SIAC

SECURITIES INDUSTRY AUTOMATION CORPORATION

CTS

CONSOLIDATED TAPE SYSTEM

PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION

June 2, 2017
Version 3.1

CONSOLIDATED TAPE SYSTEM (CTS)
PARTICIPANT COMMUNICATIONS INTERFACE SPECIFICATION

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SUMMARY OF CHANGES

This section summarizes the modifications made to the document since it was previously published.

Version 1.0 June 7, 2007	
All	Baseline Document – Restructured Format Elimination of: • 'Priority' field in Message Header • 'Destination' and 'Status' fields in Category A Type M Administrative messages • 'Destination' field in Category A Type T Market Activity messages • Category A Type L AMEX Closing Prices administrative messages • 'Transaction Status' field (spread checking) and 'Number of Trades" in Trade Last Sale and Trade Last Sale Expanded messages • 'Trade Print' field (no print trade) in Trade Last Sale Expanded message • 'Correcting Action', 'Price Denominator Indicator of Last Price', 'Last Price', 'Last Tick' and 'New Local Issue Indicator' fields in Trade Correction messages • 'Cancel or Error Action', 'Price Denominator Indicator of Last Price', 'Last Price' , 'Last Tick' and Local Issue Indicator in Cancel/Error messages

Version 1.1 July 6, 2007	

69
60-64, 71, 77, 112
83
 	
83-85, 102, 106, 109
	• New Halt Reason 'Y' Sub-Penny Trading
	• New 'Index Sign' Field in Index Messages
	• Modification to Consolidated Last Criteria of Sale Condition 'O' – Market Center Opening Trade
	• Redefined and New Sale Conditions
	  o Redefined Sale Condition 'H' – Price Variation Trade
	  o New Sale Condition 'M' – Market Center Official Close
	  o New Sale Condition 'Q' – Market Center Official Open
	  o New Sale Condition 'X' – Cross Trade

Version 1.2 July 13, 2007	
80, 92, 95	Added additional code/values (previously omitted) to the following fields: • Price Denominator Indicator • Stop Stock Indicator • Trade Through Exempt Indicator

Version 1.3 October 31, 2007	
83, 85, 111	Added new Sale Condition: 'V' – Stock-Option Trade Added: Glossary Definition of Stock-Option Trade

Version 1.4 March 27, 2008	
13, 18, 21, 22 94	Added: New CTS Participant 'BATS Trading' • New Block Header Participant ID - 'ZB' • New Originating Participant ID - 'ZB' • New Destination Participant ID - 'ZB' New Trade Reporting Facility Indicator ID – 'Z'

SUMMARY OF CHANGES

Version 1.5 - September 17, 2009	
114	Revised: Input Error Codes Code 54 – From: INVALID CORRECTION CONDITION (TRADE REPORT CANNOT BE CORRECTED TO A "G" OR "H" SALE CONDITION) To: **Unused** Code 55 – From: INVALID ORIGIN CONDITION (TRADE REPORT WITH "G" OR "H" SALE CONDITIONS CANNOT BE CORRRECTED/CANCELLED/ERRORED) To: **Unused**
13, 18, 21, 22 94	Revised: Participant ID Value • From: American Stock Exchange To: NYSE AMEX • From: Boston Stock Exchange To: NASDAQ OMX BX • From: National Association of Securities Dealers To: FINRA • From: NASDAQ To: NASDAQ OMX • From: Philadelphia Stock Exchange To: NASDAQ OMX PHLX
83	Revised: Sale Condition Code denoting "Regular" (No Condition - for Short or Long Trades): From: @ To: BLANK
24, 25	Clarification regarding Warm and Cold Recovery and the use of the Regional Reference Number (RRN).
13, 18, 21, 22 94	Added New Participant Direct Edge A: • New Participant ID 'JA' • New Block Header Participant ID 'JA' • New Originating Participant ID 'JA' • New Destination Participant ID 'JA' • New Trade Reporting Facility Indicator ID 'J'
13, 18, 21, 22 94	Added New Participant Direct Edge X: • New Participant ID 'KX' • New Block Header Participant ID 'KX' • New Originating Participant ID 'KX' • New Destination Participant ID 'KX' • New Trade Reporting Facility Indicator ID 'K'
13, 18, 21, 22, 89, 94	Added New Participant BATS Y Exchange: • New Participant ID 'YB' • New Block Header Participant ID 'YB' • New Originating Participant ID 'YB' • New Destination Participant ID 'YB' • New Trade Reporting Facility Indicator ID 'Y'
13, 18, 21, 22, 89, 94	Revised: Participant Name From: BATS Trading To: BATS Exchange, Inc.

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Version 1.6 – February 16, 2010	
114, 115, 116	Revised Input Error Code Conditions: Code 69 - From: Indication on 'Basket' Master To: First IPO Trade is from Non-Primary Market Code 78 - From: Resume Specified and Stock Is Not Halted, Delayed, No Open or No Resume To: Unused Code 83 - From: "G" Quote Indication and Stock Is Halted To: Price Range Indication and Stock Is Halted Code 89 - From: Market Imbalance Indication and Stock Is Halted To: Unused
13, 18, 21, 22, 94	Revised: Participant Name From: NASDAQ OMX PHLX To: NASDAQ OMX PSX
34	Added: New Participant to CTS Category C Type 4 Line Integrity message
Version 1.7 – May 12, 2010	
15	Revised: Text pertaining to the number of IP addresses supplied
89, 101	Added: Notation pertaining to use of .Test suffix
86	Added: Notations 1-3 regarding use of Sale Conditions
Version 1.8 – May 24, 2010	
69, 111	Redefined existing Halt Reason Code **'M'** (Regulatory) as follows: From: Additional Information To: Volatility Trading Pause
Version 1.9 – July 9, 2010	
49, 50, 51, 55	Added: New 'Short Sale Restriction Indicator' field to the following messages: Prior Day Trade Correction (Category P, Type C) Prior Day Trade Last Sale (Category P, Type E) Prior Day Trade Cancel/Error (Category P, Type X) Trading Status (Category T, Type G)
91	Added: New 'Short Sale Restriction Indicator' field
91	Added: New code and value to the 'Type' field of Trading Status (Category T, Type G) message: Code E – Short Sale Restriction
110, 112	Added: New Short Sale Restriction to Field Description and Glossary Added: New Input Error Code - Invalid Short Sale Restriction Indicator
Version 2.0 – December 10, 2010	
89	Added: New dedicated 'Test' symbols: • Network A: CBO and CBX • Network B: IBO and IGZ

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Version 2.1 – October 11, 2011	
89	Added: New dedicated 'Test' symbols: Network B: ZBZX and ZTEST
55, 56, 73	Revised to support 'Limit Up-Limit Down': • From - Last Price Denominator Indicator To - Last Price/Opening (Reopening) Quote Midpoint Denominator Indicator • From - Last Price To - Last Price/Opening (Reopening) Quote Midpoint Price
95	Added: New Limit Up-Limit Down (LULD) Quote Midpoint Code 'F' to 'Type' field.
106	Added: New Limit Up-Limit Down (LULD) Quote Midpoint to Glossary.

Version 2.2 – May 10, 2012	
12, 13, 18, 21, 22, 27, 40, 43, 44, 45, 67, 79, 83, 85, 94, 102, 106	Revised: Participant name: From: NYSE AMEX Stock Exchange To: NYSE MKT Stock Market

Version 2.3 – June 27, 2012	
19, 20, 26, 40	Revised Category 'M' messages: From – 'Market Summary' Messages To – 'Market Status' Messages
69	Added: New 'Market-Wide Circuit Breaker' Halt Reason codes 1, 2 and 3 to 'Halt Reason' field of the Trading Status Category T, Type G message
107	Added the following to the Glossary: • Market-Wide Circuit Breaker Level 1 – 7% Decline • Market-Wide Circuit Breaker Level 2 – 13% Decline • Market-Wide Circuit Breaker Level 3 – 20% Decline

Version 2.3-A – December 12, 2012	
56, 112	Revised: Input Error Code '9' - From: Unused To: Invalid Quote Midpoint

SUMMARY OF CHANGES

Version 2.4 – June 28, 2013	
23, 29, 45 & 50-60	Revised: Message descriptions for Admins, Control, Prior Day, Trade Corrections, Trades with Conditions U & T, Trading Status, Trade Cancel/Errors and Indexes to reflect that these messages are accepted by CTS before Participant Start of Day.
81, 88 & 111	Redefined: Existing code 'I' in the Sale Condition field to denote the following change in value: From – Cap Election Trade To – Odd Lot Trade
81, 83 & 102	Added: New Code **9** in Sale Condition field to denote 'Corrected Consolidated Close Price as per Listing Market'.

Version 2.4a – February 3, 2014	
N/A	**Note**: FINRA reactivation – no functional changes required.

Version 2.5 – October 31, 2014	
17, 24, 26, 28-32, 37-40, 42, 44-48 50-52, 54-56, 58, 59, 61-64, 119, 125-126	Added: New *Expanded* Message Header (**27 Bytes**) including the following: • New Message Header Identifier • New Timestamp (represented in microseconds since midnight ET) Added: New Error Code **16** denoting 'INVALID TIMESTAMP'

Version 2.6 – February 4, 2015	
17, 24, 26, 29-33, 38-41, 43, 45-49, 51-53, 55-60, 62-65	Modified: New *Expanded* Message Header (increased from 27 Bytes to **33 Bytes**) to include a second Timestamp (represented in microseconds since midnight ET) Updated: Total length of messages adjusted to include new Message Header length of 33 Bytes Updated: Old/New Message Header generated back to Participant description Revised: Effective Date from April 2015 to July 2015

SUMMARY OF CHANGES

Version 2.7 – February 25, 2015	

86, 88, 106 & 117	Modified: <u>Existing</u> code '**7**' in the Sale Condition field to denote the following change in value:
	• From - Reserved
	       To - Qualified Contingent Trade
	
	Redefined: <u>Existing</u> code 'V' in the Sale Condition field to denote the following change in value:
	• From – Stock Option Trade
	       To - Contingent Trade
	
	Effective Date: July 2015

Version 2.7a – April 22, 2015	
27-28	Added: Definitions for Timestamp 1 and Timestamp 2 fields of the <u>New</u> *Expanded* Message Header Revised Effective Date: from July 2015 to August 3rd, 2015
Version 2.8 – September 10, 2015	
95	Added: New dedicated 'Test" symbol: • Network B: ZTST
Version 2.9 – November 16, 2015	
10, 15, 19, 20, 97	Added New Participant – The Investors Exchange (IEX): • New Participant ID 'VX' • New Block Header Participant ID 'VX' • New Originating Participant ID 'VX' • New Destination Participant ID 'VX' • New Trade Reporting Facility Indicator ID 'V'
Version 2.9a – April 20, 2016	

9, 10, 15, 19, 20, 93 & 97	Revised 'Participant Names':
	• From: BATS Exchange
	   To: Bats BZX Exchange, Inc.
	• From: BATS Y Exchange
	   To: Bats BYX Exchange, Inc.
	• From: Direct Edge A Stock Exchange
	   To Bats EDGA Exchange, Inc.
	• From Direct Edge X Stock Exchange
	   To: Bats EDGX Exchange, Inc.

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Version 3.0 – September 15, 2016	
94	Added: New dedicated 'Test' symbols: • Network A: NTEST (NYSE) • Network B: ATEST (NYSE MKT) • Network B: PTEST (NYSE ARCA)
123	Revised: Description for Error Code **64** • From: TOO MANY TRADES ERROR • To: MARKET CENTER OFFICIAL CLOSING PRICE ALREADY PUBLISHED

Version 3.1 – June 2, 2017	
94	Added: New dedicated 'Test' symbols: • Network B: ZIEXT, ZEXIT & ZXIET (IEX)

1.0   INTRODUCTION

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

1.1   Document Scope

This specification defines the communications and input message format requirements for the Consolidated Tape Association (CTA) Participants and other reporting facilities that interface with the Consolidated Tape System (CTS). This document is one of two documents that support the Participants' interface into CTS. The other document is the 'TCP/IP for NMS Participant Input Interface Specification'.   Participants may request to receive the CTS and TCP/IP Participant Input Specifications by sending an email message to CQS-CTS-OPRA@siac.com.

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

1.2   Background

Trades and associated administrative messages in listed equity securities that meet NYSE MKT Stock Market or NYSE eligibility (regardless of the market center on which such trades occur), Local Issues and non-NYSE Bonds are eligible to be reported to the Consolidated Tape System.

CTS validates and sequences the last sale price and size of all last sale transactions received and disseminates them over Consolidated Output Multicast Lines (ML)s. An 'A' identifier represents last sales for NYSE listed securities traded by CTS Participants. A 'B' identifier represents last sales for securities that are listed on Bats BZX, NYSE ARCA, NYSE MKT, and those eligible for NYSE MKT listing but listed on regional stock exchanges. This data is transmitted to subscriber locations over the consolidated Multicast Line facility via the Internet Protocol (IP) Multicast Network.

Background (continued)

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

Bats BZX Exchange, Inc.

Bats BYX Exchange, Inc.

Bats EDGA Exchange, Inc.

Bats EDGX Exchange, Inc.

CBOE Stock Exchange, Inc.

Chicago Stock Exchange, Inc.

Financial Industry Regulatory Authority

International Securities Exchange, Inc.

The Investors' Exchange, LLC

NASDAQ OMX Stock Exchange, Inc.

