. No message can span message boundaries. The Block Length Header format is:

Field Name	Length (bytes)	Format	Code	Value
Block Length	2	Binary Not ASCII	Zero-filled	A two byte (16 bits) binary (not ASCII) field, indicating the length of the block.
Reserved	2	Binary Not ASCII	Zero-filled	A two byte (16 bits) binary (not ASCII) field. Field Reserved for future use.
Total Length	4 (32 bits) Binary <u>not</u> <u>USASCII</u>			

4.4 BLOCK HEADER

The first record of every block transmitted or received is a Block Header. The Block Header is delimited with a Unit Separator character (US), as is every other record (except the last) in the applicable block. The Block Header format is:

Field Name	Length (bytes)	Format	Code	Value
Participant ID	2	Alphabetic	AQ	NYSE MKT
			BQ	NASDAQ OMX BX
			CN	NSX
			IS	ISE
			JA	Bats EDGA
			KX	Bats EDGX
			MQ	CHX
			NA	NASDAQ OMX
			ND	FINRA
			NY	NYSE
			PB	NASDAQ OMX PSX
			PQ	NYSE Arca
			VX	IEX
			WQ	CBSX
			YB	Bats BYX
			ZB	Bats BZX
			SI	CQS
			AL	All Participants
Reserved	8	Alphanumeric	Space-filled	Field Reserved for future use.
Total Length	10			

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

4.5 EXPANDED MESSAGE HEADER

The **Expanded Message Header** uniquely identifies the Category and Type of each message within a Block. The **Expanded Message Header** can represent an entire message or appears before the Message Text segment in each message transmitted. The **Expanded Message Header** contains a total of **33** Bytes and consists of the following data fields:

Field Name	Length (bytes)
Message Category	1
Message Type	1
Originating Participant ID	2
Destination Participant ID	2
Message Sequence Number	6
Status	1
Message Header Identifier	1
Reserved	1
Regional Reference Number	6
Timestamp 1	6
Timestamp 2	6
Total Length	33

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

Expanded Message Header, *continued*

4.5.1 MESSAGE CATEGORY

The Message Category field is 1 Byte, Alphabetic (A). This field, in combination with the Message Type field identifies the Message and contains one of the following Message Categories:

MESSAGE CATEGORY	
Code	Value
A	ADMINISTRATIVE, QUOTE, FINRA, CONTROL, REJECTION/WARNING
C	CONTROL

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

Expanded Message Header, *continued*

4.5.2 MESSAGE TYPE

The Message Type field is 1 Byte, Alphanumeric (AN). The Message Type field, along with the Message Category field identifies the message as follows:

Message Category*	Message Type	Value
A	C	FINRA Close
A	D	Equity Long Quote
A	E	Local Issue Long Quote
A	F	Bond (Network 'F' only) Long Quote
A	H	General Administrative Unformatted
A	N	Local Issue Short Quote
A	O	FINRA Open
A	Q	Equity Short Quote
A	R	Rejection/Warning
A	V	Bond Short Quote
C	A	Activate Participant BBO Calculation
C	E	End of Participant BBO Calculation
C	I	Sequence Inquiry
C	N	Sequence Information
C	4	Line Integrity
C	5	Test
C	6	Start of Day
C	7	End of Participant Reporting

****Category codes are repeated for clarification.***

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

Expanded Message Header, *continued*

The *source* of the message can originate from either a **Participant (PART.)** or from the **CQS Processor** as follows:

Message Category	Message Type	Originator	Message Category	Message Type	Originator
A	C	FINRA	C	A	CQS
A	D	PART.	C	E	CQS
A	E	PART.	C	I	PART.
A	F	PART.	C	N	CQS
A	H	PART./CQS	C	4	PART./CQS
A	N	PART.	C	5	PART./CQS
A	O	FINRA	C	6	CQS
A	Q	PART.	C	7	PART./CQS
A	R	CQS			
A	V	PART.			

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

Expanded Message Header, *continued*

4.5.3 ORIGINATING PARTICIPANT ID

The Originating Participant ID is 2 Bytes, alphabetic character field, which identifies the originating Participant or Processor (CQS) that initiates the message:

ORIGINATING PARTICIPANT ID	
Code	Value
AQ	NYSE MKT
BQ	NASDAQ OMX BX
CN	NSX
IS	ISE
JA	Bats EDGA
KX	Bats EDGX
MQ	CHX
NA	NASDAQ OMX
ND	FINRA
NY	NYSE
PB	NASDAQ OMX PSX
PQ	NYSE Arca
VX	IEX
WQ	CBSX
YB	Bats BYX
ZB	Bats BZX
SI	CONSOLIDATED QUOTATION SYSTEM

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

Expanded Message Header, *continued*

4.5.4 DESTINATION PARTICIPANT ID

The Destination Participant ID is 2 Bytes, Alphabetic (A). It identifies the Participant to *receive* the message. The Destination of a Message is normally the Consolidated Quote System (SI); Control Messages are sent by CQS to all Participants (AL) with the exception of test messages; Test messages are addressed by CQS to a specific Participant destination:

DESTINATION PARTICIPANT ID	
Code	Value
AQ	NYSE MKT
BQ	NASDAQ OMX BX
CN	NSX
IS	ISE
JA	Bats EDGA
KX	Bats EDGX
MQ	CHX
NA	NASDAQ OMX
ND	FINRA
NY	NYSE
PB	NASDAQ OMX PSX
PQ	NYSE Arca
VX	IEX
WQ	CBSX
YB	Bats BYX
ZB	Bats BZX
SI	CONSOLIDATED QUOTE SYSTEM
AL	ALL PARTICIPANTS

Expanded Message Header, *continued*

4.5.5 MESSAGE SEQUENCE NUMBER (MSN)

The Message Sequence Number (MSN) is 6 Bytes, Numeric (N), Right Justified and Zero Filled. A Participant assigns a unique and increasing MSN to each message on a per input line basis. Each MSN must be in the range 000000 through 999999, and should be one higher than the MSN in the previous message on a per input line basis.

The Message Sequence Number is checked for (n+1), where n equals the Message Sequence Number of the previous message. If the MSN does not equal (n+1), the following applies:

1. If the MSN is less than (n+1), and the Message Status field is set to “0”, denoting “Not a Duplicate message”, the message is not processed and a Rejection/Warning message is transmitted to the Participant signifying a possible duplicate.
2. If the MSN is less than (n+1), and the Message Status field is set to “1”, denoting “a Possible Duplicate message”, the message is not processed and no Rejection/Warning message is transmitted to the Participant.
3. If the MSN is greater than (n+1), the message is processed and a Rejection/Warning message is transmitted to the Participant signifying a sequence number gap.
4. The following MSN rollover logic applies when the total input messages for a line becomes greater than “999999”:
 - If the next expected MSN on a Participant line exceeds “999900”, and a message with a MSN under “000100” is received, it is processed. The next expected MSN is set to that sequence number plus 1.
 - If the last MSN on a Participant line is “999999”, upon a rollover the next expected MSN is “000000” on a per Participant input line basis.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

Expanded Message Header, *continued*

4.5.6 MESSAGE STATUS

The Message Status is 1 Byte, Numeric (N). It identifies whether or not a message is a possible duplicate message. For effects of Message Status value settings on Message Sequence Number processing (MSN), reference the Message Sequence Number description. If the message has already been processed by CQS, a duplicate message is ignored:

Message Status	
Code	Value
0	Not a Duplicate
1	Possible Duplicate

4.5.7 MESSAGE HEADER IDENTIFIER

The Message Header Identifier field is **1** Byte, ASCII Alphanumeric field that distinguished between the use of the old Message Header (21 Bytes) and the current **Expanded Message Header (33 Bytes)** formats.

Header Identifier Value	Description
B	Current Expanded Message Header (33 Bytes)
Other than B	Old Message Header (21 Bytes)

Note: When a Participant sends to CQS the Expanded Message Header, the 'Message Header Identifier' field will be populated with the value 'B' indicating current Expanded Message Header.

