



MATCH NowTM

FIX Specification & Developer's Guide Version 1.13

Supported Versions: FIX 4.0 and 4.2

TriAct Canada Marketplace LP
130 King Street West, Suite 1050
Toronto, Ontario M5X 1B1
416-861-1010
www.triactcanada.com

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Revision History

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| 2012/02/06 | 1.13 | Torstein Braaten | Add Cancel on Disconnect Functionality |
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| 2007/05/01 | 1.2 | Bill Hollings | Removed restriction against increasing OrderQty in a Cancel/Replace Request. |
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Contents

| | |
|---|------------|
| Revision History | ii |
| CHAPTER ONE: OVERVIEW | 2-1 |
| This Document | 2-1 |
| What's New in Version 1.13 | 2-1 |
| What's New in Version 1.12 | 2-1 |
| What's New in Version 1.11 | 2-1 |
| What's New in Version 1.10 | 2-1 |
| What's New in Version 1.9 | 2-2 |
| What's New in Version 1.8 | 2-2 |
| What's New in Version 1.3 | 2-2 |
| What's New in Version 1.2 | 2-2 |
| What's New in Version 1.1 | 2-2 |
| General Information on FIX 4.0 and FIX 4.2 connections to MATCH Now | 2-3 |
| Recovery and Cancel on Disconnect Functionality | 2-3 |
| Cancel on Disconnect Functionality | 2-4 |
| Communications | 2-4 |
| Full Certification | 2-4 |
| CHAPTER TWO: MATCH NOW | 2-1 |
| Sending Orders to MATCH Now | 2-1 |
| MATCH Now-Liquidity Destination | 2-1 |
| MATCH Now-Market Flow Destination | 2-2 |
| Setting Constraints on Orders | 2-2 |
| Order-based Constraints | 2-2 |
| List-based Constraints | 2-3 |
| CHAPTER THREE: FIX MESSAGES | 3-1 |
| MATCH Now-Supported Messages | 3-1 |
| MATCH Now Implementation of FIX Messages | 3-1 |
| New Order – Single | 3-3 |
| New Order – List | 3-5 |
| List Execute | 3-5 |
| Execution Report | 3-6 |
| Order Cancel/Replace Request | 3-7 |
| Examples – Order Cancel/Replace | 3-9 |
| Order Cancel Request | 3-9 |
| Examples – Order Cancel | 3-10 |
| Order Cancel Reject | 3-10 |
| Order Status Request | 3-11 |
| Email | 3-11 |
| MATCH Now Liquidity Information Email | 3-12 |

| | |
|--|------------|
| Field Values Supported by MATCH Now | 3-12 |
| MATCH Now-Supported Order Sides (54) Values | 3-12 |
| MATCH Now-Supported Order Types (40) Values | 3-13 |
| MATCH Now-Supported TimelnForce (59) Values | 3-13 |
| MATCH Now-Supported Rule 80A (47) Values | 3-13 |
| MATCH Now-Supported CxlType (125) Values | 3-13 |
| MATCH Now-Supported ExecTransType (20) Values | 3-14 |
| MATCH Now-Supported OrderStatus (39) Values | 3-14 |
| MATCH Now-Supported Order Reject Reason (103) Values | 3-14 |
| MATCH Now-Order Reject Reason (35=8) (58) Values | 3-14 |
| Supported Symbol Suffixes | 3-15 |
| CHAPTER FOUR: FIX TEST PLAN | 4-1 |
| MATCH Now-Supported Messages | 4-1 |
| Connection Instructions | 4-2 |
| Basic Connectivity Test | 4-2 |
| Session Protocol Test | 4-3 |
| MATCH Now LIP Feed | 4-3 |
| MATCH Now – Liquidity Destination | 4-3 |
| MATCH Now – Market Flow Destination | 4-4 |
| Single Orders | 4-4 |
| Special Cases | 4-4 |
| Single Order Scenarios: | 4-4 |
| List Order Scenarios | 4-4 |
| Recovery Tests | 4-5 |
| Test 1 | 4-5 |
| Test 2 | 4-5 |

Chapter One: Overview

This Document

The purpose of this developer's guide is to provide the information necessary to interface with the TriAct Canada Marketplace MATCH Now system using the FIX 4.0 and FIX 4.2 message standards. This document is not intended to replace the FIX protocol manuals.

For complete versions of any of the FIX Protocol Specification manuals, please visit the Specifications page of the FIX web site (<http://www.fixprotocol.org>).

What's New in Version 1.13

Adding Cancel on Disconnect ("COD") functionality

What's New in Version 1.12

Tag 6005 – User configuration to provide price improvement at the Midpoint for liquidity orders matching against Marketflow orders

Tag 6005 - Removal of Internalize order constraint.

TriAct now supports FIX 4.2.

- On a new order: Cancel reject is Tag 35 (OrdStatus) = 9 and Tag 434 (CxlRejResponseTo) = 1
- Cancel/replace reject is Tag 35=9 and Tag 434=2,
- Cancel/replace pending message is Tag 39 = E

TriAct recommends that Access Vendors and Subscribers connect to MATCH Now in FIX 4.2 or make changes to the FIX 4.0 connection to allow for sequence numbers greater than 950,000

What's New in Version 1.11

Tag 6005 – User configuration to trade or not in locked markets (single order trading)

Tag 69 – Same as above but for list trading

Update 30 second matching in the liquidity environment to matching every 5 seconds

What's New in Version 1.10

Tag 132 – NBBO bid now returned in FIX execution reports

Tag 133 – NBBO offer now returned in FIX execution reports

Tag 9100 – Contrabroker now returned in FIX execution reports

Tag 6791 – Orders with bypass marker set will be rejected

What's New in Version 1.9

Updated to reflect current policy regarding LIP feed distribution.

What's New in Version 1.8

Tag 6776 – PrincipalTrade will now be returned on all applicable FIX execution reports.

Tag 6777 – WashTrade will now be returned on all applicable FIX execution reports.

What's New in Version 1.3

Tag 47 – Rule80A is now Mandatory on the *New Order – Single* and *New Order – List* messages.

The use of tag 65 – SymbolSfx in combination with tag 55 – Symbol has been clarified. Symbols such as ABC.PR.A can be split in any of the three combinations:

- ABC.PR.A in tag 55
- ABC.PR in tag 55 and A in tag 65
- ABC in tag 55 and PR.A in 65

What's New in Version 1.2

When changing order quantities via tag **38 – OrderQty** on the *Order Cancel/Replace Request* message, the quantity may be either increased or decreased. Previous version of this specification incorrectly indicated that the order quantity could only be decreased.