NASDAQ OMX BX Stock Exchange, Inc.

NASDAQ OMX PSX Stock Exchange, Inc.

National Stock Exchange, Inc.

New York Stock Exchange, Inc.

NYSE MKT Stock Market

NYSE Arca ^{SM}

2.0   DUAL SITE REDUNDANCY

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

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

3.1 TCP/IP Interface Requirements

To enable the delivery of data, a transfer control protocol is required that contains addressing and control information. CTS Communications Interface utilizes TCP/IP protocol, with Ethernet circuits. A full explanation of TCP/IP is beyond the scope of this document. The requirements for the TCP/IP interface are defined in the supplement to this document, 'TCP/IP for NMS Participant Input Interface Specification'.

3.2 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.

4.0   GENERAL PARTICIPANT INPUT MESSAGE PROCESSING

4.1   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. CTS will not attempt to correlate input coming in over these multiple inputs. Participants with multiple input connections should ensure that all transactions for any given security symbol (e.g., ABC) are transmitted over the same line throughout the day. Should transactions for the same security symbol be transmitted simultaneously over separate connections, CTS would <u>not</u> guarantee the order of the input.

Error Recovery Techniques, such as communications hardware error detection and retries, allow a choice of user options, permitting the application modules to concern themselves with "higher level" error recovery, e.g., resetting the logical connection, resetting the channel, etc. Each Participant is supplied with primary data center IP addresses/ports and disaster recovery center IP addresses/ports. In the event the primary data center is unavailable, each Participant will be required to switch to the disaster recovery center IP addresses/ports.

4.2   Restart Considerations

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

4.3   General Design Considerations

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

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

4.4   Basic Requirements

All transmissions are performed using the USASCII character code set as specified in the USA Standard Code for Information Interchange charts in **Appendix B**.

5.0 TRANSMISSION CHARACTERISTICS

5.1 Transmission Block

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

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

TCP/IP Header	Block Length Header	S T X	Block Header	U S	Message-1 Header & Text	U S	Message-n Header & Text	E T X	*P* *A* *D*

1000 Byte Block (Max) from Block Length Header to PAD*

*CTS requires that the length of the block be an '**even**' number. In the event that the length of the block is not an even number, a PAD character representation consisting of a HEX '**FF**' character is required after the ETX control character.

5.2 Data Format

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

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

5.3 TCP/IP Header

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

5.4 Block Length Header

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

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

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

5.5 Block Header

The first record of every block transmitted or received is a Block Header. The Block Header is delimited with a Unit Separator character (US), as is every other record (except the last) in the applicable block. The Block Header is a 10-byte field and the format is:

Field Name	Length (bytes)	Format	Code	Value
Participant ID	2	Alphabetic	AM	NYSE MKT
			BO	NASDAQ OMX BX
			CI	NSX
			IS	ISE
			JA	Bats EDGA
			KX	Bats EDGX
			MW	CHX
			NA	NASDAQ OMX
			ND	FINRA
			NY	NYSE
			PB	NASDAQ OMX PSX
			PC	NYSE Arca ^{SM}
			VX	IEX
			WT	CBSX
			YB	Bats BYX
			ZB	Bats BZX
			SI	CTS
			AL	All Participants
Reserved	8	Alphanumeric	Space-filled	Field Reserved for future use.
Total Length	**10**			

5.6 Expanded Message Header

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

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

EXPANDED MESSAGE HEADER FIELD DESCRIPTIONS

5.6.1   Message Header Field Descriptions

5.6.1.1   Message Category

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

MESSAGE CATEGORY	
Code	**Value**
A	Administrative
C	Control
M	Market Status
P	Prior Day
T	Trade
Y	Index

5.6.1.2 Message Type

The Message Type field is 1 Byte, Alphanumeric (AN). The *source* of the message can either be a Participant or CTS. The Message Type field, along with the Message Category field identifies the message as follows:

MESSAGE CATEGORY*	MESSAGE TYPE	MESSAGE SOURCE**	VALUE
Administrative			
A	F	Participant	Symbol Maintenance
A	M	Part. & CTS	Administrative Unformatted (free form text)
A	R	CTS	Rejection/Warning
A	T	Participant	Market Activity Information
Control			
C	I	Participant	Sequence Inquiry
C	N	CTS	Sequence Information
C	1	CTS	Start of Participant Reporting
C	2	Part. & CTS	End of Participant Reporting
C	4	Part. & CTS	Line Integrity
C	5	Part. & CTS	Test
C	6-9	CTS	Reserved
Market Status			
M	B	Participant	Start of Closing Trade Prices (Most Active Issues)
M	C	Participant	Most Active Issues (Closing Trade Prices)
M	D	Participant	End of Closing Trade Prices (Most Active Issues)
M	E	Participant	Start of Closing Trade Prices
M	F	Participant	Closing Trade Prices
M	G	Participant	End of Closing Trade Prices
M	H	Participant	Start of Bid and Offer Closing Prices
M	I	Participant	Bid and Offer Closing Prices
M	J	Participant	End of Bid and Offer Closing Prices
M	O	Participant	Approximate Trades and Total Dollar Value
M	P	Participant	Crossing Session Summary
Prior Day			
P	C	Participant	Prior Day Trade Correction
P	E	Participant	Prior Day Trade Last Sale
P	X	Participant	Prior Day Trade Cancel/Error
Trade			
T	C	Participant	Trade Correction
T	E	Participant	Trade Last Sale Long
T	G	Part. & CTS	Trading Status
T	L	Participant	Trade Last Sale Short
T	X	Participant	Trade Cancel/Error
Index			
Y	X	Participant	Index Short
Y	Y	Participant	Index Long
Y	V	Participant	Bid and Offer Index Short
Y	W	Participant	Bid and Offer Index Long

*Category Codes are repeated for clarification purposes.
**Defines possible provider(s) of the particular Message Category and Message Type.

5.6.1.3 Originating Participant ID

The Originating Participant ID field is 2 Bytes, Alphabetic (A). It identifies the Originating Participant or Processor (CTS) that initiates the message.

ORIGINATING PARTICIPANT ID	
Code	**Value**
AM	NYSE MKT
BO	NASDAQ OMX BX
CI	NSX
IS	ISE
JA	Bats EDGA
KX	Bats EDGX
MW	CHX
NA	NASDAQ OMX
ND	FINRA
NY	NYSE
PB	NASDAQ OMX PSX
PC	NYSE ARCA [SM]
VX	IEX
WT	CBSX
YB	Bats BYX
ZB	Bats BZX
SI	CONSOLIDATED TAPE SYSTEM

5.6.1.4 Destination Participant ID

The Destination Participant ID field is 2 Bytes, Alphabetic (A). It identifies the Participant to *receive* the message. The Destination of a message is normally the Consolidated Tape System (SI); Control Messages are generated by CTS to all Participants (AL) with the exception of Test messages; Test messages are addressed by CTS to a specific Participant destination as follows:

DESTINATION PARTICIPANT ID	
Code	**Value**
AM	NYSE MKT
BO	NASDAQ OMX BX
CI	NSX
IS	ISE
JA	Bats EDGA
KX	Bats EDGX
MW	CHX
NA	NASDAQ OMX
ND	FINRA
NY	NYSE
PB	NASDAQ OMX PSX
PC	NYSE ARCA ^{SM}
VX	IEX
WT	CBSX
YB	Bats BYX
ZB	Bats BZX
SI	CONSOLIDATED TAPE SYSTEM
AL	ALL CTS PARTICIPANTS

5.6.1.5 Message Sequence Number

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

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

1. If the MSN is less than (n+1), and the Message Status field is set to "0", denoting "Not a Duplicate message", the message is not processed and a Rejection/Warning message is transmitted to the Participant signifying a possible duplicate.

2. If the MSN is less than (n+1), and the Message Status field is set to "1", denoting "a Possible Duplicate message", the message is not processed and no Rejection/Warning message is transmitted to the Participant.

3. If the MSN is greater than (n+1), the message is processed and a Rejection/Warning message is transmitted to the Participant signifying a sequence number gap.

4. The following MSN rollover logic applies when the total input messages for a line becomes greater than "999999":

    - If the next expected MSN on a Participant line exceeds "999900", and a message with a MSN under "000100" is received, it is processed. The next expected MSN is set to that sequence number plus 1.

    - If the last MSN on a Participant line is "999999", upon a rollover the next expected MSN is "000000" on a per Participant input line basis.

Message Sequence Number, *continued*

CTS Treatment of MSN after a failure and recovery depends on the following type of restart:

Type of Restart	Recovery Condition
'WARM'	CTS failed but is able to recover; Participants are expected to transmit MSNs greater than the MSN of the last message received from the Participant. In this case, a Participant should transmit to CTS a Sequence Inquiry message. Upon receipt, CTS will transmit a Sequence Information message with the next expected sequence number from the Participant. The Regional Reference Number provided as part of the Sequence Information message is the last Regional Reference Number received on the line. In instances of a warm start, the next anticipated sequence number would be returned to the Participant.
'COLD'	CTS failed and is unable to perform a WARM recovery; after recovery, CTS will accept Participant messages with a sequence number greater than zero. However, Participants should keep track of the MSNs already transmitted and should <u>not</u> transmit any messages with the same MSN as a prior message transmitted to CTS. A zero sequence number and a space-filled RRN would be returned in the Sequence Information message. In instances of a cold start, a zero sequence number and a space-filled RRN would be returned in the Sequence Information message.

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 **within ten (10) minutes as per SEC requirement.**

If a Participant inputs a **Sequence Inquiry** (Category C Type I) message, CTS will respond with a **Sequence Information** (Category C Type N) message with the **'Current Sequence Number'** field populated with the next expected Sequence Number from the Participant and the **'Last Participant Regional Reference Number Received'** field populated with the last Regional Reference Number from the Participant.

5.6.1.6   Message Status

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

Message Status	
Code	**Value**
0	**Not a Duplicate**
1	**Possible Duplicate**

5.6.1.7   Message Header Identifier

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

Value	Description
B	**New Expanded Message Header (33 bytes)**
Other than B	**Old Message Header (21 bytes)**

For CTS messages generated back to the Participant:

When a Participant sends to CTS the Expanded Message Header, the 'Message Header Identifier' field is populated with the value 'B' indicating New Expanded Message Header.

5.6.1.8   Reserved

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

5.6.1.9 Regional Reference Number (RRN)

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

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

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

Note: In addition to the Regional Reference Number in the Message Header, the Trade Correction and Trade Cancel/Error messages contain a required Regional Reference Number field used to identify the transaction being adjusted.

5.6.2.0   **Timestamp 1**

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

- **If from an Exchange: Timestamp 1** denotes the Exchange Matching Engine Publication timestamp for a transaction. Exchanges use a clock sync methodology ensuring that timestamps are accurate within tolerances of 100 microseconds or less. Exchanges shall provide the timestamp in terms of the number of microseconds since midnight Eastern Time (ET).

- **If from the FINRA Alternative Display Facility (ADF) and/or a FINRA Trade Reporting Facility (TRF): Timestamp 1** denotes the time of execution that a FINRA member reports to the FINRA ADF or a FINRA TRF. FINRA shall convert times that its members report to it in seconds or milliseconds to microseconds and shall provide such times to the Processor in microseconds since midnight Eastern Time (ET).

For the ASCII-printable base95 allowable characters reference **Appendix G**.

5.6.2.1   **Timestamp 2**

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

- **If from an Exchange: Timestamp 2** field will be blank.

- **If from the FINRA Alternative Display Facility (ADF) or a FINRA Trade Reporting Facility (TRF):**

  - **If the FINRA ADF or a FINRA TRF** provides a proprietary feed of trades reported by the facility, then the FINRA facility will publish the time of the transmission as also published on the facility's proprietary trade feed. The TRF or ADF shall convert times that its members report to it in seconds or milliseconds to microseconds and shall provide such times to the Processor in microseconds since midnight Eastern Time (ET).

  - **If the FINRA ADF or the FINRA TRF facility** does **not** have a proprietary trade feed then the **Timestamp 2** field will be blank.

For the ASCII-printable base95 allowable characters reference **Appendix G**.

Timestamp, *continued*

Timestamps Sample:

Timestamp 1 / Timestamp 2 – Each 6 Bytes in length, ASCII Printable base95							
Wall Time ET	base95						Microseconds since midnight
04:00:00.000000	!	q	k	J	r	C	14400000000
09:30:00.000000	$	G	t	2	a		34200000000
10:11:33.015317	$	f	N	x	&	O	36693015317
12:30:00.000000	%	m	M	j	W	R	45000000000
16:00:00.000000	'	J	0	l	L	M	57600000000
20:10:00.000000	)	D	@	&	?	>	72600000000

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

The following CTS messages are generated back to the Participant:

MESSAGE CATEGORY	MESSAGE TYPE	MESSAGE SOURCE	VALUE
Administrative			
A	M	Part. & CTS	Administrative Unformatted (free form text)
A	R	CTS	Rejection/Warning
Control			
C	N	CTS	Sequence Information
C	1	CTS	Start of Participant Reporting
C	2	Part. & CTS	End of Participant Reporting
C	4	Part. & CTS	Line Integrity
C	5	Part. & CTS	Test
Trade			
T	G	Part. & CTS	Trading Status

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

6.0   MESSAGE FORMATS

The Message Category and Message Type identify the Message and determine the format of the text. Message formats are fixed field formats (with the exception of Administrative and some Control messages which have unformatted text).
Reference: **Appendix D** *- 'Glossary'*

This section outlines the message formats used to transmit trade information into CTS. If the input fails any of the message text validations, a reject message is returned to the Participant on the line from which the original message was sent.
Reference: **Appendix E** *- 'Input Error Conditions'*

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

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

6.1   Category A – Administrative/Announcement/Market Status/Rejection/Warning Messages

The Category A messages consists of the following Category and Types:

Message Category	Message Type	Value
A	**F**	Symbol Maintenance
A	**M**	Administrative Unformatted (free form text)
A	**R**	Rejection/Warning
A	**T**	Market Activity Information

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

6.1.1　　Category A Type F – Symbol Maintenance

The Symbol Maintenance format is used by the New York Stock Exchange (NYSE) and NYSE MKT Stock Market to input Symbol Maintenance including instructions for message dissemination to CTS, at any time during the day, including before Market Open and after Market Close. This message will be forwarded to the Web Admin Facility (WAF) to be scheduled and disseminated by operators at the CTS Control Center.

