



# **Risk Management & Echo Messaging FIX Specification**

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NYSE Arca Equities (FIX and ArcaDirect)  
NYSE Arca/Amex Options (FIX Only)

September 24, 2010  
Version 1.2

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# Preface

## Document Control

<i>Date</i>	<i>Revision</i>	<i>Change Made by:</i>	<i>Synopsis of Change</i>
October 14 <sup>th</sup> , 2009	1.0	Marc Abend	Initial Document
February 24 <sup>th</sup> , 2010	1.1	Marc Abend	Updates to OrderID in all FIX Message Tables (UTP is live, officially changed to up to 20 characters)
September 24, 2010	1.2	Marc Abend	Updates to title page and ArcaDirect Section

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# 1 Risk Management Process - Sponsored FIX Sessions

## 1.1 Sessions Risk Management Overview

NYSE Arca now offers a wide range of DMA Risk management functionality. It is designed to allow sponsoring brokers to manage risk for their clients that are directly connected to the NYSE Arca Equities, Options and NYSE AMEX Options exchanges. The functionality ranges from short sale checking to per FIX session dollar and share thresholds to FIX message echo to DMA providers.

All NYSE Arca ETPID/OTPID/ATPID holders are eligible to use this functionality. Below is a description of each of the features we offer.

## 1.2 Risk Management Settings

### NYSE Arca Equities Risk Management Settings

These thresholds are set on a per FIX session basis. Clients define the thresholds and instruct NYSE ARCA to set them on the desired sponsored sessions.

Risk Management Settings available on Sponsored FIX Sessions:

- **Maximum Shares Per order** – When a per order share limit is reached or exceeded we will reject the order back to the client and/or send an email to a client defined list of recipients.
- **Maximum Notional Value Per order** – When the maximum notional value of an order is reached or exceeded we will reject the order back to the client and/or send an email alert.
- **Aggregate Notional Value of Shares Bought or sold by Symbol** – When this threshold is reached or exceeded NYSE Arca can cancel all open buy or sell orders for that symbol and/or send an email alert.
- **Shares Bought or sold by Symbol** – When this threshold is reached or exceeded NYSE Arca can cancel all open buy (sell) orders for that symbol and/or send an email alert.
- **Maximum Notional Value Traded per Session** – When this threshold is reached or exceeded NYSE Arca can cancel all open orders that were entered through the FIX session and/or send an email alert.
- **Maximum Shares Traded per Session** - When this threshold is reached or exceeded NYSE Arca can cancel all open orders that were entered through the FIX session and/or send an email alert.

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### **NYSE Arca/Amex Options Risk Management Settings**

These thresholds are set on a per FIX session basis. Clients define the thresholds and instruct NYSE ARCA to set them on the desired sponsored sessions.

- **Maximum Number of Contracts per Order** - Maximum total contracts allowed per order on the order entry session. Exceeding this value will result in the order rejecting.
- **Maximum Notional Value per Order** - Maximum total dollar amount allowed per order on the order entry session (Number of contracts x 100 x option premium price). Exceeding this value will result in the order rejecting.
- **Maximum Notional Value Traded per Session** - Aggregate maximum total dollar amount allowed to be traded on the session. Exceeding this value will result in session lockout for the trading day.
- **Maximum Number of Contracts Traded per Session** - Aggregate maximum total amount of contracts allowed to be traded on the session. Exceeding this value will result in session lockout for the trading day.
- **Maximum Buy Side Quantity Per Underlying** - Aggregate maximum total amount of Buy Side contracts allowed per underlying symbol to be traded on the session. Exceeding this value will result in session lockout for that underlying for the trading day.
- **Maximum Sell Side Quantity Per Underlying** - Aggregate maximum total amount of Sell Side contracts allowed per underlying symbol to be traded on the session. Exceeding this value will result in session lockout for that underlying for the trading day.
- **Maximum Long Synthetic Quantity Per Underlying** - Aggregate maximum amount of contracts (Buy Side Calls + Sell Side Puts combined) allowed per underlying to be traded on the session. Exceeding this limit will result in a lockout of that underlying on this session for the remaining of the trading day.
- **Maximum Short Synthetic Quantity Per Underlying** - Aggregate Maximum amount of contracts (Sell Side Calls + Buy Side Puts combined) per underlying allowed to be traded on the session. Exceeding this limit will result in a lockout of that underlying on this session for the remaining of the trading day.

