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HL7 Conformance Statement

RamSoft RIS/PACS 6.0

MANUFACTURER

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HL7 Conformance Statement

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OVERVIEW

The RamSoft Mirth Connect (RMC) facilitates communication between RamSoft PACS products and external systems (such as a RIS, HIS, or RamSoft Gateway™ to provide Modality Worklists (MWL)).

RMC conforms to the HL7 2.x specification. The following message types are supported.

Inbound Messages

Event	Message type	Event type
Patient Create / Update	ADT	A01, A02, A03, A04, A05, A06, A07, A08, A12, A13, A28, A31
Patient Merge	ADT	A30, A34, A35, A39, A40, A44, A47
Patient Cancel / Delete	ADT	A11, A23, A38
Order	ORM	O01
Result	ORU	R01
Lab Result	ORU	R01
Scheduling	SIU	S12, S13, S14, S15
Billing Account Create / Update	BAR	P01, P05
Billing Account Cancel	BAR	P06
Financial Transaction	DFT	P03
User Information	MFN	M02

Outbound Messages

Event	Message type	Event type
Patient Create / Update	ADT	A08
Patient Merge	ADT	A40
Patient Cancel / Delete	ADT	A23
Order	ORM	O01
Result	ORU	R01
Billing Account Create / Update	BAR	P01, P05
Financial Transaction	DFT	P03
Vaccination	VXU	V04
User Information	MFN	M02
Scheduling	SIU	S12, S14, S15, S17

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COMMUNICATION

RMC communicates via Mirth Channels. Standard Mirth Channels include support for real-time interfaces over TCP/IP and batch interfaces using SFTP file transfers. It can both send and receive messages.

General Message Format

Syntax

- All HL7 messages begin with \x0B (ASCII 11) and terminate with \x1C (ASCII 28) and \x0D (ASCII 13).
- Each message segment ends with the carriage return character (\x0D, ASCII 13).
- Field sequences in the message segments are separated by "|" (\xC0, ASCII 124).
- Field components are separated by "^" (\x5E, ASCII 94).
- Field sub-components are separated by "&" (\x26, ASCII 38).
- Repeated fields are separated by "~" (\x7E, ASCII 126).
- Any message segment not listed in our conformance statement will be ignored on inbound messages.

UTC Offsets

- All time fields are processed with UTC Offset, if present. If no time zone is present, then the server's UTC Offset is used to interpret time.

Message Header Requirements

- *MSH-10.1* contains the Message ID. The Message ID uniquely identifies the message and is sent back to the sending system in the Message acknowledgement segment (MSA). This field is mandatory.

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Deployment Diagram

The following deployment diagram describes a typical RMC setup in the field. The situation depicted in the diagram shows a very simple deployment case where one RIS is sending and receiving HL7 messages to and from the RMC. The Mirth HL7 engine is normally on the same machine as the RamSoft server. Many installations also have the database on the same machine, however, in this diagram it resides on its own dedicated server. This diagram is provided for clarity, but more complicated setups are supported. Please speak with a RamSoft Sales Representative to find out if we can meet your needs.

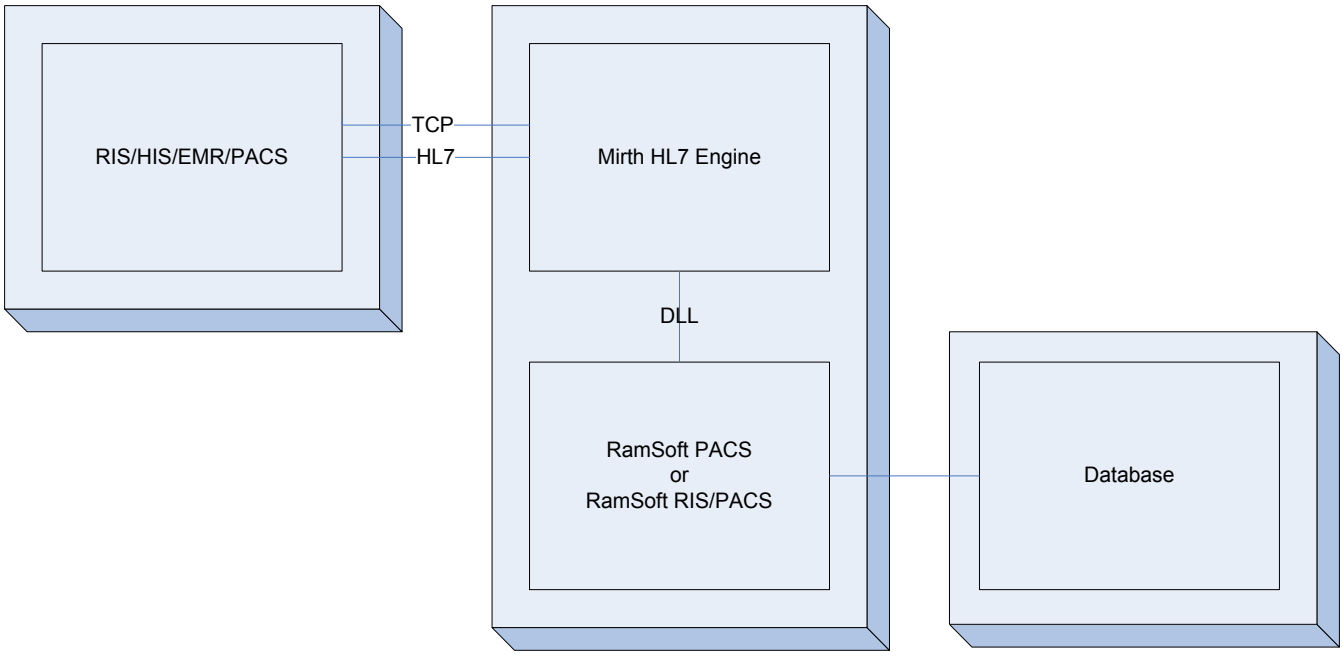

Figure 1: Typical Deployment

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Message Queuing

RMC uses a set of message queues to manage message transmission. These queues allow the RMC to maintain a backlog of messages in the event that the receiving system is unavailable. When the receiving system comes back online, messages within the queue are still in the queue, waiting to be sent. This ensures that messages do not become lost in the event of network or other IT-related issues.

Message Queue Algorithm

The following is the algorithm that depicts the flow of data through the system.

1. Events are added to the message queue based on trigger events when "Mirth HL7 Enabled" is set to true in System Configuration.

2. RMC polls the Message Queue at a specified time interval (default: every second).

3. The message queue contents are processed, and all data necessary to construct the queued messages are consolidated and HL7 messages are created for each queue entry. These messages are then dispatched to the receiving system.

4. All sent messages are recorded to RMC Database.

5. If the message was delivered, the external system will send an ACK (acknowledgement) HL7 message back to RMC for every message that was sent to it. These ACKs should have the same *MSA-2 Message Control ID* as the messages they are replying to. In case of failure in delivering messages, we continue retrying for a configurable number of times. If all retries fail, the status of the message in queue will be marked as error to prevent further attempts but will remain in the queue. After fixing the network problem, the message status can be changed to normal, and RMC will resend this message.

6. ACKs are processed to gather the MSA-2 *Message Control ID* field's contents. This is used to delete any entries corresponding to that ID from the message queue.

General Storing in DB

1. By default, all values are stored in RamSoft DB with upper case.
2. Some values can be stored as case sensitive (original value) according to conditions (see section 0 **SEGMENT DEFINITIONS**).

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MESSAGES DEFINITION

Acknowledgement ACK

The ACK message is sent whenever another message has been successfully received and processed. RMC logs ACK messages both inbound and outbound. Inbound ACK messages are logged under the Source connector under the response. Outbound the ACK messages are logged on to the message Destination under the response.

Segment Name	Segment Description
MSH	Message Header
MSA	Message Acknowledgement

ACK Sample Message

MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||ACK|101|P|2.3.1|||||||
MSA|AA|104|Request was Successfully processed

Negative Acknowledgement ACK

The negative ACK message is sent whenever another message has been successfully received but unsuccessfully processed. RMC logs Negative ACK messages both inbound and outbound. Inbound Negative ACK messages are logged under the Source connector under the response. Outbound the Negative ACK messages are logged on the message Destination under the response.

Segment Name	Segment Description
MSH	Message Header
MSA	Message Acknowledgement
ERR	Error Comments

When RMC receives a negative ACK it does not try to resend the failed message.

Negative ACK Sample Message

When there are exceptions:
MSH|^~\&|RECEIVING FACILITY|RAMSOFT|SENDING FACILITY|20101223202939-0400||ACK|101|P|2.3.1
MSA|AE|101|
ERR|^^^207&Application Internal Error

When the message is rejected:
MSH|^~\&|RECEIVING FACILITY|RAMSOFT|SENDING FACILITY|20101223202939-0400||ACK|101|P|2.3.1
MSA|AR|101|
ERR|^^^101&PID Segment does not exist in HL7 message

Note: RMC will try to resend messages for a configurable number of retries when an AR response is received.

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Patient Create / Update

Patient Create / Update message (ADT^A08) is used to register a new patient or update an existing patient's information. Patient Merge must be used when Patient ID or Issuer of Patient ID has changed to avoid duplicate patients. RMC can be configured to ignore create/update messages for patients that were previously merged when the sending HIS/RIS systems can't filter messages on inactive patients from sending, so the patients won't be added again to the RamSoft DB.

Segment Name	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[{AL1}]	Allergy
[{PRB}]	Problem Codes
[{DG1}]	Diagnosis Codes
[GT1]	Guarantor
[{IN1}]	Insurance

RamSoft Extension: We have a parameter in the outbound channel configuration that allows GT1 and IN1 segments to be sent with the ADT^A08 message. The IHE standard requires these segments to be sent only in BAR messages. In this case, IN1 will be processed as described in Billing Account Create / Update.

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ADT^A08 Sample Messages

MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||ADT^A08|101|P|2.3.1|||||UNICODE UTF-8||
EVN|A08|20101223202939-0400||||
PID||P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^^^^||19741018|M||2106-3^WHITE^HL70005|10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI|(909)481-5872^^^qa@ramsoft.com|(909)481-5800x1||M||12345|286-50-9510|||2135-2^HISPANIC OR LATINO^HL70189|
PV1||O|||||||||||||||||||||||||||||||||||||||||||||||
AL1|1|I^PENICILLIN|SV|PRODUCES HIVES|
AL1|2|I^CAT DANDER|M|RESPIRATORY DISTRESS|

ADT^A08 with Problem and Diagnosis codes

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180507164826-0400||ADT^A08|21478|P|2.3.1|||||UNICODE UTF-8||
EVN|A08|20180507164826-0400||||
PID|1||P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131-1^OTHER^HL70005|60 ADELAIDE STREET EAST^^TORONTO^ON^M5C3E4^CAN|4166741347^^^SALES@RAMSOFT.COM^^^9093535333|9094815800 1^^^^^^^4162345353|F|||RAM||12345|1234564564|ON|||2135-2^HISPANIC OR LATINO^HL70189|
PV1||O|||||||||||||||||||||||||||||||||||||||||||||||
AL1|1|I^PENICILLIN|SV|PRODUCES HIVES|
AL1|2|I^CAT DANDER|M|RESPIRATORY DISTRESS|
PRB||20180507164437-0400|202063008^(ARTHROPATHY NOS| OF THE UPPER ARM) OR (ELBOW ARTHRITIS NOS)|||20180507000000-0400
PRB||20180507164525-0400|202793005^(BACK PAIN: [LUMBAR SPINE] OR [LOW] OR [ACUTE LUMBAR]) OR (LUMBALGIA) OR (LUMBAGO)|||20180507000000-0400
DG1|1|I|S30.1^DISLOCATION OF JAW; OPEN DISLOCATION^I9CDX|||W|
DG1|2|I|V00.131A^Fall from skateboard, initial encounter^I10||20180430121859|W|
DG1|3|I|I50.21^Acute systolic (congestive) heart failure^I10||20180501121726|W|
DG1|4|I|789.06^ABDOMINAL PAIN; EPIGASTRIC^I9CDX||20180430181157|W|

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Patient Merge

Patient Merge message (ADT^A40) is used to merge two patients together or indicate that the Patient ID or Issuer of Patient ID has changed. The new patient is identified in the PID segment and the old patient is identified in the MRG segment.

Segment Name	Segment Description
MSH	Message Header
EVN	Event Segment
PID	Patient Identification
MRG	Merge Patient Information

ADT^A40 Sample Message

MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||ADT^A40|102|P|2.3.1||||||
UNICODE UTF-8||
EVN|A40|20101223202939-0400||||
PID||P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^^^^||19741018|M||2106-3^WHITE ^HL70005|10808
FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^US||(909)481-5872^^^qa@ramsoft.com|(909)481-
5800x1||M||12345|286-50-9510|||2135-2^HISPANIC OR LATINO^HL70189|
MRG|758026^^^ISSUER|||758026^^^ISSUER|

Patient Cancel / Delete

Patient Cancel / Delete message (ADT^A23) is used to delete a patient in the RamSoft database that has been registered. This message will also delete all studies associated with this patient.. RMC ignores this message if the specified patient record contains any study information to avoid accidental deletion of data.

Segment Name	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification

ADT^A23 Sample Message

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430162310-0400||ADT^A23|21324|P|2.3.1|||||||UNICODE UTF-8||EVN|A23|20180430162310-
0400||||PID|1||650642^^^RAMSOFT^MR|650642^^^RAMSOFT^MR||TEST^^^^|^||U||^^|^^^^^||^^^^^^|^^^^^^||U|||||^^|

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Order Message

The Order Message (ORM^O01) is used for scheduling and updating orders for diagnostic imaging. It is strongly recommended to use this transaction set instead of the Scheduling transaction set to perform this task. RMC does not differentiate between order creation and order modification, so the same message is used to accomplish both tasks.

Segment Name	Segment Description
MSH	Message Header
EVN	Event Segment
PID	Patient Identification
PV1	Patient Visit
ZVI	Dose information
ORC	Common Order
OBR	Observation Request
[NTE]	Notes and Comments Segment
{[OBX]}	Observation Result
[GT1]	Guarantor
[{IN1}]	Insurance
[ZDS]	Additional identification information (custom for IHE)

The ZDS segment lies outside the repeatable segment group in this message. This ensures that all data within the repeatable segment group must pertain to a single study. RMC will send multiple ORC and OBR segments when multiple procedure codes exist for the study.

RamSoft Extension: We have a parameter in the outbound channel configuration that allows GT1 and IN1 segments to be sent with the ORM^O01 message.

RMC supports up to 3 active insurance segments (Primary, Secondary, and Tertiary) and unlimited inactive insurance segments.

Inbound message:

Based on following algorithm, we consider the IN1 segment is active or inactive insurance.

IN1 segment #1:

- Active Primary insurance if insurance level is 1.
- Active Secondary insurance if insurance level is 2.
- Active Tertiary insurance if insurance level is 3.
- Inactive insurance if insurance level is empty or does not match any of insurance level

IN1 segment #2:

- Active Secondary insurance if insurance level is 2 and IN1 segment #1 is active Primary insurance
- Active Tertiary insurance if insurance level is 3 and IN1 segment #1 is active Primary insurance or active Secondary insurance
- Otherwise, inactive insurance

IN1 segment #3:

- Active Tertiary insurance if insurance level is 3 and IN1 segment #1 is active Primary insurance and IN1 segment #2 is active Secondary insurance
- Otherwise, inactive insurance

Other IN1 segments:
- Inactive insurances

As long as there is at least one active insurance, any existing active insurances for the patient that are not received in IN1 segments (active insurances) will be marked as "Inactive".

Outbound message:

- Send active insurances for the patient
- Allow to send inactive insurances for the patient if the config ALLOW_SEND_INACTIVE_INSURANCES_OUTBOUND is "true".

IN1 segments are populated as following rules:
- IN1 segment for active insurances is populate first, then IN1 segments for inactive insurances.
- The order of insurance type: Primary insurance is first, then Secondary insurance. Last is Tertiary insurance.

For example, if the patient has Primary, Secondary and Tertiary active insurances and Primary, Secondary and Tertiary inactive insurances, the order of IN1 segments is following:

IN1 segment #1 – Primary Insurance.
IN1 segment #2 – Secondary Insurance
IN1 segment #3 – Tertiary Insurance.
IN1 segment #4 – Inactive Primary Insurance.
IN1 segment #5 – Inactive Secondary Insurance
IN1 segment #6 – Inactive Tertiary Insurance.

If the patient has Secondary and Tertiary active insurances and Secondary and Tertiary inactive insurances, the order of IN1 segments is following:

IN1 segment #1 – Secondary Insurance
IN1 segment #2 – Tertiary Insurance.
IN1 segment #3 – Inactive Secondary Insurance
IN1 segment #4 – Inactive Tertiary Insurance.

If patient has only one type of active insurance this insurance and Primary, Secondary and Tertiary inactive insurances, the order of IN1 segments is following:
IN1 segment #1 – Active Insurance (can be Primary or Secondary or Tertiary)
IN1 segment #2 – Inactive Primary Insurance.
IN1 segment #3 – Inactive Secondary Insurance
IN1 segment #4 – Inactive Tertiary Insurance.

Mapping of Orders to Studies

We support a 1-to-many mapping between orders and studies. Patient ID, Issuer of Patient ID, and Accession Number uniquely identifies a single study in our system. Patient ID and Issuer of Patient ID combination must be unique, Accession and Issuer of Patient ID combination must be unique. Study Instance UID also uniquely identifies a single study.