What's New in Version 1.1

The focus of changes in Version 1.1 of the MATCH Now FIX interface has been to tighten up the enforcement of field values on incoming orders, and to specifically reject or ignore order parameters that are not supported by TriAct Canada Marketplace.

The following changes in behaviour are reflected in Version 1.1 of the TCM FIX interface:

- Tag **7003 – ProgramTrade** is now supported on all orders submitted to both the MATCH Now – Liquidity and MATCH Now-Market Flow destinations. This allows dealers to indicate that an order is part of a program trade. MATCH Now does not use this value internally, but does report it on the regulatory and TCM data feeds.
- For orders submitted to the MATCH Now-Market Flow destination, values in the tag **6005 – TCM Constraints**, (specifically the values *Midpoint Eligible* and *Internalize* in this field) will be ignored. Previously, the MATCH Now-Market Flow destination erroneously supported the *Internalize* indication. Allowing MATCH Now-Market Flow orders to only trade if internalized was a violation of best-execution regulations, and has been corrected.
- MATCH Now only supports Market and Limit orders. In tag **40 – OrdType** for all orders submitted to both the MATCH Now-Liquidity and MATCH Now-Market Flow destinations, any values other than *Market (1)* or *Limit (2)* will now be rejected. Previously, order types such as *Stop (3)* or *Stop Limit (4)* were accepted but actually traded as *Market* or *Limit* orders, ignoring the Stop price.

- In tag **59 – *TimelnForce***, acceptable values have been tightened up to better reflect MATCH Now trading behaviour. Previously, other values were accepted and simply ignored, resulting in the possibility of trades executing that may not have been intended by the dealer if the order was submitted to MATCH Now by mistake or en-route to another trading venue (in the case of orders to the MATCH Now-Market Flow destination). The following *TimelnForce* values are acceptable for each destination, and all others will be rejected:
 - MATCH Now-Liquidity: *Day (0)*
 - MATCH Now-Market Flow: *Day (0), GTC (1), IOC (3), FOK (4), GTX (5) & GTD (6)*

In addition to describing functional changes to the MATCH Now FIX interface, version 1.1 of this specification also corrects some errors and omissions in previous versions, including the following:

- Tag **7008 – *Jitney*** allows executing brokers to identify a different originating broker for any order to either the MATCH Now-Liquidity or MATCH Now-Market Flow destinations. The *Jitney* broker ID is forwarded by MATCH Now for regulatory reporting. MATCH Now uses the executing broker as the identifier when internalizing order execution.
- The section on *Order Cancel/Replace Request* messages has been updated to clarify the parameters that can be changed on an order within the MATCH Now-Liquidity destination.

General Information on FIX 4.0 and FIX 4.2 connections to MATCH Now

The MATCH Now FIX engine adheres strictly to the FIX standard. Reductions or extensions to the FIX protocol are not permitted.

The client may connect and disconnect any number of times during the trading day. At 23:00 EST/EDT time each night, the cache files holding the FIX messages are cleaned up by MATCH Now. Clients may connect the following day anytime after 05:00.

MATCH Now supports FIX 4.0 (January 1997) and FIX 4.2 (May 2001) over TCP/IP protocol. The internet is available for Direct Connect testing.

Recovery and Cancel on Disconnect Functionality

During initialization, or in the middle of a FIX session, message gaps may occur. It is the responsibility of the receiving application to monitor incoming sequence numbers to detect gaps. This information may then be used to respond with Resend Request messages.

MATCH Now will maintain a list of sent messages, each with a unique sequence number. MATCH Now's FIX engine automatically stores all outbound messages for all connections onto disk. This disk file remains in place even if the FIX engine is stopped and restarted.

Certain administrative messages (which do not increment the sequence number) will not be present in the retransmission of messages in response to a Resend Request from a client.

Please note TriAct now recommends that all FIX 4.0 connections either upgrade to FIX 4.2 or allow for FIX 4.0 Tag 34 (msgSeqNo) for values > 999,999. All FIX 4.0 connections will need to define a value to be used for "infinity" in their send and receive Tag 16 (EndSeqNo) = 999,999 or 0 (zero).

Cancel on Disconnect Functionality

Cancel on Disconnect (“COD”) functionality allows an automated cancellation of open and unfilled orders in the event of involuntary loss of connectivity between MATCH Now and an Access Vendor/Subscriber on a specifically designated FIX trading connection. COD is an optional, automated function configurable by session bundle. When triggered on an order entry session bundle enabled for COD, the session bundle will be blocked and all open day orders associated with the blocked session bundle will be cancelled. All cancellation messages will be kept in the queue and will be delivered to the client when the session is unblocked and the client requests recovery after reconnecting during the same trading day.

Communications

Clients may connect to MATCH Now through with a variety of network services and hardware configurations, allowing you to transmit orders or requests via your own modem or over leased lines, utilizing the standard FIX protocol. Clients can also access MATCH Now through Data Service Networks such as TNS or Atrium.

Full Certification

Each FIX installation is fully tested in a simulated production environment. Our experienced Quality Assurance team develops and conducts a comprehensive certification plan, in which the routing functionality undergoes thorough testing and this in turn allows the team to further improve and enhance our systems. We test all levels of the system, including application messages, order and report transmission, throughput verification and data recovery. Testing can be done via leased lines or over the Internet.

Chapter Two: MATCH Now

Sending Orders to MATCH Now

MATCH Now has two distinct trading destinations: MATCH Now-Liquidity and MATCH Now-Market Flow. Each destination is served by a separate FIX connection from the client. A client wishing to submit orders to both destinations must maintain a separate FIX connection to each destination.