4.5.8 RESERVED

The Reserved Field is a 1 Byte , Alphanumeric (AN) field. Field is reserved for future use. Reserved fields are space-filled unless otherwise defined.

4.5.9 REGIONAL REFERENCE NUMBER (RRN)

The Regional Reference Number (RRN) is 6 Bytes, Alphanumeric (AN), Right justified, space-filled. Otherwise, this field is space-filled.

Each of the six bytes in the Regional Reference Number field is restricted to the binary values 48 through 122. This includes the following ASCII characters: all ten numeric, all upper case alphabetic, all lower case alphabetic, and the special character for colon, semicolon, less-than, equals, greater-than, question-mark, commercial-at-sign, opening-bracket, left-slant, closing-bracket, circumflex, underscore, and grave-accent. This allows a Participant a 75 character set for the regional reference number field.

The Regional Reference Number must be unique and increasing (not necessarily in sequential order) on a per security symbol basis (e.g., different symbols, ABC and XYZ may have the same Regional Reference Number over different lines, however symbol 'ABC' with Regional Reference Number '123456' on line 1 cannot be repeated over any other line).

4.6.0 TIMESTAMP 1

The **Timestamp 1** field is 6 bytes, ASCII Printable base95 Alphanumeric/Special Character (values in the range of 32-126 inclusive), which will be populated with a provided Timestamp representing the number of microseconds since midnight Eastern Time (ET) as follows:

- **If from an Exchange: Timestamp 1** 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 the number of microseconds since midnight Eastern Time (ET).
- **If from the FINRA Alternative Display Facility (ADF): Timestamp 1** 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 convert times that its members report to it in seconds or milliseconds to microseconds and shall provide such times to the Processor in microseconds since midnight Eastern Time (ET).

For the ASCII-printable base95 allowable characters reference Appendix J.

4.6.1 TIMESTAMP 2

The **Timestamp 2** field is 6 bytes, ASCII Printable base95 Alphanumeric/Special Character (values in the range of 32-126 inclusive), which will be populated with a provided Timestamp representing the number of microseconds since midnight Eastern Time (ET) as follows:

- **If from an Exchange: Timestamp 2** field will be blank.
- **If from the FINRA Alternative Display Facility (ADF):**
 - **If the FINRA ADF** provides a proprietary feed of its quotation information, then the FINRA ADF will publish the time of the quotation as also published on the facility's proprietary feed. FINRA shall convert times that it reports quotations on its proprietary feed in seconds or milliseconds to microseconds and shall provide such times to the Processor in microseconds since midnight Eastern Time (ET).
 - **If the FINRA ADF** does **not** have a proprietary quotation feed then the **Timestamp 2** field will be blank.

For the ASCII-printable base95 allowable characters reference Appendix J.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

Timestamp, *continued*

Timestamp Sample:

Timestamps - 6 Bytes, ASCII Printable base95							
Wall Time ET	base95						Microseconds since midnight
04:00:00.000000	!	q	k	J	r	C	14400000000
09:30:00.000000	\$	G	t	2	a		34200000000
10:11:33.015317	\$	f	N	x	&	O	36693015317
12:30:00.000000	%	m	M	j	W	R	45000000000
16:00:00.000000	'	J	0	l	L	M	57600000000
20:10:00.000000)	D	@	&	?	>	72600000000

Note: For the 16:00:00.000000 Example the base95 code is:
('J0lLM = 'single quote, Uppercase J, zero, lowercase L, uppercase L, Uppercase M)

The following CQS messages are generated back to the Participant (Note: Messages are in the current Expanded Message Header format):

MESSAGE CATEGORY*	MESSAGE TYPE	MESSAGE SOURCE**	VALUE
Administrative			
A	H	PART/CQS	General Administrative Unformatted
A	R	CQS	Rejection/Warning
Control			
C	A	CQS	Activate Participant BBO Calculation
C	E	CQS	End of Participant BBO Calculation
C	N	CQS	Sequence Information
C	4	PART./CQS	Line Integrity
C	5	PART./CQS	Test
C	6	CQS	Start of Day
C	7	PART./CQS	End of Participant Reporting

Precision Time Protocol (PTP) is utilized to provide a standard method to synchronize devices on a network with sub-microsecond precision. The protocol synchronizes slave clocks to a master clock ensuring that events and timestamps in all devices use the same time base.

5.0 MESSAGE FORMATS

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

This section outlines the message formats used to transmit quote information into CQS. If the input fails any of the message text validations, a reject message is returned to the Participant on the line from which the original message was sent.

Reference: [Appendix I](#) - *'Input Error Conditions'*

A field description is provided as part of the Message Header format, or in the FIELD DESCRIPTIONS section of this document.

Modification(s) within message formats are **shaded in yellow** to indicate the most up-to-date information on technical changes being made.

5.1 CATEGORY A TYPE C - FINRA CLOSE

The FINRA Closed message, consisting of the [Message Header](#) only, is transmitted by FINRA to CQS to indicate the Closed state of a FINRA Market Maker quote. All FINRA Market Maker quotes must be in either an Open or Closed state where Open implies current and Closed implies not current.

Reference: [Appendix C](#) for further details.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

5.2 LONG QUOTE

CATEGORY A TYPE D - EQUITY LONG QUOTE

CATEGORY A TYPE E - LOCAL ISSUE LONG QUOTE

CATEGORY A TYPE F - BOND (NETWORK F) LONG QUOTE

The Long Quote format is used to report quote data for CTA eligible security, Local Issue or Network 'F' bond information that does **not** meet the Short Quote format restrictions. The Long Quote can also be used to report trading suspensions in a security, price indications, trading range indications and cancellations of previous quotes or corrections to price indications.

Message Category	Message Type
A	D
A	E
A	F

Field Name	Length (bytes)
Message Header	33
Security Symbol	11
Reserved	4
Instrument Type	1
Reserved	1
Settlement Condition	1
Market Condition	1
Quote Condition	1
Reserved	1
Retail Interest Indicator	1

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

LONG QUOTE, *continued*

Field Name	Length (bytes)
Bid Price Denominator Indicator	1
Bid Price	12
Bid Size	7
Offer Price Denominator Indicator	1
Offer Price	12
Offer Size	7
FINRA Market Maker ID	4
Reserved	3
Short Sale Restriction Indicator	1
Reserved	2
Total Length	105

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

5.3 CATEGORY A TYPE H - ADMINISTRATIVE UNFORMATTED

The General Administrative Unformatted (free form text) message is designed to facilitate non-computerized miscellaneous information messages to the CQS Control Center from a Participant. The General Administrative Unformatted message consists of the Message Header immediately followed by free form message text of variable length not to exceed three hundred and four (304) characters.

The **Category A Type H** Administrative Message format is as follows:

Field Name	Length (bytes)	Value
Message Header	33	Message Header
Reserved	3	Alphanumeric – Space-filled Reserved for Future Use
Text	Participant to CQS 300 CQS to Participant 150	Alphanumeric Free Form administrative informational message text
Total Length	Variable (186 to 336)	

5.4 SHORT QUOTE

CATEGORY A TYPE N - LOCAL ISSUE SHORT QUOTE

CATEGORY A TYPE Q - EQUITY SHORT QUOTE

CATEGORY A TYPE V - BOND (NETWORK F) SHORT QUOTE

The Short Quote format is used to report quote data for CTA eligible security, Local Issue or Network 'F' Bonds only if the quote meets all the field restrictions. If any of the field restrictions are not met, usage of the Long Quote format is required. The short quote formats can also be used to report trading suspensions in a security, price indications and trading range indications.

Field Restrictions:

- a) Bid and Offer prices are less than \$1000
- b) Bid and Offer sizes are less than 1000 round-lots
- c) Instrument type is not required
- d) Settlement condition is regular way settlement
- e) Market condition is normal auction market.

