Results Repository (RR)
And
MPE / MHE
Interface Control Document

Revision 1.29

USPS Engineering Systems
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Change History

Date	Rev.	Change Description	Author
8/2/2018	1.15	Initial Document	L. Shah
10/11/2018	1.16	Added trusted weight field to Nest Item Request in Table 12, Table 14 Close Bag Request	L. Shah
01/24/2019	1.17	Adding Container type with the open bag request, Added additional field on open bag Removed section 5 Clarified wordings Updated Host Status code	Team
04/04/2019	1.18	Removed Trusted weight from close bag transaction Updated protocol summary General document clarification / correction	Team
04/10/2019	1.19	Removed schema from Nesting transaction on page 20.	Team
05/02/2019	1.20	Changed Item weight from 3 char to 4 Numeric values	A.Ahmadi
09/04/2019	1.21	added schema back to Nesting transaction on page 20.	A.Ahmadi
09/04/2019	1.21	Changed Item weight back to 3 char from 4 Numeric value for ‘N” transaction	A.Ahmadi
09/05/2019	1.22	Updated date and version number on cover page	A.Ahmadi
10/07/2019	1.23	Update section 8.1 Close Bag Request – Updated Container Type description and example, updated Bag Total Weight description, updated Is End Of Run description. Update section 7.1 Nest Item Request – Description for Item Weight updated and examples updated.	L. Shah
01/28/2022	1.24	Correction of total length of Open Bag Response message (Table 11). Update example for Item Weight in Table 6.	L. Shah
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4/27/2022	1.26	Added Request A and Request D (International Open Bag Request and International Close Bag Response)	L. Ross
12/27/2023	1.27	Added Nesting Format 2 message. Added Sections 7.3 and 7.4. Added a note in Section 1.	I. Ionov, L. Shah
04/16/2024	1.28	Added N82 error code to Section 3.3	I. Ionov
04/28/2025	1.29	Added digits 24 to the scan time where applicable (multiple tables); updated version, file name, and date	L. Shah, I. Ionov

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1 Standards, guidelines, and good practices

The following section contains examples intended to assist RR users in configuring and utilizing RR Version 5.0. or higher efficiently. It includes some standard configuration settings, as well as guidelines and good practices which will ensure effective RR performance.

- u Message - Host Status request should be sent in a configurable interval; Host status shall be sent every 5 minutes or greater. Host Status shall be sent only during idle time.
- If MPE receives anything other than I1, then MPE may send a host status 'u' request every 30 seconds.
- When RR responds back with an invalid sequence number error to MPE, RR will drop the connection and MPE should re-establish connection with initialization.
- If MPE receives invalid sequence number from RR, MPE shall disconnect and re-establish connection.
- MPE should have a timeout value between 1 and 15 seconds. The default value is 3 seconds. In the event of timeout, an MPE should disconnect and establish connection.
- MPE should not display or log "RR Communication Error" or "RR not available" or similar message indication a connection issue with RR when it receives any error code, i.e. I0 etc.
- For 'u' request, when receiving "I1" from the RR Server, MPE can continue to send dispatch request.
- All values are configurable ranging from 0-9999 seconds.
- Any weight of an item exceeds 100 lbs, weight should be sent as AAA.

1.1 Message Protocols

The RR provides a Transfer Control Protocol (TCP) interface to the MPE / MHE for processing mail. In this interface the RR is the Server and the MPE / MHE is the client. RR monitors a configurable port for any incoming messages. Each client must establish a socket connection to the RR Server by initializing and transmitting relevant, applicable data according to this document. Invalid data or an unauthorized client results in a rejected connection. The RR supports synchronous communication with each client. The MPE / MHE must wait for a response before sending a new request. Sending a new request before a reply from the RR violates this protocol and RR closes the socket connection. Once the socket connections have been established, the MPE / MHE must maintain the proper communication protocol, as described in this document. As part of authentication, there is a **sequence number** established during initialization which must being remented by one (1) for all subsequent transactions by the MPEs / MHEs.

If sequence number reaches 9999, next valid sequence number is 0000. RR tracks the sequence number for validating each request. If RR receives a request which it cannot process (such as invalid sequence number 'N22', invalid request type – N23) or RR has internal error in processing this request – N24, RR sends an error message (for example N22, N23, or N24) indicating an error has occurred and the connection will be closed by RR. When MPE receives N22, N23, or N24 error message, it will need to detect socket closure initiated by RR. It will close current socket connection, reconnect to RR and send initialization message. After initialization is successful, it can resume mail processing.

RR application will validate the request to check if there is pipe character '|' in it. If there is, then RR will send back error message N98 indicating "invalid request data, forbidden pipe character in request". RR will not disconnect socket from this MPE. Mail processing continues when MPE receives N98. The sequence number in the request is incremented by 1 from last sequence number.
It is important that no MPE request should have pipe character included. It is reserved by RR application for message communication between threads and processes. RR will send N32 and then disconnect the connection if MPE sends the burst of duplicate requests either exact the same data, except sequence number, or the same request type with different value in other data fields, except sequence number in very short time periods.

The MPE / MHE must maintain an open socket for communication. In the event a disconnect occurs, the MPE / MHE must reestablish the connection. Disconnections may result from a faulty Network, switches, hardware failures, etc. Each MPE / MHE is allowed to have only one (1) connection to the RR. When an existing socket connection between the RR and MPE / MHE has been established, a second attempt to establish a connection causes the RR to close the first connection, enabling the second MPE / MHE connection.