The **Category A Type F** Symbol Maintenance format is as follows:

Field Name	Length (bytes)	Description
Message Header	**33**	Message Header
Admin Identifier	24	Alphanumeric - Left Justified, Blank Filled. Each formatted administrative message will contain a unique set of alphanumeric characters, which corresponds to a specific administrative message text and its accompanying instructions.
Reserved	6	Alphanumeric – Space-filled Reserved for Future Use
Instructions	26	Alphanumeric Field, Left Justified, Blank Filled. Contains scheduling instructions for CTS Control Centers regarding the dissemination of the administrative message.
Reserved	6	Alphanumeric – Space-filled Reserved for Future Use
Admin Text	902	Alphanumeric Field, Left Justified, Blank Filled. Free Form administrative informational message text
Total Length	**997**	

6.1.2   Category A Type M – Administrative Unformatted (free form text)

The Administrative Unformatted (free form text) format is designed to facilitate non-computerized miscellaneous information messages to the CTS Control Center from a Participant or from CTS to a Participant. The Administrative Unformatted message consists of the Message Header immediately followed by free form text of variable length not to exceed three hundred and four (300) characters. The Administrative Unformatted (free form text) message is disseminated over the CTS Multicast Output in the same format as it is transmitted. For Network B Bond and Local Issues that are included in the CTS database, the Equity fixed format should be used for reporting Corrections, Cancels or Errors. Otherwise, a Category A Type M Administrative message must be used. If an administrative message is used for reporting corrections, cancels or errors, the following data should be provided broken down as follows:

Corrections	Cancels or Errors
Original Security Symbol	Security Symbol
Original User Origin Code	User Origin Code
Original Volume	Volume
Original Price	Price
Original Sale Condition	Sale Condition
Original Approximate Time of Transmission	Approximate Time of Transmission
Original Security Symbol	
Correct User Origin Code	
Correct Volume	
Correct Price	
Correct Sale Condition	

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

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

6.1.3   Category A Type R – Rejection/Warning

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

Reference: **Appendix E** *– 'Input Error Conditions' for the entire list of Error Codes.*

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

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

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

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

6.1.3   Category A Type R – Rejection/Warning, continued

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

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

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

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

6.1.4   Category A Type T – Market Activity Information

The Market Activity Information format is used to report market activity related information. Market Activity Information messages are directly routed by the CTS processor to the Multicast Output in the same format as it is received.

The **Category A Type T** Market Activity Information format is as follows:

Field Name	Length (bytes)	Description
Message Header	**33**	Message Header
Reserved	3	Alphanumeric – Space-filled Reserved for Future Use
Text	Variable (Participant to CTS) 300	Alphanumeric Free Form administrative informational message text.
Total Length	**Variable (maximum 336)**	

6.2   Category C – Control Messages

Control Messages are used to notify CTS Participants of specific system events. Control Messages can consist of a Message Header only, or of a Message Header and Message Text.

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

A. Control Messages Consisting of <u>Message Header Only</u>

Category	Type	Value
C	1	Start of Participant Reporting
C	2	End of Participant Reporting
C	4	Line Integrity (Participant to CTS)

B. Control Messages Consisting of <u>Message Header and Message Text</u>

Category	Type	Value
C	I	Sequence Inquiry
C	N	Sequence Information
C	4	Line Integrity (CTS to Participant)
C	5	Test

Note: Control (Category C) messages will be accepted and processed by CTS if received ***before*** the Participant Start of Day (SOD).

6.2.1   Category C Type 1 – Start of Participant Reporting

The Start of Participant Reporting message consists of the **Message Header only** and is generated 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, trades with a **.**TEST suffix, Prior Day Trades, Prior Day Corrections, Prior Day Cancel/Errors, Correction and Cancel messages to CTS **before** the Start of Participant Reporting message has been initiated.

6.2.2   Category C Type 2 – End of Participant Reporting (EOPR)

The End of Participant Reporting message consists of the **Message Header only** and can be automatically generated by CTS to a Participant (once CTS executes an 'End of Participant Reporting Trades' command) or generated by a Participant to CTS to signify the end of trade reporting for a Participant. (A Participant can elect to generate this message at the completion of its' scheduled quoting day, **or** request that CTS schedule this message to be automatically generated at the end of each trading day on behalf of a Participant). After the EOPR message is generated, CTS will not accept any further trade or control messages from the Participant, however, CTS will continue to accept administrative messages following transmission of an EOPR message.

6.2.3   Category C Type 4 – Line Integrity – Participant to CTS

The **Participant to CTS** Category C Type 4 Line Integrity message is for optional use by a Participant. This message 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.) to provide verification of input line integrity either on a primary or backup input line. **A Participant is required to input C4 messages every 5 seconds regardless of the threshold interval utilized by the Participant.** If a Participant does not input C4 messages or data to 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 **Participant to CTS** Category C Type 4 Line Integrity message will consist of the **Message Header** only.

Category C Type 4 – Line Integrity – Participant to CTS, continued

The Message Header Field Descriptions will be the same as in this CTS Participant Communications Interface Specification, with the **exception** of the **Message Sequence Number (MSN)** field which will be populated as follows:

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

Note:
- CTS will wait until a Participant has sent/received a Start of Day (SOD) before beginning to automatically disconnect a Participant if a C4 or data is not received from the Participant.

- A Category C Type 4 (C4) Line Integrity message coming **from a Participant to CTS** is mutually exclusive from a C4 Input Message **sent by CTS to a Participant** (there is no correlation between the two C4 messages).

6.2.4 Category C Type I – Sequence Inquiry

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

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

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

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

6.2.5   Category C Type N – Sequence Information

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

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

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

6.2.6   Category C Type 4 – Line Integrity – CTS to Participant

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

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

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

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

6.2.7   Category C Type 5 – Test

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 <u>only</u> message in a block.

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

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

6.3 Category M– Market Status Messages

Market Status Messages are used to provide market data information.
Market Status Messages can consist of a **Message Header only**, or, of a **Message Header and Message Text**.

Market Status Messages consisting of the **Message Header only** are used to denote the Start and End of **Market Status** Messages.

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

A. Market Status Messages consisting of the <u>Message Header only and the exception noted below</u>*.

Category	Type	Value
M	B*	Start of Most Active Issues*
M	D	End of Most Active Issues
M	E	Start of Closing Trade Prices
M	G	End of Closing Trade Prices
M	H	Start of Bid/Offer Closing Prices
M	J	End of Bid/Offer Closing Prices

* The Category M Type B - Start of Most Active Issues Message is followed by a 2-byte 'Number of Most Active Issues' field.

B. Market Status Messages consisting of the <u>Message Header and Message Text</u>:

Category	Type	Value
M	C	Most Active Issues
M	F	NYSE MKT Stock Market or NYSE Closing Trade Prices
M	I	Bid/Offer Closing Prices
M	O	Approximate Trades and Total Dollar Value
M	P	Crossing Session

6.3.1 Category M Type B – Start of Most Active Issues

The Start of Most Active Issues message **consists of the Message Header followed by a 2-byte 'Number of Most Active Issues'** field and is used to indicate that the Start of Most Active Issues messages will immediately follow.

The **Category M Type B** Start of Most Active Issues format is as follows:

Field Name	Length (bytes)	Description
Message Header	**33**	Message Header
Number of Most Active Issues	2	Numeric – Zero-filled Contains the total number of most active issues
Total Length	**35**	

6.3.2 Category M Type D – End of Most Active Issues

The End of Most Active Issues message consists of the **Message Header only** and is used immediately following the end of the Most Active Issues messages to indicate that the Most Active Issues have been completed.

6.3.3 Category M Type E – Start of Closing Trade Prices

The Start of Closing Trade Prices consists of the **Message Header only** and is used to indicate that the Closing Trade Price messages will immediately follow.

6.3.4 Category M Type G – End of Closing Trade Prices

The End of Closing Trade Prices message consists of the **Message Header only** and is used immediately following the end of the Closing Trade Prices messages to indicate that the Closing Trade Prices have been completed.

6.3.5   Category M Type H – Start of BID/OFFER Closing Trade Prices

The Start of BID/OFFER Closing Trade Prices message consists of the **Message Header only** and is used to indicate that the BID/OFFER Closing Trade Price messages will immediately follow.

6.3.6   Category M Type J – End of BID/OFFER Closing Trade Prices

The End of BID/OFFER Closing Trade Prices message consists of the **Message Header only** and is used immediately following the end of the BID/OFFER Closing Trade Prices messages to indicate that the BID/OFFER Closing Trade Prices have been completed.

6.3.7   Category M Type C –Most Active Issues

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

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

Message Category	Type
M	C

Field Name	Length (bytes)
Message Header	**33**
Security Symbol	11
Reserved	1
Trade Volume	11
Open Price Denominator Indicator	1
Open Price	12
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Last Price Denominator Indicator	1
Last Price	12
Net Change Tick Indicator	1
Net Change in Price Denominator Indicator	1
Net Change in Price	12
Reserved	13
Total Length	**135**

6.3.8   Category M Type F – NYSE MKT Stock Market or NYSE Closing Trade Prices

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

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

Message Category	Type
M	F

Field Name	Length (bytes)
Message Header	**33**
Security Symbol	11
Reserved	1
Trade Volume	11
Open Price Denominator Indicator	1
Open Price	12
High Price Denominator Indicator	1
High Price	12
Low Price Denominator Indicator	1
Low Price	12
Last Price Denominator Indicator	1
Last Price	12
Net Change Tick Indicator	1
Net Change in Price Denominator Indicator	1
Net Change in Price	12
Reserved	13
Total Length	**135**

6.3.9   Category M Type I –BID/OFFER Closing Prices

The BID/OFFER Closing Prices format is used to report the closing quote prices for issues regardless of trading activity on the NYSE MKT Stock Market. In addition, this format is also used to report the closing BID/OFFER prices for issues which **did not trade on the NYSE during the day**. The entire BID/OFFER Closing Prices is reported with one message generated per issue. The BID/OFFER Closing Prices Messages are preceded by a Start of BID/OFFER Closing Prices Messages and followed by an End of BID/OFFER Closing Prices Messages. A Participant is required to utilize **all** fields in the BID/OFFER Closing Price message.

Message Category	Type
M	I

Field Name	Length (bytes)
Message Header	**33**
Security Symbol	11
Reserved	1
Closing Bid Price Denominator Indicator	1
Closing Bid Price	12
Closing Offer Price Denominator Indicator	1
Closing Offer Price	12
Reserved	14
Total Length	**85**

6.3.10   Category M Type O – Approximate Trades and Total Dollar Value

The Approximate Trades and Total Dollar Value format 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.

Message Category	Type
M	O

Field Name	Length (bytes)
Message Header	**33**
Total Trades	9
Reserved	1
Dollar Value Denominator Indicator	1
Dollar Value	22
Reserved	13
Total Length	**79**

6.3.11   Category M Type P –Crossing Session

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

Message Category	Type
M	P

Field Name	Length (bytes)
Message Header	**33**
Crossing Session I Trade Volume	11
Crossing Session II Dollar Value Denominator Indicator	1
Crossing Session II Dollar Value	22
Crossing Session II Trade Volume	11
Reserved	13
Total Length	**91**

6.4 Category P– Prior Day Messages

Prior Day messages are used to report trades, corrections, cancels or errors for transactions that occurred earlier than the current day and had not been reported.

> **Note**: Prior Day (Category P) messages will be accepted and processed by CTS if received **_before_** the Participant Start of Day (SOD).

Category P messages consist of the following Category and Types:

Message Category	Type	Value
P	C	Prior Day Trade Correction
P	E	Prior Day Trade Last Sale
P	X	Prior Day Trade Cancel/Error

6.4.1   Category P Type C –Prior Day Trade Correction

The Prior Day Trade Correction format is used to correct a Bond, Listed Equity or Local Issue transaction originally reported earlier than or during the current day using the Prior Day Trade Report Message Format. All other corrections should be reported using the Trade Correction Message format. Participants must provide the original trade information for the message to be accepted by CTS.

