



SECURITIES INDUSTRY AUTOMATION CORPORATION

CTS

CONSOLIDATED TAPE SYSTEM

PARTICIPANT INPUT BINARY SPECIFICATION

**February 14, 2018
Version 1.6**

CONSOLIDATED TAPE SYSTEM (CTS)
PARTICIPANT INPUT BINARY SPECIFICATION

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VERSION HISTORY

Version	Date	Description
1.0	July 1, 2016	Initial Document
1.1	September 15, 2016	<p><u>Added:</u></p> <ul style="list-style-type: none"> New Dedicated Test Symbols: ATEST, NTEST & PTEST New Error Code 18 to denote 'Market Center Official Closing Price'
1.2	February 21, 2017	<p><u>Added:</u></p> <ul style="list-style-type: none"> 'Message Length' field in Message Header and field description. New 'Auction Status Category T Type A' message and field descriptions. New 'Auction Collar Price' and 'Number of Extension' Error Codes. New 'Upper Limit Price Band/Lower Limit Price Band' fields, field descriptions and Error Codes. 'Short Sale Restriction Indicator' to Correction Message. <p><u>Corrected:</u></p> <ul style="list-style-type: none"> T-Time representation to be represented in Seconds since Epoch. The implied 2 decimal (Short) maximum trade price to \$655.35. Trade Cancel/Error Message transposed appearance of 'Trade Reporting Facility ID' to be following 'Trade Through Exempt Indicator' field. <p><u>Eliminated:</u></p> <ul style="list-style-type: none"> Administrative Message 'Text Length' field (Length is identified in Message Header). Market Summary Messages/field descriptions/error codes which are no longer supported: <ul style="list-style-type: none"> Category M Types B, C & D Category M Types E, F & G Category M Types H, I & J 'Sale Condition' code '@' representing a 'Regular Sale' trade (replaced with 'Space' representing a 'Regular Sale' trade). Administrative Message 'Category A Type S' has been removed. Index Message 'Index Sign' fields and field descriptions as signed integer identifies positive/negative value. <p><u>Modified:</u></p> <ul style="list-style-type: none"> 'Block Pad Byte' description to include binary representation. Order of field appearances in Message Header. 'Reserved' field length in Message Header. Trade Correction Message 'Corrected Instrument Type' field to 'Instrument Type'. 'Sale Condition Category' field codes representation. Index Message usable Data Type representation. Prior Day Trade Correction 'Corrected Instrument Type' field to 'Instrument Type' and eliminated 'Original Instrument Type' field. Data Type 'Signed Integer' representation description. Minor edits/clarification throughout document/removed verbiage associated with eliminated functionality. Binary and ASCII Protocol Differences and Notes.

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Version	Date	Description
1.3	May 5, 2017	<u>Added:</u> <ul style="list-style-type: none">▪ CBOE Stock Exchange, Inc. (CBSX) Participant ID ‘W’
1.4	June 2, 2017	<u>Added:</u> <ul style="list-style-type: none">▪ New Dedicated Test Symbols: ZIEXT, ZEXIT, ZXIET & 01V thru 12V
1.5	August 28, 2017	<u>Modified:</u> <ul style="list-style-type: none">▪ Block Sequence Number rollover limited to occur after 999,999,999 (instead of 3,999,999,999) for a transitional period▪ From: NYSE MKT / To: NYSE American
1.6	February 14, 2018	<u>Modified:</u> <ul style="list-style-type: none">▪ From: National Stock Exchange / To: NYSE National, Inc.▪ From: Bats EDGA Exchange / To: Cboe EDGA Exchange▪ From: Bats EDGX Exchange / To: Cboe EDGX Exchange▪ From: Bats BYX Exchange / To: Cboe BYX Exchange▪ From: Bats BZX Exchange / To: Cboe BZX Exchange▪ IEX status to Primary Listing Exchange▪ Halt Reason value ‘X’ From: Equipment Changeover / To: Operational▪ Description of Auction Status message <u>Added:</u> <ul style="list-style-type: none">▪ Participant Reference Number requirements previously published in FAQ’S version 1.1, August 24, 2017 https://www.ctaplan.com/tech-specs for easy reference

1.0 INTRODUCTION

The Securities Industry Automation Corporation (SIAC) serves 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).

1.1 Background

CTS receives transactions generated by participating U.S. Stock Exchanges and the Financial Industry Regulatory Authority (FINRA). In addition, CTS calculates and identifies the Consolidated Last, High and Low, the Participant Open, Last, High and Low and the Limit Up-Limit Down Price Bands. CTS consolidates transactions that occurred on participating U.S. Stock Exchanges and FINRA and disseminates this information via computer-to-computer linkages to the financial community in the U.S. and abroad.

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

Note:

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

1.2 Dual Site Redundancy

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

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

1.3 Scope

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

1.4 Data Feed Reference Material

Technical Specifications

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

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

Consolidated Tape Association (CTA) Announcements

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

Future Data Feed Enhancements

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

Data Feed Related Resources

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

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

2.0 GENERAL DESIGN OF DATA DISTRIBUTION NETWORK

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

2.1 TCP/IP Interface Requirements

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

2.2 TCP/IP Dynamic Input Throttling

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

3.0 CTS INTERFACE METHOD

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

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

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

Once a Participant establishes a connection, SIAC recommends that the Participant system, prior to transmitting data, generate a Sequence Information and Message Count Inquiry message to obtain the last Block Sequence Number obtained by CTS. If there is a discrepancy between the Block Sequence Number the Participant system is ready to send, and the Block Sequence Number CTS is ready to receive, the Participant system should re-send the messages in question, before generating any new messages. If a Participant is unable to utilize the Sequence Information and Message Count Inquiry method, SIAC recommends an alternative method. The Participant system, prior to sending data, should re-send a few blocks of data sent prior to disconnect. CTS will reject those messages it has already processed (due to a lower than expected Block Sequence Number) and process those it has not received.

3.1 General Design Considerations

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

4.0 TRANSMISSION CHARACTERISTICS

4.1 Data Transmission

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

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

A Participant is required to send a Block Separator which will be used to determine the start of the CTS Binary Block. It is the Participant's responsibility to create the correct CTS Binary Block structure. Incorrect Block Structure information (e.g., Block Separator, Block Header, optional Block Pad, etc.) will result in lost messages or blocks being rejected back to a Participant. An invalid Block Separator will cause a drop of all data received up until a valid Block Separator is found.

In the case of an incorrectly formatted Block, the CTS system will search for the next Block Separator before it will resume processing. To ensure that the Block Separator bytes are not, in fact, actual data within the Block, CTS will additionally check for a valid Block structure and the next Block Separator at the correct position given by the Block Size before considering the Block valid.

4.2 Block Separator

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

4.3 Binary Block Structure

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

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

4.4 Block Data

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

The Block Data structure is as follows:

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

#### 4.5 Block Pad Byte

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

#### 4.6 Data Type

The following data types are used by CTS:

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

#### 4.6.1 Numeric Types

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

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

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

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

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

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

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

#### 4.7 Block Header

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

#### 4.7.1 Version

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

#### 4.7.2 Block Size

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

#### 4.7.3 Block Sequence Number

**Integer.** All transmission blocks are assigned a sequential Block Sequence Number. When the Block Sequence Number reaches 999,999,999, the next expected value is 0000000000 (a future enhancement will increase the number to 3,999,999,999). . On a per line basis, the Block Sequence Number on the lines are set to zero at the start of each day, and incremented by one each time a Block is transmitted, with the following conditions:

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

#### 4.7.4 Messages in Block

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

#### 4.7.5 Block Checksum

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

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## 5.0 MESSAGE HEADER

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

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

### 5.1 Message Length

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

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## 5.2 Message Category and Message Type Table

Message Category	Message Type	Message Source*	Value
<b>Administrative</b>			
A	H	Part. & CTS	Administrative Unformatted (free form text)
A	R	CTS	Rejection
A	W	CTS	Warning
<b>Control</b>			
C	A	CTS	Start of Day
C	I	Participant	Sequence Information and Message Count Inquiry
C	N	CTS	Sequence Information and Message Count Response
C	T	Part. & CTS	Line Integrity
C	Z	CTS	End of Day
C	5	Part. & CTS	Test
<b>Index</b>			
I	I	Participant	Index
I	Q	Participant	Bid and Offer Index
<b>Market Status</b>			
M	O	Participant	Approximate Trades and Total Dollar Value
M	P	Participant	Crossing Session Summary
<b>Prior Day</b>			
P	C	Participant	Prior Day Trade Correction
P	T	Participant	Prior Day Trade
P	X	Participant	Prior Day Trade Cancel/Error
<b>Trade</b>			
T	A	Participant	Auction Status
T	C	Participant	Trade Correction
T	L	Participant	Long Trade
T	S	Part. & CTS	Trading Status
T	T	Participant	Short Trade
T	X	Participant	Trade Cancel/Error

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

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### 5.2.1 Message Category

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

### 5.2.2 Message Type

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

### 5.3 Participant ID

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

Code	Value
A	NYSE American, LLC (NYSE American)
B	NASDAQ OMX BX, Inc. (NASDAQ OMX BX)
C	NYSE National, Inc. (NYSE National)
D	Financial Industry Regulatory Authority, Inc. (FINRA)
I	International Securities Exchange, LLC (ISE)
J	Cboe EDGA Exchange, Inc. (Cboe EDGA)
K	Cboe EDGX Exchange, Inc. (Cboe EDGX)
M	Chicago Stock Exchange, Inc. (CHX)
N	New York Stock Exchange, LLC (NYSE)
P	NYSE Arca, Inc. (NYSE Arca)
S	Consolidated Tape System (CTS)
T	NASDAQ Stock Market, LLC (NASDAQ)
V	Investors' Exchange, LLC. (IEX)
W	CBOE Stock Exchange, Inc. (CBSX)
X	NASDAQ OMX PSX, Inc. (NASDAQ OMX PSX)
Y	Cboe BYX Exchange, Inc. (Cboe BYX)
Z	Cboe BZX Exchange, Inc. (Cboe BZX)



## 5.4 Timestamp 1

**2 x Integer (pair of integers).** Timestamp 1 is a Participant-provided timestamp representing the number of nanoseconds since Epoch. The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315). If Timestamp 1 is not provided, this field should be set to zero. For any messages generated by CTS, e.g., Messages generated on behalf of a Participant, Price Band messages, Administrative messages, Control messages and Market Status messages, the Timestamp 1 field will be set to zero.