Typical response time for the RR to process a transaction request is under 400 milliseconds; however, due to internal RR processing and external dependencies, we recommend that the MPE / MHE set their timeout to a value greater than 2 seconds. If no response is received from the RR after 2 seconds, then the MPE must close and re-establish the socket connection.
This section describes the message specifications between the RR and MPEs / MHEs using TCP/IP communication, consisting of the following **case sensitive** transaction **request** types:

1. Initialization 'b'
2. Results Repository (RR) Host Status 'u'
3. Realized Sort Outcomes (RSO) 's'
4. Sort Plan Value 'r'
5. Error Message
6. Open Bag 'O'
7. Close Bag 'C'
8. Nest Item 'N'
9. Nest Item Format 2 'N'

Note: All data fields contain ASCII characters. If the Required field is 'N', then the field can be blank. If the Required field is 'Y', then the field must be populated with accurate data accordingly to the data type field. The Type field in the tables depicted indicates whether numeric characters (0-9), right-justified and zero-filled or any ASCII character, left-justified and blank-padded. The value must fall within the scope defined for that field.
Note: The examples are provided with bolded request type for clarity and where <CR> represents a Carriage Return character. The example message is enclosed in brackets [ ]. The brackets [ ] are not part of the message protocol.
Note: Transaction requests are case sensitive.
Note: All fields are required unless otherwise specified.

2 Result Repository (RR) Initialization

2.1 Initialization Request 'b'

(b Message, ASCII value 098)
As part of the requirements for TCP/IP communication, an initialization message protocol is defined between the MPE and RR. When an MPE opens a socket connection with the RR, the first message that the RR must receive from the MPE is an initialization request. If it is a non-authorized connection, RR logs an error status and closes the connection. The MPE closes the connection, checks the configuration, and attempts to reconnect and reinitialize. If it is a duplicate connection, RR logs the status, terminates the current socket (i.e., first) connection to MPE, and accept the latest (i.e., second) connection from the same MPE using the same IP, DNS, or name. Initialization requests for MPEs can only be sent to the RR during the authentication stage. If an MPE passes authentication, the RR does not expect a b request. In the case that, during processing, a b request is made that has the correct sequence number, the RR responds with an N23 error message. Otherwise, if this b request has an incorrect sequence number, RR responds with an N22 error message. Under this condition, RR drops the connection to this MPE. After initialization of the

MPE is successful, it is in a mail processing state. Any request RR receives from this MPE thereafter is validated against mail processing request types. If a request is not supported for capable MPE, RR will send N23 error message and then drop the connection.

2.1.1 Initialization Request (MPE to RR)

An Initialization request has up to six fields. First is request code b, followed by a unique four-digit sequence number generated by the MPE. The initial sequence number is generated when an initialization message is sent from an MPE. Additional fields identify the MPE's location ZIP Code, the RR's location ZIP Code, the MPE name, and the RR server name. The MPE's location ZIP Code and the RR's location ZIP Code are optional fields, blank by default. A unique sequence number is included as part of the initialization request from the MPE. The sequence number is increased by one and embedded after the request code field in each subsequent request to the RR. The RR echoes the same sequence number in the response message to the MPE. If the sequence number is not incremented by one for each subsequent request, the RR returns the error message N22 and then drops the connection.

The following table describes the MPE to RR Initialization request.

Table 1 Initialization Request

Field Number	Field Name	Type	Position	# of Char	Description	RR Required
1	Request Code	Char	1	1	Initialization request code as "b"	Y
2	Sequence Number	Numeric	2-5	4	Unique sequence number. Values must be numeric and range from 0000 to 9999, leading zeros expected.	Y
3	MPE ZIP Code	Char	6-10	5	Optional MPE location ZIP Code, blank by default.	N
4	RR ZIP Code	Char	11-15	5	Optional RR server location ZIP Code, blank by default.	N
5	MPE Name	Char	16-45	30	MPE name or MPE IP address as configured in the RR RR_configuration.ini file. This must be a unique name on each RR server.	Y
6	RR server Name	Char	46-75	30	RR name or RR IP address as configured in the RR configuration.ini file. This must be a	Y

Field Number	Field Name	Type	Position	# of Char	Description	RR Required
					unique name on the USPS domain. Note: This can also be RR Server hostname	
	TOTAL		75	75		

Note: For the 10.10 Network, the MPE name can be the 10.10 IP Address, a unique name, or the MPE's full name, as shown in the following example.

Example:

```
[b0234001001003810.10.90.191              10.10.90.200              ]
[b0000        ORDMSWYB1                10.10.90.21]
    [b0000        ORDMSWYB2                10.10.90.21]
    [b000060600606000RDMSWYB3                10.10.90.21]
    [b00006060060600 ORDMSWYB4.usps.gov          CHICOILMTRR1.USPS.GOV
```

2.1.2 Initialization Response (RR to MPE)

The Initialization response is a string of 49-alphanumeric characters, beginning with the same four-digit sequence number found in the request. The remaining characters represent the request code, the RR's current date (MMDDYYYY), time in hours and minutes (HHMM), the MPE ID, and MPE Name. The following table depicts the RR to MPE Initialization response.