Message Category	Type
P	C

Field Name	Length (bytes)
Message Header	**33**
Security Symbol	16
Trade Reporting Facility Indicator	1
Reserved	13
Prior Day Trade Date (MMDDYY)	6
Reserved	2
Prior Day Trade Time (HMS)	3
Stop Stock Indicator	1
Sale Condition	4
Seller's Sale Days	3
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Issue Type	1
Output Network	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	11
Prior Day Trade Date (MMDDYY)	6
Reserved	2
Prior Day Trade Time (HMS)	3
New Stop Stock Indicator	1
New Sale Condition	4
New Seller's Sale Days	3
New Price Denominator Indicator	1
New Trade Price	12
New Trade Volume	9
New Issue Type	1
New Output Network	1
New Trade Through Exempt Indicator	1
New Short Sale Restriction Indicator	1
Reserved	11
Total Length	**175**

6.4.2   Category P Type E –Prior Day Trade Last Sale

The Prior Day Trade Last Sale format is used to report Bond, Listed Equity or Local Issue trades which occurred earlier than the current day and was not reported.

Message Category	Type
P	E

Field Name	Length (bytes)
Message Header	**33**
Prior Day Trade Date (MMDDYY)	6
Reserved	2
Prior Day Trade Time (HMS)	3
Security Symbol	16
Stop Stock Indicator	1
Price Denominator Indicator	1
Sale Condition	4
Seller's Sale Days	3
Trade Price	12
Trade Volume	9
Issue Type	1
Output Network	1
Trade Reporting Facility Indicator	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	10
Total Length	**105**

6.4.3 Category P Type X –Prior Day Trade Cancel/Error

The Prior Day Trade Cancel/Error format is used for Bond, Listed Equity or Local Issues 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 or during the current day using the Prior Day Trade Report Message or Prior Day Trade Correction Message formats. All other cancel/error messages should be reported using the Trade Cancel/Error Message. Participants must provide the original trade information for the message to be accepted by CTS.

Message Category	Type
P	X

Field Name	Length (bytes)
Message Header	**33**
Security Symbol	16
Cancel or Error	1
Trade Reporting Facility Indicator	1
Reserved	12
Prior Day Trade Date (MMDDYY)	6
Reserved	2
Prior Day Trade Time (HMS)	3
Stop Stock Indicator	1
Sale Condition	4
Seller's Sale Days	3
Price Denominator Indicator	1
Trade Price	12
Trade Volume	9
Issue Type	1
Output Network	1
Trade Through Exempt Indicator	1
Short Sale Restriction Indicator	1
Reserved	11
Total Length	**119**

6.5 Category T– Trade Messages

Trade messages are used to report the "last sale" or trade data for Network B Bond, Listed Equity or Local Issue, perform automated corrections, cancellations or errors of trade reports (originally reported using fixed formats), and report Opening Delays, Trading Halts, Resumes, Indications, Imbalances, and T-Times.

Category T messages consist of the following Category and Types:

Message Category	Message Type	Value
T	**C**	Trade Correction
T	**E**	Trade Last Sale Expanded
T	**G**	Trading Status
T	**L**	Trade Last Sale Short
T	**X**	Trade Cancel/Error

6.5.1   Category T Type C – Trade Correction

The Trade Correction format allows a Participant to perform automated corrections to a trade report for those symbols, which are in the CTS database (Network B Bond, Listed Equity or Local Issue) and which were originally reported using a fixed trade format. A Regional Reference Number must be assigned to the original transaction that is to be corrected. The Regional Reference Number **must be unique and increasing** (not necessarily in sequential order) per Participant or by stock per Participant.

> **Note 1**: To identify a transaction being adjusted, the Regional Reference Number assigned to the original trade, or if the original trade has already been corrected, the Regional Reference Number of the most recent correction to the trade, is to be reflected in the Regional Reference Number field of the Correction Message Text. Trades, which have been previously canceled or errored, cannot be corrected.

Message Category	Type
T	C

Field Name	Length (bytes)
Message Header	**33**
Regional Reference Number *(of transaction being corrected)*	6
Reserved	2
Security Symbol	16
New Price Denominator Indicator	1
Reserved	16
New Stock Stop Indicator	1
New Sale Condition	4
New Seller's Sale Days	3
New Trade Reporting Facility Indicator	1
New Trade Through Exempt Indicator	1
Reserved	3
New Trade Price	12
New Trade Volume	9
Reserved	31
Total Length	**139**

> **Note 2**: Trade Correction (Category T, Type C) messages will be accepted and processed by CTS if received *__before__* the Participant Start of Day (SOD).

6.5.2   Category T Type E – Trade Last Sale Report Expanded

The Trade Last Sale Report Expanded format is used to report the 'last sale' or trade data, for Network B Bond, Listed Equity or Local Issue, with any of the following requirements:

a.	The stock symbol exceeds 11 characters
b.	Seller's Sale Days is greater than 99 days
c.	More than 1 sale condition is required
d.	Whole price exceeds 3 characters
e.	Numerator exceeds 3 characters
f.	Volume exceeds 7 characters
g.	Trade Reporting Facility is required
h.	Trade Through Exemption is required

Note 1: A Participant can also report Bond trades using the free form textual messages that are transmitted directly on the Consolidated Multicast Line as Bond Trade Information messages.

Note 2: Trade Last Sale Report Expanded (Category T, Type E) messages with **Sale Conditions 'U' and 'T'** will be accepted and processed by CTS if received _**before**_ the Participant Start of Day (SOD).

Message Category	Type
T	E

Field Name	Length (bytes)
Message Header	**33**
Security Symbol	16
Reserved	1
Local Issue Indicator	1
Stop Stock Indicator	1
Price Denominator Indicator	1
Reserved	1
Sale Condition	4
Seller's Sale Days	3
Reserved	1
Trade Reporting Facility Indicator	1
Trade Through Exempt Indicator	1
Reserved	2
Trade Price	12
Trade Volume	9
Reserved	5
Total Length	**92**

6.5.3 Category T Type G – Trading Status

The Trading Status format allows a Participant that is the listing exchange for a security, which is included in the CTS database (Network B Bond, Listed Equity or Local Issue) 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.

Message Category	Type
T	G

Field Name	Length (bytes)
Message Header	**33**
Security Symbol	16
Type	1
In View of Common	1
Halt Reason	1
Price Denominator Indicator	1
Low Indication Price	12
High Indication Price	12
Last Price/Opening (Reopening) Quote Midpoint Denominator Indicator	1
Last Price/Opening (Reopening) Quote Midpoint Price	12
Buy Volume	9
Sell Volume	9
Trade Dissemination Time	4
Due to Related Security Indicator	1
Cancel/Correction Indicator	1
Short Sale Restriction Indicator	1
Reserved	4
Total Length	**119**

Note 1: 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.

Category T Type G – Trading Status, continued

Note 2: 'Limit Up-Limit Down' is not applicable to Local Issues or Bonds.

Note 3: The redefined Last Price/Opening (Reopening) Quote Midpoint Price field will be <u>rejected back to a Participant</u> with a *new* Participant Input Rejection (Error) / Warning **Error Code 9** (*reference to Appendix E: Input Error Conditions)* 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).
- A previous 'Quote Midpoint' value was received for the NMS Stock. (In this instance, if the previous Quote Midpoint was in error, the listing exchange can contact SIAC and request a manual override of the Quote Midpoint).
- An eligible trade was received from the listing exchange prior to the 'Quote Midpoint' value.

Note 4: Trading Status (Category T, Type G) messages will be accepted and processed by CTS if received ***before*** the Participant Start of Day (SOD).

6.5.4 Category T Type L – Trade Last Sale Report

The Trade Last Sale Report format is used to report the "last sale" or trade data, for listed equity, local issues and bonds, when there is no requirement to use the Type-E, Expanded message format.

Note: Trade (Category T, Type L) messages with Sale Conditions **'U' or 'T'** will be accepted and processed by CTS if received *__before__* the Participant Start of Day (SOD).

Message Category	Type
T	L

Field Name	Length (bytes)
Message Header	**33**
Reserved	1
Sale Condition	1
Seller's Sale Days	2
Price Denominator Indicator	1
Reserved	1
Stop Stock Indicator	1
Trade Whole Price	3
Trade Numerator Price	3
Trade Volume	7
Security Symbol	11
Total Length	**64**

6.5.5   Category T Type X – Trade Cancel/Error

The Trade Cancel/Error format allows a Participant to perform automated cancellations or errors of trade reports for those symbols that are in the CTS database and which were originally reported using a fixed message format. A Regional Reference Number must be assigned to the original transaction that is to be corrected. The Regional Reference Number must be *unique and increasing* (not necessarily in sequential order) per Participant or by symbol per Participant.

Note 1: To identify a transaction being adjusted, the Regional Reference Number assigned to the original trade, or if the original trade has already been corrected, the Regional Reference Number of the most recent correction to the trade is to be reflected in the Regional Reference Number field of the Correction Message Text. **Trades which have been cancelled or errored cannot be corrected.**

Note 2: Trade Cancel/Error (Category T, Type X) messages will be accepted and processed by CTS if received *before* the Participant Start of Day (SOD).

Message Category	Type
T	X

Field Name	Length (bytes)
Message Header	**33**
Regional Reference Number *(of transaction being cancelled or errored)*	6
Reserved	2
Security Symbol	16
Cancel or Error	1
Reserved	16
Trade Reporting Facility Indicator	1
Trade Through Exempt Indicator	1
Reserved	3
Total Length	**79**

6.6   Category Y– Index Messages

Category Y messages consist of the following Category and Types:

Message Category	Message Type	Value
Y	**A**	Short Index (NYSE only)
Y	**X**	Short Index
Y	**Y**	Long Index
Y	**V**	Short Bid and Offer Index
Y	**W**	Long Bid and Offer Index

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

6.6.1   Category Y Type A (NYSE only) and Type X – Short Index

The Short Index format allows up to five indices to be included and contains the total number of indices, each index's I.D. and value.

Message Category	Type
Y	A
Y	X

Field Name	Length (bytes)
Message Header	**33**
Number of Indices	2
Index Symbol #1	3
Reserved	1
Index Sign	1
Index Value (Includes Decimal Point)	8
Index Symbol #n	3
Reserved	1
Index Sign	1
Index Value (Includes Decimal Point)	8
Total Length	**48 - 100**

➔
Can Include up to 5 Index Groups

Note: Index (Category Y Type A) messages will be accepted and processed by CTS if received *__before__* the Participant Start of Day (SOD).

6.6.2   Category Y Type Y – Long Index

The Long Index format allows up to twenty indices to be included and contains the total number of indices, each index's I.D. and value. This message is used instead of the Short Index message when any of the following criteria apply:

    a.   Number of index groups exceeds five (5)

    b.   Symbol exceeds 3 characters

    c.   The index value exceeds 8 characters (including the decimal point) or the flexible price scheme is required

Message Category	Type
Y	Y

Field Name	Length (bytes)
Message Header	**33**
Number of Indices	2
Index Symbol #1	11
Index Value Denominator Indicator	1
Index Value	12
Index Sign	1
Reserved	5
Index Symbol #n	11
Index Value Denominator Indicator	1
Index Value	12
Index Sign	1
Reserved	5
Total Length	**65 - 635**

→
Can Include up to 20 Index Groups

Note: Index (Category Y Type Y) messages will be accepted and processed by CTS if received ***before*** the Participant Start of Day (SOD).

6.6.3   Category Y Type V – Short Bid and Offer Index

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

Message Category	Type
Y	V

Field Name	Length (bytes)
Message Header	**33**
Number of Indices	2
Index Symbol #1	3
Reserved	1
Bid Index Sign	1
Offer Index Sign	1
Bid Index Value (Includes Decimal Point)	8
Offer Index Value (Includes Decimal Point)	8
Index Symbol #n	3
Reserved	1
Bid Index Sign	1
Offer Index Sign	1
Bid Index Value (Includes Decimal Point)	8
Offer Index Value (Includes Decimal Point)	8
Total Length	**57 - 145**

➔ **Can Include up to 5 Index Groups**

Note: Index (Category Y Type V) messages will be accepted and processed by CTS if received ***before*** the Participant Start of Day (SOD).

6.6.4   Category Y Type W – Long Bid and Offer Index

The Long Bid and Offer Index format is a variable length record and can accommodate a maximum number of 20 index groups. Each group contains the Bid and Offer value of a stock index. This message is used instead of the Short Bid and Offer Index message when any of the following criteria apply:

a.   Number of Bid and Offer index groups exceeds five (5)

b.   Symbol exceeds 3 characters

c.   The Bid and/or Offer index value exceeds 8 characters (including the decimal point) or the flexible price scheme is required.

Message Category	Type
Y	W

Field Name	Length (bytes)
Message Header	**33**
Number of Indices	2
Index Symbol #1	11
Index Value Denominator Indicator	1
Bid Index Value	12
Offer Index Value	12
Bid Index Sign	1
Offer Index Sign	1
Reserved	4
Index Symbol #n	11
Index Value Denominator Indicator	1
Bid Index Value	12
Offer Index Value	12
Bid Index Sign	1
Offer Index Sign	1
Reserved	4
Total Length	**77 - 875**

➔
Can Include up to 20 Index Groups

Note: Index (Category Y Type W) messages will be accepted and processed by CTS if received ***before*** the Participant Start of Day (SOD).