Inbound Algorithm to Match Order to Study

We use the following algorithm to locate the study record to update:

1. If *ZDS-1* contains Study Instance UID, then we use this field exclusively to locate the study to update. Otherwise, proceed to step 2.
2. We locate the patient record based on Patient ID and Issuer of Patient ID as described in the PID segment. If no match is found, then we create a new patient and study. For the located patient, we locate the study using *OBR-18.1* as Accession Number. Patient ID and Accession number are required fields. If PatientID or Accession Number are empty the HL7 message will be rejected.
3. If a match is not found, we create a new study.

Inbound Processing

We support multiple studies (multiple accession numbers) per ORM message. We perform an iteration for each repeating field (Accession Number) in *OBR-18.1*.

1. If this Accession Number is identical, then
   a) Update study information based on the first ORC / OBR segment and store procedure information based on all OBR segments.
   b) If *OBR-4.1* matches a valid Study Type Code in our database, then we update this study using this Study Type Codes' description and procedure codes attached to this Study Type Code. We also process procedure codes in *OBR-44.1* from all OBR segments.
   c) If *OBR-4.1* does not match a valid Study Type Code, we update this study using *OBR-4.2* as Study Description and procedure codes in *OBR-44.1* from all OBR segments.
2. If this Accession Number is not identical, then
   a) Create study information based on the first ORC / OBR segment and store procedure information based on all OBR segments. Set this Accession Number for this study information.
   b) If *OBR-4*.1 matches a valid Study Type Code in our database, then we create this study using this Study Type Codes' description and procedure codes attached to this Study Type Code. We also process procedure codes in *OBR-44.1* from all OBR segments.
   c) If *OBR-4.1* does not match a valid Study Type Code, we create this study using *OBR-4.2* as Study Description and process procedure codes in *OBR-44.1* from all OBR segments.
3. If multiple accession numbers are found after processing, then these studies will be grouped.

ORM^O01 Sample Messages

```
MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||ORM^O01|104|P|2.3.1|||||| UNICODE
UTF-8||
EVN|O01|20101223202939-0400||||
PID||P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^^^||19741018|M||2106-3^WHITE ^HL70005|10808
FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^US||(909)481-5872^^^qa@ramsoft.com|(909)481-5800x1||M||12345|286-50-
9510|||2135-2^HISPANIC OR LATINO^HL70189|
PV1||O|ER^ER^^MEDICAL CENTER^^^^^ER||||1234567890^JONES^SAMUEL^^MD^|1234567890^JONES^SAMUEL^^MD^|
306507^SMITH^JOHN^^MD^~689789^JONES^ED^^MD^|||||||||||||||||||||||||||||||||||||||||
ORC|SC|A123456|A123456||SC||1^^^20110615025434-0400^^R^^^||20110704211036-
0400|FRONTDESK||1234567890^JONES^SAMUEL^^MD^|^^^MEDICAL CENTER|8883439146|||MEDICAL CENTER|
OBR||A123456|A123456|70100^XRAY JAW < 4 VIEWS^^^|||20110704211036-0400|||||R|Patient was in an
altercation||^^^JAW^|1234567890^JONES^SAMUEL^^MD^||A123456|RP890|A123456||||CR|||^^^20110615025434-
0400^^R^^^^|||WALK|830.1^DISLOCATION OF JAW; OPEN
DISLOCATION^|2345678901&PATEL&APU&&MD&||&LEVINSON&KERRY&K&RT&|&TRANKLIN&KATY&K&&||||PATIENT WAS
DRUNK||U|||70100^XRAY JAW < 4 VIEWS^^^||
NTE|1|O|CLINICAL NOTES|RE|
OBX|1|ST|^BODY HEIGHT||1.69|m|||||F||||||
OBX|2|ST|^BODY WEIGHT||75|kg|||||F||||||
ZDS|1.2.124.113540.0.0.3.725.4^RAMSOFT^Application^DICOM|
```

With Financial segments (GT1 and IN1) included:

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20170301102640-0500||ORM^O01|4710|P|2.3.1||||||UNICODE UTF-8||
EVN|O01|20170301102640-0500||||
```

PID|1||RAM2054^^^VM-CLINICAID^MR|RAM2054^^^VM-CLINICAID^MR||TESTER^PAT^M^^MS.|SWEET^MOM|19850302|F||UNK^DECLINED^HL70005|23 DUVAL ST^^KEY WEST^FL^33040^USA||3055552244^^^TEST@RAMSOFT.COM^^^30511222551305665522^^^^^^|ENG|S|||012345678|||UNK^DECLINED^HL70189|
PV1|1|O|XRAY^AN73-XRAY1^^BLUEWATER -ONTARIO^^^^^|||0011223344^TESTER^REFERRING^^^^^^^^^^^|0011223344^TESTER^REFERRING^^^^^^^^^^^|||||||||||RAM46|||||||||||||||||||||||||||20170301094804||0.00||||||VI
ORC|SC|RAM2058|RAM2058||ZZ||1^^^20170301094804-0500^^R^^^^||20170301102640-0500|RAMSOFT||0011223344^TESTER^REFERRING^^^^^^^^^^^|BLUEWATER - ONTARIO||||BLUEWATER - ONTARIO||
OBR|1|RAM2058|RAM2058|CXR^CHEST XRAY|||20170301102640-0500||||||R|||^^^CHEST^B|0011223344^TESTER^REFERRING^^^^^^^^^^^||RAM2058|20 58|RAM2058||||CR|||1^^^20170301094804-0500^^R^^^^|||WALK|R05^Cough^I10~R06.02^Shortness of breath^I10|1144778899&AL&TEST&&&||&&&&&|&&&&|||||||U|||71020^CHEST X-RAY 2VW FRONTAL\T\LATL|||NTE|1|O||RE
ZDS|1.2.124.113540.0.201604121019.3.2058^RAMSOFT^Application^DICOM
GT1|1|2054|TESTER^PAT^M^^MS.||23 DUVAL ST^^KEY WEST^FL^33040^USA|3055552244|3056655522|19850302|F||SEL|||||RAMSOFT, INC.|60 ADELAIDE ST, STE 700^^TORONTO^ON^M5C3R4^CA|8883439146|||1|||||||||||||||||||||||||||||TEST^EMERGENCY^CONTACT^^MS.|||OTH|||||||||
IN1|1|123456789|CAR132^AETNA01|AETNA|PO BOX 441^^KEY WEST^FL^33040^USA|DOROTHY|8004111441^^^^^^^^|123|||RAMSOFT, INC.|20170101|||CM|TESTER^PAT^M|SEL|19850302|23 DUVAL ST^^KEY WEST^FL^33040^USA|||||||||||||||||PAY|||||||||1|F|60 ADELAIDE ST, STE 700^^TORONTO^ON^M5C3R4^CA|||||123456789

Master Files Notification

MFN^M02 message is used for sending the user information to other vendors or between RamSoft systems.

Segment Name	Segment Description
MSH	Message Header
MFI	Master File Identification
{MFE}	Master File Entry
{STF}	Staff Identification
{PRA}]	Practitioner Information
{ZLI}	Custom Staff Information

Inbound Processing

We use following behavior to perform inserting/updating/deleting a user based on value of MFE.1 (NOTE: Password exchange can only happen between Ramsoft systems)

- For MAD/MUP:
  - If the input user exists: perform updating this existing user
  - Otherwise: perform inserting new user
- For MAC/MDC:
  - If the input user exists: perform updating this existing user status with status of (MAC/MDC)
  - Otherwise: perform inserting new user with status of (MAC/MDC)
- For MDL:
  - Only perform deleting if this user exists
- For inserting user password to add new user:
  - If SALT (ZLI.3) is present, insert inbound password.
  - Otherwise, insert default password.
- For updating user password:
  - Only update password if SALT is present.

- If user imaging facility (STF.8) is present, this imaging facility is created in DB.
- The interface user will handle setting both Role and Group to allow receiving inbound message from external systems.
- Message is rejected if role (STF.4.1) or group (ZLI.4) is not provided.

Outbound Processing

1. We send user information in each MFN message.
2. We are based on the value of MFE.1 to identify which events of user and send it out:
    a. MAD: add a new user
    b. MUP: update an existing user
    c. MDC: deactivate an user
    d. MAC: Reactivate an user

MFN^M02 Sample Outbound Messages

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180509180005-0400||MFN^M02|21569|P|2.3.1|||||UNICODE UTF-8||
MFI|PRA|RAMSOFT|UPD|||20180509180005-0400|NE
MFE|MAD|21569|20180509180005-0400||
STF|||111^^1234567890^^ITEST^RADIOLOGIST^M^MD^DR.||INTERPRETING
MDI|F|19550202000000|A|||3055552222^^O~3055552211^^C~3055559999^^B~3055552221^^FI23 DUVAL ST^^KEY
WEST^FL^33040^USIIIISales@RamSoft.com|||user notesPRA
||ALL STUDIES|||123DEA^DEA~321LICNUM^SL^FL^^^US~1234567890^NPI
ZLI|TESTRAD|65F90C0849C738089AA4DD1B53541DC84EF89EBB55CB295170445FD8E6ADF5105646ECCF3647839434C80BC3B5EC5BA1E024976BF142F1ECF822CB91FC08D078IC11ACFE2419849BE8DBF1BD9E57A1170|ALL STUDIES

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180509181140-0400||MFN^M02|21572|P|2.3.1|||||UNICODE UTF-8||
MFI|PRA|RAMSOFT|UPD|||20180509181140-0400|NE
MFE|MDC|21572|20180509181140-0400||
STF|||111^^1234567890^^ITEST^RADIOLOGIST^J^MD^DR.||INTERPRETING
MDI|F|19550202000000|I|||3055552222^^O~3055552211^^C~3055559999^^B~3055552221^^FI23 DUVAL ST^^KEY
WEST^FL^33040^USIIIISales@RamSoft.com|||user notesPRA
||ALL STUDIES|||123DEA^DEA~321LICNUM^SL^FL^^^US~1234567890^NPI
ZLI|TESTRAD|65F90C0849C738089AA4DD1B53541DC84EF89EBB55CB295170445FD8E6ADF5105646ECCF3647839434C80BC3B5EC5BA1E024976BF142F1ECF822CB91FC08D078IC11ACFE2419849BE8DBF1BD9E57A1170|ALL STUDIES
MSH|^~\&|RAMSOFT|PROD_RC11567|Practice Suite|20140103061314||MFN^M02|960fdb0e-2a7e-4550-a5ab-bd12db57ebd7|P|2.5|||||UNICODE UTF-8||
MFI|PRA|RAMSOFT|UPD|||20140103061314|NE
MFE|MAD|960fdb0e-2a7e-4550-a5ab-bd12db57ebd7|20140103061314||
STF|1435826|I^^^CITYTEST^CITYTEST^ISTAFF|||A|||(111)589-1770|30581 Stephenson Hwy.^^STES Heights^CA^12121|||||||
ZLI|CITYTEST1|AA130103AFEF1AF9957EEAA51DD8E83A

MSH|^~\&|RAMSOFT|PROD_RC11567|Practice Suite|20140203061314||MFN^M02|960fdb0e-2a7e-4550-a5ab-bd12db57ebd7|P|2.5|||||UNICODE UTF-8||
MFI|PRA|RAMSOFT|UPD|||20140203061314|NE
MFE|MDC|960fdb0e-2a7e-4550-a5ab-bd12db57ebd7|20140203061314||
STF|1435826|I^^^CITYTEST^CITYTEST^ISTAFF|||A|||(111)589-1770|23123 Stephenson Hwy.^^TEST Heights^CA^12121|||||||
ZLI|CITYTEST1|AA130103AFEF1AF9957EEAA51DD8E83A

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Observation Result Unsolicited

The Observation Result message (ORU^R01) is used to transmit the results of diagnostic studies. Reports can be sent with a status of "A" for Addendum, "F" for Final and "P for Preliminary report. Reports can be sent and received in various formats as following:

- Plain Text Format
- RTF Format
- Base64Encoded String (Word Format)
- Base64Encoded String (PDF Format)
  Note: PDF is not considered a diagnostic report for inbound report. RamSoft will accept Diagnostic Reports inbound in this format, but will only be able to store PDF content and title of report (preliminary or final only), neither signing physician nor signing date/time are stored for PDF reports.
  RamSoft does support conversion of text/word diagnostic reports and sending those in PDF format *outbound* (sample is provided in section 3.8.3.5).
- Base64Encoded String (PDF Format) are accepted inbound for other types of documents;

Segment Name	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PV1]	Patient Visit Information
{ORC}	Common Order Segment
OBR	Observation Request Segment
[NTE]	Notes and Comments Segment
{OBX}	Observation Result

Report text can be contained within a single OBX segment or multiple consecutive OBX segments. In the latter case, each OBX segment corresponds to a single line of text in the report.

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Inbound Processing

1. We use the following algorithm to locate the study record to store the report:
    a. We locate the patient record based on Patient ID and Issuer of Patient ID as described in the PID segment. If no match is found, then we create a new patient and study.
    b. For the located patient, we match *OBR-18.1* to Accession Number. Patient ID and Accession number are required fields. If PatientID or Accession Number is empty the HL7 message will be rejected.
    c. If no match is found, then we create a new patient and study.
2. All reports sent within a single ORU message must belong to the same study.
3. Each ORC, OBR, {OBX} sequence could contain a single report. A single report may consist of multiple OBX segments.
4. Plain text reports
    a. Each OBX segment is treated as a new line.
    b. Each occurrence of '\.br\' is treated as a new line.
    c. Each occurrence of any combination of line feed and carriage return escape sequence '\E\n', '\E\r', '\r\n' is treated as a new line.
    d. Each occurrence of any combination of line feed and carriage return hex sequence '\X0D\', '\X0A\', '\X0D0A\', '\X0A0D\' hex sequence is treated as a new line.
    e. Each occurrence of '~', '\R\' is treated as new line.
    f. Will be inserted onto the Global Template set in PowerReader or onto Facility Template when matching facility is found. Facility Templates override the Global Template.

Outbound Processing

1. We send a single report in each ORU message.
2. For plain text reports, line feeds (any combination of line feed and carriage return) are replaced with OBX_LINEBREAK string or denoted by a segment break if OBX_LINEBREAK is NULL.
3. For plain text reports, OBX_SPLIT_DELIMITERS are denoted by segment breaks.
4. Segment breaks are also inserted when the segment size exceeds OBX_SEGMENT_SIZE. Plain text, RTF, and HTML OBX segments are broken at a blank space (word wrapped), unless there is a word that exceeds the segment size.

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ORU^R01 Sample Messages

Report in Text Format

MSHI^~\&IRAMSOFTIRAMSOFTIRAMSOFTIRAMSOFTI20180501170708-0400IIORU^R01I21436IPI2.3.1IIIIIIUNICODE UTF-8IIEVNIR01I20180501170708-0400IIIIPIDI1IP12345^^^RAMSOFT^MRIP12345^^^RAMSOFT^MRIIPATIENT^TEST^M^JR^MR.ICRAWFORD^JOANI19741018IMII2131-1^OTHER^HL70005I60 ADELAIDE STREET EAST^^TORONTO^ON^M5C3E4^CAII4166741347^^^SALES@RAMSOFT.COM^^^90935353331909481580010^^^^^^4162345353IFRAIMII12345I1234564564ONIII2135-2^HISPANIC OR LATINO^HL70189IPV1I1IOIXRAY^XRAY1^^RAMSOFT^^^^^IIII0001114478^TESTER^REF^^^^^^^^^^^I0001114478^TESTER^REF^^^^^^^^^^IIIIIIIA1IIIIRAM208IIIIIIIIIIIIIIIIIIIIIIIIIIII20180501121239II450.00IIIIIVIORCISCIRAM842IRAM842IIZZII1^^^2018050115150 0-0400^^R^^^^II20180501170708-0400IHARMONYII0001114478^TESTER^REF^^^^^^^^^^IRAMSOFTI3055551111IIIRAMSOFTIIOBRI1IRAM842IRAM842ICXR-PALAT^CHEST X-RAY PA AND LATERAL VIEWSIII20180501170708-0400IIIIIRII50.21 - Acute systolic (congestive) heart failureII^^^CHEST^I0001114478^TESTER^REF^^^^^^^^^^I3055551111IRAM842I842IRAM842IIIIDXIII1^^^2018050115150 0-0400^^R^^^^IIIWALKII50.21^Acute systolic (congestive) heart failure^I10I0001112224&TEST&RAD&&&DR.II&&&&I&&&&&IIIIpatient SOBIIUIII71048^X-RAY EXAM CHEST 4+VIEWSINTEI1IOIAP and lateral images of the chest were obtained in the seated position.IREOBXI1IFTI1.2.124.113540.1.4.1970578261.9328.1525208097.107^TXT^^1II\.br\\.br\PATIENT NAME: PATIENT, TEST MJR MR.\.br\\.br\D.O.B: 18-Oct-1974 AGE: 43 years \.br\\.br\DATE: 01-May-2018 03:15:00 PM\.br\\.br\MR NUMBER: P12345\.br\\.br\ORDERING PHYSICIAN: TESTER, REF\.br\\.br\EXAM: CHEST X-RAY PA AND LATERAL VIEWS \.br\\.br\HISTORY: Acute systolic (congestive) heart failure. \.br\\.br\TECHNIQUE: AP and lateral images of the chest were obtained in the seated position.\.br\\.br\FINDINGS: The lungs appear hyperaerated. Retrocardiac lucency may be due to gas in the \.br\carina. Small patchy density in the lateral and posterior left lung base may represent lower lobe \.br\inflammatory or fibrotic change. No pleural effusion is seen. There is no vascular congestion.\.br\The cardiac size appears satisfactory. \.br\No soft tissue or bony abnormality is identified.\.br\\.br\IMPRESSION: \.br\Small patchy density at the left lung base is possibly inflammatory or fibrotic. \.br\Correlate clinically and perhaps with prior radiographs. \.br\\.br\\.br\Electronically Signed by TEST, RAD DR. at 5/1/2018 4:53:57 PM\.br\ 5/1/2018 4:53:57 PM\.br\\.br\\.br\\.br\IIIIIIFIII20180501165357-0400II0001112224^TEST^RAD^^^DR.IFINAL

Report in Text Format With Financial segments (GT1 and IN1) and OBX segments with height and weight included

MSHI^~\&IRAMSOFTIRAMSOFTIRAMSOFTIRAMSOFTI20180501170523-0400IIORU^R01I21435IPI2.3.1IIIIIIUNICODE UTF-8II EVNIR01I20180501170523-0400IIII PIDI1IP12345^^^RAMSOFT^MRIP12345^^^RAMSOFT^MRIIPATIENT^TEST^M^JR^MR.ICRAWFORD^JOANI19741018IMII2131-1^OTHER^HL70005I60 ADELAIDE STREET EAST^^TORONTO^ON^M5C3E4^CAII4166741347^^^SALES@RAMSOFT.COM^^^90935353331909481580010^^^^^^4162345353IFRAIMII12345I1234564564ONIII2135-2^HISPANIC OR LATINO^HL70189I PV1I1IOIXRAY^XRAY1^^RAMSOFT^^^^^IIII0001114478^TESTER^REF^^^^^^^^^^I0001114478^TESTER^REF^^^^^^^^^^IIIIIIIA1IIIIRAM208IIIIIIIIIIIIIIIIIIIIIIIIIIII20180501121239II450.00IIIIIVI OBXI1ISTI^BODY HEIGHTII1.72699999999999999mIIIIIFIIIIII OBXI2ISTI^BODY WEIGHTII61.7IkgIIIIIFIIIIII GT1I1I404IPATIENT^TEST^M^JR^MR.II60 ADELAIDE STREET EAST^^TORONTO^ON^M5C3E4^CAI4166741347I9094815800 1I19741018IMIISELIIIIIRAMSOFTI9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^USI9094815800II1IIIIIIIIIIIIIIIIIIIIIIIIIIIITESTER^CONTACT^M^^MS.I4165555511IIOTHIIIIIII IN1I1I9998875B44I984228^AETNA01IAETNAIPO BOX 981106^^EL PASO^TX^799981106^USIBARBARA MONTAI8006240756^^^^^^^^IBBB5905IIIRAMSOFTI20180401IIICMIPATIENT^TEST^MISELI19741018I60 ADELAIDE STREET EAST^^TORONTO^ON^M5C3E4^CAIIIIIIIIIIIIIIIIU45677IIIIIII1IMI9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^USIIIII9998875B44 ORCISCIRAM842IRAM842IIZZII1^^^20180501151500-0400^^R^^^^II20180501170523-0400IHARMONYII0001114478^TESTER^REF^^^^^^^^^^IRAMSOFTI3055551111IIIRAMSOFTII OBRI1IRAM842IRAM842ICXR-PALAT^CHEST X-RAY PA AND LATERAL VIEWSIII20180501170523-0400IIIIIRII50.21 - Acute systolic (congestive) heart failureII^^^CHEST^I0001114478^TESTER^REF^^^^^^^^^^I3055551111IRAM842I842IRAM842IIIIDXIII1^^^20180501151500-0400^^R^^^^IIIWALKII50.21^Acute systolic (congestive) heart failure^I10I0001112224&TEST&RAD&&&DR.II&&&&I&&&&&IIIIpatient SOBIIUIII71048^X-RAY EXAM CHEST 4+VIEWSI

NTEI1IOIAP and lateral images of the chest were obtained in the seated position.IREOBXI1IFTI1.2.124.113540.1.4.1970578261.9328.1525208097.107^TXT^^1II\.br\\.br\PATIENT NAME: PATIENT, TEST MJR MR.\.br\\.br\D.O.B: 18-Oct-1974 AGE: 43 years \.br\\.br\DATE: 01-May-2018 03:15:00 PM\.br\\.br\MR NUMBER: P12345\.br\\.br\ORDERING PHYSICIAN: TESTER, REF\.br\\.br\EXAM: CHEST X-RAY PA AND LATERAL VIEWS \.br\\.br\HISTORY: Acute systolic (congestive) heart failure. \.br\\.br\TECHNIQUE: AP and lateral images of the chest were obtained in the seated position.\.br\\.br\FINDINGS: The lungs appear hyperaerated. Retrocardiac lucency may be due to gas in the \.br\carina. Small patchy density in the lateral and posterior left lung base may represent lower lobe \.br\inflammatory or fibrotic change. No pleural effusion is seen. There is no vascular congestion.\.br\The cardiac size appears satisfactory. \.br\No soft tissue or bony abnormality is identified.\.br\\.br\IMPRESSION: \.br\Small patchy density at the left lung base is possibly inflammatory or fibrotic. \.br\Correlate clinically and perhaps with prior radiographs. \.br\\.br\\.br\Electronically Signed by TEST, RAD DR. at 5/1/2018 4:53:57 PM\.br\ 5/1/2018 4:53:57 PM\.br\\.br\\.br\\.br
IIIIIIFIII20180501165357-0400II0001112224^TEST^RAD^^^DR.IFINAL

Report in RTF

http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU_RTF.txt

Report in Word Format (Base64Encoded)

http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU_WORD.txt

Report in PDF Format (Base64Encoded)

http://software.ramsoft.com/apps/HL7%20SAMPLE%20MESSAGES/ORU_PDF.txt

Note: PDF is not supported for Diagnostic Reports (Type 1) inbound, but RamSoft does support PDF format outbound.

Lab Result

Similar to the Observation Result message, the Lab Result message is used for the transmission of patient lab result report.

Segment Name	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PV1]	Patient Visit Information
{ORC}	Common Order Segment
OBR	Observation Request Segment
[NTE]	Notes and Comments Segment
[TQ1]	Timing Model Segment
OBX	Observation Result
[SPM]	Specimen Segment

Inbound Processing

We use the following algorithm to distinguish a lab result message from an inbound ORU message:

a. We check the LOINC type from OBX-3.1. If it is LOINC type, this message is lab result message.
b. If there is no OBX segment, we check the value of SPM-21 and SPM-24. If SPM-21 and SPM-24 is not empty, this message is lab result message. If either SPM-21 and SPM-24 is empty or there is no SPM segment, this message is considered as result message.

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ORU^R01 Lab Result Sample Inbound Message

MSH|^~\&#|NIST Test Lab APP|NIST Lab Facility||NIST EHR Facility|20110531140551-0500||ORU^R01^ORU_R01|NIST-LRI-NG-001.00|T|2.5.1|||AL|NE|||UNICODE UTF-8|||LRI_Common_Component^Profile
Component^2.16.840.1.113883.9.16^ISO~LRI_NG_Component^Profile
Component^2.16.840.1.113883.9.13^ISO~LRI_RU_Component^Profile Component^2.16.840.1.113883.9.14^ISO
PID|1||PATID1234^^^NIST MPI^MR||Jones^William^A^JR^^^|||19610615|M||2106-3^White^HL70005^CAUC^Caucasian^L
ORC|RE|ORD723222^NIST EHR|R-783274^NIST Lab Filler|GORD874211^NIST EHR|||||||57422^Radon^Nicholas^M^JR^DR^^^NIST-AA-1^L^^^NPI
OBR|1|ORD723222^NIST EHR|R-783274^NIST Lab Filler|30341-2^Erythrocyte sedimentation rate^LN^815115^Erythrocyte sedimentation rate^99USI^^^Erythrocyte sedimentation rate|||20110331140551-0800|||||L||7520000^fever of unknown origin^SCT^22546000^fever, origin unknown^99USI^^^Fever of unknown origin|||57422^Radon^Nicholas^M^JR^DR^^^NIST-AA-1^L^^^NPI|||||||20110331160428-0800|||F|||10092^Hamlin^Pafford^M^Sr.^Dr.^^^NIST-AA-1^L^^^NPI||||||||||||||||||||CC^Carbon Copy^HL70507^C^Send Copy^L^^^Copied Requested
NTE|1||Patient is extremely anxious about needles used for drawing blood.
TQ1|1||||||20110331150028-0800|20110331152028-0800
OBX|1|NM|30341-2^Erythrocyte sedimentation rate^LN^815117^ESR^99USI^^^Erythrocyte sedimentation rate||10|mm/h^millimeter per hour^UCUM|0 to 17|N|||F|||20110331140551-0800|||||20110331150551-0800|||Century Hospital^^^^^NIST-AA-1^XX^^^987|2070 Test Park^^Los Angeles^CA^90067^USA^B^^06037|2343242^Knowsalot^Phil^J.^III^Dr.^^^NIST-AA-1^L^^^DN
SPM|1|||119297000^BLD^SCT^BldSpc^Blood^99USA^^^Blood Specimen|||||||||||20110331140551-0800|||||||COOL^Cool^HL70493^CL^Cool^99USA^^^Cool

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Scheduling

Scheduling messages may be received from an information system that does not support Order messages. It can also be sent by RMC whenever the status of the order (study information) is changed.

Segment Name	Segment Description
MSH	Message Header
SCH	Schedule Activity Information
PID	Patient Identification
[PV1]	Patient Visit Information
{RGS}	Resource Group
{AIS}	Appointment Information – Service
[NTE]	Notes and Comments

Inbound Processing

1. We support only one study per SIU message.
2. In the 1st AIS segment, we read *AIS-3-2* as the Study Description.
3. We process procedure codes in AIS-3.1 from all AIS segments.
4. We add any Procedure Codes that do not exist to our database.

Outbound Processing

We send SIU messages based on:

1. The change of status of the study. The following table shows different type of SIU message will be sent using the RamSoft Scheduler:

Status of an appointment is changed to	Status of study is changed to	SIU message types
Scheduled	Scheduled	S12
Confirmed/Arrived/Ready For Scan	Confirmed/Arrived/Ready For Scan	S14
Need to reschedule/No show	Scheduled/Cancelled	S15
Cancelled with notice	Cancelled	S17

2. Changing the date and time of an appointment or the resource: sends SIU^S14

SIU Sample Messages

Message SIU S12
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430173742-0400||SIU^S12|21358|P|2.3.1||||||UNICODE UTF-
8||PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||213
1-1^OTHER^HL70005|60 ADELAIDE STREET
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^SALES@RAMSOFT.COM^^^9093535333|9094815800 1^^^^^^416234
5353|FRA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|SCH|RAM841||||||||||1^^30^20180430180000-
0400^20180430183000-
0400^R||||MR^MR1^^RAMSOFT^^^^^|0001114478^TESTER^REF^^^^^^^^^^^||||N|||||WAITLIST|RAM841|RAM841RGS|1||MR
AIS|1||72148^MRI LUMBAR SPINE W/O DYE|20180430180000-0400|-240|min|30|min||WAITLISTNTE|1||car accident

Message SIU S14
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430173026-0400||SIU^S14|21354|P|2.3.1||||||UNICODE UTF-
8||PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131-
1^OTHER^HL70005|60 ADELAIDE STREET
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^SALES@RAMSOFT.COM^^^9093535333|90948158001^^^^^^4162345353|F
RA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|SCH|RAM841|||||||||||1^^30^20180430183000-
0400^20180430190000-
0400^R||||MR^MR1^^RAMSOFT^^^^^|0001114478^TESTER^REF^^^^^^^^^^^||||N|||||WAITLIST|RAM841|RAM841RGS|1||MRAIS|1||7
2148^MRI LUMBAR SPINE W/O DYE|20180430183000-0400|-240|min|30|min||WAITLISTNTE|1||car accident

Message SIU S15
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430173731-0400||SIU^S15|21356|P|2.3.1||||||UNICODE UTF-8||
PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131-
1^OTHER^HL70005|60 ADELAIDE STREET
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^SALES@RAMSOFT.COM^^^9093535333|90948158001^^^^^^4162345353|F
RA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|
SCH|RAM841|||||||||||1^^^^^R||||MR^MR1^^RAMSOFT^^^^^|0001114478^TESTER^REF^^^^^^^^^^^||||||||PENDING|RAM841|RAM841
RGS|1||
AIS|1||72148^MRI LUMBAR SPINE W/O DYE||-240|min||||PENDING
NTE|1||car accident

Message SIU S17
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20180430174419-0400||SIU^S17|21360|P|2.3.1||||||UNICODE UTF-8||
PID|1|P12345^^^RAMSOFT^MR|P12345^^^RAMSOFT^MR||PATIENT^TEST^M^JR^MR.|CRAWFORD^JOAN|19741018|M||2131-
1^OTHER^HL70005|60 ADELAIDE STREET
EAST^^TORONTO^ON^M5C3E4^CA||4166741347^^^SALES@RAMSOFT.COM^^^9093535333|90948158001^^^^^^4162345353|F
RA|M||12345|1234564564ON|||2135-2^HISPANIC OR LATINO^HL70189|
SCH|RAM841|||||||||||1^^^^^R||||MR^MR1^^RAMSOFT^^^^^|0001114478^TESTER^REF^^^^^^^^^^^||||||||CANCELLED|RAM841|RAM
841
RGS|1||
AIS|1||72148^MRI LUMBAR SPINE W/O DYE|20180430180000-0400|-240|min||||CANCELLED
NTE|1||car accident

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Billing Account Create / Update

Billing Account messages (BAR^P01, BAR^P05) are used to create and update insurance information of the patient. Those messages are sent by RMC whenever patient or insurance information is created or updated.

Segment Name	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
GT1	Guarantor
IN1	Insurance

RMC supports up to 3 insurance segments: Primary, Secondary, and Tertiary.

RMC supports up to 3 active insurance segments: Primary, Secondary, and Tertiary and ignore all inactive insurance segments

Inbound message:

Based on following algorithm, we consider the IN1 segment is active or inactive insurance.

IN1 segment #1:
- Active Primary insurance if insurance level is 1.
- Active Secondary insurance if insurance level is 2.
- Active Tertiary insurance if insurance level is 3.
- Inactive insurance if insurance level is empty or does not match any of insurance level

IN1 segment #2:
- Active Secondary insurance if insurance level is 2 and IN1 segment #1 is active Primary insurance
- Active Tertiary insurance if insurance level is 3 and IN1 segment #1 is active Primary insurance or active Secondary insurance
- Otherwise, inactive insurance

IN1 segment #3:
- Active Tertiary insurance if insurance level is 3 and IN1 segment #1 is active Primary insurance and IN1 segment #2 is active Secondary insurance
- Otherwise, inactive insurance

Other IN1 segments:
- Inactive insurances

As long as there is at least one active insurance, any existing active insurances for the patient that are not received in IN1 segments (active insurances) will be marked as "Inactive".

Outbound message:

- Send active insurances for the patient
- Allow to send inactive insurances for the patient if the config ALLOW_SEND_INACTIVE_INSURANCES_OUTBOUND is "true".

IN1 segments are populated as following rules:
- IN1 segment for active insurances is populate first, then IN1 segments for inactive insurances.
- The order of insurance type: Primary insurance is first, then Secondary insurance. Last is Tertiary insurance.

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For example,
If patient has Primary, Secondary and Tertiary active insurances and Primary, Secondary and Tertiary inactive insurances, the order of IN1 segments is following:
IN1 segment #1 – Primary Insurance.
IN1 segment #2 – Secondary Insurance
IN1 segment #3 – Tertiary Insurance.
IN1 segment #4 – Inactive Primary Insurance.
IN1 segment #5 – Inactive Secondary Insurance
IN1 segment #6 – Inactive Tertiary Insurance.