Message Category	Message Type
A	N
A	Q
A	V

Field Name	Length (bytes)
Message Header	33
Security Symbol	11
Reserved	1
Price Denominator Indicator	1
Quote Condition	1

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

SHORT QUOTE, *continued*

Field Name	Length (bytes)
Bid Whole Price	3
Bid Numerator Price	3
Bid Size	3
Offer Whole Price	3
Offer Numerator Price	3
Offer Size	3
FINRA Market Maker ID	4
Total Length	69

5.5 CATEGORY A TYPE O - FINRA OPEN

The FINRA Open message consists of the [Message Header](#) only and is transmitted by FINRA to CQS. This message indicates the Open state of a FINRA Market Maker quote. All FINRA Market Maker quotes must be in either an Open or Closed state, whereby **Open** implies 'current' and **Closed** implies 'not current'. FINRA can transmit several FINRA Open messages in a trading day.

Reference: [Appendix C](#) for further details.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

5.6 CATEGORY A TYPE R - REJECTION/WARNING MESSAGE

If after receipt of a message, CQS finds a contextual or formatting error, it responds with a rejection (error)/warning message. All message types can elicit a rejection (error)/warning response from CQS.

Reference: [Appendix I](#) for a list of Input Error Codes.

The **Rejection** portion of the Rejection/Warning format is used for all error codes except Error Code #7 to notify a Participant that CQS has found an error either in the Message Header (such as a less than expected sequence number) or text (such as an Invalid Bid Price) of a Participant Input message. The Rejection/Warning Message contains the error code and the complete original Participant message (Message Header and Message Text) being rejected. If the Rejection/Warning Message cannot fit into the output block, the text of the original Participant message (at the end of the Rejection/Warning Message) must be truncated so that the Rejection/Warning Message fits into an output block.

The **Rejection** format of the Rejection/Warning Message *except for **Error Code #7*** is as follows:

Field Name	Length (bytes)	Value
Message Header	33	Message Header
Error Code	2	Numeric Error Code Number
Erroneous Message Header*	33	Alphanumeric Original Message Header of message being rejected
Erroneous Message Text*	Variable	Alphanumeric Original Message Text (e.g., Short Trade, Long Trade, etc.) of message being rejected
Total Length	Variable (Message truncated to fit into an output block)	

**Not an actual field name - used as a reference point only.*

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

CATEGORY A TYPE R - REJECTION/WARNING MESSAGE, continued

The **Warning** portion of the Rejection/Warning format is used for **Error Code 7** to notify a Participant that CQS has detected a gap between the sequence number of the last message received and that of the previous message received. The Rejection/Warning Message contains the error code, the previous message's sequence number and regional reference number and the original Participant Message Header being rejected.

The **Warning** format of the Rejection/Warning message is as follows:

Field Name	Length (bytes)	Value
Message Header	33	Message Header
Error Code	2	Numeric Error Code Number
Previous Message Sequence Number	6	Numeric Previously accepted message sequence number
Previous Regional Reference Number	6	Numeric Previously accepted Regional Reference Number
Erroneous Message Header*	33	Alphanumeric Original Message Header of previous message received
Total Length	80	

**Not an actual field name - used as a reference point only*

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

6.0 CONTROL MESSAGES – CATEGORY C

6.1 CATEGORY C - CONTROL MESSAGE DESCRIPTION

Control Messages are used to notify CQS Participants of specific system events. Control Message formats fall into two categories:

- a. Those consisting of a **Message Header only**
- b. Those consisting of a **Message Header and Text**

Except where noted otherwise (e.g., Line Integrity message) only one control message is transmitted in a block and no other messages appear in that block.

6.2 CONTROL MESSAGES CONSISTING OF MESSAGE HEADER ONLY

Message Category	Message Type	Description
C	A	ACTIVATE PARTICIPANT BBO CALCULATION
C	E	END OF PARTICIPANT BBO CALCULATION
C	4	LINE INTEGRITY - PARTICIPANT TO CQS
C	6	START OF DAY
C	7	END OF PARTICIPANT REPORTING

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

6.3 CATEGORY C TYPE A - Activate Participant BBO Calculation

The Activate Participant BBO Calculation message consists of the [Message Header](#) only and is automatically generated by CQS to a Participant after the execution of a Resume BBO command to indicate the resumption of the National and FINRA BBO calculations.

6.4 CATEGORY C TYPE E - End Of Participant BBO Calculation

The End of Participant BBO Calculation message consists of the [Message Header](#) only and is automatically generated by CQS to a Participant after the execution of a Suspend BBO command indicate the suspension of the National and FINRA BBO calculations.

6.5 CATEGORY C TYPE 4 –Line Integrity Participant to CQS

The **Participant to CQS** Category C Type 4 Line Integrity message is for optional use by a Participant. This message is to be generated by a Participant to CQS at set intervals selected by a Participant (interval is configurable on a per exchange basis, e.g., Participant ‘A’ could be configured for 10 second wait intervals while Participant ‘B’ could be configured for 20 second wait intervals, etc.) to provide verification of input line integrity either on a primary or backup input line. **A Participant is required to input C4 messages every 5 seconds regardless of the threshold interval utilized by the Participant.** If a Participant does not input C4 messages or data to CQS within the Participants’ configured wait interval, CQS will assume an issue exists and 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 Communications Interface Specification, **with the exception of the Message Sequence Number field which will be populated as follows:**

The Message Sequence Number (MSN) field is not incremented for Participant to CQS Category C Type 4 (‘C4’) Line Integrity messages. The MSN field will contain the MSN of the last original message generated by the Participant.

Note:

- CQS will wait until a Participant has sent/received a Start of Day (SOD) before beginning to automatically disconnect a Participant if a C4 or data is not received from the Participant.
- A Category C Type 4 (‘C4’) Line Integrity message coming from a Participant to CQS is mutually exclusive from a C4 Input Message sent by CQS to a Participant (there is no correlation between the two C4 messages).

6.6 CATEGORY C TYPE 6 – Start of Day

The Start of Day message consists of the [Message Header](#) only and is automatically generated by CQS to indicate CQS's readiness to accept data transmission from the Participant to which the message is transmitted. A Participant should not initiate data transfer with CQS until receipt of this message. However, before the Start of Day message has been initiated, a Participant may transmit control and administrative messages to CQS.

6.7 CATEGORY C TYPE 7 – End of Participant Reporting (EOPR)

The End of Participant Reporting message consists of the [Message Header](#) **only** and has been designed to allow CQS to generate an EOPR message to the Participants. This message is automatically generated by CQS to a Participant after the execution of an End of Participant Reporting Quotes command to indicate that CQS will not accept any further quote or control messages from the Participants. However, CQS continues to accept administrative messages following transmission of an EOPR message.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

6.8 CONTROL MESSAGES CONSISTING OF MESSAGE HEADER AND MESSAGE TEXT

Message Category	Message Type	Description
C	I	SEQUENCE INQUIRY
C	N	SEQUENCE INFORMATION
C	4	LINE INTEGRITY - CQS to PARTICIPANT
C	5	TEST

6.9 CATEGORY C TYPE I - SEQUENCE INQUIRY

Participants' computers and the CQS processor use the Sequence Inquiry message to synchronize message sequence numbers. Upon receipt of this message, CQS transmits back to the inquiry processor a Sequence Information message containing the sequence number of the next expected message. Multiple lines for a single Participant are treated as independent lines with their own message sequence numbers. The Sequence Inquiry message is transmitted in a separate message block containing only the Sequence Inquiry message.

The **Category C Type I** Sequence Inquiry format is as follows:

Field Name	Length (bytes)	Description
Message Header	33	Message Header
Reserved	5	Alphanumeric – Space-filled Reserved for Future Use
Total Length	38	

Note: The Regional Reference number that is returned is the last regional reference number received for the individual line on which that the Sequence Inquiry message was sent.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

6.10 CATEGORY C TYPE N - SEQUENCE INFORMATION

The Sequence Information message is generated by CQS to a Participant in response to a Sequence Inquiry message. It contains the sequence number of the last message received prior to receipt of the Sequence Inquiry message. The Sequence Information message is transmitted in a separate message block containing only the Sequence Information message.

