SIAC

SECURITIES INDUSTRY AUTOMATION CORPORATION

CONSOLIDATED TAPE SYSTEM

CTS

OUTPUT MULTICAST
INTERFACE SPECIFICATION

November 6, 2015
Version 77

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132	Added: Sub-Penny Trading
52-55, 73, 75, 77, 83, 92 98	Added: New 'Index Sign' field utilizing Reserved byte in the following Index messages: • Category Y Type X - Short Index • Category Y Type Y - Long Index Added new Bid Index Sign and Offer Index Sign fields utilizing Reserved byte in the following Index messages: • Category Y Type V – Short Bid & Offer Index • Category Y Type W – Long Bid & Offer Index
VERSION #42 – July 3, 2007	
07-113, 130, 160	Deleted an existing Sale Condition (**Note**: the code may be repurposed at a future date): • 'G'- 'Opening/Reopening Trade Detail' Redefined the following existing Sale Condition: • 'H' - From: 'Intraday Trade Detail' To: 'Price Variation Trade' Added new Sale Conditions: • 'M' -Market Center Official Close • 'Q' -Market Center Official Open • 'X' -Cross Trade Modification to: Processing criteria of Consolidated Last for Sale Condition 'O' – Market Center Opening Trade
VERSION #43 – July 23, 2007	
94 & 102 154	Added new Consolidated High/Low/Last Price Indicator code: 'H' – High/Low Added new Participant Open/High/Low/Last Price Indicator codes: • 'L' – Open/Last • 'M' – Open/High/Low • 'N' – Open/High/Last • 'O' – Open/Low/Last • 'P' – High/Low • 'Q' – High/Low/Last Redefined Participant Open/High/Low/Last Price Indicator code: • 'G' – From: 'Not Applicable' To: 'Unused' Modification to Approximate 'Volume' Administrative Message

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VERSION #44 – July 31, 2007	
15, 22, 29, 31 & 68 20, 25-26, 32 & 57 Summary of Changes Section	Eliminated All References to: • Category C Type J 'End of Day' and Category C Type K 'End of Retransmission Request' Control Messages Modified Message Type Routing of: • Category A Type A 'Start of End of Day Summary' • Category A Type B 'End of End of Day Summary' • Category A Type C 'Start of Start of Day Summary' • Category A Type D 'End of Start of Day Summary' • Category E Type O 'Equity Start of Day Summary' • Category E Type S 'Equity Consolidated End of Day Summary' • Category E Type T 'Equity Participant End of Day Summary' Eliminated Summary of Changes VERSION #1 – September 12, 2004 up to and including VERSION #35 – October 19, 2005 (maintaining a 2-year Summary of Changes)
VERSION #45 – October 31, 2007	
107, 108, 110 & 132	• Added new Sale Condition: 'V' - Stock-Option Trade • Added: Glossary Definition of Stock-Option Trade
VERSION #46 – December 3, 2007	
133-136 110 25	• Revised: Timeline of CTS Multicast Line Messages for the New York Stock Exchange (NYSE) effective December 13, 2007: Market Open: From 8:20 a.m. - To 9:30 a.m. E.T. • Revised Consolidated Last and Participant Last Processing Criteria for: Sale Condition '4' – Derivatively Priced Trade • Modified Message Type Routing of Market Summary Messages with an '**A**' in the Message Network Field: • Category M Type B 'Start of Most Active Issues' • Category M Type C 'Most Active Issues' • Category M Type D 'End of Most Active Issues' • Category M Type E 'Start of Closing Trade Prices' • Category M Type F 'Closing Trade Prices' • Category M Type G 'End of Closing Trade Prices' • Category M Type H 'Start of Closing Bid/Offer Prices' • Category M Type I 'Closing Bid/Offer Prices' • Category M Type J 'End of Closing Bid/Offer Prices'
VERSION #47 – January 29, 2008	
133-136	Revised: Timeline of CTS Multicast Line Messages for the International Securities Exchange (ISE) effective February 11, 2008: • Market Open: From 9:30 AM - To 9:00 A.M. ET • Market Closed: From 4:00 PM - To 4:15 P.M. ET

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VERSION #48 – August 18, 2008	
30, 101, 105, 120, 133-136	Added: New CTS Participant ‘BATS Trading’ • New Participant ID – ‘Z’ • New Primary Listing Market ID – ‘Z’ • New Trade Reporting Facility (TRF) ID – ‘Z’ Added: Timeline of CTS Multicast Line Messages for new CTS Participant ‘BATS Trading’: • Market Open: 8:00 A.M. ET • Market Closed: 4:00 P.M. ET
VERSION #49 – September 29, 2008	
133-136	Revised: Timeline of CTS Multicast Line Messages for the International Securities Exchange (ISE) effective October, 2008: • Market Open: From 9:00 AM - To 8:00 A.M. ET • Market Closed: From 4:15 PM - To 5:00 P.M. ET
VERSION #50 – January 5, 2009	
133-136	Revised: Timeline of CTS Multicast Line Messages for the International Securities Exchange (ISE): Market Closed: From 5:00 P.M. ET - To 8:00 P.M. ET
30, 101, 105, 120, 133-136	Revised: Participant ID Value: From: National Association of Securities Dealers To: FINRA
VERSION #51 – February 27, 2009	
All	Revised: Participant ID Value: • From: American Stock Exchange To: NYSE AMEX • From: Boston Stock Exchange To: NASDAQ OMX BX • From: Philadelphia Stock Exchange To: NASDAQ OMX PHLX
133-136	• Revised: Total number of IP Multicast Lines broadcasting CTS messages: From: 4 lines To: 26 lines • Revised: Message routing by symbol and network over 26 Multicast Lines.
VERSION #52 – May 13, 2009	
133-136	Revised: Timeline of CTS Multicast Line Messages for BATS Trading: Market Closed: From 4:00 P.M. E.T. - To 5:00 P.M. E.T.
VERSION #53 –September 17, 2009	
30, 101, 105, 120,	Revised: Participant ID Value: • From - BATS Trading To - BATS Exchange, Inc.

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VERSION #53 – September 17, 2009 cont'd	
30, 101, 105, 120, 133-136	Added New Participant: Direct Edge A: • New Participant ID 'J' • New Primary Listing Market ID 'J' • New Trade Reporting Facility ID 'J' • New Last Participant ID 'J' Added: Timeline of CTS Multicast Line Messages for new CTS Participant Direct Edge A: • Market Open: 08:00 A.M. ET • Market Closed: 08:00 P.M. ET
30, 101, 105, 120, 133-136	Added New Participant: Direct Edge X: • New Participant ID 'K' • New Primary Listing Market ID 'K' • New Trade Reporting Facility ID 'K' • New Last Participant ID 'K' Added: Timeline of CTS Multicast Line Messages for new CTS Participant Direct Edge X: • Market Open: 08:00 A.M. ET • Market Closed: 08:00 P.M. ET
30, 101, 105, 120, 133-136	Added New Participant: BATS Y-Exchange Inc.: • New Participant ID 'Y' • New Primary Listing Market ID 'Y' • New Trade Reporting Facility ID 'Y' • New Last Participant ID 'Y' Added: Timeline of CTS Multicast Line Messages for new CTS Participant BATS Y-Exchange, Inc: • Market Open: 08:00 A.M. ET • Market Closed: 05:00 P.M. ET
52-55, 73, 75, 77 & 79	Revised: The following Index Messages will no longer accommodate a maximum of 5 index groups: • Short Index - Category Y, Type X • Short Bid and Offer Index – Category Y, Type V The following Index Messages will no longer accommodate a maximum of 20 index groups: • Long Index - Category Y, Type Y • Long Bid and Offer Index – Category Y, Type W
133-136	Revised: Timeline of CTS Multicast Line Messages for the Chicago Stock Exchange: • Market Open: From 09:30 A.M. ET - To 07:00 A.M. ET • Market Closed: From 04:00 P.M. ET - To 04:15 P.M. ET

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VERSION #54 – October 29, 2009	
133-136	Revised: Timeline of CTS Multicast Line Messages for the CBOE Stock Exchange: Market Open: From 09:15 A.M. ET To 09:00 A.M. ET
VERSION #55 – January 11, 2010	
87	Added: 'Regulatory' and 'Non-Regulatory' descriptions to associated Halt Reason codes.
133-136	Revised: Timeline of CTS Multicast Line Messages for the CBOE Stock Exchange: Market Closed: From 04:00 P.M. ET To 04:30 P.M. ET
30, 101, 105, 120, 133-136, 152	Revised: Participant ID, Primary Listing Market Participant Identifier and Trade Reporting Facility Identifier Value: From: NASDAQ PHLX To: NASDAQ PSX Revised: Summary of Daily CTS Multicast Line Messages
118, 156	Revised: Description of '/TEST' suffix which is to be used only with a symbol that is **not** in the CTS security master database.
VERSION #56 – May 24, 2010	
83 & 129-130	Redefined existing Halt Reason Code **'M'** (Regulatory) as follows: From: Additional Information To: Volatility Trading Pause
VERSION #57 – July 9, 2010	
32, 35, 37, 40, 43, 44, 47-49, 51, & 59-61	Added: New Short Sale Restriction Indicator to the following messages: • Start of Day Summary (Category B/E/L, Type O) • Long Trade (Category B/E/L, Type B) • Correction (Category B/E/L, Type P) • Cancel/Error (Category B/E/L, Type Q) • Trading Status (Category B/E/L, Type F) • Consolidated End of Day Summary (Category B/E/L, Type S) • Prior Day Trade (Category B/E/L, Type J) • Prior Day Correction (Category B/E/L, Type K) • Prior Day Cancel/Error (Category B/E/L, Type L) • Closing Trade Prices (Category M, Type F) • Most Active Issues (Category M, Type C) • Closing Bid/Offer Prices (Category M, Type I)
114	Added: New code 'E' to 'Security Status' field of Trading Status (Category B/E/L, Type F) message denoting 'Short Sale Restriction in Effect'.
34, 80, 116 & 131	Added: • "Non-applicable" notation pertaining to use of Short Sale Restriction Indicator in Short Trade (Category B/E/L, Type I). • Short Sale Restriction Indicator in Field Appearances Within Messages • New Short Sale Indicator field • New Short Sale Restriction Indicator to Field Description and Glossary

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VERSION #58 – July 30, 2010	
133-136	Revised: Timeline of CTS Multicast Line Messages for the National Stock Exchange: • Market Close: From 06:30 P.M. ET To 08:00 P.M. ET
VERSION #59 – August 18, 2010	
24	Revised: Multicast Line Symbol Distribution for Network A and Network B
VERSION #60 – September 29, 2010	
133-136	Revised: Timeline of CTS Multicast Line Messages for the CBOE Stock Exchange: • Market Open: From 09:00 A.M. ET To 08:30 A.M. ET • Market Close: From 04:30 P.M. ET To 04:45 P.M. ET
VERSION #61 – December 10, 2010	
24, 107	Added: New dedicated 'Test' symbols: • Network A: CBO and CBX • Network B: IBO and IGZ
VERSION #62 – March 25, 2011	
133	Revised: Timeline of CTS Multicast Line Messages for the NASDAQ OMX BX: Market Open: From-08:00 A.M. ET To-07:00 A.M. ET
VERSION #63 – October 11, 2011	
32	Revised: Minimum number of bytes in Start of Day Summary Message: • From: 90 To: 84
24, 115	Added: New dedicated 'Test' symbols: • Network B: ZBZX and ZTEST
114	Added: New Limit Up-Limit Down Code 'F' to 'Security Status' field of the Trading Status message (Category E, Type F)
43, 69, 74, 76, 90, 95 & 96	Revised to support 'Limit Up-Limit Down (LULD)': • From-High Indication Price Denominator Indicator To-High Indication Price/Upper Limit Price Band Denominator Indicator • From-High Indication Price To-High Indication Price/Upper Limit Price Band • Revised: From-Low Indication Price Denominator Indicator To-Low Indication Price/Lower Limit Price Band Denominator Indicator • From-Low Indication Price To-Low Indication Price/Lower Limit Price Band
43, 74 & 95	Added: New 'Limit Up-Limit Down (LULD) Indicator'
127	Added: Limit Up-Limit Down and website link in Glossary
VERSION #64 – March 14, 2012	
52-55, 68, 70, 72 & 74	Revised: The following Index Messages can accommodate a maximum of 5 index groups: • Short Index - Category Y, Type X • Short Bid and Offer Index – Category Y, Type V The following Index Messages can accommodate a maximum of 20 index groups: • Long Index - Category Y, Type Y • Long Bid and Offer Index – Category Y, Type W

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VERSION #65 – May 10, 2012	
15, 22-24, 27, 30, 59-60, 82, 84, 97, 100, 101, 105, 107, 108, 110, 115, 120, 123-125, 127, 131, 134-136, 139, 146 & 151	Revised: Participant Name: • From: NYSE AMEX Stock Exchange • To: NYSE MKT Stock Market
VERSION #66 – June 27, 2012	
19, 22, 27, 31, 58 & 135	Revised Category 'M' messages: • From – 'Market Summary' Messages To – 'Market Status' Messages
22, 27, 58, 62, 63, 76, 78, 79 & 94	Added the following new messages: • New 'Market-Wide Circuit Breaker Decline Level Status' - Message Category M, Type K • New 'Market-Wide Circuit Breaker Status' - Message Category M, Type L
88	Added: New 'Market-Wide Circuit Breaker' Halt Reason codes 1, 2 and 3 to 'Halt Reason' field of Trading Status (Category B/E/F, Type F) message.
128	Added the following to the Glossary: • 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 #66A – July 24, 2012	
47, 48 & 50	Revised description of the following messages: • Prior Day Trade (Category B/E/L, Type J) • Prior Day Correction (Category B/E/L, Type K) • Prior Day Cancel/Error (Category B/E/L, Type L)
31 36,44,46	Revised verbiage in the following sentences: • Each message transmitted by CTS consists of a Message Header and a Message Text or Message Header Only. • In cases where no trades qualify to update the Last Price, both the Previous Close Date and Previous Close Price fields are provided.
VERSION #67 – March 6, 2013	
133	Revised 'Market Open' for NASDAQ OMX: • From - 7:00 AM ET To - 4:00 AM ET

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VERSION #68 – June 28, 2013	
29	Revised description in the 'Timestamp' section as follows: • From: "The Timestamp indicates the Time that a transaction is disseminated over the Multicast Line(s)". To: "The Timestamp indicates the Time that processing a message is completed". • From: "For Retransmissions, the Time will reflect the original Time that the message was disseminated". To: "For Retransmissions, the Time will reflect the original Time that processing the message was completed".
98	Added: Description of the Limit Up-Limit Down Indicator codes 'C-J'.
78, 110, 111, 113 & 136	Redefined: Existing code 'I' in the Sale Condition field to denote the following change in value: • From – Cap Election Trade To – Odd Lot Trade
78, 110, 111, 113 & 127	Added: New code 9 in Sale Condition field to denote 'Corrected Consolidated Close Price as per Listing Market'.
73, 88 & 127	Added: New code '8' in Financial Status field to denote 'Creations and/or Redemptions Suspended for Exchange Traded Product (ETP)'
VERSION #69 – October 4, 2013	
73, 88 & 127	Redefined: Existing code '8' in Financial Status field: • From: Creations and/or Redemptions Suspended for Exchange Traded Products. • To: Creations Suspended (for Exchange Traded Products).
73, 88 & 137	Added: New code '9' in Financial Status field to denote 'Redemptions Suspended' (for Exchange Traded Products).
73, 88 & 132	Added: New code 'A' in Financial Status field to denote 'Liquidation' (for Exchange Traded Products).
VERSION #69a –February 3, 2014	
N/A	**Note**: FINRA reactivation – no functionality changes.
VERSION #70 –May 6, 2014	
19, 24, 68 & 70	Added: New Control Message: • Category C Type P - 'Disaster Recovery Data Center Activation'.

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VERSION #71 – May 16, 2014	
144	Revised 'Market Closed' for NSX: • From: 8:00 PM ET To: 5:00 PM ET
VERSION #72 – May 22, 2014	
142-143	Revised 'Transmission Schedule of End of Day Reports for the following: • NYSE/NYSE MKT Most Active Issues • NYSE/NYSE MKT Closing Trade Prices • NYSE Market Volume & Index Reports
VERSION #73 –October 31, 2014	
19, 29, 30, 33, 34, 36-59, 63-71, 166-168	Added: New *Expanded* Message Header (**39 Bytes**) including the following: • Modified Message Header Identifier • New Transaction ID Part A field (Reserved for internal use only) • New Transaction ID Part B field (Reserved for internal use only) • Modified CTS Timestamp (represented in microseconds since midnight ET) • New Timestamp (represented in microseconds since midnight ET)
VERSION #74 – November 6, 2014	
25-26	Revised: Message Routing by Network and Symbol Distribution **Note: No change to routing of Index Messages**.
VERSION #75 – February 4, 2015	
19, 29, 34, 36-59, 63-71	Modified: New *Expanded* Message Header (increased from 39 Bytes to **45 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 45 Bytes Revised: Effective Date from April 2015 to July 2015
VERSION #76 – February 25, 2015	
115, 116, 118, 131, 142	Modified: Existing code '**7**' in the Sale Condition field to denote the following change in value: • From – Reserved To – Qualified Contingent Trade Redefined: Existing code '**V**' in the Sale Condition field to denote the following change in value: • From – Stock Option Trade To – Contingent Trade Effective Date: July 2015
VERSION #76a – April 22, 2015	
34-35	Added: Definitions for Timestamp 1 and Timestamp 2 fields of the New *Expanded* Message Header Revised: Effective Date from July 2015 to August 3rd, 2015

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VERSION #77 – September 10, 2015	
25 & 123	Added: New dedicated ‘Test’ symbol: • Network B: ZTST
VERSION #78 – November 6, 2015	
145	Revised ‘Market Open’ times for BATS BZX Exchange, BATS BYX Exchange, BATS EDGA Exchange and BATS EDGX Exchange: From: 8:00 AM ET To: 7:00 AM ET

REFERENCE MATERIAL

For Technical Specifications visit www.ctaplan.com - and select Tech Specs tab for the following:

■ CTS Multicast Output Specification
■ CTS Input Specification
■ Common IP Multicast Distribution Network Specification
■ Enhanced Autolink Facility User Guide

FURTHER INFORMATION

■ CTA Announcements including feed enhancements, traffic rates, etc. visit www.ctaplan.com

FUTURE ENHANCEMENTS

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 by email, please subscribe at: https://www.ctaplan.com/subscribe

RELATED RESOURCES

For customers selecting to initiate Secure Financial Transaction Infrastructure (SFTI) connections to CTS**:**

■ Submit a request at: http://www.nyxdata.com/Connectivity
■ Contact SFTI Sales at: NYSE-Technologies-Sales@nyx.com
■ For supporting SFTI® documentation including Customer and Technical guides visit: www.nyxdata.com/docs.

1.0 INTRODUCTION

1.1 BACKGROUND

The Securities Industry Automation Corporation (SIAC) has continuously served as the "Processor" for the Consolidated Tape Plan from its inception on April 30, 1976. In fulfilling its role as the Processor, SIAC plans, develops, operates, and maintains the Consolidated Tape System (CTS).

CTS receives, validates and sequences the last sale price and size of all equity transactions in listed securities from all U.S. Stock Exchanges and the Financial Industry Regulatory Authority. CTS processes the data, consolidates them into Network A and Network B data streams, calculates and appends Open, High, Low, and Last price information, and distributes them via multicast output feeds to approved subscribers of the CTS service, for worldwide redistribution to their customers as part of their individual vendor services. CTS subscribes to the CTS multicast output feeds and a ticker application produces the Network A and Network B visual low speed tickers.

Essential in ensuring the timely reporting of trade information are the CTS Multicast Line (ML) output facilities. Approved subscribers of the CTS service can redistribute CTS data worldwide to their customers as part of their individual services or use the data for their own purposes.

The consolidated ML output facilities designate traffic with two network identifiers. An "A" network identifier represents last sales for NYSE listed securities traded by CTS Participants. A "B" network identifier represents last sales for securities that are listed on the NYSE MKT, NYSE ARCA, those securities eligible for the NYSE MKT Stock Market listing but traded solely by Regional Exchanges, Local Issues and Bonds. CTS also generates the Tape A and Tape B visual Low Speed Ticker (LST).

1.2 DUAL SITE REDUNDANCY

Computer systems that support the processing and dissemination of consolidated trades are operational at two data centers are 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 trade and 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 CTS dual site configuration is illustrated in **Appendix A**.

1.3 SCOPE

This specification defines the communications interface and message format requirements for Data Recipients (vendors, broker/dealers or others who receive the data feed) connecting to the National Market System (NMS) IP Multicast distribution network.

2.0 GENERAL DESIGN OF DATA DISTRIBUTION NETWORK

The CTS Communications Interface design utilizes the IP Multicast protocol with T1 and T3 circuits. The requirements for the IP Multicast Network interface are defined in the supplement to this document, "National Market Systems Common IP Multicast Distribution Network Recipient Interface Specification" which can be accessed at the following website: http://www.ctaplan.com and select the Technical Specifications tab.

3.0 TRANSMISSION CHARACTERISTICS

3.1 TRANSMISSION BLOCK

Encapsulated within each IP packet is a single transmission block. One type of transmission block is used for all types of messages:

S O H	**BLOCK TEXT**	**E T X**

|<---------- TRANSMISSION BLOCK----------------->|

A block can have a maximum of 1,000 characters including the text.

3.2 CHARACTER SET

All transmissions are in standard 8-bit USASCII code.

3.3 SOH AND ETX

The Start of Header (SOH) control character (x01) indicates the beginning of the block, whereas the End of Text (ETX) control character (x03) signifies the end of the block.

3.4 US

The Unit Separator (US) control character (x1F) is needed in multiple message blocks to signify the end of the preceding message but not the end of the block.

3.5 BLOCK TEXT

The block text can consist of multiple messages. A message is a unit of data that can be processed by the receiving station independently of other data. A message may not span a block boundary.

A message consists of a Message Header, which is of fixed length and format, and a Message Text segment, which is variable in length and format. A US character delimits each message while an ETX character delimits the last message in the block.

3.6 BLOCK TEXT FORMAT

The block text consists of multiple messages with each message consisting of a Message Header and, with the exception of certain control messages, a Message Text.

The block text is depicted below:

S O H	**MESSAGE 1 HEADER & TEXT**	**U S**	**MESSAGE 2 HEADER & TEXT**	**U S**	**~ ~ ~ ~**	**MESSAGE n HEADER & TEXT**	**E T X**
|<------------------------------------ **BLOCK TEXT** ------------------------------------>|							

3.7 DATA FORMAT

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.

3.8 RETRANSMISSION CAPABILITY

CTS safe-stores all messages transmitted to the Data Recipients within a single trading day. This safe-store provides a facility for message retransmission.

If Data Recipients do not receive a message(s), they can request to have the message retransmitted. Retransmission requests are accepted in the period following transmission of the Start of Day message and before the transmission of the End of Transmission message.

The Enhanced AutoLink Facility is utilized for automatically receiving and processing CTS message retransmission requests.

The Enhanced AutoLink Facility works in conjunction with the Retransmission and Playback System (RAPS), a server associated with the CTS host, which supports CTS retransmissions. In addition, during non-production hours, RAPS provides data playback capability facilitating test requirements to IP multicast Data Recipients.