- **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 nanoseconds since Epoch.
- **If from the FINRA Alternative Display Facility (ADF) 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 provide such times to the Processor in terms of nanoseconds since Epoch.

## 5.5 Participant Reference Number

**Signed Long.** Set to Zero. The Participant Reference Number must be unique by Participant ID, by Trade Reporting Facility (TRF), and by Security Symbol for trade corrections, cancel and errors. A Participant Reference Number must be increasing (not necessarily in sequential order, e.g., different symbols, ABC and XYZ may have the same Participant Reference Number over different lines, however symbol 'ABC' with Participant Reference Number '123456' on line 1 cannot be repeated over any other line, duplications will be rejected. Only zero and positive Participant Reference Numbers are allowed (negative Participant Reference Numbers will be rejected).

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

RRN/PRN Input Example:

**ASCII RRN:**

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

**New Binary PRN:**

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

PRN Validation:

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

## **5.6 Message ID**

**Byte.** The Message ID identifies the individual message within the block beginning with number one (1).

## **5.7 Reserved**

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

## 6.0 MESSAGE FORMATS

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

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

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

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

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## 6.1 Administrative Unformatted (free form text) Messages – Category A

The Administrative Unformatted (free form text) Category A message is designed to facilitate non-computerized miscellaneous information messages to CTS from a Participant or from CTS to a Participant. The text section of the Administrative message is transmitted in free format (printable ASCII characters only).

### 6.1.1 Administrative Unformatted (free form text) – Category A Type H

**Varchar [maximum 900].** The Administrative Unformatted (free form text) message is used to provide administrative informational messages. The length of the free form text **cannot** exceed 900 characters. The Administrative Unformatted message is disseminated over the CTS Multicast feed in the same format as it is received from a Participant.

The Administrative Unformatted (free form text) message is also used to report Market Activity (e.g., Volume and Index related activity) to CTS. Administrative messages are disseminated over the CTS Multicast feed in the same format as it is received from a Participant.

Field Name	Length	Type	Value
Text	Maximum 900	Varchar [ ]	Free Form administrative informational message text
<b>Total Length</b>	<b>Maximum 900</b>		

**Note:**

- Administrative messages will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).

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### 6.1.2 Rejection – Category A Type R

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

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

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

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### 6.1.3 Warning – Category A Type W

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

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

## 6.2 Control Messages – Category C

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

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

Only one Control message is transmitted in a block and no other messages appear in that block.

**Note:**

- Control messages will be accepted and processed by CTS if received **before** the Participant Start of Day.

### A. Control Messages Consisting of Message Header Only

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

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

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

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

The Start of Day message consists of the **Message Header only** and is sent by CTS to a Participant to indicate CTS' readiness to accept data transmission from the Participant to which the message is transmitted. A Participant should not initiate data transfer with CTS until receipt of this message. However, a Participant may transmit Administrative messages, Control, Index, Trading Status, trades with conditions T or U, Prior Day Trades, Prior Day Corrections, Prior Day Cancel/Errors, Correction and Cancel messages to CTS **before** the Start of Day message has been initiated. Messages other than the above exceptions received by CTS before the Start of Day message has been transmitted will be rejected.

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

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

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

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

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

**Note:**

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



#### 6.2.4 Line Integrity Participant to CTS / CTS to Participant – Category C Type T

##### Line Integrity Participant to CTS:

The **Participant to CTS** Category C Type T Line Integrity message consists of the **Message Header only** and is for optional use by a Participant. Line Integrity messages may be generated by a Participant to CTS at set intervals selected by a Participant (interval is configurable on a per exchange basis, e.g., Participant ‘A’ could be configured for 10 second wait intervals, while Participant ‘B’ could be configured for 20 second wait intervals, etc.). The interval selected by a Participant will be used across all their input lines to provide verification of input line integrity either on a primary or backup input line. A Participant is required to input Category C Type T messages every 5 seconds regardless of the threshold interval utilized by the Participant once connection is established. If a Participant does not input Category C Type T messages or data to CTS within the Participants’ configured wait interval, CTS will assume an issue exists and will break the connection on the Participants’ connected input line. This will allow the Participant to reconnect to their primary or backup input line (e.g., a connection should be made to the backup input line if the disconnect was made to the primary, and conversely, a connection should be made to the primary input line if the disconnect was made to the backup input line).

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

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

##### Line Integrity CTS to Participant:

The **CTS to Participant** Category C Type T Line Integrity message consists of the **Message Header only** and is generated by CTS to each Participant at 1-minute intervals. A Participant can commence sending Line Integrity messages to CTS once the Participants’ lines have been started, the Participant has established connections and a Start of Day has been sent to the Participant. Its primary function is to provide verification of line integrity during periods of inactivity. However, this message is also sent during periods of activity.

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

##### Note:

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

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### 6.2.5 End of Day – Category C Type Z

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

### 6.2.6 Test – Category C Type 5

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

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

### 6.3 Index Messages – Category I

Index messages are used to provide index value information of a security.

#### 6.3.1 Index – Category I Type I

The Index message contains the index and the index value.

Field Name	Length	Type
Index Symbol	11	Char [ ]
Index Value	8	Signed Long
<b>Total Length</b>	<b>19</b>	

**Note:**

- Index messages will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).

#### 6.3.2 Category I Type Q – Bid and Offer Index

The Bid and Offer Index message contains the Bid and Offer index values.

Field Name	Length	Type
Index Symbol	11	Char [ ]
Bid Index Value	8	Signed Long
Offer Index Value	8	Signed Long
<b>Total Length</b>	<b>27</b>	

**Note:**

- Bid and Offer Index messages will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).

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## 6.4 Market Status Messages – Category M

Market Status messages are used to provide market data information.

Unless otherwise noted, detailed information on each field is contained in alphabetical order in the **Field Descriptions** section of this document.

### 6.4.1 Approximate Trades and Total Dollar Value – Category M Type O

The Approximate Trades and Total Dollar Value message allows a Participant to report the total trades and total dollar value of trades at their respective market centers. A Participant is required to utilize all fields in the Approximate Total Trades and Dollar Value message.

Field Name	Length	Type
Total Trades	4	Integer
Dollar Value	8	Long
<b>Total Length</b>	<b>12</b>	

### 6.4.2 Crossing Session – Category M Type P

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

Field Name	Length	Type
Crossing Session I Total Trades Volume	8	Long
Crossing Session II Dollar Value	8	Long
Crossing Session II Total Trades Volume	8	Long
<b>Total Length</b>	<b>24</b>	

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## 6.5 Prior Day Messages – Category P

Prior Day messages are used to report CTA eligible Equity, Local Issue or Bond trades, corrections, cancels or errors for transactions that occurred **earlier than the current trading day** and had not been reported. Trade Reporting Facility ID is restricted to CTA eligible Equity transactions.

**Note:**

- Prior Day Trade Correction messages will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).

### 6.5.1 Prior Day Trade Correction – Category P Type C

The Prior Day Trade Correction message is used to correct a transaction originally reported earlier than the current day. Corrections to current day transactions are reported using the Trade Correction message Category 'T' Type 'C'. Participants must provide the original trade information for the message to be accepted by CTS.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Corrected Sale Condition	4	Char [ ]
Corrected Trade Price	8	Long
Corrected Trade Volume	4	Integer
Corrected Seller's Sale Days	1	Byte
Corrected Stop Stock Indicator	1	Char
Corrected Trade Through Exempt Indicator	1	Char
Corrected Short Sale Restriction Indicator	1	Char
Corrected Prior Day Trade Date and Time	8	2 x Integer
Trade Reporting Facility ID	1	Char
Original Sale Condition	4	Char [ ]
Original Trade Price	8	Long
Original Trade Volume	4	Integer
Original Seller's Sale Days	1	Byte
Original Stop Stock Indicator	1	Char
Original Trade Through Exempt Indicator	1	Char
Original Short Sale Restriction Indicator	1	Char
Original Prior Day Trade Date and Time	8	2 x Integer
<b>Total Length</b>	<b>69</b>	

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### 6.5.2 Prior Day Trade– Category P Type T

The Prior Day Trade message is used to report a CTA eligible Equity, Local Issue or Bond transaction which occurred **earlier than the current trading day** and was not reported.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Trade Volume	4	Integer
Seller's Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Prior Day Trade Date and Time	8	2 x Integer
<b>Total Length</b>	<b>41</b>	

**Note:**

- Prior Day Trade messages will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).

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### 6.5.3 Prior Day Trade Cancel/Error – Category P Type X

The Prior Day Trade Cancel/Error message is used for CTA eligible Equity, Local Issue or Bond information to 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. This message format is strictly used to cancel/error a trade or correction originally reported earlier than the current day using the Prior Day Long Trade message or Prior Day Trade Correction message formats. Cancel/Errors to current day transactions are reported using the Cancel/Error message, Category 'T' Type 'X'. Participants must provide the original trade information for the message to be accepted by CTS.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Trade Volume	4	Integer
Seller's Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Prior Day Trade Date and Time	8	2 x Integer
Cancel/Error Action	1	Char
<b>Total Length</b>	<b>42</b>	

**Note:**

- Prior Day Trade Cancel/Error messages will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).

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## 6.6 Trade Messages – Category T

Trade messages are used to report CTA eligible Equity, Local Issue or Bond information. Trade messages allow for automated corrections, cancellations or errors of trade reports (originally reported using fixed message formats), reporting Opening Delays, Trading Halts, Resumes, Indications, Imbalances, and T-Times.