The **Category C Type N** Sequence Information format is as follows:

Field Name	Length (bytes)	Description
Message Header	33	Message Header
Current Sequence Number	6	Numeric – Zero-filled Contains Next Expected Participant Sequence Number
Last Participant Regional Reference Number Received	6	Alphanumeric – Space-filled Contains Last Participant Regional Reference Number Received
Total Length	45	

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

6.11 CATEGORY C TYPE 4 – LINE INTEGRITY -- CQS TO PARTICIPANT

The CQS to Participant Category C Type 4 Line Integrity format is generated by CQS to each Participant at 1-minute intervals. Its primary function is to provide verification of line integrity during periods of inactivity. However, this message is also sent during periods of activity.

The **Category C Type 4 – CQS to Participant** format is as follows:

Field Name	Length (bytes)	Description
Message Header	33	Message Header
Month	2	Numeric – Zero-filled Month expressed in digits
Date	2	Numeric – Zero-filled Date expressed in digits
Hour	2	Numeric – Zero-filled Hour expressed in digits
Minute	2	Numeric – Zero-filled Minute expressed in digits
Total Length	41	

<p>Note: A Category C Type 4 ('C4') Line Integrity message coming from a Participant to CQS is mutually exclusive from a C4 Input Message sent by CQS to a Participant (there is no correlation between the two C4 messages).</p>
--

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

6.12 CATEGORY C TYPE 5 - TEST

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

The **Category C Type 5** Test format is as follows:

Field Name	Length (bytes)	Description
Message Header	33	Message Header
Data	95	Alphanumeric – Space-filled Consists of all ASCII characters starting with hex 20 up to and including hex 7E, in sequential order
Total Length	128	

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

7.0 FIELD DESCRIPTIONS

Field Name	Bytes	Description
BID NUMERATOR PRICE	3	<p>Numeric, Right-Justified, Zero-filled.</p> <p>Represents the numerator value of the fractional portion of a price.</p>
BID PRICE	12	<p>Numeric, Right-Justified, Zero-filled.</p> <p>Represents the whole and fractional or decimal portion of the Participant Bid Price information with the BID PRICE DENOMINATOR INDICATOR code determining the price representation.</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>When the BID PRICE and the BID SIZE fields are all zeroes, it represents a "No Bid" quote, a "No Quote" (i.e., neither a Bid nor an Offer, which zeroes out the quote), an Opening Delay or Trading Halt condition. If the bid size is zero and there is a bid price, it represents either a Trading Range Indication, or a Price Indication.</p>
BID PRICE DENOMINATOR INDICATOR	1	<p>Numeric.</p> <p>Refer to PRICE DENOMINATOR INDICATOR for codes.</p>
BID SIZE	3 or 7	<p>Numeric, Right-Justified, Zero-filled.</p> <p>The Bid Size identifies the number of round-lots, for a security (e.g., 001 = one round-lot). Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are 1, 10, 25 or 50 shares. When the BID SIZE field is all zeroes, it represents either a "No Bid" quote, a "No Quote" (i.e., neither a Bid nor an Offer, which zeroes out the quote), a Trading Range Indication, or a Price Indication).</p>

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description						
BID WHOLE PRICE	3	<p>Numeric, Right-Justified, Zero-filled.</p> <p>Represents the whole dollar portion of the quote.</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>When the BID WHOLE PRICE, the BID NUMERATOR PRICE and the BID SIZE fields are all zeroes, it represents a "No Bid" quote, a "No Quote" (i.e., neither a Bid nor an Offer, which zeroes out the quote), an Opening Delay or Trading Halt condition. If the bid size is zero and there is a bid whole price or bid numerator price, it represents either a Trading Range Indication, or a Price Indication.</p>						
FINRA MARKET MAKER ID	4	<p>Alphanumeric/Special Character, Left-Justified, Space-filled.</p> <p>For FINRA, represents the firm identifier of the FINRA Market Maker. (Used by FINRA only.)</p>						
INSTRUMENT TYPE	1	<p>Alphanumeric.</p> <p>Identifies the instrument type relevant to the quote. Currently, this field is only applicable for Network ‘F’ bond quotes</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>A</td><td>Corporate Bond</td></tr><tr><td>B</td><td>Government Bond</td></tr></table>	Code	Value	A	Corporate Bond	B	Government Bond
Code	Value							
A	Corporate Bond							
B	Government Bond							

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description								
MARKET CONDITION	1	<p>Alphanumeric.</p> <p>Identifies the market condition of a quote for a security. Crossed Market and Locked Market are only applicable to Government Bonds. In cases of a Normal Auction Market, the Bid Price must be less than the Offer Price. In cases of a Crossed Market, the Bid Price must be greater than the Offer Price. In cases of a Locked Market, the Bid Price must be equal to the Offer Price.</p> <p>Reference: Appendix B for definition of values.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>A</td><td>Normal Auction Market</td></tr><tr><td>B</td><td>Crossed Market</td></tr><tr><td>C</td><td>Locked Market</td></tr></table>	Code	Value	A	Normal Auction Market	B	Crossed Market	C	Locked Market
Code	Value									
A	Normal Auction Market									
B	Crossed Market									
C	Locked Market									
OFFER NUMERATOR PRICE	3	<p>Alphanumeric.</p> <p>Represents the numerator value of the fractional portion of a price.</p>								
OFFER PRICE	12	<p>Numeric, Right-Justified, Zero-filled.</p> <p>The Offer Price is the whole and fractional or decimal portion of the Participant Offer Price information with the OFFER PRICE DENOMINATOR INDICATOR code determining the price representation.</p> <p>The Offer Price represents the lowest price acceptable to a prospective seller at a particular time for a security.</p> <p>When the OFFER PRICE and the OFFER SIZE fields are all zeroes, it represents a "No Offer" quote, a "No Quote" (i.e., neither a Bid nor an Offer; which zeroes out the quote), an Opening Delay or Trading Halt condition. If the offer size is zero and there is an offer price, it represents either a Trading Range Indication, or a Price Indication.</p>								

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description
OFFER PRICE DENOMINATOR INDICATOR	1	Numeric. Refer to PRICE DENOMINATOR INDICATOR for codes.
OFFER SIZE	3 or 7	Numeric, Right-Justified, Zero-filled. The Offer Size identifies the number of round-lots for a security (e.g., 001 = one round-lot). Primarily, a unit of trade or round-lot consists of 100 shares or multiples thereof (e.g., 200, 1000, 5000). Certain securities trade in round-lot multiples other than 100 shares; other units of trade are 1, 10, 25 or 50 shares. When the OFFER SIZE field is all zeroes, it represents a "No Offer" quote, a "No Quote" (i.e., neither a Bid nor an Offer, which zeroes out the quote), a Trading Range Indication, or a Price Indication.
OFFER WHOLE PRICE	3	Numeric, Right-Justified, Zero-filled. Identifies the whole dollar portion of the Offer price. Represents the lowest whole price acceptable to a prospective seller at a particular time for a security. When the OFFER WHOLE PRICE , the OFFER NUMERATOR PRICE , and the OFFER SIZE fields are all zeroes, it represents a "No Offer" quote, a "No Quote" (i.e., neither a Bid nor an Offer, which zeroes out the quote) or an Opening Delay or Trading Halt condition. If the offer size is zero and there is an offer whole price or offer numerator price, it represents either a Trading Range Indication, or a Price Indication.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description
PRICE DENOMINATOR INDICATOR	1	<p>Alphanumeric.</p> <p>If Bid and/or Offer Prices are zero, this field must contain a valid Price Denominator Code for the Short format, and be ZERO-FILLED for the Long format.</p> <p>Identifies the price denominator of the fraction or the location of the decimal. The Price Denominator Indicator field contains one of the codes listed below.</p>