A Data Recipient may request automated retransmission(s) by connecting directly through SFTI to the Enhanced AutoLink Facility via TCP/IP addresses and ports. A Data Recipient is required to enter their assigned user ID and password along with system, line, and sequence number information. The request will be forwarded to the Enhanced AutoLink Facility, then to a RAPS server associated with the CTS host, and out to the proper IP multicast groups. An **Enhanced AutoLink Facility Users Guide** for automated retransmission requests can be accessed at the following website: http://www.ctaplan.com and select the Technical Specifications tab.

When a message is retransmitted, its retransmission requester field contains the unique character(s) identifying the Data Recipient who requested the retransmission. The MSN field in the retransmitted message contains the original message sequence number and the original time of transmission. If the MSN counter for a line has been reset to Zero, no messages transmitted prior to reset are available for retransmission.

Retransmissions are transmitted at a lower message rate than regular original messages in order not to delay transmission of current messages. The total number of retransmissions requested at any one time by a particular Data Recipient may be divided into several smaller output message blocks.

If for any reason, RAPS does not receive a message(s) or is unavailable to perform its functions, CTS has the ability to retransmit messages to RAPS and Data Recipients over the Production multicast IP groups. In this case, retransmission messages are sent in a separate message block from original messages and other requested retransmission messages. The following message types are not included in retransmissions:

1. Start of Test Cycle (cycles of test messages are not available for retransmissions)
2. End of Test Cycle
3. Line Integrity

In the event of an AutoLink failure, a manual method of requesting retransmission(s) is also available. A Data Recipient can place a telephone call to the SIAC CTS Control Center and provide the timeframe required or the first and last message number in the sequence range to be retransmitted.

Note: It is the responsibility of the Data Recipient to ignore retransmitted messages not requested by them.

4.0 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 **45** Bytes and consists of the following data fields:

Field Name	Length (bytes)
Message Category	1
Message Type	1
Message Network	1
Retransmission Requester	2
Message Header Identifier	1
Transaction ID Part A	2
Message Sequence Number	9
Participant ID	1
CTS Timestamp	6
Timestamp 1	6
Timestamp 2	6
Transaction ID Part B	9
Total Length:	**45**

EXPANDED MESSAGE HEADER FIELD DESCRIPTIONS

4.1 MESSAGE CATEGORY

The Message Category is a **1** Byte, Alphabetic character field containing one of the following Message Categories:

Message Category Code	Value
A	Administrative
B	Bond
C	Control
E	Listed Equity
L	Local Issue
M	Market Status
Y	Index

Note: Additional Message Category(s) will be implemented as required. If Data Recipients are not prepared to process new Message Category(s) when implemented, they should be able to handle them to the extent that they do not impact their normal data processing.

4.2 MESSAGE TYPE

The Message Type is a **1** Byte, Alphabetic character field containing one of the following Message Types:

Message Category*	Message Type	Value
ADMINISTRATIVE, ANNOUNCEMENT & VOLUME MESSAGES		
A	A	Start of End of Day Summary
A	B	End of End of Day Summary
A	C	Start of Start of Day Summary
A	D	End of Start of Day Summary
A	H	Administrative Unformatted (free form text)
A	S	Market Volume and Index
BOND MESSAGES		
B	B	Bond Long Trade
B	F	Bond Trading Status
B	J	Bond Prior Day
B	K	Bond Prior Day Correction
B	L	Bond Prior Day Cancel/Error
B	O	Bond Start of Day Summary
B	P	Bond Correction
B	Q	Bond Cancel/Error
B	S	Bond Consolidated End of Day Summary
B	T	Bond Participant End of Day Summary
CONTROL MESSAGES		
C	I	Start of Day
C	L	Reset Message Sequence Number
C	M	Start of Test Cycle
C	N	End of Test Cycle
C	P	Disaster Recovery Data Center Activation
C	T	Line Integrity
C	Z	End of Transmission

Category codes are repeated for clarification.

Note: Additional Message Type(s) will be implemented as required. If Data Recipients are not prepared to process new Message Type(s) when implemented, they should be able to handle them to the extent that they do not impact their normal data processing.

Message Types, continued

Message Category*	Message Type	Value
	EQUITY MESSAGES	
E	B	Equity Long Trade
E	F	Equity Trading Status
E	I	Equity Short Trade
E	J	Equity Prior Day
E	K	Equity Prior Day Correction
E	L	Equity Prior Day Cancel/Error
E	O	Equity Start of Day Summary
E	P	Equity Correction
E	Q	Equity Cancel/Error
E	S	Equity Consolidated End of Day Summary
E	T	Equity Participant End of Day Summary
	LOCAL ISSUE MESSAGES	
L	B	Local Issue Long Trade
L	F	Local Issue Trading Status
L	I	Local Issue Short Trade
L	J	Local Issue Prior Day
L	K	Local Issue Prior Day Correction
L	L	Local Issue Prior Day Cancel/Error
L	O	Local Issue Start of Day Summary
L	P	Local Issue Correction
L	Q	Local Issue Cancel/Error
L	S	Local Issue Consolidated Local Issue End of Day Summary
L	T	Local Issue Participant Local Issue End of Day Summary

Category codes are repeated for clarification.

Note: Additional Message Type(s) will be implemented as required. If Data Recipients are not prepared to process new Message Type(s) when implemented, they should be able to handle them to the extent that they do not impact their normal data processing.

Message Types, continued

Message Category*	Message Type	Value
MARKET STATUS MESSAGES		
M	B	Start of Closing Trade Prices (For Most Active Stocks)
M	C	Most Active Issues Closing Trade Prices
M	D	End of Closing Trade Prices (For Most Active Stocks)
M	E	Start of Closing Trade Prices
M	F	NYSE or NYSE MKT Closing Trade Prices
M	G	End of Closing Trade Prices
M	H	Start of Closing Bid/Offer Prices
M	I	Closing Bid/Offer Prices
M	J	End of Closing Bid/Offer Prices
M	K	Market-Wide Circuit Breaker Decline Level Status
M	L	Market-Wide Circuit Breaker Status
M	N	Approximate Adjusted Volume Market Center
M	O	Approximate Total Trades and Dollar Value
M	P	Crossing Session Summary
INDEX MESSAGES		
Y	X	Short Index
Y	Y	Long Index
Y	V	Short Bid and Offer Index
Y	W	Long Bid and Offer Index

Category codes are repeated for clarification.

Note: Additional Message Type(s) will be implemented as required. If Data Recipients are not prepared to process new Message Type(s) when implemented, they should be able to handle them to the extent that they do not impact their normal data processing.

4.3 MESSAGE NETWORK

The Message Network is a **1** Byte, Alphabetic character field identifying the Network on which the message is disseminated:

Message Network Field Value	Description
A	Message relates to symbols with NYSE as the listing market. The Primary Listing Market Participant ID identifies the listing market in instances when the listing market is an Exchange other than the NYSE.
B	Message relates to symbols with NYSE MKT or one of the regional Exchanges as the listing market. Message can also be for Local Issues and Bonds. The Primary Listing Market Participant ID identifies the listing market in instances when the listing market is an Exchange other than the NYSE MKT.
C	Message relates to all the Exchanges

CTS messages are disseminated over a total of twenty-six (26) IP Multicast lines:

- For messages with ‘A’ in the Network field, there are twelve (12) lines dedicated to listed equity messages.
- For messages with ‘B’ in the Network field, there are twelve (12) lines dedicated to listed equity, bond and local issue messages.
- For messages with ‘B’ in the Network field, there are two (2) lines dedicated to Index messages.
- Messages with “C” in the network field can be sent across any or all lines depending on the message routing rules listed in the following section.

4.4 MESSAGE ROUTING

Traffic for CTS Network 'A' and Network 'B' messages are routed by network and security symbol to twenty-six (26) assigned multicast lines as follows:

CTS NETWORK 'A' Symbol Range Distribution			**CTS NETWORK 'B' Symbol Range Distribution**		
Multicast Lines	**From**	**To**	**Multicast Lines**	**From**	**To**
1	A	ANZZZZ	1	A	DZZZZZ
2	AO	BXZZZZ	2	E	EWZZZZ
3	BY	CRZZZZ	3	EX	GZZZZZ
4	CS	ELZZZZ	4	H	IWEZZZ
5	EM	GLZZZZ	5	IWF	KIZZZZ
6	GM	IQZZZZ	6	KJ	RMZZZZ
7	IR	LVZZZZ	7	RN	SKZZZZ
8	LW	NOZZZZ	8	SL	SPZZZZ
9	NP	PRZZZZ	9	SQ	UMZZZZ
10	PS	STZZZZ	10	UN	VNZZZZ
11	SU	USZZZZ	11	VO	XLEZZZ
12	UT	ZZZZZZ	12	XLF	ZZZZZZ

Test Messages:
- CTS messages containing dedicated 'Test' symbols for Listing Market NYSE (CBO, CBX) will route according to the above symbol range distribution to multicast lines for Network A.
- CTS messages containing dedicated 'Test' symbols for Listing Market NYSE MKT Stock Market (IBO), Listing Market NYSE ARCA (IGZ) and Listing Market BATS (ZBZX, ZTEST, **ZTST**) will route according to the above symbol range distribution to multicast lines for Network B.

Traffic for CTS Network 'B' Index Messages are routed by the index symbol to two (2) assigned multicast lines as follows:

INDEX MESSAGE ROUTING		
CTS NETWORK 'B' Symbol Range Distribution		
Multicast Lines	**From**	**To**
1	A	MZZZZZ
2	N	ZZZZZZ

Note: Data Recipients are responsible for handling any symbol over any line. Redistribution of traffic will not occur intraday. Notification may not be sent to the Data Recipients regarding redistribution of traffic.

Message Routing, continued

Distribution of Message Types over a total of twenty-six (26) multicast lines:

Message Category	Message Type	Value	Distribution of Message Types over 24 Multicast Lines	
			Network A	**Network B**
ADMINISTRATIVE & ANNOUNCEMENT MESSAGES (With C in the Network field are disseminated over all lines)				
A	A	Start of End of Day Summary	L1-12	L1-12
A	B	End of End of Day Summary	L1-12	L1-12
A	C	Start of Start of Day Summary	L1-12	L1-12
A	D	End of Start of Day Summary	L1-12	L1-12
A	H	Administrative Unformatted (free form text) from **NYSE**	L1	N/A
A	H	Administrative Unformatted (free form text) from **Participants** (except NYSE)	N/A	L1
VOLUME MESSAGES				
A	S	Market Volume and Index	L1	N/A
BOND MESSAGES				
B	B	Bond Long Trade	N/A	L1-12
B	F	Bond Trading Status	N/A	L1-12
B	J	Bond Prior Day	N/A	L1-12
B	K	Bond Prior Day Correction	N/A	L1-12
B	L	Bond Prior Day Cancel/Error	N/A	L1-12
B	O	Bond Start of Day Summary	N/A	L1-12
B	P	Bond Correction	N/A	L1-12
B	Q	Bond Cancel/Error	N/A	L1-12
B	S	Bond Consolidated End of Day Summary	N/A	L1-12
B	T	Bond Participant End of Day Summary	N/A	L1-12
CONTROL MESSAGES (With C in the Network field are disseminated over any or all lines)				
C	I	Start of Day	L1-12	L1-12
C	L	Reset Message Sequence Number	L1-12	L1-12
C	M	Start of Test Cycle	L1-12	L1-12
C	N	End of Test Cycle	L1-12	L1-12
C	P	Disaster Recovery Data Center Activation	L1-12	L1-12
C	T	Line Integrity	L1-12	L1-12
C	Z	End of Transmission	L1-12	L1-12

Note: Data Recipients are responsible for handling any symbol over any line. Redistribution of traffic will not occur intraday. Notification may not be sent to the Data Recipients regarding redistribution of traffic.

Message Routing, continued

Distribution of Message Types over a total of twenty-six (26) multicast lines:

Message Category	Message Type	Value	Distribution of Message Types over 24 Multicast Lines	
			Network A	Network B
		EQUITY MESSAGES		
E	B	Equity Long Trade	L1-12	L1-12
E	F	Equity Trading Status	L1-12	L1-12
E	I	Equity Short Trade	L1-12	L1-12
E	J	Equity Prior Day	L1-12	L1-12
E	K	Equity Prior Day Correction	L1-12	L1-12
E	L	Equity Prior Day Cancel/Error	L1-12	L1-12
E	O	Equity Start of Day Summary	L1-12	L1-12
E	P	Equity Correction	L1-12	L1-12
E	Q	Equity Cancel/Error	L1-12	L1-12
E	S	Equity Consolidated End of Day Summary	L1-12	L1-12
E	T	Equity Participant End of Day Summary	L1-12	L1-12
		LOCAL ISSUE MESSAGES		
L	B	Local Issue Long Trade	N/A	L1-12
L	F	Local Issue Trading Status	N/A	L1-12
L	I	Local Issue Short Trade	N/A	L1-12
L	J	Local Issue Prior Day	N/A	L1-12
L	K	Local Issue Prior Day Correction	N/A	L1-12
L	L	Local Issue Prior Day Cancel/Error	N/A	L1-12
L	O	Local Issue Start of Day Summary	N/A	L1-12
L	P	Local Issue Correction	N/A	L1-12
L	Q	Local Issue Cancel/Error	N/A	L1-12
L	S	Local Issue Consolidated Local Issue End of Day	N/A	L1-12
L	T	Local Issue Participant Local Issue End of Day Summary	N/A	L1-12

Note: Data Recipients are responsible for handling any symbol over any line. Redistribution of traffic will not occur intraday. Notification may not be sent to the Data Recipients regarding redistribution of traffic.

Message Routing, continued

Distribution of Message Types over a total of twenty-six (26) multicast lines:

Message Category	Message Type	Value	Distribution of Message Types over 24 Multicast Lines	
			Network A	Network B
MARKET STATUS MESSAGES				
M	B	Start of Closing Trade Prices (For Most Active Stocks)	L1-12	L1-12
M	C	Most Active Issues Closing Trade Prices	L1-12	L1-12
M	D	End of Closing Trade Prices (For Most Active Stocks)	L1-12	L1-12
M	E	Start of Closing Trade Prices	L1-12	L1-12
M	F	NYSE or NYSE MKT Closing Trade Prices	L1-12	L1-12
M	G	End of Closing Trade Prices	L1-12	L1-12
M	H	Start of Closing Bid/Offer Prices	L1-12	L1-12
M	I	Closing Bid/Offer Prices	L1-12	L1-12
M	J	End of Closing Bid/Offer Prices	L1-12	L1-12
M	K	Market-Wide Circuit Breaker Decline Level Status	L1-12	L1-12
M	L	Market-Wide Circuit Breaker Status	L1-12	L1-12
M	N	Approximate Adjusted Volume Market Center	L1	L1
M	O	Approximate Total Trades and Dollar Value	L1	L1
M	P	Crossing Session Summary	L1	L1
M	K	Market-Wide Circuit Breaker Decline Level Status	L1-12	L1-12
M	L	Market-Wide Circuit Breaker Status	L1-12	L1-12

Message Category	Message Type	Value	Distribution of Index Message Types over 2 Multicast Lines
			Network 'B'
INDEX MESSAGES			
Y	X	Short Index	L1-2
Y	Y	Long Index	L1-2
Y	V	Short Bid and Offer Index	L1-2
Y	W	Long Bid & Offer Index	L1-2

Note: Data Recipients are responsible for handling any symbol over any line. Redistribution of traffic will not occur intraday. Notification may not be sent to the Data Recipients regarding redistribution of traffic.

4.5 RETRANSMISSION REQUESTER

The Retransmission Requester field is **2** Bytes, Alphabetic/Special Character, Left Justified, space-filled. It identifies the Data Recipient requesting the retransmission. The character(s) can be upper case, lower case or a special character. Alphabetic upper case character "O" (meaning original message), and space is entered in the Retransmission Requester field for non-retransmission messages.

The alphabetic upper case character "V" and space is entered in the Retransmission Requester field to indicate transmission of the associated message to **all** Data Recipients. A unique identification character(s) is assigned to each participating Data Recipient.

Note: All currently defined one-character Retransmission Requester codes will be expanded by a space character. That is, the first character is the already defined code and the second character is a space. It is the responsibility of the Data Recipient to ignore retransmitted messages not requested by them.

4.6 NEW MESSAGE HEADER IDENTIFIER

The new modified **Message Header Identifier** is **1** Byte, ASCII Alphanumeric field that distinguishes between the use of the old message header (**24 bytes**) and the new **Expanded Message Header** (**45 bytes**) formats.
.

Header Identifier Value	Description
A	Old Message Header (24 bytes)
B	New Message Header (45 bytes)

4.7 TRANSACTION ID PART A

The **Transaction ID Part A** field is **2** Bytes, ASCII Printable base95 Alphanumeric/Special Character (values in the range of 32-126 inclusive) which will be populated by CTS and is **Reserved for Internal Use** only.

Note: Data Recipients should ignore/disregard this field to the extent that it does not impact their normal data processing.

4.8 MESSAGE SEQUENCE NUMBER (MSN)

The Message Sequence Number (MSN) field is **9** Bytes, Numeric, Right- Justified and Zero-Filled. All messages are assigned a sequence number. On a per line basis, the MSN on the MLs are set to zero at the start of each day and are incremented by one each time a message (other than a Retransmission, Line Integrity, or Reset Message Sequence Number message) is transmitted. The following exceptions or special considerations should be noted:

1. Retransmitted messages contain the Message Sequence Number (MSN) of the original message.

2. The Category C Type T (Line Integrity) message contains the sequence number of the last message transmitted, which was not a retransmitted message.

3. The MSN field in the message header of a Category C Type L (Reset Message Sequence Number) message contains the number to which the MSN counter is to be reset. This number is either zero or a number greater than the highest number previously transmitted.

4. Category C Type Z (End of Transmission) messages, which are transmitted three times to ensure positive recognition, contain the same sequence number in each iteration of the message, one higher than the last non-retransmission message. The MSN does not change when the message is transmitted the second and third time.

5. The Category C Type M (Start of Test Cycle) and Category C Type I (Start of Day) messages contain a zero sequence number.

4.9 CTS FAILURE AND RECOVERY-TREATMENT OF MESSAGE SEQUENCE NUMBER

TYPE of RESTART	RECOVERY CONDITION
"WARM"	CTS failed but able to recover; MSNs are transmitted without a gap. Upon recovery, possible duplicate sequence numbers may be sent.
"COLD"	CTS failed and unable to perform a WARM recovery; the first MSN after recovery is reset to the next 100,000 from the last number transmitted before failure and incremented thereafter.

4.10 PARTICIPANT ID

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

Code	Value
A	NYSE MKT Stock Market
B	NASDAQ OMX BX Stock Exchange
C	National Stock Exchange
D	Financial Industry Regulatory Authority
I	International Securities Exchange
J	Direct Edge A Stock Exchange
K	Direct Edge X Stock Exchange
M	Chicago Stock Exchange
N	New York Stock Exchange
P	NYSE Arca SM
T	NASDAQ OMX Stock Exchange
S	Consolidated Tape System
V	**Investor's Exchange**
W	CBOE Stock Exchange
X	NASDAQ OMX PSX Stock Exchange
Y	BATS Y-Exchange
Z	BATS Exchange

Note: Additional Participant ID(s) will be implemented as required. If Data Recipients are not prepared to process new Participant ID(s) when implemented, they should be able to handle them to the extent that they do not impact their normal data processing.

4.11 EXPANDED MESSAGE HEADER CTS TIMESTAMP

The **CTS Timestamp** field is **6** Bytes, ASCII Printable base95 Alphanumeric/Special Character (values in the range of 32-126 inclusive) time in terms of the number of microseconds since midnight Eastern Time (ET).

For the ASCII Printable base95 allowable characters reference **Appendix I**.

The **CTS Timestamp** indicates the time that processing a message is completed. For Retransmissions, the time will reflect the original time that processing the message was completed**.**

Sample:

Old CTS Timestamp (6 Bytes)		**Expanded Message Header CTS Timestamp (6 Bytes)**		
Wall Time ET	Converted to HMS and Milliseconds	Wall Time ET	Converted to Microseconds Since Midnight	Microseconds Since Midnight
14:28:45.413543	>L]413	14:28:45.413543	&e{Q(Z	52125413543

4.12 TIMESTAMP 1

The **Timestamp 1** is a **6** Byte, ASCII Printable base95 Alphanumeric/Special Character field (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 Exchange Matching Engine Publication timestamp for a transaction. 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) and/or a FINRA Trade Reporting Facility (TRF): Timestamp 1** denotes the time of execution that a FINRA member reports to the FINRA ADF or a FINRA TRF. 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).

Timestamps, continued

4.13 TIMESTAMP 2

The **Timestamp 2** is a **6** Byte, ASCII Printable base95 Alphanumeric/Special Character field (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) or a FINRA Trade Reporting Facility (TRF):**
  - **If the FINRA ADF or a FINRA TRF** provides a proprietary feed of trades reported by the facility, then the FINRA facility will publish the time of the transmission as also published on the facility's proprietary trade feed. The TRF or ADF 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).
  - **If the FINRA ADF or the FINRA TRF facility** does **not** have a proprietary trade feed then the **Timestamp 2** field will be blank.

Timestamp 1 / Timestamp 2 – Each timestamp is 6 Bytes in length, ASCII Printable base95 Samples							
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

Please Note: For the 16:00:00.000000 Example the base95 code is:

('J0lLM = 'single quote, Uppercase J, zero, lowercase L, uppercase L, Uppercase M)

For ASCII Printable base95 allowable characters reference **Appendix I**.

Note: In the absence of a provided 'Timestamp 1' and 'Timestamp 2', and for messages generated by CTS, e.g., Price Band messages, Administrative messages, Control messages and Market Status messages, the **Timestamp 1** and **Timestamp 2** fields will be **blank**.

Timestamps, continued

4.14 TRANSACTION ID PART B

The **Transaction ID Part B** is **9** Bytes, ASCII Printable base95 Alphanumeric/Special Character field which will be populated by CTS and is **Reserved for Internal Use** only.

Note: Data Recipients should ignore/disregard this field to the extent that it does not impact their normal data processing.

5.0 MESSAGE FORMATS

Each message transmitted by CTS consists of a Message Header and a Message Text or Message Header Only. The Message Category and Type 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). Trade messages are disseminated over twenty-six multicast lines according to network and security symbol.

5.1 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.

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

5.2 GLOSSARY

A definition of terms is contained in the Glossary section, **Appendix B**.

5.3 SUMMARY OF DAILY CTS MULTICAST LINE MESSAGES

A summary of a daily CTS Multicast Line messages along with "CTS post 4:00 p.m. Market Status Messages' timeline are provided in **Appendix C**.

6.0 MESSAGE CATEGORIES AND TYPES

6.1 START OF DAY SUMMARY

The Start of Day (SOD) Summary messages are transmitted shortly after the Multicast Line "Start of Day" messages. The Participant ID field of the Message Header is populated with 'S', signifying that the message is generated by the Consolidated Tape System. It provides, by security, Consolidated and Participant previous close price and previous close price date information for CTA eligible securities, Local Issues, and Bonds. In instances when an issue trades on only one Exchange for the day, both the Consolidated and Participant summary information are identical. **If there is no price associated with a security, e.g., an Initial Public Offering (IPO), no Start of Day Summary message is generated for that security.** Other messages can be intermingled within this message transmission. This message transmission is preceded and ended by Start of Day Summary and End of Start of Day Summary administrative textual messages.