Table 2 Initialization Response

Field Number	Field Name	Type	Position	# of Char	Description	MPE Required
1	Sequence number	Char	1-4	4	Echo of the same message sequence number received in the Initialization request.	Y
2	Request Code	Char	5	1	Initialization request Code as "b"	Y
3	Month and Day	Char	6-9	4	Current month and day of RR (MMDD)	Y
4	Year	Char	10-13	4	Current year of RR (YYYY)	Y
5	Hour and Minute	Char	14-17	4	Current RR time in hours and minutes (HHMM)	Y
6	MPE ID	Char	18-19	2	The MPE ID is the two-character unique identifier, ranging from "01" to "FF" in hexadecimal format. The MPE ID for each MPE connected to RR must be unique.	Y

Field Number	Field Name	Type	Position	# of Char	Description	MPE Required
7	MPE Name	Char	20-49	30	MPE name or MPE IP address as configured in the RR configuration.ini file.	Y
8	Location	Char	50-52	3	This is the 3-character site code where the device is located. Example ORD, JFK, SFO. If no value, spaces should be used	Y
	TOTAL		52	52		

Example: [0234b022220071021AA10.10.90.200 JFK]

2.1.3 Initialization Error Response

If the RR receives an incorrect Initialization request from the MPE, the RR returns an error code as shown in the following table.

Table 3 Initialization Error Response

Field Number	Field Name	Type	Position	# of Char	Description	MPE Required
1	Sequence number	Char	1-4	4	Echo of the same message sequence number received in the Initialization request.	Y
2	Response Code	Char	5	1	Initialization response code as b **Note**: Response code will be "B" in the case for error code 00 (Invalid request code)	Y
3	Error Code	Numeric	6-7	2	Error code: 00 – Invalid request code 01 – Invalid request length 02 – Invalid sequence number 03 – Invalid MPE Name 04 – Invalid RR Name	Y

Field Number	Field Name	Type	Position	# of Char	Description	MPE Required
	TOTAL		7	7		

Example: [0000b01]

3 Result Repository (RR) Host Status

(u Message, ASCII value 117)

3.1 Result Repository Host Status Request (MPE to RR)

The following table depicts the RR Host Status request. This can be used for heart beat/ health status of RR. The response from RR can be utilized to manage sorter alert/operation.

Table 4 RR Host Status Request

Field Number	Field Name	Type	Position	# of Char	Description	RR Required
1.	Request Code	Char	1	1	Host status request code as “u”	Y
2.	Sequence Number	Numeric	2-5	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
	TOTAL		5	5		

Example: [u0123]

3.2 Result Repository Host Status Response (RR to MPE)

The response to a Host Status request depends on the state of RR Server.

The following table depicts a Host Status response.

Table 5 Host Status Response

Field Number	Field Name	Type	Position	# of Char	Description	MPE Required
1.	Sequence Number	Numeric	1-4	4	Echo of the same message sequence number received in the Host Status request.	Y
2.	Response Code	Char	5	1	Response code as “i”	Y
3.	Status	Numeric	6	1	0 disconnected from host. 1 connected to host and ready to process 2-9 TBD	Y
	TOTAL		6	6		

Example: [0123i1]

3.3 Result Repository Host Status Error Codes (RR to MPE)

- i0 – Server is down (not responding)
- N20 – Server not configured
- N22 – Invalid sequence number
- N23 – Invalid request type
- N24 – Internal error
- N30 – Server Database unavailable
- N31 – Server Database out of date
- N82 – D&R request not sent to TC
- Nxx – Where xx can by any number between 00 to 99 that could be defined in the future

For more details on Error codes the following document is to be used as a reference: "Transaction Concentrator and Mail Processing Equipment (MPE) TCP/IP Message Protocol Specification. Revision 17" (TC_MPE_TCP_Protocol_2012_07_18_rA17.doc).

4 Realized Sort Outcomes (RSO)

(s Message, ASCII value 115)

4.1 Realized Sort Outcomes (RSO) Store Request (MPE to RR)

The Realized Sort Outcomes Store Request is a request from client to store a realized sort outcome in the RR database for processing. The following table depicts an RSO store request.

Table 6 RR RSO Store Request

Field Number	Field Name	Type	Position	#of char	Description	RR Required
1.	Request Code	Char	1	1	RSO Store request code as "s"	Y
2.	Message sequence Number	Numeric	2-5	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
3.	MPE Name	Char	6-37	32	The name of the equipment or computer	Y
4.	Location	Char	38-40	3	The Mail Handling Facility at which the Dispatching equipment is located. This is the 3-character site code (OE) where the device is located. Example: ORD, JFK, SFO. If no value, spaces should be used.	Y
5.	Item ID 1-5	Char	41-210	170	Item ID as well as Del Con; left justified; if smaller value than 34; spaces should be used. Multiple (up to 5) fixed fields per RSO are provided.	N

Field Number	Field Name	Type	Position	#of char	Description	RR Required
6.	Item Weight	Numeric	211-213	3	The weight granularity is in tenth of pounds. The weight is in pounds; 012 is 01.2 Lbs. If no value; leading zeros should be used. Example: [012] is 01.2 Lbs [005] is 0.5Lbs [000] is 0 Lbs leading spaces should be used [12] is 1.2Lbs [5] is 0.5Lbs [000] is 0Lbs	Y
7.	Bin Number	Char	214-216	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
8.	Schema	Char	217-221	5	The Schema code that provides the bin number the mail was sorted to	Y
9.	Scan Time	Char	222-233	12	Date and Time of scan (YYMMDDHH(24)MMSS)	Y
10.	Destination Country	Char	234-235	2	2-character Destination Country code. Example: AU Spaces to be padded if null or N/A.	Y
11.	Actual Outcome	Char	236-237	2	2-character Actual Outcome code. Shall include the Hold as well as Release outcomes. The below are the Known Hold Outcomes: NL : DNL for EU NQ : Queue until M0 and reprocess for EU UD : Return to Sender – Customer Request H4 : Hold for USPIS H3 : Hold for CBP BD : Return to Sender – Export Compliance H2 : Hold for EC HD : Hold for EC due to missing EC disposition H1 : Hold for EC to process through iPass (missing manifest) H5 : Hold for Multiple Dispositions	Y