### 6.6.1 Auction Status – Category T Type A

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

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



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### 6.6.2 Trade Correction – Category T Type C

The Trade Correction message is used to correct CTA eligible Equity, Local Issue or Bond information. A Participant Reference Number must be assigned to the original transaction that is to be corrected. The Participant Reference Number of trade being corrected must be unique by Participant ID, by Trade Reporting Facility (TRF) and by Security Symbol and by Participant Regional Reference Number.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Corrected Sale Condition	4	Char [ ]
Corrected Trade Price	8	Long
Corrected Trade Volume	4	Integer
Corrected Seller's Sale Days	1	Byte
Corrected Stock Stop Indicator	1	Char
Corrected Trade Through Exempt Indicator	1	Char
Corrected Short Sale Restriction Indicator	1	Char
Trade Reporting Facility ID	1	Char
Timestamp 2	8	2 x Integer
Original Participant Reference Number (of original transaction being corrected)	8	Signed Long
<b>Total Length</b>	<b>49</b>	

**Note:**

- To identify a transaction being corrected, the Participant Reference Number assigned to the original trade, or if the original trade has already been corrected, the Participant Reference Number of the most recent correction to the trade, is to be reflected in the Participant Reference Number field of the Correction Message body. Trades which have been previously cancelled or errored, cannot be corrected.
- Trade Correction messages will be accepted and processed by CTS if received ***before*** the Participant Start of Day (SOD).

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### 6.6.3 Long Trade – Category T Type L

The Long Trade message is used to report trade information for CTA eligible Equity, Local Issue or Bonds.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Sale Condition	4	Char [ ]
Trade Price	8	Long
Trade Volume	4	Integer
Seller's Sale Days	1	Byte
Stop Stock Indicator	1	Char
Trade Through Exempt Indicator	1	Char
Trade Reporting Facility ID	1	Char
Timestamp 2	8	2 x Integer
<b>Total Length</b>	<b>40</b>	

Note:

- Long Trade messages with Sale Conditions 'U' and 'T' will be accepted and processed by CTS if received before the Participant Start of Day (SOD).

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#### 6.6.4 Trading Status – Category T Type S

The Trading Status message allows a Participant that is the listing exchange for CTA eligible Equity, Local Issue or Bond information which is included in the CTS database to notify CTS of Opening Delays, Trading Halts, Resumes, Indications, Imbalances, Limit Up-Limit Down Quote Midpoints, and T-Times. A non-listing exchange can enter a trading range indication if the stock is **not** halted; and a price indication if it **is** halted for either a regulatory or non-regulatory reason.

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

**Note:**

- Trading Status messages will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).
- The Trading Status message is applicable to the Listing Exchange of the issue designated by the symbol in **SECURITY SYMBOL** field. Only certain Trading Status messages received from non-Listing Exchanges are accepted: 1) if a stock is not halted, only Trading Range Indications are accepted; 2) if a stock is halted, only Price Indications are accepted. All other Trading Status messages from non-Listing Markets are rejected back to the Participant.
- ‘Limit Up-Limit Down’ is not applicable to Local Issues or Bonds.
- The Last Price/Opening (Reopening) Quote Midpoint Price field will be **rejected back to a Participant** to denote an ‘**Invalid Midpoint Quote**’ as follows:
  - A valid Trading Status Message is received containing an invalid ‘Quote Midpoint’ value (e.g., alpha vs. numeric).
  - An eligible trade was received from the listing exchange prior to the ‘Quote Midpoint’ value.

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### 6.6.5 Short Trade – Category T Type T

The Short Trade message is used to report trade information for **CTA eligible Equity** only (not used for Local Issues or Bonds).

Field Name	Length	Type
Security Symbol	5	Char [ ]
Sale Condition	1	Char
Sale Condition Category	1	Char
Trade Price	2	Short
Trade Volume	2	Short
Reserved	3	TBD
<b>Total Length</b>	<b>14</b>	

**Note:**

- Short Trade messages with Sale Conditions ‘U’ or ‘T’ will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).

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### 6.6.6 Trade Cancel/Error – Category T Type X

The Trade Cancel/Error message allows a Participant to perform automated cancellations or errors of trade reports for CTA eligible Equity, Local Issue or Bond information which were originally reported using a fixed message format. A Participant Reference Number must be assigned to the original transaction that is to be corrected. The Participant Reference Number of trade being corrected must be unique by Participant ID, by Trade Reporting Facility (TRF), by Security Symbol and by Participant Regional Reference Number.

Field Name	Length	Type
Security Symbol	11	Char [ ]
Instrument Type	1	Char
Trade Through Exempt Indicator	1	Char
Trade Reporting Facility ID	1	Char
Original Participant Reference Number <i>(of Original Transaction being cancelled or errored)</i>	8	Signed Long
Timestamp 2	8	2 x Integer
Cancel/Error Action	1	Char
<b>Total Length</b>	<b>31</b>	

**Note:**

- To identify a transaction being adjusted, the Participant Reference Number assigned to the original trade, or if the original trade has already been corrected, the Participant Reference Number of the most recent correction to the trade is to be reflected in the Participant Reference Number field of the Correction Message body. **Trades which have been cancelled or errored cannot be corrected.**
- Trade Cancel/Error messages will be accepted and processed by CTS if received **before** the Participant Start of Day (SOD).

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## 7.0 FIELD DESCRIPTIONS

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

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**FIELD DESCRIPTIONS**

Field Name	Length	Description						
Bid Index Value	8	<p>Signed Long. Bid Index Value represents an <u>index value (i.e., not a price) and has implied 6 decimal places</u> and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807.</p> <p>The Bid Index Value represents the value of the index’s calculation formula using the current Bid values of the component securities.</p> <p><b>Note:</b> For Government Bonds, the Bid Index Value could reflect a value that is greater than the Offer Index Value.</p>						
Buy Volume	4	<p>Integer. Integer has a maximum volume of 4,294,967,295. Optional set to zero.</p> <p>The Buy Volume represents the reported imbalance of buy orders without matching sell orders for the security for a Participant.</p>						
Cancel/Error Action	1	<p>Char.</p> <p>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).</p> <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>	Code	Value	1	Cancel	2	Error
Code	Value							
1	Cancel							
2	Error							
Closing Bid Price	8	<p>Long. Long have implied 6 decimal places a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Closing Bid Price represents the last qualifying quote for a security by a Participant during the trading day.</p>						

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Closing Offer Price	8	Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.  The Closing Offer Price represents the last qualifying quote for a security by a Participant during the trading day.
Corrected ( <i>followed by</i> 'NAME OF FIELD')	Variable	Refer to the field name following the word 'Corrected' for field description. A field defined as 'Corrected' represents the specific field(s) possible new value for a trade that has been corrected.
Crossing Session I Total Trades Volume	8	Long. Long have a maximum volume of 184,467,440,737,095,516. Optional set to zero.  Contains the number of shares traded at the Participant's close price and taking place after the close of a Participant's regular session.
Crossing Session II Dollar Value	8	Long. Long have implied 6 decimal places and a maximum value of \$18,446,744,073,709.551615. Optional set to zero.  Contains the Dollar Value traded after the close of a Participant's regular session.
Crossing Session II Total Trades Volume	8	Long. Long have a maximum volume of 184,467,440,737,095,516. Optional set to zero.  Contains the number of shares traded after the close of a Participant's regular session. Crossing Session II is designed to facilitate trading between member firms. Trades from the NYSE are executed at the aggregate price reported by member firms. Trades from the NYSE American Stock Market are executed at the close price of the NYSE American Stock Market.
Dollar Value	8	Long. Long have implied 6 decimal places and a maximum value of \$18,446,744,073,709.551615. Optional set to zero.  The Dollar Value represents the total dollar worth of the daily trade transactions.



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**FIELD DESCRIPTIONS**

Field Name	Length	Description																																												
Halt Reason	1	<div>Char.</div> <div>Denotes the reason for the Opening Delay or Trading Halt.</div> <table><tr><th>Code</th><th>Value</th><th>Regulatory</th><th>Non Regulatory</th></tr><tr><td>Space</td><td>Halt Reason Not Applicable</td><td></td><td></td></tr><tr><td>D</td><td>News Dissemination</td><td>X</td><td></td></tr><tr><td>I</td><td>Order Imbalance</td><td></td><td>X</td></tr><tr><td>M</td><td>Limit Up-Limit Down (LULD) Trading Pause</td><td>X</td><td></td></tr><tr><td>P</td><td>News Pending</td><td>X</td><td></td></tr><tr><td>X</td><td>Operational</td><td></td><td>X</td></tr><tr><td>Y</td><td>Sub-Penny Trading</td><td></td><td>X</td></tr><tr><td>1</td><td>Market-Wide Circuit Breaker Level 1 – Breached</td><td>X</td><td></td></tr><tr><td>2</td><td>Market-Wide Circuit Breaker Level 2 – Breached</td><td>X</td><td></td></tr><tr><td>3</td><td>Market-Wide Circuit Breaker Level 3 – Breached</td><td>X</td><td></td></tr></table>	Code	Value	Regulatory	Non Regulatory	Space	Halt Reason Not Applicable			D	News Dissemination	X		I	Order Imbalance		X	M	Limit Up-Limit Down (LULD) Trading Pause	X		P	News Pending	X		X	Operational		X	Y	Sub-Penny Trading		X	1	Market-Wide Circuit Breaker Level 1 – Breached	X		2	Market-Wide Circuit Breaker Level 2 – Breached	X		3	Market-Wide Circuit Breaker Level 3 – Breached	X	
Code	Value	Regulatory	Non Regulatory																																											
Space	Halt Reason Not Applicable																																													
D	News Dissemination	X																																												
I	Order Imbalance		X																																											
M	Limit Up-Limit Down (LULD) Trading Pause	X																																												
P	News Pending	X																																												
X	Operational		X																																											
Y	Sub-Penny Trading		X																																											
1	Market-Wide Circuit Breaker Level 1 – Breached	X																																												
2	Market-Wide Circuit Breaker Level 2 – Breached	X																																												
3	Market-Wide Circuit Breaker Level 3 – Breached	X																																												