Message Category	Type
B	O
E	O
L	O

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Security Symbol	11
Temporary Suffix	1
Financial Status	1
Currency Indicator	3
Instrument Type	1
Short Sale Indicator	1
Reserved	10
CONSOLIDATED DATA	
Participant ID	1
Previous Close Price Denominator Indicator	1
Previous Close Price	12
Previous Close Price Date	6
Reserved	10

START OF DAY SUMMARY, continued

Field Name	Length (bytes)
NUMBER OF ITERATIONS	
Number of Iterations	2
PARTICIPANT DATA (can include up to 26 Participants)	
Participant ID	1
Previous Close Price Denominator Indicator	1
Previous Close Price	12
Previous Close Price Date	6
Reserved	10
Minimum Total Length:	**135**

6.2 SHORT TRADE

The Short Trade format is used **only** if the trade meets all the field restrictions noted below. If any of the field restrictions are **not** met, the Long Trade format is used.

Field Restrictions: The Short Trade format is used only if:

a. The Security symbol does not exceed **3 bytes**.
b. A Temporary Suffix is not required.
c. The Trade Reporting Facility (TRF) Identifier is not required.
d. The Financial Status Indicator is not required.
e. The currency is in U.S. Dollars.
f. There is only one sale condition relative to the trade transaction.
g. Seller's Sale Days is not required.
h. The Price meets the requirements for a **8 byte** price field. (Refer to Section 11 for 'Price Denominator Indicator' field description)
i. The volume does not exceed '9999' (**4 bytes**).
j. The Stop Stock Indicator field is not required.
k. The trade is not a Held Trade.
l. The trade is not a Bond Trade.
m. The Instrument Type is not required.
n. The Trade Through Exempt Indicator is not required.
o. The Primary Listing Market Participant Identifier is not required.
p. The Short Sale Restriction Indicator is not required.

Message Category	Type
E	I
L	I

Field Name	Length (bytes)
Message Header	**45**
Security Symbol	3
Sale Condition	1
Trade Volume	4
Price Denominator Indicator	1
Trade Price	8
Consolidated High/Low/Last Indicator	1
Participant Open/High/Low/Last Indicator	1
Reserved	1
Total Length	**65**

6.3 LONG TRADE

The Long Trade format is used to report trade information that does **not** meet the Short Trade format.
Note: The Trade Reporting Facility (TRF) Identifier is restricted to Equity trades.

Message Category	Type
B	B
E	B
L	B

Field Name	Length (bytes)
Message Header	**45**
Security Symbol	11
Temporary Suffix	1
Test Message Indicator	1
Trade Reporting Facility Identifier	1
Primary Listing Market Participant Identifier	1
Reserved	1
Financial Status	1
Currency Indicator	3
Held Trade Indicator	1
Instrument Type	1
Seller's Sale Days	3
Sale Condition	4
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	1
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Consolidated High/Low/Last Indicator	1
Participant Open/High/Low/Last Indicator	1
Reserved	1
Stop Stock Indicator	1
Total Length	**103**

6.4 CORRECTION

The Correction format is used to correct a CTA eligible security*, a Local Issue or a Bond transaction. The output sequence number to be corrected will reflect the sequence number of either the original trade, or, if the original trade has already been corrected, of the most recent correction to the trade. Included in the Correction message is the current status of the Consolidated Last, High, Low, Volume, and Previous Close Price Date and the Participant's Open, High, Low, Last, Previous Close Price Date, Volume, and Tick at the time of the correction for the affected security. In instances when an issue trades only on one exchange for the day, both the Consolidated and the Participant summary information are identical. In cases where no trades qualify to update the Last Price, both the Previous Close Date and Previous Close Price fields are provided.

***Note**: The Trade Reporting Facility (TRF) Identifier is restricted to Equity transactions.

Message Category	Type
B	P
E	P
L	P

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Reserved	5
Primary Listing Market Participant Identifier	1
Trade Reporting Facility Identifier	1
Security Symbol	11
Temporary Suffix	1
Financial Status	1
Currency Indicator	3
Instrument Type	1
Output Sequence Number of Transaction Being Adjusted	9
Reserved	1

CORRECTION, continued

Field Name	Length (bytes)
ORIGINAL TRADE INFORMATION	
Seller's Sale Days	3
Sale Condition	4
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Stop Stock Indicator	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	8
CORRECTED TRADE INFORMATION	
Seller's Sale Days	3
Sale Condition	4
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Stop Stock Indicator	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	8
CONSOLIDATED DATA	
Last Participant ID	1
Last Price Denominator Indicator	1
Last Price	12
Previous Close Price Date	6
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Total Volume	11
Reserved	11

CORRECTION, continued

Field Name	Length (bytes)
PARTICIPANT DATA	
Last Price Denominator Indicator	1
Last Price	12
Previous Close Price Date	6
Total Volume	11
Tick	1
Open Price Denominator Indicator	1
Open Price	12
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Reserved	12
Total Length	**309**

6.5 CANCEL/ERROR

The Cancel/Error format is used for CTA eligible securities*****, Local Issues or Bonds to either report the cancellation of a trade (buyer and seller agrees to cancel a trade) or error a trade that never took place but was reported. The output sequence number to be corrected will reflect the sequence number of either the original trade, or, if the original trade has already been corrected, of the most recent correction to the trade. **Corrections are not applied to a cancelled or error trade. If a correction to a cancelled or error trade is required, the Participant will enter as a new trade.** Included in the Cancel/Error message is the current status of the Consolidated Last, High, Low, Volume, and Previous Close Price Date and the Participant's Open, High, Low, Last, Previous Close Price Date, Volume, and Tick at the time of the cancel/error. In instances when an issue trades only on one Exchange for the day, both the Consolidated and the Participant summary information are identical. In cases where no trades qualify to update the Last Price, the Previous Close Price is provided and the Previous Close Price Date field is populated.

***Note**: The Trade Reporting Facility (TRF) Identifier is restricted to Equity transactions.

Message Category	Type
B	Q
E	Q
L	Q

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Reserved	5
Primary Listing Market Participant Identifier	1
Trade Reporting Facility Identifier	1
Security Symbol	11
Temporary Suffix	1
Financial Status	1
Currency Indicator	3
Instrument Type	1
Cancel/Error Action	1
Output Sequence Number of Transaction Being Adjusted	9

CANCEL/ERROR, continued

Field Name	Length (bytes)
ORIGINAL TRADE INFORMATION	
Seller's Sale Days	3
Sale Condition	4
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Stop Stock Indicator	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	8
CONSOLIDATED DATA	
Last Participant ID	1
Last Price Denominator Indicator	1
Last Price	12
Previous Close Price Date	6
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Total Volume	11
Reserved	11

CANCEL/ERROR, continued

Field Name	Length (bytes)
PARTICIPANT DATA	
Last Price Denominator Indicator	1
Last Price	12
Previous Close Price Date	6
Total Volume	11
Tick	1
Open Price Denominator Indicator	1
Open Price	12
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Reserved	12
Total Length	**269**

6.6 TRADING STATUS

The Trading Status format is transmitted when a Participant in a CTA eligible security, Local Issue or a Bond elects to notify CTS of an Opening Delay, a Trading Halt, a Trading Resume, a Price Indication or a Market Imbalance. The Trading Status message is also used to identify the Limit Up-Limit Down action associated with a security (e.g., Price Bands, Limit State Entered, Limit State Exited).

Note1: 'Limit Up-Limit Down' is not applicable to Local Issues or Bonds**.**
Note 2: 'Limit Up-Limit Down' Price Bands are republished every 30 seconds at clock time.

Message Category	Type
B	F
E	F
L	F

Field Name	Length (bytes)
Message Header	**45**
Security Symbol	11
Temporary Suffix	1
Reserved	4
Financial Status	1
Currency Indicator	3
Instrument Type	1
Security Status	1
Halt Reason	1
Due to Related Security Indicator	1
In View of Common Indicator	1
Last Price Denominator Indicator	1
Last Price	12
Status Indicator	1

TRADING STATUS, continued

Field Name	Length (bytes)
High Indication Price/Upper Limit Price Band Denominator Indicator	1
High Indication Price/Upper Limit Price Band	12
Low Indication Price/Lower Limit Price Band Denominator Indicator	1
Low Indication Price/Lower Limit Price Band	12
Reserved	1
Buy Volume	9
Sell Volume	9
Short Sale Restriction Indicator	1
Limit Up-Limit Down (LULD) Indicator	1
Reserved	4
Total Length	**135**

6.7 CONSOLIDATED END OF DAY SUMMARY

The Consolidated End of Day (EOD) Summary messages are transmitted shortly before the "Goodnight" messages. The Participant ID field of the Message Header is populated with ‘S’, signifying that the message is generated by the Consolidated Tape System. The Consolidated EOD Summary message provides by security, the Consolidated High, Low, Last and Volume for CTA eligible securities, Local Issues and Bonds.

In cases where no trades qualify to update the **Last Price**, the previous close **Last Price** is provided and the **Previous Close Price Date** field is populated with the date associated with the **Last Price** value.

Note: If a trade qualifies to update the **Last Price**, the **Previous Price Close Date** field will be space-filled. If there is no trading activity for a security for the day, then no Consolidated EOD Summary and no Participant EOD Summary will be generated for that security.

Message Category	Type
B	S
E	S
L	S

Field Name	Length (bytes)
GENERAL	
Message Header	**45**
Security Symbol	11
Temporary Suffix	1
Financial Status	1
Currency Indicator	3
Instrument Type	1
Short Sale Restriction Header	1
Reserved	10

CONSOLIDATED END OF DAY SUMMARY, continued

Field Name	Length (bytes)
Last Participant ID	1
Last Price Denominator Indicator	1
Last Price	12
Previous Close Price Date	6
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Total Volume	11
Reserved	11
Number of Participants	2
Total Length	**143**

6.8 PARTICIPANT END OF DAY SUMMARY

The Participant End of Day (EOD) Summary messages are transmitted shortly before the "Goodnight" messages. The Participant ID field of the Message Header is populated with 'S', signifying that the message is generated by the Consolidated Tape System. The Participant EOD Summary message provides by security, the Participant Open, High, Low, Last, Volume and Tick information for CTA eligible securities, Local Issues and Bonds.

In cases where no trades qualify to update the **Last Price**, the previous close **Last Price** is provided and the **Previous Close Price Date** field is populated with the date associated with the **Last Price** value.

Note: If a trade qualifies to update the **Last Price**, the **Previous Price Close Date** field will be space-filled. If there is no trading activity for a security for the day, then no Participant EOD Summary and no Consolidated EOD Summary will be generated for that security.

Message Category	Type
B	T
E	T
L	T

Field Name	Length (bytes)
GENERAL	
Message Header	**45**
Security Symbol	11
Temporary Suffix	1
Participant ID	1
Last Price Denominator Indicator	1
Last Price	12
Previous Close Price Date	6
Total Volume	11
Tick	1
Open Price Denominator Indicator	1
Open Price	12
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Reserved	9
Total Length	**137**

6.9 PRIOR DAY TRADE

The Prior Day Trade format is used to report a CTA eligible security*, a Local Issue or a Bond trade that occurred on a trading day earlier than the current trading day and was not reported.

***Note:** The Trade Reporting Facility (TRF) Identifier is restricted to Equity transactions.

Message Category	Type
B	J
E	J
L	J

Field Name	Length (bytes)
Message Header	**45**
Prior Day Trade Date (MMDDYY)	6
Reserved	2
Prior Day Trade Time (HMS)	3
Security Symbol	11
Temporary Suffix	1
Financial Status	1
Currency Indicator	3
Trade Through Exempt Indicator	1
Instrument Type	1
Seller’s Sale Days	3
Sale Condition	4
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Stop Stock Indicator	1
Trade Reporting Facility Identifier	1
Primary Listing Market Participant Identifier	1
Short Sale Restriction Indicator	1
Reserved	10
Total Length	**117**

6.10 PRIOR DAY CORRECTION

The Prior Day Correction format is used to correct a CTA eligible security*, a Local Issue or a Bond transaction originally reported on a trading day earlier than the current trading day. Corrections to current day transactions are reported using the Correction message, Category B/E/L, Type P format.

Note: The Trade Reporting Facility (TRF) Identifier is restricted to Equity transactions.

Message Category	Type
B	K
E	K
L	K

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Symbol	11
Temporary Suffix	1
Financial Status	1
Currency Indicator	3
Instrument Type	1
Trade Reporting Facility Identifier	1
Primary Listing Market Participant Identifier	1
Reserved	11
ORIGINAL TRADE INFORMATION	
Prior Day Trade Date (MMDDYY)	6
Reserved	2
Prior Day Trade Time (HMS)	3
Seller's Sale Days	3
Sale Condition	4
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Stop Stock Indicator	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	11

PRIOR DAY CORRECTION, continued

Field Name	Length (bytes)
CORRECTED TRADE INFORMATION	
Prior Day Trade Date (MMDDYY)	6
Reserved	2
Prior Day Trade Time (HMS)	3
Seller’s Sale Days	3
Sale Condition	4
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Stop Stock Indicator	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	11
Total Length	**183**

6.11 PRIOR DAY CANCEL/ERROR

The Prior Day Trade Cancel/Error format is used for CTA eligible securities*, Local Issues or Bonds to report the cancellation of a trade (buyer and seller agrees to cancel a trade) or error of a trade that never took place but was reported on a trading day other than the current trading day. Cancel/Errors to current day transactions are reported using the Cancel/Error message, Category B/E/L, Type Q format.

Note: The Trade Reporting Facility (TRF) Identifier is restricted to Equity transactions.

Message Category	Type
B	L
E	L
L	L

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Symbol	11
Temporary Suffix	1
Financial Status	1
Currency Indicator	3
Instrument Type	1
Cancel/Error Action	1
Trade Reporting Facility Identifier	1
Primary Listing Market Participant Identifier	1
Reserved	12

PRIOR DAY CANCEL/ERROR, continued

Field Name	Length (bytes)
ORIGINAL TRADE INFORMATION	
Prior Day Trade Date (MMDDYY)	6
Reserved	2
Prior Day Trade Time (HMS)	3
Seller's Sale Days	3
Sale Condition	4
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Stop Stock Indicator	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	11
Total Length	**131**

6.12 SHORT INDEX

The Short Index format is a variable length record and can accommodate a maximum of 5 index groups. Each group contains the value of a stock index.

Message Category	Type
Y	X

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Number of Indices in Group	2
INDEX GROUP #1	
Index Symbol #1	3
Reserved	1
Index Sign	1
Index Value (includes decimal point)	8
INDEX GROUP #n *(can include up to 5 Index Groups)*	
Index Symbol #5	3
Reserved	1
Index Sign	1
Index Value (includes decimal point)	8
Maximum Total Length	**112**

6.13 LONG INDEX

The Long Index format is a variable length record and can accommodate a maximum number of 20 index groups. Each group contains the value of a stock index.

Message Category	Type
Y	Y

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Number of Indices in Group	2
INDEX GROUP #1	
Index Symbol #1	11
Index Value Denominator Indicator	1
Index Value	12
Index Sign	1
Reserved	5
INDEX GROUP #n ***(can include up to 20 Index Groups)***	
Index Symbol #20	11
Index Value Denominator Indicator	1
Index Value	12
Index Sign	1
Reserved	5
Maximum Total Length	**647**

6.14 SHORT BID AND OFFER INDEX

The Short Bid and Offer Index format is a variable length record and can accommodate a maximum number of 5 index groups. Each group contains the Bid and Offer value of a stock index.

Message Category	Type
Y	V

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Number of Indices in Group	2
INDEX GROUP #1	
Index Symbol #1	3
Reserved	1
Bid Index Sign	1
Offer Index Sign	1
Bid Index Value (includes decimal point)	8
Offer Index Value (includes decimal point)	8
INDEX GROUP #n *(can include up to 5 Index Groups)*	
Index Symbol #5	3
Reserved	1
Bid Index Sign	1
Offer Index Sign	1
Bid Index Value (includes decimal point)	8
Offer Index Value (includes decimal point)	8
Maximum Total Length	**157**

6.15 LONG BID AND OFFER INDEX

The Long Bid and Offer Index format is a variable length record and can accommodate a maximum number of 20 index groups. Each group contains the Bid and Offer value of a stock index.

Message Category	Type
Y	W

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Number of Indices in Group	2
INDEX GROUP #1	
Index Symbol #1	11
Index Value Denominator Indicator	1
Bid Index Value	12
Offer Index Value	12
Bid Index Sign	1
Offer Index Sign	1
Reserved	4
INDEX GROUP #n ***(can include up to 20 Index Groups)***	
Index Symbol #20	11
Index Value Denominator Indicator	1
Bid Index Value	12
Offer Index Value	12
Bid Index Sign	1
Offer Index Sign	1
Reserved	4
Maximum Total Length	**887**

7.0 ADMINISTRATIVE MESSAGES

7.1 ADMINISTRATIVE UNFORMATTED (FREE FORM TEXT)

Message Category	Type
A	H

General Administrative Unformatted messages (referred to as “admins”) are those messages that, because of the nature of the information they contain, cannot be readily arranged in a fixed format.

A list of administrative messages commonly transmitted is provided in **Appendix D**. A list of frequently used abbreviations in Administrative messages is provided in **Appendix E**.

All Administrative messages are disseminated over any or all multicast lines, with the exception of the two lines disseminating Index Messages.

7.2 ADMINISTRATIVE MESSAGE LENGTH

The length of an Administrative message is variable. The total length of the entire message **cannot** exceed 1000 characters, including the SOH character, the Message Header, the ETX character and all characters between those characters.

7.3 ADMINISTRATIVE MESSAGE TEXT

The text section of the Administrative message is transmitted in free format. Administrative messages generally start with three “Begin Announce” (**yyy**) characters and end with two “End Announce” (**zz**) characters. In addition, Administrative messages include slashes and dots within the text.

Examples of Administrative messages are noted in **Appendix F**. The examples provided are intended to be indicative of the kinds of Administrative messages, not necessarily limited to the number of examples shown, that can be transmitted. Dots and slashes inserted **within** the text are not shown in all the examples.

ADMINISTRATIVE MESSAGES, continued

7.4 MARKET VOLUME AND INDEX

Message Category	Type
A	S

```
yyy1.00P M  APPROX  NYSE  VOL  STOCK  000 NY WS  00 MKT  WS  00    MKT  DN  00CTS NYSE
IDX000.00DN0.00 INDU000.00  TRAN000.00UNCH  UTIL000.00UNCH  FINC000.00UNCHzz
```

7.5 START OF END OF DAY SUMMARY MESSAGES

Message Category	Type
A	A

7.6 END OF END OF DAY SUMMARY MESSAGES

Message Category	Type
A	B

7.7 START OF START OF DAY SUMMARY MESSAGES

Message Category	Type
A	C

7.8 END OF START OF DAY SUMMARY

Message Category	Type
A	D

8.0 MARKET STATUS

8.1 MARKET STATUS MESSAGES DESCRIPTIONS

Market Status messages are formatted messages used to provide market data information that was previously provided using the administrative free text format. The following represents all Market Status messages, which are transmitted over the Multicast lines:

Message Category	Message Type	Description
M	E	Start of Closing Trade Prices
M	F	Closing Trade Prices
M	G	End of Closing Trade Prices
M	B	Start of Most Active Issues
M	C	Most Active Issues Closing Trade Prices
M	D	End of Most Active Issues
M	H	Start of Closing Bid/Offer Prices
M	I	Closing Bid/Offer Prices
M	J	End of Closing Bid/Offer Prices
M	K	Market-Wide Circuit Breaker Decline Level Status
M	L	Market-Wide Circuit Breaker Status
M	N	Approximate Adjusted Volume Market Center Message
M	O	Approximate Total Trades and Dollar Value
M	P	Crossing Session

The Closing Trade Prices, Most Active Issues, and Closing Bid/Offer Prices are all preceded by a start message and followed by an end message. The start and end messages consists of only the message header (with the exception of the Start of Closing Trade Prices for Most Active Stocks).

8.2 CLOSING TRADE PRICES

The Closing Trade Prices format is used to report the closing trade prices for issues trading on the NYSE MKT or the NYSE. The entire Closing Trade Prices are reported with one message generated per issue. The Closing Trade Prices messages are preceded by a Start of Closing Trade Prices message and followed by an End of Closing Trade Prices message.

Note: A Participant is ONLY required to utilize the 'Security Symbol', 'Last Price Denom' & 'Last Price' fields in the Closing Trade Prices message. All other fields are filled dependent on the availability of data from the Participant. If a Participant does not provide data, then the unspecified fields are zero-filled.

Message Category	Type
M	F

Field Name	Length (bytes)
Message Header	**45**
Security Symbol	11
Temporary Suffix	1
Trade Volume	11
Open Price Denominator Indicator	1
Open Price	12
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Last Price Denominator Indicator	1
Last Price	12
Net Change Tick Indicator	1
Net Change in Price Denominator Indicator	1
Net Change in Price	12
Reserved	1
Financial Status Indicator	1
Short Sale Restriction Indicator	1
Reserved	10
Total Length	**147**

8.3 MOST ACTIVE ISSUES

The Most Active Issues format is used to report the closing trade prices of the NYSE 15 Most Active Issues and the NYSE MKT 10 Most Active Issues. The entire Most Active Issues are reported with one message generated per issue. The transmission of the Most Active Issues is preceded by a Start of Most Active Issues and concluded with the End of Most Active Issues message.

Note: A Participant is ONLY required to utilize the 'Security Symbol', 'Last Price Denominator Indicator' & 'Last Price' fields in the Most Active Issues message. All other fields are filled dependent on the availability of data from the Participant. If a Participant does not provide data, then the unspecified fields are zero-filled.

Message Category	Type
M	C

Field Name	Length (bytes)
Message Header	**45**
Security Symbol	11
Temporary Suffix	1
Trade Volume	11
Open Price Denominator Indicator	1
Open Price	12
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Last Price Denominator Indicator	1
Last Price	12
Net Change Tick Indicator	1
Net Change in Price Denominator Indicator	1
Net Change in Price	12
Reserved	1
Financial Status Indicator	1
Short Sale Restriction Indicator	1
Reserved	10
Total Length	**147**

8.4 CLOSING BID/OFFER PRICES

The Closing Bid/Offer Prices format is used to report the closing quote prices for issues regardless of trading activity on the NYSE MKT. In addition this format is also used to report the Bid/Offer prices for stocks, which did not trade on the NYSE during the day. The transmission of Closing Bid/Offer Prices is preceded by the Start of Closing Bid/Offer Prices and concluded with the End of Closing Bid/Offer Prices messages. Closing Bid/Offer Prices are provided for each issue.

Note: A Participant is required to utilize all fields in the Closing Bid/Offer Message.

Message Category	Type
M	I

Field Name	Length (bytes)
Message Header	**45**
Security Symbol	11
Temporary Suffix	1
Closing Bid Price Denominator Indicator	1
Closing Bid Price	12
Closing Offer Price Denominator Indicator	1
Closing Offer Price	12
Reserved	1
Financial Status Indicator	1
Short Sale Restriction Indicator	1
Reserved	11
Total Length	**97**

8.5 MARKET-WIDE CIRCUIT BREAKER DECLINE LEVEL STATUS

The Market-Wide Circuit Breaker Decline Level Status format is used to report the calculated Level 1, Level 2 and Level 3 threshold values for the current trading day necessary to trigger a circuit breaker. Levels are reset each trading day based on the closing value of the S&P 500 Index. If Levels are set as a result of inaccurate activity, Levels will be reset and disseminated. The most recently disseminated Levels will be in effect for that trading day.

