Options Price Reporting Authority
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Chicago, IL 60605

OPRA

OPTIONS PRICE REPORTING AUTHORITY

BINARY PARTICIPANT INTERFACE SPECIFICATION

June 22, 2026

Version 5.1

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ADDENDUMS

1. TCP/IP FOR NATIONAL MARKET SYSTEM (NMS) PARTICIPANT INPUT

THE ADDENDUM IS AVAILABLE FROM WWW.OPRAPLAN.COM UNDER INPUT SPECIFICATIONS-BINARY.

DOCUMENT HISTORY

Version	Date	Description
1.9	5/4/2015	- Section 4.04: Block Header - updated with new version number - Section 5.0: Message Header - updated to include the new expanded message header - Message Formats (throughout): updated to include the new expanded message header
2.0	5/18/2015	- Section 5.01, 10.01 and Appendix 'C': Added New Exchange: EDGX Options
2.1	3/22/2016	- Section 5.0: Message Header - updated to remove the old header - Message Formats (throughout): updated to remove the old header - Appendix D – Expanded Index Symbol – Remove 3 digit restriction
2.2	10/21/2016	- Added new Participant MIAX PEARL
2.3	5/12/2017 & 8/21	- 5.00 & 6.00 - Added new Indicative Value Message Type 'I'
2.4	7/11/2017	- Revise NYSE AMEX to NYSE American
2.5	5/11/2018	- 10.17 Updated Line Integrity characteristics section with OPRA response back to participant
2.6	10/18/18	- Appendix D, pages 73 -74: Expanded quote size values from 5 to 6 positions
2.7	10/24/2018	- Added new Participant MIAX EMERALD
2.8	02/25/2019	- Updated all references from old website of www.opradata.com to new website of www.opraplan.com.
2.9	3/1/2019	- Message Types: Added future new trade message types table (Activation November 4, 2019), page 18 - 19. - Block Sequence Number rollover increase updated on page 12 - Verbiage added for Block Sequence Number Reset after Disaster Recovery site activation, page 67 & 69
3.0	3/27/2019	- Added trade code "d" to New Message Types table, page 21
3.1	4/5/2019	- Message Types: Updated new trade messages type table as per the OPRA committee's agreed revisions, page 18 - 19
3.2	4/22/2019	- Administrative Message bytes length for existing and new message format versions
3.3	8/7/2019	- Added notation on Trade Type Codes that will be removed on November 4, 2019, on pages 17 - 21, pending any fallback - Modified Nasdaq Participant ID names and abbreviations: pages 15, 63
3.4	9/17/2019	- Updated list of Trade Type codes that will continue/obsolete after November 4, 2019, page 19 & 21
3.5	5/22/2020	- Added: Delta at Close fields under Administrative Flex messages - Deleted: obsolete Last Sale message types

DOCUMENT HISTORY

Version	Date	Description
4.0	12/16/2020	Added: - Section 'Dual Site Redundancy' to describe redundancy for data input - Section "Error Handling" to describe system behavior for handling for various levels of rejects - Mandatory Timeout interval for all input lines Modified: - Description of Input data throttling mechanism - Section 'OPRA interface Method' to cover changes in interface method - Block Sequence Number limit to rollover occur after 4,294,967,295 - Section 'Data Transmission' updated to disconnect participant line upon receiving malformed data - Administrative (Category C) message to only allow printable ASCII characters - Maximum allowed length for Administrative (Category C) message - Control (Category H) message updated to a fixed length (Message Header Only) - Line integrity (Category H Type O) - Message is no longer request-response driven, OPRA will send it based on configured interval - Start of Day time for Regular and Extended lines - Minor edits and clarifications throughout document Eliminated: - Test Cycles scheduled prior to SOD - Control (Category H) message types A, B, D, G, h, I - Rollover of Message Count Status after 9,999,999,999
4.0a	01/22/2021	Modified: - End of Day time from 7:00 pm to 6:05 pm
4.0b	02/5/2021	- Eliminated Open Interest publication on Extended Lines - Clarified system acceptance time for Indicative Quote (Message Type I) - Corrected Summary of Message Category & Type table to include missing message type S
4.0c	4/26/2021	- Added code 'u' and 'v' to the list of Message Types supported for Equity and Index Last Sale message
4.0d	5/3/2021	- Updated description for Trade Codes 'u' and 'v' for Equity and Index Last Sale message
4.0e	6/11/2021	- Added clarification for Price Field Validation under Appendix D - Special Processing Field Restrictions
5.0	06/15/2021	- Extended Session naming convention replaced with Global Trading Hours along with an updated trading schedule, effective November 21, 2021
5.0a	7/30/2021	- Added list of OPRA Test Symbols
5.0b	03/25/2022	- Removed unused Block Sequence Number Status Mismatch message
5.0c	04/10/2023	- Added new Participant MEMX

DOCUMENT HISTORY

Version	Date	Description
5.0d	07/07/2023	- Added section 1.03 to clarify system behavior during Failure Recovery
5.0e	11/22/2023	- Added Participant Code for new Participant MIAX Sapphire
5.0f	01/29/2024	- Removed Test Symbol 'ZZZ' and 'IBO' under Security Symbol Field Description
5.0g	06/12/2024	- Updated OPRA Configuration diagram under Appendix A to remove reference to 'ICE Global Network'
5.0h	07/25/2024	- Updated Global Trading Hour (GTH) session end time from 9:15 am to 9:25 am
5.0i	02/20/2026	- Added Participant Code for new Participants IEX and MX2
5.1	06/21/2026	- Added Trading Session Identifier in the Equity and Index Last Sale message

1.0 INTRODUCTION

The Securities Industry Automation Corporation (SIAC) serves as the Processor for the Options Price Reporting Authority (OPRA). In fulfilling its role as the Processor, SIAC plans, develops, operates and maintains the OPRA system.

1.01 BACKGROUND

OPRA receives options transactions generated by participating U.S. Options Markets. In addition, OPRA calculates and identifies the "Best Bid and Best Offer" (BBO – highest bid and lowest offer). OPRA consolidates this information and disseminates it via computer-to-computer linkages to the financial community in the U.S. and abroad.

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

Computer systems that support the processing and dissemination of option transactions are operational at primary and backup sites. The backup site provides recovery capability in the event of a disaster at the primary site. Through computerized communications equipment, OPRA transaction data is disseminated from either the primary or backup site. The OPRA site configuration is illustrated in **Appendix A**.

1.02 Dual Site Redundancy

OPRA systems that support the processing and dissemination of Trade and Quote data are operational at primary and backup sites. The backup site provides recovery capability in the event of a disaster at the primary site. OPRA transaction data is disseminated from either the primary or backup site. The dual-site configuration provides system fold-over for a limited site disaster (system failure) or full site disaster (loss of facility).

Participants can input transaction data to OPRA on either the Primary or the Backup Site, however the data is disseminated by OPRA only from Primary Site under normal operations. Dual input to both primary and Backup Data Centers sites may not be supported in case of a Site failure. In the event of a Primary Data Center failover to the Disaster Recovery site (Backup Data Center), all Participant input socket connections at the Primary Data Center will be closed. Participants should have an automated mechanism in place once a Participant's Primary Data Center's input sockets close, to 'hunt' for the Participant's open input sockets at the Backup Data Center, and immediately establish input connectivity to either their primary or backup input connections (primary and backup connections are assigned the same port number however, the IP addresses are different).

1.03 Failure Recovery

1.03.1 Input Gateway Failure and Recovery

- In the event the Primary input Gateway connection encounters an unexpected state, Input Participants can reconnect to the Secondary (backup) input connection

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

1.03.2 Primary Data Center Failure Recovery

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

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

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

- Upon restart:
    - Output block sequence for all the lines is reset to one (1) and System transmits the Reset Block Sequence Number (Category H Type K) message
    - Zero Quotes (Quote messages with Zero Price and Size) are published on behalf of all participants across all symbols, and NBBO is not persisted.
    - Input Lines are enabled and Data Publication Resumes
    - Messages prior to the Restart cannot be requested for Retransmission

Note: In the event of Input Gateway Failure Recovery or Primary Data Center Failure Recovery, OPRA publishes Zero Quotes on behalf of all participants across all symbols. As such, upon reconnection it is recommended that Participants publish the latest quotes for all their symbols in addition to resending any missed messages while OPRA was unavailable.

1.04 SCOPE

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

2.0 GENERAL DESIGN OF DATA DISTRIBUTION NETWORK

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

2.01 TCP/IP NETWORK INTERFACE

The requirements for the TCP/IP Network Interface are defined in Section 4.0 of this document and in the addendum to this document, "TCP/IP for National Market System (NMS) Participant Input". This addendum is available from www.opraplan.com.

2.02 TCP/IP INPUT THROTTLING

Input messages for each line are read at a pre-assigned rate, currently 1000 messages per millisecond. A line is throttled when a participant exceeds the maximum number of messages allowed during the current time window. Throttled messages are queued and processed in time sequence as the message read rate allows.

3.0 OPRA INTERFACE METHOD

Any Participant may input to OPRA over multiple logical TCP/IP connections. Each logical connection is considered as a complete independent entity. OPRA will not attempt to correlate input coming in over these multiple inputs. Participants have the option of inputting over all input lines on a round robin basis or utilizing specific lines for specific symbols.

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

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

Restart considerations consist of getting the systems involved back into synchronization from the point of failure. In the event of a TCP/IP socket connection interruption and re-establishment, SIAC recommends that the Participant system, prior to sending data, generate an inquiry message to obtain the last sequence number received by OPRA. This can be accomplished by utilizing the Block Sequence Number Status Inquiry Request (Category N, Type L) message (Participant generated), and Block Sequence Number Status Response (Category N, Type M) Solicited message (SIAC generated). If there is a discrepancy in the sequence numbers and OPRA expects a lower sequence number than what the Participant system is ready to send, the Participant system should re-send the messages in question, before generating any new messages.