MATCH Now-Liquidity Destination

- Orders sent to the MATCH Now-Liquidity destination will sit in MATCH Now's liquidity pool, which is a confidential order book that is not exposed publicly.
- Every 5 seconds, MATCH Now executes a call-market match between orders in the liquidity pool and trades are generated as a result. Each order in MATCH Now's liquidity pool may participate in more than one match until it has been completely filled.
- In addition, liquidity orders are eligible to be matched against orders that arrive at the MATCH Now-Market Flow destination. This match occurs immediately upon receipt of an order to the MATCH Now-Market Flow destination, and does not wait for the next 5 second call.
- Orders may be submitted to the MATCH Now-Liquidity destination as single orders via the FIX *New Order-Single* message, or as part of a wave or list via the FIX *New Order-List* message. Only one of these types may be submitted via each FIX connection, so a client who wishes to submit both single orders and list orders must maintain two separate FIX connections for this purpose.
- Certain constraints may be specified on either a single order or a list of orders submitted to the MATCH Now-Liquidity destination. These constraints are explained in the section below called **Setting Constraints on Orders**.
- Orders submitted to the MATCH Now-Liquidity destination may be cancelled or corrected via the FIX *Order Cancel* and *Order Cancel/Replace Request* messages. Once an order has been completely filled, it may no longer be cancelled or modified.

MATCH Now-Market Flow Destination

- Orders sent to the MATCH Now-Market Flow destination will attempt to match immediately against orders sitting in the MATCH Now liquidity pool, and trades are generated as a result.
- Orders submitted to the MATCH Now-Market Flow destination must be single orders submitted via the FIX *New Order-Single* message. The MATCH Now-Market Flow destination does not support waves or lists of orders.
- All orders submitted to the MATCH Now-Market Flow destination are treated as *Immediate or Cancel* orders (also sometimes called *Fill or Kill* orders), and are executed immediately, with the result being a Complete Fill, Partial Fill, Reject or Done for day response. Orders submitted to the MATCH Now-Market Flow destination do not sit open on a book. As such, MATCH Now ignores most TimeInForce settings on orders submitted to the MATCH Now-Market Flow destination.
- If an order routed to the MATCH Now-Market Flow destination passes through the first filter above and receives either a Partial Fill or Nothing-Done, MATCH Now sends back a Done for day message. Tag 58 message will be "No Trade" when there is either no liquidity or liquidity that is not marketable based on order constraints or price limit of either side.
- Other than a minimum fill quantity, the MATCH Now-Market Flow destination does not support constraints on orders.
- All orders to the MATCH Now-Market Flow destination are eligible for partial fills unless minimum fill quantity is set equal to order quantity. MATCH Now rejects AON orders, and will treat FOK orders as IOC (eligible for partial fill).
- Orders submitted to the MATCH Now-Market Flow destination may *not* be cancelled or corrected.
- MATCH Now uses FIX Email messages to transmit information regarding liquidity in the MATCH Now liquidity pool. This assists the order-routing algorithms of these access vendors, by providing the state of the liquidity pool before orders are routed to the MATCH Now-Market Flow destination. These FIX Email messages are transmitted on the MATCH Now-Market Flow FIX channel. The content of these messages is described below in the section **MATCH Now Liquidity Information Email**.

Setting Constraints on Orders

Order-based Constraints

Certain constraints may be specified on each order submitted. These constraints apply to the specific order either as a single stand-alone order or as part of a list of orders (in the case of the MATCH Now-Liquidity destination). Constraints applied to a particular order take precedence over constraints specified at the list, user default, or system default levels.

Orders submitted to the MATCH Now-Market Flow destination may specify a minimum fill quantity via the MinQty (110) field in the FIX *New Order-Single* message.

Orders submitted to the MATCH Now-Liquidity destination may specify the following constraints as part of the FIX *New Order-Single* or *New Order-List* messages:

- A minimum fill quantity may be specified via the MinQty (110) field.
- An expiration time for the order may be specified via the ExpireTime (126) field.
- Using the TCM Constraints (6005) field, additional MATCH Now-specific constraints may be specified via a string containing sub-fields of the form *tag=value*, where each sub-field within the string is separated by the ASCII STX character (^B or 0x02). An example of the use of this field would be: ...<SOH>6005=TM=1<STX>TLM=0<SOH>....

- The following additional constraints may be specified in the TCM Constraints (6005) field:

| Tag | Tag_name | Values | Description |
|---------|---------------------|--------|--|
| TM | MIDPOINT_ELIGIBLE | 0 or 1 | If true (1), Liquidity orders will be allowed to match against other Liquidity orders. If false (0), Liquidity orders will only match against Market Flow orders only. Default: true (1) |
| TLM | TRADE_LOCKED_MKTS | 0 or 1 | If true (1), orders will trade when bid=ask If false (0), orders will not trade when bid=ask Default: true (1) |
| MM P | MIDPOINT_FILLS_ONLY | 0 or 1 | If true (1), when Liquidity orders match against Market Flow orders they provide midpoint price improvement (same behavior as matching with other Liquidity orders.) No price improvement is provided when bid =ask. If false (0), when Liquidity orders match against Market Flow orders they provide 20% price improvement up to a maximum of \$0.01. No price improvement is provided when bid =ask. Default: false (0) |

List-based Constraints

Certain constraints may be specified for a complete list of orders submitted to the MATCH Now-Liquidity destination. A list is defined as multiple and different symbols that can be on one side or both sides of the market. These constraints apply to all orders with the list and take precedent over constraints specified at the user default, or system default levels.

List constraints are specified in the ListExeclnst (69) field of the FIX *New Order-List* message. The constraints are specified via a string containing sub-fields of the form *tag value* (separated by a space), where each sub-field within the string is separated by the ASCII LF character (^J, \n or 0x0A). An example of the use of this field would be:

```
...<SOH>69=4 1500<LF>8 2000<LF>50 0<LF>55 1<LF>6 20000<LF>7 30000<LF>52 Passive-2<LF><SOH>....
```

The following list constraints may be specified in the ListExeclnst (69) field:

| Tag | Tag_name | Values | Description |
|-----|-------------|-----------|---|
| 4 | CANCEL_TIME | HHMM | Time at which order will be done for the day Default: market close |
| 6 | BUY_IMB | 999999999 | Cash Buy Imbalance. Dollar amount that buys may exceed sells. Up to 9 chars Default: no limit |

| Tag | Tag_name | Values | Description |
|-----|-------------------|-----------|--|
| 7 | SELL_IMB | 999999999 | Cash Sell Imbalance. Dollar amount that sells may exceed buys. Up to 9 chars Default: no limit |
| 8 | MIN_SHARES | 999999 | Minimum Shares per Fill Up to 6 chars Default: zero (no minimum fill) |
| 50 | MIDPOINT_ELIGIBLE | 0 or 1 | If true (1), Liquidity orders will be allowed to match against other Liquidity orders. If false, Liquidity orders will only match against Market Flow orders only. Default: true (1) |
| 60 | TRADE_LOCKED_MKTS | 0 or 1 | If true (1), orders will trade when bid=ask If false (0), orders will not trade when bid=ask Default: true (1) |