Note: The Market-Wide Circuit Breaker Decline Level Status format will be disseminated by CTS on a daily trading day basis at approximately 7:00 am and at 8:00 am ET; and additional occurrences if necessary, e.g., due to erroneously set Levels.

Message Category	Type
M	K

Field Name	Length (bytes)
Message Header	**45**
Price Denominator Indicator	1
Level 1 Value	12
Reserved	3
Level 2 Value	12
Reserved	3
Level 3 Value	12
Reserved	3
Total Length	**91**

8.6 MARKET-WIDE CIRCUIT BREAKER STATUS

The Market-Wide Circuit Breaker Status format is used to report the Market-Wide Circuit Breaker threshold Level that has been breached. Each Level will be disseminated only once during the trading day, unless a Level is breached as a result of erroneous activity. The most recently disseminated breached Level will be in effect.

The duration of Market-Wide Circuit Breaker Level 1 and Level 2 Regulatory Trading Halts is fifteen minutes. Following Level 3 Market-Wide Circuit Breaker Regulatory Trading Halts, trading will be halted for the remainder of the trading day and carried over to the following trading day in a Regulatory Trading Halted state.

Message Category	Type
M	L

Field Name	Length (bytes)
Message Header	**45**
Market-Wide Circuit Breaker Level Indicator	1
Reserved	3
Total Length	**49**

8.7 APPROXIMATE ADJUSTED VOLUME MARKET CENTER

The Approximate Adjusted Volume Market Center format is a variable length record and can accommodate a maximum number of 26 market center groups. This format is used to report the volume of adjusted trading activity for each Participant that trades on Tape A and Tape B. As CTS calculates and generates these messages, the Participant ID field will be populated with "S" for CTS.

Message Category	Type
M	N

Field Name	Length (bytes)
GENERAL TRADE INFORMATION	
Message Header	**45**
Number of Participants	2
PARTICIPANT GROUP #1	
Participant ID Group #1	1
Trading Volume	11
Reserved	14
PARTICIPANT GROUP #n ***(can include up to 26 Participant Groups)***	
Participant ID Group #26	1
Trading Volume	11
Reserved	14
Maximum Total Length	**723**

8.8 APPROXIMATE TOTAL TRADES AND DOLLAR VALUE

The Approximate Total Trades and Dollar Value format allows a Participant to report the total trades and total dollar value of trades at their respective market centers.

Message Category	Type
M	O

Field Name	Length (bytes)
Message Header	**45**
Total Trades	9
Reserved	1
Dollar Value Denominator Indicator	1
Dollar Value	22
Reserved	13
Maximum Total Length	**91**

8.9 CROSSING SESSION SUMMARY

The Crossing Session Summary format is used to report the total volume and dollar value of trades transacted after the close of a Participant's regular session.

Message Category	Type
M	P

Field Name	Length (bytes)
Message Header	**45**
Crossing I Trading Volume	11
Crossing II Dollar Value Denominator Indicator	1
Crossing II Dollar Value	22
Crossing II Trading Volume	11
Reserved	13
Maximum Total Length	**103**

8.10 START OF CLOSING TRADE PRICES

Message Category	Type
M	E

8.11 END OF CLOSING TRADE PRICES

Message Category	Type
M	G

8.12 START OF MOST ACTIVE ISSUES

Message Category	Type
M	B

Field Name	Length (bytes)
Message Header	**45**
Number of Most Active Issues	2
Total Length	**47**

8.13 END OF MOST ACTIVE ISSUES

Message Category	Type
M	D

8.14 START OF CLOSING BID/OFFER PRICES

Message Category	Type
M	H

8.15 END OF CLOSING BID/OFFER PRICES

Message Category	Type
M	J

9.0 CONTROL MESSAGES

9.1 CONTROL MESSAGE SUMMARY

The following list represents all control messages transmitted:

Message Category	Message Type	Description
C	I	Start of Day
C	L	Reset Message Sequence Number
C	M	Start of Test
C	N	End of Test
C	P	Disaster Recovery Data Center Activation
C	T	Line Integrity
C	Z	End of Transmission

9.2 CONTROL MESSAGE DESCRIPTIONS

Control messages are in a fixed format and perform specified system advisory and control functions.

Control messages consist of the standard Message Header only, and are **not** blocked with any other messages including control messages.

The Message Network field of the Message Header contains USASCII alphabetic upper case character "C" for all control messages.

The Participant ID field of the Message Header contains USASCII alphabetic upper case character "S" for all control messages.

While the Start of Day and End of Transmission control messages are normally transmitted three times with a one minute quiescent period after each transmission, when they are retransmitted they are sent out one time only and are **not** followed by the one minute quiescent period.

When included in a retransmission sequence, the Retransmission Requester field of a control message contains the specified requester code; otherwise this field contains the USASCII alphabetic upper case character "O" (meaning original message).

CONTROL MESSAGE DESCRIPTIONS (continued)

9.3 START OF DAY - CATEGORY C TYPE I

The Start of Day message signals the start of normal data dissemination over the MLs.

The Start of Day message is sent three times with a quiescent period of one minute following each of the three transmissions.

The Message Sequence Number (MSN) field in the Start of Day message always contains a sequence number of zero. The MSN counter is reset to zero, and is not incremented during the normal Start of Day message transmission cycle.

9.4 RESET MESSAGE SEQUENCE NUMBER - CATEGORY C TYPE L

The Reset Sequence Number message is transmitted when the sequence number on an output ML requires resetting.

The Message Sequence Number (MSN) field in the Reset Sequence Number message contains the number to which the MSN counter is to be reset. This number is higher than the highest MSN previously transmitted, or it may be zero.

CONTROL MESSAGE DESCRIPTIONS (continued)

9.5 START OF TEST – CATEGORY C TYPE M

The Start of Test message is transmitted after the ML is started and before the Start of Day message is sent out. The Start of Test message is followed by the transmission of a repeated test message cycle.

The Message Sequence Number (MSN) is reset to zero by the Start of Test message. For each of the canned messages within the group, the sequence number will increment by 1. The purpose of the test message cycle is for Data Recipients to confirm systems and network connectivity.

There are two distinct test message cycles. Each test message cycle is initiated by transmission of the Start of Test message (disseminated over all MLs). Each test message cycle includes a complete set of messages types routed over the respective ML with the exception of administrative messages and some control messages. The test message cycle is repeated until shortly before transmission of the Start of Day message and is terminated by transmission of an End of Test Message.

Retransmission requests are **not** accepted during the test message cycle.

9.6 END OF TEST - CATEGORY C TYPE N

The End of Test message is transmitted to signal the end of the transmission of a test message group.

The Message Sequence Number (MSN) field of the End of Test message contains a number one greater than the number of the last test message transmitted in the final test message transmission group.

9.7 DISASTER RECOVERY DATA CENTER ACTIVATION – CATEGORY C TYPE P

The Disaster Recovery Data Center Activation message is transmitted to signify that the Consolidated Tape System (CTS) has switched processing from the Primary Data Center to the Disaster Recovery Data Center. The Disaster Recovery Data Center Activation message is preceded by the transmission of a Reset Sequence Number (Category C Type L) message.

The Message Sequence Number (MSN) field of the Disaster Recovery Data Center Activation message contains a number **one greater than the highest MSN previously transmitted**.

CONTROL MESSAGE DESCRIPTIONS (continued)

9.8 LINE INTEGRITY - CATEGORY C TYPE T

The Line Integrity message is automatically transmitted over the MLs at intervals of approximately one minute to verify continued integrity of ML transmission.

The Line Integrity message transmission does not interrupt a transmission in progress, but is transmitted whether or not additional messages are queued for transmission. Line Integrity messages are **not** retransmitted.

The Message Sequence Number (MSN) is not incremented for Line Integrity messages. The MSN field will contain the MSN of the last original message.

9.9 END OF TRANSMISSION - CATEGORY C TYPE Z

The End of Transmission message is transmitted over the Multicast Lines (MLs) to advise all Data Recipients that there are no further messages of any type transmitted for the day.

The message is transmitted three times, with a quiescent line interval of one minute following each transmission.

The Message Sequence Number (MSN) field of the End of Transmission message contains a number one greater than the highest MSN previously transmitted. The MSN counter is not incremented and the MSN does not change when the message is transmitted the second and third time in the normal message transmission sequence.

Note: Under normal conditions, upon receiving the Category C Type Z, End of Transmission message, it is the Data Recipients' responsibility to terminate their production CTS output ML feeds from CTS.

10.0 FIELD APPEARANCES WITHIN MESSAGES

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- B -		
BID INDEX SIGN	SHORT BID AND OFFER INDEX LONG BID AND OFFER INDEX	1 (per group) 1 (per group)
BID INDEX VALUE	LONG BID AND OFFER INDEX	1-20
BID INDEX VALUE (INCLUDES DECIMAL POINT)	SHORT BID AND OFFER INDEX	1-5
BUY VOLUME	TRADING STATUS	1
- C -		
CANCEL/ERROR ACTION	CANCEL/ERROR PRIOR DAY CANCEL/ERROR	1 1
CLOSING BID PRICE DENOMINATOR INDICATOR	CLOSING BID/OFFER PRICES	1
CLOSING BID PRICE	CLOSING BID/OFFER PRICES	1
CLOSING OFFER DENOMINATOR INDICATOR	CLOSING BID/OFFER PRICES	1
CLOSING OFFER PRICE	CLOSING BID/OFFER PRICES	1
CONSOLIDATED HIGH LOW/LAST INDICATOR	SHORT TRADE LONG TRADE	1 1
CROSSING I TRADING VOLUME	CROSSING SESSION	1
CROSSING II DOLLAR VALUE	CROSSING SESSION	1
CROSSING II DOLLAR VALUE DENOMINATOR INDICATOR	CROSSING SESSION	1
CROSSING II TRADING VALUE	CROSSING SESSION	1
CURRENCY INDICATOR	LONG TRADE CORRECTION CANCEL/ERROR TRADING STATUS CONSOLIDATED END OF DAY SUMMARY START OF DAY SUMMARY PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 1 1 1 1 1 1 1 1

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- D -		
DOLLAR VALUE	APPROXIMATE TOTAL TRADES AND DOLLAR VALUE	1
DOLLAR VALUE DENOM INDICATOR	APPROXIMATE TOTAL TRADES AND DOLLAR VALUE	1
DUE TO RELATED SECURITY	TRADING STATUS	1
- F -		
FINANCIAL STATUS	LONG TRADE CORRECTION CANCEL/ERROR TRADING STATUS CONSOLIDATED END OF DAY SUMMARY START OF DAY SUMMARY PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR MOST ACTIVE ISSUES CLOSING TRADES PRICES CLOSING BID & OFFER PRICES	1 1 1 1 1 1 1 1 1 1 1 1
- H -		
HALT REASON	TRADING STATUS	1
HELD TRADE INDICATOR	LONG TRADE	1
HIGH INDICATION PRICE/UPPER LIMIT PRICE BAND	TRADING STATUS	1
HIGH INDICATION PRICE /UPPER LIMIT PRICE BAND DENOMINATOR INDICATOR	TRADING STATUS	1
HIGH PRICE DENOMINATOR INDICATOR	CORRECTION CANCEL/ERROR CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY CLOSING TRADE PRICES MOST ACTIVE ISSUES	2 2 1 1 1 1
HIGH PRICE	CORRECTION CANCEL/ERROR CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY CLOSING TRADE PRICES MOST ACTIVE ISSUES	2 2 1 1 1 1

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- I -		
IN VIEW OF COMMON INDICATOR	TRADING STATUS	1
INDEX SIGN	SHORT INDEX LONG INDEX	1 (per group) 1 (per group)
INDEX SYMBOL	SHORT INDEX LONG INDEX SHORT BID AND OFFER INDEX LONG BID AND OFFER INDEX	1 (per group) 1 (per group) 1 (per group) 1 (per group)
INDEX VALUE DENOMINATOR INDICATOR	LONG INDEX LONG BID AND OFFER INDEX	1 (per group) 1 (per group)
INDEX VALUE (INCLUDES DECIMAL POINT)	SHORT INDEX	1 (per group)
INDEX VALUE (INCLUDES DECIMAL POINT)	LONG INDEX	1 (per group)
INSTRUMENT TYPE	LONG TRADE CORRECTION CANCEL/ERROR TRADING STATUS CONSOLIDATED END OF DAY SUMMARY START OF DAY SUMMARY PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 1 1 1 1 1 1 1 1
- L -		
LAST PARTICIPANT ID	CORRECTION CANCEL/ERROR CONSOLIDATED END OF DAY SUMMARY	1 1 1
LAST PRICE	CORRECTION CANCEL/ERROR CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY TRADING STATUS CLOSING TRADE PRICES MOST ACTIVE ISSUES	2 2 1 1 1 1 1

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- L -		
LAST PRICE DENOMINATOR INDICATOR	CORRECTION CANCEL/ERROR TRADING STATUS END OF DAY SUMMARY CLOSING TRADE PRICES MOST ACTIVE ISSUES CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY	2 2 1 2 1 1 1 1 1
LEVEL 1 VALUE	MARKET-WIDE CIRCUIT BREAKER DECLINE LEVEL STATUS	1
LEVEL 2 VALUE	MARKET-WIDE CIRCUIT BREAKER DECLINE LEVEL STATUS	1
LEVEL 3 VALUE	MARKET-WIDE CIRCUIT BREAKER DECLINE LEVEL STATUS	1
LEVEL INDICATOR	MARKET-WIDE CIRCUIT BREAKER STATUS	1
LIMIT UP-LIMIT DOWN INDICATOR	TRADING STATUS	1
LOW INDICATION/LOWER LIMIT PRICE BAND	TRADING STATUS	1
LOW INDICATION PRICE/LOWER LIMIT PRICE BAND DENOMINATOR INDICATOR	TRADING STATUS	1
LOW PRICE	CORRECTION CANCEL/ERROR CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY CLOSING TRADE PRICES MOST ACTIVE ISSUES	2 2 1 1 1 1 1
LOW PRICE DENOMINATOR INDICATOR	CORRECTION CANCEL/ERROR CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY CLOSING TRADE PRICES MOST ACTIVE ISSUES	2 2 1 1 1 1 1

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- N -		
NET CHANGE TICK INDICATOR	CLOSING TRADE PRICES MOST ACTIVE ISSUES	1 1
NET CHANGE PRICE DENOMINATOR INDICATOR	CLOSING TRADE PRICES MOST ACTIVE ISSUES	1 1
NET CHANGE IN PRICE	CLOSING TRADE PRICES MOST ACTIVE ISSUES	1 1
NUMBER OF INDICES IN GROUP	SHORT INDEX LONG INDEX SHORT BID AND OFFER INDEX LONG BID AND OFFER INDEX	1 1 1 1
NUMBER OF ITERATIONS	START OF DAY SUMMARY	1
NUMBER OF MOST ACTIVE ISSUES	START OF MOST ACTIVE ISSUES	1
NUMBER OF PARTICIPANTS	APPROXIMATE ADJUSTED VOLUME CONSOLIDATED END OF DAY SUMMARY	1 1
- O -		
OFFER INDEX SIGN	SHORT BID AND OFFER INDEX LONG BID AND OFFER INDEX	1 (per group) 1 (per group)
OFFER INDEX VALUE	LONG BID AND OFFER INDEX	1 (per group)
OFFER INDEX VALUE (INCLUDES DECIMAL POINT)	SHORT BID AND OFFER INDEX	1 (per group)
OPEN PRICE	CORRECTION CANCEL/ERROR PARTICIPANT END OF DAY SUMMARY CLOSING TRADE PRICES MOST ACTIVE ISSUES	1 1 1 1 1
OPEN PRICE DENOMINATOR INDICATOR	CORRECTION CANCEL/ERROR PARTICIPANT END OF DAY SUMMARY CLOSING TRADE PRICES MOST ACTIVE ISSUES	1 1 1 1 1
OUTPUT SEQUENCE NUMBER OF TRANSACTION BEING ADJUSTED	CORRECTION CANCEL/ERROR	1 1

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- P -		
PARTICIPANT ID	APPROXIMATE ADJUSTED VOLUME PARTICIPANT END OF DAY SUMMARY START OF DAY SUMMARY	1 1 2
PARTICIPANT OPEN/HIGH/LOW/LAST INDICATOR	SHORT TRADE LONG TRADE	1 1
PREVIOUS CLOSE PRICE	START OF DAY SUMMARY	2
PREVIOUS CLOSE PRICE DENOMINATOR INDICATOR	START OF DAY SUMMARY	2
PREVIOUS CLOSE PRICE DATE	CORRECTION CANCEL/ERROR CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY START OF DAY SUMMARY	2 2 1 1 2
PRICE DENOMINATOR INDICATOR	SHORT TRADE LONG TRADE CORRECTION CANCEL/ERROR PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR MARKET-WIDE CIRCUIT BREAKER DECLINE LEVEL-STATUS	1 1 2 1 1 2 1 1
PRIMARY LISTING MARKET PARTICIPANT IDENTIFIER	LONG TRADE CORRECTION CANCEL/ERROR PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 1 1 1 1 1
PRIOR DAY TRADE DATE (MMDDYY)	PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 2 1
PRIOR DAY TRADE TIME (HMS)	PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 2 1

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- R -		
RESERVED	START OF DAY SUMMARY	3
	SHORT TRADE	1
	LONG TRADE	3
	CORRECTION	6
	CANCEL/ERROR	4
	TRADING STATUS	3
	CONSOLIDATED END OF DAY SUMMARY	2
	PARTICIPANT END OF DAY SUMMARY	1
	PRIOR DAY TRADE	2
	PRIOR DAY CORRECTION	5
	PRIOR DAY CANCEL/ERROR	3
	SHORT INDEX	1 (per group)
	LONG INDEX	1 (per group)
	SHORT BID AND OFFER INDEX	1 (per group)
	LONG BID AND OFFER INDEX	1 (per group)
	CLOSING TRADE PRICES	2
	MOST ACTIVE ISSUES	2
	CLOSING BID/OFFER PRICES	2
	APPROXIMATE ADJUSTED VOLUME MARKET CENTER	1 (per group)
	MESSAGE	2
	APPROXIMATE TOTAL TRADES AND DOLLAR VALUE	2
	CROSSING SESSION	1
	MARKET-WIDE CIRCUIT BREAKER DECLINE LEVEL STATUS	3
	MARKET-WIDE CIRCUIT BREAKER STATUS	1
- S -		
SALE CONDITION	SHORT TRADE	1
	LONG TRADE	1
	CORRECTION	2
	CANCEL/ERROR	1
	PRIOR DAY TRADE	1
	PRIOR DAY CORRECTION	2
	PRIOR DAY CANCEL/ERROR	1
SECURITY STATUS	TRADING STATUS	1

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- S -		
SECURITY SYMBOL	SHORT TRADE LONG TRADE CORRECTION CANCEL/ERROR TRADING STATUS CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY CLOSING TRADE PRICES CLOSING BID/OFFER PRICES MOST ACTIVE ISSUES START OF DAY SUMMARY PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 1 1 1 1 1 1 1 1 1 1 1 1 1
SELL VOLUME	TRADING STATUS	1
SELLER’S SALE DAYS	LONG TRADE CORRECTION CANCEL/ERROR PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 2 1 1 2 1
SHORT SALE RESTRICTION INDICATOR	START OF DAY SUMMARY LONG TRADE CORRECTION CANCEL/ERROR TRADING STATUS CONSOLIDATED END OF DAY SUMMARY PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR CLOSING TRADE PRICES MOST ACTIVE ISSUES CLOSING BID/OFFER PRICES	1 1 2 1 1 1 1 1 1 1 1 1
STATUS INDICATOR	TRADING STATUS	1
STOP STOCK INDICATOR	LONG TRADE CORRECTION CANCEL/ERROR PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 2 1 1 2 1

FIELD APPEARANCES WITHIN MESSAGE, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- T -		
TEMPORARY SUFFIX	LONG TRADE CORRECTION CANCEL/ERROR TRADING STATUS CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY CLOSING TRADE PRICES MOST ACTIVE ISSUES START OF DAY SUMMARY CLOSING BID/OFFER PRICES PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 1 1 1 1 1 1 1 1 1 1 1 1 1
TEST MESSAGE INDICATOR	LONG TRADE	1
TICK	CORRECTION CANCEL/ERROR PARTICIPANT END OF DAY SUMMARY	1 1 1
TOTAL TRADES	APPROXIMATE TOTAL TRADES AND DOLLAR VALUE	1
TOTAL VOLUME	CORRECTION CANCEL/ERROR CONSOLIDATED END OF DAY SUMMARY PARTICIPANT END OF DAY SUMMARY	2 2 1 1
TRADE PRICE	LONG TRADE SHORT TRADE CORRECTION CANCEL/ERROR PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 1 2 1 1 2 1

FIELD APPEARANCES WITHIN MESSAGES, continued

FIELD NAME	MESSAGE NAME	# OF APPEARANCES/MSG
- T -		
TRADE REPORTING FACILITY IDENTIFIER	EQUITY LONG TRADE EQUITY CORRECTION EQUITY CANCEL/ERROR EQUITY PRIOR DAY TRADE EQUITY PRIOR DAY CORRECTION EQUITY PRIOR DAY CANCEL/ERROR	1 1 1 1 1 1
TRADE THROUGH EXEMPT INDICATOR	LONG TRADE CORRECTION CANCEL/ERROR PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 2 1 1 2 1
TRADE VOLUME	SHORT TRADE LONG TRADE CORRECTION CANCEL/ERROR CLOSING TRADE PRICES MOST ACTIVE ISUES PRIOR DAY TRADE PRIOR DAY CORRECTION PRIOR DAY CANCEL/ERROR	1 1 2 1 1 1 1 1 2
TRADING VOLUME	APPROXIMATE ADJUSTED VOLUME MARKET CENTER MESSAGE	2

11.0 FIELD DESCRIPTIONS

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>BID INDEX SIGN</td><td>1</td><td>Alphabetic.

The Bid Index positive or negative value of the Bid Index’s calculation formula.

<table><tr><th>Code</th><th>Value</th></tr><tr><td>Blank</td><td>Positive Value</td></tr><tr><td>A</td><td>Negative Value</td></tr></table></td></tr>
<tr><td>BID INDEX VALUE</td><td>12</td><td>Numeric, Right-Justified, Zero-Filled.

The Bid Index whole and fractional or decimal portion information with the Index Value Denominator Indicator determining the price representation. The Bid Index may represent a value of zero.

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

Note: For Government Bonds, the Bid Index Value could reflect a value that is greater than the Offer Index Value.</td></tr>
<tr><td>BID INDEX VALUE (INCLUDES DECIMAL POINT)</td><td>8</td><td>Numeric, Right-Justified, Zero-Filled.

The Bid Index value may include a decimal point with digits to the right of the decimal or it may represent a value of zero.

Note: For Government Bonds, the Bid Index Value could reflect a value that is greater than the Offer Index Value.</td></tr>
</table>

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>BUY VOLUME</td><td>9</td><td>Numeric, Right-Justified, Zero-Filled.

The Buy Volume represents the reported imbalance of buy orders without matching sell orders for the security for a Participant. Refer to Appendix B for Market Imbalance and Market on Close Imbalance (MOC) definitions.</td></tr>
<tr><td>CANCEL/ERROR ACTION</td><td>1</td><td>Numeric, otherwise Zero-Filled.

Denotes whether the referenced transaction is to be cancelled (buyer and seller agrees to cancel a trade) or errored (error a trade that never took place but was reported).