SHORT QUOTE			
		Price Field Size	
Price Denominator Code	Denominator Value	Whole	Numerator
3	8	3	3
4	16	3	3
5	32	3	3
6	64	3	3
7	128	3	3
8	256	3	3
9	100 (decimals)	3	3
LONG QUOTE			
		Price Field Size	
Price Denominator Code	Denominator Value	Whole	Numerator
U	8	11	1
V	16	10	2
W	32	10	2
X	64	10	2
Y	128	9	3
Z	256	9	3
A	10	11	1
B	100	10	2
C	1,000	9	3
D	10,000	8	4
E	100,000	7	5
F	1,000,000	6	6
G	10,000,000	5	7
H	100,000,000	4	8
WHOLE PRICES (ONLY)			
		Price Field Size	
Price Denominator Code	Denominator Value	Whole	Numerator
I	N/A	12	0
NOTE: The maximum whole price allowable is up to 92.2 billion			

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description
QUOTE CONDITION	1	<p>Alphanumeric.</p> <p>Denotes a particular condition applicable to the quote. The Quote Condition field is used to determine whether a quote qualifies for the National and FINRA Best Bid and Best Offer calculation.</p> <p><i>Reference: Appendix D for definition of values.</i></p>

Code	Value	For BBO-Ineligible Quotes	
		Regulatory	Non-Regulatory
A	Slow Quote on Offer Side		
B	Slow Quote on Bid Side		
C	Closing		
D	News Dissemination	X	
E	Slow Quote Due to LRP or Gap Quote on the Bid Side		
F	Slow Quote Due to LRP or Gap Quote on the Offer Side		
G	Trading Range Indication		
H	Slow Quote on the Bid and Offer Sides		
I	Order Imbalance		X
J	Due To Related Security-News Dissemination	X	
K	Due To Related Security-News Pending	X	
L	Closed Market Maker (FINRA)		
M	Limit Up-Limit Down (LULD) Trading Pause	X	
N	Non-Firm Quote		
O	Opening Quote		
P	News Pending	X	
Q	Undefined		
R	Regular (FINRA Open)		
S	Due To Related Security		X
T	Resume	X	X
U	Slow Quote Due to Liquidity Replenishment Point (LRP), or Gap Quote on Both the Bid and Offer Sides		
V	In View of Common	X	X
W	Slow Quote Due to Set Slow List on Both the Bid and Offer Sides		
X	Equipment Changeover		X
Y	Sub-Penny Trading		X
Z	No Open/No Resume	X	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	
4	On Demand Intra-Day Auction		

continued

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description										
QUOTE CONDITION, <i>continued</i>												
	BBO-Eligible Quotes											
Code	Value											
A	Slow Quote on Offer Side											
B	Slow Quote on Bid Side											
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											
O	Opening Quote											
R	Regular (FINRA Open)											
W	Slow Quote Due to Set Slow List on Both the Bid and Offer Sides											
RETAIL INTEREST INDICATOR	1	<p>Alphanumeric, Space-filled unless otherwise defined.</p> <p>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.</p> <table><tr><td>Code</td><td>Value</td></tr><tr><td>BLANK</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	BLANK	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											
BLANK	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											
RESERVED	Variable	<p>Alphanumeric, Space-filled unless otherwise defined.</p> <p>Reserved for future use.</p>										

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description
SECURITY SYMBOL	11	<p>Alphabetic, Left Justified, Space-filled.</p> <p>Contains the security symbol. Suffixes start with one of the following characters with no embedded blanks: (1) USASCII Period, (2) lower case p, (3) lower case 'r', or (4) lower case 'w'. The Security Symbol length will remain at a maximum of 11 characters.</p> <p><i>Reference: Appendix G for the list of allowable symbol suffixes</i></p> <p>Security Symbol field exceptions:</p> <ul style="list-style-type: none">a) The Bankrupt (Q) prefix is not contained in this field.b) Temporary Suffixes are not contained in this field.c) Quote Conditions (News Pending, Opening Quote, etc.) are not contained in this field. <p><u>Identification of Test Data:</u></p> <p>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. There are two types of test messages that can be disseminated, but do not contain the same characteristics:</p> <ul style="list-style-type: none">1. CQS messages containing a suffix of '.TEST' used with any base symbol that is <u>not</u> in the CQS database. Messages with a '.TEST' suffix are <u>not</u> included in any Participant statistics (e.g., quote counts, etc.). <p style="text-align: right;"><i>continued</i></p>

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description																																																			
SECURITY SYMBOL, <i>continued</i>		<div>2. CQS messages containing any of the following dedicated test symbols:</div> <table><tr><th>Test Symbol</th><th>Listing Market</th><th>CQS Network</th></tr><tr><td>CBO</td><td>NYSE</td><td>E</td></tr><tr><td>CBX</td><td>NYSE</td><td>E</td></tr><tr><td>NTEST</td><td>NYSE</td><td>E</td></tr><tr><td>IBO</td><td>NYSE MKT</td><td>F</td></tr><tr><td>ATEST</td><td>NYSE MKT</td><td>F</td></tr><tr><td>IGZ</td><td>NYSE Arca</td><td>F</td></tr><tr><td>ZVV</td><td>NYSE Arca</td><td>F</td></tr><tr><td>ZZK</td><td>NYSE Arca</td><td>F</td></tr><tr><td>ZZZ</td><td>NYSE Arca</td><td>F</td></tr><tr><td>PTEST</td><td>NYSE Arca</td><td>F</td></tr><tr><td>ZBZX</td><td>Bats BZX</td><td>F</td></tr><tr><td>ZTEST</td><td>Bats BZX</td><td>F</td></tr><tr><td>ZTST</td><td>Bats BZX</td><td>F</td></tr><tr><td>ZIEXT</td><td>IEX</td><td>F</td></tr><tr><td>ZEXIT</td><td>IEX</td><td>F</td></tr><tr><td>ZXIET</td><td>IEX</td><td>F</td></tr></table>	Test Symbol	Listing Market	CQS Network	CBO	NYSE	E	CBX	NYSE	E	NTEST	NYSE	E	IBO	NYSE MKT	F	ATEST	NYSE MKT	F	IGZ	NYSE Arca	F	ZVV	NYSE Arca	F	ZZK	NYSE Arca	F	ZZZ	NYSE Arca	F	PTEST	NYSE Arca	F	ZBZX	Bats BZX	F	ZTEST	Bats BZX	F	ZTST	Bats BZX	F	ZIEXT	IEX	F	ZEXIT	IEX	F	ZXIET	IEX	F
Test Symbol	Listing Market	CQS Network																																																			
CBO	NYSE	E																																																			
CBX	NYSE	E																																																			
NTEST	NYSE	E																																																			
IBO	NYSE MKT	F																																																			
ATEST	NYSE MKT	F																																																			
IGZ	NYSE Arca	F																																																			
ZVV	NYSE Arca	F																																																			
ZZK	NYSE Arca	F																																																			
ZZZ	NYSE Arca	F																																																			
PTEST	NYSE Arca	F																																																			
ZBZX	Bats BZX	F																																																			
ZTEST	Bats BZX	F																																																			
ZTST	Bats BZX	F																																																			
ZIEXT	IEX	F																																																			
ZEXIT	IEX	F																																																			
ZXIET	IEX	F																																																			
SETTLEMENT CONDITION	1	<div>Alphanumeric.</div> <div>Identifies the settlement condition for a security.</div> <div>Reference: Appendix B for definition of values.</div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>A</td><td>Regular Way Settlement</td></tr><tr><td>B</td><td>Cash (only) Settlement</td></tr><tr><td>H</td><td>Next Day (only) Settlement</td></tr></table>	Code	Value	A	Regular Way Settlement	B	Cash (only) Settlement	H	Next Day (only) Settlement																																											
Code	Value																																																				
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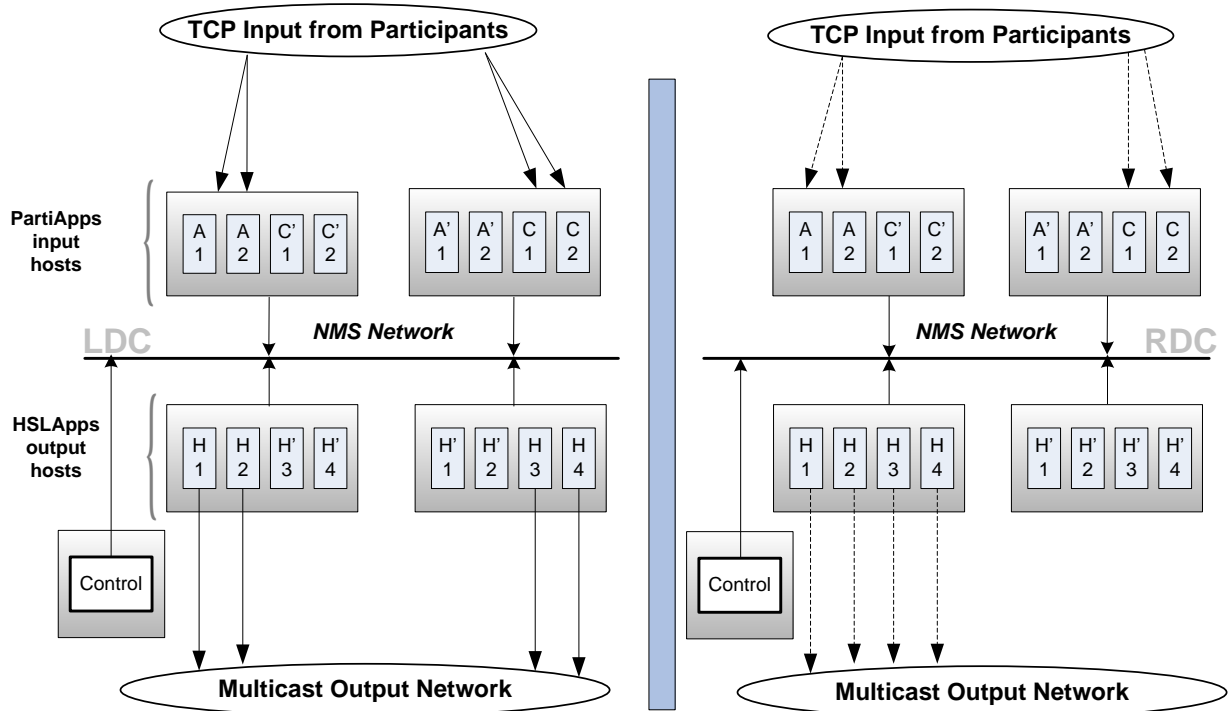
**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