Note: OPRA can reset the Block Sequence number on input lines to a value higher than the last processed Block Sequence number (e.g. this can be done if there are issues in sequence number handshake between a participant and OPRA on an input line). Participant system shall be able to process the jump in next expected block sequence number when reestablishing connection with OPRA.

3.01 GENERAL DESIGN CONSIDERATION

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

4.0 TRANSMISSION CHARACTERISTICS

4.01 DATA TRANSMISSION

Data transmitted between the Participants and OPRA is sent using TCP/IP. For a description of the TCP/IP Segment, please reference section 7 of the addendum to this document, "TCP/IP for NMS Participant Input"). This addendum is available from www.opraplan.com. TCP/IP Header is not returned to the application on reading the socket.

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

The block separator will be used to determine the start of the OPRA Binary Block. It is the Participant's responsibility to create the correct OPRA Binary Block structure: block separator, version byte, block length, check sum and pad byte (when needed). Incorrect block structure information (e.g. incorrectly formatted Block Header, invalid Block Data etc.) will result in block being rejected, possibly followed by a port level disconnect.

4.02 BLOCK SEPARATOR

The separator is a 2 Byte sequence of Hex 0xA5 & 0x5A (offers better guarantees that the format will be identified correctly). The Block Separator is not included in the block size it is independent of the Block. Every Block must be preceded by a Block Separator.

4.03 OPRA BINARY BLOCK STRUCTURE

Block Structure	Bytes
Block Header	21
Block Data	Variable
Block Pad Byte (if required)	1

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

4.04 BLOCK HEADER

Field Name	Length (bytes)	Modification
Version	1	New Version 4
Block Size	2	
Reserved*	1	
Reserved*	1	
Reserved*	1	
Block Sequence Number	4	
Messages In Block	1	
Block Timestamp	8	
Block CheckSum	2	
Total Length:	**21**	

4.04.1 VERSION

1 Byte, unsigned integer. Indicates the OPRA binary protocol version. Version value is set to 4 (Hex 0x04) for current version

4.04.2 BLOCK SIZE

2 Bytes, unsigned integer. Size in bytes of entire block (as described in 4.01)

4.04.3 RESERVED

1 Byte, unsigned integer. Value is binary zero (Hex 0x00). Reserved for future use.

4.04.4 RESERVED

1 Byte, unsigned integer. Value is binary zero (Hex 0x00). Reserved for future use.

4.04.5 RESERVED

1 Byte, unsigned integer. Value is binary zero (Hex 0x00). Reserved for future use.

* Note: To maintain consistency between the input and output message format the “Reserved” field is represented as three separate fields.

4.04.6 BLOCK SEQUENCE NUMBER

4 Bytes, unsigned integer. All transmission blocks are assigned a sequential Block Sequence Number. Block Sequence Number rolls over after 4,294,967,295 to 1. On a per line basis, the Block Sequence Number on the lines are set to Zero at the start of each day, and incremented by one each time a block is transmitted, with the following conditions:

1. OPRA expects a one (1) as first Block Sequence Number.
2. All Sequence Number Status Messages (Category 'N') have a zero block sequence number.
3. The Block Sequence Number field is not incremented for Participant to OPRA Line Integrity (Category H Type O) messages

4.04.7 MESSAGES IN BLOCK

1 byte, unsigned integer. The number of messages contained in the block data.

4.04.8 BLOCK TIMESTAMP

8 Bytes, contains the block timestamp. The first 4 bytes (Seconds) contains the number of seconds from epoch 1/1/1970, 00:00:00 UTC. The next 4 bytes contain the nanosecond portion of the time.

SIAC recommends to represent this time in HH:MM:SS.mmmmmm format EST/EDT when communicating with OPRA.

4.04.9 BLOCK CHECKSUM

2 Bytes, Unsigned Integer. Lower 16 bits of the 32 bit sum of all bytes in the block, excluding the Block Checksum field.

4.05 BLOCK DATA

The Block Data consists of one or more OPRA messages.

A message consists of a Message Header, which is of fixed length and format, and Message Data, which is variable in length and format.

Message categories C (Administrative), H (Control) and N (Sequence / Message Count Status) are each sent in their own individual block.

The Block Data structure is depicted below:

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

4.06 BLOCK PAD BYTE

1 Byte, unsigned integer contains binary zero (Hex 0x00). Only used when the length of a block consists of an odd number of bytes. It is then added to the block to ensure the block is an even number of bytes.

4.07 DATA FORMAT

1. Numeric values will be 1, 2, 4 or 8 byte binary integers and will be sent in network order (big-endian)

2. Any value that is unused or does not apply to a given message type has a value of Hex 0x00, except where noted.

3. Prices and index values are represented as either 2 byte unsigned integers in Short Quotes (category q) or 4 byte signed integers in all other message categories, except where noted. Price and index values will be restricted to 8 digits and will be non-negative.

4. All other numeric fields (sizes, volumes, fields in the block header) will be represented as 1, 2, or 4 byte unsigned integers, except where noted. Reference Appendix ‘D’ for field size restrictions.

5. ASCII characters are either digits (‘0’-‘9’), upper or lower case letters (‘A’-‘Z’, ‘a’-‘z’) or space (‘ ’).

6. All negative values will be represented as 2’s compliment.

4.08 ERROR HANDLING

It is the Participant's responsibility to submit syntactically correct messages. Any message block with invalid structure or incorrect data will result in the bock getting rejected (a reject message is not sent back to the Participant). There are various levels of validations performed on the input messages as follows:

1. Any incorrectly formatted message block results in the block being rejected, immediately followed by a port level disconnect. The Block Sequence number is not incremented in this case since it cannot be ascertained whether any part of the message block is valid. Syntax errors include:
    - Incorrect Block Header information, e.g. wrong version, Block Size or number of messages contained in block
    - Invalid Block Structure, e.g. Block containing more than one 1 Control Message (Category H), Administrative message (Category C) or Sequence Status message (Category N)
    - Syntactically invalid data
    - Unrecognized Message Category/Type
    - Incorrect Message Length for the Message Category/Type

2. Incorrect Session Level information results in entire message block or an individual message being rejected. For each connection, upon breaching a maximum number of session level rejects, the input port is disconnected followed by a Denial of Service. Any attempt to connect to the target port is denied until the denial of service timer expires. Default threshold is 100 session level rejects triggering Denial of Service for a minimum of 60 seconds. Session Layer Rejects include:
    - Block header validation failure due to lower than expected Block Sequence Number - Block Sequence number is not incremented in this case as entire block is rejected
    - Message Header validation failure due to invalid Participant ID or Session Indicator - Each incorrect message is rejected individually and Block Sequence number is incremented.

3. Incorrect data in message body as per Field Description is treated as Application Level Rejects. Block sequence number is incremented and Input connection is not affected by such rejects

5.0 MESSAGE HEADER

The Message Header supplied on each message contains the following number of bytes and data fields:

MESSAGE HEADER FORMAT	
Field Name	**Length**
Participant ID	1
Message Category	1
Message Type	1
Session Indicator	1
Participant Reference Number	4
Total Length	**8**

All messages, except for Administrative (Category C) have a fixed length, which is determined by reading the Message Category. Administrative messages contain additional 2 byte 'Message Data Length' field in the message header.

5.01 MESSAGE HEADER FIELD DESCRIPTIONS

5.01.1 PARTICIPANT ID

The Participant ID field is a **1 Byte**, ASCII character that identifies the Participant or Processor that initiated the message

CODE	PARTICIPANT/PROCESSOR IDENTIFICATION ABBREVIATION	VALUE
A	AMEX	NYSE American
B	BOX	Boston Options Exchange
C	CBOE	Cboe Options Exchange
D	EMERALD	MIAX Emerald
E	EDGX	Cboe EDGX Options
G	MX2	MX2 Options
H	GEMX	Nasdaq GEMX
I	ISE	Nasdaq ISE
J	MRX	Nasdaq MRX
M	MIAX	Miami International
N	NYSE	NYSE ARCA
O	OPRA	Options Price Reporting
P	PEARL	MIAX PEARL
Q	NASD	NASDAQ Options Market
S	SPHR	MIAX Sapphire
T	BX	NASDAQ BX Options
U	MEMX	Members Options Exchange
V	IEX	IEX Options LLC
W	C2	Cboe C2 Options Exchange
X	PHLX	NASDAQ PHLX
Z	BATS	Cboe BZX Options

Note: **Messages with Participant ID Code O (Options Price Reporting Authority – OPRA) are sent by SIAC on behalf of OPRA.**

5.01.2 MESSAGE CATEGORY

The Message Category field is a 1 **Byte**, ASCII character, either an upper or lower case letter.

LOWER CASE CODE	VALUE
a	EQUITY AND INDEX LAST SALE
f	EQUITY AND INDEX END OF DAY SUMMARY
k	LONG EQUITY AND INDEX QUOTE
q	SHORT EQUITY AND INDEX QUOTE
UPPER CASE CODE	**VALUE**
C	ADMINISTRATIVE

H	CONTROL
N	SEQUENCE NUMBER STATUS
Y	UNDERLYING VALUE MESSAGE

5.01.3 MESSAGE TYPE

The Message Type field is a 1 **Byte**, ASCII character, either an upper or lower case letter, or a space. The Message Type character is space filled to either indicate a specific value, or that a Message Type is not applicable to a specified Message Category.

Refer to section 'SUMMARY OF MESSAGE CATEGORIES AND TYPES' for list of Message Types supported for each Message Category

5.01.4 SESSION INDICATOR

1 Byte, unsigned integer. Session Indicator value on messages from Participant to OPRA is:

- Hex 0x00 for regular trading session (only used for Regular OPRA Session)
- Hex 0x01 to Hex 0x05 for Pre-Market trading session (only used for Global Trading Hours (GTH) OPRA Session).
    - OPRA GTH Participants will use Session Indicator values 1-5 where each value indicates the day of the week (Monday to Friday) to which the message belongs to, since GTH session spans across more than one calendar day.