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
High Indication Price / Upper Limit Price Band	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The High Indication Price represents an approximation of what the high end 'Offer' price of a security's trading range may be. It is used for a security that is not Opening Delayed or Trading Halted, i.e., Trading Range Indication or following an Opening Delay or a Trading Halt, i.e., Price Indication.</p> <p><b>Note:</b> For Government Bonds, the High Indication Price (i.e., Bid) could reflect a value that is greater than the Low Indication Price (i.e., Offer).</p> <p>The <b>Upper Limit Price Band</b> represents the Listing Exchange's last effective LULD Price Band Price that triggered the preceding Limit State that led to the LULD Trading Pause. Used in conjunction with the 'Security Status' field set to 'Trading Halt' and the 'Halt Reason' field set to 'Limit-Up-Limit Down (LULD) Trading Pause'. If Upper Limit Price Band is non-zero, the Lower Limit Price Band is zero.</p>
High Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The High Price represents the highest price paid for a security during the trading day.</p> <p><b>Note:</b> 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 set to zero.</p>
Index Symbol	11	<p>Char [11]. Left justified, space-filled.</p> <p>Contains the Index symbol.</p>
Index Value	8	<p>Signed Long. Index Value represents an <u>index value (i.e., not a price)</u> and has implied 6 decimal places and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807.</p> <p>The Index Value represents a statistical composite that measures changes in the economy or in financial markets.</p>

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

## FIELD DESCRIPTIONS

Field Name	Length	Description										
Instrument Type	1	<p>Char.</p> <p>Identifies the instrument type relevant to the trade.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>CTA Eligible Equity</td></tr><tr><td>1</td><td>Local Issue</td></tr><tr><td>2</td><td>Corporate Bond</td></tr><tr><td>3</td><td>Government Bond</td></tr></table>	Code	Value	0	CTA Eligible Equity	1	Local Issue	2	Corporate Bond	3	Government Bond
Code	Value											
0	CTA Eligible Equity											
1	Local Issue											
2	Corporate Bond											
3	Government Bond											
Last Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Last Price represents the last price for that security either on a Consolidated or an individual Participant basis at the time it is disseminated.</p> <p><b>Note 1:</b> For Trading Status Information, the Last Price is provided when the Security Status is either an Opening Delay, Trading Halt, Price Indication or Trading Range Indication.</p> <p><b>Note 2:</b> In instances when no trades qualify to be included in the ‘Last’ 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, Last Price is set to zero.</p>										
Last Price / Opening (Reopening) Quote Midpoint	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Last Price represents the last price for that security either on a Consolidated or an individual Participant basis at the time it is disseminated.</p> <p><b>Opening (Reopening) Quote Midpoint:</b> The Opening (Reopening) Quote Midpoint represents a listing exchange’s midpoint of a quote and is used when the listing exchange is Opening (Reopening) with a quote midpoint instead of a trade. Used in conjunction with ‘Security Status’ field code set to Limit Up-Limit Down Quote Midpoint, with the Opening (Reopening) Quote Midpoint value contained in the Last Price/Opening (Reopening) Quote Midpoint field.</p>										

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Low Indication Price / Lower Limit Price Band	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The <b>Low Indication Price</b> represents an approximation of what the low end "Bid" price of a security's trading range may be. It is used for a security that is not Opening Delayed or Trading Halted, i.e., Trading Range Indication or following an Opening Delay or a Trading Halt, i.e., Price Indication.</p> <p><b>Note:</b> For Government Bonds, the High Indication Price (i.e., Bid) could reflect a value that is greater than the Low Indication Price (i.e., Offer).</p> <p>The <b>Lower Limit Price Band</b> represents the Listing Exchange's last effective LULD Price Band Price that triggered the preceding Limit State that led to the LULD Trading Pause. Used in conjunction with the 'Security Status' field set to 'Trading Halt' and the 'Halt Reason' field set to 'Limit-Up-Limit Down (LULD) Trading Pause'. If Lower Limit Price Band is non-zero, the Upper Limit Price Band is zero.</p>
Low Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Low Price represents the lowest price paid for a security during the trading day.</p> <p><b>Note:</b> 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 set to zero.</p>
Number of Extensions	1	<p>Byte. Optional set to zero.</p> <p>Identifies the number of manual or automatic extensions the applicable auction has received.</p>
Offer Index Value	8	<p>Signed Long. Offer Index Value represents an <u>index value (i.e., not a price)</u> and has <u>implied 6 decimal places</u> and a maximum value of -9,223,372,036,854.775808 to +9,223,372,036,854.775807.</p> <p>Represents the value of the index's calculation formula using the current offer values of the component securities.</p> <p><b>Note:</b> For Government Bonds, the Bid Index Value could reflect a value that is greater than the Offer Index Value.</p>

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Open Price	8	<p>Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Open Price represents the first qualifying price paid for a security during the trading day.</p> <p><b>Note:</b> 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 set to zero.</p>
Original (followed by 'NAME OF FIELD')	Variable	<p>Refer to the field name following the word 'Original' for field description. In messages containing two sets of identical fields, one set of fields is used to denote the original trade detail when it was executed and the other set of fields is to denote the corrected field(s) originally reported incorrectly.</p>
Participant Reference Number (of trade being corrected or cancelled or errored)	8	<p>Signed Long. Set to Zero.</p> <p>Contains the Participant Reference Number of transaction to be corrected, cancelled or errored.</p> <p>The Participant Reference Number must correspond to the Participant Reference number in the Message Header of the transaction being corrected, cancelled or errored. If the trade has already been corrected, the Participant Reference Number of the most recent correction to the trade is required. Corrections, Cancels or Errors entered for trades which have already been canceled or errored will be rejected back to the Participant.</p>
Prior Day Trade Date and Time	8	<p>2 x Integer (pair of Integers). Optional set to zero.</p> <p>The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315).</p> <p>Represents the date and time the prior day trade was executed. In the Prior Day Correction messages, there are two Prior Day Trade Dates and Time, one to denote the date and time the original trade was executed as reported in a Prior Day Trade and one to denote the corrected date and time of trade execution. In the Prior Day Cancel/Error messages, the date and time denotes the reported execution date of the original trade being cancelled or reported in error.</p>

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description					
Sale Condition	1 or 4	Char. or Char [4].  Denotes the sale condition associated with a trade. Also noted is the impact of Sale Conditions on the Open, Last, High and Low calculations both on a Consolidated and Participant basis.					
		CONSOLIDATED Update		PARTICIPANT Update			VOLUME Update
CODE	SALE CONDITION	LAST	HIGH/LOW	OPEN	LAST	HIGH/LOW	
Space	Regular Sale	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	Inter-market 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) <i>or</i> Rule 155 (NYSE American 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

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

**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., **Notes #1, #2, #3 and #4**) in the above calculation chart and are described below:

**‘OPEN’, ‘LAST’, ‘HIGH’, ‘LOW’ CALCULATIONS**

<b>Note 1</b>	<b>YES</b> , if it is the only qualifying last; <b>OR</b> If it is that Participant's first qualifying last; <b>OTHERWISE NO</b>
<b>Note 2</b>	<b>YES</b> , if it is the only qualifying last; <b>OTHERWISE NO</b>
<b>Note 3</b>	<b>YES</b> , if it is the only qualifying last; <b>OR</b> If it is from the same participant as the last; <b>OR</b> If it is from the LISTING MARKET for that Security; <b>OTHERWISE NO</b>
<b>Note 4</b>	<b>YES</b> , if it is the first qualifying or only qualifying trade of the day; <b>OTHERWISE <u>NO</u>.</b>  (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., above **Notes #1, #2, #3 and #4**) the trade qualifies, the ‘Note Criteria’ takes precedence and the trade **will** be included in the calculations.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description	
Sale Condition, <i>continued</i>	1 or 4	Char. or Char [4].  Denotes a particular condition applicable to the trade. The Short Trade format ‘Sale Condition Category’ field identifies the Category 1, 2, 3 or 4 level associated with a trade.	
The Participant Input four (4) Char Sale Condition field is <b>Char specific</b> whereby a Sale Condition from Category 1 should be in the first Char position, a Sale Condition from Category 2 should be in the second Char position, a Sale Condition from Category 3 should be in the third Char position and a Sale Condition from Category 4 should be in the fourth Char position. If a Sale Condition is not required from any one of the categories, the unused Sale Condition Char should be space-filled. The Category hierarchy in the 4 Char Sale Condition field is currently as follows:			
Category 1	Category 2	Category 3	Category 4
Settlement Type	Reason for Trade-Through Exemption / Other Reason	Extended Hours / Sequence Type	SRO Trade Detail
<b>Space</b> (Regular Settlement)	<b>Space</b> (No Trade Through Exempt Reason)	<b>Space</b> (Not Extended Hours or Sold Out of Sequence)	<b>Space</b> (No SRO Required Trade Detail)
<b>C</b> Cash Trade (Same Day Clearing)	<b>F</b> Inter-market Sweep Order	<b>L</b> Sold Last (Late Reporting)	<b>B</b> Average Price Trade
<b>N</b> Next Day Trade (Next Day Clearing)	<b>O</b> Market Center Opening Trade	<b>T</b> Extended Hours Trade	<b>E</b> Automatic Execution
<b>R</b> Seller	<b>4</b> Derivatively Priced	<b>U</b> Extended Hours Sold (Out of Sequence)	<b>H</b> Price Variation Trade
	<b>5</b> Market Center Reopening Trade	<b>Z</b> Sold (Out of Sequence)	<b>I</b> Odd Lot Trade
	<b>6</b> Market Center Closing Trade		<b>K</b> Rule 127 (NYSE only) or Rule 155 (NYSE American only)
	<b>7</b> Qualified Contingent Trade		<b>M</b> Market Center Official Close
	<b>8</b> Reserved		<b>P</b> Prior Reference Price
	<b>9</b> Corrected Consolidated Close Price as per Listing Market		<b>Q</b> Market Center Official Open
			<b>V</b> Contingent Trade
			<b>X</b> Cross Trade



CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

**SALE CONDITION**, *continued*

**Note 1:**

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

**Note 2:**

- 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 3:**

- Sale Conditions L (Sold Last – Late Reporting), O (Market Center Opening Trade), P (Prior Reference Price), and Z (Sold – Out of Sequence), are mutually exclusive of each other (i.e., these sale conditions **cannot** be used in combination).