7.0   FIELD DESCRIPTIONS

Field Name	Bytes	Description
BID INDEX SIGN	1	Alphabetic, Space-filled. The Bid Index positive or negative value of the Bid Index's calculation formula. <table><tr><th>Code</th><th>Value</th></tr><tr><td>Blank</td><td>Positive Value</td></tr><tr><td>A</td><td>Negative Value</td></tr></table>
BID INDEX VALUE	12	Numeric, Right Justified, Zero-filled. The Bid Index whole and fractional or decimal portion information with the Index Value Denominator Indicator determining the price representation. The Bid Index may represent a value of zero. The Bid Index Value represents the value of the index's calculation formula using the current Bid values of the component securities. **Note**: For Government Bonds, the Bid Index Value could reflect a value that is greater than the Offer Index Value.
BID INDEX VALUE (INCLUDES DECIMAL POINT)	8	Numeric, Right Justified, Zero-filled. The Bid Index value may include a decimal point with digits to the right of the decimal or it may represent a value of zero. **Note**: For Government Bonds, the Bid Index Value could reflect a value that is greater than the Offer Index Value.
BUY VOLUME	9	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. The Buy Volume represents the reported imbalance of buy orders without matching sell orders for the security for a Participant. Refer to **Appendix D** for Market Imbalance and Market on Close Imbalance (MOC) definitions.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
CANCEL/ERROR	1	Numeric. Denotes whether the referenced transaction is to be cancelled (buyer and seller agrees to cancel a trade) or errored (error a trade that never took place but was reported). <table><tr><th>Code</th><th>Value</th></tr><tr><td>1</td><td>Cancel</td></tr><tr><td>2</td><td>Error</td></tr></table>
CANCEL/CORRECTION INDICATOR	1	Alphanumeric. Identifies the status of a Price Indication. *(Used with TYPES 5, 6, 7, 8, 9, A, C and D)* <table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>Not a Corrected Price Indication, Cancelled Price Indication, Cancelled Market Imbalance, or Cancelled Trading Range Indication</td></tr><tr><td>1</td><td>Corrected Price Indication</td></tr><tr><td>2</td><td>Cancelled Price Indication, Cancelled Market Imbalance, or Cancelled Trading Range Indication</td></tr></table>
CLOSING BID PRICE	12	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. The Price is the whole and fractional or decimal portion of the Participant closing price information with the Closing Bid Price Denominator Indicator determining the price representation. The Participant Closing Bid Price represents the last qualifying quote for a security by a Participant during the trading day.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
CLOSING BID PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
CLOSING OFFER PRICE	1	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. The Price is the whole and fractional or decimal portion of the Participant closing price information with the Closing Offer Price Denominator Indicator determining the price representation. The Participant Closing Offer Price represents the last qualifying quote for a security by a Participant during the trading day.
CLOSING OFFER PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
CROSSING SESSION I TRADE VOLUME	11	Numeric, Right Justified, Zero-filled. 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 DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **DOLLAR VALUE DENOMINATOR INDICATOR** for code values

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
CROSSING SESSION II DOLLAR VALUE	22	Numeric, Right Justified, Zero-filled. The Dollar Value is the whole and decimal portion, if any of the total dollar worth of the total daily trade transactions.
CROSSING SESSION II TRADE VOLUME	11	Numeric, Right Justified, Zero-filled. 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 MKT Stock Market are executed at the close price of the NYSE MKT Stock Market.
DOLLAR VALUE	22	Numeric, Right Justified, Zero-filled. The Dollar Value is the whole and decimal portion, if any of the total dollar worth of the total daily trade transactions. **The DOLLAR VALUE PRICE DENOMINATOR INDICATOR** code determines the value representation.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
DOLLAR VALUE DENOMINATOR INDICATOR	1	Alphanumeric. The Dollar Value Denominator Indicator field can contain one of the codes listed below. Otherwise, this field is **zero-filled**. It is used to identify the dollar value of the fraction or location of decimal.

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

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
DUE TO RELATED SECURITY INDICATOR	1	Numeric. This Opening Delay or Trading Halt is used when events relating to one security will affect the price and performance of another security. Due to Related Security can be used by itself or in conjunction with a Halt Reason (Regulatory or Non-Regulatory). Used with **TYPE 1 & 2**. Mutually exclusive with In View of Common Indicator set to 0.

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

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
HALT REASON	1	Alphanumeric. Otherwise, this field is space-filled. This field is otherwise space-filled. Denotes the reason for the Opening Delay or Trading Halt. Used with '**TYPE' 1 & 2**. May be used when Due to Related Security Indicator is set to '1'. Mutually exclusive with "In View of Common Indicator' set to 0.

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

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
HIGH INDICATION PRICE	12	Numeric. Right Justified, Zero-filled. Otherwise, this field is zero-filled. The High Indication Price is the whole, fractional or decimal portion of the high indication price. The High Indication Price Denominator Indicator determines the price representation. The High Indication Price represents an approximation of what the high end "Offer" price of a security's trading range may be. It is used for a security that is not Opening Delayed or Trading Halted, i.e., Trading Range Indication or following an Opening Delay or a Trading Halt, i.e., Price Indication. **Note**: For Government Bonds, the HIGH INDICATION PRICE (i.e., BID) could reflect a value that is greater than the LOW INDICATION PRICE (i.e., Offer).
HIGH PRICE	12	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. The High Price is the whole and fractional or decimal portion of the High Price information with the High Price Denominator Indicator determining the price representation The High Price represents the highest price paid for a security during the trading day **Note:** In instances when no trades qualify to be included in the "High" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
HIGH PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes. **Note:** In instances when no trades qualify to be included in the "High" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled
IN VIEW OF COMMON	1	Numeric. Identifies whether matters affecting the common stock of a company also affect the performance of the non-common associated securities, e.g., warrants, rights, preferred, classes, etc. Those securities (which must be of the same company) are globally Opening Delayed, Trading Halted, Resumed or No Open/No Resume for a Participant in view of the common stock Used with **TYPE 1, 2, 3 4 and B**.

Code	Value
0	Not In View of Common
1	In View of Common

|
| INDEX SIGN | 1 | Alphabetic, Space-filled.

Represents the positive or negative value of the index.

Code	Value
Blank	Positive Value
A	Negative Value

|

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
INDEX SYMBOL	3 or 11	Alphabetic, Left Justified, Space-filled. Contains the Index symbol.
INDEX VALUE (INCLUDES DECIMAL POINT)	8	Numeric, Right Justified, Zero-filled. The Index value may include a decimal point with digits to the right of the decimal or it may represent a value of zero.
INDEX VALUE	12	Numeric, Right Justified, Zero-filled. The Index Value is the whole and fractional or decimal portion information with the Index Value Denominator Indicator determining the price representation. The Index may represent a value of zero. The Index Value represents a statistical composite that measures changes in the economy or in financial markets.
INDEX VALUE DENOMINATOR INDICATOR	1	Numeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
ISSUE TYPE	1	Numeric. Identifies the instrument type relevant to the trade. <table><tr><th>Code</th><th>Value</th></tr><tr><td>0</td><td>CTA Eligible Trade</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>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
LAST PRICE/OPENING (REOPENING) QUOTE MIDPOINT	12	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. **Last Price**: is the whole and fractional or decimal portion of the last price information with the Last Price Denominator Indicator determining the price representation. The Last Price represents the last price for that security either on a Consolidated or an individual Participant basis at the time it is disseminated. **Opening (Reopening) Quote Midpoint**: 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 'Type' 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. **Note 1:** 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 **Note 2:** 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 zero-filled.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
LAST PRICE/ OPENING (REOPENING) QUOTE MIDPOINT DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes. **Note:** In instances when no trades qualify to be included in the "Last" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.
LOCAL ISSUE INDICATOR	1	Numeric. Identifies the instrument type relevant to the trade. <table><thead><tr><th>Code</th><th>Value</th></tr></thead><tbody><tr><td>0</td><td>CTA Eligible Trade</td></tr><tr><td>1</td><td>Local Issue</td></tr><tr><td>2</td><td>Local Trade Report for Bankrupt Issues</td></tr><tr><td>3</td><td>Corporate Bond Trade Report</td></tr><tr><td>4</td><td>Government Bond Trade Report</td></tr><tr><td>5</td><td>Corporate Bond Trade Report for Bankrupt Bonds</td></tr></tbody></table>

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
LOW INDICATION PRICE	12	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. The Low Indication Price is the whole and fractional or decimal portion of the low indication price. The Low Indication Price Denominator Indicator determines the price representation. The Low Indication Price represents an approximation of what the low end "Bid" price of a security's trading range may be. It is used for a security that is not Opening Delayed or Trading Halted, i.e., Trading Range Indication or following an Opening Delay or a Trading Halt, i.e., Price Indication. **Note:** For Government Bonds, the HIGH INDICATION PRICE (i.e., BID) could reflect a value that is greater than the LOW INDICATION PRICE (i.e., OFFER).
LOW PRICE	12	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. The Low Price is the whole and fractional or decimal portion of the Low Price information with the Low Price Denominator Indicator determining the price representation. The Low Price represents the lowest price paid for a security during the trading day. **Note:** In instances when no trades qualify to be included in the "Low" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
LOW PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes. **Note:** In instances when no trades qualify to be included in the "Low" calculation, either on a Consolidated or an individual Participant basis, this field is zero-filled.
NET CHANGE IN PRICE	12	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. The Net Change In Price is the whole or decimal portion of the change in a security's price from the previous day's last price information with the NET CHANGE IN PRICE DENOMINATOR INDICATOR code determining the value representation.
NET CHANGE IN PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
NET CHANGE TICK INDICATOR	1	Alphanumeric. Represents for a security, the upward, downward or unchanged price movement from prior day's closing value: {table below}

Code	Value
0	+
1	-
2	Unchanged

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
NEW (*followed by* 'NAME OF FIELD')	Variable	Please refer to the field name following the word "New" for field description. A field defined as "New" represents the specific field(s) possible new value for a trade that has been corrected.
NUMBER OF INDICES	2	Numeric, Right Justified, Zero-filled. Represents the total number of indices contained in a particular message.
OFFER INDEX SIGN	1	Alphabetic, Space-filled. Represents the positive or negative value of the index's calculation formula. <table><tr><th>Code</th><th>Value</th></tr><tr><td>**Blank**</td><td>Positive Value</td></tr><tr><td>**A**</td><td>Negative Value</td></tr></table>
OFFER INDEX VALUE	12	Numeric, Right Justified, Zero-filled. Represents the value of the index's calculation formula using the current offer values of the component securities. The Offer Index Value is the whole and fractional or decimal portion information with the Index Value Denominator Indicator determining the price representation. The Offer Index may represent a value of zero. **Note:** For Government Bonds, the BID INDEX VALUE could reflect a value that is greater than the OFFER INDEX VALUE.

FIELD DESCRIPTIONS, continued

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

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
OUTPUT NETWORK	1	Alphabetic character. Identifies the ML network on which the output message should be disseminated. This field is used whenever there is no CTS master, and the input message local issue indicator denotes the stock as being a listed equity (field value = 0).

Code	Value
A	Message relates to symbols with NYSE as the primary listed market. The Primary Listing Market Participant ID identifies the primary listing market in instances when the primary market is an Exchange **other than the NYSE.**
B	Message relates to symbols with the NYSE MKT Stock Market or one of the Regional Exchanges as the Primary Market. Message can also be for Local Issues and Bonds. The Primary Listing Market Participant ID identifies the primary listing market in instances when the primary market is an Exchange **other than the NYSE MKT Stock Market**.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
PRICE DENOMINATOR INDICATOR	1	Alphanumeric. Identifies the price denominator of the fraction or the location of the decimal.

SHORT TRADE			
		Price Field Size	
Price Denominator Code	**Denominator Value**	**Whole**	**Numerator**
3	8	3	3
4	16	3	3
5	32	3	3
6	64	3	3
7	128	3	3
8	256	3	3
9	100 (decimals)	3	3

LONG TRADE			
		Price Field Size	
Price Denominator Code	**Denominator Value**	**Whole**	**Numerator**
U	8	11	1
V	16	10	2
W	32	10	2
X	64	10	2
Y	128	9	3
Z	256	9	3
A	10	11	1
B	100	10	2
C	1,000	9	3
D	10,000	8	4
E	100,000	7	5
F	1,000,000	6	6
G	10,000,000	5	7
H	100,000,000	4	8

WHOLE PRICES (ONLY)			
		Price Field Size	
Price Denominator Code	**Denominator Value**	**Whole**	**Numerator**
I	N/A	12	0
NOTE: The maximum whole price allowable is up to 92.2 billion			