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## 2 ECHO Process - Sponsored FIX Sessions

### 2.1 FIX Echo Overview

DMA providers can receive a real time copy of FIX messages that their client sends to and receives from NYSE Arca. The echo session has the ability to send:

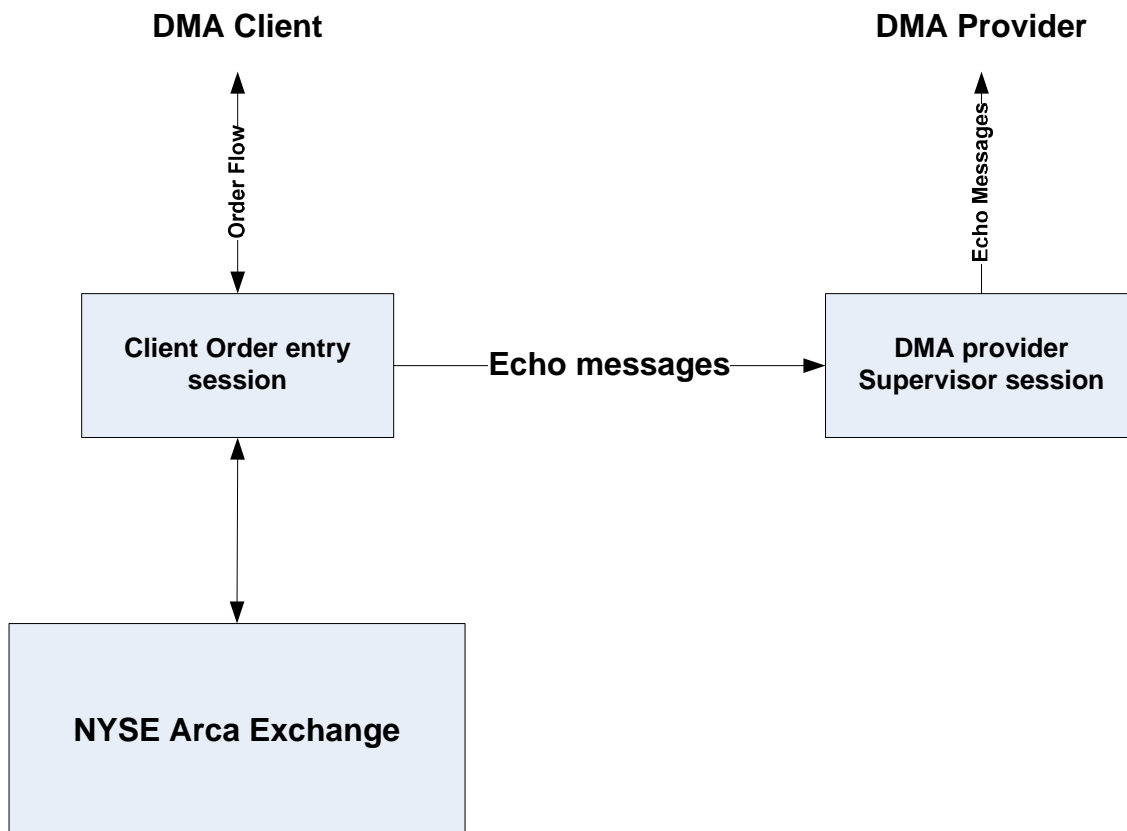
Incoming messages (from sponsored client)

1. Orders
2. Cancels
3. Replaces

Outgoing messages (DMA Supervisor Echo Session)

1. Fills
2. Order acks
3. Cancel outs
4. Replaced messages
5. Busts and corrects

#### Echo architecture



## 2.2 FIX Echo Execution Report Message Format

In addition to requirements for the standard FIX message header, the following fields will be specified on these messages.