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**SALE CONDITION, *continued***

**Rule 611- Trade Reporting Matrix**

Rule	Short Name	Description	TTE Field	Sales Condition Field			
			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	<b>O</b> 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	<b>5</b> 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	<b>6</b> 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	<b>F</b> 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	<b>F</b> INTERMARKET SWEEP	N/A	TBD by each SRO

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**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

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																																		
Sale Condition Category	1	<p>Char.</p> <p>In the Short Trade format, identifies the Sale Condition Category level associated with a trade. Sale Condition Categories are defined in the ‘Sale Condition’ field description.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Sale Condition Category Not Applicable</td></tr><tr><td>1</td><td>Sale Condition Category 1</td></tr><tr><td>2</td><td>Sale Condition Category 2</td></tr><tr><td>3</td><td>Sale Condition Category 3</td></tr><tr><td>4</td><td>Sale Condition Category 4</td></tr></table>	Code	Value	Space	Sale Condition Category Not Applicable	1	Sale Condition Category 1	2	Sale Condition Category 2	3	Sale Condition Category 3	4	Sale Condition Category 4																						
Code	Value																																			
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1	Sale Condition Category 1																																			
2	Sale Condition Category 2																																			
3	Sale Condition Category 3																																			
4	Sale Condition Category 4																																			
Security Status	1	<p>Char.</p> <p>Represents the trading action related to the transaction.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Security Status Not Applicable</td></tr><tr><td>1</td><td>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>Trade Dissemination Time (T-Time)</td></tr><tr><td>C</td><td>No Market Imbalance</td></tr><tr><td>D</td><td>No Market on Close Imbalance</td></tr><tr><td>E</td><td>Short Sale Restriction</td></tr><tr><td>F</td><td>Limit Up-Limit Down (LULD) Quote Midpoint</td></tr></table>	Code	Value	Space	Security Status Not Applicable	1	Opening Delay	2	Trading Halt	3	Resume	4	No Open/No Resume	5	Price Indication	6	Trading Range Indication	7	Market Imbalance Buy	8	Market Imbalance Sell	9	Market on Close Imbalance Buy	A	Market on Close Imbalance Sell	B	Trade Dissemination Time (T-Time)	C	No Market Imbalance	D	No Market on Close Imbalance	E	Short Sale Restriction	F	Limit Up-Limit Down (LULD) Quote Midpoint
Code	Value																																			
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CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description																												
Security Symbol	5 or 11	<p>Char [5] or Char [11]. Left justified, space-filled.</p> <p>Identifies the Security Symbol. 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. Suffixes start with one of the following characters with no embedded spaces: (1) ASCII Period (.), (2) lower case p, (3) lower case r, or (4) lower case w.</p> <p><b>Identification of Test Data:</b></p> <p>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.</p> <p>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. Alphanumeric Test Symbols are Reserved for future use.</p> <table><tr><th>Listing Exchange</th><th>Test Symbol</th></tr><tr><td rowspan="4">NYSE</td><td>CBO</td></tr><tr><td>CBX</td></tr><tr><td>NTEST</td></tr><tr><td>01N thru 12N</td></tr><tr><td rowspan="3">NYSE American</td><td>IBO</td></tr><tr><td>ATEST</td></tr><tr><td>01A thru 12A</td></tr><tr><td rowspan="6">NYSE Arca</td><td>IGZ</td></tr><tr><td>ZVV</td></tr><tr><td>ZZK</td></tr><tr><td>ZZZ</td></tr><tr><td>PTEST</td></tr><tr><td>01P thru 12P</td></tr><tr><td rowspan="4">Cboe BZX</td><td>ZBZX</td></tr><tr><td>ZTEST</td></tr><tr><td>ZTST</td></tr><tr><td>01Z thru 12Z</td></tr><tr><td rowspan="4">IEX</td><td>ZIEXT</td></tr><tr><td>ZEXIT</td></tr><tr><td>ZXIET</td></tr><tr><td>01V thru 12V</td></tr></table>	Listing Exchange	Test Symbol	NYSE	CBO	CBX	NTEST	01N thru 12N	NYSE American	IBO	ATEST	01A thru 12A	NYSE Arca	IGZ	ZVV	ZZK	ZZZ	PTEST	01P thru 12P	Cboe BZX	ZBZX	ZTEST	ZTST	01Z thru 12Z	IEX	ZIEXT	ZEXIT	ZXIET	01V thru 12V
Listing Exchange	Test Symbol																													
NYSE	CBO																													
	CBX																													
	NTEST																													
	01N thru 12N																													
NYSE American	IBO																													
	ATEST																													
	01A thru 12A																													
NYSE Arca	IGZ																													
	ZVV																													
	ZZK																													
	ZZZ																													
	PTEST																													
	01P thru 12P																													
Cboe BZX	ZBZX																													
	ZTEST																													
	ZTST																													
	01Z thru 12Z																													
IEX	ZIEXT																													
	ZEXIT																													
	ZXIET																													
	01V thru 12V																													

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description
Sell Volume	4	<p>Integer. Integer has a maximum volume of 4,294,967,295.</p> <p>The Sell Volume represents the reported imbalance of sell orders without matching buy orders for the security for a Participant.</p>
Seller's Sale Days	1	<p>Byte. Maximum number of Seller's Sale Days is 60 days. Optional set to zero.</p> <p>Sale Condition must be 'R' and the Seller's Sale Days is not less than two business days after trade date and not more than sixty days after trade date (e.g., Cash Settlement is present trading day, Next Day Trade Settlement is the day after Cash Settlement trading day and Seller's Sale Days is between 3 – 60 days following Next Day Trade Settlement.</p> <p>Specifies the number of days that may elapse before delivery of the security.</p>
Short Sale Restriction Indicator	1	<p>Char.</p> <p>Identifies whether or not a Short Sale Restriction is in effect by the Primary Listing Market for a security.</p> <p><b>Day 1:</b> When a security's price decreases by 10% or more from the previous day's closing price, the primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Activated'.</p> <p><b>Day 2:</b> As the short sale restriction will remain in effect the day after activation, the primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Continued' (anticipated prior to the primary listing market open). In the event a security's price decreases by an additional 10% or more from the previous day's closing price, the primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Activated' (reverts to Day 1).</p> <p><b>Day 3:</b> As the short sale restriction is to be lifted at the end of Day 2, the primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Deactivated' (anticipated prior to the primary listing market open).</p>

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**FIELD DESCRIPTIONS**

Field Name	Length	Description												
Short Sale Restriction Indicator, <i>continued</i>		<table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>Short Sale Restriction Not Applicable</td></tr><tr><td>A</td><td>Short Sale Restriction Activated</td></tr><tr><td>C</td><td>Short Sale Restriction Continued</td></tr><tr><td>D</td><td>Short Sale Restriction Deactivated</td></tr><tr><td>E</td><td>Short Sale Restriction in Effect</td></tr></table> <p><b>Note 1:</b> Code values ‘Space’, ‘A’, ‘C’ and ‘D’ are to be used only in conjunction with the ‘Security Status’ field of the Category T, Type S (Trading Status) message.</p> <p><b>Note 2:</b> Code values ‘Space’ and ‘E’ are to be used only with Category P, Type L (Prior Day Long Trade) and Category P, Type X (Prior Day Cancel/Error) messages.</p>	Code	Value	Space	Short Sale Restriction Not Applicable	A	Short Sale Restriction Activated	C	Short Sale Restriction Continued	D	Short Sale Restriction Deactivated	E	Short Sale Restriction in Effect
Code	Value													
Space	Short Sale Restriction Not Applicable													
A	Short Sale Restriction Activated													
C	Short Sale Restriction Continued													
D	Short Sale Restriction Deactivated													
E	Short Sale Restriction in Effect													
Stop Stock Indicator	1	Char.  Identifies whether a trade is considered a stop stock at the time of the trade. <table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>Stop Stock Not Applicable</td></tr><tr><td>1</td><td>Stop Stock</td></tr></table>	Code	Value	0	Stop Stock Not Applicable	1	Stop Stock						
Code	Value													
0	Stop Stock Not Applicable													
1	Stop Stock													

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Timestamp 2	8	<p>2 x Integer (pair of Integers). Optional set to zero.</p> <p>Timestamp 2 is a FINRA Alternative Display Facility (ADF) or a FINRA Trade Reporting Facility-provided timestamp represented in terms of nanoseconds since Epoch. The first integer contains the number of seconds from Epoch 1/1/1970, 00:00:00 UTC. The next integer contains the nanosecond portion of the time (e.g., 972402315). If Timestamp 2 is not provided, this field should be set to zero. For any messages generated by CTS, e.g., Messages generated on behalf of a Participant, Price Band messages, Administrative messages, Control messages and Market Status messages, the Timestamp 2 field will be set to zero.</p> <ul style="list-style-type: none"><li>▪ <b>If from an Exchange: Timestamp 2</b> field should be set to zero.</li><li>▪ <b>If from the FINRA Alternative Display Facility (ADF) or a FINRA Trade Reporting Facility:</b><ul style="list-style-type: none"><li>▪ <b>If the FINRA ADF or a FINRA TRF</b> 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 ADF or TRF shall provide such times to the Processor in nanoseconds since Epoch.</li><li>▪ <b>If the FINRA ADF or a FINRA TRF facility does not</b> have a proprietary trade feed then the Timestamp 2 field should be set to zero.</li></ul></li></ul>



CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description
Total Trades	4	<p>Integer. Integer has a maximum volume of 4,294,967,295. Optional set to zero.</p> <p>Contains the total number of trade transactions executed from a Participant.</p>
Trade Dissemination Time (T-Time)	4	<p>Integer. Optional set to zero.</p> <p>T-Time is represented in seconds since Epoch.</p> <p>Required for Trading Status message 'Security Status' field code 'B', otherwise set to zero. A trading halt indication type signifies the temporary halt in trading in a security by the Primary Market.</p> <p><b>Note:</b> When a Participant inputs T-Time, CTS responds back to the Participant over its input line with an administrative message containing the following contents:</p> <p><b>Note:</b> <i>There is no corresponding 'T-Time' information disseminated over the CTS multicast feed.</i></p>
Trade Price	2 or 8	<p>2 Short. Short have implied 2 decimal places and a maximum price of \$655.35.</p> <p>8 Long. Long have implied 6 decimal places and a maximum price of \$18,446,744,073,709.551615. Optional set to zero.</p> <p>The Trade Price is the monetary value of an individual share of stock at the time of the trade.</p>