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
PRICE DENOMINATOR INDICATOR OF LAST PRICE	1	Alphanumeric. Refer to **PRICE DENOMINATOR INDICATOR** for codes.
PRIOR DAY TRADE	6	Numeric. Represented in **MM/DD/YY** format where: • **MM** = a Right Justified, Zero-Filled month • **DD** = a Right Justified, Zero-Filled day • **YY** = Right Justified, Zero-Filled year Represents the date the prior day trade was executed. In the Prior Day Correction messages, there are two Prior Day Trade Dates, one to denote the date the original trade was executed as reported in a Prior Day Trade and one to denote the corrected date of trade execution. In the Prior Day Cancel/Error messages, the date denotes the reported execution date of the original trade being cancelled or reported in error.
PRIOR TRADE TIME	3	Alphanumeric/Special Character. Format is **HMS** where: • **H** = Hours • **M** = Minutes • **S** = Seconds Modified USASCII character set is used for time (Military Eastern Time) representation. Represents the time the prior day trade was executed. In the Prior Day Correction messages, there are two Prior Day Trade Times, one to denote the time the original trade was executed and one to denote the time the corrected trade was executed. In the Prior Day Cancel/Error messages, the time denotes the reported execution time of the original trade being cancelled or reported in error. A Time conversion table listing USASCII, Hexadecimal and Decimal representation is provided in **Appendix F**.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
REGIONAL REFERENCE NUMBER	6	Alphanumeric, Right Justified, Space-filled. Contains the Regional Reference Number of transaction to be corrected. The Regional Reference Number must correspond to the Regional Reference number in the Message Header of the transaction being corrected, or, if the trade has already been corrected, the Regional reference Number of the most recent correction to the trade. Corrections, Cancels or Errors entered for trades which have already been canceled or errored will be rejected back to the Participant.
RESERVED	N	Alphanumeric. Fields reserved for future use. Reserved fields are space or zero (0) filled unless otherwise defined.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
SALE CONDITION	1	Alphanumeric, Space-filled. 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		PARTICIPANT			SALE COND. UPDATES VOLUME
CODE	SALE CONDITION	LAST	HIGH/ LOW	OPEN	LAST	HIGH/ LOW	
Blank	REGULAR	YES	YES	#4	YES	YES	YES
B	AVERAGE PRICE TRADE	NO	NO	NO	NO	NO	YES
C	CASH TRADE (Same Day Clearing)	NO	NO	NO	NO	NO	YES
E	AUTOMATIC EXECUTION	YES	YES	#4	YES	YES	YES
F	INTERMARKET SWEEP ORDER	YES	YES	#4	YES	YES	YES
H	PRICE VARIATION TRADE	NO	NO	NO	NO	NO	YES
I	ODD LOT TRADE	NO	NO	NO	NO	NO	YES
K	**RULE 127** (NYSE Only) *or* **RULE 155** (NYSE MKT only)	YES	YES	#4	YES	YES	YES
L	SOLD LAST (Late Reporting)	#3	YES	#4	YES	YES	YES
M	MARKET CENTER OFFICIAL CLOSE	NO	NO	NO	YES	YES	NO
N	NEXT DAY TRADE (Next Day Clearing)	NO	NO	NO	NO	NO	YES
O	MARKET CENTER OPENING TRADE	#1	YES	YES	#2	YES	YES
P	PRIOR REFERENCE PRICE	#2	YES	#4	#2	YES	YES
Q	MARKET CENTER OFFICIAL OPEN	NO	NO	YES	NO	YES	NO
R	SELLER	NO	NO	NO	NO	NO	YES
T	EXTENDED HOURS TRADE	NO	NO	NO	NO	NO	YES
U	EXTENDED HOURS SOLD (Out of Sequence)	NO	NO	NO	NO	NO	YES
V	CONTINGENT TRADE	NO	NO	NO	NO	NO	YES
X	CROSS TRADE	YES	YES	#4	YES	YES	YES
Z	SOLD (Out of Sequence)	#2	YES	#4	#2	YES	YES
4	DERIVATIVELY PRICED	#2	YES	#4	#2	YES	YES
5	MARKET CENTER REOPENING TRADE	YES	YES	#4	YES	YES	YES
6	MARKET CENTER CLOSING TRADE	YES	YES	#4	YES	YES	YES
7	QUALIFIED CONTINGENT TRADE	NO	NO	NO	NO	NO	YES
8	RESERVED	NO	NO	NO	NO	NO	TBD
9	CORRECTED CONSOLIDATED CLOSE PRICE AS PER LISTING MARKET	YES	YES	NO	NO	NO	NO

FIELD DESCRIPTIONS, continued

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

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

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

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

- If all of the Sale Conditions indicate that the trade qualifies, it **will** be included in the calculations.

- If **any one or all** of the Sale Conditions indicate '**NO**', the trade **does not qualify**, the '**NO**' takes precedence and the trade **will not** be included in the calculations.

- If **all** of the Sale Conditions indicate that the trade qualifies, including a Sale Condition whose criteria deviates from a trade's qualification (i.e., above **Notes #1, #2, #3 and #4**) the trade qualifies, the 'Note Criteria' takes precedence and the trade **will** be included in the calculations.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
SALE CONDITION, continued	4	Alphanumeric, Space-filled. Denotes a particular condition applicable to the trade.

The Participant Input Four (4) byte Sale Condition field is left justified and no ordering is required. Only one Sale Condition from a category is allowable in any one of the positions of the 4-byte field.   That is, the input entry of Sale Conditions is not byte specific to its corresponding Category byte position. If a Sale Condition is not required from any one of the categories, the unused Sale Condition byte should be space-filled (blank), left justified. The Category hierarchy in the 4-byte field is as follows:

Category 1 – Settlement Type	Category 2 – Reason for Trade-Through/Other Reason	Category 3 – Extended Hours/Sequence Type	Category 4 – SRO Required Detail
Blank (Regular Settlement)	**Blank** (No Trade Through Exempt Reason)	**Blank** (Not Extended Hours) **or** (Sold Out of Sequence)	**Blank** (No Unusual Trade Detail)
C Cash Trade (Same Day Clearing)	F Intermarket Sweep Order	**L** Sold Last (Late Reporting)	**B** Average Price Trade
N Next Day Trade (Next Day Clearing)	**O** Market Center Opening Trade	**T** Extended Hours Trade	**E** Automatic Execution
R Seller	4 Derivatively Priced	**U** Extended Hours Sold (Out of Sequence)	**H** Price Variation Trade
	5 Market Center Reopening Trade	**Z** Sold (Out of Sequence)	**I** Odd Lot Trade
	6 Market Center Closing Trade		**K** **Rule 127** (NYSE only) **or** **Rule 155** (NYSE MKT Stock Market only)
	7 Qualified Contingent Trade		**M** Market Center Official Close
	8 Reserved		P Prior Reference Price
	9 Corrected Consolidated Close Price per the Listing Market		**Q** Market Center Official Open
			V Contingent Trade
			X Cross Trade

FIELD DESCRIPTIONS, continued

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).

Rule 611- Trade Reporting Matrix

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

Rule 611- Trade Reporting Matrix, continued

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

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
SECURITY SYMBOL	11 or 16	Alphabetic, Left-Justified, Space-filled. Contains 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 blanks: (1) Letter slash, (2) lower case p, (3) lower case r, or (4) lower case w. *Reference:* **Appendix C** *for the list of allowable symbol suffixes.* **Note:** Security Symbol field exceptions: Temporary Suffixes are **not** contained in this field. **<u>Identification of Test Data</u>:** The purpose of a Test Message is to have a mechanism whereby end-to-end connectivity and functionality between the CTS Participant and Data Recipient can be tested prior to the opening or during the trading day. There are two types of test messages that can be disseminated, but **do not** contain the same characteristics: 1. CTS messages containing a suffix of '.TEST' used with any base symbol that is <u>not</u> in the CTS database. Messages with a '.TEST' suffix are **not** included in any Participant statistics (e.g., Open/High/Low/Last calculations, volume counts, trade counts, etc.). Start or End of Day Summary messages are **not** generated by CTS for any security symbols containing a '.TEST' suffix. *'Security Symbol' Field Description continued on next page.*

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
SECURITY SYMBOL, *continued*		2. CTS messages containing any of the following dedicated test symbols :

Test Symbol	Listing Market	CTS Network
CBO	NYSE	A
CBX	NYSE	A
NTEST	NYSE	A
IBO	NYSE MKT	B
ATEST	NYSE MKT	B
IGZ	NYSE ARCA	B
ZVV	NYSE ARCA	B
ZZK	NYSE ARCA	B
ZZZ	NYSE ARCA	B
PTEST	NYSE ARCA	B
ZBZX	Bats BZX	B
ZTEST	Bats BZX	B
ZTST	Bats BZX	B
ZIEXT	**IEX**	**B**
ZEXIT	**IEX**	**B**
ZXIET	**IEX**	**B**

Field Name	Bytes	Description
		Messages with any of the dedicated test symbols will be included in Participant statistics (e.g., Open/High/Low/Last calculations), but will be excluded in volume counts, trade counts, etc. Start and End of Day Summary messages will be generated for dedicated test symbols.
SELL VOLUME	9	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled.

The Sell Volume represents the reported imbalance of sell orders without matching buy orders for the security for a Participant. |
| SELLER'S SALE DAYS | 2 or 3 | Numeric, Right Justified, Zero-filled.

Used if Sale Condition = "R" (Seller). Otherwise, this field is zero-filled. Specifies the number of days that may elapse before delivery of the security. |

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
SHORT SALE RESTRICTION INDICATOR	1	Alphanumeric, Space-filled. Identifies whether or not a Short Sale Restriction is in effect by the Primary Listing Market for a security. **Day 1**: When a security's price decreases by 10% or more from the previous day's closing price, the primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Activated'. **Day 2**: 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). **Day 3**: As the short sale restriction is to be lifted at the end of Day 2, the primary listing market will generate a Trading Status message denoting 'Short Sale Restriction Deactivated' (anticipated prior to the primary listing market open).

Code	Value
Blank	Short Sale Restriction Not in Effect
A	Short Sale Restriction Activated
C	Short Sale Restriction Continued
D	Short Sale Restriction Deactivated
E	Short Sale Restriction in Effect

Note 1: Code values 'Blank', 'A', 'C' and 'D' are to be used only in conjunction with the 'TYPE' field of the Category T, Type G (Trading Status) message.

Note 2: Code values 'Blank' and 'E' are to be used only with Category P, Type E (Prior Day Trade Last Sale) and Category P, Type X (Prior Day Cancel/Error) messages.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
STOP STOCK INDICATOR	1	Numeric. 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>Not Applicable</td></tr><tr><td>1</td><td>Applicable</td></tr><tr><td>2</td><td>Local Issue or Basket Instrument Trade Report</td></tr><tr><td>3</td><td>Local Trade Report for Bankrupt Issues</td></tr><tr><td>4</td><td>Corporate Bond Trade Report</td></tr><tr><td>5</td><td>Government Bond Trade Report</td></tr><tr><td>6</td><td>Corporate Bond Trade Report for Bankrupt Bonds</td></tr></table> **Note:** Code values 2, 3, 4, 5 and 6 are only applicable to Category T, Type L (Trade Last Sale Report) messages.
TOTAL TRADES	9	Numeric, Right Justified, Zero-filled. Contains the total number of trade transactions executed from a Participant.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
TRADE DISSEMINATION TIME (T-TIME)	4	Numeric, Right Justified, Zero-filled. Format is **HH:MM** (24 hour clock). Required for Trading Status 'Type' field value '**B'**, otherwise zero-filled. A trading halt indication type signifies the temporary halt in trading in a security by the Primary Market. **Note:** When a Participant inputs T-Time, CTS responds back to the Participant over its input line with an administrative message containing the following contents: **T-TIME IS \<HH:MM:> FOR \<symbol>** **Note:** *There is no corresponding 'T-Time' message disseminated over the CTS multicast feed.*
TRADE NUMERATOR PRICE	3	Numeric, Right Justified, Zero-filled. Represents portion of price less than one dollar, expressed as the numerator of the fraction specified in **PRICE DENOMINATOR INDICATOR**.
TRADE PRICE	8 or 12	Numeric, Right Justified, Zero-filled. Otherwise, this field is zero-filled. The Trade Price is the whole and decimal portion of the Trade Price information with the in **PRICE DENOMINATOR INDICATOR** code determining the price representation. The Trade Price is the monetary value of an individual share of stock at the time of the trade.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
TRADE REPORTING FACILITY (TRF) INDICATOR	1	Alphabetic (including lower case), Space-filled.

Identifies the Participant with whom a TRF has been formed. Otherwise, this field is space-filled.

- 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 '**d**'.
- If FINRA is entering transactions on behalf of a TRF, it will identify the specific TRF in the TRF Indicator field.
- In cases of Bonds and Local Issues, which are **not eligible for TRF** transactions, the TRF Identifier fields will be space-filled.

TRF Indicator Code	Value
d	FINRA
A	NYSE MKT
B	NASDAQ OMX BX
C	NSX
D	FINRA
I	ISE
J	Bats EDGA
K	Bats EDGX
M	CHX
N	NYSE
P	NYSE ARCA
T	NASDAQ OMX
V	IEX
W	CBSX
X	NASDAQ OMX PSX
Y	Bats BYX
Z	Bats BZX

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
TRADE THROUGH EXEMPT INDICATOR	1	Numeric, Zero-filled. Denotes whether or not a trade is exempt (Rule 611) and when used jointly with certain Sale Conditions, will more fully describe the characteristics of a particular trade. <table><tr><th>Code</th><th>Value</th></tr><tr><td>**Blank** *or* **0**</td><td>Not a Trade Through Exemption</td></tr><tr><td>**1**</td><td>Trade Through Exemption</td></tr></table>
TRADE VOLUME	7 or 9 or 11	Numeric, Right Justified, Zero-filled. Contains the total number of shares traded in a single transaction for an individual security.
TRADE WHOLE PRICE	3	Numeric, Right Justified, Zero-filled. Represents the whole dollar portion of the trade price.

FIELD DESCRIPTIONS, continued

Field Name	Bytes	Description
TYPE	1	Alphanumeric, Space-filled. Represents the trading action related to the transaction.