<table><tr><th>Code</th><th>Value</th></tr><tr><td>1</td><td>Cancel</td></tr><tr><td>2</td><td>Error</td></tr></table></td></tr>
<tr><td>CLOSING BID/OFFER PRICE</td><td>12</td><td>Numeric, Right-Justified, Zero-Filled

The Price is the whole and fractional or decimal portion of the Participant closing Bid/Offer price information with the Participant Closing Bid/Offer Price Denominator Indicator determining the price representation.

The Participant Closing Price represents the last qualifying trade paid for a security by a Participant during the trading day.</td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
CLOSING BID/OFFER PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
CLOSING PRICE	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Price is the whole and fractional or decimal portion of the Participant closing price information with the Participant Closing Price Denominator Indicator determining the price representation. The Participant Closing Price represents the last qualifying trade paid for a security by a Participant during the trading day.
CLOSING PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes/values.
CONSOLIDATED HIGH/LOW/LAST PRICE INDICATOR	1	Alphanumeric. Identifies the Consolidated High/Low/Last Price applicable to the transaction. **Indicator** / **Value**: **A** – None **B** – High **C** – Low **D** – Last **E** – High/Last **F** – Low/Last **G** – High/Low/Last **H** – High/Low

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
CROSSING SESSION II DOLLAR VALUE	22	Numeric, Right-Justified, Zero-Filled. Contains the Dollar Value traded after the close of a Participant's regular session.
CROSSING SESSION II DOLLAR VALUE DENOMINATOR	1	Alphanumeric. Refer to **DOLLAR VALUE DENOMINATOR INDICATOR** table for codes/values.
CROSSING SESSION I VOLUME	11	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. Contains the number of shares traded at the Participant's close price and which takes place after the close of a participant's regular session.
CROSSING SESSION II VOLUME	11	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. Contains the number of shares traded after the close of a participant's regular session. Trades from the NYSE are executed at the aggregate price reported by member firms. Trades from the NYSE MKT are executed at the close price of the NYSE MKT.
CURRENCY INDICATOR	3	Alphanumeric, otherwise Space-Filled. Represents the International Standard Foreign Currency code in which the transaction was executed. For transactions executed in U.S. Dollars, this field is space-filled.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
DOLLAR VALUE	22	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Dollar Value is the whole and decimal portion, if any of the total dollar worth of the total daily trade transactions. The Dollar Value Price Denominator Indicator code determines the value representation.
DOLLAR VALUE DENOMINATOR INDICATOR	1	Alphanumeric. The Dollar Value Denominator Indicator field can contain one of the codes listed below. Otherwise, this field is **zero-filled**. It is used to identify the dollar value of the fraction or location of decimal.

Price Denominator Code	Denominator Value	22 Byte Field	
		Whole	Numerator
3	8	21	1
4	16	20	2
5	32	20	2
6	64	20	2
7	128	19	3
8	256	19	3
A	10	21	1
B	100	20	2
C	1,000	19	3
D	10,000	18	4
E	100,000	17	5
F	1,000,000	16	6
G	10,000,000	15	7
H	100,000,000	14	8
I	N/A (Whole Price Only)	22	0

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
DUE TO RELATED SECURITY INDICATOR	1	Numeric. This Opening Delay or Trading Halt is used when events relating to one security will affect the price and performance of another security. Due to Related Security can be used by itself or in conjunction with a Halt Reason (Regulatory or Non-Regulatory). Refer to **Appendix B** for definition of values. **Code** / **Value** 0 – Not Due to Related Security 1 – Due to Related Security

Code	Value
0	Not Due to Related Security
1	Due to Related Security

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>FINANCIAL STATUS</td><td>1</td><td>Alphanumeric.

Identifies the financial status of the security.

<table>
<tr><th>Code</th><th>Value</th></tr>
<tr><td>0</td><td>Not Bankrupt / Not Below Continuing Listing Standards / Not Late Filing/ Not Creations Suspended (for Exchange Traded Products) / Not Redemptions Suspended (for Exchange Traded Products) / Not Liquidation (for Exchange Traded Products)</td></tr>
<tr><td>1</td><td>Bankrupt</td></tr>
<tr><td>2</td><td>Below Continuing Listing Standards
(For NYSE, NYSE MKT & Regional listed issues)</td></tr>
<tr><td>3</td><td>Bankrupt & Below Continuing Listing Standards
(For NYSE, NYSE MKT & Regional listed issues)</td></tr>
<tr><td>4</td><td>Late Filing</td></tr>
<tr><td>5</td><td>Bankrupt & Late Filing</td></tr>
<tr><td>6</td><td>Below Continuing Listing Standards & Late Filing
(For NYSE, NYSE MKT & Regional listed issues)</td></tr>
<tr><td>7</td><td>Bankrupt, Below Continuing Listing Standards & Late
Filing
(For NYSE, NYSE MKT & Regional listed issues)</td></tr>
<tr><td>8</td><td>Creations Suspended (for Exchange Traded Products)</td></tr>
<tr><td>9</td><td>Redemptions Suspended (for Exchange Traded Products)</td></tr>
<tr><td>A</td><td>Liquidation (for Exchange Traded Products)</td></tr>
</table>
</td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
HALT REASON	1	Alphanumeric, otherwise Space-Filled. Denotes the reason for the Opening Delay or Trading Halt. Refer to **Appendix B** for definition of values.

Code	Value	Regulatory	Non-Regulatory
D	News Dissemination	X	
E	*Unused*		X
I	Order Imbalance		X
M	Limit Up-Limit Down (LULD) Trading Pause	X	
P	News Pending	X	
X	Equipment Changeover		X
Y	Sub-Penny Trading		X
1	Market-Wide Circuit Breaker Level 1 – Breached	X	
2	Market-Wide Circuit Breaker Level 2 – Breached	X	
3	Market-Wide Circuit Breaker Level 3 – Breached	X	

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>HELD TRADE INDICATOR</td><td>1</td><td>Alphanumeric, otherwise Space-Filled.

A "held trade" is a trade reported by a non-primary market during a regulatory trading halt on the primary market, and it is held by CTS for dissemination until after the close of the primary market. The Held Trade Indicator reflects whether this trade qualifies for the Participant or Consolidated Last Price at the time it is disseminated.

<table>
<tr><th>Code</th><th>Value</th></tr>
<tr><td>A</td><td>This trade was held by the Processor during a primary market regulatory halt and should not be used as a last sale for the Participant in that security or on a Consolidated basis. Other trades were disseminated from this Participant for this security.</td></tr>
<tr><td>B</td><td>This trade was held by the Processor during a primary market regulatory halt and can be used as a last sale for the reporting Participant but <u>not</u> on a Consolidated basis.</td></tr>
<tr><td>C</td><td>This trade was held by the Processor during a primary market regulatory halt and can be used as a last sale both for the reporting Participant and on a Consolidated basis.</td></tr>
</table>

Note: For Corrections and Cancel/Error messages, the summary information details the Consolidated and Participant last details.</td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
HIGH INDICATION PRICE/UPPER LIMIT PRICE BAND	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. **High Indication Price**: The High Indication Price is the whole, fractional or decimal portion of the high indication price. The High Indication Price Denominator Indicator determines the price representation. The High Indication Price represents an approximation of what the high end "Offer" price of a security's trading range may be. It is used for a security that is not Opening Delayed or Trading Halted, i.e., Trading Range Indication or following an Opening Delay or a Trading Halt, i.e., Price Indication. **Upper Limit Price Band:** represents the upper price band value for a security. When the ‘Security Status’ field code is ‘Limit Up-Limit Down’, and the ‘Limit Up-Limit Down Indicator’ field code is Limit Up-Limit Down’ Price Bands, the Upper Limit Price Band value will be contained in the ‘High Indication Price/Upper Limit Price Band’ fields. When the Upper Limit Price Band field is zero, it identifies that the previous Price Bands have been removed and are no longer effective for a security. **Note**: For Government Bonds, the High Indication Price (i.e., Bid) could reflect a value that is greater than the Low Indication Price (i.e., Offer).
HIGH INDICATION PRICE / UPPER LIMIT PRICE BAND DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes/values. **Note:** In instances when no trades qualify to be included in the "High" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>HIGH PRICE</td><td>12</td><td>Numeric, Right-Justified, Zero-Filled.

The High Price is the whole and fractional or decimal portion of the High Price information with the High Price Denominator Indicator determining the price representation.

The High Price represents the highest price paid for a security during the trading day.

Note: In instances when no trades qualify to be included in the "High" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.</td></tr>
<tr><td>HIGH PRICE DENOMINATOR INDICATOR</td><td>1</td><td>Alphanumeric.

Refer to PRICE DENOMINATOR INDICATOR for codes/values.

Note: In instances when no trades qualify to be included in the "High" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.</td></tr>
<tr><td>IN VIEW OF COMMON INDICATOR</td><td>1</td><td>Numeric.

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

<table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>Not In View of Common</td></tr><tr><td>1</td><td>In View of Common</td></tr></table></td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
INDEX CHANGE TICK INDICATOR	1	Numeric. Refer to **NET CHANGE TICK INDICATOR** for codes/values.
INDEX CHANGE VALUE	12	Numeric, Right-Justified, Zero-Filled. The Index Change Value is the whole and fractional or decimal portion of the index change information with the Index Value Denominator Indicator determining the value representation. The Index may represent a value of zero. The Index Change Value represents a statistical composite that measures changes in the economy or in financial markets from the prior day's ending value.
INDEX SIGN	1	Alphabetic. Represents the positive or negative value of the index. **Code** / **Value** Blank / Positive Value A / Negative Value
INDEX SYMBOL	3 or 11	Alphabetic, Left-Justified, Space-Filled, otherwise Space-Filled. Contains the Index symbol.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
INDEX VALUE	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Index Value is the whole and fractional or decimal portion information with the Index Value Denominator Indicator determining the price representation. The Index may represent a value of zero. The Index Value represents a statistical composite that measures changes in the economy or in financial markets.
INDEX VALUE (INCLUDES DECIMAL POINT)	8	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Index value may include a decimal point with digits to the right of the decimal or it may represent a value of zero.
INDEX VALUE DENOMINATOR INDICATOR	1	Numeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
INSTRUMENT TYPE	1	Alphanumeric, otherwise Space-Filled. Identifies the instrument type relevant to the trade. Currently, this field is only applicable for **Network B Bond** trades. **Code** / **Value**: A – Corporate Bond B – Government Bond

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
LAST PART. (PARTICIPANT) ID	1	Alphabetic. Refer to **PARTICIPANT ID** for codes.
LAST PRICE	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Last Price is the whole and fractional or decimal portion of the last price information with the Last Price Denominator Indicator determining the price representation. The Last Price represents the last price for that security either on a Consolidated or an individual Participant basis at the time it is disseminated. **Note 1**: For Trading Status Information, the Last Price is provided when the Security Status is: Opening Delay, Trading Halt, Price Indication or Trading Range Indication. **Note 2**: In instances when no trades qualify to be included in the **Last Price** calculation, either on a Consolidated or an individual Participant basis, the **Last Price** will reflect the most current Last Price, e.g., the previous close or if no previous close exists, the Last Price is zero-filled.
LAST PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes/values. **Note:** In instances when no trades qualify to be included in the "Last" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>LEVEL 1, LEVEL 2 AND LEVEL 3 VALUE</td><td>12</td><td>Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled.

The Level 1 Value, Level 2 Value and Level 3 Value is the whole and fractional or decimal portion of the Market-Wide Circuit Breaker Level Status Values with the Price Denominator Indicator determining the price representation.

Identifies the daily established drop level value (trigger value) associated with each Decline Level:

• Level 1 Value = 7%
• Level 2 Value = 13%
• Level 3 Value = 20%</td></tr>
<tr><td>LEVEL INDICATOR</td><td>1</td><td>Alphanumeric.

Identifies the threshold level value that breached one of the current trading days’ established level for the trading day.

<table><tr><th>Code</th><th>Value</th></tr><tr><td>1</td><td>Level 1 Breached</td></tr><tr><td>2</td><td>Level 2 Breached</td></tr><tr><td>3</td><td>Level 3 Breached</td></tr></table></td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
LIMIT UP-LIMIT DOWN (LULD) INDICATOR	1	Alphanumeric. Identifies the Limit Up-Limit Down action (e.g., Price Bands, Consolidated Quotation system National Best Bid/Offer Limit State Entered/Exited) related to a security. When the 'Limit Up-Limit Down Indicator' code is set to either Limit Up-Limit Down Price Bands, the Price Band values will be contained in the 'High Indication Price/Upper Limit Price Band' and 'Low Indication Price/Lower Limit Price Band' fields.

Code	Value
Blank	Limit Up-Limit Down Not Applicable
A	Limit Up-Limit Down Price Band
B	Republished Limit Up-Limit Down Price Band
C	National Best Bid Limit State Entered
D	National Best Bid Limit State Exited
E	National Best Offer Limit State Entered
F	National Best Offer Limit State Exited
G	National Best Bid and National Best Offer Limit State Entered
H	National Best Bid and National Best Offer Limit State Exited
I	National Best Bid Limit State Entered and National Best Offer Limit State Exited
J	National Best Bid Limit State Exited and National Best Offer Limit State Entered

continued on next page

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
LIMIT UP-LIMIT DOWN (LULD) INDICATOR, *continued*		**Note 1**: Limit Up-Limit Down is not applicable to Local Issues or Bonds. **Note 2**: All Limit State combination possibilities are reflected, though some may be a rare occurrence. **Note 3:** When the 'Limit Up-Limit Down Indicator' codes are set to codes C through J, all price fields will be zero-filled. **Note 4:** Indicators C through J **do not represent Price Bands**, they are used to identify that the symbol has entered/exited Limit State**.**
LOW INDICATION PRICE/LOWER LIMIT PRICE BAND	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. **Low Indication Price**: The Low Indication Price is the whole and fractional or decimal portion of the low indication price. The Low Indication Price Denominator Indicator determines the price representation. The Low Indication Price represents an approximation of what the low end "Bid" price of a security's trading range may be. It is used for a security that is not Opening Delayed or Trading Halted, i.e., Trading Range Indication or following an Opening Delay or a Trading Halt, i.e., Price Indication. **Lower Limit Price Band:** represents the lower price band value for a security. When the 'Security Status' field code is 'Limit Up-Limit Down', and the 'Limit Up-Limit Down Indicator' field code is Limit Up-Limit Down Price Bands, the Lower Limit Price Band values will be contained in the 'Low Indication Price/Lower Limit Price Band' fields. When the Lower Limit Price Band field is zero, it identifies that the previous Price Bands have been removed and are no longer effective for a security. **Note:** For Government Bonds, the High Indication Price (i.e., Bid) could reflect a value that is greater than the Low Indication Price (i.e., Offer).

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
LOW INDICATION PRICE/LOWER LIMIT PRICE BAND DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes/values. **Note:** In instances when no trades qualify to be included in the "Low" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.
LOW PRICE	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Low Price is the whole and fractional or decimal portion of the Low Price information with the Low Price Denominator Indicator determining the price representation. The Low Price represents the lowest price paid for a security during the trading day. **Note**: In instances when no trades qualify to be included in the "Low" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.
LOW PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes/values. **Note**: In instances when no trades qualify to be included in the "Low" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
NET CHANGE IN PRICE	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Net Change in Price is the whole or decimal portion of the change in a security's price from the previous day's last price information with the **NET CHANGE IN PRICE DENOMINATOR INDICATOR** code determining the value representation.
NET CHANGE IN PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
NET CHANGE TICK INDICATOR	1	Alphanumeric, otherwise Space-Filled. Represents for a security, the upward, downward or unchanged price movement from prior day's closing value: Code / Value: 1 = + 2 = - 3 = Unchanged
NUMBER OF INDICES IN GROUP	2	Numeric, Right-Justified, Zero-Filled. Represents the total number of indices contained in a particular message.
NUMBER OF PARTICIPANTS	2	Numeric, Right-Justified, Zero-Filled. Represents the actual number of Participants for which an issue will be reported.

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>NUMBER OF ITERATIONS</td><td>2</td><td>Numeric, Right-Justified, Zero-Filled.

Represents the number of times that repeating fields are iterated.</td></tr>
<tr><td>NUMBER OF MOST ACTIVE ISSUES</td><td>2</td><td>Numeric, Right-Justified, Zero-Filled.

Represents the actual number of most active issues being reported.</td></tr>
<tr><td>OFFER INDEX SIGN</td><td>1</td><td>Alphanumeric, otherwise Space-Filled.

Represents the positive or negative value of the Offer Index’s calculation formula.

<table><tr><th>Code</th><th>Value</th></tr><tr><td>BLANK</td><td>Positive Value</td></tr><tr><td>A</td><td>Negative Value</td></tr></table></td></tr>
<tr><td>OFFER INDEX VALUE</td><td>12</td><td>Numeric, Right-Justified, Zero-Filled.

Represents the value of the index calculation formula using the current offer values of the component securities.

The Offer Index Value is the whole and fractional or decimal portion information with the Index Value Denominator Indicator determining the price representation. The Offer Index may represent a value of zero.

Note: For Government Bonds, the BID INDEX VALUE could reflect a value that is greater than the OFFER INDEX VALUE.</td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
OFFER INDEX VALUE (INCLUDES DECIMAL POINT)	8	Numeric, Right-Justified, Zero-Filled. The Offer Index value may include a decimal point with digits to the right of the decimal or it may represent a value of zero. **Note**: For Government Bonds, the BID INDEX VALUE could reflect a value that is greater than the OFFER INDEX VALUE.
OPEN HIGH/LOW/LAST PRICE	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The price is the whole and fractional or decimal portion of the Participant Open/High/Low/Last Price information with the Participant Open/High/Low/Last Price Denominator Indicator determining the price representation. These fields differ from the Open/High/Low/Last Price in that they are Participant specific.
OPEN/HIGH/LOW/LAST PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes .
OPEN PRICE	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Open Price is the whole and fractional or decimal portion of the Open Price information with the Open Price Denominator Indicator determining the price representation. The Open Price represents the first qualifying price paid for a security during the trading day. **Note:** In instances when no trades qualify to be included in the "Open Price" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>OPEN PRICE DENOMINATOR INDICATOR</td><td>1</td><td>Alphanumeric.

Refer to PRICE DENOMINATOR INDICATOR for codes.

Note: In instances when no trades qualify to be included in the "Open Price" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.</td></tr>
<tr><td>OUTPUT SEQUENCE NUMBER OF TRANSACTION BEING ADJUSTED</td><td>9</td><td>Numeric, Right-Justified, Zero-Filled.

The output sequence number to be corrected will reflect the sequence number of either the original trade, or, if the original trade has already been corrected, of the most recent correction to the trade.</td></tr>
<tr><td>OUTPUT NETWORK</td><td>1</td><td>Alphabetic Character.

Identifies the ML network on which the output message should be disseminated. This field is used whenever there is no CTS master, and the input message local issue indicator denotes the security as being a listed equity (field value = 0).

<table>
<tr><th>Network Field Value</th><th>Description</th></tr>
<tr><td>A</td><td>Message relates to symbols with NYSE as the primary listed market. The Primary Listing Market Participant ID identifies the primary listing market in instances when the primary market is an Exchange <u>other than</u> the NYSE.</td></tr>
<tr><td>B</td><td>Message relates to symbols with NYSE MKT or one of the regional Exchanges as the primary market. Message can also be for Local Issues and Bonds. The Primary Listing Market Participant ID identifies the primary listing market in instances when the primary market is an Exchange <u>other than</u> the NYSE MKT.</td></tr>
</table>
</td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
PARTICIPANT ID	1	Alphabetic. Identifies the Participant or Processor that initiated the message.

Code	Value
A	NYSE MKT
B	NASDAQ OMX BX
C	NSX
D	FINRA
I	ISE
J	EDGA
K	EDGX
M	CHX
N	NYSE
T	NASDAQ OMX
P	NYSE Arca
S	CTS
V	**IEX**
W	CBSX
X	NASDAQ OMX PSX
Y	BATS Y
Z	BATS

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
PARTICIPANT OPEN/HIGH/LOW/LAST PRICE INDICATOR	1	Alphabetic. Identifies the Participant High/Low/Last Price applicable to the transaction.

Indicator	Value
A	None
B	High
C	Low
D	Last
E	High/Last
F	Low/Last
G	Unused
H	Open
I	Open/High
J	Open/Low
K	Open/High/Low/Last
L	Open/Last
M	Open/High/Low
N	Open/High/Last
O	Open/Low/Last
P	High/Low
Q	High/Low/Last

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
PREVIOUS CLOSE PRICE	12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Previous Close Price is the whole and fractional or decimal portion of the Previous Close Price information with the Previous Close Price Denominator Indicator determining the price representation. The Previous Close Price represents the last qualifying price paid for a security during the trading day.
PREVIOUS CLOSE PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
PREVIOUS CLOSE PRICE DATE	6	Numeric. Represented in MM/DD/YY format where MM = Right Justified, Zero-Filled month, DD = a Right-Justified, Zero-Filled day, and YY = a Right-Justified, Zero-Filled year. Represents the date the security last traded. **Note:** When a trade qualifies for the **Last Price**, the Previous Close Price Date field will be space-filled. This applies only to messages that do not contain a Previous Close Price field.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
PRICE DENOMINATOR INDICATOR	1	Alphanumeric. 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. Otherwise, this field is **zero-filled**.

Fractional Prices

Price Denom Code	Denominator Value	12 Byte Field		8 Byte Field	
		Whole	Numerator	Whole	Numerator
3	8	11	1	7	1
4	16	10	2	6	2
5	32	10	2	6	2
6	64	10	2	6	2
7	128	9	3	5	3
8	256	9	3	5	3

Decimal Prices

Price Denominator Code	Denominator Value	12 Byte Field		8 Byte Field	
		Whole	Numerator	Whole	Numerator
A	10	11	1	7	1
B	100	10	2	6	2
C	1,000	9	3	5	3
D	10,000	8	4	4	4
E	100,000	7	5	3	5
F	1,000,000	6	6	2	6
G	10,000,000	5	7	1	7
H	100,000,000	4	8	0	8

Decimal Prices

Price Denominator Code	Denominator Value	12 Byte Field		8 Byte Field	
		Whole	Numerator	Whole	Numerator
I	N/A	12	0	8	0

Note: The maximum whole price allowable is 92.2 billion.

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>PRIMARY LISTING MARKET PARTICIPANT IDENTIFIER</td><td>1</td><td>Alphanumeric.

Identifies the Primary Listing Market in instances when the Primary Market is an Exchange <u>other than</u> the NYSE or the NYSE MKT (NYSE and NYSE MKT are identified in the Message Network field of the CTS Message Header by default).