Chapter Three: FIX Messages

MATCH Now-Supported Messages

MATCH Now supports the following FIX messages:

| | |
|---|------------------------|
| 0 | Heartbeat |
| 1 | Test Request |
| 2 | Resend Request |
| 3 | Reject |
| 4 | Sequence Reset |
| 5 | Logout |
| 8 | Execution Report |
| 9 | Order Cancel Reject |
| A | Logon |
| C | Email |
| D | New Order – Single |
| E | New Order – List |
| F | Order Cancel Request |
| G | Cancel/Replace Request |
| H | Order Status Request |
| K | List Cancel Request |
| L | List Execute |

MATCH Now Implementation of FIX Messages

MATCH Now fully supports all FIX Administrative Messages as defined by the FIX 4.0 and FIX 4.2 protocol and these are not described in this document.

MATCH Now's implementations of the supported FIX 4.0 and FIX 4.2 Application Messages are described in the following sections.

Orders

As mentioned above, there are two distinct destinations within MATCH Now: *MATCH Now-Liquidity* and *MATCH Now-Market Flow*, and each handles orders differently from the other. In addition, the MATCH Now-Liquidity destination accepts orders in two forms: single orders and list orders.

The following table summarizes the behaviour of orders submitted to these destinations and indicates the acceptable values for many of the FIX fields. Further information can be found in the specifications of the *New Order – Single* and *New Order – List* messages in the sections that follow this one.

In this table, the behaviour is indicated by:

- **support** : these values are used by the MATCH Now destination to affect matching functionality
- **reject** : these values are not supported by the destination, and orders containing them will be rejected by the destination or returned unfilled and done for the day
- **report** : these values are accepted and will be reported on the MATCH Now Market Data Feed and as required by regulators, but are not explicitly used by the MATCH Now destination
- **(---**) : these values are not used by the MATCH Now destination and will be ignored if submitted

| Order Attribute | FIX Tag | Values | Market Flow Orders | Liquidity Single Orders | Liquidity List Orders |
|----------------------------------|---------|-----------------------------------|--------------------|-------------------------|-----------------------|
| Side | 54 | buy / sell / short / short-exempt | support | support | support |
| | | all others | reject | reject | reject |
| Order Type | 40 | market / limit | support | support | support |
| | | all others | reject | reject | reject |
| Acct Type (Rule 80A) | 47 | IN / NC / CL / ST | report | report | report |
| | | all others | reject | reject | reject |
| Price (for Limit orders) | 44 | numeric | support | support | support |
| Time in Force | 59 | DAY | support | support | support |
| | | IOC / FOK | support | reject | reject |
| | | GTC/GTD/GTX ¹ | support | reject | reject |
| | | OPG | reject | reject | reject |
| Expire Time | 126 | FIX time format | support | support | support |
| Handling Instructions | 21 | all values | --- | --- | --- |
| Special Terms | 18 | AON ² | reject | reject | reject |
| | | all others | --- | --- | --- |
| | 63 | all values | --- | --- | --- |
| Max Floor (Iceberg) | 111 | integer | --- | --- | --- |
| Minimum Fill Volume ³ | 110 | numeric | support | support | support |
| Bypass Marker | 6791 | non-blank | reject | reject | reject |
| Anonymous | 7012 | Y/N | support | support | support |
| Program Trade | 7003 | Y/N | report | report | report |

| Order Attribute | FIX Tag | Values | Market Flow Orders | Liquidity Single Orders | Liquidity List Orders |
|--------------------------------------|---------|-----------------------|--------------------|-------------------------|-----------------------|
| Jitney # | 7008 | 3-digit broker number | report | report | report |
| Regulation ID | 7013 | SS / IA | report | report | report |
| Midpoint Eligible | 6005 | TM=1 / TM=0 | --- | support | support |
| Midpoint Fills Only | 6005 | MMP=1 / MMP=0 | --- | support | --- |
| Trade in Locked Markets | 6005 | TLM=1 / TLM=0 | --- | support | support |
| Buy/Sell Imbalance | 69 | numeric | --- | --- | support |
| Expire Time ⁴ | 69 | HHMM | --- | --- | support |
| Minimum Fill Volume ^{3, 4} | 69 | numeric | --- | --- | support |
| Midpoint Eligible ⁴ | 69 | 50 1 / 50 0 | --- | --- | support |
| Trade in Locked Markets ⁴ | 69 | 60 1 / 60 0 | --- | --- | Support |

¹ Good-Till type Market Flow orders receive Cancelled responses (OrdStatus(39) = 4) when no further liquidity is available. This is different than Day orders, which receive Done-for-Day responses (OrdStatus(39) = 3). If this variance in response is a concern, all Market Flow orders should be submitted as Day orders, since all Market Flow orders are either filled immediately or returned, regardless of the TimeInForce value.

² Although the AON special terms type is not supported, an effective all-or-none order can be accomplished by setting the MinQty (110) field to the same value as the OrderQty (38) field.

³ The Minimum Fill Volume constraint applies to *each* fill executed on an order. For an order that executes over multiple fills, the volume of each fill will be at least this value.

⁴ When included in tag 69 of the first *New Order - List* message in a list of orders, these values apply to all orders in the list. These list-level values may then be overridden in the individual orders with tags 110, 126 and 6005.

New Order – Single

New Order – Single messages may be used for submitting orders to both the MATCH Now-Liquidity destination and the MATCH Now-Market Flow destination. There are some differences in message content between the two destinations. These differences are explained in the table below and the associated tables covering MATCH Now supported tag values above.

With the exception of MinQty (tag 110), MATCH Now does not support special terms, settlement terms, handling instructions, or execution instructions, and these will be ignored if set.