FIELD DESCRIPTIONS

Field Name	Bytes	Description										
SHORT SALE RESTRICTION INDICATOR	1	<p>Alphanumeric, Space-filled.</p> <p>Identifies whether or not a Short Sale Restriction is in effect. Populated by the Primary Listing Market for a security, with the previous quote price.</p> <div><p>Day 1: 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>Day 2: 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>Day 3: 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></div> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Blank</td><td>Short Sale Restriction Not in Effect</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>	Code	Value	Blank	Short Sale Restriction Not in Effect	A	Short Sale Restriction Activated	C	Short Sale Restriction Continued	D	Short Sale Restriction Deactivated
Code	Value											
Blank	Short Sale Restriction Not in Effect											
A	Short Sale Restriction Activated											
C	Short Sale Restriction Continued											
D	Short Sale Restriction Deactivated											

APPENDIX A: DUAL SITE CONFIGURATION

CTS / CQS DUAL SITE CONFIGURATION



**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
CASH (only) SETTLEMENT	A security settling in cash all day on a participant, or on a 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 (only) settlement.
CROSSED MARKET	Indicates a Bid Price, which is greater than the Offer Price for a security for a quote. (Only applicable to Network 'F' Bonds.)
CTA ELIGIBLE	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 NYSE MKT Stock Market for such securities.
INTERMARKET TRADING SYSTEM (ITS)	An automated system through which Specialists, Brokers and Market Makers at the NYSE, NYSE MKT Stock Market and Regional Exchanges can obtain executions for customer orders at the National Best Bid and/or Offer prices.
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.
LOCAL ISSUE	A Local Issue is an issue that does <u>not</u> meet NYSE MKT Stock Market or NYSE listing requirements (is not CTA eligible) but is traded at one or more Regional Exchanges.
LOCKED MARKET	Indicates an identical Bid and Offer Price for a security for a quote. (Only applicable to Network 'F' Bonds.).

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
MARKET-WIDE CIRCUIT BREAKER LEVEL 1 – 7% DECLINE	<p>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.</p> <p>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.</p>
MARKET-WIDE CIRCUIT BREAKER LEVEL 1 – 13% DECLINE	<p>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.</p> <p>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.</p>
MARKET-WIDE CIRCUIT BREAKER LEVEL 1 – 20% DECLINE	<p>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.</p> <p>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 <u>not</u> Resume for the remainder of the trading day.</p>

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
NEXT DAY (only) SETTLEMENT	Same definitions as cash (only) settlement except settlement is next day.
NON-REGULATORY OPENING DELAY OR TRADING HALT	<p>An operational Opening Delay or Trading Halt for a Participant due to Order Imbalance, Slow Quote Due to an LRP or Gap Quote on the Bid Side, Equipment Changeover or Due to Related Security.</p> <p>In addition, Due to Related Security can be used in conjunction with a non-regulatory Delay/Halt Reason, i.e., Order Imbalance, Slow Quote Due to an LRP or Gap Quote on the Bid Side or Equipment Changeover.</p>
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	<p>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.</p> <p>Quote Condition '4' is anticipated to be input with a zero bid price, zero bid size, zero offer price and zero offer size.</p>
OPENING DELAY	Postponement of the opening of trading in a security for a Participant.
PRICE INDICATION	Reflects an approximate price range of what a security's trading range (bid and offer prices, no sizes) will be when trading resumes after an Opening Delay or a Trading Halt.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
REGULATORY OPENING DELAY OR TRADING HALT	<p>An Opening Delay or Trading Halt in a particular security for a Listing Market in advance of a major news announcement and is noted with a News Dissemination, News Pending or Volatility Market Pause quote condition.</p> <p>In addition, Due to Related Security can be used in conjunction with a regulatory Delay/Halt Reason, i.e., News Dissemination or News Pending.</p>
REGULAR WAY SETTLEMENT	The settlement date is within three (3) business days following the date of the transaction.
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 Opening Delayed or 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 Opening Delay or Trading Halt for a security whose price may fall below \$1.05, possibly leading to a sub-penny execution.
TRADING HALT	Temporary halt in the trading of a particular security by a Participant.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX C: FINRA OPEN / FINRA CLOSED

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

Upon detection of a FINRA Open (Category-A 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-A 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-A 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-A 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-A Type-C) message, individual Market Maker quotes in either the Open or Closed state may be transmitted in the FINRA Open (Category-A Type-O) or Local Issue Quote (Category-A Type-N) message format, with the state of the quote indicated in the Quote Condition field of the message text as one of the following:

R	-	Regular (Open Market Maker Quote)
L	-	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 and FINRA BBO. The National and FINRA BBO calculations are 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 and FINRA 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 and FINRA Best Bid & Offer (BBO) calculations.
2. Those that do not qualify for inclusion in the National and FINRA Best Bid & Offer (BBO) calculations.

Most quote conditions that **do not** qualify for inclusion in the National and FINRA BBO calculations indicate trading suspensions in a security.

BBO Eligible Quotes

The quote conditions in this section indicate active trading sessions in which quotes qualify for inclusion in the National and FINRA BBO calculation.

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.

APPENDIX D: QUOTE CONDITIONS

BBO Eligible Quotes, *continued*

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.

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.