Trade Day	GTH Session Duration	Session Indicator Value
Monday	**Sunday into Monday**	**1**
Tuesday	**Monday into Tuesday**	**2**
Wednesday	**Tuesday into Wednesday**	**3**
Thursday	**Wednesday into Thursday**	**4**
Friday	**Thursday into Friday**	**5**

    - For example, GTH Trading Session for Monday starts on Sunday (8:15 pm) and ends on Monday morning. The Session Indicator on all messages received from the Participant for that session should be set to '1' indicating that messages belong to Trade Date of Monday.
    - The Session Indicator may be affected by US Holidays. For example, if Friday is a US holiday, the Session Indicator on all messages for the GTH sessions starting on the preceding Thursday as well as the GTH session starting on the following Sunday shall be set to '1', indicating that the messages from both the sessions belong to the trade date of Monday.

5.01.5 PARTICIPANT REFERENCE NUMBER (PRN)

4 Byte, unsigned integer

- The PRN is for optional use by the Participant
- The PRN does not need to be unique on a per security basis

6.0 MESSAGE FORMATS

Each message transmitted by Participants or OPRA consists of a Message Header and Message Data. The particular Message Category, Message Type, determines the format of the data and the message length. Administrative messages contain an additional field with the data length.

Message formats are fixed field formats with the exception of Administrative messages which have unformatted data. The textual portion of these messages is a variable length field which can contain any printable ASCII characters (code 32 - 126).

6.01 MESSAGE FORMAT FIELD DESCRIPTIONS

Detailed information on each field specified in every message format is contained in alphabetical order in the **Field Descriptions** section of this document.

7.0 SUMMARY OF MESSAGE CATEGORIES AND TYPES

CATEGORYS(S)	TYPE(S)	MESSAGE DESCRIPTION
a	**A, B, C, D, E, F, G, H, I, J, S** **a, b, c, d e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v**	CANC, OSEQ, CNCL, LATE, CNCO, OPEN, CNOL, OPNL, AUTO, REOP, ISOI SLAN, SLAI, SLCN, SCLI, SLFT, MLET, MLAT, MLCT, MLFT, MESL, TLAT, MASL, MFSL, TLET, TLCT, TLFT, TESL, TASL, TFSL, CBMO, MCTP, EXHT
C	**Space filled**	Administrative
f	**Space filled**	Equity and Index End of Day Summary
H **H** **H** **H** **H**	**C** **E** **F** **J** **O**	Start of Day Start of Summary End of Summary End of Day Line Integrity

SUMMARY OF MESSAGE CATEGORIES AND TYPES (continued)

CATEGORY(S)	TYPE(S)	MESSAGE DESCRIPTION
k, q	**Space filled**	Regular Trading
k, q	**F**	Non-Firm Quote
k, q	**I**	Indicative Value
k, q	**R**	Rotation
k, q	**T**	Trading Halted
k, q	**A**	Eligible for Automatic Execution
k, q	**B**	Bid contains Customer Trading Interest
k, q	**O**	Offer contains Customer Trading Interest
k, q	**C**	Both Bid and Offer contain Customer Trading Interest
k, q	**X**	Offer Side of Quote Not Firm; Bid Side Firm
k, q	**Y**	Bid Side of Quote Not Firm; Offer Side Firm
N	**L**	Block Sequence Number Status Inquiry Request
N	**M**	Block Sequence Number Status Response
N	**R**	Message Count Status Inquiry Request
N	**S**	Message Count Status Response
Y	**Space filled**	Index based on Last Sale
Y	**I**	Index based on Bid and Offer

7.01 EQUITY AND INDEX LAST SALE

The Equity and Index Last Sale message is used to report equity and index options last sale information.

Category	Type
a	A-J, S
	a-v

Field Name	Length (bytes)	Field Restrictions
Message Header	8	
Security Symbol	5	
Reserved	1	
Expiration Block	3	
Strike Price Denominator Code	1	
Strike Price	4	x
Volume	4	x
Premium Price Denominator Code	1	
Premium Price	4	x
Trade Identifier	4	
Trading Session Identifier	1	
Reserved	3	
Total Length:	**39**	

An existing Reserved byte in the message has been repurposed as a 1-byte Trading Session Identifier. Participants should use this field to indicate the applicable trading session of a trade, independent of the sale condition that is specified in the Message Type field. Until a Participant is ready to populate this field, Message Type 'v' (Extended Hours Trade) may continue to be used to identify trades that occurred during extended trading hours. Once all Participants have migrated to the new field, Message Type 'v' will be retired.

Note: Reference Appendix 'D' for details regarding field restrictions

The following Message Types, all mutually exclusive, apply to Category a (Equity and Index Last Sale) messages.

CHARACTER TYPES AND DESCRIPTIONS		
CODE	**VALUE**	
A	CANC	Transaction previously reported (other than as the **last** or **opening** report for the particular option contract) is now to be cancelled.
B	OSEQ	Transaction is being reported late **and** is out of sequence; i.e., later transactions have been reported for the particular option contract.
C	CNCL	Transaction is the last reported for the particular option contract and is now cancelled.
D	LATE	Transaction is being reported late, but is in the correct sequence; i.e., no later transactions have been reported for the particular option contract.
E	CNCO	Transaction was the first one (opening) reported this day for the particular option contract. Although later transactions have been reported, this transaction is now to be cancelled.
F	OPEN	Transaction is a late report of the opening trade and is out of sequence; i.e., other transactions have been reported for the particular option contract.
G	CNOL	Transaction was the only one reported this day for the particular option contract and is now to be cancelled.
H	OPNL	Transaction is a late report of the opening trade, but is in the correct sequence; i.e., no other transactions have been reported for the particular option contract.
I	AUTO	Transaction was executed electronically. Prefix appears solely for information; process as a regular transaction.
J	REOP	Transaction is a reopening of an option contract in which trading has been previously halted. Prefix appears solely for information; process as a regular transaction.
S	ISOI	Transaction was the execution of an order identified as an Intermarket Sweep Order. Process like normal transaction.

Message Type Description - Category a, continued

CHARACTER TYPES AND DESCRIPTIONS			
Type	**Type Descrip-tion**	**VALUE**	**DESCRIPTION**
a	SLAN	Single Leg Auction Non ISO	Transaction was the execution of an electronic order which was "stopped" at a price and traded in a two sided auction mechanism that goes through an exposure period. Such auctions mechanisms include and not limited to Price Improvement, Facilitation or Solicitation Mechanism.
b	SLAI	Single Leg Auction ISO	Transaction was the execution of an Intermarket Sweep electronic order which was "stopped" at a price and traded in a two sided auction mechanism that goes through an exposure period. Such auctions mechanisms include and not limited to Price Improvement, Facilitation or Solicitation Mechanism marked as ISO.
c	SLCN	Single Leg Cross Non ISO	Transaction was the execution of an electronic order which was "stopped" at a price and traded in a two sided crossing mechanism that does not go through an exposure period. Such crossing mechanisms include and not limited to Customer to Customer Cross and QCC with a single option leg.
d	SCLI	Single Leg Cross ISO	Transaction was the execution of an Intermarket Sweep electronic order which was "stopped" at a price and traded in a two sided crossing mechanism that does not go through an exposure period. Such crossing mechanisms include and not limited to Customer to Customer Cross.
e	SLFT	Single Leg Floor Trade	Transaction represents a non-electronic trade executed on a trading floor. Execution of Paired and Non-Paired Auctions and Cross orders on an exchange floor are also included in this category.
f	MLET	Multi Leg auto-electronic trade	Transaction represents an electronic execution of a multi leg order traded in a complex order book.
g	MLAT	Multi Leg Auction	Transaction was the execution of an electronic multi leg order which was "stopped" at a price and traded in a two sided auction mechanism that goes through an exposure period in a complex order book. Such auctions mechanisms include and not limited to Price Improvement, Facilitation or Solicitation Mechanism.
h	MLCT	Multi Leg Cross	Transaction was the execution of an electronic multi leg order which was "stopped" at a price and traded in a two sided crossing mechanism that does not go through an exposure period. Such crossing mechanisms include and not limited to Customer to Customer Cross and QCC with two or more options legs.
i	MLFT	Multi Leg floor trade	Transaction represents a non-electronic multi leg order trade executed against other multi-leg order(s) on a trading floor. Execution of Paired and Non-Paired Auctions and Cross orders on an exchange floor are also included in this category.
j	MESL	Multi Leg auto-electronic trade against single leg(s)	Transaction represents an electronic execution of a multi Leg order traded against single leg orders/ quotes.
k	TLAT	Stock Options Auction	Transaction was the execution of an electronic multi leg stock/options order which was "stopped" at a price and traded in a two sided auction mechanism that goes through an exposure period in a complex order book. Such auctions mechanisms include and not limited to Price Improvement, Facilitation or Solicitation Mechanism.
l	MASL	Multi Leg Auction against single leg(s)	Transaction was the execution of an electronic multi leg order which was "stopped" at a price and traded in a two sided auction mechanism that goes through an exposure period and trades against single leg orders/ quotes. Such auctions mechanisms include and not limited to Price Improvement, Facilitation or Solicitation Mechanism.