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

## FIELD DESCRIPTIONS

Field Name	Length	Description																																						
Trade Reporting Facility ID	1	<p>Char. Space-filled.</p> <p>Identifies the Participant with whom a Trade Reporting Facility (TRF) has been formed.</p> <ul style="list-style-type: none"><li>▪ If the Participant with which FINRA has formed a TRF is submitting transactions to CTS, the Participant will submit under its own Participant ID and populate the TRF Indicator field with a lower case <b>d</b>'.</li><li>▪ If FINRA is entering transactions on behalf of a TRF, it will identify the specific TRF in the TRF Indicator field.</li><li>▪ In cases of Bonds and Local Issues, which are <b>not eligible for TRF</b> transactions, the TRF Identifier fields should be space-filled.</li></ul> <table><tr><th>Code</th><th>Value</th></tr><tr><td>Space</td><td>TRF Not Applicable</td></tr><tr><td>d</td><td>FINRA</td></tr><tr><td>A</td><td>NYSE American</td></tr><tr><td>B</td><td>NASDAQ OMX BX</td></tr><tr><td>C</td><td>NYSE National</td></tr><tr><td>D</td><td>FINRA</td></tr><tr><td>I</td><td>ISE</td></tr><tr><td>J</td><td>Cboe EDGA</td></tr><tr><td>K</td><td>Cboe EDGX</td></tr><tr><td>M</td><td>CHX</td></tr><tr><td>N</td><td>NYSE</td></tr><tr><td>P</td><td>NYSE Arca</td></tr><tr><td>T</td><td>NASDAQ</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>Cboe BYX</td></tr><tr><td>Z</td><td>Cboe BZX</td></tr></table>	Code	Value	Space	TRF Not Applicable	d	FINRA	A	NYSE American	B	NASDAQ OMX BX	C	NYSE National	D	FINRA	I	ISE	J	Cboe EDGA	K	Cboe EDGX	M	CHX	N	NYSE	P	NYSE Arca	T	NASDAQ	V	IEX	W	CBSX	X	NASDAQ OMX PSX	Y	Cboe BYX	Z	Cboe BZX
Code	Value																																							
Space	TRF Not Applicable																																							
d	FINRA																																							
A	NYSE American																																							
B	NASDAQ OMX BX																																							
C	NYSE National																																							
D	FINRA																																							
I	ISE																																							
J	Cboe EDGA																																							
K	Cboe EDGX																																							
M	CHX																																							
N	NYSE																																							
P	NYSE Arca																																							
T	NASDAQ																																							
V	IEX																																							
W	CBSX																																							
X	NASDAQ OMX PSX																																							
Y	Cboe BYX																																							
Z	Cboe BZX																																							

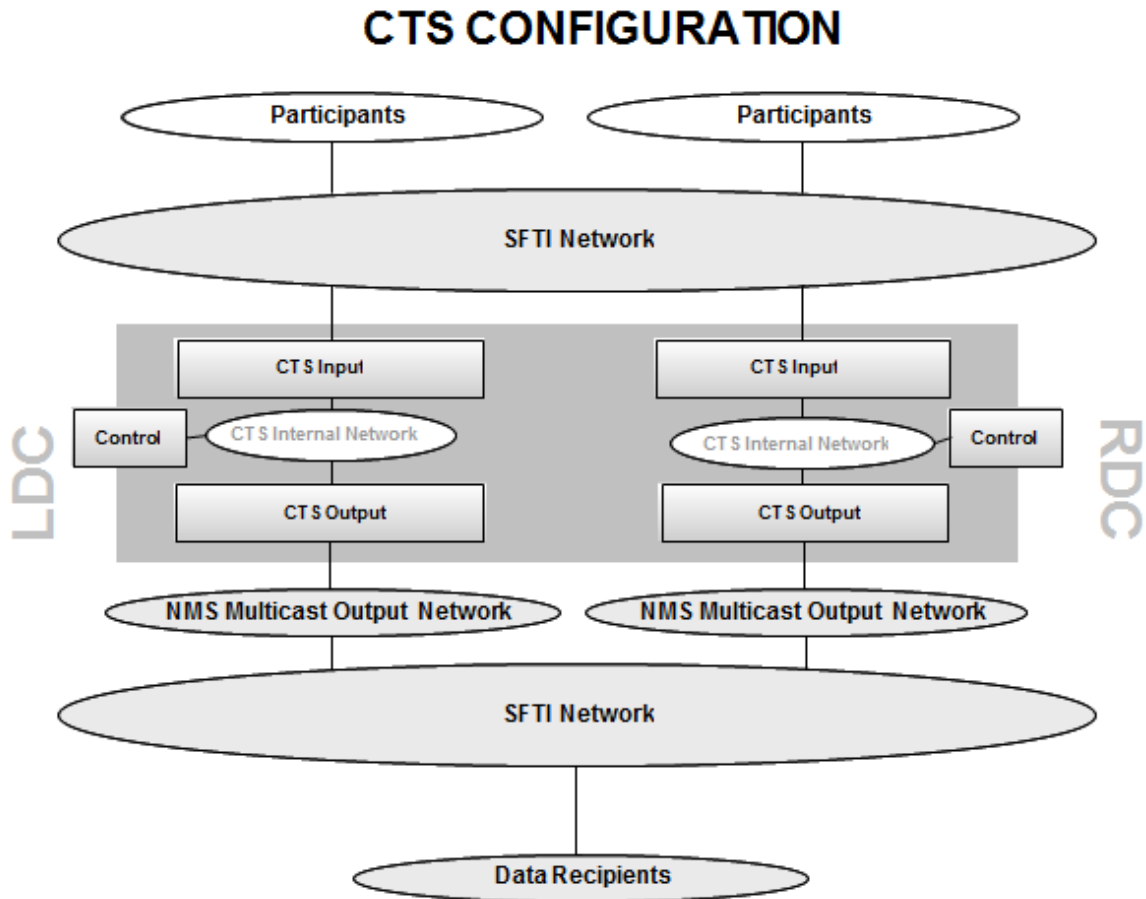
CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**FIELD DESCRIPTIONS**

Field Name	Length	Description						
Trade Through Exempt Indicator	1	<p>Char.</p> <p>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.</p> <table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>Not a Trade Through Exemption</td></tr><tr><td>1</td><td>Trade Through Exemption</td></tr></table>	Code	Value	0	Not a Trade Through Exemption	1	Trade Through Exemption
Code	Value							
0	Not a Trade Through Exemption							
1	Trade Through Exemption							
Trade Total Volume	8	<p>Long. Long have a maximum volume of 184,467,440,737,095,516. Optional set to zero.</p> <p>Contains the total number of shares traded for an individual security.</p>						
Trade Volume	2 or 4	<p>2 Short. Short have a maximum volume of 65,535.</p> <p>4 Integer. Integer has a maximum volume of 4,294,967,295. Short or Integer Optional set to zero.</p> <p>Contains the total number of shares traded in a single transaction for an individual security.</p>						

**APPENDIX A: CTS CONFIGURATION**



CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX B: SYMBOL AND INDEX SUFFIX EXAMPLES**

	<b>Suffix</b>	<b>Description</b>
<b>A</b>	.A	Series (or Class) <b>A</b> - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	.A.CL	Series <b>A</b> Called - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	.A.CV	Series <b>A</b> Convertible - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	.Aw	Series <b>A</b> When Issued - <i>Also</i> Series <b>B-T &amp; V-Z</b>
<b>C</b>	.CL	Called
	.CT	Certificates
	.CV	Convertible
	.CVR	Contingent Value Right
	.CV.CL	Convertible Called
<b>D</b>	.DP	Amount of most recent dividend to go 'ex- distribution'
	.DV	Accumulated dividend per share net expenses, through and including the previous day's close of trading
<b>E</b>	.EC	EMERGING COMPANY MARKETPLACE SM
	.EU	Estimated cash amount per creation unit
<b>F</b>	.F.N	Foreign News
<b>I</b>	.ID	Index – differentiates an index from a stock with the same root symbol
	.IV	Intra-Day Net Asset Value per share
<b>M</b>	.MN	Mini
<b>N</b>	.NV	Net Asset Value per share as at the close on the previous day's close of trading
<b>P</b>	.PO	Percent Paid
	.PP	Partial Paid
	.PT.CL	Part Called
	p	Preferred
	pA	Preferred Series <b>A</b> - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	pA.CV	Preferred Series <b>A</b> Convertible - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	pA.CL	Preferred Series <b>A</b> Called - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	pAw	Preferred Series <b>A</b> When Issued - <i>Also</i> Series <b>B-T &amp; V-Z</b>
	pw	Preferred When Issued
	p.CL	Preferred Called
	p.CV	Preferred Convertible
	p.CV.CL	Preferred Convertible Called
	p.WD	Preferred When Distributed
	pCA	Indicates Class <b>A</b> of a Second Category of Preferred - <i>Also</i> Class <b>B-K</b> and <b>M-S</b>

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX B: SYMBOL AND INDEX SUFFIX EXAMPLES**

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

**Note:**

- 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.
- Suffixes start with one of the following characters with no embedded spaces: a) ASCII Period (‘.’); b) Lower case ‘p’; c) Lower case ‘r’; d) Lower case ‘w’.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX C: GLOSSARY**

<b>Term</b>	<b>Description</b>
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 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 a stock.
Cash Trade	A transaction which requires delivery of securities and payment on the same day the trade takes place.
Closing Price	The Participant Closing Price represents the last qualifying trade paid for a security by a Participant during the trading day.
Contingent Trade	A Sale Condition code used to identify a transaction where the execution of the transaction is contingent upon some event.
Corrected Consolidated Close Price as per Listing Market	A transaction executed by the Listing Market to establish the official Consolidated Last Price as indicated by the Listing Exchange.
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.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX C: GLOSSARY**

Term	Description
Crossing Session I (NYSE American)	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 American) 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 American Crossing Session I trade at 5:00 p.m. at the price of the NYSE American 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 American Crossing Session I is exempt from "up-tick rule" for sell short orders. ETFs, which participate in NYSE American Crossing Session I, use the closing price at 4:15 p.m. See NYSE American 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 American)	NYSE American Crossing Session II (called "After Hours Trading Facility II" on the NYSE American) operates between 4:00 p.m. and 5:15 p.m. (EST). This session on the NYSE American accommodates the trading of NYSE American coupled orders in baskets, which are composed of at least 15 NYSE securities valued at \$1 million or more and also include NYSE American securities. Members, that have either facilitated a basket trade or have paired two customers' baskets, submit aggregate information on transactions in NYSE American securities included in the baskets to the NYSE American for execution. At 5:15 p.m., the aggregate information of all NYSE American securities included in baskets executed in this session prints to the Consolidated Tape (Tape B).
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.



CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX C: GLOSSARY**

<b>Term</b>	<b>Description</b>
CTA Eligible Equity	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 American for such securities.
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.
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.
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.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

Term	Description
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.
Late Filing	A financial status designation pertaining to Tape 'A' and Tape 'B' issues (i.e. issues listed on the NYSE, the NYSE American 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, or that a National Best Offer is equal to the Lower Limit Price Band.
Limit Up-Limit Down (LULD) Price Bands	<p>The Limit Up-Limit Down Price Band represents a price range which is set at a percentage level above and below the average price of a security over the immediately preceding five (5) minute period. Price Bands prevail for a minimum of thirty (30) seconds. During a Limit State Price Bands will not be disseminated and will recommence when Limit State is terminated.</p> <p>For further details related to Limit Up-Limit Down, reference the following: <a href="http://www.sec.gov/rules/sro/nms/2012/34-67091.pdf">http://www.sec.gov/rules/sro/nms/2012/34-67091.pdf</a></p>
Limit Up-Limit Down (LULD) Quote Mid-Point	Indicates a listing exchange's midpoint of a quote when the listing exchange opens (reopens) with a quote instead of opening (reopening) with a trade.
Limit Up-Limit Down (LULD) Trading Pause	Denotes a five-minute regulatory trading halt (pause) for an individual security that does not exit a Limit State within 15 seconds.
Local Issue	A Local Issue is an issue that does not meet NYSE American 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.
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.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX C: GLOSSARY**

<b>Term</b>	<b>Description</b>
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).
Market-Wide Circuit Breaker Level 1 – 7% Breached	<p>This regulatory Trading Halt is used to denote that trading is suspended due to the S&amp;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:</p> <ul style="list-style-type: none"> <li>• Before 3:25 p.m. ET – duration 15 minutes</li> <li>• At or after 3:25 p.m. ET – trading shall continue unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.</li> </ul>
Market-Wide Circuit Breaker Level 2 – 13% Breached	<p>This regulatory Trading Halt is used to denote that trading is suspended due to the S&amp;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:</p> <ul style="list-style-type: none"> <li>• Before 3:25 p.m. ET – duration 15 minutes</li> <li>• At or after 3:25 p.m. ET – trading shall continue unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.</li> </ul>
Market-Wide Circuit Breaker Level 3 – 20% Breached	<p>This regulatory Trading Halt is used to denote that trading is suspended due to the S&amp;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:</p> <p>At any time during regular trading hours, trading shall Halt and not Resume for the remainder of the trading day.</p>

CONSOLIDATED TAPE SYSTEM (CTS)  
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**APPENDIX C: GLOSSARY**

Term	Description
Mixed Lot	An order for a number of shares greater than 100 (e.g., 142, 373, 1, 948 etc.), but not a multiple of 100. 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.
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.
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, Operational.
Not-Regular Way	The transaction that constituted the trade-through was not a 'regular way' contract.
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 <u>less than</u> the standard units of trade of 1, 10 or 100 shares.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX C: GLOSSARY**

Term	Description
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: <ul style="list-style-type: none"><li>• one point or more away from the last sale when the last sale is under \$20.00; or</li><li>• two points or more away from the last sale when the last sale is \$20.00 or more</li></ul>
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.
Operational	Denotes a non-regulatory Trading Halt. The ability to trade a security by a Participant is temporarily inhibited due to technical reasons.
Order Imbalance	Denotes a non-regulatory halt condition where there is a significant imbalance of buy or sell orders.
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.
Regular Sale	A trade made without stated conditions is deemed regular way for settlement on the third business day following the transaction date.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX C: GLOSSARY**

Term	Description
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.).
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: <ol style="list-style-type: none"><li>1. has a volume of 10,000 shares or more <i>and/or</i></li><li>2. has a dollar value of \$200,000 or more.</li></ol>
Rule 155 Trade (NYSE American)	To qualify as a NYSE American 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.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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**APPENDIX C: GLOSSARY**

<b>Term</b>	<b>Description</b>
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.
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 <u>not</u> Opening Delayed or Trading Halted. The Trading Range Indication is used prior to or after the opening of a security.

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX D: INPUT ERROR CONDITIONS**

CODE	DESCRIPTION	REJECTION REASON
1	Invalid Version	Unsupported Block Version number
2	Invalid Block Size	Block Size is less than minimum (1) or more than maximum allowable length
3	Invalid Block Sequence Number	Duplicate Message - the current Block Sequence Number is less than or equal to that of the last message processed. The expected message Block Sequence Number is not incremented and the message is <b>not</b> accepted
4	Invalid Messages in Block	Messages in Block is less than minimum (1) or more than maximum allowable length
5	Invalid Block Checksum	Block Checksum does not match
6-10	Reserved	N/A
11	Invalid text length	Text length is beyond acceptable bounds for the message
12	Message not acceptable before CTS market open or after CTS market close	Message sent outside acceptable timeframe, message sent before SOD disseminated or after Participant EOD sent
13	Invalid Message Category and Type	Unsupported Message Category and Message Type
14	Invalid Participant ID	Participant ID is not a supported value
15	Invalid Timestamp 1	Timestamp is not within the appropriate range, invalid date and time (Time is prior to or after the present date)
16	Invalid Participant Reference Number	Participant Reference Number is not within specified allowable ASCII character range
17	Duplicate Participant Reference Number	Participant Reference Number must be unique by Participant ID, by Trade Reporting Facility (TRF), by Security Symbol and by Participant Regional Reference Number
18	Market Center Official Closing Price Already Published	Primary Market trades are not accepted after Market Center Official Closing Price has been published
19	Invalid Auction Collar Price	Auction Price is zero, expecting non-zero
20	Invalid Number of Extensions	Number of Extensions is not a supported value
21	Invalid Quote Midpoint Price	Quote Midpoint Price zero, expecting non-zero
22	Trade From Primary during Primary Market Halt	Primary Market trades are not acceptable during Primary Market Halt period
23	First IPO Trade is from Non-Primary Market	IPO trades are not accepted from Non-Primary Markets prior to Primary Market trade
24	Reserved	N/A



CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX D: INPUT ERROR CONDITONS**

CODE	DESCRIPTION	REJECTION REASON
25	Reserved	N/A
26	Invalid Bid Index Value	Bid Index Value is zero, expecting non-zero
27	Invalid Buy Volume	Buy Volume is zero, expecting non-zero
28	Invalid Cancel or Error Action	Cancel or Error Action is not a supported value
29	Invalid Correction or Cancel/Error action	Correction or Cancel/Error action from Exchange not using Participant Reference Number
30	Original Transaction does not match Input	Original Transaction does not match Input
31	Invalid Participant Reference Number (of trade being corrected, cancelled or errored)	Trade Target is not a trade or a correction, or is already canceled or errored)
32	Original Trade Not Found	Original Trade Not Found
33	Original Trade Already Corrected	Original Trade Already Corrected
34	Invalid Closing Bid Price	Bid Price is zero, expecting non-zero
35	Invalid Closing Offer Price	Offer Price is zero, expecting non-zero
36	Invalid Crossing Session I Trade Volume	Crossing Session I Trade Volume is zero, expecting non-zero
37	Invalid Crossing Session II Dollar Value	Crossing Session II Dollar Value is zero, expecting non-zero
38	Invalid Crossing Session II Trade Volume	Crossing Session II Trade Volume is zero, expecting non-zero
39	Invalid Dollar Value	Dollar Value is zero, expecting non-zero
40	Invalid Halt Reason	Halt Reason is not a supported value
41	Invalid Opening Delay	Opening delay specified and stock is Trading Halted or No Open or No Resume
42	Invalid Trading Halt	Trading Halt specified and stock is Opening Delay or No Open or No Resume
43	Invalid No Open/No Resume	No Open/No Resume specified and stock is not Opening Delayed or Trading Halted
44	Invalid Participant Trading Status Halt Reason	Trading Status Message from Participant that is not the Listing Exchange for the security symbol
45	Invalid Price Indication/Trading Range Indication	Price Indication/Trading Range Indication received and security symbol is not Trading Halted

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX D: INPUT ERROR CONDITIONS**

CODE	DESCRIPTION	REJECTION REASON
46	Invalid High Price Indication	High Price not greater than Low Price on Price Indication/Invalid combination of Trading Pause High Price and Low Price
47	Invalid Trade Dissemination Time or T-Time and Security Not Halted or Opening Delayed	Security Not Halted or Opening Delayed
48	Invalid High Indication Price	Price is zero, expecting non-zero
49	Invalid High Price	Price is zero, expecting non-zero
50	Reserved	N/A
51	Invalid Index Symbol	Index Symbol contains unsupported ASCII character
52	Invalid Index Value	Index Value is zero, expecting non-zero
53	Invalid Instrument Type	Instrument Type value is not a supported value
54	Invalid Last Price	Last Price is zero, expecting non-zero
55	Invalid Opening (Reopening) Quote Midpoint Price	Opening (Reopening) Quote Midpoint Price received when not expecting to receive (e.g., eligible trade already received setting reference price).
56	Invalid Low Indication Price	Low Indication Price is zero, expecting non-zero//Invalid combination of Trading Pause High Price and Low Price
57	Invalid Low Price	Low Price is zero, expecting non-zero
58	Invalid Low Price	Low Price is greater than High Price
59	Invalid Lower Limit Price Band	Lower Limit Price Band is non-zero, Upper Limit Price Band must be zero
60	Invalid Upper Limit Price Band	Upper Limit Price Band is non-zero, the Lower Limit Price Band must be zero
61	Reserved	N/A
62	Invalid Offer Index Value	Offer Index Value is zero, expecting non-zero
63	Invalid Open Price	Open Price is zero, expecting non-zero
64	Invalid Prior Day Trade Date and Time	Prior Day Trade Date is current date or future date
65	Invalid Sale Condition	Sale Condition is not a supported value
66	Invalid Volume for Sale Condition I	Volume contains volume less than a round lot
67	Invalid Time For Sale Condition 9	Sale Condition 9 Trade received before allowable reporting time of 30 seconds after market close
68	Invalid Participant Input for Sale Condition 9	Sale Condition 9 Trade received from non-listing market