Field Number	Field Name	Type	Position	#of char	Description	RR Required
					H6 : Hold for Duplicate Customs Barcode HL : APBS Item Looping Outcome	
12.	Destination Zip	Numeric	238-246	9	Left Justified & Padded with trailing zeros. If ZZZZZ = 5-digit Destination Zip then pad with trailing zeros. Example: 001270000 ZZZZZWWWW = 9-digit Destination Zip. Example: 551161234 Send as all zeros if null or N/A	Y
	Total		246	246		

```
0 Item ID
        [s0123JFKAPBS12                 JFK
        125123222041207160405l2AUH4001270000]
1 Item ID
        [s0123JFKAPBS12                 JFKEE123456789US
        125123222041207160405l2AUH4001270000]
5 Item IDs
        [s0123JFKAPBS12                 JFKEE123456789US          EE123456788US
        EE123456777US           EE123456666US          EE123455555US
```

The following table depicts an RSO response.

Table 7 RSO Store Response

Field Number	Field Name	Type	Position	# of Char	Description	RR Required
1.	Sequence Number	Numeric	1-4	4	Echo of the same message sequence number received in the RSO Store request.	Y
2.	Response Code	Char	5	1	Response code as “s”	Y
3.	Acknowledgment	Char	6	1	A / N	Y
4.	Carriage Return	Char	7	1	<CR> where <CR> is one character representing Carriage Return(ASCII 13)	Y

Field Number	Field Name	Type	Position	# of Char	Description	RR Required
	TOTAL		7	7		

Example: [0123sA<CR>] where <CR> is ASCII 13
Note: If the response is other than A (Acknowledgement), the MPE shall wait a configurable period and retransmit (default 1 min). The MPE shall also have a have a configurable maximum number of retries (Default 6).

5 Sort Plan Value

Sort Plan Value Removed

6 Open Bag

MPE Sorter sends open bag command with EDL information to RR.

6.1 Open Bag Request - (MPE to RR)

MPE sends an open bag request to RR. The following table depicts an Open Bag request.

Table 8 Open Bag Request

Field Number	Field Name	Type	# of Char	Description	RR Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Request Code	Char	1	Open bag request code as "O"	Y
3.	Sequence Number	Numeric	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
4.	MPE Sorter Name	Char	32	MPE unique name that identifies it.	Y
5.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
6.	IMTL	Char	24	24-digit barcode in compliance with ATLAS label printing. This 24 digit must be unique for 90 days (configurable).	Y

Field Number	Field Name	Type	# of Char	Description	RR Required
7.	Location	Char	3	This is the 3-character site code; where the device is located. Example: ORD, JFK, IAD; or blank (empty spaces by default).	N
8.	Facility ZIP	Numeric	5	Facility's ZIP Code	Y
9.	Label Type	Numeric	1	Label Type. 24th character of the IMTL.	Y
10.	Service Standard	Numeric	1	Service standard, 0 through 6	Y
11.	CIN Description	Char	21	CIN Description. Note: CIN file can be obtained from DTMS or TC.	Y
12.	Destination ZIP	Numeric	5	3- or 5-digit ZIP, based on depth of sort; example, '220' or '22082'	Y
13.	Last Facility	Char	35	Facility name where the mail is processed; i.e., 'Dulles P&DC'.	Y
14.	Print NLM	Char	3	Can contain 'NLM' (non-linear measurement). Blank (empty spaces by default).	N
15.	Destination Facility Name	Char	21	The destination facility name corresponding to destination ZIP. Blank (empty spaces by default).	N
16.	Route/Auto	Char	4	Route information. Could contain "AUTO". Blank (empty spaces by default).	N
17.	Open bag date and time	Numeric	14	Date and time of request. Format: YYYYMMDDHH(24)MMSS	Y
18.	Sort Program Name	Char	8	Sort program information. Blank (empty spaces by default)	Y
19.	Operation Number	Numeric	3	Operation Number with leading zero i.e., "093"	Y
20.	Container Type	Char	3	3-digit Container type (such as bag) that is used for the operation.	Y
21.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		193		

Examples:

{O0001APPSMPE1 JFK1143042FCM NON-CODEABLE LTRS22043DULLES PDC NLMADC WASHINGTON DC 201AUTO0010670801610530100037192112018030313012209 3P1P}
{O0003APPSMPE2 JFK1143062LTRS RTS LBL_MODE 22011ADC WASHINGTON DC 200 NLMADC WASHINGTON DC 200AUTO0010670801610530100037191012018030313112209 3P1P}

6.2 Open Bag Response (RR to MPE)

RR responds to MPE Open Bag request with Open Bag response message. The following table depicts an Open Bag response.