<u>Tag</u>	<u>Field</u>	<u>Description</u>	<u>Req.</u>	<u>Values</u>
	<b>Standard Header</b>		<b>Y</b>	<b>MsgType = 8</b>
1	Account	If this field is present, we copy the information into execution messages referring to this order. This field can be used for clearing information.	N	User specified up to 10 characters
6	AvgPx	Indicates Average Price of fills on order	Y	.0001-99999999.9999
11	ClOrdID	ClOrdID behavior defined in Execution Report section	Y	User specified up to 30 characters
14	CumQty	Indicates total quantity of fills on open order	Y	1-999,999
17	ExecID	Execution ID assigned by ARCA	Y	Numerical up to 9 characters (Equities) <i>*Will change to 20 characters for NYSE Arca Equities when UTP goes live</i> Numerical up to 20 characters (Options)
19	ExecRefID	On trade break or trade correction only	Y	Contains the ExecID (Tag 17) value of the Fill that is broken or corrected.
20	ExecTransType	All execution reports	Y	0=New 1=Cancel (Trade Break Only) 2=Correct (Trade Correction Only)
30	LastMkt	Designates system of execution	Y	P- Listed, OTC BB – Bulletin Board PO- Options
31	LastPx	Indicates price of fill	Y	.0001-99999999.9999
32	LastShares	Indicates quantity of fill	Y	1-999,999
37	OrderID	OrderID assigned by ARCA	Y	Numerical up to 20 characters
38	OrderQty	Indicates share quantity on	Y	Up to 999,999

<u>Tag</u>	<u>Field</u>	<u>Description</u>	<u>Req.</u>	<u>Values</u>
		order		
39	OrdStatus	Indicates status of order (Fix 4.0) or Indicates status or message (Fix 4.1and 4.2)	Y	0=New 1=Partially Filled 2=Filled 3=Done For Day 4=Cancelled 5=Replaced 6=Pending/Cxl Replace 8=Rejected C = Billable Cancel (No Self Trade Only) E= Pending Cxl/Replace (4.2 only)
40	OrdType	Indicates order type of order	Y	1=Market 2=Limit 3=Stop 4=Stop Limit 7= Limit or Better
44	Price	Indicates price on order in decimals.	Y*	0-9999999.9999 (Limit order only) *Please see NYSE Bonds Section on Treasuries on special price scaling.
50	SenderSubID	Client will receive value specified in TargetSubID on order.	Y	ARCA
52	SendingTime	Time sent by ARCA	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS
54	Side	Buy, Sell, or Sell Short	Y	1=Buy 2=Sell 5=Sell Short
55	Symbol	This field must contain a valid symbol in upper case lettering.	Y	OCC Option Series Underlying or Equities Ticker Symbol
57	TargetSubID	Client will receive value specified in SenderSubID on order.	Y (C)	User Specified up to 10 characters (Required if specified on the original order)
58	Text	Additional description of message	Y	0=New Order 1=Partially Filled 2=Filled 3=Done For Day 4=Cancelled 5=Replaced 6=Pending/Cxl Replace 8=Rejected

<u>Tag</u>	<u>Field</u>	<u>Description</u>	<u>Req.</u>	<u>Values</u>
59	TimeInForce	If a value is not present in this field, the default is Day.	N	0=Day 2=At the Opening 3=IOC 4=FOK 6=GTD
60	TransactTime	Indicates time of transaction on ack or fill	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS
65	SymbolSfx	This field must contain a valid symbol in upper case lettering.	N	Valid Suffix value (Returned if used on original order, or if Comstock symbol is used in Tag 55 on Original Order)
76	ExecBroker	Indicates Executing Broker	N	This will get passed back only if order session has this tag enabled.
77	OpenClose	Indicates status of client position in the option.	Y	O=Open C=Close
99	Stop Price	Set to dictate stop price on stop orders	N	.01-99,9999
150	ExecType	Indicates status of order (FIX 4.1 and 4.2 only)	Y	0=New 1=Partially Filled 2=Filled 3=Done For Day 4=Cancelled 5=Replaced 6=Pending Cxl/Replace 8=Rejected C = Billable Cancel (No Self Trade Only) E= Pending Cxl/Replace (4.2 only)
151	LeavesQty	Indicates open shares remaining on order	Y	1-999,999
167	SecurityType	Identifies type of instrument.	Y	OPT= Options
200	MaturityMonth	Indicates Maturity Month	Y	YYYYMM
201	PutOrCall	Indicates Put or Call	Y	0=Put, 1=Call
202	StrikePrice	Indicates Strike Price	Y	0 – 99999999.9999
205	MaturityDay	Indicates Maturity Day for series with more than one expiration date in a month.	Y	DD
211	PegDifference	Refer to pegged orders section 4	N	-9999.99-9999.99