APPENDIX D: QUOTE CONDITIONS

BBO Eligible Quotes, *continued*

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.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX D: QUOTE CONDITIONS

BBO Ineligible Quotes, *continued*

The quote conditions which result in quotes **not** qualifying for inclusion in the National and FINRA BBO calculations fall into distinct categories: closing quotes, opening delays/trading halts, price indications/trading range indications and non-firm quotes. To indicate an opening delay or a trading halt, a quote with the condition:

Code	Value
C	Closing
D	News Dissemination
I	Order Imbalance
G	Trading Range Indication
I	Order Imbalance
J	Due To Related Security-News Dissemination
K	Due To Related Security-News Pending
L	Closed Market Maker (FINRA)
M	Limit Up-Limit Down (LULD) Trading Pause
N	Non-Firm Quote
P	News Pending
Q	Undefined
S	Due To Related Security
T	Resume
U	Slow Quote Due to NYSE Liquidity Replenishment Point (LRP), or Gap Quote on both Bid and Offer Sides
V	In View of Common
W	Slow Quote Due to Set Slow List on Both the Bid and Offer Sides
X	Equipment Changeover
Y	Sub-Penny Trading
Z	No Open/No Resume
1	Market-Wide Circuit Breaker Level 1 - Breached
2	Market-Wide Circuit Breaker Level 2 - Breached
3	Market-Wide Circuit Breaker Level 3 - Breached
4	On Demand Intra-Day Auction

along with zero-filled bid/offer price and size fields are disseminated over CQS. Prior to re-commencing activity in a security (during an opening delay or trading halt), some of these conditions are used to indicate a probable trading price range (price indication) for a security. A bid and/or an offer without its corresponding size(s), is disseminated along with the appropriate condition.

APPENDIX D: QUOTE CONDITIONS

BBO Ineligible Quotes, *continued*

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 D - News Dissemination

This regulatory Opening Delay or Trading Halt is used when relevant news influencing the security is being disseminated. Trading is suspended until the primary market determines that an adequate publication or disclosure of information has occurred.

Quote Condition G - Trading Range Indication

The trading range indication is used to denote the probable trading range (bid and offer prices, no sizes) of a security that is **not** Opening Delayed or Trading Halted. The Trading Range Indication is used prior to or after the opening of a security.

Quote Condition I - Order Imbalance

This non-regulatory Opening Delay or Trading Halt is used when there is a significant imbalance of buy or sell orders.

Quote Condition J - Due to Related Security - News Dissemination

This regulatory Opening Delay or Trading Halt is used when news, which may influence the price of the stock, has been disseminated for a related security. Trading is suspended until the resultant impact is assessed.

Quote Condition K - Due to Related Security - News Pending

This quote condition indicates a regulatory Opening Delay or Trading Halt due to an expected news announcement in a related security. An Opening Delay or Trading Halt may be continued once the news has been disseminated.

APPENDIX D: QUOTE CONDITIONS

BBO Ineligible Quotes, *continued*

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 M – Limit Up-Limit Down (LULD) Trading Pause

This quote condition indicates a regulatory Opening Delay or Trading Halt due to conditions in which a stock experiences a 10% or more change in price over a five minute period.

Quote Condition N - Non-Firm Quote

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

Quote Condition P - News Pending

This condition is used to indicate a regulatory Opening Delay or Trading Halt due to an expected news announcement, which may influence the security. An Opening Delay or Trading Halt may be continued once the news has been disseminated.

Quote Condition Q - *Undefined*

Quote Condition S - Due to Related Security

This non-regulatory Opening Delay or Trading Halt is used when events relating to one security will affect the price and performance of another related security (e.g., a call for redemption of a convertible preferred security or convertible debt security which could affect the related common security). This non-regulatory Opening Delay or Trading Halt is also used when non-regulatory halt reasons such as Order Imbalance, Slow Quote Due to an LRP or Gap Quote on the Bid Side and Equipment Changeover are combined with Due To related Security on CQS.

APPENDIX D: QUOTE CONDITIONS

BBO Ineligible Quotes, *continued*

Quote Condition T - 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 has been Opening delayed or Trading Halted.

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 V - In View of Common

This quote condition is used when matters affecting the common stock of a company affect the performance of the non-common associated securities, e.g., warrants, rights, preferred, classes, etc. Those securities, which must be of the same company, are globally Opening Delayed, Trading Halted, or No Open/No Resume for a Participant in view of the common stock.

Quote Condition X - Equipment Changeover

This non-regulatory Opening Delay or Trading Halt is used when the ability to trade a security by a Participant is temporarily inhibited due to a systems, equipment or communications facility problem or for other technical reasons.

Quote Condition Y – Sub-Penny Trading

This non-regulatory Opening Delay or Trading Halt is used to indicate an Opening Delay or Trading Halt for a security whose price may fall below \$1.05, possibly leading to a sub-penny execution.

Quote Condition Z - No Open/No Resume

This quote condition is used to indicate that an Opening Delay or a Trading Halt is to be in effect for the rest of the trading day in a security for a Participant.

APPENDIX D: QUOTE CONDITIONS

BBO Ineligible Quotes, *continued*

Quote Condition 1 – Market-Wide Circuit Breaker Level 1 – Breached

This quote condition is used to indicate 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.

Quote Condition 2 – Market-Wide Circuit Breaker Level 2 – Breached

This quote condition is used to indicate 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.

Quote Condition 3 – Market-Wide Circuit Breaker Level 3 – Breached

This quote condition is used to indicate 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 not Resume for the remainder of the trading day.

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.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX E: NATIONAL AND FINRA BEST BID AND OFFER OVERVIEW

National Best Bid and Best Offer calculations are performed for each Market Center beginning at various times (between 4:00 a.m. and 9:30 a.m. ET) 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 and/or FINRA BBO, the appropriate National and/or FINRA 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 and/or FINRA BBO.

A new quote can be the entire new National and FINRA BBO quote (both Bid and Offer). In addition, the National and FINRA 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 and FINRA 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).

Note: To avoid dissemination of duplicate National or FINRA BBO calculations: if a quote is received from a Participant who is currently part or all of the National or FINRA BBO, and the National or FINRA BBO's are **not** affected by the quote, then the National or FINRA BBO is **not** updated with a later time, and appendages are **not** added.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

NATIONAL AND FINRA BEST BID AND OFFER OVERVIEW, *continued*

BBO Considerations

There are several trading conditions that affect the calculation of a National and FINRA BBO for a security, including:

Non-Qualifying Quote Conditions

If a quote with a non-qualifying quote condition is entered from a Participant which made up part or the entire current National and FINRA BBO, CQS will calculate and append a new National and FINRA BBO to the non-qualifying conditional output ML (Multicast Line) Short or Long Quote message.

Participant Overall Halt in Trading

If a Participant were to halt trading in all securities during the trading day (due to computer failure, market shutdown, etc.), CQS, when instructed by the Participant, can send a "Zero Quote" for those issues in which that Participant had an outstanding BBO eligible quote. A new National and a FINRA BBO are calculated and, if necessary, either or both appended to the output HSL Short or Long Quote message.

FINRA BBO Considerations

FINRA submits individual FINRA Market Maker quotes. A FINRA BBO is calculated and included in the National BBO calculations.

If a new FINRA quote causes a new FINRA BBO, the appropriate FINRA BBO information, including Market Maker identifiers, is appended to the output HSL Short or Long Quote message.

If part of the new FINRA BBO is also part of the new National BBO, the appropriate National BBO information is also appended to the new output HSL Short or Long Quote message.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX F: 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 HSL and appends a new BBO, excluding that Participant, if that Participant was part of the current BBO.