Table 9 Open Bag Response

Field Number	Field Name	Type	# of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Sequence Number	Numeric	4	Echo of the same message sequence number received in the Open Bag request.	Y
3.	Response Code	Char	1	Response code as "O"	Y
4.	Acknowledgement	Char	1	Value of either "**A**" (ACK) or "**N**" (NACK)	Y
5.	MPE ID	Char	2	The MPE ID corresponding to MPE name sent in O request. The MPE ID is the two-character unique identifier, ranging from "01" to "FF" in hexadecimal format. The MPE ID for each MPE connected to RR must be unique.	Y
6.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
7.	EDL	Char	24	Echo of EDL sent in O request	Y
8.	Error Code	Char	2	01 – Invalid Request Code 02 – Invalid Sequence Number 03 – Invalid Run Sequence Consecutive Start or Stop messages received. 04 – Internal Error 05 – Invalid Request Length 06 – Client Not Initialized 07 – EDL already exists 08 – Invalid or Missing Header 09 – Invalid or Missing Terminator 10 – Invalid or Missing MPE Name empty 11 – Invalid or Missing Bin number. 12 – EDL Length incorrect 13 – Open bag data and time missing or invalid. If acknowledgement is A (ACK) then the value will be empty (i.e., spaces)	Y
9.	Open bag response date time	Numeric	14	Date and time of response. Format: YYYYMMDDHH(24)MMSS	Y
10.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		53		

Examples:
{0000OA18001067080161053010003719 20180303130122}
{0001ON180010670801610530100037190720180202110122}

7 Nest Item

Sorter sends nest item command with item id(s), item weight(s) to RR.

7.1 Nest Item Request - (MPE to RR)

MPE send nest item request to RR. The following table depicts a Nest Item Request.

Table 10 Nest Item Request

Field Number	Field Name	Type	# of Char	Description	Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Request Code	Char	1	Nest Item Store request code as "N"	Y
3.	Message Sequence number	Numeric	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
4.	MPE Name	Char	32	The name of the equipment or computer	Y
5.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
6.	Location	Char	3	The Mail Handling Facility at which the Dispatching equipment is located. This is the 3-character site code (OE) where the device is located. Example: ORD, JFK, SFO. If no value, spaces should be used.	Y
7.	Item ID 1-5	Char	170	Item ID as well as Del Con; left justified; if smaller value than 34; spaces should be used. Multiple (up to 5) fixed fields per RSO are provided.	Y
8.	Item Weight	Numeric	3	The weight granularity is in tenth of pounds; If no	Y

Field Number	Field Name	Type	# of Char	Description	Required
				value; leading zeros or spaces should be used. E.g for leading zeroes should be used: [012] is 01.2 Lbs [005] is 0.5Lbs [000] is 0 Lbs Example for leading spaces should be used [12] is 1.2Lbs [5] is 0.5Lbs [ ] is 0Lbs	
9.	Schema	Char	5	The Schema code that provides the outcome for the barcode. If not available, Schema should be passed as all zeros.	Y
10.	Destination Zip	Char	9	Left Justified & Padded with trailing zeros. If ZZZZZ = 5-digit Destination Zip, then pad with trailing zeros. Example: 001270000 ZZZZZWWWW = 9-digit Destination Zip. Example: 551161234 Send as all zeros if null or N/A	Y
11.	Scan Time	Char	12	Date and Time of scan (YYMMDDHH(24)MMSS)	Y
12.	Trusted Weight	Char	1	Y - Yes N - No	Y
13.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		245		

7.2 Nest Item Response - (RR to MPE)

RR responds back to MPE Nest Item request with Nest Item Response. The following table illustrates a Nest Item Response.

Table 11 Nest Item Response

Field Number	Field Name	Type	Max # of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Sequence Number	Numeric	4	Echo of the same message sequence number received in the Nest Item request. N	Y
3.	Response Code	Char	1	Response code as "N"	Y
4.	Acknowledgement	Char	1	Value of either "**A**" (ACK) or "**N**" (NACK)	Y
5.	MPE ID	Char	2	The MPE ID corresponding to MPE name sent in O request. The MPE ID is the two-character unique identifier, ranging from "01" to "FF" in hexadecimal format. The MPE ID for each MPE connected to RR must be unique.	Y
6.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
7.	Error Code	Char	2	01 – Invalid Request Code 02 – Invalid Sequence Number 03 – Invalid Run Sequence, Consecutive Start or Stop messages received. 04 – Internal Error 05 – Invalid Request Length 06 – Client Not Initialized 07 – Missing Request Code 08 – Invalid or Missing Header 09 – Missing item id and/or item weight 10 – Invalid or Missing Terminator If acknowledgement is A (ACK) then the value will be empty (i.e. spaces)	Y
8.	Nest Item Response data and time	Char	14	Date and time of message. Format: YYYYMMDDHH(24)MMSS	Y
9.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		29		

Examples:
{0001NA18 20180303130100}

{0002NN180920180303130100}

7.3 Nest Item Request Format 2 - (MPE to RR)

MPE send nest item request to RR. The following table depicts a Nest Item Request Format 2.