If patient has Secondary and Tertiary active insurances and Secondary and Tertiary inactive insurances, the order of IN1 segments is following:
IN1 segment #1 – Secondary Insurance
IN1 segment #2 – Tertiary Insurance.
IN1 segment #3 – Inactive Secondary Insurance
IN1 segment #4 – Inactive Tertiary Insurance.

If patient has only one type of active insurance this insurance and Primary, Secondary and Tertiary inactive insurances, the order of IN1 segments is following:
IN1 segment #1 – Active Insurance (can be Primary or Secondary or Tertiary)
IN1 segment #2 – Inactive Primary Insurance.
IN1 segment #3 – Inactive Secondary Insurance
IN1 segment #4 – Inactive Tertiary Insurance.

BAR^P01 Sample Message

MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||BAR^P01|108|P|2.3.1|||||UNICODE UTF-8||
EVN|P01|20101223202939-0400||||
PID||P12345^^^ISSUER|P12345^^^ISSUER||PATIENT^TEST^M^^^^||19741018|M||2131-1|10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI|(909)481-5872^^^qa@ramsoft.com|(909)481-5800x1|||M||12345|286-50-9510|||2135-2|
GT1|1||PATIENT^TEST^M^^^^||10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI(909)481-5872|(909)481-5800x1|||M||SELI||||RAMSOFT|9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^USI(909)481-5800||1|||||||||||||||||||||||||BLUGGER^KENT^^^^^|(909)555-5555||OTH|
IN1|1|89765|BCBS|BLUE CROSS BLUE SHIELD|1 SUNSET BLVD^^BEVERLY HILLS^CA^90210^USIDAVID^^^^^^|(213)555-5555|G412343|||RAMSOFT|20101006||||PATIENT^TEST^M^^^^|SELI|19741018|10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI||||||||||||||||||||||||||1|M|9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^USI||||89765
IN1|2|89765|AUTOSTATE|ICT LIFE|55 MELROSE PLACE^^BEVERLY HILLS^CA^90210^USII|2135551234|897654||||20101006|||CM|PATIENT^TEST^M|SELI|19741018|10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI||||||||||||||||||||||||||1|M|9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^USI||||89765

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BAR^P05 Sample Message

MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||BAR^P05|108|P|2.3.1|||||UNICODE UTF-8||
EVN|P05|20101223202939-0400||||
PID||P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^^^^||19741018|M||2106-3^WHITE ^HL70005|10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI|(909)481-5872^^^qa@ramsoft.com|(909)481-5800x1||M||12345|286-50-9510|||2135-2^HISPANIC OR LATINO^HL70189|
GT1|1||PATIENT^TEST^M^^^^||10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI|(909)481-5872|(909)481-5800x1||M||SELI||||RAMSOFT|9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^USI|(909)481-5800|||1|||||||||||||||||||||||||||BLUGGER^KENT^^^^^|(909)555-5555||OTH|IN1|1|189765|BCBS|BLUE CROSS BLUE SHIELD|1 SUNSET BLVD^^BEVERLY HILLS^CA^90210^USI^^^^^^|(213)555-5555|G412343|||RAMSOFT|20101006||||PATIENT^TEST^M^^^^|SELI|19741018|10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI||||||||||||||||||||||||||||1|M|9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^USI||||||89765|IN|1|2|34212|AUTOSTATE|STATE FARM|55 MELROSE PLACE^^BEVERLY HILLS^CA^90210^USI^^^^^^|(213)555-1234|NA|||RAMSOFT|20101006||||PATIENT^TEST^M^^^^|SELI|19741018|10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI||||||||||||||||||||||||||||||||1|M|9480 UTICA AVE^^RANCHO CUCAMONGA^CA^91730^USI||||34212|

Billing Account Cancel

Billing Account messages (BAR^P06) is used to cancel the insurance information of the patient.

Segment Name	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PV1]	Visit Segment

Inbound message:
- All available active insurances (primary, secondary, and tertiary) of the patient are deleted

BAR^P06 Sample Inbound Message

MSH|^~\&|RAMSOFT|SENDING FACILITY|RAMSOFT|RECEIVING FACILITY|20101223202939-0400||BAR^P06|108|P|2.3.1|||||UNICODE UTF-8||
EVN|P06|20101223202939-0400||||
PID||P12345^^^ISSUER|P12345^^^ISSUER||PATIENT^TEST^M^^^^||19741018|M||2131-1|10808 FOOTHILL BLVD^^RANCHO CUCAMONGA^CA^91730^USI|(909)481-5872^^^qa@ramsoft.com|(909)481-5800x1||M||12345|286-50-9510|||2135-2|

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Detailed Financial Transaction

The Detailed Financial Transaction message (DFT^P03) allows RMC to send charge information to billing software (Charge Processor). This is normally triggered by clicking the Post Charge button in RamSoft software. It also allows RMC receive charge information to update patient balance information and other information (referring / reading doctor, study, study procedures).

Segment Name	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PV1]	Patient Visit Information
{FT1}	Financial Transaction
[{PR1}]	Procedure
[GT1]	Guarantor
{[IN1]}	Insurance
[ACC]	Accident and workman information

RamSoft Extension: We have a parameter in the outbound channel configuration that allows GT1 and IN1 segments to be sent with the DFT^P03 message. The IHE standard requires these segments to be sent only in BAR messages.

Inbound Processing

1. We use the following algorithm to update the patient balance information
   a) We locate the patient record based on Patient ID and Issuer of Patient ID as described in the PID segment. If no match is found, then we create a new patient.
   b) In PV1 segment, we read PV1.46 as Patient Balance.
   c) Patient ID and Patient Balance are required fields. If PatientID or Patient Balance is empty the HL7 message will be rejected.
   d) The patient balance field is updated with Patient Balance according to Patient ID
2. Insurance segments are ignorned inbound.
3. We use the following algorithm to update other information from FT1 segments: We read FT1.23 as Accession Number. If FT1.23 has value, we process updating following information:
   a) Locate Study according to Accession Number. If found, perform update this. Otherwise, the study is not inserted and the patient demographics will only be updated.
   b) To update referring / reading doctor, we read FT1.20 as Reading Doctor information. If FT1.20 is empty, we read from PV1 segment (PV1.8, PV1.7) and FT1.21 as Referring Physician information.
   c) To update study info, we read FT1.16 as Patient Location and if blank we will read from PV1.3.
   d) To update study procedures, for each FT1 segments, we read FT1.25 as Procedure Code, FT1.26 Procedure Code Modifier, FT1.19 as Diagnosis Code, FT1.10 as Quantity.
   e) Update HL7BILLED field to "Y" according to this study.

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Outbound Processing

We populate ACC segment according to active insurances which have extra insurance information:
If patient has Primary, Secondary and Tertiary active insurances the order of ACC segments is following:
ACC segment #1 – Primary Insurance.
ACC segment #2 – Secondary Insurance
ACC segment #3 – Tertiary Insurance.

If patient has Secondary and Tertiary active insurances the order of ACC segments is following:
ACC segment #1 – Secondary Insurance
ACC segment #2 – Tertiary Insurance.

If patient has Primary and Tertiary active insurances the order of ACC segments is following:
ACC segment #1 – Primary Insurance
ACC segment #2 – Tertiary Insurance.

If patient has only one type of active insurance this insurance will be sent in first ACC segment.

When interfacing with other vendor, we send only one ACC segment as following:
- Send ACC segment of Primary Insurance
- Send ACC segment of Secondary Insurance if there are no ACC segment of Primary Insurance
- Send ACC segment of Tertiary Insurance if there are no ACC segment of Primary Insurance and no ACC segment of Secondary Insurance.

DFT^P03 Sample Message

Inbound Message:

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20150421141041+0700||DFT^P03|251|P|2.3.1|||||UNICODE UTF-8||EVN|P03|20150421141041+0700||||PID|1|TEST1^^^RAMSOFT^MR|TEST1^^^RAMSOFT^MR||PATIENT1^GCS^ICT^^|^|IU||UNK^DECLINED^HL70005|^^^^^USI|^^^^^^|^^^^^^|UNK|SI||||UNK^DECLINED^HL70189|PV1|1|O|^^^^^^^^^||||^HIEU^NGUYEN^^^|^HIEU^NGUYEN^^^|||||||||||RAM13|||||||||||||||||||||||||||||25300|||||V|FT1|1|626.1|I|20150415164034+0700|20150421141041+0700|CG|626.1|HELLO WORLD|||1|0|0|||||^^^^^^^^|ISE||PVL1^PHAT^LUONG^^^|^HIEU^NGUYEN^^^||TESTSTUDY1||TESTPRCODE^CUSTOM^CPT-4|FT1|2|626.2|I|20150415164034+0700|20150421141041+0700|CG|626.2|HELLO WORLD|||20|0|0|||||^^^^^^^^|ISE||PVL1^PHAT^LUONG^^^|^HIEU^NGUYEN^^^||TESTSTUDY1||A9698^INJECT NON-RADIOACTIVE CONTRAST PER STUDY^CPT-4|

Outbound Message:

MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20150421141041+0700||DFT^P03|251|P|2.3.1|||||UNICODE UTF-8||EVN|P03|20150421141041+0700||||PID|1|TEST1^^^RAMSOFT^MR|TEST1^^^RAMSOFT^MR||PATIENT1^GCS^ICT^^|^|IU||UNK^DECLINED^HL70005|^^^^^USI|^^^^^^|^^^^^^|UNK|SI||||UNK^DECLINED^HL70189|PV1|1|O|^^^^^^^^^||||^HIEU^NGUYEN^^^|^HIEU^NGUYEN^^^|||||||||||RAM13|||||||||||||||||||||||||||||25300|||||V|FT1|1|626.1|I|20150415164034+0700|20150421141041+0700|CG|626.1|HELLO WORLD|||1|0|0|||||^^^^^^^^|ISE||PVL1^PHAT^LUONG^^^|^HIEU^NGUYEN^^^||TESTSTUDY1||TESTPRCODE^CUSTOM^CPT-4|FT1|2|626.2|I|20150415164034+0700|20150421141041+0700|CG|626.2|HELLO WORLD|||20|0|0|||||^^^^^^^^|ISE||PVL1^PHAT^LUONG^^^|^HIEU^NGUYEN^^^||TESTSTUDY1||A9698^INJECT NON-RADIOACTIVE CONTRAST PER STUDY^CPT-4|GT1|1|1||PATIENT1^GCS^ICT^^||^^^^^USI|||U||SELF|||||^^^^^|||||||||||||||||||||||||||||||||||||OTH|||||||

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Vaccination

The Vaccination update message (VXU^V04) allows RMC to send vaccination information to immunization registries.

Segment Name	Segment Description
MSH	Message Header
PID	Patient Identification
PD1	Patient Demographics
RXA	Vaccination
NK1	Next of Kin (Guarantor)

VXU^V04 Sample Outbound Message

MSH|^~\&|RAMSOFT|X68||RAMSOFT|20160518145101+0700||VXU^V04^VXU_V04|317928|P|2.5.1|||AL|ER|PID|1||411285^^^HOSPITAL SULTAN ISMAIL^MR~991-20-6016688^^^MAA^SS||TEST PATIENT RP MERGE^TEST^TEST NE JR
MS.^^^^LI^|19991206|F|||31 JALAN MUTIARA,TAMAN MUTIARA, 8 JALAN RUBY^^JOHOR
BAHRU^^81100^MYS^LI|^PRN^PH^^^011^7654321~^^^^^^|||SI|20160000096|||||NK1|1|TESTING
GUARS^^^^^^LIMTH^OTHER^HL70063|68 TEST ST,TAMAN MUTIARA^^JOHOR
BAHRU^^81100^MYS^LI^PRN^PH^^^011^7654321|ORC|RE||172587^HOSPITAL SULTAN
ISMAIL|||||||||RXA|0|1|20160518||22^DTP-Haemophilus influenzae type b conjugate vaccine^CVX|200|^^UCUM|||^^^|||||||

SEGMENT DEFINITIONS

The following section contains a detailed listing of all segment types used by the RMC for constructing HL7 messages. The sequence number is specified in the left most column and the component contents are enumerated in the right column. Some components contain even more subcomponents. In these cases, the table cell is split into two columns, the left side indicating the components, the right indicating the sub-components. In HL7, subcomponents are separated using & characters.

|component1^subcomponent1&subcomponent2&subcomponent3^component3|

An example of a sequence that contains 3 components with the second component containing 3 subcomponents.

The Inbound and Outbound columns specify which fields are mandatory and which are optional. Mandatory fields are marked by an "R" for "Required", conditional fields are marked by a "C" and non-mandatory ones are marked with "O" for "Optional". Mandatory fields are only required to be present if the sequence they belong to is in the message.

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MSH

The MSH segment stores message control information. This includes the message type, a unique message identifier, etc.

Seq.	Length	Data Type	Inbound	Description	Component
1	1	ST	R	Field Separators	Field Separators "|"
2	4	ST	R	Encoding Characters	Encoding Characters "^~\&"
3		HD	R	Sending Application	**Outbound**: Configurable
4		HD	R	Sending Facility	Inbound: Updates referring physician assigned facility if *OBR-16.14, ORC-12.14, PV1-8.14, PV1-7.14, ORC-17*, and *ORC-13* are blank and facility is setup as a "Referring Facility" **Outbound**: Configurable
5		HD	O	Receiving Application	**Outbound**: Configurable
6		HD	O	Receiving Facility	**Outbound**: Configurable
7		TS	O	Date/Time of Message	
9	1 – 3 2 – 3	MSG	R	Message Identifiers	1 – Message Type (e.g. ADT, ORM) 2 – Trigger Event (e.g. A08) **Outbound**: Copy *MSH-9.2* to *EVN-1*
10	10	ST	R	Message Control ID	
11	3	PT	O	Processing ID	**Outbound:** 'P'
12		VID	O	Version ID	**Outbound:** '2.3.1'
18	16	ID	O	Character Set	**Outbound:** 'UNICODE UTF-8'

The *MSH-5 field* is used in ACK messages to specify the application that sent the message being acknowledged. RMC does not populate this field.

MSH-7 is filled out in ACK messages with the time of acknowledgment.

MSH-9 contains the message type (e.g.: ADT, ORM…) and trigger event (e.g. A08, O01). ACK messages do not have a trigger event.

MSH-10 stores a unique ID identifying a message. The uniqueness of this ID must last until an ACK has been received for the message containing it.

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MSA

The MSA segment is used to store ACK information. The MSA segment is only used in ACK messages.

Seq	Length	Data Type	Inbound	Description	Component
1	2	ID	R	Acknowledgement Code	1 – Acknowledgment Code Inbound: We support both original mode and enhanced mode codes: 'AA' – Application Accept 'AE' – Application Error 'AR' – Application Reject 'CA' – Commit Accept 'CE' – Commit Error 'CR' – Commit Reject
2	20	ST	R	Message Control ID	1 – Message Control ID
3	80	ST	O	Text Message	1 – Optional field describing the condition

The *MSA-1 field* will contain either "AA" if the message containing it is an ACK or "AR" if the message is a NACK.

MSA-2 contains the *MSH-10* value (message ID) of the message which is being acknowledged.

ERR

The ERR segment is used to store error information. The ERR segment is only used in ACK messages.

Seq	Length	Data Type	Inbound	Description	Component
1	80	ID	R	Error code and location	

EVN

The EVN segment stores event information.

Seq	Length	Data Type	Inbound	Description	Component
1	3	ID	O	Event Type Code	See *MSH-9.2*
2	26	TS	O	Recorded Date/Time	Current date and time

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PID

The PID segment is used to communicate patient identification information. It is present in all messages supported by the RMC except MFNs.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	1	SI	O	Set ID - PID	Outbound: Always set to '1'
2	64	CX	O	Patient ID	Outbound: See *PID-3*
3	1 - 64 4 - 64	CX	R	Patient Identifier List	1 – Patient ID *(0010,0020)* Inbound: We read *PID-3.1* Outbound: We copy to *PID-3.1*, *PID-2.1* 4 – Issuer Of Patient ID *(0010,0021)* Inbound: We read *PID-3.4*, *MSH-4.1*, if blank, then we set to a configurable value. Outbound: We copy to *PID-2.4* Outbound: 5 – Identifier Type Code 'MR' Inbound: If repeated fields are received, the first field is parsed, and the rest are ignored. Note: Patient ID is required Field. If no value is present, HL7 message will be rejected.
5	1 - 64 2 - 64 3 - 64 4 - 64 5 - 64	XPN	R	Patient Name	1 – Family Name *(0010,0010)* 2 – Given Name *(0010,0010)* 3 – Middle Name *(0010,0010)* 4 – Suffix *(0010,0010)* 5 – Prefix *(0010,0010)* Inbound: based on the system config "Allow Case Sensitive Person Name" value - If it is false, stored with upper case - Otherwise, stored as original values
6	1 - 64 2 - 64	CX	O	Mother's Maiden Name	1 – Family Name 2 – Given Name
7	26	TS	O	Date / Time of Birth	Date of Birth *(0010,0030)* Time is not stored in our system
8	1	IS	O	Sex	Sex *(0010,0040)* 'F' – 'FEMALE' 'M' – 'MALE' 'O' – 'OTHER' 'U' – NULL Inbound: - For new patient, we translate all other values to 'OTHER' - For existing patient, we ignore to update for all other values
10	1 – 16 2 – 64	CE	O	Race	1 – Identifier | 2 – Text | 3 – Coding System

<table>
<tr><th>Seq</th><th>Length</th><th>Data Type</th><th>Inbound</th><th>Description</th><th>Component, Database and DICOM Mapping</th></tr>
<tr><td></td><td>3 - 64</td><td></td><td></td><td></td><td>
<table>
<tr><td>1002-5</td><td>AMERICAN INDIAN OR ALASKA NATIVE</td><td>HL70005</td></tr>
<tr><td>2028-9</td><td>ASIAN</td><td>HL70005</td></tr>
<tr><td>2054-5</td><td>BLACK OR AFRICAN AMERICAN</td><td>HL70005</td></tr>
<tr><td>2076-8</td><td>NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER</td><td>HL70005</td></tr>
<tr><td>2106-3</td><td>WHITE</td><td>HL70005</td></tr>
<tr><td>2131-1</td><td>OTHER</td><td>HL70005</td></tr>
<tr><td>UNK</td><td>DECLINED</td><td>HL70005</td></tr>
</table>
Inbound:
- For new patient, we translate all other values to 'UNK'
- For existing patient, we ignore to update for all other values</td></tr>
<tr><td>11</td><td>1 – 256
3 – 24
4 - 3
5 - 10
6 - 2</td><td>XAD</td><td>O</td><td>Address</td><td>1 – Street Address (0010,1040)
3 – City (0010,1040)
4 – State/Province (0010,1040)
5 – Zip/Postal Code (0010,1040)
6 – Country (0010,2150)</td></tr>
<tr><td>13</td><td>1 – 64
4- 64
7 -64</td><td>XTN</td><td>O</td><td>Home Phone</td><td>1 - Phone Number (0010,2154)
4 – Email Address
7 – Cell Phone Number</td></tr>
<tr><td>14</td><td>1 - 64
7 - 64</td><td>XTN</td><td>O</td><td>Business Phone</td><td>1 – Phone Number (0010,2154)
7 – Fax Number</td></tr>
<tr><td>15</td><td>16</td><td>CE</td><td>O</td><td>Language</td><td>Language (0010,0101)</td></tr>
<tr><td>16</td><td>1</td><td>CE</td><td>O</td><td>Marital Status</td><td>'M' – 'MARRIED'
'S' – 'SINGLE'
'D' – 'DIVORCED'
'W' – 'WIDOWED'
'A' – 'LEG. SEP.'
'U' – 'UNKNOWN'
'O' – 'OTHER'
Inbound:
We are translating empty value to 'UNKNOWN'
We translate all other values to 'OTHER'
Outbound:
We are translating empty value to 'U'
We translate all other values to 'O'</td></tr>
<tr><td>18</td><td>1 - 16</td><td>CX</td><td>O</td><td>Patient Account Number</td><td>1 – Account Number (0010, 0050)</td></tr>
<tr><td>19</td><td>1 - 16</td><td>ST</td><td>O</td><td>SSN</td><td>1 – SSN / Alternate Patient ID (0010,1000)</td></tr>
</table>

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<table>
<tr><th>Seq</th><th>Length</th><th>Data Type</th><th>Inbound</th><th>Description</th><th>Component, Database and DICOM Mapping</th></tr>
<tr><td>22</td><td>1 – 16
2 – 64
3 - 64</td><td>CE</td><td>O</td><td>Ethnicity</td><td>
<table>
<tr><td>1 – Identifier</td><td>2 – Text</td><td>3 – Coding System</td></tr>
<tr><td>2135-2</td><td>HISPANIC OR LATINO</td><td>HL70189</td></tr>
<tr><td>2186-5</td><td>NOT HISPANIC OR LATINO</td><td>HL70189</td></tr>
<tr><td>UNK</td><td>DECLINED</td><td>HL70189</td></tr>
</table>
Inbound:
- For new patient, we translate all other values to 'UNK'
- For existing patient, we ignore to update for all other values
</td></tr>
</table>

PV1

The PV1 segment communicates patient visit information, so it is not needed in any of the ADT messages which only deal with patient identification information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
2	1	IS	O	Patient Class	Patient Class. The following values from Table 4 of Health Level Seven Version 2.3.1 are supported for Inbound / Outbound: 'E' - Emergency 'I' - Inpatient 'O' - Outpatient 'P' - Preadmit 'R' - Recurring Patient 'B' - Obstetrics If value is not defined, value is set to 'O' for both directions.
3	1 - 64 2 - 64 4 - 64 6 - 16 9 - 64	PL	O	Assigned Patient Location	1 – Department (must exist under Locations on the corresponding facility) 2 – Room (must exist under Locations on the corresponding facility) 4 – Imaging Facility / Institution Name (0008, 0080) 6 – Patient's Location Code (not displayed or editable in our system) 9 – Patient's Location *(0038,0300)*
7	60	XCN	O	Attending Physician	See *OBR-16*
8	60	XCN	O	Referring Physician	See *OBR-16*
9	1 - 16 2 - 64 3 - 64 4 - 64 5 - 64	XCN	O	Consulting Doctors	1 – ID Number Inbound: Updates Physician's NPI only if both Imaging Facility and Physician are registered in our system. Outbound: Sends Physician's NPI.

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	6 - 64 14 - 64 with repeats				2 – Family Name 3 – Given Name 4 – Middle Name 5 – Suffix 6 – Prefix 14 – Assigned Facility Inbound: Only update Physician's facility if the facility is registered in our system and is associated with the physician Outbound: Sends Physician's assigned facility. Inbound / Outbound: We can send and receive multiple Consulting Physicians delimited with ~ e.g. I12345^SMITH^JOHN^^MD^^^^^^^^^RAMSOFT~89765^JONES^ED^^MD^^^^^^^^^I Outbound: There is a configured number of how many consulting physicians are sent. See General Configuration Options
15	1 - 16	IS	O	Ambulatory Status	1-Ambulatory Status See Table 9 of Health Level Seven Version 2.3.1 (Ref. 7.1) for details.
19	1 - 64	CX	O	Visit Number	1-Visit Number
44	1 - 26	TS	O	Patient's Visit Date/ Time	1-Visit Date/Time
46	1 - 9	CP	O	Patient Balance	PV1.46 is only present for Inbound / Outbound DFT messages
51	1	IS	O	Visit Indicator	Outbound: V – if *PV1:19* is present

Essential Notes: In Inbound messages the sequences of PV1 segment as Assigned Patient Location, Attending Physician, Referring Physician, Consulting Doctors can be stored only in study level messages (e.g. ORM, ORU). In Outbound Messages RMC sends in ADT messages simple PV1 segment including only patient class. Note: if ADT messages are setup to send before an ORM or ORU on the same destination, then the study info is available to provide a detailed PV1 segment. In ORM, ORU messages detailed PV1 segment is sent.

AL1

The AL1 segment is used to specify allergies and is repeated for each allergy.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	O	Set ID – AL1	Outbound: Auto generated value
3	2 - 64	CE	C	Allergy Type	2 – Allergy Name
4	1 - 16	IS	O	Allergy Severity	1 – Allergy Severity 'MI' – Mild 'MO' – Moderate 'SV' – Severe Other values are displayed as blank.
5	1 - 256	ST	O	Allergy Reaction	1 – Allergy Notes

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MRG

The MRG segment is used to specify a patient that is to be merged into another or whenever the Patient ID or Issuer of Patient ID must be changed.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	1 - 64 4 - 64	CX	C	Prior Patient Identifier List	1 – Patient ID *(0010,0020)* Inbound: We read *MRG-1.1*, *MRG-4.1* in that order Outbound: We copy to *MRG-4.1* 4 – Issuer Of Patient ID *(0010,0021)* Inbound: We read *MRG-1.4*, *MRG-4.4*. If both are blank, then we assume that the Prior Patient Issuer is the same as the Current Patient. Outbound: We copy to *MRG-4.4*
4	64	CX	C	Prior Patient ID	See *MRG:1*

ORC

The ORC segment contains Order Control and status information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	1 - 2	ID	R	Order Control Code	1 – Order Control Code (mapped to RamSoft Statuses)
2	16	EI	O	Placer Order Number	See *OBR-2*
3	64	EI	C	Filler Order Number	See *OBR-3*
5	1 - 2	ID	O	Order Status	1 – Order Status (mapped to RamSoft Statuses)
7	200	TQ	O	Quantity / Timing	See *OBR-27*
8	1 - 16	EIP	O	Parent	See *OBR-29.1.1*
9	26	TS	O	Date/Time of Transaction	Outbound: Date/time of message
10	64	XCN	O	Entered By	Outbound: Username that last updated the study
12	60	XCN	O	Ordering Provider	See *OBR-16*
13	60	PL	O	Enterer's Location	Inbound: Updates referring physician assigned facility if *OBR-16.14*, *ORC-12.14*, *PV1-8.14*, *PV1-7.14*, and *ORC-17* are blank and facility is setup as a "Referring Facility" Outbound: 4 – We Copy *ORC-17*
14	1-64	XTN	O	Call Back Phone Number	See *OBR-17*
17	60	CE	O	Entering Organization	Inbound: Updates referring physician assigned facility if *OBR-16.14*, *ORC-12.14*, *PV1-8.14*, and *PV1-7.14* are blank and facility is setup as a "Referring Facility" Outbound: We use Referring Assigned Facility. If it is empty, we use Institution Name

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ORC-1 and ORC-5 Status Mappings

RamSoft Status Code (Default)	ORC-1 Value	ORC-5 Value
<30	SN or NW	SC
30 to 69	SC	SC
70 to 79	SC	ZA
80 to 89	OC	CA
90 to 99	SC	IP
100 to 104	SC	ZP
105 to 109, 115 to 129, 150 to 159	SC	CM
110 to 114	DC	CA
130 to 139	SC	HD
140 to 149	SC	CA
160 to 179	SC	ZW
180 to 189	SC	ZX
190 to 199	SC	ZY
>= 200	SC	ZZ

Inbound: We always set the status code to the lowest code in the range.

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OBR

The Observation Request (OBR) segment defines the attributes for a diagnostic study. Each OBR segment contains only one Study Type Code in *OBR-4.1* and one Procedure Code in *OBR-44*. Multiple OBR segments should be used when the study contains multiple study types or multiple procedure codes.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