Code	Value
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

APPENDIX A: CTS DUAL SITE CONFIGURATION
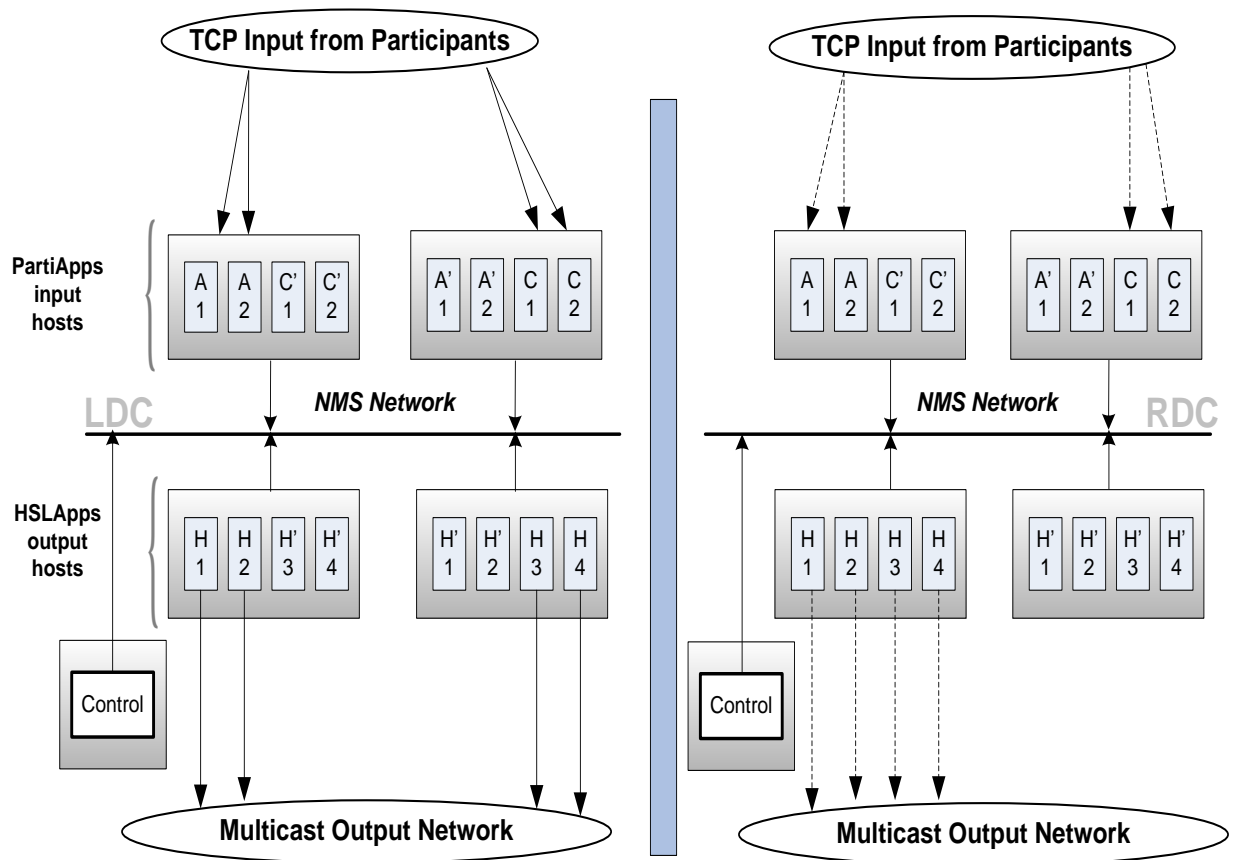
APPENDIX B: MODIFIED USA STANDARD CODE FOR INFORMATION INTERCHANGE

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

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

APPENDIX C: ALLOWABLE SYMBOL SUFFIXES FOR CTS TRADES

SUFFIX	DESCRIPTION
- A -	
.A	Series (or Class) **A** Also Series **B-T** & **V-Z**
.A.CL	Series **A** Called Also Series **B-T** & **V- Z**
.A.CV	Series **A** Convertible Also Series **B-T** & **V-Z**
.Aw	Series **A** When Issued Also Series **B-T** & **V-Z**
- C -	
.CL	Called
.CT	Certificates
.CV	Convertible
.CVR	Contingent Value Right
.CV.CL	Convertible Called
- D -	
.DP	Amount of most recent dividend to go "ex- distribution"
.DV	Accumulated dividend per share, net expenses, through and including the previous day's close of trading

Note 1: All inclusive list of allowable symbol suffixes. Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.

Note 2: Suffixes start with one of the following characters with no embedded blanks: a) Letter dot ('**.**'); b) Lower case '**p**'; c) Lower case 'r'; d) Lower case 'w'.

APPENDIX C: ALLOWABLE SYMBOL SUFFIXES FOR CTS TRADES, continued

SUFFIX	DESCRIPTION
- E -	
.EC	EMERGING COMPANY MARKETPLACE[SM]
.EU	Estimated cash amount per creation unit
- F -	
.F**.**N	Foreign News
-I-	
.ID	Index – differentiates an index from a stock with the same root symbol
.IV	Intra-Day Net Asset Value per share
- N -	
.NV	Net Asset Value per share, as of the close on the previous day's close of trading
- P -	
.PP	Partial Paid
.PT**.**CL	Part Called
p	Preferred
pA	Preferred Series **A** Also Series **B-T** & **V-Z**
pA**.**CV	Preferred Series **A** Convertible Also Series **B-T** & **V-Z**
pA**.**CL	Preferred Series A Called Also Series **B-T** & **V-Z**

Note 1: All inclusive list of allowable symbol suffixes. Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.
Note 2: Suffixes start with one of the following characters with no embedded blanks: a) Letter dot ('.'); b) Lower case 'p'; c) Lower case 'r'; d) Lower case 'w'.

APPENDIX C: ALLOWABLE SYMBOL SUFFIXES FOR CTS TRADES, continued

SUFFIX	DESCRIPTION
- P -	
pAw	Preferred Series **A** When Issued *Also* Series **B-T** & **V-Z**
pw	Preferred When Issued
p**.**CL	Preferred Called
p**.**CV	Preferred Convertible
p**.**CV**.**CL	Preferred Convertible Called
p**.**WD	Preferred When Distributed
pCA	Indicates Class **A** of a Second Category of Preferred Could also be **B-K** and **M-S**
- R -	
r	Rights
rw	Rights When Issued
- S -	
.SC	Small Corporate Offering Registration
.SO	Current shares outstanding in thousands
.SP	Special
.SD	Stamped

Note 1: All inclusive list of allowable symbol suffixes. Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.

Note 2: Suffixes start with one of the following characters with no embedded blanks: a) Letter dot ('.'); b) Lower case 'p'; c) Lower case 'r'; d) Lower case 'w'.

APPENDIX C: ALLOWABLE SYMBOL SUFFIXES FOR CTS TRADES, continued

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

Note 1: All inclusive list of allowable symbol suffixes. Any combination of suffixes can be represented. Root Symbols for Government Bonds, e.g., TB, TN, US and ZC, and root symbols for Corporate Bonds, e.g., GMC are always followed by a three (3) upper case character suffix.

Note 2: Suffixes start with one of the following characters with no embedded blanks: a) Letter dot ('.'); b) Lower case 'p'; c) Lower case 'r'; d) Lower case 'w'.

APPENDIX D: GLOSSARY

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

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
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.
Corrected Indication	Denotes a correction to the last indication or new indication. It will contain the corrected approximation of what that security's opening or reopening price range (Bid and Offer prices, no sizes) will be when trading resumes after a delayed opening or after a trading halt.
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.
Crossing Session I (NYSE MKT)	Single-sided orders and coupled (both buy and sell side) orders may be entered into Crossing Session I (called "After Hours Trading" on the NYSE MKT) between 4:15 p.m. and 5:00 p.m. (EST). Systemized limit orders entered during the normal 9:30 to 4 p.m. trading session labeled good-till-executed (GTX) migrate to the Crossing Session I for possible execution. There is a single NYSE MKT Crossing Session I trade at 5:00 p.m. at the price of the NYSE MKT closing price determined during the Exchange's 9:30 a.m. to 4:00 p.m. trading session. This trade is printed on the Consolidated Tape (Tape B). All coupled orders are executed in the trade. GTX and singled-sided orders are executed against each other (buys against sells) on a first-come-first-served basis. GTX orders, which are not executed, migrate back to the "book" for the next trading day. Single-sided orders, which are not executed, are cancelled. NYSE MKT Crossing Session I is exempt from "up-tick rule" for sell short orders. ETFs, which participate in NYSE MKT Crossing Session I, use the closing price at 4:15 p.m. See NYSE MKT Rules 1300 to 1306 for more details.

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
Crossing Session I (NYSE)	For the NYSE, Crossing Session I operates between 4:15 p.m. and 5:00 p.m. (EST). During this time, one-sided, two-sided, or good-till-executed (GTX) orders for a particular security can be entered for execution at 5:00 p.m. Matched orders are executed at the NYSE closing price determined during the Exchange's 9:30 a.m. to 4:00 p.m. trading session and are printed on the Consolidated Tape at approximately 6:40 p.m.
Crossing Session II (NYSE MKT)	NYSE MKT Crossing Session II (called "After Hours Trading Facility II" on the NYSE MKT) operates between 4:00 p.m. and 5:15 p.m. (EST). This session on the NYSE MKT accommodates the trading of NYSE MKT coupled orders in baskets, which are composed of at least 15 NYSE securities valued at $1 million or more and also include NYSE MKT securities. Members, that have either facilitated a basket trade or have paired two customers' baskets, submit aggregate information on transactions in NYSE MKT securities included in the baskets to the NYSE MKT for execution. At 5:15 p.m., the aggregate information of all NYSE MKT securities included in baskets executed in this session prints to the Consolidated Tape (Tape B).
Crossing Session II (NYSE)	For the NYSE, Crossing Session II operates between 4:00 p.m. and 6:15 p.m. (EST). This session accommodates the trading of baskets of at least 15 NYSE securities valued at $1 million or more. NYSE Members that have either facilitated a basket trade or have paired two customers' baskets can submit aggregate information to the Exchange for execution. At approximately 6:40 p.m., the aggregate information of all baskets executed in this session prints to the consolidated tape.
Crossing Session III (NYSE: Guaranteed Price Orders)	For the NYSE, Crossing Session III operates between 4:00 p.m. and 6:30 p.m. This session functions to execute the unfilled portions of "guaranteed price" orders. The term "guaranteed price coupled order" means an order to buy for a minimum of 10,000 shares coupled with an order to sell the same quantity of the same security. One side of the guaranteed price coupled order must be for the account of a NYSE member organization and the other side must be for the account of one of its customers. Such orders must be entered and priced in accordance with Rule 907.

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
Crossing Session IV (NYSE: VWAP Orders)	For the NYSE, Crossing Session IV operates between 4:00 p.m. and 6:30 p.m. Crossing Session IV allows firms to execute the unfilled balance of an order at a price that is not pre-determined, but is calculated to ensure that the entire order is filled at a price no worse than the volume weighted average price (VWAP). Trades must be for a minimum of 10,000 shares (program trades for less than 10,000 shares can be completed in CS II) and can be priced up to four places to the right of the decimal.
CTA Eligible	Generally, any common stock, long-term warrant or preferred stock which becomes registered on any national securities exchange or is admitted to unlisted trading privileges thereon and which at the time of such registration or at the commencement of such trading substantially meets the original listing requirements of the NYSE or the NYSE MKT for such securities.
Derivatively Priced	The transaction that constituted the trade-through was the execution of an order at a price that was not based, directly or indirectly, on the quoted price of the security at the time of execution, and for which the material terms were not reasonably determinable at the time the commitment to execute the order was made (REG NMS 611b7).
Dollar Value	The whole and decimal portion, if any, of the total dollar worth of the total daily trade transactions.
Due to Related Security	Describes a halt condition, and is used when events concerning one security will affect the price and performance of another related security (e.g., a call for redemption of a convertible preferred security or convertible debt security which could affect the related common security).
Equipment Changeover	Denotes a non-regulatory Trading Halt. The ability to trade a security by a Participant is temporarily inhibited due to a systems, equipment or communications facility problem or for other technical reasons.

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
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.

APPENDIX D: 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.
Intermarket Sweep Order	The transaction that constituted the trade-through was the execution of an order identified as an Intermarket Sweep Order.
In View of Common	Matters affecting the common stock of a company may affect the performance of the non-common associated securities (e.g., warrants, rights, preferred, classes, etc.). Those securities, (which must be of the same company) are globally Opening Delayed or Trading Halted for a Participant in view of the common stock.
Intraday Trade Detail	Indicates the trade was included as part of a transaction, other than an opening or reopening transaction that involved a group or "bunch" of orders executed at the same time and price and previously reported by the Participant as a single cumulative trade report.
Late Filing	A financial status designation pertaining to Tape 'A' and Tape 'B' issues (i.e. issues listed on the NYSE, the NYSE MKT or on one of the Regional exchanges). The status identifies a company, which has failed to meet established listings standards for filing its annual reports.
Limit State	Indicates that a National Best Bid is equal to the Upper Limit Price Band, or that a National Best Offer is equal to the Lower Limit Price Band.

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
Limit Up-Limit Down (LULD) Price Bands	The Limit Up-Limit Down Price Band represents a price range which is set at a percentage level above and below the average price of a security over the immediately preceding five (5) minute period. Price Bands prevail for a minimum of thirty (30) seconds. During a Limit State Price Bands will not be disseminated and will recommence when Limit State is terminated. For further details related to Limit Up-Limit Down, reference the following: http://www.sec.gov/rules/sro/nms/2012/34-67091.pdf
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 MKT Stock Market or NYSE listing requirements (is not CTA eligible) but is traded at one or more Regional Exchanges. Local Issues are included in the CTS database.
Market Center Closing Trade	The transaction that constituted the trade-through was a single priced closing transaction by the Market Center (REG NMS Rule 611b3).
Market Center Official Close	Indicates the 'Official' closing value as determined by a Market Center. This transaction report will contain the market center generated closing price.
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.