Any FIX tags that do not appear in the table below will be ignored.

| Tag | Field Name | Req'd | Comments |
|-----|------------------------|-------|--|
| | <i>Standard Header</i> | Y | MsgType = D |
| 50 | SenderSubID | Y | Must contain "BrokerNumber:TSXTraderID" |
| 11 | ClOrdID | Y | Up to 25 characters |
| 1 | Account | N | Stored in the MATCH Now database, and returned in Execution Reports, but NOT used for allocations. |
| 18 | ExecInst | N | Not supported. A value of G (All or None) will be explicitly rejected, and all other values will be ignored. |

| Tag | Field Name | Req'd | Comments |
|------------|-------------------------|--------------|---|
| 110 | MinQty | N | Minimum shares per fill. The volume of <i>each</i> fill will be at least this value. |
| 55 | Symbol | Y | Can have up to 8 characters in Symbol.SymbolSfx |
| 65 | SymbolSfx | N | Optional - up to 8 characters in Symbol.SymbolSfx. Compound symbols such as ABC.PR.A can be split in any of three ways between tag 55 & 65: <ul style="list-style-type: none"> • ABC.PR.A in tag 55 • ABC.PR in tag 55 and A in tag 65 • ABC in tag 55 and PR.A in tag 65 |
| 54 | Side | Y | Refer to MATCH Now-Supported Order Sides (54) Values. Other values are rejected. |
| 60 | TransactTime | N | Time this order request was initiated/released by the trader or trading system. |
| 38 | OrderQty | Y | The number of shares to be traded. Must be an Integer. |
| 40 | OrdType | Y | Refer to MATCH Now-Supported Order Types (40) Values. Other values are rejected. |
| 44 | Price | N | Limit price if a Limit order. |
| 21 | HandlInst | Y | Ignored. All orders are treated as automated. |
| 15 | Currency | N | Currently ignored |
| 59 | TimeInForce | N | Refer to MATCH Now-Supported TimeInForce (59) Values. Other values are rejected. |
| 126 | ExpireTime | N | Order expiration time in FIX time format. |
| 47 | Rule80A | Y | Refer to MATCH Now-Supported Rule 80A (47) Values. Other values are rejected. |
| 6005 | TCM Constraints | N | TM (Midpoint eligible); MMP (Midpoint Fills Only and TLM (Trade in locked mkts). Refer to the discussion of Order-based Constraints above. Applies to liquidity orders. Ignored on marketflow orders. |
| 7003 | Program Trade | N | Contains a Y/N indication of whether or not this order is part of a program trade. Default is 'N' if not included. |
| 7008 | Jitney | N | Broker on whose behalf this order is being submitted if different than the executing broker. |
| 7012 | Anonymous | N | Contains a Y/N indication of whether or not the broker wishes to remain anonymous when trades associated with this order are reported. Default is 'N' if not included. |
| 7013 | RegulationID | N | Does not affect order handling, but is reported to feeds. |
| | <i>Standard Trailer</i> | Y | |

New Order – List

New Order – List messages may be used for submitting orders to the MATCH Now-Liquidity destination. The MATCH Now-Market Flow destination does not support *New Order – List* messages.

As defined by the FIX specification, *New Order – List* messages are similar in content to *New Order – Single* messages described above, and add the capability to group orders into lists to be executed in concert. A new list needs to contain multiple and different symbols that can be on one side or both sides of the market.

Of particular interest is tag 69 of the *New Order – List* message, which specifies constraints on a list of orders, as described in the List-based Constraints section above.

The submission of orders via *New Order – List* messages does not activate the orders for execution until a subsequent *List Execute* message (described below) is received.

Any FIX tags that do not appear in the table below or in the table above covering the *New Order – Single* tags will be ignored.

| Tag | Field Name | Req'd | Comments |
|-----|-------------------------|-------|---|
| | <i>Standard Header</i> | Y | MsgType = E |
| 50 | SenderSubID | Y | Must contain "BrokerNumber:TSXTraderID" |
| 66 | ListID | Y | Must be unique, by customer, for the day |
| 105 | WaveNo | N | Ignored. |
| 67 | ListSeqNo | Y | Order number in the list of orders. No checking on ordering. (E.g., Order 3 may come after Order 4.) |
| 68 | ListNoOrds | Y | Total number of orders in the list. |
| 69 | ListExeclnst | N | Refer to the discussion of List-based Constraints above. This tag should only appear in the first order message for a list (where ListSeqNo = 1). |
| xyz | Other Tags | Y/N | See Tag listing for <i>New Order – Single</i> messages above |
| | <i>Standard Trailer</i> | Y | |

List Execute

| Tag | Field Name | Req'd | Comments |
|-----|-------------------------|-------|--|
| | <i>Standard Header</i> | Y | MsgType = L |
| 66 | ListID | Y | Must be unique, by customer, for the day |
| 105 | WaveNo | N | Ignored. |
| 58 | Text | N | Ignored. |
| | <i>Standard Trailer</i> | Y | |

Execution Report

Below is the list of the FIX tags that MATCH Now sends in a FIX 4.0 and Fix 4.2 Execution Report.

| Tag | Field Name | Req'd | Comments |
|------------|------------------------|--------------|---|
| | <i>Standard Header</i> | Y | MsgType = 8 |
| 1 | Account | N | As submitted in the order. |
| 6 | AvgPx | Y | Average price across executions so far for the order |
| 11 | ClOrdID | N | As submitted in the order. |
| 14 | CumQty | Y | Total number of shares executed so far for the order. |
| 17 | ExecID | Y | MATCH Now-assigned order for this execution report. |
| 19 | ExecRefID | N | Original execution report for Cancels or Corrects. |
| 20 | ExecTransType | Y | Refer to MATCH Now-Supported ExecTransType (20) Values |
| 31 | LastPx | Y | Execution price of this execution |
| 32 | LastShares | Y | Number of shares executed in this execution |
| 37 | OrderID | Y | MATCH Now-assigned order ID. |
| 38 | OrderQty | Y | As submitted in the order. |
| 39 | OrdStatus | Y | Refer to MATCH Now-Supported OrderStatus (39) Values |
| 40 | OrdType | N | As submitted in the order. |
| 44 | Price | N | As submitted in the order. |
| 47 | Rule80A | N | As submitted in the order. |
| 54 | Side | Y | As submitted in the order. |
| 55 | Symbol | Y | As submitted in the order. |
| 57 | TargetSubID | Y | As submitted in the SenderSubID (50) field of the order. |
| 58 | Text | N | Text of rejection reason when OrdStatus = 8 (rejected) |
| 59 | TimelnForce | N | As submitted in the order. |
| 60 | TransactTime | N | Time of execution (GMT) |
| 65 | SymbolSfx | N | As submitted in the order. |
| 103 | OrdRejReason | N | Refer to MATCH Now-Supported Order Reject Reason (103) Values |
| 126 | ExpireTime | N | As submitted in the order. |
| 132 | BidPx | Y | Canadian NBBO bid at time of execution |
| 133 | OfferPx | Y | Canadian NBBO offer at time of execution |

| Tag | Field Name | Req'd | Comments |
|------------|-------------------------|--------------|---|
| 6776 | PrincipalTrade | N | Indicates a transaction where the dealer, as principal, sells securities to or buys securities from its own customer Valid Values: Y = Yes N = No |
| 6777 | WashTrade | N | Indicates a trade that has occurred between proprietary accounts of the same dealer firm Valid Values: Y = Yes N = No |
| 7003 | Program Trade | N | As submitted in the order. |
| 7008 | Jitney | N | As submitted in the order. |
| 7012 | Anonymous | N | As submitted in the order. |
| 7013 | RegulationID | N | As submitted in the order. |
| 9100 | Contrabroker | Y | Contrabroker – 001 if anonymous |
| | <i>Standard Trailer</i> | Y | |