Participants in CQS are excluded from the BBO calculation at the Participant's designated closing time. A Participant can have multiple closing times, on a per security basis, thus allowing inclusion of quotes in the BBO calculation for those securities, which have not been closed. When a Participant is closed, CQS cycles through its database and disseminates a closing quote message using that Participant's last BBO eligible quote for only those securities for which that Participant was part or all of the current BBO. A Participant can continue to submit quotes for securities, which have been closed; however, the quotes will **not** be included in the BBO calculations.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX G: ALLOWABLE SYMBOL SUFFIXES FOR CQS QUOTES*

Suffix	Description
-A-	
.A	Series (or Class) A Also Series B-T & V-Z
.A.CL	Series A Called Also Series B-T & V-Z
.A.CV	Series A Convertible Also Series B-T & V-Z
.Aw	Series A When Issued Also Series B-T & V-Z
-C-	
.CL	Called
.CT	Certificates
.CV	Convertible
.CVR	Contingent Value Right
.CV.CL	Convertible Called
-D-	
.DP	Amount of most recent Dividend to go “ex-distribution” (CTS Only)
.DV	Accumulated dividend per share, net of expenses, through and including the previous day’s close of trading (CTS Only)
-E-	
.EC	EMERGING COMPANY MARKETPLACE SM
.EU	Estimated cash amount per creation unit (CTS Only)

* All inclusive list of allowable symbol suffixes. Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

ALLOWABLE SYMBOL SUFFIXES FOR CQS QUOTES*

Suffix	Description
-F-	
.F.N	Foreign News
-I-	
.ID	Index – differentiates an index from a stock with the same root symbol
.IV	Intraday Net Asset Value per share
-M-	
.MN	“Mini”
-N-	
.NV	Net Asset Value per share, as of the close on the previous trading day (CTS Only)
-P-	
.PO	Percent Paid
.PP	Partial Paid
.PT.CL	Part Called
p	Preferred
pA	Preferred Series A Also Series B-T & V-Z
pA.CV	Preferred Series A Convertible. Also Series B-T & V-Z
pA.CL	Preferred Series A Called Also Series B-T & V-Z
pAw	Preferred Series A When Issued Also Series B-T & V-Z
pw	Preferred When Issued

*All inclusive list of allowable symbol suffixes. Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

ALLOWABLE SYMBOL SUFFIXES FOR CQS QUOTES*

Suffix	Description
-P-	
p.CL	Preferred Called
p.CV	Preferred Convertible
p.CV.CL	Preferred Convertible Called
p.WD	Preferred When Distributed
p.CA	Indicates Class A of a Second Category of Preferred Could also be B-K and M-S
-R-	
r	Rights
rw	Rights When Issued
-S-	
.SC	Small Corporate Offering Registration
.SD	Stamped
.SM	“Mini” Settlement
.SO	Current Shares outstanding, in thousands (CTS Only)
.SP	Special
.SV	Settlement

* All inclusive list of allowable symbol suffixes. Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

ALLOWABLE SYMBOL SUFFIXES FOR CQS QUOTES*

Suffix	Description
-T-	
.TEST	Exclusive suffix used for intraday quote test messages Note: A Test Message requires that a suffix of '.TEST' be used, with any base symbol that is <u>not</u> in the CQS database.
.TC	Total cash amount per creation unit in thousands (CTS Only)
.TT	Tier II Securities
-U-	
.U	Units (A combination of securities composed of two or more warrants, common stocks, preferred stocks and/or Network 'F' Bonds)
-V-	
.VR	Variable Common Right
-W-	
.WD	When Distributed
w	When Issued
.WS	Warrants
.W.WS	With Warrants
.WS.A	Warrants Series A Also: Series B-T & V-Z
.WSw	Warrants When Issued

* All inclusive list of allowable symbol suffixes. Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX H: TEMPORARY SUFFIX REPRESENTATION

Note: Temporary Suffixes are represented in a codified 'Temporary Suffix' field. Refer to the Field Descriptions section of this document for the Temporary Suffix codes.

TEMPORARY SUFFIX	REPRESENTATION
Ex-Dividend	XD
Ex-Distribution	XDIS
Ex-Rights	Xr
New	N
Ex-Interest	XI

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX I: INPUT ERROR CONDITIONS

ERROR CODE	DESCRIPTION - MESSAGE HEADER ERRORS
1	INVALID MESSAGE CATEGORY AND TYPE
2	INVALID ORIGINATING PARTICIPANT CODE
3	INVALID MESSAGE DESTINATION CODE
4	INVALID POSSIBLE DUPLICATION FLAG
6	INVALID SHORT SALE RESTRICTION INDICATOR
7	MISSING MESSAGE - THE CURRENT SEQUENCE NUMBER IS GREATER THAN EXPECTED. THE MESSAGE IS ACCEPTED.
8	DUPLICATE MESSAGE - THE CURRENT SEQUENCE NUMBER IS LESS THAN OR EQUAL TO THAT OF THE LAST MESSAGE PROCESSED. THE EXPECTED MESSAGE SEQUENCE NUMBER IS NOT INCREMENTED AND THE MESSAGE IS <u>NOT</u> ACCEPTED.
10	INVALID MESSAGE LENGTH - LENGTH IS BEYOND ACCEPTABLE BOUNDS FOR THE MESSAGE.
11	MESSAGE NOT ACCEPTABLE BEFORE CQS MARKET OPEN OR AFTER CQS MARKET CLOSE.
12	SEQUENCE NUMBER NOT NUMERIC
13	INVALID CANCEL INDICATOR
14	INVALID SETTLEMENT CONDITION
15	INVALID MARKET CONDITION
16	INVALID TIMESTAMP
17	INVALID INSTRUMENT TYPE
18	INVALID MARKET MAKER ID
19	INVALID LOCAL ISSUE OR BOND TYPE

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX I: INPUT ERROR CONDITIONS

ERROR CODE	DESCRIPTION - MESSAGE HEADER ERRORS
20 - 25	RESERVED
26	INVALID STOCK SYMBOL (EITHER THE STOCK SYMBOL AND SUFFIX ARE INCORRECT OR NO MASTER RECORD EXISTS FOR THE STOCK)
27 - 30	NOT USED IN CQS
31	INVALID QUOTE CONDITION
32	NOT USED IN CQS
33 - 34	RESERVED
35	INVALID DENOMINATOR CODE
36	INVALID RETAIL INTEREST INDICATOR
37-44	RESERVED
45	INVALID BANKRUPTCY SETTING
46	INVALID BANKRUPTCY CODE
47	INVALID BID PRICE
48	INVALID BID SIZE
49	INVALID OFFER PRICE
50	INVALID OFFER SIZE
51	NOT USED IN COMPUTER INTERFACE

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX J - ASCII PRINTABLE CHARACTER BASE 95 (32-126 Inclusive)

ASCII	DEC	Description	ASCII	DEC	Description
	32	Space	<	60	Less than
!	33	Exclamation	=	61	Equals
"	34	Double quotes	>	62	Greater than
#	35	Number	?	63	Question mark
\$	36	Dollar	@	64	At symbol
%	37	Percent	A	65	Uppercase A
&	38	Ampersand	B	66	Uppercase B
'	39	Single Quote	C	67	Uppercase C
(40	Open Parenthesis	D	68	Uppercase D
)	41	Close Parenthesis	E	69	Uppercase E
*	42	Asterisk	F	70	Uppercase F
+	43	Plus	G	71	Uppercase G
,	44	Comma	H	72	Uppercase H
-	45	Hyphen	I	73	Uppercase I
.	46	Period	J	74	Uppercase J
/	47	Slash or Divide	K	75	Uppercase K
0	48	Zero	L	76	Uppercase L
1	49	One	M	77	Uppercase M
2	50	Two	N	78	Uppercase N
3	51	Three	O	79	Uppercase O
4	52	Four	P	80	Uppercase P
5	53	Five	Q	81	Uppercase Q
6	54	Six	R	82	Uppercase R
7	55	Seven	S	83	Uppercase S
8	56	Eight	T	84	Uppercase T
9	57	Nine	U	85	Uppercase U
:	58	Colon	V	86	Uppercase V
;	59	Semicolon	W	87	Uppercase W

**CONSOLIDATED QUOTATION SYSTEM (CQS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION**

APPENDIX J- ASCII PRINTABLE CHARACTER BASE 95 (32-126 Inclusive), continued

ASCII	DEC	Description	ASCII	DEC	Description
X	88	Uppercase X	u	117	Lowercase u
Y	89	Uppercase Y	v	118	Lowercase v
Z	90	Uppercase Z	w	119	Lowercase w
[91	Opening bracket	x	120	Lowercase x
\	92	Backslash	y	121	Lowercase y
]	93	Closing bracket	z	122	Lowercase z
^	94	Caret	{	123	Opening Brace
_	95	Underscore	 	124	Vertical Bar
`	96	Grave accent	}	125	Closing Brace
a	97	Lowercase a	~	126	Equivalency Sign-Tilde
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			