Message Type Description - Category a, continued

CHARACTER TYPES AND DESCRIPTIONS			
Type	**Type Description**	**VALUE**	**DESCRIPTION**
m	MFSL	Multi Leg floor trade against single leg(s)	Transaction represents a non-electronic multi leg order trade executed on a trading floor against single leg orders/ quotes. Execution of Paired and Non-Paired Auctions on an exchange floor are also included in this category.
n	TLET	Stock Options auto-electronic trade	Transaction represents an electronic execution of a multi leg stock/options order traded in a complex order book.
o	TLCT	Stock Options Cross	Transaction was the execution of an electronic multi leg stock/options order which was "stopped" at a price and traded in a two sided crossing mechanism that does not go through an exposure period. Such crossing mechanisms include and not limited to Customer to Customer Cross.
p	TLFT	Stock Options floor trade	Transaction represents a non-electronic multi leg order stock/options trade executed on a trading floor in a Complex order book. Execution of Paired and Non-Paired Auctions and Cross orders on an exchange floor are also included in this category.
q	TESL	Stock Options auto-electronic trade against single leg(s)	Transaction represents an electronic execution of a multi Leg stock/options order traded against single leg orders/ quotes.
r	TASL	Stock Options Auction against single leg(s)	Transaction was the execution of an electronic multi leg stock/options order which was "stopped" at a price and traded in a two sided auction mechanism that goes through an exposure period and trades against single leg orders/ quotes. Such auctions mechanisms include and not limited to Price Improvement, Facilitation or Solicitation Mechanism.
s	TFSL	Stock Options floor trade against single leg(s)	Transaction represents a non-electronic multi leg stock/options order trade executed on a trading floor against single leg orders/ quotes. Execution of Paired and Non-Paired Auctions on an exchange floor are also included in this category.
t	CBMO	Multi Leg Floor Trade of Proprietary Products	Transaction represents execution of a proprietary product non-electronic multi leg order with at least 3 legs. The trade price may be outside the current NBBO.
u	MCTP	Multilateral Compression Trade of Proprietary Products	Transaction represents an execution in a proprietary product done as part of a multilateral compression. Trades are executed outside of regular trading hours at prices derived from end of day markets. Trades do not update Open, High, Low, and Closing Prices.
v	EXHT	Extended Hours Trade	Transaction represents a trade that was executed outside of regular market hours. Trades do not update Open, High, Low, and Closing Prices.

7.02 EQUITY AND INDEX END OF DAY SUMMARY

The Equity and Index End of Day Summary message is transmitted shortly before the Good Night messages. It provides, by symbol, a Participant's open, high, low, last, net change and underlying information.

Note: If no quote or last sale occurred for a security, no Equity and Index End of Day Summary is generated.

Message Category	Type
f	Space filled

Field Name	Length (bytes)	Field Restrictions
Message Header	8	
Security Symbol	5	
Reserved	1	
Expiration Block	3	
Strike Price Denominator Code	1	
Strike Price	4	x
Volume	4	x
Open Interest Volume	4	x
Premium Price Denominator Code	1	
Open Price	4	x
High Price	4	x
Low Price	4	x
Last Price	4	x
Net Change	4	x
Underlying Price Denominator Code	1	
Underlying Price	8	x
Bid Price	4	x
Offer Price	4	x
Total Length:	**68**	

Note: Reference Appendix 'D' for details regarding field restrictions

7.03 EQUITY AND INDEX QUOTE MESSAGES

An Equity and Index Quote message is used to report an equity and index option's quote.

For bandwidth efficiencies, there are two Equity and Index Quote Message formats:

1) Long Equity and Index Quote (Category k) – Contains a full quote, using four byte integers for all prices and sizes.
2) Short Equity and Index Quotes (Category q) – Contains a "short" quote, using two byte unsigned integers for prices and sizes.

Below are the short quote category 'q' restrictions:

a) Security Symbol is restricted to a maximum of four (category 'q') characters.
b) Strike Price Denominator Code is implied to be 'A' (one digit to the right of the decimal point)
c) Premium Price Denominator Code is implied to be 'B' (two digits to the right of the decimal point).

Any quote that meets the requirements of the Short Quote given above must be sent as a Short Equity and Index Quote message. Any other quote (Security Symbol of five characters, any price or size unable to fit in a two byte integer with the given Denominator Code restrictions), will be sent as a Long Equity and Index Quote message.

Note: Reference Appendix 'D' for details regarding field restrictions

The following Message Types apply to Category k (Long Equity and Index Quote) and Category q (Short Equity and Index Quote):

CODE	VALUE
Space	Regular Trading
F	Non-Firm Quote
I	Indicative Value*
R	Rotation
T	Trading Halted
A	Eligible for Automatic Execution
B	Bid contains Customer Trading Interest
O	Offer contains Customer Trading Interest
C	Both Bid and Offer contain Customer Trading Interest
X	Offer side of Quote Not Firm; Bid Side Firm
Y	Bid Side of Quote Not Firm; Offer Side Firm

* Message Type I for both Category k and q Quote messages is allowed only after 15 minutes past the close time (4:15 P.M.)

7.03.1 LONG EQUITY AND INDEX QUOTE

Message Category	Type
k	Space filled,
	A, B, C, F, I, O,
	R, T, X, Y

Field Name	Length (bytes)	Field Restrictions
Message Header	8	
Security Symbol	5	
Reserved	1	
Expiration Block	3	
Strike Price Denominator Code	1	
Strike Price	4	x
Premium Price Denominator Code	1	
Bid Price	4	x
Bid Size	4	x
Offer Price	4	x
Offer Size	4	x
Total Length:	**39**	

Note: Reference Appendix 'D' for details regarding field restrictions

7.03.2 SHORT EQUITY AND INDEX QUOTE

Message Category	Type
q	Space filled, A, B, C, F, I, O, R, T, X, Y

Field Name	Length (bytes)	Field Restrictions
Message Header	8	
Security Symbol	4	
Expiration Block	3	
Strike Price	2	x
Bid Price	2	x
Bid Size	2	x
Offer Price	2	x
Offer Size	2	x
Total Length:	**25**	

Note: Reference Appendix 'D' for details regarding field restrictions

7.04 ADMINISTRATIVE

Administrative (unformatted) messages (called admins) are those messages that, because of the nature of the information they contain, cannot be readily arranged in a fixed format.

Message Category	Type
C	Space filled

Field Name	Message Block Version 4 Length (bytes)
Message Header	8
Message Data Length	2
Message Data (Printable ASCII character codes 32 - 126)	Variable (Max 200)
Total (Maximum) Number of Bytes	**210**

- Message Data Length is a 2 Byte unsigned integer which represents the length of the Message Data field. Message Data Length can be zero if there is no message data.
- Administrative messages are not blocked with any other messages. These will be sent individually, one to a block
- Total Message Length: 8 Byte Message Header + 2 Byte Message Data Length + Variable Length Message Data

7.04.1 Administrative Message Length

The length of an administrative message is variable. The total length of the variable length message data field cannot exceed 200 characters.

7.04.2 Administrative Message Text

For most administrative messages, the text section of the Administrative message is transmitted in free format.

7.04.3 Administrative Equity and Index FLEX Message Standards

Participants use **Category C, Type = (Space filled)** Administrative messages to transmit market data on nonstandard options that do not fit normal formats.

The following standards have been adopted by the Participants to transmit **FLEX** (equity and index options) information. The formatted text immediately follows the last character in the Message Header.

Administrative Message Standards, continued

EQUITY AND INDEX OPTIONS			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
FLEX Type	3	Alphabetic	I – Index (optional) E – Equity (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	
Filler	1	Space	
Message Type	3	Alphabetic	RFQ - Request for Quote QTE - Quote LST - Last Sale CXL - Cancel ADM - Admin Message IND - Indicative Quote
Filler	1	Space	
Request Identifier	5	Alphanumeric Left Justified Space filled	
Filler	1	Space	
Text	V	Alphanumeric	Variable text up to 175 character (ASCII code 32 - 126)

EQUITY INDICATIVE QUOTE (IND)			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
FLEX Type	3	Alphabetic	E – Equity (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	MSFT(Space)
Filler	1	Space	
Message Type	3	Alphabetic	IND - Indicative Quote
Filler	1	Space	
Text	V	Alphanumeric	2 YR ATMC 1.55-1.63
This message is an Equity FLEX Indicative Quote MSFT 2 Year at-the-money call. 1.55% bid, offered at 1.63%.			

Administrative Message Standards, continued

EQUITY ADMINISTRATIVE MESSAGE (ADM)			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
FLEX Type	3	Alphabetic	E – Equity (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	MSFT(Space)
Filler	1	Space	
Message Type	3	Alphabetic	ADM – Admin Message
Filler	1	Space	
Text	V	Alphanumeric	RFQ MSFT1 Market Closed
This message is an Equity FLEX Administrative Message that RFQ MSFT1 has been closed.			

INDEX OPTIONS REQUEST FOR QUOTE (RFQ)			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
ad Type	3	Alphabetic	I - Index (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	OEX
Filler	1	Space	
Message Type	3	Alphabetic	RFQ - Request for Quote
Filler	1	Space	
Request Identifier	5	Alphanumeric Left Justified Space filled	1
Filler	1	Space	
Text	V	Alphanumeric	Call 12/31/13 105% EUR CL $20M QUOTE IN % BY 1030 CST
This message is an Index FLEX Request for Quote for OEX call, Expiration date 12/31/13, Strike Price 5% out of the money (calculated at the close), European Expiration, settled on the close $20,000,000. Quotes must be made in percentages of the closing index value and must be in by 10:30 central standard time.			

Administrative Message Standards, continued

INDEX OPTIONS QUOTE (QTE)			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
FLEX Type	3	Alphabetic	I - Index (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	XMI
Filler	1	Space	
Message Type	3	Alphabetic	QTE - Quote
Filler	1	Space	
Request Identifier	5	Alphanumeric Left Justified Space filled	12
Filler	1	Space	
Text	V	Alphanumeric	4 ½%-5% $10Mx$10M
This message is an Index FLEX Quote for XMI, according to the terms of the request assigned identifier RFQ12. Bid 4/12%-Offer 5%, size $10,000,000 up.			