Table 12 Nest Item Request Format 2

Field Number	Field Name	Type	# of Char	Description	Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Request Code	Char	1	Nest Item Store request code as "N"	Y
3.	Message Sequence number	Numeric	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
4.	MPE Name	Char	32	The name of the equipment or computer	Y
5.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
6.	Location	Char	3	The Mail Handling Facility at which the Dispatching equipment is located. This is the 3-character site code (OE) where the device is located. Example: ORD, JFK, SFO. If no value, spaces should be used.	Y
7.	Item ID 1-5	Char	170	Item ID as well as Del Con; left justified; if smaller value than 34; spaces should be used. Multiple (up to 5) fixed fields per RSO are provided.	Y
8.	Item Weight	Numeric	3	The weight granularity is in tenth of pounds; If no value; leading zeros or spaces should be used. E.g for leading zeroes should be used: [012] is 01.2 Lbs	Y

Field Number	Field Name	Type	# of Char	Description	Required
				[005] is 0.5Lbs [000] is 0 Lbs Example for leading spaces should be used [12] is 1.2Lbs [5] is 0.5Lbs [ ] is 0Lbs	
9.	Schema	Char	5	The Schema code that provides the outcome for the barcode. If not available, Schema should be passed as all zeros.	Y
10.	Destination Zip	Char	9	Left Justified & Padded with trailing zeros. If ZZZZZ = 5-digit Destination Zip then pad with trailing zeros. Example: 001270000 ZZZZZWWWW = 9-digit Destination Zip. Example: 551161234 Send as all zeros if null or N/A	Y
11.	Scan Time	Char	12	Date and Time of scan (YYMMDDHH(24)MMSS)	Y
12.	Trusted Weight	Char	1	Y - Yes N - No	Y
13	Item Dimensions and Volume	Char	16	LLLxWWWxHHH,VVVV This field can be blank. LLL – Length in inches WWW – Width in inches HHH – Height in inches VVVV – Volume in cubic inches	N
14	Place Holder	Char	15	To be used in future.	N
15.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		276		

7.4 Nest Item Format 2 Response - (RR to MPE)

RR responds back to MPE Nest Item request with Nest Item Format 2 Response. The following table illustrates a Nest Item Format 2 Response.

Table 13 Nest Item Format 2 Response

Field Number	Field Name	Type	Max # of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Sequence Number	Numeric	4	Echo of the same message sequence number received in the Nest Item request. N	Y
3.	Response Code	Char	1	Response code as "N"	Y
4.	Acknowledgement	Char	1	Value of either "**A**" (ACK) or "**N**" (NACK)	Y
5.	MPE ID	Char	2	The MPE ID corresponding to MPE name sent in O request. The MPE ID is the two-character unique identifier, ranging from "01" to "FF" in hexadecimal format. The MPE ID for each MPE connected to RR must be unique.	Y
6.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
7.	Error Code	Char	2	01 – Invalid Request Code 02 – Invalid Sequence Number 03 – Invalid Run Sequence, Consecutive Start or Stop messages received. 04 – Internal Error 05 – Invalid Request Length 06 – Client Not Initialized 07 – Missing Request Code 08 – Invalid or Missing Header 09 – Missing item id and/or item weight 10 – Invalid or Missing Terminator 11 – Invalid Item dimensions and volume If acknowledgement is A (ACK) then the value will be empty (i.e. spaces)	Y
8.	Nest Item Response data and time	Char	14	Date and time of message. Format: YYYYMMDDHH(24)MMSS	Y
9.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		29		

Examples:

{0001NA18 20180303130100}
{0002NN180920180303130100}

8 Close Bag

Sorter sends a close bag command after its done nest items to a bag.

8.1 Close Bag Request - (MPE (APPS) to RR)

MPE sends a close bag request to RR. The following table illustrates a Close Bag request.

Table 12 Close Bag Request

Field Number	Field Name	Type	Max # of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket { character	Y
2.	Request Code	Char	1	Open bag request code as "C"	Y
3.	Sequence Number	Numeric	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
4.	MPE Name	Char	32	MPE unique name that identifies it.	Y
5.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin.	Y
6.	EDL	Char	24	24 character receptacle barcode	Y
7.	Container Type	Char	3	3 ~~digit~~ character Container type (such as bag) that is used for the operation. This can be used to pre-determine the tare weight (empty weight of container without contents). Example: "P1P"	Y
8.	Bag Total Weight	Numeric	4	This is the total weight of its contents. (Sum of all item weights for this EDL should match this value). Leading spaces or zeroes to be used in case of no value. The weight is in pounds (lbs). Example: "0005" is 0.5 lbs, " 5" is .5 lbs, "0015" is 1.5 lbs, "0215" is 21.5 lbs	Y
9.	Close bag date and time	Char	14	Date and time of request. Format: YYYYMMDDHH(24)MMSS	Y
10.	Is End Of Run	Char	1	Flag to indicate if close bag operation is from end of run or not. Y – Indicates close bag request is End-Of-Run. N – Indicates close bag request is not End-Of-Run.	Y
11.	Bag Item Count	Char	4	Total number of items nested to the bag.	Y
12.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		92		

Examples:
{C0002APPSMPE1 1001067080161053010003721100101012018040512012O}

8.2 Close Bag Response - (RR to MPE (APPS))

RR responds back to MPE Nest Item request with Nest Item Response. The following table illustrates a Nest Item Response.

Table 13 Close Bag Response

Field Number	Field Name	Type	# of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Sequence Number	Numeric	4	Echo of the same message sequence number received in the Close Bag request.	Y
3.	Response Code	Char	1	Response code as "C"	Y
4.	Acknowledgement	Char	1	Value of either "**A**" (ACK) or "**N**" (NACK)	Y
5.	MPE ID	Char	2	The MPE ID corresponding to MPE name sent in "C" request. The MPE ID is the two-character unique identifier, ranging from "01" to "FF" in hexadecimal format. The MPE ID for each MPE connected to RR must be unique.	Y
6.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin.	Y
7.	EDL	Char	24	Echo of EDL sent in O request	Y
8.	Error Code	Char	2	01 – Invalid Request Code 02 – Invalid Sequence Number 03 – Invalid Run Sequence Consecutive Start or Stop messages received. 04 – Internal Error 05 – Invalid Request Length 06 – Client Not Initialized 07 – EDL already exists 08 – Invalid or Missing Header 09 – Invalid or Missing Terminator 10 – Invalid or Missing MPE Name empty 11 – Invalid or Missing Bin number. 12 – EDL Length incorrect 13 – Close bag date and time missing or invalid. If acknowledgement is A (ACK) then the value will be empty (i.e. spaces)	Y
9.	Close bag response date time	Char	14	Date and time of response. Format: YYYYMMDDHH(24)MMSS	Y
10.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		53		

Examples:
{0002CA18001067080161053010003719 20180305130100}

9 Bag/Container Almost Full

Sorter sends a bag almost full when it's about to get full at a certain percentage (such as 80%).