APPENDIX D: GLOSSARY

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

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
Market-Wide Circuit Breaker Level 1 – 7% Breached	This regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 7% decline level below its closing value on the previous trading day. A Level 1 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: • Before 3:25 p.m. ET – duration 15 minutes • At or after 3:25 p.m. ET – trading shall continue unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.
Market-Wide Circuit Breaker Level 2 – 13% Breached	This regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 13% decline level below its closing value on the previous trading day. A Level 2 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: • Before 3:25 p.m. ET – duration 15 minutes • At or after 3:25 p.m. ET – trading shall continue unless there is a Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt.
Market-Wide Circuit Breaker Level 3 – 20% Breached	This regulatory Trading Halt is used to denote that trading is suspended due to the S&P 500 Index reaching a 20% decline level below its closing value on the previous trading day. A Level 3 Market-Wide Circuit Breaker Regulatory Trading Halt would operate as follows: At any time during regular trading hours, trading shall Halt and not Resume for the remainder of the trading day.
Mixed Lot	An order for a number of shares greater than 100 (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.

APPENDIX D: GLOSSARY

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

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
Odd Lot	An order amount for a security that is less than the normal unit of trading for that particular asset. Odd lots are considered to be anything _less than_ the standard units of trade of 1, 10 or 100 shares.
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: • one point or more away from the last sale when the last sale is under $20.00; or • two points or more away from the last sale when the last sale is $20.00 or more
Opening Delay	Postponement of the opening of trading in a security for a Participant.
Opening/Reopening Trade Detail	An Opening/Reopening Trade Detail report indicates the trade was included as part of an opening or reopening transaction previously reported by a Participant on an aggregate basis.
Order Imbalance	Denotes a non-regulatory halt condition where there is a significant imbalance of buy or sell orders.
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.

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
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.
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: 1. has a volume of 10,000 shares or more *and/or* 2. has a dollar value of $200,000 or more.
Rule 155 Trade (NYSE MKT)	To qualify as a NYSE MKT Rule 155, from time to time, a specialist may arrange for the sale, or purchase, of a block of security, or other large number of shares of securities, at a single "clean-up" price. Generally such a sale or purchase is outside of the current market. Such sale or trade is designated as a Rule 155 trade.

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APPENDIX D: GLOSSARY

TERM	DESCRIPTION
Self Help	The transaction that constituted the trade-through was effected when the market center displaying the protected quotation that was traded through was experiencing a failure, material delay or malfunction of its systems or equipment.
Seller	A Seller's Option transaction gives the seller the right to deliver the security at any time within a specific period, ranging from not less than two calendar days, to not more than sixty calendar days. A security offered "Seller's Option" may command a lesser price than if offered "Regular Way".
Short Sale Restriction	A restriction designed to control short selling from further driving down the price of a security any day in which the price declines by 10% or more from the previous day's closing price. Once the Short Sale Restriction is activated, a Short Sale Restriction would be in effect in that security for the remainder of the day as well as the following day, unless deactivated.
Single-Priced Opening	The transaction that constituted the trade-through was a single-priced opening transaction by the market center.
Single-Priced Reopening	The transaction that constituted the trade-through was a single-priced reopening transaction by the market center.
Single-Priced Closing	The transaction that constituted the trade-through was a single-priced closing transaction by the market center.

APPENDIX D: GLOSSARY

TERM	DESCRIPTION
Sold	Sold is used when a trade is printed (reported) out of sequence and at a time different from the actual transaction time.
Sold Last	Sold Last is used when a trade prints in sequence but is reported late or printed in conformance to the One or Two Point Rule.
Stock-Option Trade	Stock-Option Trade is used to identify cash equity transactions which are related to options transactions and therefore potentially subject to cancellation if market conditions of the options leg(s) prevent the execution of the stock-option order at the price agreed upon.
Stopped Stock	The transaction that constituted the trade-through was the execution by a trading center of an order for which, at the time of receipt of the order, the trading center had guaranteed an execution at no worse than a specified price (a "stopped order"), where: (i) The stopped order was for the account of a customer;(ii) The customer agreed to the specified price on an order-by-order basis; and (iii) The price of the trade-through transaction was for a stopped buy order lower than the National Best Bid in the security at the time of execution, or for a stopped sell order higher than the National Best Offer in the security at the time of execution.
Sub-Penny Trading	Indicates a non-regulatory Opening Delay or Trading Halt for an NYSE security whose price may fall below $1.05, possibly leading to a sub-penny execution.
Trading Halt	A temporary halt in the trading of a particular security by a Participant.
Trading Range Indication	Denotes the probable trading range (Bid and Offer prices, no sizes) of a security that is not Opening Delayed or Trading Halted. The Trading Range Indication is used prior to or after the opening of a security.

APPENDIX E: INPUT ERROR CONDITIONS

ERROR CODE	DESCRIPTION - MESSAGE ERRORS
1	INVALID MESSAGE CATEGORY AND TYPE
2	INVALID PARTICIPANT
3	INVALID MESSAGE DESTINATION
4	INVALID POSSIBLE DUPLICATE FLAG
5	INVALID INDEX SIGN
6	INVALID SHORT SALE RESTRICTION INDICATOR
7	SEQUENCE NUMBER GAP
8	SEQUENCE NUMBER DUPLICATION
9	INVALID QUOTE MIDPOINT
10	INVALID MESSAGE LENGTH - THE LENGTH IS BEYOND THE ACCEPTABLE BOUNDS FOR THE MESSAGE TYPE
11	MESSAGE PRIOR TO CTS SOD
12	INVALID SEQUENCE NUMBER
13 - 15	UNUSED
16	INVALID TIMESTAMP
17 - 24	UNUSED
25	UNPRINTABLE ALPHANUMERIC CHARACTER
26	INVALID STOCK SYMBOL (EITHER THE STOCK SYMBOL AND SUFFIX ARE INCORRECT OR NO MASTER RECORD EXISTS FOR THE STOCK)
27	INVALID NUMBER OF TRADES OR INVALID TRADE CONDITIONS CODE

APPENDIX E: INPUT ERROR CONDITIONS, continued

ERROR CODE	DESCRIPTION - MESSAGE ERRORS
28	INVALID PRICE
29	INVALID VOLUME
30	INVALID STOP INDICATOR FOR LOCAL ISSUE OR BOND
31	TRADE FROM PRIMARY DURING PRIMARY MARKET HALT
32	INVALID NUMBER OF DAYS FIELD
33	INVALID NUMBER OF MESSAGES BEHIND
34	UNUSED
35	INVALID DENOMINATOR CODE
36	INVALID REPORTING TIME
37 – 40	UNUSED
41	INVALID TRADE REPORTING FACILITY INDICATOR
42	INVALID TRADE THROUGH EXEMPT INDICATOR
43 – 44	UNUSED
45	INVALID TRANSACTION STATUS CODE (OK/LOCAL ISSUE INDICATOR)
46	INVALID BANKRUPTCY INDICATOR
47	INVALID NO PRINT INDICATOR
48	INVALID REGIONAL REFERENCE NUMBER
49	DUPLICATE REGIONAL REFERENCE NUMBER

APPENDIX E: INPUT ERROR CONDITIONS, continued

ERROR CODE	DESCRIPTION - MESSAGE ERRORS
50	TC OR TX FROM EXCHANGE NOT USING REGIONAL REFERENCE NUMBER
51	INVALID CORRECTIVE ACTION INDICATOR
52	BAD TRADE 1 OF CORR/CANCEL/ERROR
53	BAD TRADE 2 OF CORR/CANC/ERROR
54	UNUSED
55	UNUSED
56	INVALID PRIOR DAY DATE FIELD
57	INVALID PRIOR DAY TIME FIELD
58	INVALID OUTPUT NETWORK FIELD
59	INVALID ISSUE TYPE FIELD
60	UNUSED
61	INVALID CORRECTIVE ACTION-MUST BE CORRECT CANCEL OR ERROR
62	ORIGINAL TRANSACTION NOT FOUND
63	ORIGINAL TRANSACTION ALREADY CORRECTED
64	**MARKET CENTER OFFICIAL CLOSING PRICE ALREADY PUBLISHED**
65	UNUSED
66	ORIGINAL TRANSACTION DOES NOT MATCH INPUT
67	INVALID INDICATION INDICATOR
68	INVALID IVC INDICATOR
69	FIRST IPO TRADE IS FROM NON-PRIMARY MARKET

APPENDIX E: INPUT ERROR CONDITIONS, continued

ERROR CODE	DESCRIPTION - MESSAGE ERRORS
70	IVC SPECIFIED FOR A NON-COMMON AND COMMON STOCK NOT FOUND
71	NO REASON WHERE REQUIRED OR INVALID REASON SPECIFIED
72	OPENING DELAY SPECIFIED AND STOCK IS TRADING HALTED, NO OPEN OR NO RESUME
73	TRADING HALT SPECIFIED AND STOCK IS OPENING DELAY, NO OPEN OR NO RESUME
74	NO OPEN/NO RESUME SPECIFIED AND STOCK IS MARKED IVC OR STOCK IS NOT OPENING DELAYED OR TRADING HALTED
75	IVC SPECIFIED FOR COMMON AND NOT ELIGIBLE NON-COMMON COULD BE FOUND
76	COMMON IS IN INVALID STATE FOR IVC OR NO OPEN/NO RESUME IVC
77	NON-COMMON IS IN INVALID STATE FOR IVC OR NO OPEN/NO RESUME IVC
78	UNUSED
79	INVALID PRICE INDICATION STATUS VALUE
80	UNUSED
81	PARTICIPANT "TG" MESSAGE FROM PARTICIPANT WHICH IS NOT THE PRIMARY MARKET
82	PRICE INDICATION AND STOCK IS NOT HALTED
83	PRICE RANGE INDICATION AND STOCK IS HALTED
84	INVALID LOW PRICE ON PRICE

APPENDIX E: INPUT ERROR CONDITIONS, continued

ERROR CODE	DESCRIPTION - MESSAGE ERRORS
85	UNUSED
86	INVALID HIGH PRICE ON PRICE INDICATION OR MARKED WHERE DISALLOWED
87	UNUSED
88	HIGH PRICE NOT GREATER THAN LOW PRICE ON PRICE INDICATION
89	UNUSED
90	INVALID BUY SIZE FIELD FOR MARKET IMBALANCE (NOT NUMERIC NOR ZERO)
91	INVALID OFFER SIZE FIELD FOR MARKET IMBALANCE (NOT NUMERIC NOR ZERO)
92	INVALID T-TIME FIELD
93	INVALID NUMBER OF INDICES
94	INVALID T-TIME: SECURITY NOT HALTED OR OPENING DELAYED OR NON-PRIMARY MARKETS NOT HELD
95	INVALID DUE TO RELATED SECURITY INDICATOR
96	DUE TO RELATED SECURITY ONLY ALLOWED FOR TRADING HALTS/OPENING DELAYS
97	INVALID TARGET (TARGET IS NOT A TRADE OR A CORRECTION, OR IS ALREADY CANCELED)
98	TOO MANY READS
99	UNDEFINED ERROR

APPENDIX F: ASCII PRINTABLE CHARACTER PRIOR DAY MESSAGES TIME CONVERSION

The Time Conversion Table is used to convert the 'Prior Day Trade Time' Hour/Minute/Second (HMS) in Prior Day Trade, Prior Day Correction and Prior Day Cancel/Error messages.

TIME	ASCII	DEC	Description		TIME	ASCII	DEC	Description
0	0	48	Zero		30	N	78	Uppercase N
1	1	49	One		31	O	79	Uppercase O
2	2	50	Two		32	P	80	Uppercase P
3	3	51	Three		33	Q	81	Uppercase Q
4	4	52	Four		34	R	82	Uppercase R
5	5	53	Five		35	S	83	Uppercase S
6	6	54	Six		36	T	84	Uppercase T
7	7	55	Seven		37	U	85	Uppercase U
8	8	56	Eight		38	V	86	Uppercase V
9	9	57	Nine		39	W	87	Uppercase W
10	:	58	Colon		40	X	88	Uppercase X
11	;	59	Semicolon		41	Y	89	Uppercase Y
12	<	60	Less than		42	Z	90	Uppercase Z
13	=	61	Equals		43	[	91	Opening bracket
14	>	62	Greater than		44	\	92	Backslash
15	?	63	Question mark		45	]	93	Closing bracket
16	@	64	At symbol		46	^	94	Caret
17	A	65	Uppercase A		47	_	95	Underscore
18	B	66	Uppercase B		48	`	96	Grave accent
19	C	67	Uppercase C		49	a	97	Lowercase a
20	D	68	Uppercase D		50	b	98	Lowercase b
21	E	69	Uppercase E		51	c	99	Lowercase c
22	F	70	Uppercase F		52	d	100	Lowercase d
23	G	71	Uppercase G		53	e	101	Lowercase e
24	H	72	Uppercase H		54	f	102	Lowercase f
25	I	73	Uppercase I		55	g	103	Lowercase g
26	J	74	Uppercase J		56	h	104	Lowercase h
27	K	75	Uppercase K		57	i	105	Lowercase i
28	L	76	Uppercase L		58	j	106	Lowercase j
29	M	77	Uppercase M		59	k	107	Lowercase k

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

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

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

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