INDEX OPTIONS LAST SALE (LST)			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
FLEX Type	3	Alphabetic	I - Index (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	SPX
Filler	1	Space	
Message Type	3	Alphabetic	LST – LAST SALE
Filler	1	Space	
Request Identifier	5	Alphanumeric Left Justified Space filled	2
Filler	1	Space	
Text	V	Alphanumeric	250 @ 23.75 5NSX
This message is an Index FLEX Last Sale for SPX Request for Quote number 2. 250 contracts traded at 23.75; clearing symbol is 5NSX.			

Administrative Message Standards, continued

EQUITY OPTIONS LAST SALE (LST)			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
FLEX Type	3	Alphabetic	E - Equity (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	IBM
Filler	1	Space	
Message Type	3	Alphabetic	LST – LAST SALE
Filler	1	Space	
Request Identifier	5	Alphanumeric Left Justified Space filled	2
Filler	1	Space	
Strike Price	1-9	Alphanumeric	125.125
Filler	1	Space	
Type (call or put)	1	Alphabetic	C
Filler	1	Space	
Exercise Style (Amer, Eur)	3-4	Alphanumeric	AMER
Filler	1	Space	
Expiration Date	10	Alphanumeric	01.02.09
Filler	1	Space	
Volume	5	Alphanumeric	500
Filler	1	Space	
Premium	1-9	Alphanumeric	3.57
Filler	1	Space	
Clearing Symbol	6	Alphanumeric	1IBM
This message is an Equity FLEX Last Sale for IBM, 125.125 Call. American exercise, expiring 01/02/13. 500 sold at 3.57			

Administrative Message Standards, continued

FLEX OPTIONS DELTA ADJUSTED AT CLOSE TRADE (Initial)			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
FLEX Type	3	Alphabetic	I - Index (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	SPX
Filler	1	Space	
Message Type	3	Alphabetic	LST – LAST SALE
Filler	1	Space	
Request Identifier	5	Alphanumeric Left Justified Space filled	2
Filler	1	Space	
Strike Price	1-9	Alphanumeric	3521.65
Filler	1	Space	
Type (call or put)	1	Alphabetic	C
Filler	1	Space	
Settlement Type	2	Alphanumeric	PM
Filler	1	Space	
Exercise Style	3-4	Alphanumeric	EUR
Filler	1	Space	
Expiration Date	10	Alphanumeric	02.05.20
Filler	1	Space	
Volume	5	Alphanumeric	75
Filler	1	Space	
Premium Price	1-9	Alphanumeric	9.63
Filler	1	Space	
Clearing Symbol	6	Alphanumeric	4SPX
Price Type	1-9	Alphanumeric	DAC
Filler	1	Space	
Delta	1-9	Alphanumeric	.50
Filler	1	Space	
Reference Price	1-9	Alphanumeric	3345.75
This message is an Equity Delta Adjusted at Close Trade FLEX Last Sale for SPX, 3521.65 PM/Eur Call. expiring 02/05/20, 5 sold at 9.63, Price Type DAC, Delta .50, Reference Price 3345.75			

Administrative Message Standards, continued

FLEX OPTIONS DELTA ADJUSTED AT CLOSE TRADE (Adjusted)			
Field Descriptions	**Bytes**	**Character**	**Details**
Product Type	4	Alphabetic	FLEX
Filler	1	Space	
FLEX Type	3	Alphabetic	I - Index (optional)
Filler	1	Space	
Security Symbol	5	Alphanumeric Left Justified Space filled	SPX
Filler	1	Space	
Message Type	3	Alphabetic	LST – LAST SALE
Filler	1	Space	
Request Identifier	5	Alphanumeric Left Justified Space filled	2
Filler	1	Space	
Strike Price	1-9	Alphanumeric	3521.65
Filler	1	Space	
Type (call or put)	1	Alphabetic	C
Filler	1	Space	
Settlement Type	2	Alphanumeric	PM
Filler	1	Space	
Exercise Style	3-4	Alphanumeric	EUR
Filler	1	Space	
Expiration Date	10	Alphanumeric	02.05.20
Filler	1	Space	
Volume	5	Alphanumeric	75
Filler	1	Space	
Premium Price	1-9	Alphanumeric	12.38
Filler	1	Space	
Clearing Symbol	6	Alphanumeric	4SPX
Price Type	1-9	Alphanumeric	ADJ
Filler	1	Space	
Delta	1-9	Alphanumeric	.50
Filler	1	Space	
Reference Price	1-9	Alphanumeric	3345.75
Filler	1	Space	
Closing Price	1-9	Alphanumeric	3351.25
This message is an Equity Delta Adjusted at Close Trade FLEX Last Sale for SPX, 3521.65 PM/Eur Call. expiring 02/05/20, 5 sold at 12.38, Price Type ADJ, Delta .50, Reference Price 3345.75, Closing Price 3351.25			

7.05 CONTROL

Control messages perform specified control functions, for example "Start of Day" message.

Category	Type
H	C, E, F, J, O

- Control messages consist of standard Message Header Only
- Control messages are not blocked with any other messages. These will be sent individually, one to a block
- For all Control messages, the Participant ID field in the Message Header will contain a character identifying OPRA or the Participant originating the message (refer section 5.01.1 for list of Participant ID codes)
- Note: As Control messages no longer support the variable length freeform 'Message Data' field, the message header does not contain the additional 2-byte 'Message Data Length' field

The following Message Types apply to Category H (Control) messages. Refer to Control Message Descriptions section for definition of values:

CODE	MESSAGE SOURCE	PARTICIPANT ID CODE	VALUE
C	OPRA	O	Start of Day
E	Participant	Any valid code except 'O'	Start of Summary
F	Participant	Any valid code except 'O'	End of Summary
J	OPRA	O	End of Day
O	Participant & OPRA	Any valid code	Line Integrity

CONTROL MESSAGE, continued

7.05.1 Start of Day – Category H, Type C

The Start of Day message is sent by OPRA to a Participant to signal the start of normal data processing of messages received over a line. Messages received by OPRA before the Start of Day message has been transmitted will be rejected, except for Line Integrity (Category H Type O), Block Sequence Number Status Inquiry Request (Category N Type L) and Message Count Status Inquiry Request (Category N Type R) messages.

7.05.2 Start of Summary - Category H, Type E

The Start of Summary message is transmitted by a Participant to signal the beginning of transmission of one or more End of Day Summary messages by that Participant.

7.05.3 End of Summary - Category H, Type F

The End of Summary message is transmitted by a Participant to signal the end of transmission of one or more End of Day Summary messages by that Participant.

7.05.4 End of Day - Category H, Type J

The End of Day message is sent by OPRA to a Participant to signal the end of transmission of data over the input lines. Participant should not transmit any further messages to OPRA after receiving End of Day. Messages received by OPRA after the End of Day message has been transmitted will be rejected.

CONTROL MESSAGE, continued

7.05.5 Line Integrity Message - Category H, Type O

Line Integrity Participant to OPRA:

The Participant to OPRA Line Integrity message is used by a Participant to provide verification of Participant input line integrity. It may be generated by a Participant to OPRA via their input lines at a set interval (e.g., 1-second; 5-seconds).

A timeout duration of 10 seconds is defined for all input lines. A Participant is required to input messages with an idle time of no more than 5 seconds. Once connected, if a Participant does not input Category H Type O messages or any other data to OPRA within the configured timeout interval, OPRA will wait for additional time (typically 10 seconds) and if still no message is received, OPRA 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., a connection should be made to the backup input line if the disconnect was made to the primary, and conversely, a connection should be made to the primary input line if the disconnect was made to the backup input line).

The Block Sequence Number field should not be incremented for Participant to OPRA Line Integrity messages. The Block Sequence Number field shall contain the Block Sequence Number of the last original message generated by the Participant.

Line Integrity OPRA to Participant:

The OPRA to Participant Line Integrity message is generated by OPRA to each Participant at 10 second intervals. OPRA can commence sending Line Integrity messages to Participants once the Participants' lines have been started and the Participant has established connections. Its primary function is to provide verification of line integrity during periods of inactivity.

Note:

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

7.06 SEQUENCE / MESSAGE COUNT STATUS

- The Sequence Status message types ('L', 'M' and 'N') are used to synchronize the Block Sequence Numbers sent to OPRA by the Participants.
- The Message Count Status types ('R' and 'S') are used to retrieve the count of messages received on an individual line since startup.

The following Message Types apply to the Category N - Sequence/Message Count Status message:

CODE	MESSAGE SOURCE	VALUE
L	Participant	Block Sequence Number Status Inquiry Request
M	OPRA	Block Sequence Number Status Response
R	Participant	Message Count Status Inquiry Request
S	OPRA	Message Count Status Response

1) **Type 'L'** – Block Sequence Number Status Inquiry Request – This message is sent by the Participant to OPRA to request the last Block Sequence Number received on that line.

2) **Type 'M'** – Block Sequence Response – Sent to the participant by OPRA in response to a Type 'L' message, it contains the last Block Sequence Number received on that input line.

3) **Type 'R'** – Message Count Status Inquiry Request – This message is sent by the Participant to OPRA to request the message count on that line.

4) **Type 'S'** – Message Count Status Response – This message is sent from OPRA to the participants in response to a 'Message Count Status Request'. It contains the count of messages received on an individual line since startup. This message count does not include category 'N' (all types) nor Line Integrity messages (category 'H', type 'O').