<u>Tag</u>	<u>Field</u>	<u>Description</u>	<u>Req.</u>	<u>Values</u>
526	Optional Data	Customer Defined Identifier used for clearing purposes.	N	Returned from order
9416	ExtendedExecInst	Returned if used on original order message	Y (C)	0 = On MPL Orders (Equities) 1 = fast cancel replace (Options) 2 = IOI Dark Pool Opt Out (Equities) (Required if specified on the original order)
9417	ExtendedPNP	Returned if used on original order	Y (C)	B = PNP Blind (Required if specified on the original order)
9730	LiquidityIndicator	This will get passed back only if the order session has the feature enabled.	N	A = Liquidity Adding B = Liquidity Adding while the order was not displayed R = Liquidity Reducing O = Liquidity Neutral – Orders executed in an auction X = Routed to another venue F = Routed to NYSE where the order was liquidity adding at NYSE* N = Routed to NYSE where the order was liquidity taking at NYSE C = Routed to NYSE where the order participated in the opening or re-opening*
9731	DBExecID	Is populated by a numeric ID that is generated by the Equities (Listed and OTC) Exchanges. Both sides of the trade have the same ID.	N	This will get passed back only if order session has the feature enabled.
	<b>Standard Footer</b>		<b>Y</b>	

## 2.3 FIX Echo Session Order Blocking & Status Messaging

There are several functions available to a sponsoring party to control a sponsored session.

- Cancel functionality through a Supervisor Session – The echo FIX session used to echo client messages to DMA providers may also be used to cancel their client’s orders. They can choose to cancel all orders entered through a specific session, all orders for a side, all orders for a symbol or a single order.
- Order Blocking via Supervisor session – Through a supervisor connection DMA providers can prevent order flow from coming in on their clients FIX session(s). This can be done real time for all orders on a session, for specific symbols, or a symbol side combination.

### Customized SecurityStatus Message

<u>Tag</u>	<u>Value</u>	<u>Notes</u>
MsgType (Tag 35)	F	
TargetLocationID (Tag 143)	Sponsored party FIX session name (e.g. LEKIMC2-N)	The exact name of the Sponsored FIX session (ex: LEKIMC2-N)
Symbol (Tag 55)	Ticker Symbol of the orders to be blocked.	Ticker Symbol on Equities  Underlying symbol if Options  If blocking all orders, do not send this Tag
SymbolSfx (Tag 65)	Symbol Suffix of the orders to be blocked.	Ticker Suffix on Equities  Underlying symbol suffix if Options  If blocking all orders, do not send this Tag
Side (Tag 54)	Side of the orders to be blocked	Required to block orders for a given symbol and side. If specified the value should be 1 or 2. If side is not specified, all sides for the symbol are blocked. If no Symbol is specified, then side will be ignored.
SecurityType (Tag 167)	OPT (Options Only)	Required If sending a blocking or unblocking message for Options. Do not send this Tag on Equities.
SecurityTradingStatus (Tag 326)	17 = Ready to Trade 18 = Not available to trade	

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To receive the status on blocks (what blocks are active, if any):

**Customized SecurityStatusRequest Message**

<b><u>Tag</u></b>	<b><u>Value</u></b>	<b><u>Notes</u></b>
MsgType (Tag 35)	E	
TargetLocationID (Tag 143)	Sponsored party FIX session name (e.g. LEKIMC2-N)	The exact name of the Sponsored FIX session (ex: LEKIMC2-N)

- Alert messages through a Supervisor Session – NYSE ARCA can send FIX news alert messages to DMA providers when the following events occur:
  - Client session disconnects/reconnects
  - Short sale rejects
  - Risk management thresholds are exceeded

**This is a session configurable feature.** If you need this added to your supervisor echo session, please e-mail [connectivity@nyx.com](mailto:connectivity@nyx.com) or call our hotline at (888) 689-7739 Option 1.