<table>
<tr><th>Code</th><th>Value</th></tr>
<tr><td>B</td><td>NASDAQ OMX BX</td></tr>
<tr><td>C</td><td>NSX</td></tr>
<tr><td>D</td><td>FINRA</td></tr>
<tr><td>I</td><td>ISE</td></tr>
<tr><td>J</td><td>EDGA</td></tr>
<tr><td>K</td><td>EDGX</td></tr>
<tr><td>M</td><td>CHX</td></tr>
<tr><td>T</td><td>NASDAQ OMX</td></tr>
<tr><td>P</td><td>NYSE Arca</td></tr>
<tr><td>V</td><td>IEX</td></tr>
<tr><td>W</td><td>CBSX</td></tr>
<tr><td>X</td><td>NASDAQ OMX PSX</td></tr>
<tr><td>Y</td><td>BATS Y</td></tr>
<tr><td>Z</td><td>BATS</td></tr>
</table>

Note:
• Messages relating to symbols with the NYSE as the primary listed market are disseminated with the Message Network value ‘A’.
• Messages relating to symbols with the NYSE MKT as the primary listed market are disseminated with the Message Network value ‘B’.</td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
PRIOR DAY TRADE DATE	6	Numeric. Represented in MM/DD/YY format where MM = a Right-Justified, Zero-Filled month, DD = a Right-Justified, Zero-Filled day, and YY = a Right-Justified, Zero-Filled year. Represents the date the prior day trade was executed. In the Prior Day Correction messages, there are two Prior Day Trade Dates, one to denote the date the original trade was executed as reported in a Prior Day Trade and one to denote the corrected date of trade execution. In the Prior Day Cancel/Error messages, the date denotes the reported execution date of the original trade being cancelled or reported in error.
PRIOR DAY TRADE TIME	3	Alphanumeric/Special Character. Format is HMS where H=Hours, M=Minutes and S=Seconds. Modified USASCII character set is used for time (Military Eastern Time) representation. Represents the time the prior day trade was executed. In the Prior Day Correction messages, there are two Prior Day Trade Times, one to denote the time the original trade was executed and one to denote the time the corrected trade was executed. In the Prior Day Cancel/Error messages, the time denotes the reported execution time of the original trade being cancelled or reported in error. A Time conversion table listing USASCII, Hexadecimal and Decimal representation is provided in **Appendix H**.
RESERVED	N	Alphanumeric. Fields reserved for future use. Reserved fields are space or Zero-Filled unless otherwise defined. **Note:** Reserved fields will be redefined and implemented as required. If Data Recipients are not prepared to process new field(s) when implemented, they should be able to handle them to the extent that they do not impact their normal data processing.

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>SALE CONDITION</td><td>1</td><td>Alphanumeric, Space-Filled.

Denotes a particular condition applicable to the trade. Refer to Appendix B for definition of values.

<table>
<tr><th>Code</th><th>Value</th></tr>
<tr><td>@</td><td>Regular Trade (indicates a trade with no associated conditions)</td></tr>
<tr><td>BLANK</td><td>No Sale Condition required within the Category it appears (Long Trade format only)</td></tr>
<tr><td>B</td><td>Average Price Trade</td></tr>
<tr><td>C</td><td>Cash Trade (Same Day Clearing)</td></tr>
<tr><td>E</td><td>Automatic Execution</td></tr>
<tr><td>F</td><td>Inter-market Sweep Order</td></tr>
<tr><td>H</td><td>Price Variation Trade</td></tr>
<tr><td>I</td><td>Odd Lot Trade</td></tr>
<tr><td>K</td><td>Rule 127 (NYSE only) <u>or</u> Rule 155 (NYSE MKT only)</td></tr>
<tr><td>L</td><td>Sold Last (Late Reporting)</td></tr>
<tr><td>M</td><td>Market Center Official Close</td></tr>
<tr><td>N</td><td>Next Day Trade (Next Day Clearing)</td></tr>
<tr><td>O</td><td>Market Center Opening Trade</td></tr>
<tr><td>P</td><td>Prior Reference Price</td></tr>
<tr><td>Q</td><td>Market Center Official Open</td></tr>
<tr><td>R</td><td>Seller</td></tr>
<tr><td>T</td><td>Extended Hours Trade</td></tr>
<tr><td>U</td><td>Extended Hours Sold (Out of Sequence)</td></tr>
<tr><td>V</td><td>Contingent Trade</td></tr>
<tr><td>X</td><td>Cross Trade</td></tr>
<tr><td>Z</td><td>Sold (Out of Sequence)</td></tr>
<tr><td>4</td><td>Derivatively Priced</td></tr>
<tr><td>5</td><td>Market Center Reopening Trade</td></tr>
<tr><td>6</td><td>Market Center Closing Trade</td></tr>
<tr><td>7</td><td>Qualified Contingent Trade</td></tr>
<tr><td>8</td><td>Reserved</td></tr>
<tr><td>9</td><td>Corrected Consolidated Close Price as per Listing Market</td></tr>
</table>

Note 1: Reference the ‘Open’, ‘Last’, ‘High’, ‘Low’ Calculations Table for the impact of the above sale conditions on the Consolidated High, Low and Last; and Participant Open, High, Low and Last price calculations.

Note 2: Reference the ‘Sale Condition Category’ Table for hierarchal placement of Sale Conditions in the 4-byte Sale Condition field.

Note 3: Reference the ‘Rule 611 – Trade Reporting Matrix’.</td></tr>
</table>

SALE CONDITION, *continued*

The Multicast Output 4-byte Sale Condition field is byte specific whereby a Sale Condition from Category 1 will be in the first byte position, a Sale Condition from Category 2 will be in the second byte position, a Sale Condition from Category 3 will be in the third byte position and a Sale Condition from Category 4 will be in the fourth byte position. Only one Sale Condition from each Category is allowable in its corresponding Category byte position of the 4-byte positions. The Category hierarchy of the new and redefined Sale Conditions represented in the 4-byte field is as follows:

Category 1 – Settlement Type	**Category 2 – Reason for Trade-Through Exemption/Other Reason**	**Category 3 – Extended Hours/Sequence Type**	**Category 4 – SRO Required Detail**
The '**@**' code in the first byte followed by 'blanks' in the 2nd, 3rd, and 4th, bytes is used to indicate a trade without conditions.			
Blank (Regular Settlement)	**Blank** (No Trade Through Exempt Reason)	**Blank** (Not Extended Hours or Sold Out of Sequence)	**Blank** (No Unusual Trade Detail)
C Cash Trade (Same Day Clearing)	**F** Inter-market Sweep Order	**L** Sold Last (Late Reporting)	**B** Average Price Trade
N Next Day Trade (Next Day Clearing)	**O** Market Center Opening Trade	**T** Extended Hours Trade	**E** Automatic Execution
R Seller	**4** Derivatively Priced	**U** Extended Hours Sold (Out of Sequence)	**H** Price Variation Trade
	5 Market Center Reopening Trade	**Z** Sold (Out of Sequence)	I Odd Lot Trade
	6 Market Center Closing Trade		**K** Rule 127 (NYSE only) or Rule 155 (NYSE MKT only)
	7 Qualified Contingent Trade		**M** Market Center Official Close
	8 Reserved		**P** Prior Reference Price
	9 Corrected Consolidated Close Price as per Listing Market		**Q** Market Center Official Open
			V Contingent Trade
			X Cross Trade

SALE CONDITION, *continued*

Note 1: Reference below for the impact of the above sale conditions on the: Consolidated High/Low/Last and Participant Open/High/Low/Last price calculations.

Note 2: Sale Conditions within the same category are mutually exclusive (e.g., Sale Condition C, N or R **cannot be used in combination).**

Note 3: Sale condition U (Extended Hours Sold – Out of Sequence) **cannot be used in combination with any of the Sale Conditions listed in Category 2** – Reason for Trade-Through Exemption (Rule 611).

Note 4: Sale Condition "L" (Sold Last – Late Reporting), Sale Condition "O" (Market Center Opening Trade), Sale Condition "P" (Prior Reference Price), and Sale Condition "Z" (Sold – Out of Sequence), are mutually exclusive of each other (i.e., **cannot be used in combination**).

SALE CONDITION, *continued*

'OPEN', 'LAST', 'HIGH', 'LOW' CALCULATIONS

The following criteria will be used to determine the impact of Sale Conditions on the Open, Last, High, and Low calculations both on a Consolidated and Participant basis (shading reflects modifications):

		CONSOLIDATED		PARTICIPANT			SALE COND UPDATE VOLUME
CODE	**SALE CONDITION**	**LAST**	**HIGH/ LOW**	**OPEN**	**LAST**	**HIGH/ LOW**	
Blank	No Sale Condition required within the Category it appears (Long Trade format only)	N/A					
@	REGULAR TRADE (Indicates a trade with no associated conditions)	YES	YES	**#4**	YES	YES	YES
B	AVERAGE PRICE TRADE	NO	NO	NO	NO	NO	YES
C	CASH TRADE (Same Day Clearing)	NO	NO	NO	NO	NO	YES
E	AUTOMATIC EXECUTION	YES	YES	**#4**	YES	YES	YES
F	INTERMARKET SWEEP ORDER	YES	YES	**#4**	YES	YES	YES
H	PRICE VARIATION TRADE	NO	NO	NO	NO	NO	YES
I	ODD LOT TRADE	NO	NO	NO	NO	NO	YES
K	RULE 127 (NYSE Only) **or** RULE 155 (NYSE MKT only)	YES	YES	**#4**	YES	YES	YES
L	SOLD LAST (Late Reporting)	**#3**	YES	**#4**	YES	YES	YES
M	MARKET CENTER OFFICIAL CLOSE	NO	NO	NO	YES	YES	NO
N	NEXT DAY TRADE (Next Day Clearing)	NO	NO	NO	NO	NO	YES
O	MARKET CENTER OPENING TRADE	**#1**	YES	YES	**#2**	YES	YES
P	PRIOR REFERENCE PRICE	**#2**	YES	**#4**	**#2**	YES	YES
Q	MARKET CENTER OFFICIAL OPEN	NO	NO	YES	NO	YES	NO
R	SELLER	NO	NO	NO	NO	NO	YES
T	EXTENDED HOURS TRADE	NO	NO	NO	NO	NO	YES
U	EXTENDED HOURS SOLD (Out of Sequence)	NO	NO	NO	NO	NO	YES
V	CONTINGENT TRADE	NO	NO	NO	NO	NO	YES
X	CROSS TRADE	YES	YES	**#4**	YES	YES	YES
Z	SOLD (Out of Sequence)	**#2**	YES	**#4**	**#2**	YES	YES
4	DERIVATIVELY PRICED	**#2**	YES	**#4**	**#2**	YES	YES
5	MARKET CENTER REOPENING TRADE	YES	YES	**#4**	YES	YES	YES
6	MARKET CENTER CLOSING TRADE	YES	YES	**#4**	YES	YES	YES
7	QUALIFIED CONTINGENT TRADE	NO	NO	NO	NO	NO	YES
8	RESERVED	NO	NO	NO	NO	NO	TBD
9	CORRECTED CONSOLIDATED CLOSE PRICE as per LISTING MARKET	YES	YES	NO	NO	NO	NO

SALE CONDITION, *continued*

Deviations from a trade's qualification for the Open, Last, High and Low calculations both on a Consolidated and individual Participant basis are denoted with a number (i.e., Note #1, #2, #3 and #4) in the above calculation chart and are described below:

'OPEN', 'LAST', 'HIGH', 'LOW' CALCULATIONS

Note 1:	**YES**, if it is the only qualifying last; OR If it is that Participant's first qualifying last; OTHERWISE ***NO***
Note 2:	**YES**, if it is the only qualifying last; OTHERWISE ***NO***
Note 3:	**YES**, if it is the only qualifying last; OR If it is from the same participant as the last; OR If it is from the PRIMARY MARKET for that Security; OTHERWISE ***NO***
Note 4:	**YES**, if it is the first qualifying or only qualifying trade of the day; OTHERWISE ***NO***. (In instances of multiple Market Center Opening Trades, the latest trade takes precedence.)

In instances of multiple sale conditions, the following criteria will be used to determine the impact of the Sale Conditions on the Open, Last, High, and Low calculations both on a Consolidated and individual Participant basis:

MULTIPLE SALE CONDITION 'OPEN', 'LAST', 'HIGH', 'LOW' CALCULATIONS

- If all of the Sale Conditions indicate that the trade qualifies, it will be included in the calculations.
- If any one or all of the Sale Conditions indicate 'NO', the trade does not qualify, the 'NO' takes precedence and the trade will not be included in the calculations.
- If all of the Sale Conditions indicate that the trade qualifies, including a Sale Condition whose criteria deviates from a trade's qualification (i.e., **Notes** #1, #2, #3 and #4) the trade qualifies, the 'Note Criteria' takes precedence and the trade will be included in the calculations.

SALE CONDITION, continued

Rule 611- Trade Reporting Matrix

			TTE Field	Sales Condition Field			
Rule	**Short Name**	**Description**	**611 Exemption**	**Settlement Type**	**Reason for 611 Exemption**	**Extended Hours/Sold**	**SRO Required Detail**
			Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**
611b1	Self Help	The transaction that constituted the trade-through was effected when the trading center displaying the protected quotation that was traded through was experiencing a failure, material delay, or malfunction of its systems or equipment.	YES	N/A	N/A	N/A	TBD by each SRO
611b2	Not Regular Way	The transaction that constituted the trade-through was not a "regular way" contract	YES	YES	N/A	N/A	TBD by each SRO
611b3	Single Price Opening	The transaction that constituted the trade-through was a single-priced opening transaction by the trading center.	YES	N/A	**O** MARKET CENTER OPENING TRADE	N/A	TBD by each SRO
611b3	Single Price Reopening	The transaction that constituted the trade-through was a single-priced reopening transaction by the trading center.	YES	N/A	**5** MARKET CENTER REOPENING TRADE	N/A	TBD by each SRO
611b3	Single Price Closing	The transaction that constituted the trade-through was a single-priced closing transaction by the trading center.	YES	N/A	**6** MARKET CENTER CLOSING TRADE	N/A	TBD by each SRO
611b4	Crossed Market	The transaction that constituted the trade-through was executed at a time when a protected bid was priced higher than a protected offer in the NMS stock.	YES	N/A	N/A	N/A	TBD by each SRO
611b5	Inter-market Sweep	The transaction that constituted the trade-through was the execution of an order identified as an inter-market sweep order.	YES	N/A	**F** INTERMARKET SWEEP	N/A	TBD by each SRO
611b6	Inter-market Sweep	The transaction that constituted the trade-through was effected by a trading center that simultaneously routed an inter-market sweep order to execute against the full displayed size of any protected quotation in the NMS stock that was traded through.	YES	N/A	**F** INTERMARKET SWEEP	N/A	TBD by each SRO

SALE CONDITION, continued

Rule 611- Trade Reporting Matrix, continued

			TTE Field	Sales Condition Field			
Rule	**Short Name**	**Description**	**611 Exemption**	**Settlement Type**	**Reason for 611 Exemption**	**Extended Hours/Sold**	**SRO Required Detail**
			Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**
611b7	Derivatively Priced	The transaction that constituted the trade-through was the execution of an order at a price that was not based, directly or indirectly, on the quoted price of the NMS stock at the time of execution and for which the material terms were not reasonably determinable at the time the commitment to execute the order was made.	YES	N/A	**4** DERIVATIVELY PRICED	N/A	TBD by each SRO
611b9	Stopped Stock	The transaction that constituted the trade-through was the execution by a trading center of an order for which, at the time of receipt of the order, the trading center had guaranteed an execution at no worse than a specified price (a "stopped order"), where: (i) The stopped order was for the account of a customer; (ii) The customer agreed to the specified price on an order-by-order basis; and (iii) The price of the trade-through transaction was, for a stopped buy order, lower than the national best bid in the NMS stock at the time of execution or, for a stopped sell order, higher than the national best offer in the NMS stock at the time of execution.	YES	N/A	**4** DERIVATIVELY PRICED	N/A	TBD by each SRO

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>SECURITY STATUS</td><td>1</td><td>Alphanumeric.

Identifies the trading status applicable to the transaction. Refer to Appendix B for definition of values.

<table>
<tr><th>Code</th><th>Value</th></tr>
<tr><td>1</td><td>Opening Delay</td></tr>
<tr><td>2</td><td>Trading Halt</td></tr>
<tr><td>3</td><td>Resume</td></tr>
<tr><td>4</td><td>No Open/No Resume</td></tr>
<tr><td>5</td><td>Price Indication</td></tr>
<tr><td>6</td><td>Trading Range Indication</td></tr>
<tr><td>7</td><td>Market Imbalance Buy</td></tr>
<tr><td>8</td><td>Market Imbalance Sell</td></tr>
<tr><td>9</td><td>Market On Close Imbalance Buy</td></tr>
<tr><td>A</td><td>Market On Close Imbalance Sell</td></tr>
<tr><td>B</td><td>Reserved</td></tr>
<tr><td>C</td><td>No Market Imbalance</td></tr>
<tr><td>D</td><td>No Market On Close Imbalance</td></tr>
<tr><td>E</td><td>Short Sale Restriction</td></tr>
<tr><td>F</td><td>Limit Up-Limit Down</td></tr>
</table>

Note 1: The Last Price is provided when the Security Status is an Opening Delay, Trading Halt, Price Indication or Trading Range Indication. Market Imbalances and Market on Close Imbalances contain either buy or sell volumes. The remaining security status values are <u>not</u> accompanied by either price or volume data.

Note 2: ‘Limit Up-Limit Down’ code will be used in conjunction with a new ‘Limit Up-Limit Down Indicator’ field, which will further identify the Limit Up-Limit Down (LULD) action (e.g., Price Bands, National Best Bid/Offer Limit State Entered/Exited) related to a security.</td></tr>
</table>

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>SECURITY SYMBOL</td><td>3
or
11</td><td>Alphabetic, Left-Justified, Space-Filled.

Identifies the Security Symbol. Suffixes start with one of the following characters with no embedded blanks: (1) Letter slash, (2) lower case p, (3) lower case r, or (4) lower case w.
Reference: Appendix G for the list of allowable symbol suffixes.

Security Symbol field exceptions:
a) Temporary Suffixes are not contained in this field.
b) Sale Conditions (SOLD, SOLD LAST, CASH TRADE, etc.) are not contained in this field.

Note: CTS will allow for a base or root symbol to consist of from one (1) up to six (6) characters with the remaining characters in the security symbol field available for possible suffixes.

Identification of Test Data:
The purpose of a Test Message is to have a mechanism whereby end-to-end connectivity and functionality between the CTS Participant and Data Recipient can be tested prior to the opening or during the trading day. There are two types of test messages that can be disseminated, but do not contain the same characteristics:

CTS messages containing a suffix of '.TEST' used with any base symbol that is not in the CTS database. Messages with a '.TEST' suffix are not included in any Participant statistics (e.g., Open/High/Low/Last calculations, volume counts, trade counts, etc.). Start or End of Day Summary messages are not generated by CTS for any security symbols containing a '.TEST' suffix.

CTS messages containing any of the following dedicated test symbols:

<table>
<tr><th>Test Symbol</th><th>Listing Market</th><th>Network(s)</th></tr>
<tr><td>CBO</td><td>NYSE</td><td>A</td></tr>
<tr><td>CBX</td><td>NYSE</td><td>A</td></tr>
<tr><td>IBO</td><td>NYSE MKT</td><td>B</td></tr>
<tr><td>IGZ</td><td>NYSE ARCA</td><td>B</td></tr>
<tr><td>ZVV</td><td>NYSE ARCA</td><td>B</td></tr>
<tr><td>ZZK</td><td>NYSE ARCA</td><td>B</td></tr>
<tr><td>ZZZ</td><td>NYSE ARCA</td><td>B</td></tr>
<tr><td>ZBZX</td><td>BATS</td><td>B</td></tr>
<tr><td>ZTEST</td><td>BATS</td><td>B</td></tr>
<tr><td>ZTST</td><td>BATS</td><td>B</td></tr>
</table>
continued on next page</td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
SECURITY SYMBOL, *continued*		Messages with any of the dedicated test symbols will be included in Participant statistics (e.g., Open/High/Low/Last calculations), but will be excluded in volume counts, trade counts, etc. Start and End of Day Summary messages will be generated for dedicated test symbols.
SELL VOLUME	9	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. Represents the reported imbalance of sell orders without matching buy orders for the security for a Participant. Refer to **Appendix B** for Market Imbalance and Market on Close Imbalance (MOC) definitions.
SELLER'S SALE DAYS	3	Numeric, Right-Justified, Zero-Filled. Used if Sale Condition = "R" (Seller). Otherwise, this field is zero-filled. Specifies the number of days that may elapse before delivery of the security.
SHORT SALE RESTRICTION INDICATOR	1	Alphanumeric, Space-Filled. Identifies whether or not a Short Sale Restriction is in effect for a security. A Short Sale Restriction is to be in effect if a security's price decreases by 10% or more from the previous day's closing price. Once activated, the Short Sale Restriction will remain in effect for the remainder of the day as well as the following day, unless 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
E	Short Sale Restriction in Effect

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>STATUS INDICATOR</td><td>1</td><td>Alphanumeric, otherwise Space-Filled.

Identifies the status of a Market Imbalance, Price Indication or Trading Range Indication. Refer to Appendix B for definition of values.

<table><tr><th>Code</th><th>Value</th></tr><tr><td>1</td><td>Price Indication</td></tr><tr><td>2</td><td>New Price Indication</td></tr><tr><td>3</td><td>Corrected Price Indication</td></tr><tr><td>4</td><td>Cancelled Market Imbalance /
Price Indication /Trading Range Indication</td></tr></table>
Note 1: Price Indication/New Price Indication/Corrected Price Indication/Cancelled Price Indication - only valid with Security Status code of 5.

Note 2: Cancelled Market Imbalance - only valid with Security Status codes of 7, 8, 9, A, C, or D.

Note 3: Cancelled Trading Range Indication - only valid with Security Status code of 6.</td></tr>
<tr><td>STOP STOCK INDICATOR</td><td>1</td><td>Numeric.

Refer to Appendix B for Stop Stock definition.

<table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>Not Applicable</td></tr><tr><td>1</td><td>Applicable</td></tr></table></td></tr>
</table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
TEMPORARY SUFFIX	1	Alphabetic, otherwise Space-Filled. Contains the temporary status of the security. Refer to **Appendix B** for definition of values. Refer to **Appendix G** for Temporary Suffix representation. **Code** / **Value** A – Ex-Dividend B – Ex-Distribution C – Ex-Rights D – New E – Ex-Interest
TEST MESSAGE INDICATOR	1	Alphanumeric. Indicates whether the message is an actual trade or a test message: **Code** / **Value** BLANK – Not a Test Message T – Test Message **Note:** The purpose of a Test Message is to have a mechanism whereby end-to-end connectivity between the CTS Participant and Data Recipient can be tested prior to the opening or during intraday trading. A Test Message requires that a suffix of "/TEST" be used, **with a base symbol that does not exist in the CTS security master database**. Test messages are not to be included in any Exchange statistics (e.g., trade counts, etc.). Start of Day or End of Day Summary messages are not generated by CTS for any security symbols containing a '/TEST' suffix.

FIELD DESCRIPTIONS, continued

<table>
<tr><th>Field Name</th><th>Bytes</th><th>Description</th></tr>
<tr><td>TICK</td><td>1</td><td>Numeric.

Represents for a Participant the upward, downward or unchanged price movement in a security's trades:

<table><tr><th>Code</th><th>Value</th></tr><tr><td>1</td><td>+</td></tr><tr><td>2</td><td>-</td></tr><tr><td>3</td><td>0+</td></tr><tr><td>4</td><td>0-</td></tr></table>
Note 1: For values 3 & 4, if the price of the last sale is unchanged from the previous last sale for that security, the tick reflects a zero in addition to the tick of the previous last sale that changed.

Note 2: In instances when no trades qualify to be included in the tick calculation, the tick will reflect the most current calculated tick which may be the previous days' tick.

Note 3: In instances when no trades qualify to be included in the tick calculation and <u>no</u> previous close exists, the tick will reflect a plus (+).</td></tr>
<tr><td>TOTAL VOLUME</td><td>11</td><td>Numeric, Right-Justified, Zero-Filled.