Note:
- All Sequence Number Status messages are sent individually, in their own block. These are not blocked with any other messages
- All Sequence Number Status Messages must be sent with a zero block sequence number

7.06.1 BLOCK SEQUENCE NUMBER STATUS INQUIRY REQUEST

Category	Type
N	L

Field Name	Length (bytes)
Message Header	8
Reserved	4
Reserved	4
Total Length:	**16**

7.06.2 BLOCK SEQUENCE NUMBER STATUS RESPONSE

Category	Type
N	M

Field Name	Length (bytes)
Message Header	8
Block Sequence Number	4
Reserved	4
Total Length:	**16**

7.06.3 MESSAGE COUNT STATUS INQUIRY REQUEST

Category	Type
N	R

Field Name	Length (bytes)
Message Header	8
Reserved	8
Total Length:	**16**

7.06.4 MESSAGE COUNT STATUS RESPONSE

Category	Type
N	S

Field Name	Length (bytes)
Message Header	8
Message Count	8
Total Length:	**16**

7.07 UNDERLYING VALUE

The following Message Types apply to the Category Y (Underlying Value) message:

CODE	VALUE
Space	Index based on Last Sale
I	Index based on Bid and Offer

7.07.1 UNDERLYING VALUE – LAST SALE

The Underlying Value – Last Sale message (Message Type 'space ') is a fixed length record containing the Last Sale Index Value.

Message Category	Type
Y	Space filled

Field Name	Length (bytes)	Field Restrictions
Message Header	8	
Security Symbol	5	x
Reserved	1	
Index Value Denominator Code	1	
Index Value	4	x
Reserved	4	
Total Length:	**23**	

Note: Reference Appendix 'D' for details regarding field restrictions

7.07.2 UNDERLYING VALUE – BID AND OFFER

The Underlying Value – Bid and Offer message (Message Type 'I') is a fixed length record containing the Last Sale Bid/Offer Index Value.

Message Category	Type
Y	I

Field Name	Length (bytes)	Field Restrictions
Message Header	8	
Security Symbol	5	x
Reserved	1	
Index Value Denominator Code	1	
Bid Index Value	4	x
Offer Index Value	4	x
Total Length:	**23**	

Note: Reference Appendix 'D' for details regarding field restrictions

8.0 FIELD DESCRIPTIONS

ASCII code characters are defined as follows:

TERMINOLOGY	DESCRIPTION
Alphabetic	ASCII characters: upper case **A – Z** **or** lower case **a – z**
Numeric	ASCII characters numeric **0 – 9**
Alphanumeric	Any combination of Alphabetic and Numeric as defined above
Space	A space character ‘ ’

Note: Price and size fields in equity quotes have two sizes and message formats:

1) **Long quotes (Category k), Four Bytes**
2) **Short quotes (Category q), Two Bytes**

FIELD DESCRIPTIONS, continued

- B -

8.01 BID INDEX VALUE

4 Bytes, signed integer.

The Bid Index Value is the whole and decimal portion of the Bid Index Value information with the Premium Price Denominator Code determining the location of the decimal point.

The Bid Index Value represents the value of the index's calculation formula using the current bid values of the component securities.

8.02 BID PRICE

4 Byte signed integer (for Categories f and k), 2 byte unsigned integer (for Category q). A Zero in this field represents a valid Bid Price.

The Bid Price is the whole and decimal portion of the Bid Price information with the Premium Price Denominator Code determining the location of the decimal point.

Represents the price at which a buyer is willing to buy an option.

8.03 BID SIZE

4 or 2 Bytes, unsigned integer. When there is no Bid Size, this value is Zero.

The Bid Size identifies the number of contracts being bought for an option at the Bid Price.

When the Bid Size and the Bid Price are both zero, it represents a cancel of a previous quote.

FIELD DESCRIPTIONS, continued

- D -

8.04 DENOMINATOR CODE(S)

1 Byte, alphabetic.

The following Denominator Codes are used for all Denominator Code fields. These are, Index Value Denominator Code, Premium Price Denominator Code, Strike Price Denominator Code, and Underlying Price Denominator Code.

Denominator		Numerator	Field Limit			
Code	Value	(number of decimal places)	Index Value Denom	Premium Price Denom	Strike Price Denom	Underlying Price Denom
A	10	1	YES	YES	YES	YES
B	100	2	YES	YES	YES	YES
C	1,000	3	YES	YES	YES	YES
D	10,000	4	YES	YES	YES	YES
E	100,000	5	YES	YES	YES	YES
F	1,000,000	6	YES	YES	NO	YES
G	10,000,000	7	YES	YES	NO	YES
H	100,000,000	8	NO	NO	NO	YES
I	No Fraction	0	YES	YES	YES	YES

Field Limits:

- Index Value Denominator Code supports denominator code ‘A’ thru ‘G’ and ‘I’
- Premium Price Denominator Code supports denominator code ‘A’ thru ‘G’ and ‘I’
- Strike Price Denominator Code supports denominator code ‘A’ thru ‘E’ and “I”
- Underlying Price Denominator Code supports ALL denominator codes

FIELD DESCRIPTIONS, continued

- E -

8.05 EXPIRATION BLOCK

Expiration Block is a three byte field which represents the expiration month, day, and year of the option, and is used in Message Categories a, d, f, k and q.

Field Name	Length (bytes)
Expiration Month	1
Expiration Day	1
Expiration Year	1
Total Length:	**3**

- **Expiration Month: 1 Byte**, alphabetic. Indicates the expiration month and identifies the option as a Call or a Put.

CALL OPTIONS		PUT OPTIONS	
CODE	**VALUE**	**CODE**	**VALUE**
A	**JANUARY**	**M**	**JANUARY**
B	**FEBRUARY**	**N**	**FEBRUARY**
C	**MARCH**	**O**	**MARCH**
D	**APRIL**	**P**	**APRIL**
E	**MAY**	**Q**	**MAY**
F	**JUNE**	**R**	**JUNE**
G	**JULY**	**S**	**JULY**
H	**AUGUST**	**T**	**AUGUST**
I	**SEPTEMBER**	**U**	**SEPTEMBER**
J	**OCTOBER**	**V**	**OCTOBER**
K	**NOVEMBER**	**W**	**NOVEMBER**
L	**DECEMBER**	**X**	**DECEMBER**

- **Expiration Day: 1 Byte**, unsigned integer. Contains Hex 0x01 to 0x1F (decimal 1 to 31), indicating the day of the month the series expires.
- **Expiration Year**: **1 Byte**, unsigned integer. Contains Hex 0x00 to 0x63 (decimal 0 to 99). Represents the year, starting with year 2000.

FIELD DESCRIPTIONS, continued

- H -

8.06 HIGH PRICE

4 Bytes, signed integer.

The High Price is the whole and decimal portion of the High Price information with the Premium Price Denominator Code determining the location of the decimal point.

Represents the highest price paid for an option during the trading day.

- I -

8.07 INDEX VALUE

4 Bytes, signed integer.

The Index Value is the whole and decimal portion of the Index Value information with the Premium Price Denominator Code determining the location of the decimal point.

Contains the index value using last sale values of index components.

8.08 INDEX VALUE DENOMINATOR CODE

1 Byte, alphabetic.

The Index Value Denominator Code field indicates the position of the floating decimal point within either the Index Value, Bid Index Value, or Offer Index Value fields.

Reference section 7.04 for Denominator Code(s) and Value(s)

FIELD DESCRIPTIONS, continued

- L -

8.09 LAST PRICE

4 Bytes, signed integer.

The Last Price is the whole and decimal portion of the Last Price information with the Premium Price Denominator Code determining the location of the decimal point.

Represents the last price paid for an option during the trading day.

8.10 LOW PRICE

4 Bytes, signed integer.

The Low Price is the whole and decimal portion of the Low Price information with the Premium Price Denominator Code determining the location of the decimal point.

Represents the lowest price paid for an option during the trading day.

- M -

8.11 MESSAGE COUNT

8 Bytes, unsigned integer.

Contains the count of messages received on an individual Participant line since startup. This message count does not include category 'N' block sequence types 'L', 'M' and 'N', nor Line Integrity messages (category 'H', type 'O')

- N -

8.12 NET CHANGE

4 Bytes, signed integer.

The Net Change is the whole and decimal portion of the Net Change information with the Premium Price Denominator Code determining the location of the decimal point.

Represents the change in the price of an option from the closing price of one day to the closing price on the next day on which the option is traded.

This value can be positive, negative or zero.

FIELD DESCRIPTIONS, continued

- O -

8.13 OFFER INDEX VALUE

4 Bytes, signed integer.

The Offer Index Value is the whole and decimal portion of the Offer Index Value information with the Premium Price Denominator Code determining the location of the decimal point.

The Offer Index Value represents the value of the index's calculation formula using the current Offer(ed) values of the component securities.

8.14 OFFER PRICE

4 Bytes, signed integer (for Categories f and k), 2 byte unsigned integer (for Category q).

The Offer Price is the whole and decimal portion of the Offer Price information with the Premium Price Denominator Code determining the location of the decimal point.

Represents the price at which a seller is offering to sell an option.

8.15 OFFER SIZE

4 or 2 Bytes, unsigned integer. When there is no Offer Size, this value is zero.

The Offer Size identifies the number of contracts for sale for an option at the Offer Price.

8.16 OPEN INTEREST VOLUME

4 Bytes, unsigned integer.

Represents the total number of outstanding option contracts that have not been exercised and have not yet reached expiration.

8.17 OPEN PRICE

4 Bytes, signed integer.

The Open Price is the whole and decimal portion of the Open Price information with the Premium Price Denominator Code determining the location of the decimal point.

Represents the first price paid for an option during the trading day.

FIELD DESCRIPTIONS, continued

- P -

8.18 PREMIUM PRICE

4 Bytes, signed integer.

The Premium Price is the whole and decimal portion of the Premium Price information with the Premium Price Denominator Code determining the location of the decimal point.

Represents the price of an option contract, determined in the competitive marketplace, which the buyer of the option pays to the option writer for the rights conveyed by the option contract.