- Short Sale management – NYSE ARCA has the ability to read an easy to borrow short sale list. A DMA provider can choose to provide a file containing a list of borrowable symbols to NYSE ARCA each morning. The file will be read into the client FIX session. If the client enters a sell short order for a symbol that is not in the list the order will be rejected back to the client.

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## **3 ArcaDirect DMA Sponsored Access**

### **3.1 ArcaDirect Risk Management Overview**

NYSE ARCA now offers DMA risk management functionality through its ArcaDirect Order Entry Protocol. The new risk management features through ArcaDirect are designed to allow sponsoring brokers to manage risk for their clients that are directly connected through ArcaDirect to the NYSE ARCA exchange. All NYSE ARCA ETPID holders are eligible to use this functionality for clients they wish to sponsor through ArcaDirect.

### **3.2 Risk Management Settings**

**ArcaDirect Session Thresholds** – These thresholds are set on a per ArcaDirect session basis. Clients define the thresholds and instruct NYSE ARCA to set them on the desired sponsored ArcaDirect sessions.

Risk Management Settings available on sponsored ArcaDirect sessions:

#### **NYSE Arca Equities Risk Management Settings**

- **Maximum Shares Per order** – When the per order share limit is reached or exceeded we will reject the order back to the client and/or send an email to a client defined list of recipients.
- **Maximum Notional Value Per order** – When the maximum notional value of an order is reached or exceeded we will reject the order back to the client.
- **Aggregate Notional Value of Shares Bought or sold by Symbol** – When this threshold is reached or exceeded NYSE Arca can cancel all open buy or sell orders for that symbol.
- **Shares Bought or sold by Symbol** – When this threshold is reached or exceeded NYSE Arca can cancel all open buy (sell) orders for that symbol.
- **Maximum Notional Value Traded per Session** – When this threshold is reached or exceeded NYSE Arca can cancel all open orders that were entered through the ArcaDirect session.
- **Maximum Shares Traded per Session** - When this threshold is reached or exceeded NYSE Arca can cancel all open orders that were entered through the ArcaDirect session.

**Options Risk Management through the ArcaDirect API is currently not available.**

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## 4 ECHO Process - Sponsored ArcaDirect Sessions

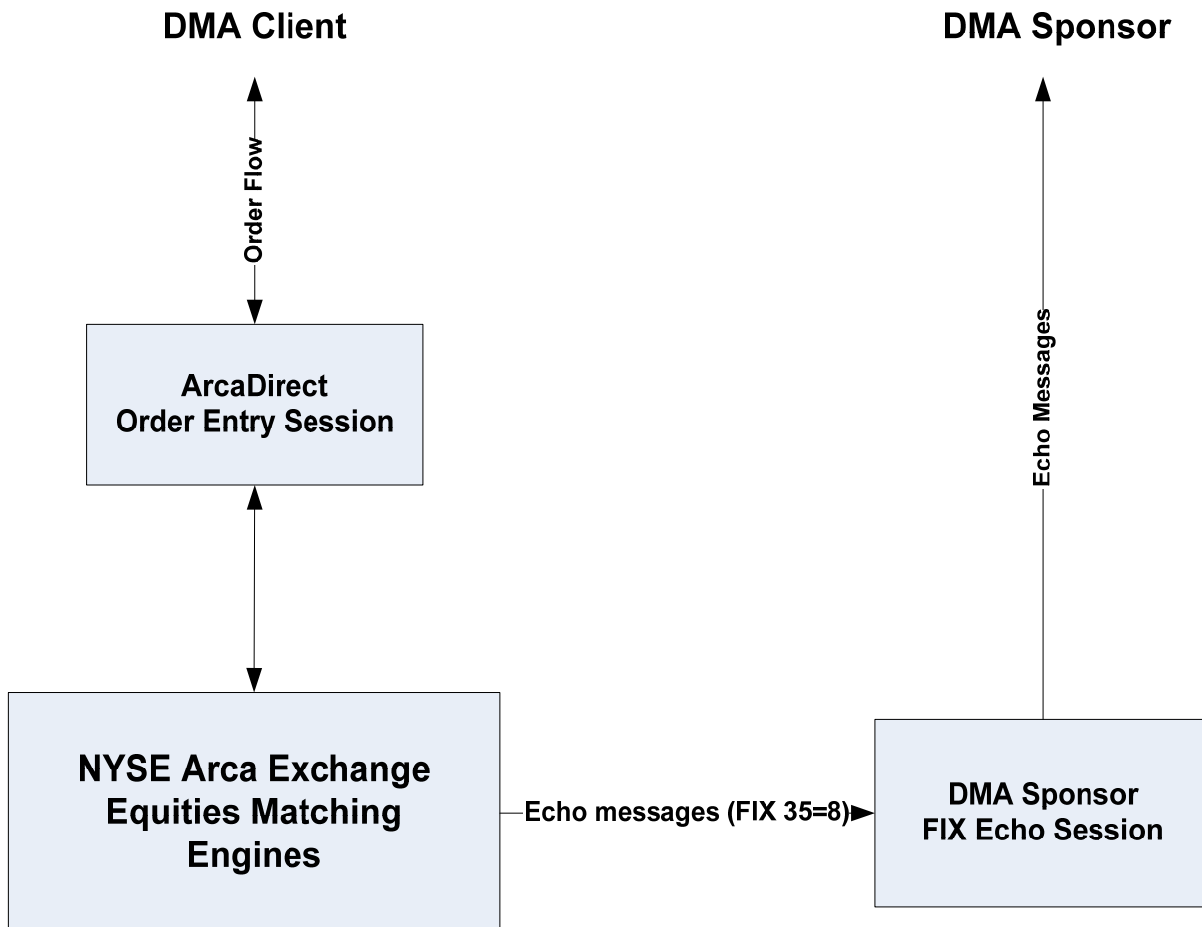
### 4.1 ArcaDirect Echo Drop Copy Overview