Contains Total Volume of shares traded in a security either on a Consolidated or an individual Participant basis at the time it is disseminated. All trades <u>except</u> those having an "M" or a "Q" Sale Condition are included in the volume count.</td></tr>
<tr><td>TOTAL TRADES</td><td>11</td><td>Numeric, Right-Justified, Zero-Filled.

Contains the total number of trade transactions executed from a Market Center.</td></tr>
</table>

FIELD DESCRIPTIONS, continued

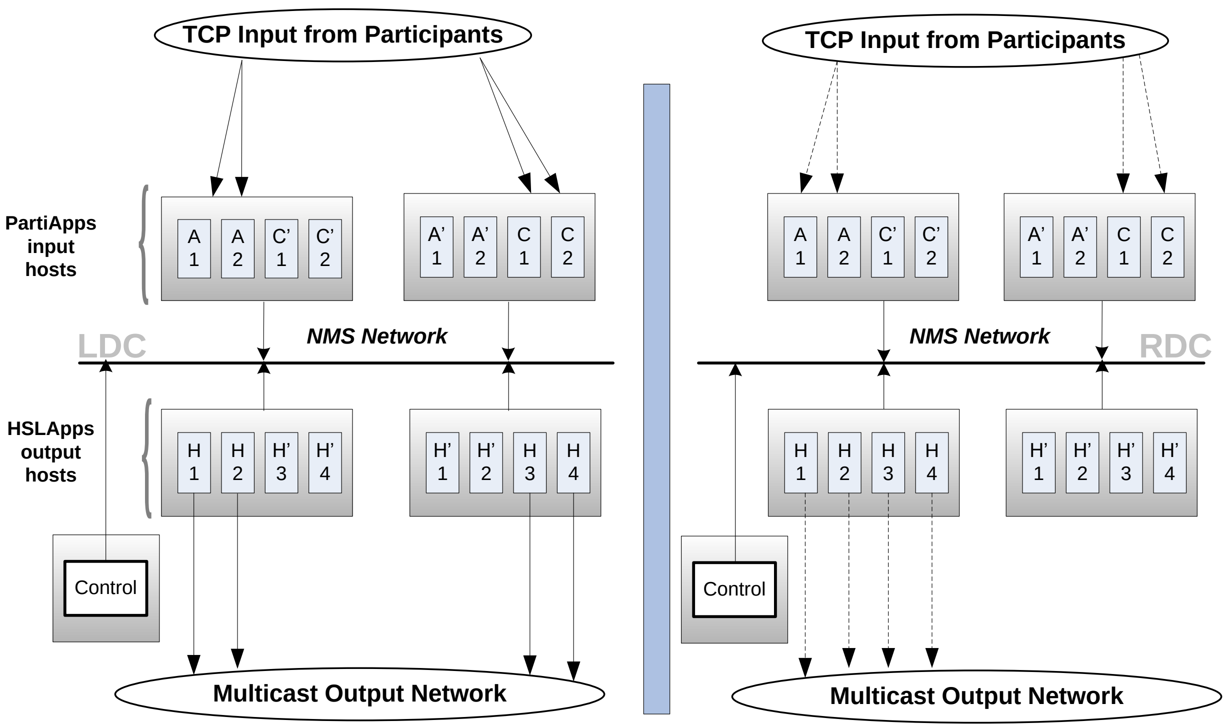
Field Name	Bytes	Description
TRADE PRICE	8 or 12	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. The Trade Price is the whole and decimal portion of the Trade Price information with the **PRICE DENOMINATOR INDICATOR** code determining the price representation. The Trade Price is the monetary value of an individual share of security at the time of the trade.
TRADE REPORTING FACILITY (TRF) IDENTIFIER	1	Alphabetic (including lower case), Space-Filled. Identifies the Participant with whom a TRF has been formed. Otherwise, this field is Space-Filled. In cases of Bonds and Local Issues, which are not eligible for TRF transactions, the TRF Identifier field will be Space-Filled.

TRF Identifier Code	Value
A	NYSE MKT
B	NASDAQ OMX BX
C	NSX
D	FINRA
I	ISE
J	EDGA
K	EDGX
M	CHX
N	NYSE
P	NYSE Arca
T	NASDAQ OMX
V	**IEX**
W	CBSX
X	NASDAQ OMX PSX
Y	BATS Y
Z	BATS

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
TRADE THROUGH EXEMPT INDICATOR	1	Numeric, Zero-Filled. Denotes whether or not a trade is exempt (Rule 611) and when used jointly with certain Sale Conditions, will more fully describe the characteristics of a particular trade. **Code** / **Value**: 0 – Not a Trade Through Exemption 1 – Trade Through Exemption **Note**: The Trade Through Exempt Indicator value will <u>not</u> have an effect on whether a trade qualifies for the Consolidated or Participant High, Low, Last and Open calculations. Only the Sale Condition determines if a trade qualifies.
TRADE VOLUME	4 or 9	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. Contains the total number of shares traded by a participant during the trading day up to the time of the report of the Participant’s daily trading volume per security or across all securities.
TRADING VOLUME	11	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. Contains the total number of shares traded by a participant during the trading day up to the time of the report of the Participant’s daily trading volume per security or across all securities.
WHOLE PRICE	3	Numeric, Right-Justified, Zero-Filled, otherwise Zero-Filled. Represents the whole dollar portion of the trade price.

APPENDIX A: CTS DUAL SITE CONFIGURATION



APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Automatic Execution	A sale condition code that identifies a NYSE trade that has been automatically executed without the potential benefit of price improvement.
Average Price Trade	A trade where the price reported is based upon an average of the prices for transactions in a security during all or any portion of the trading day.
Below Continuing Listing Standards	A financial status designation pertaining to Tape 'A' and Tape 'B' listed securities. The status identifies a company, whose issue is listed on the New York Stock Exchange, the NYSE MKT Stock Market or on one of the Regional exchanges, and has failed to meet established listings standards. The listing exchange will subsequently review the appropriateness of continuing to list the issue, and may decide to commence the process of delisting the issue.
Broken Lot	Indicates an irregular quantity or lot of securities, which is lower in terms of amount or quantity than the minimum lot quantity (for shares) or than the lot normally traded; less than 100 shares of stock.
Cancelled Indication	Denotes a cancellation to the most recent indication for a security originally sent in error.
Cash Trade	A transaction which requires delivery of securities and payment on the same day the trade takes place.
Contingent Trade	A Sale Condition used to identify a transaction where the execution of the transaction is contingent upon some event.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Corrected Consolidated Close Price as per Listing Market	A transaction executed by the Listing Market to establish the official Consolidated Close price as indicated by the Listing Market.
Corrected Indication	Denotes a correction to the last indication or new indication. It will contain the corrected approximation of what that security's opening or reopening price range (Bid and Offer prices, no sizes) will be when trading resumes after a delayed opening or after a trading halt.
Creations Suspended (for Exchange Traded Products)	A financial status designation used to denote the ability to create new shares of this Exchange Traded Product (ETP) has been temporarily suspended by the ETP Issuer. ETPs that are closed for Creations typically are allowed to continue trading on the listing market once the ETP Issuer publishes the press release. NYSE ARCA maintains a list of all U.S. Exchange Traded Products that have suspended the issuance of new shares, which can be accessed at: https://etp.nyx.com/en/trading-information/us/funds-closed-creation
Cross Trade	Indicates that the trade resulted from a Market Center's crossing session.
Crossed Market	The transaction that constituted the trade-through was executed at a time when a protected Bid was priced higher than a protected offer in the security.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Crossing Session I (NYSE MKT)	Single-sided orders and coupled (both buy and sell side) orders may be entered into Crossing Session I (called "After Hours Trading" on the NYSE MKT) between 4:15 p.m. and 5:00 p.m. (EST). Systemized limit orders entered during the normal 9:30 to 4 p.m. trading session labeled good-till-executed (GTX) migrate to the Crossing Session I for possible execution. There is a single NYSE MKT Crossing Session I trade at 5:00 p.m. at the price of the NYSE MKT closing price determined during the Exchange's 9:30 a.m. to 4:00 p.m. trading session. This trade is printed on the Consolidated Tape (Tape B). All coupled orders are executed in the trade. GTX and singled-sided orders are executed against each other (buys against sells) on a first-come-first-served basis. GTX orders, which are not executed, migrate back to the "book" for the next trading day. Single-sided orders, which are not executed, are cancelled. NYSE MKT Crossing Session I is exempt from "up-tick rule" for sell short orders. ETFs, which participate in NYSE MKT Crossing Session I, use the closing price at 4:15 p.m. See NYSE MKT Rules 1300 to 1306 for more details.
Crossing Session I (NYSE)	For the NYSE, Crossing Session I operates between 4:15 p.m. and 5:00 p.m. (EST). During this time, one-sided, two-sided, or good-till-executed (GTX) orders for a particular security can be entered for execution at 5:00 p.m. Matched orders are executed at the NYSE closing price determined during the Exchange’s 9:30 a.m. to 4:00 p.m. trading session and are printed on the Consolidated Tape at approximately 6:40 p.m.
Crossing Session II (NYSE MKT)	NYSE MKT Crossing Session II (called "After Hours Trading Facility II" on the NYSE MKT) operates between 4:00 p.m. and 5:15 p.m. (EST). This session on the NYSE MKT accommodates the trading of NYSE MKT coupled orders in baskets, which are composed of at least 15 NYSE securities valued at $1 million or more and also include NYSE MKT securities. Members, that have either facilitated a basket trade or have paired two customers' baskets, submit aggregate information on transactions in NYSE MKT securities included in the baskets to the NYSE MKT for execution. At 5:15 p.m., the aggregate information of all NYSE MKT securities included in baskets executed in this session prints to the Consolidated Tape (Tape B).

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Crossing Session II (NYSE)	For the NYSE, Crossing Session II operates between 4:00 p.m. and 6:15 p.m. (EST). This session accommodates the trading of baskets of at least 15 NYSE securities valued at $1 million or more. NYSE Members that have either facilitated a basket trade or have paired two customers' baskets can submit aggregate information to the Exchange for execution. At approximately 6:40 p.m., the aggregate information of all baskets executed in this session prints to the consolidated tape.
Crossing Session III (NYSE: Guaranteed Price Orders)	For the NYSE, Crossing Session III operates between 4:00 p.m. and 6:30 p.m. This session functions to execute the unfilled portions of "guaranteed price" orders. The term "guaranteed price coupled order" means an order to buy for a minimum of 10,000 shares coupled with an order to sell the same quantity of the same security. One side of the guaranteed price coupled order must be for the account of a NYSE member organization and the other side must be for the account of one of its customers. Such orders must be entered and priced in accordance with Rule 907.
Crossing Session IV (NYSE:VWAP Orders)	For the NYSE, Crossing Session IV operates between 4:00 p.m. and 6:30 p.m. Crossing Session IV allows firms to execute the unfilled balance of an order at a price that is not pre-determined, but is calculated to ensure that the entire order is filled at a price no worse than the volume weighted average price (VWAP). Trades must be for a minimum of 10,000 shares (program trades for less than 10,000 shares can be completed in CS II) and can be priced up to four places to the right of the decimal.
CTA Eligible	Generally, any common stock, long-term warrant or preferred stock which becomes registered on any national securities exchange or is admitted to unlisted trading privileges thereon and which at the time of such registration or at the commencement of such trading substantially meets the original listing requirements of the NYSE or the NYSE MKT for such securities.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Derivatively Priced	The transaction that constituted the trade-through was the execution of an order at a price that was not based, directly or indirectly, on the quoted price of the security at the time of execution, and for which the material terms were not reasonably determinable at the time the commitment to execute the order was made (REG NMS 611b7).
Dollar Value	The whole and decimal portion, if any, of the total dollar worth of the total daily trade transactions.
Due To Related Security	Describes a halt condition, and is used when events concerning 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).
Equipment Changeover	Denotes a non-regulatory Trading Halt. 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.
Ex-Distribution	Securities without the right to receive the forthcoming distribution of securities, which have been recently declared.
Ex-Dividend	Securities without the right to receive the forthcoming dividend recently declared.
Ex-Interest	Securities without the right to receive the forthcoming interest recently declared.
Ex-Rights	Securities without the right to buy a company's securities at a discount from the prevailing market price, which was distributed until a particular date. Typically, after that date, the rights trade separately from the security itself.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Extended Hours Trade	Identifies a trade that was executed outside of regular primary market hours and is reported as an extended hours trade.
Extended Hours Sold (Out Of Sequence)	Identifies a trade that takes place outside of regular market hours and is reported as an extended hours trade out of sequence and at a time different from the actual transaction time.
Held Trades	Trades received from a non-primary Participant during a primary market regulatory halt. These trades are held by the CTS Processor and are disseminated after the close of the primary market with an appropriate Held Trade Indicator code applicable to the trade.
Indication	An approximation of what a security's opening or reopening price range (Bid and Offer prices, no sizes) will be when trading resumes after a delayed opening or after a trading halt.
Inter-market Sweep Order	The transaction that constituted the trade-through was the execution of an order identified as an Inter-market Sweep Order.
In View Of Common	Matters affecting the common stock of a company may 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 or Trading Halted for a Participant in view of the common stock.
Intraday Trade Detail	Indicates the trade was included as part of a transaction, other than an opening or reopening transaction that involved a group or "bunch" of orders executed at the same time and price and previously reported by the Participant as a single cumulative trade report.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Late Filing	A financial status designation pertaining to Tape 'A' and Tape 'B' issues (i.e. issues listed on the NYSE, the NYSE MKT or on one of the Regional exchanges). The status identifies a company, which has failed to meet established listings standards for filing its annual reports.
Limit State	Indicates that a National Best Bid is equal to the Upper Limit Price Band, and/or that a National Best Offer is equal to the Lower Limit Price Band.
Limit Up-Limit Down (LULD) Price Bands	The Limit Up-Limit Down Price Band represents a price range which is set at a percentage level above and below the average price of a security over the immediately preceding five (5) minute period. Price Bands prevail for a minimum of thirty (30) seconds. During a Limit State Price Bands will not be disseminated and will recommence when Limit State is terminated. For further details related to Limit Up-Limit Down, reference the following: http://www.sec.gov/news/press/2011/2011-84.htm **Note**: 'Limit Up-Limit Down' Price Bands are republished every 30 seconds at clock time.
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.
Liquidation (for Exchange Traded Products)	A financial status designation used to denote that the ETP Issuer announced the ETP will be liquidated and NYSE ARCA announced the date the ETP will be suspended from trading.
Local Issue	A Local Issue is an issue that does not meet NYSE MKT Stock Market or NYSE listing requirements (is not CTA eligible) but is traded at one or more Regional Exchanges. Local Issues are included in the CTS database.
Market Center Closing Trade	The transaction that constituted the trade-through was a single priced closing transaction by the Market Center (REG NMS Rule 611b3).
Market Center Official Close	Indicates the 'Official' closing value as determined by a Market Center. This transaction report will contain the market center generated closing price.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Market Center Official Open	Indicates the 'Official' opening value as determined by a Market Center. This transaction report will contain the market center generated opening price.
Market Center Opening Trade	The trade that constituted the trade-through was a single priced opening transaction by the Market Center (REG NMS Rule 611b3).
Market Center Reopening Trade	The trade that constituted the trade-through was a single priced reopening transaction by the Market Center (REG NMS Rule 611b3).
Market Imbalance Buy	A 50,000 share or more excess of market orders to buy over market orders to sell as of 9:00 a.m. on expiration days.
Market Imbalance Sell	A 50,000 share or more, excess of market orders to sell over market orders to buy as of 9:00 a.m. on expiration days.
Market On Close (MOC) Imbalance Buy	An excess of 50,000 shares or more of MOC orders to buy over MOC orders to sell (including MOC sell plus and MOC sell short orders).
Market On Close (MOC) Imbalance Sell	An excess of 50,000 shares or more of MOC orders to sell (not including MOC sell short and MOC sell plus orders) over MOC orders to buy (including MOC orders to buy minus).

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Market-Wide Circuit Breaker Level 1 – 7% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 7% decline level below its closing value on the previous trading day. A Level 1 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: before 3:25 p.m. ET – duration 15 minutes; at or after 3:25 p.m. ET – trading shall continue, unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.
Market-Wide Circuit Breaker Level 2 – 13% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 13% decline level below its closing value on the previous trading day. A Level 2 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: before 3:25 p.m. ET – duration 15 minutes; at or after 3:25 p.m. ET – trading shall continue, unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.
Market-Wide Circuit Breaker Level 3 – 20% Decline	This Regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 20% decline level below its closing value on the previous trading day. A Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: at any time during regular trading hours, trading shall Halt and not Resume for the remainder of the trading day.
Mixed Lot	An order for a number of shares greater than 100, but not a multiple of 100 (i.e., 142, 373, 1,948, etc.). This type of order is also known as ‘PRL’ or ‘partial round lot’ order and is comprised of a round lot order and an odd lot order.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
New	A temporary suffix, used when necessary, to identify a new status or structure of an issue, but where the symbol remains the same.
News Dissemination	Denotes a regulatory trading halt when relevant news influencing the security is being disseminated. Trading is suspended until the primary market determines that an adequate publication or disclosure of information has occurred.
New Indication	Newest indication on an already indicated security denoting a new approximation of what that security's opening or reopening price range (Bid and Offer prices, no sizes) will be when trading resumes after a delayed opening or after a trading halt.
News Pending	Denotes a regulatory 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.
Next Day Trade	A transaction that requires the delivery of securities on the first business day following the trade date.
No Market Imbalance	Indicates that the imbalance of market orders for a security is less than 50,000 shares as of 9:00 a.m. on expiration day.
No Market On Close (MOC) Imbalance	The difference between the number of shares to buy MOC and the number of shares to sell MOC is less than 50,000.
No Open/No Resume	Indicates an Opening Delay or Trading Halt is to be in effect for the rest of the trading day in a security for a Participant.
Non-Regulatory Halt Or Delay	An operational Trading Halt for a Participant due to Order Imbalance, Equipment Changeover or Due to Related Security. In addition, Due To Related Security can be used in conjunction with a non-regulatory Halt Reason, i.e., Order Imbalance or Equipment Changeover.
Not-Regular Way	The transaction that constituted the trade-through was not a ‘regular way’ contract.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Odd Lot	An order amount for a security that is less than the normal unit of trading for that particular asset. Odd lots are considered to be anything less than the standard units of trade.
One Or Two Point Rule	A trade must receive Floor Official approval and be published on the tape as "opened" or "sold last" if it is: **a.** one point or more away from the last sale when the last sale is under $20.00; **or** **b.** two points or more away from the last sale when the last sale is $20.00 or more
Opening Delay	Postponement of the opening of trading in a security for a Participant.
Opening/Reopening Trade Detail	An Opening/Reopening Trade Detail report indicates the trade was included as part of an opening or reopening transaction previously reported by a Participant on an aggregate basis.
Order Imbalance	Denotes a non-regulatory halt condition where there is a significant imbalance of buy or sell orders.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Price Indication	Reflects an approximate price range of what a security's trading range (Bid and offer prices) will be when trading resumes after an Opening Delay or a Trading Halt.
Price Variation Trade	Indicates a regular market session trade transaction that carries a price that is significantly away from the prevailing consolidated or primary market value at the time of the transaction.
Prior Reference Price	A sale condition that identifies a trade based on a price at a prior point in time, i.e. more than 90 seconds prior to the time of the trade report. The execution time of the trade will be the time of the prior reference price.
Qualified Contingent Trade	A transaction consisting of two or more component orders executed as agent or principal where the execution of one component is contingent upon the execution of all other components at or near the same time and the price is determined by the relationship between the component orders and not the current market price for the security.
Redemptions Suspended (for Exchange Traded Products)	A financial status designation used to denote the ability to redeem shares of this ETP has been suspended by the ETP Issuer. ETPs that are closed for redemption will remain halted on the listing market. Note: A list of securities that suspend redemptions is not available because, in all cases, they were suspended then liquidated.
Regular Sale	A trade made without stated conditions is deemed regular way for settlement on the third business day following the transaction date.
Regulatory Halt Or Delay	An Opening Delay or Trading Halt called due to news dissemination or news pending. In addition, Due To Related Security can be used in conjunction with a regulatory Halt Reason, i.e., News Dissemination or News Pending.
Resume	Indicates that trading for a Participant is no longer suspended in a security which had been Halted or, had its Opening delayed.
Round Lot	Typically 100 shares of stock or any number of shares that is a multiple of 100 (i.e., 100, 600, 1,600, etc.).

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Rule 127 Trade (NYSE)	To qualify as a NYSE Rule 127 the trade is executed outside the present quote and meets one or both of the following conditions: (1) has a volume of 10,000 shares or more and/or (2) has a dollar value of $200,000 or more.
Rule 155 Trade (NYSE MKT)	To qualify as a NYSE MKT Rule 155, from time to time, a specialist may arrange for the sale, or purchase, of a block of security, or other large number of shares of securities, at a single “clean-up” price. Generally such a sale or purchase is outside of the current market. Such sale or trade is designated as a Rule 155 trade.
Self Help	The transaction that constituted the trade-through was effected when the market center displaying the protected quotation that was traded through was experiencing a failure, material delay or malfunction of its systems or equipment.
Seller	A Seller’s Option transaction gives the seller the right to deliver the security at any time within a specific period, ranging from not less than two calendar days, to not more than sixty calendar days. A security offered “Seller’s Option” may command a lesser price than if offered “Regular Way”.
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.
Single-Priced Opening	The transaction that constituted the trade-through was a single-priced opening transaction by the market center.
Single-Priced Reopening	The transaction that constituted the trade-through was a single-priced reopening transaction by the market center.
Single-Priced Closing	The transaction that constituted the trade-through was a single-priced closing transaction by the market center.

APPENDIX B: GLOSSARY

TERM	DESCRIPTION
Sold	Sold is used when a trade is printed (reported) out of sequence and at a time different from the actual transaction time.
Sold Last	Sold Last is used when a trade prints in sequence but is reported late or printed in conformance to the One or Two Point Rule.
Stock-Option Trade	Stock-Option Trade is used to identify cash equity transactions which are related to options transactions and therefore potentially subject to cancellation if market conditions of the options leg(s) prevent the execution of the stock-option order at the price agreed upon.
Stopped Stock	The transaction that constituted the trade-through was the execution by a trading center of an order for which, at the time of receipt of the order, the trading center had guaranteed an execution at no worse than a specified price (a "stopped order"), where: (i) The stopped order was for the account of a customer;(ii) The customer agreed to the specified price on an order-by-order basis; and (iii) The price of the trade-through transaction was for a stopped buy order lower than the National Best Bid in the security at the time of execution, or for a stopped sell order higher than the National Best Offer in the security at the time of execution.
Sub-Penny Trading	Indicates a non-regulatory Opening Delay or Trading Halt for an NYSE security whose price may fall below $1.05, possibly leading to a sub-penny execution.
Trading Halt	A temporary halt in the trading of a particular security by a Participant.
Trading Range Indication	Denotes 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.