9.1 Bag/Container Almost Full request - (MPE to RR)

MPE sends a bag almost full request to RR. The following table illustrates a Bag Almost Full request.

Table 14 Bag Almost Full Request

Field Number	Field Name	Type	Max # of Char	Description	RR Required
1.	Header	Char	1	Open curly bracket { character	Y
2.	Request Code	Char	1	Open bag request code as "F"	Y
3.	Sequence Number	Numeric	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
4.	MPE Name	Char	32	MPE unique name that identifies it.	Y
5.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin.	Y
6.	Percentage Full	Numeric	2	A numeric value between 1 and 99. Values lower than 10 are prefixed by a 0. For example, 1 is denoted as 01.	Y
7.	Bag Almost Full message date and time	Char	14	Date and time of request. Format: YYYYMMDDHH(24)MMSS	Y
10.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		58		

9.2 Bag/Container Almost Full Response - (RR to MPE)

RR responds back to MPE a Bag Almost Full request with Bag Almost Full Response.

The following table illustrates a Bag Almost Full Response.

Table 15 Bag Almost Full Response

Field Number	Field Name	Type	# of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Sequence Number	Numeric	4	Echo of the same message sequence number received in the Open Bag request.	Y
3.	Response Code	Char	1	Response code as "F"	Y
4.	Acknowledgement	Char	1	Value of either "**A**" (ACK) or "**N**" (NACK)	Y
5.	MPE ID	Char	2	The MPE ID corresponding to MPE name sent in O request. The MPE ID is the two-character unique identifier, ranging from "01" to "FF" in hexadecimal format. The MPE ID for each MPE connected to RR must be unique.	Y
6.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin. Echo of same value that was received in the request to RR.	Y
8.	Error Code	Char	2	01 – Invalid Request Code 02 – Invalid Sequence Number 03 – Invalid Run Sequence Consecutive Start or Stop messages received. 04 – Internal Error 05 – Invalid Request Length 06 – Client Not Initialized 07 – Percentage Value Incorrect 08 – Invalid or Missing Header 09 – Invalid or Missing Terminator 10 – Invalid or Missing MPE Name empty 11 – Invalid or Missing Bin number. 12 – Percentage Value Length Incorrect 13 –Date and time missing or invalid. If acknowledgement is A (ACK) then the value will be empty (i.e. spaces)	Y

Field Number	Field Name	Type	# of Char	Description	MPE Required
9.	Bag Almost Full response date time	Numeric	14	Date and time of response. Format: YYYYMMDDHH(24)MMSS	Y
10.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		29		

10 International/Military Open Bag

MPE Sorter sends open bag command with EDL information to RR.

10.1 International Open Bag Request - (MPE to RR)

MPE sends International open bag request to RR. The following table illustrates an International Open Bag request

Table 16 International Open Bag Request - (MPE to RR)

Field Number	Field Name	Type	# of Char	Description	RR Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Request Code	Char	1	Open bag request code as "A"	Y
3.	Sequence Number	Numeric	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
4.	MPE Sorter Name	Char	32	MPE unique name that identifies it.	Y
5.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
6.	IMTL	Char	24	24-digit barcode in compliance with ATLAS label printing. This 24 digit must be unique for 90 days (configurable).	Y
7.	Location	Char	3	This is the 3-character site code; where the device is located. Example: ORD, JFK, IAD; or blank (empty spaces by default).	N
8.	Facility ZIP	Numeric	5	Facility's ZIP Code	Y
9.	Label Type	Numeric	1	Label Type. 24th character of the IMTL.	Y
10.	Service Standard	Numeric	1	Service standard, 0 through 6	Y
11.	CIN Description	Char	21	CIN Description. Note: CIN file can be obtained from DTMS or TC.	Y
12.	Destination ZIP	Numeric	5	3- or 5-digit ZIP, based on depth of sort. Example: '220' or '22082'	Y
13.	Last Facility	Char	35	Facility name where the mail is processed. Example: 'Dulles P&DC'.	Y

Field Number	Field Name	Type	# of Char	Description	RR Required
14.	Print NLM	Char	3	Can contain 'NLM' (non-linear measurement). Blank (empty spaces by default).	N
15.	Destination Facility Name	Char	21	The destination facility name corresponding to destination ZIP. Blank (empty spaces by default).	N
16.	Route/Auto	Char	4	Route information. Could contain "AUTO". Blank (empty spaces by default).	N
17.	Open bag date and time	Numeric	14	Date and time of request. Format: YYYYMMDDHH(24)MMSS	Y
18.	Sort Program Name	Char	8	Sort program information. Blank (empty spaces by default)	Y
19.	Operation Number	Numeric	3	Operation Number with leading zero i.e. "093"	Y
20.	Container Type	Char	3	3-digit Container type (such as bag) that is used for the operation.	Y
21.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		193		

Example:

10.2 International Open Bag Response (RR to MPE)

RR responds to MPE International Open Bag request with International Open Bag response message. The following table depicts an Open Bag response.