8.19 PREMIUM PRICE DENOMINATOR CODE

1 Byte, alphabetic.

The Premium Price Denominator Code field indicates the position of the floating decimal point within either the Premium Price, Bid Price, Offer Price, Open Price, High Price, Low Price, or Last Price fields.

Reference section 7.04 for Denominator Code(s) and Value(s)

- R -

8.20 RECEIVED MESSAGE SEQUENCE NUMBER

4 Bytes, unsigned integer. Indicates the received message sequence number.

8.21 RESERVED

Variable (V) Bytes, unsigned integer. Reserved fields filled with Hex 0x00.

Fields reserved for future use.

FIELD DESCRIPTIONS, continued

- S -

8.22 SECURITY SYMBOL

4 Bytes (short quote only (category 'q') or
5 Bytes (for all message categories except for short quotes (category 'q')
Alphanumeric. Left Justified, Space filled.

The security symbol is used for Equity and Index options. It identifies the unique symbol assigned to the underlying security.

Identification of Test Data:
The purpose of a Test Message is to have a mechanism whereby end-to-end connectivity and functionality between the OPRA Participant and Data Recipient can be tested prior to the opening or during the trading day. Alphanumeric Test Symbols are Reserved for future use.

CTA Test Symbol	NASDAQ Test Symbol
ATEST	ZAZZT
CBO	ZBZZT
CBX	ZCZZT
CTEST	ZJZZT
IGZ	ZVZZC
MTEST	ZVZZT
NTEST	ZWZZT
PTEST	ZXZZT
ZBZX	
ZEXIT	
ZIEXT	
ZTEST	
ZTST	
ZVV	
ZXIET	
ZZK	
01A thru 12A	
01N thru 12N	
01P thru 12P	
01V thru 12V	
01Z thru 12Z	

8.23 SESSION INDICATOR

1 Byte, unsigned integer. Session Indicator value on messages from Participant to OPRA is:

- Hex 0x00 for regular trading session (only used for Regular OPRA Session)
- Hex 0x01 to Hex 0x05 for Pre-Market trading session (only used for Global Trading Hours (GTH) OPRA Session).
    - OPRA GTH Participants will use Session Indicator values 1-5 where each value indicates the day of the week (Monday to Friday) to which the message belongs to, since GTH session spans across more than one calendar day.

Trade Day	GTH Session Duration	Session Indicator Value
Monday	**Sunday into Monday**	**1**
Tuesday	**Monday into Tuesday**	**2**
Wednesday	**Tuesday into Wednesday**	**3**
Thursday	**Wednesday into Thursday**	**4**
Friday	**Thursday into Friday**	**5**

    - For example, GTH Trading Session for Monday starts on Sunday (8:15 pm) and ends on Monday morning. The Session Indicator on all messages received from the Participant for that session should be set to '1' indicating that messages belong to Trade Date of Monday.
    - The Session Indicator may be affected by US Holidays. For example, if Friday is a US holiday, the Session Indicator on all messages for the GTH sessions starting on the preceding Thursday as well as the GTH session starting on the following Sunday shall be set to '1', indicating that the messages from both the sessions belong to the trade date of Monday.

8.24 STRIKE PRICE

4 Byte, signed integer (for Categories a, d, f and k), 2 byte unsigned integer (for Category q).

The Strike Price is the whole and decimal portion of the Strike Price information with the Strike Price Denominator Code determining the location of the decimal point.

Represents the stated price per share for which the underlying security may be purchased (in the case of a call) or sold (in the case of a put) by the option holder upon exercise of the option contract.

8.25 STRIKE PRICE DENOMINATOR CODE

1 Byte, alphabetic.

The Strike Price Denominator Code field indicates the position of the floating decimal point within the Strike Price field.

Reference section 7.04 for Denominator Code(s) and Value(s)

- T -

8.26 TRADE IDENTIFIER

4 Bytes, unsigned integer.

Fields reserved for future use. Filled with Hex 0x00.

8.27 TRADING SESSION IDENTIFIER

1 Byte, unsigned integer.

Field is used to indicate the applicable trading session for a trade.

Session	Value
Regular Trading Session	0
Extended Trading Session	1

FIELD DESCRIPTIONS, continued

- U -

8.28 UNDERLYING PRICE DENOMINATOR CODE

1 Byte, alphabetic.

The Underlying Price Denominator Code field indicates the position of the floating decimal point within the Underlying Price field.

Reference section 7.04 for Denominator Code(s) and Value(s)

8.29 UNDERLYING PRICE

8 Bytes, signed integer.

The Underlying Stock Price is the whole and decimal portion of the Underlying Stock Price information with the Underlying Stock Price Denominator Code determining the location of the decimal point.

Represents the price of the underlying security.

- V -

8.30 VOLUME

4 Bytes, unsigned integer.

The volume is used for Equity and Index options.

Represents the total number of contracts traded for an option in one trade, or the total number of contracts traded for an option for the entire trading day.

9.0 FIELD APPEARANCES WITHIN MESSAGES

FIELD NAME	MESSAGE APPEARANCE	NUMBER OF APPEARANCES/ MESSAGES
	- B -	
Bid Index Value	Underlying Value – Bid and Offer	**1**
Bid Price	Equity and Index End of Day Summary	**1**
	Long Equity and Index Quote	**1**
	Short Equity and Index Quote	**1**
Bid Size	Long Equity and Index Quote	**1**
	Short Equity and Index Quote	**1**
Block CheckSum	Block Header	**1**
Block Size	Block Header	**1**
Block Timestamp	Block Header	**1**
Block Sequence Number	Block Header	**1**
	Sequence/Message Count Status – Block Sequence Number Status Response (Type M)	**1**
	- E -	
Expiration Block	Equity and Index Last Sale	**1**
	Equity and Index End of Day Summary	**1**
	Long Equity and Index Quote	**1**
	Short Equity and Index Quote	**1**

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE APPEARANCE	NUMBER OF APPEARANCES/ MESSAGES
	- H -	
High Price	Equity and Index End of Day Summary	**1**
	- I -	
Index Value	Underlying Value – Last Sale	**1**
Index Value Denominator Code	Underlying Value – Last Sale Underlying Value – Bid and Offer	**1** **1**

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE APPEARANCE	NUMBER OF APPEARANCES/ MESSAGES
	- L -	
Last Price	Equity and Index End of Day Summary	**1**
Low Price	Equity and Index End of Day Summary	**1**
	- M -	
Message Count	Sequence/Message Count Status	**1**
Message Data	Administrative	**1**
	Control	**1**
Message Data Length	Administrative	**1**
	Control	**1**
Message Header	Equity and Index Last Sale	**1**
	Equity and Index End of Day Summary	
	Long Equity and Index Quote	**1**
	Short Equity and Index Quote	**1**
	Administrative	**1**
	Control	**1**
	Sequence/Message Count Status – Block Sequence Number	**1**
	Inquiry Request (Type L)	**1**
	Sequence/Message Count Status – Block Sequence Number Status Response (Type M)	**1**
	Sequence/Message Count Status – Message Count Status Inquiry Request (Type R)	**1**
	Sequence/Message Count Status – Message Count Status (Type S)	**1**
	Underlying Value – Last Sale	**1**
	Underlying Value – Bid and Offer	**1**
Messages in Block	Block Header	**1**
	- N -	
Net Change	Equity and Index End of Day Summary	**1**

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE APPEARANCE	NUMBER OF APPEARANCES/ MESSAGES
	- O -	
Offer Index Value	Underlying Value – Bid and Offer	**1**
Offer Price	Equity and Index End of Day Summary	**1**
	Long Equity and Index Quote	**1**
	Short Equity and Index Quote	**1**
Offer Size	Long Equity and Index Quote	**1**
	Short Equity and Index Quote	**1**
Open Interest Volume	Equity and Index End of Day Summary	**1**
Open Price	Equity and Index End of Day Summary	**1**
	- P -	
Premium Price	Equity and Index Last Sale	**1**
Premium Price Denominator Code	Equity and Index Last Sale	**1**
	Equity and Index End of Day Summary	**1**
	Long Equity and Index Quote	**1**