APPENDIX C: SUMMARY OF DAILY CTS MULTICAST LINE MESSAGES

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

TIME (ET)		TRANSMISSION
01:40		Line Integrity Messages*
02:00		Start of Test Cycle Message
02:45		End of Test Cycle Message
03:30 – 03:33		Start of Day Message (Sent three times at one minute intervals)
03:33 - 20:05		Administrative Messages Pre-Opening Indication Messages Stock Indices
03:33 - 20:30		Reset Message Sequence Number Messages (if required) Retransmission Messages Test Messages
03:45 & 07:45		Start of Day Summary Message
04:00		"MARKET OPEN" (NASDAQ & NYSE ARCA)
07:00		"MARKET OPEN" (BATS BYX, BATS BZX, BATS EDGA, BATS EDGX, NASDAQ BX & CHX) MARKET-WIDE CIRCUIT BREAKER (MWCB) DECLINE LEVEL
08:00		"MARKET OPEN" (FINRA & NSX) MARKET-WIDE CIRCUIT BREAKER (MWCB) DECLINE LEVEL
09:00		"MARKET OPEN" (NASDAQ PSX)
09:30		"MARKET OPEN" (NYSE & NYSE MKT)

*Line Integrity Messages are transmitted at intervals of approximately one minute throughout the day ending when the CTS lines are brought down.

APPENDIX C: SUMMARY OF DAILY CTS MULTICAST LINE MESSAGES

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

TIME (ET)		TRANSMISSION
09:30 – 16:00		PRICE BAND MESSAGES
09:30 - 20:05		"MARKET OPEN" Trade Reports Local Issue Reports Prior Day Reports Correction Messages Cancel/Error Messages Administrative Messages Primary Market Volume and Index Messages Stock Indices Test Messages Trading Status Messages
10:00 - 16:45		NYSE MKT Approx ECM Volume (hourly) Approximate NYSE Market Volume & Index (half-hourly)
16:00		yyyMARKET CLOSED TRDS FROM MKTS STILL OPN WILL CONTINUEzz
16:00		"MARKET CLOSED" (NYSE & NYSE MKT**)**
16:00 - 16:15		<SYMBOL (S)> Not Available for NYSE Crossing Session Message (1st Iteration)
16:07 - 16:15		yyyCLOSEzz yyyTRDS FROM MKTS STILL OPN WILL CONTINUEzz Tape A & B Regional Held Trades NYSE Approx. Volume and Indices Message Approx. Adjusted Volume Tape A (1st Iteration) NYSE MKT Approximate Volume
16:10		Approximate NYSE Total Trade and Dollar Value (1st Iteration)
16:15		Consolidated End of Day Summary Messages (1st Iteration) Participant End of Day Summary Messages (1st Iteration) NYSE & NYSE MKT Closing Trade Prices (1st Iteration)

APPENDIX C: SUMMARY OF DAILY CTS MULTICAST LINE MESSAGES

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

TIME (ET)		TRANSMISSION
16:15 - 16:30		<SYMBOL (S)> Not Available for NYSE Crossing Session Message (2nd Iteration) Prior Day Correction Administrative Messages Administrative Messages (e.g., Market Volume & Index, Crossing Activity, Market Closed, Goodnight).
16:16		NYSE Closing Bid/Offer of Securities Not Traded
16:20		NYSE 15 Most Active (1st Iteration) NYSE MKT 10 Most Active (1st Iteration)
16:28		NYSE MKT Closing XAM Index
16:30		yyyMARKET CLOSED TRDS FROM MKTS STILL OPN WILL CONTINUEzz NYSE MKT Sub-Indices (Industrial & Geographical) NYSE Prior Day Correction Administrative Messages
16:30 - 16:50		Regional Approx Volume Tape A and B (2nd Iteration)
16:36		yyyCLOSEzz yyyTRDS FROM MKTS STILL OPN WILL CONTINUEzz Tape A & B Regional Held Trades (2nd Iteration) NYSE MKT Final Approx. Volume
16:45		<SYMBOL (S)>Not available for NYSE Crossing Session..News Message NYSE & NYSE MKT Closing Trade Prices (2nd Iteration) Approximate NYSE Market Volume & Index (last iteration)
16:50		NYSE 15 Most Active (2nd Iteration) NYSE MKT 10 Most Active (2nd Iteration)
16:55		NYSE Market Volume, Index & Issues Traded, Up, Down and Unchanged

APPENDIX C: SUMMARY OF DAILY CTS MULTICAST LINE MESSAGES

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

TIME (ET)		TRANSMISSION
17:00		"MARKET CLOSED" (BATS BYX, BATS BZX, CHX & NASDAQ PSX)
17:01		NYSE Crossing Session I Trades NYSE MKT Crossing Session Trades
17:00 - 17:15		NYSE MKT Crossing Session Summary Message (I & II)
17:25 - 18:00		NYSE Volume, and Indices Approximate NYSE Trade and Dollar Value (2nd Iteration) Regional Approx Volume Tape A and B (3rd Iteration) Final NYSE Market Status, Indices and Issues Traded, Up, Down and Unchanged (2nd Iteration)
17:30 - 18:00		NYSE MKT Closing Bid/Offer - NYSE MKT Equity & ECM's
18:30		"MARKET CLOSED" (FINRA) yyyMARKET CLOSED TRDS FROM MKTS STILL OPN WILL CONTINUEzz
18:35 – 18:40		NYSE Crossing Session Activity
18:40 - 18:50		Regional Approx Volume Tape A and B (4th Iteration) Consolidated End of Day Summary Messages (2nd Iteration) Participant End of Day Summary Messages (2nd Iteration)
18:50		NYSE Crossing Session Summary Message (I & II) NYSE Crossing Session Summary Administrative Messages (III & IV)
18:55		Approximate Total Trades and Dollar Value Message

APPENDIX C: SUMMARY OF DAILY CTS MULTICAST LINE MESSAGES

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

TIME (ET)		TRANSMISSION
19:00		"MARKET CLOSED" (NASDAQ BX)
20:00		"MARKET CLOSED" (BATS EDGA, BATS EDGX, NASDAQ, NSX & NYSE ARCA)
20:04 - 20:11		Consolidated End of Day Summary Messages (3rd Iteration) Participant End of Day Summary Messages (3rd Iteration)
20:11 - 20:15		"Good Night Network A" "Good Night Network B"
20:15 – 20:17		End of Transmission**

**Dependent on when the "Good Night" Message is sent (i.e., approximately 20:11 - 20:15 ET).

Note: CTS Multicast Data Recipients are reminded that test data dissemination over CTS multicast data feeds can commence as early as **8:30 P.M. ET** and terminate as late as **3:25 A.M**. ET during business weekdays. This test period is accommodated to allow testing opportunities for Participants and Data Recipients, as well as to provide test time to rectify any production problems that may have occurred the prior business day. Multicast data feed recipients should take the necessary precautions to protect their systems against any adverse impact (e.g., database corruption) if processing data throughout the test dissemination period. During the test period, note that test data can be disseminated over all CTS multicast channels (e.g., Production, Retransmission or Playback Test Group IP addresses).

APPENDIX D: ADMINISTRATIVE MESSAGES TRANSMITTED

Administrative Message	Before Market Open	During Trading Hours	After Market Open	Anytime
Test Messages	X	X		
Emergency (sent as needed) – Opening Delayed Due to Storm or other emergency conditions (e.g., transit strikes)	X			
Special Exchange Closing (Thanksgiving/Emergency Situation)	X			
Trading Hour Changes (sent as needed)	X			
Market Open (sent daily)		X		
.5 Hourly and Hourly Index and Volume (sent daily)		X		
Index Corrections (sent as needed)		X		
Minutes of Silence (Veterans Day)		X		
Secondary / Complete Distribution (sent as needed)		X		
Special Bid and Special Offering (sent as needed)		X		
Stock XYZ will not open for trading today (sent as needed)		X		
Market Closed message (sent daily)			X	
Close (end of NYSE trading reporting) (sent daily)			X	
Crossing Session Summary messages (sent daily)			X	
Held Trade reports (sent daily)			X	

ADMINISTRATIVE MESSAGES TRANSMITTED, continued

Administrative Message	Before Market Open	During Trading Hours	After Market Open	Anytime
Held Trade reports (sent daily)			X	
Regional exchange volumes (sent as needed)			X	
Adjusted volumes (Regional Exchanges) (sent daily)			X	
NYSE 15/NYSE MKT Stock Market 10 Most Active Issues message (sent daily)			X	
Closing Prices (sent daily)			X	
Bid/Offer of issues that did not trade (sent daily)			X	
Prior Day Trade Reports and Prior Day Corrections (sent as needed)			X	
Daily Final index, weekly etc. summaries (sent every Friday) (Number of issues up, down and unchanged)			X	
NYSE Crossing Session Volume			X	
Crossing Session 2 - Shared Dollar Volume of NYSE trading and number of transactions (sent daily) (Adjusted NYSE Volume)			X	
Goodnight – date (sent daily)			X	
NYSE MKT Closing Reports (sent daily)			X	
NYSE MKT Stock and Bond Values (sent daily)			X	

APPENDIX E: ABBREVIATIONS FREQUENTLY USED IN ADMIN MESSAGES

ABBREVIATION	FULL WORD
- A -	
APPROX	APPROXIMATE
ADDL	ADDITIONAL
- B -	
BK	BACK
- C -	
CXL	CANCEL
C	CASH
CL	CALLED
CTS	CENTS
CHG	CHANGE
CV	CONVERTIBLE
CT	CERTIFICATE
- D -	
DLY	DELAYED
DISS	DISSEMINATION
DN	DOWN

ABBREVIATIONS FREQUENTLY USED IN ADMIN MESSAGES

ABBREVIATION	FULL WORD
- E -	
EFF	EFFECTIVE
ERR	ERROR
XDIS	EX-DISTRIBUTION
XD	EX-DIVIDEND
XRT	EX-RIGHTS
XINT	EX-INTEREST
- F -	
FINC	FINANCIAL
- H -	
HLT	HALTED
- I -	
IMB	IMBALANCE
IMMED	IMMEDIATELY
IDX	INDEX
IND	INDICATION
INDU	INDUSTRIALS

ABBREVIATIONS FREQUENTLY USED IN ADMIN MESSAGES

ABBREVIATION	FULL WORD
- M -	
MKT	MARKET
- N -	
N	NEW
ND	NEXT DAY
- O -	
OPN	OPEN
OPD	OPENED
OPG	OPENING
ODR	ORDER
- P -	
PND	PENDING
P/R	PREFERRED
PREV	PREVIOUS
- R -	
R/T	RIGHTS

ABBREVIATIONS FREQUENTLY USED IN ADMIN MESSAGES

ABBREVIATION	FULL WORD
- S -	
SLS	SALES
SLR	SELLER
SHRS	SHARES
SLD	SOLD
SLD.LAST	SOLD LAST
SP.OFF	SPECIAL OFFERING
SP	SPECIAL
SD	STAMPED
S/T	STOPPED STOCK
- T -	
TRDS	TRADES
TRD	TRADING
TRNS	TRANSACTIONS
TRAN	TRANSPORTATION

ABBREVIATIONS FREQUENTLY USED IN ADMIN MESSAGES

ABBREVIATION	FULL WORD
- U -	
UNCH	UNCHANGED
UTIL	UTILITY
- V -	
VOL	VOLUME
- W -	
WD	WHEN DISTRIBUTED
W I	WHEN ISSUED
WS	WARRANTS

APPENDIX F: ADMINISTRATIVE MESSAGE TEXT SAMPLES

ADMINISTRATIVE MESSAGE REPORTING VOLUME

yyyTODAY APPROXIMATE VOLUMES FOR TAPE etc ….$**zz**

NYSE MKT EMERGING COMPANY MARKET MESSAGES

yyyNYSE MKT.ECM.APPROXIMATE.VOLUME25.000**zz**

yyyNYSE MKT.ECM.FINAL.VOLUME25.500**zz**

CROSSING/AFTER HOURS SESSION MESSAGES

yyyNYSE..CROSSING.SESSION.I..SHARES261.400CROSSING
SESSION.II.NYSE.LISTED.STOCKS.DOLLAR.VALUE$100.000.00
AND.SHARES247.000**zz**

yyyNYSE MKT.AFTER.HOURS.TRADING.SESSION.STOCKS.VOLUME
25.000CUMULATIVE.DAILY.VOLUME13.039.790**zz**

yyyREGIONAL.CROSSING.SESSION.I..VOLUME..PHLX500SHARES.
BSE500..SHARES**zz**

NOTICE AFFECTING OPERATIONS OF AN EXCHANGE

yyyMARKET OPENING DELAYED BECAUSE OF STORM CONDITIONS NOTICE OF OPENING WILL BE GIVEN AT LEAST 15 MINUTES IN ADVANCE**zz**

ADMINISTRATIVE MESSAGE TEXT SAMPLES

STOCKS NOT AVAILABLE FOR NYSE CROSSING

yyyXYZ NOT AVAILABLE FOR NYSE CROSSING SESSION NEWS**zz**

MARKET VOLUME AND INDEX MESSAGE (NYSE)

yyy10.00 AM APPROX NYSE VOL STOCK1.400.000NYSE WS NONE MKT UP26CTS

NYSE IDX251.24UP1.90INDU299.37UP3.33TRAN245.20UNCH UTIL235.46UNCH FINC221.75UP0.01**zz**

NASDAQ OMX PSX VOLUME WEIGHTED AVERAGE PRICE MESSAGES

yyyPSX NETWORK A VOLUME WEIGHTED AVERAGE PRICE APPROX VOLUME0.000.000**zz**

yyyPSX NETWORK B VOLUME WEIGHTED AVERAGE PRICE APPROX VOLUME00.000**zz**

END OF TRADING DAY

yyyGOODNIGHT NETWORK A <MONTHDDYYYY>**zz**

yyyGOODNIGHT NETWORK B <MONTHDDYYYY>**zz**

ADMINISTRATIVE NOTIFICATION MESSAGE FOR REPORTING CTS DELAYS

STANDARD MESSAGE SENT UPON DETECTION OF DELAY

yyyALERT ALERT ALERT THE CONSOLIDATED TAPE SYSTEM IS EXPERIENCING A REPORTING DELAY STANDBY FOR FURTHER UPDATES AS INFORMATION BECOMES AVAILABLE**zz**

EXAMPLE OF UPDATE MESSAGE ON STATUS OF DELAY

yyyALERT ALERT ALERT THE CONSOLIDATED TAPE SYSTEM IS EXPERIENCING A REPORTING DELAY AFFECTING SYMBOLS M THROUGH ZZZ DUE TO A PROBLEM WITH SYMBOL XYZ REPORTING FOR ALL OTHER SYMBOLS IS NORMAL STANDBY FOR FURTHER UPDATES AS INFORMATION BECOMES AVAILABLE**zz**

STANDARD MESSAGE SENT UPON RETURN TO NORMAL REPORTING

yyyALERT ALERT ALERT THE CONSOLIDATED TAPE SYSTEM REPORTING IS NOW NORMAL**zz**

APPENDIX G: ALLOWABLE SYMBOL AND INDEX SUFFIXES FOR CTS*

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"
/DV	Accumulated dividend per share, net of expenses, through and including the previous day's close of trading.

Note: *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.

ALLOWABLE SYMBOL AND INDEX SUFFIXES FOR CTS*

SUFFIX	DESCRIPTION
- E -	
/EC	EMERGING COMPANY MARKETPLACE℠
/EU	Estimated cash amount for creation unit
- F -	
/F/N	Foreign News
- I -	
/ID	Index – differentiates an index from a security with the same root symbol
/IV	Intra-day Net Asset Value per share
- M -	
/MN	“Mini”
- N -	
/NV	Net Asset Value per share, as of the close on the previous trading day

Note: *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.

ALLOWABLE SYMBOL AND INDEX SUFFIXES FOR CTS*

SUFFIX	DESCRIPTION
- P -	
/PO	Percent Open
/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
p/CL	Preferred Called
p/CV	Preferred Convertible
p/CV/CL	Preferred Convertible Called

Note: *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.

ALLOWABLE SYMBOL AND INDEX SUFFIXES FOR CTS*

SUFFIX	DESCRIPTION
P	
p/WD	Preferred When Distributed
p/CA	Indicates Class A of a Second Category of Preferred Also could be B-K and M-S
- R -	
r	Rights
rw	Rights When Issued
- S -	
/SC	Small Corporate Offering Registration
/SD	Stamped
/SO	Current Shares (outstanding in thousands)
/SM	“Mini” Settlement
/SP	Special
/SV	Settlement

Note: *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.

ALLOWABLE SYMBOL AND INDEX SUFFIXES FOR CTS*

SUFFIX	DESCRIPTION
- T --	
/TC	Total cash amount per creation unit (in thousands)
/TEST	Exclusive suffix used for intraday test message
/TT	Tier II Securities
- U -	
/U	Units (A combination of securities composed of two or more of warrants, common stocks, preferred stocks and/or 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

Note: *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.

TEMPORARY SUFFIX REPRESENTATION

Temporary Suffix Representation	Description
XD	Ex-Dividend
XDIS	Ex-Distribution
Xr	Ex-Rights
N	New
XI	Ex-Interest

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.

APPENDIX H: TIMESTAMP CONVERSION TABLE
ASCII PRINTABLE CHARACTER ‘PRIOR DAY MESSAGES TIME’ CONVERSION TABLE

The Timestamp conversion table is used to represent the time reflected in the Timestamp field of the Message Header. The Time conversion table is also used to convert the ‘Prior Day Trade Time’ Hour/Minute/Second (HMS) in Prior Day Trade, Prior Day Correction and Prior Day Cancel/Error messages.

TIME	ASCII	DEC	Description
0	0	48	Zero
1	1	49	One
2	2	50	Two
3	3	51	Three
4	4	52	Four
5	5	53	Five
6	6	54	Six
7	7	55	Seven
8	8	56	Eight
9	9	57	Nine
10	:	58	Colon
11	;	59	Semicolon
12	<	60	Less than
13	=	61	Equals
14	>	62	Greater than
15	?	63	Question mark
16	@	64	At symbol
17	A	65	Uppercase A
18	B	66	Uppercase B
19	C	67	Uppercase C
20	D	68	Uppercase D
21	E	69	Uppercase E
22	F	70	Uppercase F
23	G	71	Uppercase G
24	H	72	Uppercase H
25	I	73	Uppercase I
26	J	74	Uppercase J
27	K	75	Uppercase K
28	L	76	Uppercase L
29	M	77	Uppercase M

TIME	ASCII	DEC	Description
30	N	78	Uppercase N
31	O	79	Uppercase O
32	P	80	Uppercase P
33	Q	81	Uppercase Q
34	R	82	Uppercase R
35	S	83	Uppercase S
36	T	84	Uppercase T
37	U	85	Uppercase U
38	V	86	Uppercase V
39	W	87	Uppercase W
40	X	88	Uppercase X
41	Y	89	Uppercase Y
42	Z	90	Uppercase Z
43	[	91	Opening bracket
44	\	92	Backslash
45	]	93	Closing bracket
46	^	94	Caret
47	_	95	Underscore
48	`	96	Grave accent
49	a	97	Lowercase a
50	b	98	Lowercase b
51	c	99	Lowercase c
52	d	100	Lowercase d
53	e	101	Lowercase e
54	f	102	Lowercase f
55	g	103	Lowercase g
56	h	104	Lowercase h
57	i	105	Lowercase i
58	j	106	Lowercase j
59	k	107	Lowercase k

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

ASCII	DEC	Description
	32	Space
!	33	Exclamation
"	34	Double quotes
#	35	Number
$	36	Dollar
%	37	Percent
&	38	Ampersand
‘	39	Single Quote
(	40	Open Parenthesis
)	41	Close Parenthesis
*	42	Asterisk
+	43	Plus
,	44	Comma
-	45	Hyphen
.	46	Period
/	47	Slash or Divide
0	48	Zero
1	49	One
2	50	Two
3	51	Three
4	52	Four
5	53	Five
6	54	Six
7	55	Seven
8	56	Eight
9	57	Nine
:	58	Colon
;	59	Semicolon

ASCII	DEC	Description
<	60	Less than
=	61	Equals
>	62	Greater than
?	63	Question mark
@	64	At symbol
A	65	Uppercase A
B	66	Uppercase B
C	67	Uppercase C
D	68	Uppercase D
E	69	Uppercase E
F	70	Uppercase F
G	71	Uppercase G
H	72	Uppercase H
I	73	Uppercase I
J	74	Uppercase J
K	75	Uppercase K
L	76	Uppercase L
M	77	Uppercase M
N	78	Uppercase N
O	79	Uppercase O
P	80	Uppercase P
Q	81	Uppercase Q
R	82	Uppercase R
S	83	Uppercase S
T	84	Uppercase T
U	85	Uppercase U
V	86	Uppercase V
W	87	Uppercase W

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

ASCII	DEC	Description
X	88	Uppercase X
Y	89	Uppercase Y
Z	90	Uppercase Z
[	91	Opening bracket
\	92	Backslash
]	93	Closing bracket
^	94	Caret
_	95	Underscore
`	96	Grave accent
a	97	Lowercase a
b	98	Lowercase b
c	99	Lowercase c
d	100	Lowercase d
e	101	Lowercase e
f	102	Lowercase f
g	103	Lowercase g
h	104	Lowercase h
i	105	Lowercase i
j	106	Lowercase j
k	107	Lowercase k
l	108	Lowercase l
m	109	Lowercase m
n	110	Lowercase n
o	111	Lowercase o
p	112	Lowercase p
q	113	Lowercase q
r	114	Lowercase r
s	115	Lowercase s
t	116	Lowercase t

<table>
<tr><th>ASCII</th><th>DEC</th><th>Description</th></tr>
<tr><td>u</td><td>117</td><td>Lowercase u</td></tr>
<tr><td>v</td><td>118</td><td>Lowercase v</td></tr>
<tr><td>w</td><td>119</td><td>Lowercase w</td></tr>
<tr><td>x</td><td>120</td><td>Lowercase x</td></tr>
<tr><td>y</td><td>121</td><td>Lowercase y</td></tr>
<tr><td>z</td><td>122</td><td>Lowercase z</td></tr>
<tr><td>{</td><td>123</td><td>Opening Brace</td></tr>
<tr><td>|</td><td>124</td><td>Vertical Bar</td></tr>
<tr><td>}</td><td>125</td><td>Closing Brace</td></tr>
<tr><td>~</td><td>126</td><td>Equivalency Sign-Tilde</td></tr>
</table>

APPENDIX J: CORRECTION/CANCEL/ERROR MESSAGES SAMPLES

Correction - Trade Price

EVENT	MESSAGE	SEQUENCE NUMBER	SEQUENCE NUMBER OF TRANSACTION BEING ADJUSTED	ORIGINAL PRICE	CORRECTED PRICE
1	TRADE	000011352		100	
2	TRADE	000011353		100 .13	
3	CORRECTION	000012684	000011352	100	100 .63

Correction to Correction - Trade Price

EVENT	MESSAGE	SEQUENCE NUMBER	SEQUENCE NUMBER OF TRANSACTION BEING ADJUSTED	ORIGINAL PRICE	CORRECTED PRICE
1	TRADE	000013598		100 .38	
2	CORRECTION	000014254	000013598	100 .38	100 .88
3	CORRECTION	000015477	000014254	100 .88	101 .13

Correction to Correction - Sale Condition

EVENT	MESSAGE	SEQUENCE NUMBER	SEQUENCE NUMBER OF TRANSACTION BEING ADJUSTED	ORIGINAL SALE CONDITION	CORRECTED SALE CONDITION
1	TRADE	000004211		REGULAR	
2	CORRECTION	000004649	000004211	REGULAR	SOLD
3	CORRECTION	000004650	000004649	SOLD	SOLD LAST

Note 1: Corrections are **not** applied to a cancelled or error trade. If a correction to a cancelled or error trade is required, the Participant will enter a new trade.

Note 2: Security Symbols are **not** corrected. If a trade is entered with a wrong Security Symbol, the trade is cancelled and a new trade entered by the Participant.