2	16	EI	C	Placer Order Number	See *OBR-18*
3	64	EI	C	Filler Order Number	User-defined Text Field 1 Inbound: We read *OBR-3*, *ORC-3* in that order Outbound: If blank, we send Accession Number. We copy to *ORC-3*
4	1 - 64 2 - 64	CE	O	Universal Service Identifier	1 – Study Type Code 2 – Study Description (0008, 1030)
7	26	TS	O	Observation Date/Time	Outbound: Date/time of message
12	1	CE	O	Danger Code	Inbound: We read *OBR-27.6*, *ORC-7.6*, *OBR-12*, in that order. Outbound: We copy *OBR-27.6*
13	2000	ST	O	Relevant Clinical Info	History Inbound: - Stored as case sensitive - Allow receiving multiple types of line break (See *NTE-3*)
15	4 - 64 5 - 1	CM	O	Specimen Source	4 – Body Part *(0018,0015)* 5 – Laterality *(0020,0060)*
16	1 – 16 2 - 64 3 - 64 4 - 64 5 - 64 6 – 64 14 - 64	XCN	O	Ordering Provider	Referring Physician Inbound: We read *OBR-16*, *ORC-12*, *PV1-8*, *PV1-7* in that order Outbound: We copy to *ORC-12*, *PV1-8*, *PV1-7* 1 – ID Number Inbound: Updates Physician's NPI only if both Imaging Facility and Physician are registered in our system. Outbound: Sends Physician's NPI. 2 – Family Name *(0008,0090)* 3 – Given Name *(0008,0090)* 4 – Middle Name *(0008,0090)* 5 – Suffix *(0008,0090)* 6 – Prefix *(0008,0090)* 14 – Assigned Facility Name Inbound: - We read *OBR-16.14*, *ORC-12.14*, *PV1-8.14*, *PV1-7.14*, *ORC-17*, *ORC.13* in that order - Only update Physician's facility if the facility is registered in our system as Referring Facility and is associated with the physician. Outbound: Sends Physician's assigned facility.
17	1 – 64	XTN	O	Call Back Phone Number	1 – Referring Physician Business Phone Number Inbound: - If it is empty, we read *ORC-14*

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					- Only update if the USERNAME is configured on the interface
18	16	ST	R	Placer Field 1	1 – Accession Number *(0008,0050)* Inbound: We handle multiple Accession Number for study grouping. It is delimited with ~ e.g RAM123~RAM456~RAM789 Outbound: We copy to *OBR-2, OBR-20, ORC-2*
19	1 - 16	ST	O	Placer Field 2	1 – Requested Procedure ID *(0040, 1001)*
20	16	ST	O	Filler Field 1	See *OBR-18*
24	1 - 16	ID	O	Diagnostic Serv Sect ID	1 – Scheduled Modality *(0008,0060)*
27	1 – 16 4 – 26 6 – 1	TQ	O	Quantity/Timing	Inbound: We read *OBR-27, ORC-7, OBR-12 (for priority only)* in that order Outbound: We copy to *ORC-7* 1 - Quantity 4 – Study Date Time • Study Date *(0008,0020)* • Study Time *(0008,0030)* 6 – Priority *(0040,1003)* 'S' – 'STAT' 'A' – 'HIGH' 'T' or 'P' – 'MEDIUM' 'R' – 'ROUTINE' 'C' – 'CRITTEST' or 'CRITFIND' All multi-valued priorities are mapped to the first priority listed above. Inbound: If input value does not match any of the above values, then a database search is performed against the string value received for custom priorities. If no match is found, then we default to ROUTINE. Outbound: For non-default values, we send the full string value.
29	1 – 16	EIP	O	Parent	1 – Parent's Accession Number Inbound: Currently ignored. Outbound: We populate PRIMARY_ACCESSIONNUMBER for grouped studies. We copy this to *ORC-8.1.1*
30	20	ID	O	Transportation Mode	Outbound: Always set to preconfigured variable
31	1 – 64 2 – 250 3 – 64	CE	O	Reason for Study	1 – Diagnosis Code 2 – Diagnosis Description 3 – Name of Coding System Inbound/Outbound: "I9", "I10" Inbound: - Only update if not blank and if diagnosis code matches one in our database.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping	
					- We handle multiple Reason For Study delimited with ~ e.g. IV02.0^ CARRIER OR SUSPECTED CARRIER OF; CHOLERA ^I9~ V45.4^POSTPROCEDURAL; ARTHRODESIS STATUS^I9I - If Procedure Code is provided (OBR-45), update the DxMapping for this procedure. Outbound: sends study diagnosis codes. Essential Note: RMC supports up to any number of Diagnosis codes per procedure code. If the Name of Coding System is blank, default coding system is used based on the study date time. If the study date time is after the start date of the ICD-10 code, it is set to "I10". If the study date time is before the end date of the ICD-9 code, it is set to "I9".	
32	1 – 16 2 – 64 3 – 64 4 – 64 5 – 64 6 – 64	CM	O	Principal Result Interpreter	1 – Reading Physician	1 – ID Number Inbound: Updates Physician's NPI only if both Imaging Facility and Physician are registered in our system. Outbound: Sends Physician's NPI. 2 – Family Name *(0008,1060)* 3 – Given Name *(0008,1060)* 4 – Middle Name *(0008,1060)* 5 – Suffix *(0008,1060)* 6 – Prefix *(0008,1060)*
34	1 – 16 2 – 64 3 – 64 4 – 64 5 – 64 6 – 64	CM	O	Technician	1 – Performing Technologist	1 – ID Number Inbound: Updates Technologist's NPI only if both Imaging Facility and Technologist are registered in our system. Outbound: Sends Technologist's NPI. 2 – Family Name *(0008,1070)* 3 – Given Name *(0008,1070)* 4 – Middle Name *(0008,1070)* 5 – Suffix *(0008,1070)* 6 – Prefix *(0008,1070)*
35	1 – 16 2 – 64 3 – 64 4 – 64	CM	O	Transcriptionist	1 - Transcriptionist	1 – ID Number Inbound: Updates Transcriptionist's NPI only if both Imaging Facility and

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping	
	5 – 64 6 – 64					Transcriptionist are registered in our system. Outbound: Sends Transcriptionist's NPI. 2 – Family Name *(4008,010a)* 3 – Given Name *(4008,010a)* 4 – Middle Name *(4008,010a)* 5 – Suffix *(4008,010a)* 6 – Prefix *(4008,010a)*
39	2000	CE	O	Collector's Comments	Comments Inbound: - Stored as case sensitive - Allow receiving multiple types of line break (See *NTE-3*)	
41	30	ID	O	Transport Arranged	Outbound: Always set to preconfigured variable	
44	1 – 64 2 – 250 3 – 64	CE	O	Procedure Code	1 – Procedure Code *(0008,1032)* 2 – Procedure Description *(0008,1032)* 3 – Procedure Coding System Inbound: Only update if not blank. If the procedure code is not in our database, then add it along with procedure code description. Only 1 procedure code is allowed for 1 OBR segment. So, for multiple procedure codes in a study, we expect multiple OBR segments.	
45	80	CE	O	Procedure Code Modifier	1 – Procedure Code Modifier Multiple modifiers are sent delimited with ~ Inbound: Only update if not blank.	

NTE

The notes and comments segment (NTE) is used for sending notes and comments.

Seq	Length	Data Type	Inbound	Description	Sub Field and DICOM Element
1	4	SI	O	Set ID - NTE	Outbound: Sequential Number
2	8	ID	O	Source of Comment	Outbound: Always set to 'O'
3	2000	FT	O	Comment	Clinical Notes Inbound: - Stored as case sensitive - Allow receiving following characters as a line break: - \X0D0A\, \X0A0D\, \X0A\, \X0D\ - \E\r, \E\n - \.br\ - \r\n - ~ - \R\
4	250	CE	O	Comment Type	Outbound: Always set to 'RE'

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ZDS

ZDS is a custom segment defined by IHE to store the DICOM Study Instance UID being referred to in an order message. Any system that does not store the DICOM Study Instance UID should omit this segment.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	1 – 64 2 – 200 3 – 200 4 – 200	RP	O	Study Instance UID	1 – Study Instance UID *(0020,000D)* 2 – 'RAMSOFT' 3 – 'Application' 4 – 'DICOM' Inbound: Only process this segment if *ZDS-1.3* and *ZDS-1.4* match the above.

OBX Height and Weight

This OBX segment contains the patient's height and weight.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	O	Set ID - OBX	Outbound: Sequential number
2	3	ID	O	Value Type	Outbound: 'ST'
3	2 – 80	CE	R	Observation Identifier	2 – 'BODY HEIGHT' or 'BODY WEIGHT'
5	65536	REAL	R	Observation Value	Height or Weight according to unit type shown in OBX.6
6	60	CE	R	Units	For 'BODY HEIGHT': 'm', 'cm', 'in' For 'BODY WEIGHT': 'kg', 'lb' Inbound: If input value does not match above types, use default type: 'cm' for 'BODY HEIGHT' 'kg' for 'BODY WEIGHT' Outbound: 'm' for 'BODY HEIGHT' 'kg' for 'BODY WEIGHT'
11	1	ID	O	Observation Result Status	Outbound: 'F'

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OBX Report

This OBX segment contains report data. This segment is normally used when transmitting an SR report created by a reading physician.

We support sending the entire report in a single OBX segment, or multiple consecutive OBX segments. We can break the segments using any configured delimiter such as '\r\n' escape sequence. We also support other delimiters, or we can break the segment by a configurable size. We have configuration option to choose the desired method.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	O	Set ID - OBX	Outbound: Sequential number
2	3	ID	O	Value Type	Outbound: 'FT' for Text, RTF, HTML or 'CE' for binary
3	1 – 64 2 – 80 4 – 80	CE	R	Observation Identifier	1 – Identifier Inbound: We use as SOP Instance UID of report. - If there is an existing report based on this SOP Instance UID, we ignore this report. - If the value is empty or the report based on SOPInstanceUID does not exist, we continue to process the report. Outbound: SOP Instance UID of report 2 – Document Type Inbound: 'TXT', 'RTF', 'PDF', 'DOC', 'DOCM', 'DOCX', 'HTML', 'TIF', 'RTF' Outbound: 'TXT', 'RTF', 'PDF', 'DOC', 'DOCM', 'DOCX', 'HTML', 'TIF', 'RTF' 4 – Document Type ID Used to identify the type of document Inbound: If the value is empty or does not match any of supported document type Ids, we use value from REPORT_DOCUMENT_TYPE_ID Note: PDF is not supported for Diagnostic Reports inbound Supported Document Types 1 – Diagnostic Report (default) 90000 – Diagnostic Preliminary 90001 – Admin 90002 – Clinical 90003 – Study Form 90004 – Instruction 90005 – Mammo 90006 – RIS 90007 – RX 90008 – Screening 90009 – Referral 91001 – Insurance Card 91002 – Patient Forms 91003 – Labs 91004 – Patient Registration Form

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					91005 – Patient Insurance Cards 91006 – HIPAA Consent Form 91007 – Medical Records Release Form 91008 – Prior Report 99999 – Surgery Consultation Report
5	1 - 65536	*	R	Observation Value	1 – Report Text *(0040, a160)* Report may be formatted in TXT, RTF or HTML without encoding. If report is base64 encoded, it may be formatted in PDF, DOC, DOCM, DOCX, or TIFF Inbound: - For TXT report, allow receiving multiple types of line break (See *NTE-3*) and stored as case sensitive. Note: PDF is not supported for Diagnostic Reports inbound
11	1 – 1	ID	O	Observation Result Status	1 – Result Status; specifies status of the report "A" – Addendum "F" – Final (verified / signed) "P" – Preliminary Inbound: - Allow to receive signed addendum report if observer and date/time of observation are provided.
14	1 – 26	TS	O	Date/Time of Observation	1 – Date/Time of Observation *(0008,002A)* Date / time when report was created or verified / signed
16	1 – 16 2 – 64 3 – 64 4 – 64 5 – 64 6 – 64	PN	O	Responsible Observer	Physician that verified / signed the report. 1 – ID Number *(0040, a088) Sequence > (0008, 0100) Code Value* Inbound: Do not updates physician's NPI Outbound: Sends physician's NPI 2 – Family Name *(0040, a075)* 3 – Given Name *(0040, a075)* 4 – Middle Name *(0040, a075)* 5 – Suffix *(0040, a075)* 6 – Prefix *(0040, a075)*
17	60	CE	O	Observation Method	Outbound: 'PRELIMINARY', 'ADDENDUM', or 'FINAL'

SCH

The SCH segment contains information about the scheduled appointment.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	O	Placer Appointment ID	Outbound: Accession Number

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
11	1 – 4 3 – 20 4 – 26 5 – 26 6 – 16	TQ	O	Appointment Timing Quantity	1 – Quantity (Sequence number of Procedures) Inbound: We update the quantity of procedure according to AIS segments 3 – Duration 4 – Appointment Start Time Outbound: Start Time of Appointment 5 – Appointment Finish Time Inbound: We read it only if *AIS-7.1* and *SCH-11.3* is empty Outbound: Finish Time of Appointment 6 – Priority *(0040,1003)* 'S' – 'STAT' 'A' – 'HIGH' 'T' or 'P' – 'MEDIUM' 'R' – 'ROUTINE' 'C' – 'CRITTEST' or 'CRITFIND' Inbound: If input value does not match any of the above values, then a database search is performed against the string value received for custom priorities. If no match is found, then we default to ROUTINE. Outbound: For non-default values, we send the full string value. We can send multiple Quantity delimited with ~ e.g. I 1^^30^20150701064500+0000^20150701064600+0000^R ~2^^45^20150701164500+0000^20150701264600+0000^RI
15	1 – 64 2 – 64 4 – 64 6 – 16 9 – 64	PL	O	Assigned Patient Location	1 – Department (must exist under Locations on the corresponding facility) 2 – Room (must exist under Locations on the corresponding facility) 4 – Imaging Facility / Institution Name (0008, 0080) 6 – Patient's Location Code (not displayed or editable in our system) 9 – Patient's Location *(0038,0300)*
16	1 – 16 2 – 64 3 – 64 4 – 64 5 – 64 6 – 64 14 – 64	XCN	O	Filler Contact Person	Referring Physician 1 – ID Number Inbound: Updates Physician's NPI only if both Imaging Facility and Physician are registered in our system. Outbound: Sends Physician's NPI. 2 – Family Name *(0008,0090)* 3 – Given Name *(0008,0090)* 4 – Middle Name *(0008,0090)*

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					5 – Suffix *(0008,0090)* 6 – Prefix *(0008,0090)* 14 – Assigned Facility Name Inbound: Only update Physician's facility if the facility is registered in our system and is associated with the physician. Outbound: Sends Physician's assigned facility.
20	1 – 1	SI	O	Created by Blocked List	Created by Blocked List 'Y' 'N' Inbound: - For other values, we set it 'N' - If it is 'Y', we insert/update appointment to a block note. Outbound: If this appointment created by blocked list, set to 'Y' Otherwise, 'N'
25	200	CE	O	Filler Status Code	Outbound: 1 – Order Status (mapped to RamSoft Statuses)
26	1 – 16	EI	C	Placer Order Number	1 – Accession Number *(0008,0050)* Inbound: We read *SCH-26*, *SCH-27* in that order. One of these values are required.
27	16	EI	C	Filler Appointment ID	See *SCH-26*

RGS

The resource group segment (RGS) is used to identify the resource for a scheduled event. There is one group (RGS, AIS) per appointment booking.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	R	Set ID - RGS	Sequential number
3	200	CE	O	Resource Name	Inbound: Resource Name Outbound: Resource Name that exists within PowerReader

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AIS

The appointment information service segment (AIS) specifies the details of the appointment.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	O	Set ID – AIS	Sequential number
3	1 – 64 2 – 64	CE	R	Universal Service Identifier	1 – Procedure Code (0008,1032) 2 – Procedure Description (0008,1032)
4	1 – 26	TS	R	Start Date/Time	Appointment Date/Time • Appointment Date • Appointment Time Inbound: - If it is empty, we read *SCH-11.4* - We also use it as appointment start time
5	20	NM	O	Start Date/Time Offset	UTC offset of Study Date Time
7	20	NM	O	Duration	Study Duration Inbound: - If it is empty, we read *SCH-11.3* - We use it to calculate the appointment finish time
8	200	CE	O	Unit	Outbound: Default is 'min'
10	200	CE	O	Filler Status Code	HL7 Filler Status Code 1 – Filler Status Code (mapped to RamSoft Appointment Statuses) Inbound: - For new appointment, if it is empty or other values, we set RamSoft Appointment status of 0 - For update existing appointment, only update if it is valid value - We ignore if *SCH-20* is 'Y'

AIS-10 Status Mappings

Inbound HL7 Filler Status Code	RamSoft Appointment Status Code	Outbound HL7 Filler Status Code
PENDING	2 (Need to reschedule)	PENDING
WAITLIST	0 (Not yet confirmed)	WAITLIST
BOOKED	1 (Confirmed)	BOOKED
STARTED	6 (Arrived)	STARTED
COMPLETE	7 (ReadyForScan)	COMPLETE
CANCELLED	3 (Cancelled)	CANCELLED
DC	3 (Cancelled)	CANCELLED
DELETED	3 (Cancelled)	CANCELLED
BLOCKED	5 (Blocked time)	BLOCKED
OVERBOOK	1 (Confirmed)	BOOKED
NOSHOW*	4 (No show)	NOSHOW*

Note: "NOSHOW" is not HL7 standard, it is custom.

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GT1

The guarantor segment (GT1) contains the information about the person or organization with financial responsibility for payment of a patient account.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	O	Set ID – GT1	Sequential number
2	1 – 64	CX	O	Guarantor Number	Outbound: We populate Internal Patient ID of RS system
3	1 – 64 2 – 64 3 – 64 4 – 64 5 – 64	XPN	O	Guarantor Name	1 – Family Name 2 – Given Name 3 – Middle Name 4 – Suffix 5 – Prefix
5	1 – 256 3 – 24 4 – 3 5 – 10 6 – 3	XAD	O	Guarantor Address	1 – Street Address 3 – City 4 – State/Province 5 – Zip/Postal Code 6 – Country
6	1 – 64	XTN	O	Guarantor Home Phone	1 - Phone Number
7	1 – 64	XTN	O	Guarantor Business Phone	1 – Phone Number
8	26	TS	O	Guarantor's Date Of Birth	Guarantor's Birth Date
9	1	IS	O	Guarantor Sex	'F' – 'FEMALE' 'M' – 'MALE' 'O' – 'OTHER' 'U' – NULL Inbound: - For new patient, we translate all other values to 'OTHER' - For existing patient, we ignore to update for all other values
11	64	CE	O	Guarantor Relationship	Guarantor Relation to Patient 'SEL' – 'SELF' 'SPO' – 'SPOUSE' 'CHD' – 'CHILD' 'OTH' – 'OTHER' 'PAR' – 'PARENT/GUARDIAN' Inbound: All other values will be stored as 'OTHER' Outbound: PAR should show value that will send for Parent in ORM message
16	1 – 64	XPN	O	Guarantor Employer Name	1 – Patient's Employer Name
17	1 – 256 3 – 24 4 – 3 5 – 10 6 – 2	XAD	O	Guarantor Employer Address	Patient's Employer's Address 1 – Street Address 3 – City 4 – State/Province 5 – Zip/Postal Code 6 – Country

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
18	1 – 64	XTN	O	Guarantor Employer Phone Number	1 – Patient's Employer's Phone Number
20	1	IS	O	Guarantor Employment Status	Patient's Employment Status '1' – 'FULL-TIME' '2' – 'PART-TIME' '3' – 'UNEMPLOYED' '5' – 'RETIRED' 'S' – 'STUDENT' 'O' – 'OTHER' (default value used for all others) '9' – 'OTHER'
45	1 – 64 2 – 64 3 – 64 4 – 64 5 – 64	XPN	O	Contact Person's Name	Patient's Emergency Contact 1 – Family Name 2 – Given Name 3 – Middle Name 4 – Suffix 5 – Prefix
46	1 – 64	XTN	O	Contact Person's Phone Number	Patient's Emergency Contact Phone Number 1 – Phone Number
48	64	IS	O	Contact Relationship	Patient's Emergency Contact's Relationship 'SEL' – 'SELF' 'SPO' – 'SPOUSE' 'CHD' – 'CHILD' 'OTH' – 'OTHER' 'PAR' – 'PARENT/GUARDIAN' Inbound: All other values will be stored as 'OTHER' Outbound: PAR should show value that will send for Parent in ORM message

IN1

The Insurance segment (IN1) contains the patient's insurance policy coverage information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	O	Set ID – IN1	Insurance Level - "1" if Primary Insurance - "2" if Secondary Insurance - "3" if Tertiary Insurance
2	64	CE	C	Insurance Plan ID	See *IN1-49*
3	1 – 64 2 – 64	CX	R	Insurance Company ID	Insurance Company ID 1 - Insurance Company Carrier ID 2 - Insurance Company Eligibility Payer ID

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
4	64	XON	O	Insurance Company Name	Insurance Company Payer Name
5	1 – 256 3 – 24 4 – 3 5 – 10 6 – 2	XAD	O	Insurance Company Address	Insurance Company Address 1 – Street Address 3 – City 4 – State/Province 5 – Zip/Postal Code 6 – Country
6	64	XPN	O	Insurance Co Contact Person	Insurance Company Contact Name
7	1 – 64 4 – 64 9 – 64	XTN	O	Insurance Co Phone Number	1 - Insurance Company Business Phone Number 4 – Insurance Company Email Address 9 – Insurance Company Website
8	64	ST	O	Group Number	Insurance Group Number
11	64	XON	O	Insured's Group Emp Name	Insured's Employer Name
12	8	DT	O	Plan Effective Date	Insurance Effective From
13	8	DT	O	Plan Expiration Date	Insurance Effective To
14	1 – 64 2 – 26	CM	O	Authorization Information	1 – Study's Authorization Number Inbound: Update study's authorization number if it is present and AUT-6 is empty. Outbound: We populate this based on the current study for DFT messages. We also only populate this based on conjunction with study level message (ORM/ORU/DFT) for ADT messages. 2 – Study's Authorization Start Datetime Inbound: Update study's authorization start datetime if it is present and AUT-4 is empty.
15	64	IS	O	Plan Type	Patient's Financial Type 'CP' – 'CAPITATED' 'SP' – 'SELF-PAY' 'CM' – 'COMMERCIAL' 'ME' – 'MEDICARE' 'OT' – 'OTHER' 'OH' – 'OHIP' 'MA' – 'MEDICAID' 'WC' – 'WORKERS COMP' Inbound: If we receive values not listed above, we will: - Use system config for default value in case of inserting - Ignore in case of updating
16	1 – 64 2 – 64 3 – 64	XPN	O	Name Of Insured	Insured's Name 1 – Family Name 2 – Given Name 3 – Middle Name

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
17	64	CE	O	Insured's Relationship to Patient	Insured's Relationship to Patient 'SEL' – 'SELF' 'SPO' – 'SPOUSE' 'CHD' – 'CHILD' 'OTH' – 'OTHER' 'PAR' – 'PARENT/GUARDIAN' Inbound: All other values will be stored as 'OTHER' Outbound: PAR should show value that will send for Parent in ORM message
18	26	TS	O	Insured's Date Of Birth	Insured's Birth Date
19	1 – 256 3 – 24 4 – 3 5 – 10 6 – 2	XAD	O	Insured's Address	Insured's Address 1 – Street Address 3 – City 4 – State/Province 5 – Zip/Postal Code 6 – Country
35	1 - 64	IS	O	Insurance Company ID	Insurance Payer ID
42	64	CE	O	Insured's Employment Status	Insured Employment Status '1' – 'FULL-TIME' '2' – 'PART-TIME' '3' – 'UNEMPLOYED' '5' – 'RETIRED' 'S' – 'STUDENT' 'O' – 'OTHER' (default value used for all others) '9' – 'OTHER'
43	1	IS	O	Insured's Sex	Insured Sex 'F' – 'FEMALE' 'M' – 'MALE' 'O' – 'OTHER' 'U' – NULL Inbound: - For new insurance, we translate all other values to 'OTHER' - For existing insurance, we ignore to update for all other values
44	1 – 256 3 – 24 4 – 3 5 – 10 6 – 2	XAD	O	Insured's Employer's Address	Insured's Employer's Address 1 – Street Address 3 – City 4 – State/Province 5 – Zip/Postal Code 6 – Country
45	1 - 2	ST	O	Insurance Verification Status	Verification Status Inbound Only Read from DFT: If empty, set to 'UNK' 'Y' – 'VER' 'N' – 'NEL' Outbound:

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					'UNK' – set to empty 'VER' – 'Y' 'NEL' – 'N'
49	64	CX	C	Insured's ID Number	Insured ID Inbound: We read *IN1-49, IN1-2* in that order Outbound: We copy to *IN1-2*

FT1

The financial transaction segment (FT1) contains charge details to send to the Charge Processor (billing software). Each FT1 segment contains only one Procedure Code in *FT1-25*. Multiple FT1 segments are sent when the study contains multiple procedure codes.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	R	Set ID – FT1	Sequential number for each FT1 segment
2	80	ST	O	Transaction ID	Unique value for each charge (generated with InternalStudyID + '.' + Set ID)
4	26	TS	O	Transaction Date	Study Date Time • Study Date *(0008,0020)* • Study Time *(0008,0030)*
5	26	TS	O	Transaction Posting Date	Current date and time
6	8	IS	O	Transaction Type	'CG'
7	1 – 80	CE	O	Transaction Code	1 – We copy *FT1-2*
8	64	ST	O	Transaction Description	Study Description (0008, 1030)
10	6	NM	O	Transaction Quantity	Quantity of Procedure Code
11	12	CP	O	Transaction Amount - Extended	Charge Amount multiplied by Quantity
12	12	CP	O	Transaction Amount - Unit	Charge Amount
14	1 – 64	CE	O	Insurance Plan ID	1 - Insured ID
16	1 – 64 2 – 64 4 – 64 6 – 16 9 – 64	PL	O	Assigned Patient Location	1 – Department (must exist under Locations on the corresponding facility) 2 – Room (must exist under Locations on the corresponding facility) 4 – Imaging Facility / Institution Name (0008, 0080) 6 – Patient's Location Code (not displayed or editable in our system) 9 – Patient's Location *(0038,0300)*
17	1	IS	O	Fee Schedule	Patient's Insurance's Fee Schedule Name

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					Outbound: We truncate this field to 1 character. Custom mapping is required if this field is required by the Charge Processor.
18	64	IS	O	Patient Type	Patient's Financial Type 'CP' – 'CAPITATED' 'SP' – 'SELF-PAY' 'CM' – 'COMMERCIAL' 'ME' – 'MEDICARE' 'OT' – 'OTHER' 'OH' – 'OHIP' 'MA' – 'MEDICAID' 'WC' – 'WORKERS COMP' Inbound: Currently ignored
19	1 – 64 2 – 250 3 – 64	CE	O	Diagnosis Code	See OBR-31 Inbound: - Update study reason if Accession Number (FT1.23) is provided. - If Procedure Code is provided (FT1-25), update the DxMapping for this procedure. Outbound: - Sends dxMapping diagnosis codes if the study procdure code (FT1-25) has added dxMapping. - Sends study diagnosis codes if the study procedure code (FT1-25) does not have dxMapping and study has diagnosis codes.