Table 17 International Open Bag Response

Field Number	Field Name	Type	# of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Sequence Number	Numeric	4	Echo of the same message sequence number received in the Open Bag request.	Y
3.	Response Code	Char	1	Response code as "A"	Y

Field Number	Field Name	Type	# of Char	Description	MPE Required
4.	Acknowledgement	Char	1	Value of either "**A**" (ACK) or "**N**" (NACK)	Y
5.	MPE ID	Char	2	The MPE ID corresponding to MPE name sent in O request. The MPE ID is the two-character unique identifier, ranging from "01" to "FF" in hexadecimal format. The MPE ID for each MPE connected to RR must be unique.	Y
6.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin	Y
7.	EDL	Char	24	Echo of EDL sent in 'A' request	Y
8.	Error Code	Char	2	01 – Invalid Request Code 02 – Invalid Sequence Number 03 – Invalid Run Sequence Consecutive Start or Stop messages received. 04 – Internal Error 05 – Invalid Request Length 06 – Client Not Initialized 07 – EDL already exists 08 – Invalid or Missing Header 09 – Invalid or Missing Terminator 10 – Invalid or Missing MPE Name empty 11 – Invalid or Missing Bin number. 12 – EDL Length incorrect 13 – Open bag data and time missing or invalid. If acknowledgement is A (ACK), then the value will be empty (i.e. spaces).	Y
9.	Open bag response date time	Numeric	14	Date and time of response. Format: YYYYMMDDHH(24)MMSS	Y
10.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		53		

Examples:
{0000AA18001067080161053010003719 20180303130122}
{0001AN180010670801610530100037190720180202110122}

11. International/Military Close Bag

Sorter sends an international close bag command after its done nest items to a bag.

11.1 International Close Bag Request (MPE to RR)

ME Sends International Close Bag Request to RR. The following table details the request fields:

Table 18 International Close Bag Response

Field Number	Field Name	Type	Max # of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket "{" character	Y
2.	Request Code	Char	1	Open bag request code as "D"	Y
3.	Sequence Number	Numeric	4	Sequence number is equal to the sequence number of previous request plus 1 and ranges from 0000-9999.	Y
4.	MPE Name	Char	32	MPE unique name that identifies it.	Y
5.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin.	Y
6,	EDL	Char	24	24 character receptacle barcode	Y
7.	Container Type	Char	3	3 digit character Container type (such as bag) that is used for the operation. This can be used to pre-determine the tare weight (empty weight of container without contents). E.g.: "P1P"	Y
8.	Bag Total Weight	Numeric	4	Piece weight in LBS "0134" = 13.4" lbs.	Y
10.	Close bag date and time	Char	14	Date and time of request. Format: YYYYMMDDHH(24)MMSS	Y
11.	Is End Of Run	Char	1	Flag to indicate if close bag operation is from end of run or not. Y – Indicates close bag request is End-Of-Run. N – Indicates close bag request is not End-Of-Run.	Y
12.	Bag Item Count	Char	4	Total number of items nested to the bag.	Y
23.	Terminator	Char	1	Close curly bracket "}" character	Y
	TOTAL		92		

11.2 International Close Bag Response (RR to MPE)

RR responds back to MPE International Close Bag request with International Close Bag Response. The following table illustrates an International Close Bag Response.

Table 19 International Close Bag Response

Field Number	Field Name	Type	# of Char	Description	MPE Required
1.	Header	Char	1	Open curly bracket "{" character	Y

Field Number	Field Name	Type	# of Char	Description	MPE Required
2.	Sequence Number	Numeric	4	Echo of the same message sequence number received in the Close Bag request.	Y
3.	Response Code	Char	1	Response code as “D”	Y
4.	Acknowledgement	Char	1	Value of either “**A**” (ACK) or “**N**” (NACK)	Y
5.	MPE ID	Char	2	The MPE ID corresponding to MPE name sent in “C” request. The MPE ID is the two-character unique identifier, ranging from “01” to “FF” in hexadecimal format. The MPE ID for each MPE connected to RR must be unique.	Y
6.	Bin Number	Char	3	Bin number the mail was sorted to. Bin 201 is rejected bin.	Y
7.	EDL	Char	24	Echo of EDL sent in’D’ request	Y
8.	Error Code	Char	2	01 – Invalid Request Code 02 – Invalid Sequence Number 03 – Invalid Run Sequence Consecutive Start or Stop messages received. 04 – Internal Error 05 – Invalid Request Length 06 – Client Not Initialized 07 – EDL already exists 08 – Invalid or Missing Header 09 – Invalid or Missing Terminator 10 – Invalid or Missing MPE Name empty 11 – Invalid or Missing Bin number. 12 – EDL Length incorrect 13 – Close bag date and time missing or invalid. If acknowledgement is A (ACK) then the value will be empty (i.e. spaces)	Y
9.	Close bag response date time	Char	14	Date and time of response. Format: YYYYMMDDHH(24)MMSS	Y
10.	Terminator	Char	1	Close curly bracket “}” character	Y
	TOTAL		53		

11 Sign-off

_____	_____	_____
Printed Name	Signature	Date
_____	_____	_____
Printed Name	Signature	Date
_____	_____	_____
Printed Name	Signature	Date