Order Cancel/Replace Request

Order Cancel/Replace Request messages may be used for changing existing orders in the MATCH Now-Liquidity destination. The MATCH Now-Market Flow destination does not support changing orders.

An *Order Cancel/Replace Request* message will be rejected if any of the fields marked “Must match original order” below contains a value different than in the original order.

To change order parameters whose field values are ignored or rejected below, the order should be fully cancelled and a new order issued.

Any FIX tags that do not appear in the table below will be ignored, and will not reflect a change in the Order.

| Tag | Field Name | Req'd | Comments |
|------------|-------------------|--------------|--|
| | Standard Header | Y | MsgType = G |
| 1 | Account | N | Ignored. |
| 11 | ClOrdID | Y | Unique identifier of replacement order as assigned by client. |
| 18 | ExecInst | N | Not supported. A value of G (All or None) will be explicitly rejected, and all other values will be ignored. |
| 21 | HandlInst | Y | Ignored. All orders are treated as automated. |
| 38 | OrderQty | Y | May be increased or decreased. |
| 40 | OrdType | Y | May be changed. Refer to MATCH Now-Supported Order Types (40) Values. |
| 41 | OrigClOrdID | Y | Unique identifier of original order as assigned by client. |

| Tag | Field Name | Req'd | Comments |
|------------|-------------------|--------------|--|
| 44 | Price | N | May be changed if changed order is a Limit order. |
| 47 | Rule80A | N | Ignored. |
| 50 | SenderSubID | Y | Must match original order. |
| 54 | Side | Y | Must match original order. |
| 55 | Symbol | Y | Must match original order. |
| 59 | TimeInForce | N | Must match original order. |
| 65 | SymbolSfx | N | Must match original order. |
| 66 | ListID | N | Must match original order. |
| 110 | MinQty | N | Minimum shares. May be changed up or down. |
| 126 | ExpireTime | N | May be changed. |
| 6005 | TCM Constraints | N | Ignored. |
| 7003 | Program Trade | N | Not supported. Message will be rejected if included. |
| 7008 | Jitney | N | Not supported. Message will be rejected if included. |
| 7012 | Anonymous | N | May be changed. |
| 7013 | RegulationID | N | Not supported. Message will be rejected if included. |
| | Standard Trailer | Y | |

Examples – Order Cancel/Replace

Below is the sequence of events involving Correction (Cancel/Replace) on existing Orders.

| | | ClordID | OrigClordID |
|-----------|---------------------------------|---------|-------------|
| Client | New Order | 15 | - |
| MATCH Now | Ack report | 15 | - |
| Client | Correction1 | 16 | 15 |
| MATCH Now | Pending Replace (OrdStatus = 6) | 16 | - |
| MATCH Now | Replaced Report (OrdStatus = 5) | 15 | - |
| Client | Correction2 | 17 | 16 |
| MATCH Now | Pending Replace Report | 17 | - |
| MATCH Now | Replaced Report | 16 | - |

Order Cancel Request

Order Cancel Request messages may be used for cancelling existing orders in the MATCH Now-Liquidity destination. The MATCH Now-Market Flow destination does not support cancelling orders.

Any FIX tags that do not appear in the table below will be ignored.

| Tag | Field Name | Req'd | Comments |
|-----|-------------------------|-------|---|
| | <i>Standard Header</i> | Y | MsgType = F |
| 11 | ClOrdID | Y | Unique ID of cancel request as assigned by the client |
| 38 | OrderQty | Y | Original OrderQty |
| 41 | OrigClOrdID | Y | Unique ID of original order as assigned by client |
| 50 | SenderSubID | Y | (BrokerNumber:TSXTraderID) Must correspond to the original order |
| 54 | Side | Y | Refer to. (page 3-11) |
| 55 | Symbol | Y | Up to 8 characters in Symbol.SymbolSfx |
| 58 | Text | N | Ignored |
| 65 | SymbolSfx | N | Up to 8 characters in Symbol.SymbolSfx |
| 66 | ListID | N | Must be set if the corresponding order is a List order |
| 125 | CxlType | Y | Refer to MATCH Now-Supported CxlType (125) Values. Other values are rejected. |
| | <i>Standard Trailer</i> | Y | |

Examples – Order Cancel

Below is the sequence of events involving Cancel Requests on existing orders:

| | | ClordID | OrigClordID |
|-----------|----------------------------------|---------|-------------|
| Client | New Order | 15 | - |
| MATCH Now | Ack report | 15 | - |
| Client | Cancel | 16 | 15 |
| MATCH Now | Pending Cancel (OrdStatus = 6 | 16 | - |
| MATCH Now | Cancelled Report (OrdStatus = 4) | 15 | - |

Order Cancel Reject

| Tag | Field Name | Req'd | Comments |
|-----|--|-------|--|
| | <i>Standard Header</i> | Y | MsgType = 9 |
| 37 | OrderID | Y | MATCH Now-assigned number for order with ClOrdID, or 0 if order was never received |
| 11 | ClOrdID | Y | Unique order id assigned by client to the cancel request or to the <i>replacement</i> order. |
| 41 | OrigClOrdID | Y | The unique order id assigned by client to the execution or correction that occurred prior to this cancellation or correction. |
| 66 | ListID | N | Will be set if a corresponding <i>List</i> order was found. |
| 102 | CxlRejReason | N | 0 = Too late to cancel, 1 = Unknown order |
| 58 | Text | N | Not used |
| 434 | <i>CxlRejResponseTo (FIX 4.2 only)</i> | Y | 1 = <i>Order Cancel Request</i> , 2 = <i>Order Cancel/Replace Request</i> |
| | <i>Standard Trailer</i> | Y | |