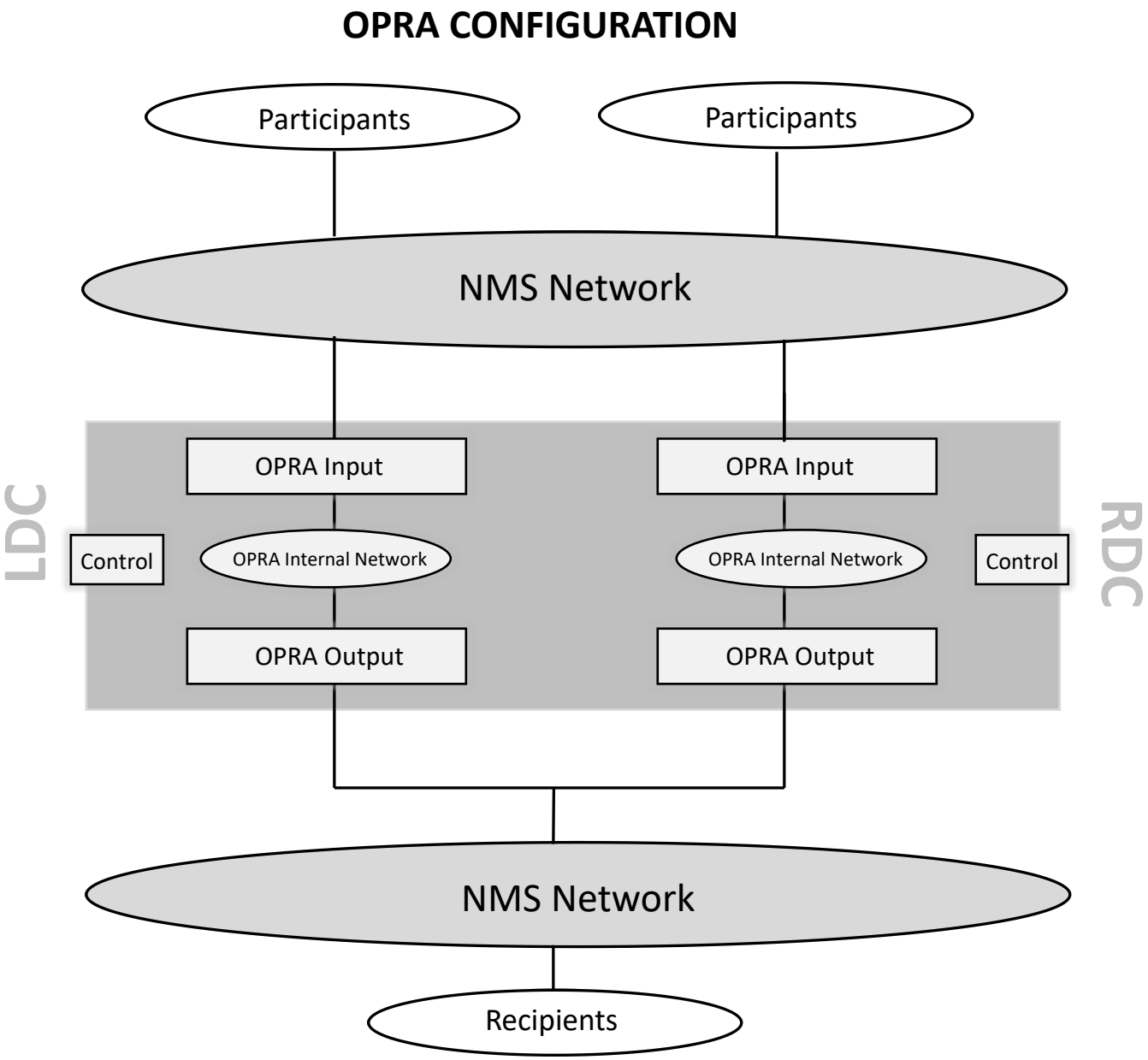
FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE APPEARANCE	NUMBER OF APPEARANCES/ MESSAGES
	- R -	
Reserved	Sequence/Message Count Status – Request and Response (Type L)	**1**
	Sequence/Message Count Status – Request and Response (Type M)	**2**
	Sequence/Message Count Status – Message Count Status (Type S)	**1**
	- S -	
Security Symbol	Equity and Index Last Sale	**1**
	Equity and Index End of Day Summary	**1**
	Long Equity and Index Quote	**1**
	Short Equity and Index Quote	**1**
	Underlying Value – Last Sale	**1**
	Underlying Value – Bid and Offer	**1**
Session Indicator	Message Header	**1**

FIELD APPEARANCES WITHIN MESSAGES. continued

FIELD NAME	MESSAGE APPEARANCE	NUMBER OF APPEARANCES/ MESSAGES
	- S -	
Strike Price	Equity and Index Last Sale	**1**
	Equity and Index End of Day Summary	**1**
	Long Equity and Index Quote	**1**
	Short Equity and Index Quote	**1**
Strike Price Denominator Code	Equity and Index Last Sale	**1**
	Equity and Index End of Day Summary	**1**
	Long Equity and Index Quote	**1**
	- T -	
Trade Identifier	Equity and Index Last Sale	**1**
Trading Session Identifier	Equity and Index Last Sale	**1**
	- U -	
Underlying Price Denominator Code	Equity and Index End of Day Summary	**1**
Underlying Price	Equity and Index End of Day Summary	**1**
	- V -	
Version	Block Header	**1**
Volume	Equity and Index Last Sale	**1**
	Equity and Index End of Day Summary	**1**

APPENDIX A: OPRA CONFIGURATION



APPENDIX B: SPECIAL BBO OPERATIONAL "KILL" PROCEDURE

If a Participant informs SIAC Operations that they are experiencing system or other problems resulting in the unreliability of their quotes, upon the request of that Participant, SIAC Operations can execute a "KILL" procedure, whereby a zero quote is generated for every issue for which that Participant had entered a quote.

When a Participant is in a "KILLED" state, their trades and administrative messages **will continue** to be processed normally. However, any subsequent quote messages will be rejected until the "Kill" state is removed for the trading day.

APPENDIX C: SCHEDULE OF DAILY OPRA MESSAGES

Note: Time ranges shown have approximate times indicated, are dependent on daily traffic volume, and are subject to change based on a Participant's hours of operation. The Times are Eastern time.

SCHEDULE FOR REGULAR OPRA SESSION

1:30 a.m.	Start of Day message
6:30 a.m.	Equity/Index Open Interest messages
7:30 a.m.	ISE FX Options trading begins
9:30 a.m.	Equity/Index Options trading begins*
9:30 a.m.	PHLX World Currency Options trading begins
4:00 p.m.	Equity Options trading ends
4:00 p.m.	PHLX World Currency Options trading ends
4:15 p.m.	Index Options trading ends
4:15 p.m.	ISE FX Options trading ends
4:15 p.m.	Quotes with Indicative Value (Message Type I) allowed
4:25 – 6:05 p.m.	Equity/Index End of Day Summary message
6:05 p.m.	End of Day message. System brought down.

***Some Index Options have non-standard trading hours.**

APPENDIX C: Schedule of Daily OPRA Messages, continued

SCHEDULE FOR GLOBAL TRADING HOURS (GTH) OPRA SESSION

7:45 p.m.*	Start of Day message on all lines
8:15 p.m.*	GTH Session Begins
9:25 a.m.	GTH Session Ends
11:35 a.m.	End of Day message

* Represents time from previous business day prior to midnight. Global Trading Hours for current business day start on previous day 8:15 P.M. and continue till 9:25 a.m. current day (or till 11:30 AM if current day is a US holiday)

Note - Global Trading Hours Regular schedule begins at 8:15 PM, ET, Sunday and ends at 9:25 AM on Monday the next calendar day. Trading resumes daily at 8:15 PM ending Friday 9:25 AM. There is no trading from Friday 9:25 AM until Sunday 8:15 PM

APPENDIX D: SPECIAL PROCESSING FIELD RESTRICTIONS

PRICE FIELDS

1) For all prices with an associated denominator code, if the numeric value exceeds the OPRA field size requirement, OPRA will reject the message. Price field values must be restricted within the maximum number of digits as specified under Special Processing Field Restrictions table for various Price fields. E.g. Strike Price of 123.4500 will be accepted if represented as value 123450 with denominator C or value 12345 with denominator B, but will be rejected if represented as value 1234500 with denominator D, since value exceeds 6 digits restriction for Strike Price prior to decimal normalization.

Please reference the chart in Appendix D for all price, size and volume fields

SIZE/VOLUME FIELDS:

1) Quote (cat k,q): Bid Size & Offer Size must be between 0 and 999,999 (6 positions)
2) Last Sale (cat a): Volume must be between 0 and 999,999 (6 positions)
3) End of Day Summary (cat f): Volume must be between 0 and 999,999 (6 positions) and Open Interest Volume must be between 0 and 9,999,999 (7 positions)

CATEGORY Y – UNDERLYING LAST SALE MESSAGE:

1) Index Values cannot have more than two significant digits to the right of the decimal point. For example: An Index Value with a denominator code of 'D', 375.3570 will be rejected (please note a reject message is not sent back to the Participant). An Index Value with a denominator code of 'D' 375.3400 will be processed. Price Denominator code will be normalized to 'B'

Note: If the above conditions are not met, then OPRA will reject the message. A reject message is not sent back to the Participant.

Please reference the following chart for field restrictions and special processing

APPENDIX D: Special Processing Field Restrictions, continued

Field	Message Cat	Binary Input/ Output Length	Binary Spec Notations	Binary Participant Input - Special Processing Field Restrictions	
				Binary Significant digits Limited To	Value Limit
Security Symbol	a,d,f,k,	5		5	
	Y	5		5	
	q	4		4	
Strike Price	a,d,f,k	4		6	999,999
	q,	2	Strike Price Denom is expected to be 'A'		65,535
Volume	a,f	4		6	999,999
Premium Price	a	4		8	99,999,999
Open Interest Volume	d,f	4		7	9,999,999
Index Value	Y	4		7	9,999,999
Bid Index Value	Y	4		7	9,999,999
Offer Index Value	Y	4		7	9,999,999

Message Categories:
'a' Equity and Index Last Sale
'f' Equity and Index EOD Summ
'k' Long Equity and Index Quote
'q' Short Equity and Index Quote

Message Categories, cont'd:
'C' Administrative
'H' Control
'N' Sequence Number Status
'Y' Underlying Value Message

APPENDIX D: Special Processing Field Restrictions, continued

Field	Message Cat	Binary Input/ Output Length	Binary Spec Notations	Binary Participant Input - Special Processing Field Restrictions	
				Binary Significant digits Limited To	Value Limit
Open Price	f	4		8	99,999,999
High Price	f	4		8	99,999,999
Low Price	f	4		8	99,999,999
Last Price	f	4		8	99,999,999
Underlying Price	f	8		8	99,999,999
Net Change	f	4		8	99,999,999
Bid Price	f,k	4		8	99,999,999
	q	2	Premium Price Denom is expected to be 'B'		65,535
Offer Price	f,k	4		8	99,999,999
	q	2	Premium Price Denom is expected to be 'B'		65,535
Bid Size	k	4		6	999,999
	q	2			65,535
Offer Size	k	4		6	999,999
	q	2			65,535

Message Categories:
'a' Equity and Index Last Sale
'f' Equity and Index EOD Summ
'k' Long Equity and Index Quote
'q' Short Equity and Index Quote

Message Categories, cont'd:
'C' Administrative
'H' Control
'N' Sequence Number Status
'Y' Underlying Value Message