20	1 – 16 2 – 64 3 – 64 4 – 64 5 – 64 6 – 64 14 – 64	XCN	O	Performed By Code	Reading Physician 1 – ID Number Outbound: Sends physician's NPI 2 – Family Name *(0008,1060)* 3 – Given Name *(0008,1060)* 4 – Middle Name *(0008,1060)* 5 – Suffix *(0008,1060)* 6 – Prefix *(0008,1060)* 14 – Assigned Facility Inbound: Only update Physician's facility if the facility is registered in our system and is associated with the physician. Outbound: Sends Physician's assigned facility.
21	1 – 16 2 – 64 3 – 64 4 – 64 5 – 64 6 – 64 14 – 64	XCN	O	Ordered By Code	Referring Physician See *PV1-9*
23	16	EI	O	Filler Order Number	Accession Number *(0008,0050)*
25	1 – 64 2 – 250 3 – 64	CE	O	Procedure Code	1 – Procedure Code *(0008,1032)* 2 – Procedure Description *(0008,1032)* 3 – Procedure Coding System

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					Inbound: - Only update if Accession Number (FT1-23) is provided. Outbound: - Sends only one study procedure code.
26	1 – 80	CE	O	Procedure Code Modifier	– Procedure Code Modifier Multiple modifiers are sent delimited with ~ character

DG1

The diagnosis segment (DG1) contains patient diagnosis information.

Seq	Length	Data Type	Outbound	Description	Component, Database and DICOM Mapping
1	4	SI	R	Set ID – DG1	Sequential number for each DG1 segment
2	1	ID	R	Diagnosis Coding Method	FIXED Value = 1 (Required Element for MU)
3	1 – 64 2 – 250 3 – 64	CE	C	Diagnosis Code	1 – Identifier Outbound: Diagnosis code 2 – Text Outbound: Diagnosis code description 3 – Name of Coding System Outbound: 'I9CDX', 'I10'
5	26	TS	C	Diagnosis Date/Time	Date and time diagnosis was entered
6	2	IS	C	Diagnosis Type	Outbound: 'W'

PR1

The procedures segment (PR1) contains procedures information.

Seq	Length	Data Type	Outbound	Description	Component, Database and DICOM Mapping
1	64	SI	R	Set ID – PR1	Get from Generator
2	3	IS	R	RamSoft Procedure Coding Method	'CPT-4'
3	1 – 64 2 – 250	CE	R	Procedure Code	1- Procedure code name 2- Description
4	250	CE	O	Procedure Description	
5	26	TS	R	Procedure Date/Time	Study date time
6	2	IS	R	Procedure Functional Type	'D'
7	4	NM	O	Procedure Minutes	

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Seq	Length	Data Type	Outbound	Description	Component, Database and DICOM Mapping
8	120	XCN	O	Anesthesiologist	
9	2	IS	O	Anesthesia Code	
10	4	NM	O	Anesthesia Minutes	
11	120	XCN	O	Surgeon	
12	1 – 16 2 – 64 3 – 64 4 – 64 5 – 64 6 – 64	CM	O	Procedure Practitioner	Reading Physician 1 – ID Number 2 – Family Name *(0008,1060)* 3 – Given Name *(0008,1060)* 4 – Middle Name *(0008,1060)* 5 – Suffix *(0008,1060)* 6 – Prefix *(0008,1060)*
13	60	CE	O	Consent Code	
14	2	NM	O	Procedure Priority	Number of study procedures 0 – Admitting Proc. 1 – Primary Proc. 2 and higher – Secondary Proc.
15	80	CE	O	Associated Diagnosis Code	Diagnosis Array of: Diagnosis Code^DiagnosisDescription
16	80	CE	O	Procedure Code Modifier	Sequence of Modifier if Modifier exists

RXA

The pharmacy/treatment administration segment (RXA) contains vaccine details.

Seq	Length	Data Type	Outbound	Description	Component, Database and DICOM Mapping
1	4	NM	R	Give Sub-ID Counter	'0'
2	4	NM	R	Administration Sub-ID Counter	'1'
3	26	TS	R	Date/Time Start of Administration	Date vaccine was administered
4	26	TS	R	Date/Time End of Administration	We copy *RXA3*
5	1 – 5 2 – 250 3 – 80	CE	R	Administered Code	1 – Identifier 2 – Text 3 – Name of Coding System https://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=cvx
6	4	NM	R	Administered Amount	Quantity of vaccine administered
7	1 – 32 2 – 250 3 – 80	CE	R	Administered Units	1 – Identifier 2 – Text 3 – Name of Coding System 'ISO+'
15	64	ST	R	Substance Lot Number	Lot number of vaccine
17	1 – 32 2 – 128 3 – 80	CE	R	Substance Manufacturer Name	1 – Identifier 2 – Text 3 – Name of Coding System https://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=mvx
21	2	ID	R	Action Code	'A'

MFI

The master file identification segment (MFI) contains master file identification information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	3	CE	O	Master File Identifier	'PRA': Practitioner master file 'CDM': Charge description master file 'CMA': Clinical study with phases and scheduled master file 'CMB': Clinical study without phases but with scheduled master file 'LOC': Location master file 'OMA': Numerical observation master file 'OMB': Categorical observation master file 'OMC': Observation batteries master file

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					'OMD': Calculated observations master file 'STF': Staff master file Default value: 'PRA'
2	64	HD	O	Master File Application Identifier	Outbound: 'RAMSOFT'
3	3	ID	O	File-Level Event Code	Outbound: 'UDP'
5	26	TS	O	Effective Date/Time	Current date and time
6	2	ID	O	Response Level Code	Outbound: 'NE'

MFE

The master file entry segment (MFE) contains master file entry information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	3	ID	R	Record-Level Event Code	'MAD': add a new user 'MUP': update an existing user 'MDC': Deactivate a user 'MAC': Reactivate a user
2	18	ST	O	Message Control ID	Outbound: - We copy *MSH.10*
3	26	TS	O	Effective Date/Time	Current date and time

STF

The staff identification segment (STF) identifies any personnel in the system.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1		CE	C	Provider Code (Only for providers)	Empty
2	16	CX	C	Staff Identifier List	User Id
3	1 – 64 2 – 64 3 – 64 4 – 64 5 – 64	XPN	R	Staff Name	1-Last name – Required and validation performed, if no last name is received, the message will be rejected. 2-First name – Optional 3-Middle name – Optional 4-Suffix – Optional 5-Prefix – Optional Inbound: based on the system config "Allow Case Sensitive Person Name" value

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					- If it is false, stored with upper case - Otherwise, stored as original values
4	64	IS	R	Staff Type (Role Name)	Outbound: - By default, User Role Name is populated. - For external system, the outbound value is customized: + If the user has role of reading physician or performing physician, set to 'PRO'. + Otherwise, set to 'BIL'.
5	1	IS	C	Administrative Sex	'M': Male 'F': Female 'O': Other
6	26	TS	O	Date/Time of Birth	Birthday
7	1	ID	R	Active/Inactive Flag	'A': active user 'I': inactive user Note: For MAD (new user) we set to Active, for MUP, if no status received, we will observe the current status of the user.
8	1 – 16 2 – 64	CE	O	Department	1-Internal Facility ID 2-Facility Name One user could have multiple facilities. Please be aware that STF.8 is repeatable field
10	1 – 64 3 – 64	XTN	C	Phone	1 – Phone Number 3 – Identifier Valid values are: 'O' – Office / Business 'C' – Cell 'B' – Beeper / Pager 'F' – FAX Inbound: Only update if identifier is recognized and a valid phone number is received. We ignore all other values inbound. Please be aware that STF.10 is repeatable field.
11	1 – 256 3 – 24 4 – 3 5 – 10 6 – 16	XAD	C	Office/Home Address/Birthplace	1-User address 3-City 4-State 5-Zip 6-Country
15	64	ST	C	Email address	Email address
18	256	ST	O	Job title	1 – User notes

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PRA

The practitioner detail segment (PRA) contains user group information and practitioner license information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
2	64		O	Group Name	User Group Name Outbound: - By default, User Group Name is populated. - For external system, this value is empty, but is required inbound to add users.
6	1 – 30 2 – 3 3 – 2 6 – 2 with repeats		O	License Information	Inbound and Outbound: 1 – License # 2 – Type of license We support the following types: 'DEA' – Drug Enforcement Agency 'SL' – State License 'NPI' – Unique Physician ID 3 – Licensing State (applies to SL only) 6 – Licensing Country (applies to SL only) This sequence repeats. DEA is expected in first subcomponent, state license is expected in the second subcomponent, and NPI is expected in the third subcomponent.

ZLI

The ZLI segment contains user account information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	64		R	Username	Username
2	128		R	Password	Password hash key
3	64		O	SALT	SALT key Inbound: - If SALT is present, insert/update user password with SALT. - Otherwise: + Do not update user password if the user exists in DB. + If the user does not exist, insert default user password to add new user. Outbound:

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
					- SALT is present when sending between two RamSoft systems. - When sending to external systems, SALT is not present.
4	64		R	Group Name	User Group Name Outbound: - By default, User Group Name is populated. - For external system, this value is empty.

SPM

The SPM segment contains specimen information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1		SI	R	Set ID SPM	Shall be valued sequentially starting the value '1' within a given segment
4	1 – 16 2 – 64 3 – 80	WE_CR	R	Specimen type	1- Identifier (is used if Name of Coding System is SCT) 2- Text (is used if Name of Coding System is SCT) 3- Name of Coding System Inbound: SCT 4- Alternate Identifier 5- Alternate Text 6- Name of Alternate Coding System 9- Original Text
17	1 – 26 2 – 26	DR	R	Specimen Collection Date/Time	1- Range Start Date/Time (Required) Must match OBR.17 and OBX.14 2- Range End Date/Time (Optional) Must match OBR.18
21	9 – 250	CWE	Varies	Specimen Reject Reason	1- Identifier 2- Text 3- Name of Coding System 4- Alternate Identifier 5- Alternate Text 6- Name of Alternate Coding System 9- Original Text
24	9 – 250	CWE	Varies	Specimen Condition	1- Identifier 2- Text 3- Name of Coding System 4- Alternate Identifier 5- Alternate Text 6- Name of Alternate Coding System 9- Original Text

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ACC

The ACC segment contains accident and workman information.

Seq	Length	Data Type	Outbound	Description	Component, Database and DICOM Mapping
1	16	TS	C	HL7 Accident Date/Time	Date of injury
2	1 – 16 2 – 64	CE	R	Accident Code	1. Accident type code: 'AUTO', 'EMP', 'OTH' 2. Claim #: Patient insurance coverage ID (Primary)
4	16	CE	C	Accident State	Insurance coverage place state
5	1	ID	R	Accident Job Related Indicator	'Y' if accident code is 'EMP' Otherwise, 'N'

NK1

The next of kin segment (NK1) contains information about the patient's other related parties. RMC allows receiving NK1 segments which contain emergency contact information and sending NK1 which contains guarantor information in VXU message.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	4	SI	R	Set ID – NK1	Sequential number for each NK1 segment
2	1 – 64 2 – 64 3 – 64 4 – 64 5 – 64	CE	R	Patient's other related party name	Contact Name 1 – Family Name 2 – Given Name 3 – Middle Name 4 – Suffix 5 – Prefix Inbound: - Update patient's emergency contact name Outbound: - Send patient's guarantor name
3	64	TS	R	Relationship	Patient's Contact's Relationship 'SEL' – 'SELF' 'SPO' – 'SPOUSE' 'CHD' – 'CHILD' 'OTH' – 'OTHER' 'PAR' – 'PARENT/GUARDIAN' Inbound: - All other values will be stored as 'OTHER' - Update patient's emergency contact relation Outbound: - Send patient's guarantor relation
4	1 – 256 3 – 24 4 – 3 5 – 10	XAD	O	Address	Contact Address 1 – Street Address 3 – City 4 – State/Province

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Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
	3 – 2				5 – Zip/Postal Code 6 – Country Outbound: - Send patient's guarantor address
5	1 – 64	XTN	O	Phone Number	Contact Phone Number Inbound: 1 - Update patient's emergency contact phone Outbound: - Send patient's guarantor phone
7	1 – 64	CE	R	Contact Role	1 – Contact Role "C" – Emergency Contact Inbound: - Only process the NK1 segment when the value is "C" and Emergency information is not provided in GT1 segment

ZVI

The ZVI segment contains dosage information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
1	32		R	Dose length product	Dose Length Product
2	32		R	Dose Index	CT Dose Index
3	32		R	Processed mSV or effective dose	Effective Dose

AUT

The authorization information segment (AUT) contains the study's authorization information.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
4	26	TS	O	Authorization start datetime	Study's Authorization Start Datetime Inbound: - Update study's authorization start date/time. - If it is empty, use IN1-14.2
5	26	TS	O	Authorization end datetime	Study's Authorization End Datetime Inbound: - Update Study's Authorization End Datetime if it is present.
6	64	CM	O	Authorization Number	Study's Authorization Number Inbound: - Update study's authorization number. - If it is empty, use IN1-14.1

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PRB

The problem detail degment (PRB) contains the data necessary to add, update, correct, and delete the problems of a patient.

Seq	Length	Data Type	Inbound	Description	Component, Database and DICOM Mapping
2	26	TS	O	Problem Modified Date/Time	Patient's Problem Modified Date/Time
3	1 – 64 2 – 250	CE	R	Patient's Problem Code	1 – Problem Code 2 – Problem Description
7	26	TS	R	Problem Date/Time	Patient's Problem Date/Time

CONFIGURATION

General Configuration Options

The following options are configurable for the entire Application.

Parameter	Description	Default Value
Debug_Set	Debug Option for verbose logging information	true
defaultPatientClass	1. Patient Class in case Patient Class is not supplied in Inbound Message. 2. Patient Class in Outbound Message if Patient Class is not filled by GUI. (Sent in *PV1-2).*	'O'
RS_Append_Delimiter_Char	Concatenation Character for clinical notes, comments, symptoms in Study	'\\'
defaultIssuerName	Default Issuer of Patient ID if none is received as described in PID segment	'UNKNOWN'
RS_PCM	RamSoft Procedure Coding Method	'CPT-4'
RS_Max_Output_ConsPhy	The number of consulting physcians is allowed to send	50
RS_IsLimit_Output_ConsPhy	Allow to send limit number of consulting physicians. If it is true, send the number as configured in RS_Max_Output_ConsPhy. Otherwise, all consulting physicians are sent.	True
Enable_Check_Mirth_Queue_Stuck	Allow to check if a Mirth record is stuck at least "Mirth_Queue_Max_StuckTime" in minutes. If so, perform restarting Mirth	True
Mirth_Queue_Max_StuckTime	The maximum duration that a record can stay in the MIRTH HL7 QUEUE table	5

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Inbound Channel Options

The following options are configurable.

Parameter	Description	Default Value
CREATE_NEW_PATIENT_ORM_MESSAGE	Creates new patient records, as needed, when processing ORM messages	true
CREATE_NEW_PATIENT_ORU_MESSAGE	Creates new patient records, as needed, when processing ORU messages	true
CREATE_NEW_STUDY_ORM_MESSAGE	Creates new study records, as needed, when processing ORM messages	true
CREATE_NEW_STUDY_ORU_MESSAGE	Creates new study records, as needed, when processing ORU messages	true
ENABLE_APPEND_OF_SYMPTOMS	Appends Symptoms received in new ORM or ORU messages to the existing Symptoms. Symptoms are separated with RS_Append_Delimiter_Char defined above	true
ENABLE_APPEND_OF_COMMENTS	Appends Comments received in new ORM or ORU messages to the existing Comments. Comments are separated with RS_Append_Delimiter_Char defined above	true
ENABLE_APPEND_OF_CLINICAL_NOTES	Appends Clinical Notes received in new ORM or ORU messages to the existing Clinical Notes. Clinical Notes are separated with RS_Append_Delimiter_Char defined above	true
REPORT_CONTENT_TYPE	Define Content Type of the report when storing report into Database. This value is used if *OBX 3-2* is not a supported content type.	Default Value is 2 (Text Format) Possible values as following: RS_REPORT_CONTENT_TYPE_PDF – 1 Note: PDF is not supported for Diagnostic Reports (Type 1) inbound RS_REPORT_CONTENT_TYPE_TXT – 2 RS_REPORT_CONTENT_TYPE_DOC – 3 RS_REPORT_CONTENT_TYPE_DOCX – 4 RS_REPORT_CONTENT_TYPE_HTML – 5 RS_REPORT_CONTENT_TYPE_JPG - 6 RS_REPORT_CONTENT_TYPE_TIFF – 7 RS_REPORT_CONTENT_TYPE_RTF – 8 RS_REPORT_CONTENT_TYPE_DOCM – 9

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Parameter	Description	Default Value
REPORT_DOCUMENT_TYPE_ID	Define Document Type of the report when storing report into Database.	Default Value is 1 (Diagnostic Report) Main Possible values as following: RS_DIAGNOSTIC_REPORT – 1 RS_DIAGNOSTIC_PRELIMINARY -90000 RS_ADMIN - 90001 RS_CLINICAL - 90002 RS_STUDY_FORM – 90003 RS_INSTRUCTION – 90004 RS_MAMMO – 90005 RS_RIS – 90006 RS_RX – 90007 RS_SCREENING – 90008 RS_REFERRAL – 90009 RS_INSURANCE_CARD – 91001 RS_PATIENT_FORMS – 91002 RS_LABS – 91003 RS_PATIENT_REGISTRATION_FORM – 91004 RS_PATIENT_INSURANCE_CARDS – 91005 RS_HIPAA_CONSENT_FORM – 91006 RS_MEDICAL_RECORDS_RELEASE_FORM – 91007 RS_SURGERY_CONSULTATION_REPORT – 99999
REPORT_DOCUMENT_TITLE	Define Report Document Title	By default, diagnostic report title will be set automatically.
REPORT_TEMPLATE_URL	Define Report Document Template to view text report in DOC, DOCX or DOCM Format.	By default no template is used
ALLOW_DISTRIBUTION_REPORT	Allow to distribute HL7 Received Report	By default, do not distribute the report
REPORT_ENCODING	Allow to define how to receive a report	Default value is 0 Main Possible values as following: 0 – perform unescaping HL7 characters and no decode for TXT, HTML, RTF. Decode for other report types. 1 – perform decoding for all report types
UPDATE_STUDY_DEMOGRAPHICS_MESSAGE	Updates study info, as needed, when receiving ORM, ORU messages	true
UPDATE_VISIT_DEMOGRAPHICS_MESSAGE	Updates study visit, as needed, when receiving ORM, ORU messages	True
UPDATE_PROBLEMCODES_MESSAGE	Allows to update patient's problem code when receiving ADT messages	False
DELETE_PROBLEMCODES_MESSAGE	Allows to delete existing patient's problem code when updating problem code	False

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Parameter	Description	Default Value
ALLOW_DUPLICATE_SIGNED_ORU_INBOUND	Allows to create a duplicate report, as needed, when receiving ORU messages	True

Outbound Channel Options

The following options are configurable for each outbound channel.

Parameter	Description	Default Value
IS_IHE_IMAGEMANAGER	Disable ADT and BAR messages to comply with IHE Image Manager Actor	false
DEFAULT_SENDING_APPLICATION	Sending Application	'RAMSOFT' Sent in *MSH-3*
DEFAULT_SENDING_FACILITY	Sending Facility	'RAMSOFT' Sent in *MSH-4* 'RAMSOFT'
DEFAULT_RECEIVING_APPLICATION	Receiving Application	'RAMSOFT' Sent in *MSH-5*
DEFAULT_RECEIVING_FACILITY	Receiving Facility	'RAMSOFT' Sent in *MSH-6*
DEFAULT_HL7_VERSIONID	HL7 Version ID	'2.3.1' Sent in *MSH-12*
ALLOW_SEND_FINANCIAL_SEGMENTS_ADT_OUTBOUND	Sends GT1 and IN1 segments in ADT^A08 message	False
ALLOW_SEND_EVENT_SEGMENT_OUTBOUND	Sends EVN segments in all messages	True
ALLOW_SEND_FINANCIAL_SEGMENTS_DFT_OUTBOUND	Sends GT1 and IN1 segments in DFT^P03 message	True
ALLOW_SEND_DG1_SEGMENT_ADT_OUTBOUND	Sends DG1 segment in ADT message	False
ALLOW_SEND_OBX_WEIGHT_HEIGHT_SEGMENT_ORM_OUTBOUND	Sends OBX Height and Weight segments in ORM message	False
ALLOW_SEND_OBX_WEIGHT_HEIGHT_SEGMENT_ORU_OUTBOUND	Sends OBX Height and Weight segments in ORU message	False
ALLOW_SEND_UTC_OFFSET_OUTBOUND	Sends UTC offset in outbound messages	True
ALLOW_SEND_DG1_SEGMENT_ORM_ORU_DFT_OUTBOUND	Allow adding the segment DG1 to outbound ORM and ORU message.	False
ALLOW_SEND_INACTIVE_INSURANCES_OUTBOUND	Allow adding the segment IN1 with INACTIVE status to outbound messages.	True
ALLOW_SEND_PR1_SEGMENT_DFT_OUTBOUND	Allow adding the segment PR1 to outbound DFT message.	False
ALLOW_SEND_AUT_SEGMENT_ORM_ORU_DFT_OUTBOUND	Allow adding the segment AUT to outbound ORM, ORU, DFT messages	False
ALLOW_SEND_PRB_SEGMENT_ADT_OUTBOUND	Allow adding the segment PRB to outbound ADT messages	False
ALLOW_SEND_PRB_SEGMENT_ORM_ORU_DFT_OUTBOUND	Allow adding the segment PRB to outbound ORM, ORU, DFT messages	False
ALLOW_SEND_UNSIGNED_DIAGNOSTIC	Allow Unsigned Diagnostic report to be sent in Outbound ORU^R01 message	False

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Parameter	Description	Default Value
DOCUMENT_OUTPUT_TYPE	Sets Content Type of the report when retrieving report from Database.	Default Value is 25 (Text) Possible values as following: RS_rxtNative - 0 (In this case report is retrieved in existing format of the record) RS_rxtNative – 0 RS_rxtPDF – 1 RS_rxtDOC - 5 RS_rxtDOCBody – 10 RS_rxtRTF - 15 RS_rxtRTFBody – 20 RS_rxtTextBody – 25 RS_rxtChartScriptXML – 30 RS_rxtChartScriptXMLRTF – 35 RS_rxtChartScriptXMLASCII – 40 RS_rxtDOCX - 45 RS_rxtDOCXBody - 50 RS_rxtHTML - 55 RS_rxtJPEG - 60 RS_rxtBMP – 65 RS_rxtTIFF - 70 RS_rxtDOCM – 75
ALLOWED_OUTPUT_DOCUMENT_TYPES	Sets string array of document types to be sent in Outbound ORU^R01 message.	(1,90000)
OBX_SEGMENT_SIZE	Sets maximum size of OBX Segment	65536 (HL7 Standard) If the document format is plain text, RTF, or HTML, word wrapping will be performed so that segments are not broken in the middle of a word unless the word exceeds the segment size.
OBX_SPLIT_DELIMITERS	Sets delimiter characters for outbound plain text OBX Segment.	Default: NULL A new OBX segment is created each time a delimiter character is encountered in the report text.
OBX_LINEBREAK	Sets string to send a line break in a plain text OBX Segment	Default: '\.br\' Set this to NULL to create a new segment instead of sending a line break string. Typical line break strings are '~', '\E\n', '\X0D\'
REPORT_ENCODING	Allow to define how to send a report	Default value is 0 Main Possible values as following:

Parameter	Description	Default Value
		0 – perform escaping HL7 characters and no encode for TXT, HTML, RTF. Encode for other report types. 1 – perform encoding for all report types 2 – perform no escaping, no encoding and only replace the character 'I' by " for TXT, HTML, RTF. Encode for other report types.
SEND_ENTIRE_REPORT	Controls whether to send the entire report for an addendum or just the amended portion	False

HTTPS FILE TRANSFER SPECIFICATIONS

RMC allows to send/receive HL7 messages between other system (sites) via HTTPS transport.

The HTTPS request sent to / from RMC need to follow a simple format
The URL: the URL of the server that receives HTTPS request
The HTTPS body: HL7 message. The HTTPS request body is the HL7 message
The content type: "txt/html; charset=UTF-8". This is configuration header content type of the HTTPS request.
The timeOut: The timeout used by HTTPS post in seconds
The attemptToPost: Counter on how many auto re-attempts to HTTP post to perform
The ResponseStr: The response from the Server that HTTPS request is sent to.

Sample of HTTPS POST:

URL: https://servername/hl7_https
content-type: text/plain; charset=UTF-8
METHOD: POST

[BODY] // Contain HL7 message
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20150504113934+0700||ORM^O01|1132|P|2.3.1|||||UNICODE UTF-8||
EVN|O01|20150504113934+0700||||
PID|1||P12345^^^ISSUER^MR|P12345^^^ISSUER^MR||PATIENT^TEST^M^DR^MR.|^|19741018|M||2106-
3^WHITE^HL70005|10808 FOOTHILL BLVD^^RANCHO
CUCAMONGA^CA^91730^USI|9094815872^^^QA@RAMSOFT.COM^^^|90948158001^^^^^^|UNK|M||12345|2865095101|
|2135-2^HISPANIC OR LATINO^HL70189|
PV1|1|O|ER^ER^^MEDICAL
CENTER^^^^^ER|||^JONES^SAMUEL^M^MD^DR.|^JONES^SAMUEL^M^MD^DR.|^SMITH^JOHN^M^MD^DR~^JONES^
ED^M^MD^DR|||||||||RAM4|||||||||||||||||||||||||||0|||||VI
ORC|SC|A123456|A123456||SC||1^^^20110615025434-
0400^^R^^^^||20150504113934+0700|HL7MIRTH||^JONES^SAMUEL^M^MD^DR.|MEDICAL CENTER|||MEDICAL CENTER||
OBR|1|A123456|A123456|^XRAY JAW < 4 VIEWS|||20150504113934+0700|||||R|Patient was in an
altercation||^^^JAW^B|^JONES^SAMUEL^M^MD^DR.||A123456|RP890|A123456||||CR|||1^^^20110615025434-
0400^^R^^^^|||WALK|830.1^DISLOCATION OF JAW; OPEN
DISLOCATION|I&PATEL&APU&&MD&||&LEVINSON&KERRY&K&RT&|&TRANKLIN&KATY&K&&|||||PATIENT WAS
DRUNK||U|||70100^XRAY JAW < 4 VIEWS|23~42~34
NTE|1|O|CLINICAL NOTES|RE
OBX|1|ST|^BODY HEIGHT||1.69|m||||F|||||
OBX|2|ST|^BODY WEIGHT||75|kg||||F|||||
ZDS|1.2.124.113540.0.0.3.725.4^RAMSOFT^Application^DICOM

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1. RMC's response of the HTTPS request

After sending a HTTPS request to RMC Server, RMC will return a response that includes a custom ACK HL7 message (See Section 0, 0) back with response text message.

- If the HL7 message which is on HTTPS request body is rejected, the response text message is defined as follow and will identified in ERR segment:

```
errorCode = 101;
responsetextMessage = '^^^' + errorCode + '&' + rejectMessage;
```

- If the HL7 message is processed successfully, the response text message is defined as follow and will presented in MSA segment:

```
responsetextMessage = "Request was Successfully processed"
```

- If there is an exception or error, the response text message is defined as follow and will identified in ERR segment

```
errorCode = 207;
errorMessage = 'Application Internal Error';
responsetextMessage = '^^^' + errorCode + '&' + errorMessage;
```

Note:

- ERR segment is defined corresponding to HL7 version 2.3.1

GOOD TO KNOW

Signature line

Which report types can be received with auto-populated signature line: HTM SR report, TXT report
Criteria required for signature line to appear on inbound report received through ORU: observer name and the observation date and time
HTML Tags within report content that will auto consider the whole report to be HTM:
HTMLParaTag = '</P>';
HTMLFontTag = '</FONT>';
HTMLLineBreakTag = '<BR>';

Write Javascript functions to generate HL7 messages from DBXML

Interface with other vendors requires specific message dependencies. For example, it requires ADT first then ORM and DFT, it should be taken care of by the interface developer. In order to send an ADT message first then ORM or DFT message, we can write Javascript functions to generate messages from our DBXML. These development steps are described in the Mirth Developer Guide.

Create/Edit Addendum report

During creating/editing an Addendum report, the following syntax should not be modified:

1. <Addendum Begin
2. Addendum End>

If there are mistakes, for example, extra spaces between "Addendum" and "Begin", the entire report will be sent instead of just amended part of report when the SEND_ENTIRE_REPORT option is set to "false".

Sample error outbound message when the SEND_ENTIRE_REPORT option is set to "false":