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

**APPENDIX D: INPUT ERROR CONDITIONS**

CODE	DESCRIPTION	REJECTION REASON
69	Invalid Volume for Sale Condition 9	Sale Condition 9 Trade received from listing market with volume other than '0'
70	Invalid Time for Sale Condition T or Sale Condition U	Sale Condition T trades expected between 3:30 am ET to 9:30 am ET and between 4:00:01 pm – 8:30 pm ET (or 1:00:01 pm on early close days)
71	Invalid Security Status	Security Status is not a supported value
72	Invalid Sale Condition in Category Position	Sale Condition values are in incorrect Category Position
73	Invalid Security Symbol	Unknown Security Symbol
74	Invalid Sell Volume	Sell Volume is zero, expecting non-zero
75	Invalid Number of Seller's Sale Days	Seller's Sale Days is not within 2 – 60 days
76	Invalid Short Sale Restriction Indicator	Short Sale Restriction Indicator is not a supported value
77	Invalid Stop Stock Indicator	Stop Stock Indicator is not a supported value
78	Invalid Timestamp 2	Timestamp is not within the appropriate range, invalid date and time (Time is prior to or after the present date)
79	Invalid Total Trades	Total Trades is zero, expecting non-zero
80	Invalid Trade Price	Price is zero, expecting non-zero
81	Invalid Trade Reporting Facility ID	Trade Reporting Facility ID is not a supported value
82	Invalid Trade Through Exempt Indicator	Trade Through Exempt Indicator is not a supported value
83	Invalid Total Volume	Total Volume is zero, expecting non-zero
84	Invalid Trade Volume	Trade Volume is zero, expecting non-zero
85	Unprintable ASCII Character	ASCII character not within 32-126 range
86	Unspecified Error	Unspecified Error

CONSOLIDATED TAPE SYSTEM (CTS)  
PARTICIPANT INPUT BINARY SPECIFICATION

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

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

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

## CTS Participant Input Binary and ASCII Protocol Differences and Notes

### General:

1. Transmission block SOH & ETX have been removed.
2. 'Block Separator' added to offer better guarantee that the format will be identified correctly.
3. 'Block Pad' byte has been added to ensure blocks are an even number of bytes. Updated 'Block Pad Byte' description to include binary representation.
4. 'Block Length Header' replaced by 'Block Size' included in Block Header.
5. Data Type (format) modified to support Big Endian (network byte order) and ASCII printable character codes 32-126 inclusive.
6. Message Category and Type Codes harmonized where applicable.
7. Reorganization of fields within message formats for consistency purposes.
8. 'Instrument Type' in message formats will identify CTA Eligible Equity, Local Issue and Bonds.
9. All Times (e.g., Timestamps, Date and Time) will be represented in nanoseconds from Epoch 1/1/1970, 00:00:00 UTC (with the exception of T-Time which is represented in seconds from Epoch).
10. Short Prices will have 2 decimal places implied and Long Prices will have 6 decimal places implied.
11. 'Due to Related Security' and 'In View of Common' processing has been removed.
12. The .TEST suffix support has been replaced by Dedicated Test Symbols.
13. 'Reserved' fields removed from most message formats, future new fields will be accommodated using 'Version' updates.
14. 'Timestamp 2' has been moved from Message Header to applicable message formats.
15. 'CBSX' has withdrawn its status as a CTA Participant and has been removed.
16. Removed 'Sale Condition' code '@' representing a 'Regular Sale' trade. Sale Condition Code 'Space' will be used to represent a 'Regular Sale' trade.
17. Added 'Sale Condition Category' field codes.
18. T-Time representation to be in seconds since Epoch.
19. Modified Data Type representation in Index/MWCB messages.
20. Minor clarification throughout document/removed verbiage associated with eliminated functionality/corrected typos.
21. Added CBOE Stock Exchange, Inc. (CBSX).

### Revised Block Header:

1. 'Version' to facilitate support of current and future format changes.
2. 'Block Size' to indicate the size in bytes of the entire transmission block.
3. 'Block Sequence Number' block sequence number for each block with rollover occurring after 999,999,999 (a future enhancement will increase the number to 3,999,999,999); field was moved from the Message Header to Block Header).
4. 'Messages in Block' to identify the number of messages contained in the transmission block.
5. 'Block Checksum' to identify sum of all the bytes in the block.

## **Differences and Notes, continued**

### **Modified Message Header:**

1. For input/output consistency, 'Participant ID' (previously 'Originating Participant ID') modified from 2 characters to 1 character.
2. 'Destination Participant ID' has been removed.
3. 'Message Sequence Number' renamed to 'Block Sequence Number' moved from Message Header to Block Header.
4. 'Status' removed; it is recommended that Participants utilize the Sequence Inquiry/Sequence Response messaging to determine expected sequence number.
5. 'Message Header Identifier' replaced by 'Version' in Block Header.
6. 'Regional Reference Number' renamed to 'Participant Reference Number'.
7. 'Timestamp 2' has been moved to applicable message formats.
8. 'Message Length' field has been added.
9. 'Reserved' field length revised.
10. Total length of Message Header increased.
11. Modified order of field appearances.

### **Administrative Messages:**

1. Category A Type H general 'Administrative Unformatted' format will be used for all Administrative messages (Category A Type F 'Symbol Maintenance', Category A Type T 'Market Activity Information' and Category A Type S have been removed).
2. 'Reject/Warning' message has been split into two separate message formats.
3. 'Reject' message modified to provide 'Block Sequence Number', Participant Reference Number' and 'Message ID'.
4. 'Warning message' modified to provide 'Previous Block Sequence Number' and 'Previous Participant Reference Number'.
5. Administrative message textual length increased to 900 characters.
6. 'Text Length' originally added to identify the length of the text in the Administrative message has been eliminated as 'Message Length' field added to Message Header.
7. Usage of YYY and ZZ begin announce and end announce characters removed.

### **Control Messages:**

1. 'Start of Participant Reporting' renamed to 'Start of Day'.
2. 'End of Participant Reporting' renamed to 'End of Day'.
3. 'Sequence Information and Message Count Inquiry' replaces 'Sequence Inquiry'.
4. 'Sequence Information and Message Count Response' replaces 'Sequence Information' and will contain the count of messages received on an individual line since startup.
5. 'Line Integrity' time will be represented in nanoseconds from Epoch 1/1/1970, 00:00:00 UTC.
6. CTS to Participant 'Line Integrity' modified to consist of Message Header only.
7. 'Test' data textual length increased to 256.

## **Differences and Notes, continued**

### **Index Messages:**

1. Category Y Type A and Type X Short Index message have been eliminated.
2. Category Y Type V Bid and Offer Index Short message has been eliminated.
3. Category Y renamed to Category I.
4. Grouping of Indices in a single message has been removed.
5. Revised usable data type representation (signed long).
6. Eliminated 'Index Sign' fields in Index Messages (sign is derived from Index value) and associated 'Index Sign' field descriptions.

### **Market Status Messages:**

1. Category M Types B, C and D messages associated with 'Most Active Issues' have been removed.
2. Category M Types E, F and G messages associated with 'Closing Trade Prices' have been removed.
3. Category M Types H, I and J messages associated with 'Bid and Offer Closing Prices' have been removed.

### **Prior Day Messages:**

1. Prior Day Trade Date and Trade Time combined in one field and will be represented in nanoseconds from Epoch 1/1/1970, 00:00:00 UTC.
2. 'Output Network' removed as messages are routed according to the network and security symbol range distribution.
3. Prior Day Trade Correction 'Corrected Instrument Type' field to 'Instrument Type' and eliminated 'Original Instrument Type' field.

### **Trade Messages:**

1. 'Sale Condition Category' introduced in Short Trade format to identify category associated with Sale Condition.
2. Added ability to support the same codes in each Sale Condition category (Each Sale Condition category will be byte specific).
3. 'Type' renamed to 'Security Status' in Trading Status message.
4. 'Cancel/Correction' in Trading Status removed as Price Indications are updated vs. corrected/cancelled.
5. 'Issue Type' renamed to 'Instrument Type'.
6. 'Local Issue Indicator' removed and is identified in 'Instrument Type'.
7. Added new dedicated Test Symbols.
8. Sale Condition Code '@' representing a 'Regular Sale' trade replaced with 'Space' to represent a 'Regular' trade.
9. Renamed Trade Correction Message 'Corrected Instrument Type' field to 'Instrument Type'.
10. 'Upper Limit Price Band' and 'Lower Limit Price Band' added in Trading Status.
11. Added 'Short Sale Restriction Indicator' to Correction Message.
12. Trade Cancel/Error Message transposed appearance of 'Trade Reporting Facility ID' to be following 'Trade Through Exempt Indicator' field.

## **Differences and Notes, continued**

### **New Auction Status Message Category/Type:**

1. Introduced 'Auction Status' message to be transmitted when a Participant in a CTA eligible security, Local Issue or a Bond reports required Auction Information.
2. Added new Auction Status message field descriptions.

### **Error Codes:**

1. Obsolete error codes eliminated.
2. New error codes introduced.
3. Error codes re-ordered.
4. Added new Auction Collar Price/Number of Extension error codes.
5. Added new 'Upper Limit Price Band' and 'Lower Limit Price Band' error codes.