Order Status Request

| Tag | Field Name | Req'd | Comments |
|------------|-------------------------|--------------|--|
| | <i>Standard Header</i> | Y | MsgType = H |
| 37 | OrderID | N | Not used - Ignored |
| 11 | ClOrdID | Y | Original ID of the order sent by client |
| 55 | Symbol | Y | Up to 8 characters in Symbol.SymbolSfx |
| 65 | SymbolSfx | N | Up to 8 characters in Symbol.SymbolSfx |
| 54 | Side | Y | OrderSide for original order sent with ClOrdID |
| | <i>Standard Trailer</i> | Y | |

Email

Below is a sample of the FIX tags that we send in an Email message from MATCH Now to a client. The sending of Email messages can be turned off. Email messages sent by the client are entered into our log files.

| Tag | Field Name | Req'd | Comments |
|------------|-------------------------|--------------|-------------------------|
| | <i>Standard Header</i> | Y | MsgType = C |
| 94 | EmailType | Y | 0 = New |
| 33 | LinesOfText | Y | Number of lines in text |
| 58 | Text | Y | Displayable text. |
| | <i>Standard Trailer</i> | Y | |

MATCH Now Liquidity Information Email

MATCH Now uses FIX Email messages to transmit information regarding liquidity in the MATCH Now liquidity pool. These FIX Email messages are transmitted on the MATCH Now-Market Flow FIX channel.

This liquidity information permits access vendors to pre-filter orders destined for the MATCH Now-Market Flow destination, to avoid sending market flow orders to MATCH Now that have no possibility of matching anything in the MATCH Now liquidity pool.

- MATCH Now Liquidity Information Email will be sent on the MATCH Now Market Flow link only.
- When there is a change in MATCH Now liquidity (e.g. when a supplier sends marketable orders to MATCH Now), MATCH Now will send a FIX Email with Tag Text(58) containing the new liquidity additions or deletions using the following format:

1. TCM_LIQUIDITY#ADD#Symbol1.Suffix=B Symbol2=S Symbol3=B ...
2. TCM_LIQUIDITY#DELETE#Symbol4=B Symbol5=S Symbol6.Suffix=S ...
3. TCM_LIQUIDITY#DELETE *

(1) Above means add "Buy Symbol1.Suffix, Sell Symbol2 and Buy Symbol3" to MATCH Now's liquidity information.

(2) Above means "Delete Buy Symbol4, Sell Symbol5, and Sell Symbol6" from MATCH Now's liquidity information.

(3) Above requests deletion of the entire MATCH Now liquidity information.

Field Values Supported by MATCH Now

This section describes the values that are supported in some of the fields within the FIX messages described in the preceding section. The behaviour that occurs when values outside these are received is described in the above descriptions of the messages.

MATCH Now-Supported Order Sides (54) Values

| | | MATCH NOW LIQUIDITY | MATCH NOW MARKET FLOW |
|---|-------------------|---------------------|-----------------------|
| 1 | Buy | √ | √ |
| 2 | Sell | √ | √ |
| 5 | Sell Short | √ | √ |
| 6 | Sell Short Exempt | √ | √ |

MATCH Now-Supported Order Types (40) Values

| | | MATCH NOW LIQUIDITY | MATCH NOW MARKET FLOW |
|---|--------|---------------------|-----------------------|
| 1 | Market | √ | √ |
| 2 | Limit | √ | √ |

MATCH Now-Supported TimeInForce (59) Values

| | | MATCH NOW LIQUIDITY | MATCH NOW MARKET FLOW |
|---|--|---------------------|-----------------------|
| 0 | Day | √ | √ |
| 1 | Good Till Cancel (GTC) | | √ |
| 2 | At the Opening (OPG) | | |
| 3 | Immediate or Cancel (IOC) | | √ |
| 4 | Fill or Kill (FOK) <i>(treated as IOC by MATCH Now as eligible for partial fill)</i> | | √ |
| 5 | Good Till Crossing (GTX) | | √ |
| 6 | Good Till Date | | √ |

MATCH Now-Supported Rule 80A (47) Values

| | | MATCH NOW LIQUIDITY | MATCH NOW MARKET FLOW |
|-------|------------------|---------------------|-----------------------|
| CL | Client | √ | √ |
| ST | Specialist | √ | √ |
| NC | Non-client | √ | √ |
| IN | Inventory | √ | √ |
| Other | Will be rejected | | |

MATCH Now-Supported CxlType (125) Values

| | | MATCH NOW LIQUIDITY | MATCH NOW MARKET FLOW |
|---|-------------------------|---------------------|-----------------------|
| F | Full remaining quantity | √ | |

MATCH Now-Supported ExecTransType (20) Values

| | |
|---|---|
| 0 | New (for Acknowledgements, Fills, confirmation of Cancel, confirmation of Cancel/Replace, Nothing Done) |
| 1 | Cancel (Cancel an execution) |
| 2 | Correct (change in Price) |
| 3 | Status (a response for a status) |

MATCH Now-Supported OrderStatus (39) Values

| | |
|---|--|
| 0 | Acks on order |
| 1 | Partial Fill |
| 2 | Fill |
| 3 | Done for Day |
| 4 | Canceled |
| 5 | Replaced |
| 6 | Pending Cancel |
| 8 | Rejections on orders |
| 9 | FIX 4.2 Order Cancel Reject <ul style="list-style-type: none"> • On a new order: Cancel reject is Tag 35 (OrdStatus) = 9 and Tag 434 (CxlRejResponseTo) = 1 • Cancel/replace reject is Tag 35=9 and Tag 434=2, |
| E | FIX 4.2 Pending replace |

MATCH Now-Supported Order Reject Reason (103) Values

| | |
|---|--|
| 0 | Invalid orders due to invalid specifications |
|---|--|

MATCH Now-Order Reject Reason (35=8) (58) Values

| | |
|--|---------------------|
| | Invalid Symbol |
| | Invalid Trader Id 1 |
| | "no trade" |

Supported Symbol Suffixes

For symbols, MATCH Now uses standard TSX / TSXV symbology as follows:

| Symbol Type | Format |
|---|--|
| Common shares | XXX |
| Special voting classes: <ul style="list-style-type: none"> • Non-voting shares • Multiple-voting shares • Subordinate-voting shares • Limited-voting shares • Restricted-voting shares | XXX.A / XXX.B (symbol for special voting classes are prescribed by the listing Exchange and variations can be accepted but currently are not being used by TSX and TSXV)) |
| Preferred shares | XXX.PR.X |
| Rights | XXX.RT / XXX.RT.X |
| Warrants | XXX.WT / XXX.WT.X |
| Units | XXX.UN |
| When issued | XXX.WI |
| Installment Receipts | XXX.IR |

MATCH Now does not support trading in Debenture, Notes, USD denominated securities or securities with special settlement.