DMA providers can receive a real time copy of ArcaDirect Execution Report messages via the FIX Protocol that their client receives from NYSE Arca. The echo session has the ability to send:

Outgoing messages (via Special Drop Echo FIX Server)

1. Fills
2. Order acks
3. Cancel outs
4. Replaced messages
5. Busts and corrects

#### Echo Drop Architecture



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## 4.2 Configurable Features

In addition to the regular execution report tags sent back on FIX Echo drop reports, the following is also configurable per FIX Echo Drop Session:

### Additional Tags:

1. ClOrdID
2. ExecBroker
3. SymbolSfx
4. Options Tags (Configurable on the session if execution reports for Option Trades will be dropping over the session)
5. Bonds Tags (Configurable on the session if execution reports for Bond trades will be dropping over the session)
6. Additional Fields (Tags 40, 57, and 59)
7. Account (This has several settings that can be configured)
  - Not sent (Default)
  - Sends Tag 1 value from our database
  - We can enable the session to pass through the Tag 1 value from the original execution report.

**Note: Only one of the above ACCOUNT configurations can be active on the FIX Drop session.**

### 4.3 ArcaDirect Echo Drop – FIX Execution Report Message Format

All dropped Execution Reports will be in FIX 4.0 format, regardless of the actual session configuration (whether it be FIX 4.0, FIX 4.1 or 4.2). Additional Tag configurations

In addition to requirements for the standard FIX message header, the following fields will be specified on these messages.

<u>Tag</u>	<u>Field</u>	<u>Description</u>	<u>Req.</u>	<u>Values</u>
	<b>Standard Header</b>		<b>Y</b>	<b>MsgType = 8</b>
1	Account	If this field is present, we copy the information into execution messages referring to this order. This field can be used for clearing information.	C	Depends on requested Echo drop copy session setting.  <u>Possible choices:</u> 1 – Not sent (Default) 2 – Sends Tag 1 value from our database 3 – We can enable the session to pass through the Account value from the original execution report.
6	AvgPx	Indicates Average Price of fills on order	Y	.0001-99999999.9999
11	CLOrdID	CLOrdID behavior defined in Execution Report section	Y	User specified up to 30 characters
14	CumQty	Indicates total quantity of fills on open order	Y	1-999,999
17	ExecID	Execution ID assigned by ARCA	Y	Numerical up to 20 characters
19	ExecRefID	On trade break or trade correction only	Y	Contains the ExecID (Tag 17) value of the Fill that is broken or corrected.
20	ExecTransType	All execution reports	Y	0=New 1=Cancel (Trade Break Only) 2=Correct (Trade Correction Only)
30	LastMkt	Designates system of execution	Y	P – NYSE Arca Equities
31	LastPx	Indicates price of fill	Y	.0001-99999999.9999
32	LastShares	Indicates quantity of fill	Y	1-999,999
37	OrderID	OrderID assigned by ARCA	Y	Numerical up to 20 characters

<u>Tag</u>	<u>Field</u>	<u>Description</u>	<u>Req.</u>	<u>Values</u>
38	OrderQty	Indicates share quantity on order	Y	Up to 999,999
39	OrdStatus	Indicates status of order (Fix 4.0) or Indicates status or message (Fix 4.1and 4.2)	Y	0=New 1=Partially Filled 2=Filled 3=Done For Day 4=Cancelled 5=Replaced 6=Pending Cxl/Replace 8=Rejected C = Billable Cancel (No Self Trade Only) E= Pending Cxl/Replace (4.2 only)
40	OrdType	Indicates order type of order	Y	1=Market 2=Limit 7= Limit or Better
44	Price	Indicates price on order in decimals.	Y*	0-9999999.9999 (Limit order only)
50	SenderSubID	Client will receive value specified in TargetSubID on order.	Y	ARCA
52	SendingTime	Time sent by ARCA	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS
54	Side	Buy, Sell, or Sell Short	Y	1=Buy 2=Sell
55	Symbol	This field must contain a valid symbol in upper case lettering.	Y	Equities Ticker Symbol
57	TargetSubID	Client will receive value specified in SenderSubID or ArcaDirect Account Field on order.	C	User Specified up to 10 characters (Required if specified on the original order and session is configured for "Send Additional Fields")
58	Text	Additional description of message	Y	0=New Order 1=Partially Filled 2=Filled 3=Done For Day 4=Cancelled 5=Replaced 6=Pending/Cxl Replace 8=Rejected

<u>Tag</u>	<u>Field</u>	<u>Description</u>	<u>Req.</u>	<u>Values</u>
59	TimeInForce	If a value is not present in this field, the default is Day.	N	0=Day 2=At the Opening 1=GTC 3=IOC 4=FOK 6=GTD 7=On Closing
60	TransactTime	Indicates time of transaction on ack or fill	Y	Time specified in UTC time. YYYYMMDD-HH-MM-SS
65	SymbolSfx	This field must contain a valid symbol in upper case lettering.	N	Valid Suffix value (Returned if used on original order, or if NYSE/SIAC symbol is used in Tag 55 on Original Order)
76	ExecBroker	Indicates Executing Broker	C	This will get passed back only if the echo drop session has this tag enabled.
128	DeliverToCompID	Configurable on Echo Drop session	N	By default "ARCA". Configurable to another value per client request.
129	DeliverToSubID	Configurable on Echo Drop session	N	By default "ARCA". Configurable to another value per client request.
150	ExecType	Indicates status of order (FIX 4.1 and 4.2 only)	Y	0=New 1=Partially Filled 2=Filled 3=Done For Day 4=Cancelled 5=Replaced 6=Pending Cxl/Replace 8=Rejected C = Billable Cancel (No Self Trade Only) E= Pending Cxl/Replace (4.2 only)
151	LeavesQty	Indicates open shares remaining on order	Y	1-999,999
9730	LiquidityIndicator	This will get passed back on the drop only if the originating order session has the feature enabled.	N	A = Liquidity Adding B = Liquidity Adding while the order was not displayed R = Liquidity Reducing O = Liquidity Neutral – Orders executed in an auction X = Routed to another venue F = Routed to NYSE where the order was liquidity adding at NYSE* N = Routed to NYSE where the order was liquidity taking at NYSE

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<u>Tag</u>	<u>Field</u>	<u>Description</u>	<u>Req.</u>	<u>Values</u>
				C = Routed to NYSE where the order participated in the opening or re-opening*
9731	DBExecID	Is populated by a numeric ID that is generated by the Equities (Listed and OTC) Exchanges. Both sides of the trade have the same ID.	N	This will get passed back on the drop only if the originating order session and drop copy session have the feature enabled.
	<i>Standard Footer</i>		Y	