Chapter Four: FIX Test Plan

MATCH Now-Supported Messages

As mentioned earlier in this document, the following FIX messages are supported by MATCH Now Direct Connect:

| | |
|--------------------------------|---|
| Administration messages | <ul style="list-style-type: none">• Heartbeat• Logon• Test Request• Resend Request• Reject• Sequence Reset• Logout |
| Application messages | <ul style="list-style-type: none">• New Order - Single• Execution Reports• Orders Cancel/Replace Request• Order Cancel Request• Order Cancel Reject• Orders Status Request• Email• Don't Know Trade (DK)• New Order List• List Execute |

Connection Instructions

Before testing, you'll need to establish a connection. Follow these steps:

1. Determine which FIX protocol version you will be using.
2. Agree on the method of testing: either Internet or wait for a leased line to be installed.
3. Provide MATCH Now with the following information:
 - Your SenderCompID.
 - Your list of SubIds (SenderSubID), if needed to represent multiple traders.
5. You'll need to know the following MATCH Now settings:
 - MATCH Now's SenderCompID will be "TCM" unless you request a change.
 - You will be supplied with an IP address and Port# in order to connect to MATCH Now.

Basic Connectivity Test

1. Establish the connection.
2. After authentication, exchange Heartbeats.
3. Disconnect, then reconnect again. (Generate Resend_Requests if gaps are detected)
4. MATCH Now will send the following messages:
 - Logon - In response to the client's logon
 - TestRequest - After the logon is received
 - HeartBeat
 - Resend_Request - If a gap is detected by MATCH Now
 - Sequence_reset - After resending all messages requested by receiving side
 - Logout - This will occur during any of the following events:
 - The incoming sequence number is less than expected
 - Regular logout
 - Logout in case the client's logon cannot be authenticated.
5. Expect to receive the following messages:
 - Logon
 - TestRequest
 - HeartBeat
 - Resend_Request (if a gap is detected by the receiving application)
 - Logout

Session Protocol Test

MATCH Now LIP Feed

- **Accept LIP Feed.** Build LIP database from LIP feed.
- **Add symbol to LIP.** Send an order to MATCH Now Liquidity; process symbol addition.
- **Delete symbol from LIP.** Cancel an order in MATCH Now Liquidity; process symbol deletion.

MATCH Now – Liquidity Destination

Single Orders

- **New Order Singles**
 - New Single Orders from client.
 - New Single Order with constraints set.
- **Cancel** - Cancel requests on outstanding orders. Partial cancellation of an order will be rejected.
- **Cancel/Replace** - Outstanding orders will be requested to be corrected for:
 - Order Type Change
 - Quantity Change
 - Price Change
 - Perform a cancel
- **Status Request** - Status Request messages will be sent by the client to determine the current status of an order.
- **Possdupe** - If the client is uncertain as to whether an order was successfully transmitted, Possduded Orders will be sent by the client under the same sequence number of the original order.
- **Execution Reports** - MATCH Now will generate all possible reports.

List Orders

- **New Order - List**
 - List Orders from client with constraints, followed by a ListExecute.
- **Cancel/Replace** - As done for single orders. Outstanding orders will be requested to be corrected for:
 - Order Type Change
 - Quantity Change
 - Price Change
 - Constraint change
 - Perform a cancel

MATCH Now – Market Flow Destination

Single Orders

- **New Order Singles** - Valid New Single Orders from client.
 - Submit an order with a match available in MATCH Now
 - Submit an order with no match available in MATCH Now
- **Cancel/Replace** – Cancels and corrections will be rejected on Market Flow orders. By definition, it will always be too late to cancel (correct) a Market Flow order. Unmatched orders are re-routed to the broker/network for on-routing to the marketplace. Cancels and corrects should apply to the re-routed orders.
- **Execution Reports** - MATCH Now will generate all possible reports.
 - Full execution
 - Partial execution; remainder is returned to the sending broker/network for on-routing to the marketplace

Special Cases

Single Order Scenarios:

Rejected Orders may occur for the following reasons:

- **Cancel_Reject** - These will be caused by either of the following reasons:
 - **Unknown order** - Cancel/Correct for an unknown order by Client.
 - **TLTC** - This case will be simulated by receiving a Cancel request on an order while the order is on its way to being filled.
 - **Unknown symbol** - An order from the Client with a security which MATCH Now doesn't trade.
 - **Unsolicited cancel** - MATCH Now may cancel an order without a request.

List Order Scenarios

The following are error scenarios for list orders:

- If a new order is received with the same list id after a *List-Execute* has been received for the same list. The order will be rejected.
- If *List Execute* for an unknown list is received. No action will be taken from the MATCH Now side.
- If *List Execute* is received for a list where all orders are not yet received for that list. Rejections will be sent for each order in the list.
- Orders received in wrong order in a list will not be rejected.
- If a new list is received with a duplicate list id. Rejection will be sent for all the orders in the duplicate list.

- If a *List Execute* is received for an already cancelled list. An alert will be logged on the MATCH Now side.

Recovery Tests

Test 1

The following steps will be performed from the MATCH Now side:

1. Establish the connection.
2. Receive a few orders, then send execution reports back.
3. Drop the connection.
4. Decrease the expected incoming sequence number to a lower number than the current expected sequence number. (E.g., if the last received message had a MsgSeqNum of 20, decrease the expected incoming number to 12.)
5. Reconnect, then establish connection.
6. As soon as connection is established and first message is received, MATCH Now will issue a Resend_Request for the gap. (from 12 to all)

MATCH Now expects the following tasks to be performed from the Client Side:

1. Retransmission of all the messages sought.
2. Emulate the same scenario for Resends.

Test 2

1. Establish the connection.
2. Receive a few orders from client. Break the connection while sending executions back to the client so that not all the reports go through. Restore the connection and check if the client receives all the remaining (missing) reports.