```
MSH|^~\&|RAMSOFT|RAMSOFT|RAMSOFT|RAMSOFT|20151016183523+0700||ORU^R01|453636|P|2.3.1|||||UNICODE UTF-8||
EVN|R01|20151016183523+0700||||
PID|1||P11^^^RAMSOFT^MR|P11^^^RAMSOFT^MR||NO
ALA|AC^RAMQQQ^ZQ^^|^IU||UNK^DECLINED^HL70005|^^^^^US||^^^^^^|^^^^^^|UNK|U||||UNK^DECLINED^HL70189|
PV1|1|O|^^^^^^^^|||||2015080925^ADMIN^NAME^^^^^^^^^^|2015080925^ADMIN^NAME^^^^^^^^^^^|||||||||RAM830|||||||||||||
||||||||||||0.00||||||VI
```

ORCISCIRAM521IRAM521IIZWII1^^^20151015190844+0700^^R^^^^II20151016183523+0700IADMINII20150809 25^ADMIN^NAME^^ ^^^^^^^^^IIIIIII
OBRI1IRAM521IRAM521I1000^THIS IS STUDY
1III20151016183523+0700IIIIIRIII^^^BRAIN^BI20150809 25^ADMIN^NAME^^^^^^^^^^^IIRAM521I521IRAM521IIIIBDUSIII1^^^2015101 5190844+0700^^R^^^^IIIWALKII2015080925&ADMIN&NAME&&&II&&&&&I&&&&&IIIIIIUIII19083^BIOPSY BREAST 1ST LESION ULTRASOUNDI
NTEI1IOIIRE
OBXI1IFTI1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1II<Addendum BeginIIIIIIAIIIII^^^^^IADDENDUM
OBXI2IFTI1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1IIThis is incorrect addendum report when extra spaces between <Addendum and BeginIIIIIIAIIIII^^^^^IADDENDUM
OBXI3IFTI1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1IIAddendum End>IIIIIIAIIIII^^^^^IADDENDUM
OBXI4IFTI1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1IIThis is test reportIIIIIIAIIIII^^^^^IADDENDUM
OBXI5IFTI1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1IIIIIIIIIAIIIII^^^^^IADDENDUM
OBXI6IFTI1.2.124.113540.1.4.1462321546.2484.1444995272.952^TXT^^1IIIIIIIIIAIIIII^^^^^IADDENDUM

Sample correct outbound message when the SEND_ENTIRE_REPORT option is set to "false":

MSHI^~\&IRAMSOFTIRAMSOFTIRAMSOFTIRAMSOFTI20151016183427+0700IIORU^R01I4536 35IPI2.3.1IIIIIIUNICODE UTF-8II
EVNIR01I20151016183427+0700IIII
PIDI1IP11^^^RAMSOFT^MRIP11^^^RAMSOFT^MRIINO
ALAAC^RAMQQQ^ZQ^^I^IIUIIUNK^DECLINED^HL70005I^^^^^USII^^^^^^I^^^^^^IUNKIUIIIIIIUNK^DECLINED^HL70189I
PV1I1IOI^^^^^^^^IIII20150809 25^ADMIN^NAME^^^^^^^^^^^I20150809 25^ADMIN^NAME^^^^^^^^^^^IIIIIIIIIIIRAM830IIIIIIIIIIIIII IIIIIIIIIIII0.00IIIIIVI
ORCISCIRAM521IRAM521IIZWII1^^^20151015190844+0700^^R^^^^II20151016183427+0700IADMINII20150809 25^ADMIN^NAME^^ ^^^^^^^^^IIIIIII
OBRI1IRAM521IRAM521I1000^THIS IS STUDY
1III20151016183427+0700IIIIIRIII^^^BRAIN^BI20150809 25^ADMIN^NAME^^^^^^^^^^^IIRAM521I521IRAM521IIIIBDUSIII1^^^20151015190844+0700^^R^^^^IIIWALKII2015080925&ADMIN&NAME&&&II&&&&&I&&&&&IIIIIIUIII19083^BIOPSY BREAST 1ST LESION ULTRASOUNDI
NTEI1IOIIRE
OBXI1IFTI1.2.124.113540.1.4.1462321546.2484.1444994575.945^TXT^^1II<Addendum BeginIIIIIIAIIIII^^^^^IADDENDUM
OBXI2IFTI1.2.124.113540.1.4.1462321546.2484.1444994575.945^TXT^^1IIThis is correct addendum reportIIIIIIAIIIII^^^^^IADDENDUM
OBXI3IFTI1.2.124.113540.1.4.1462321546.2484.1444994575.945^TXT^^1IIAddendum End>IIIIIIAIIIII^^^^^IADDENDUM

NORMATIVE REFERENCES

- Health Level Seven, Version 2.3.1, 1999
  http://www.hl7.org/implement/standards/v2messages.cfm
- IHE Radiology Technical Framework Revision 10.0, 2011
  http://www.ihe.net/Technical_Framework/index.cfm#radiology
- NEMA Digital Imaging and Communications in Medicine (DICOM), Version3 Volumes 1 – 18, 2009
  ftp://medical.nema.org/medical/dicom/2009/
- Mirth Connect Reference Guide
  http://www.mirthcorp.com/community/wiki/display/mirthuserguidev1r8p0/Transformers

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VERSIONS

Version	Revision Notes	Updated by	Reviewed by	Effective Date
Rev. A	Initial Version for 6.0	LNO	SRN, VKM	04/14/2015
Rev. B	Update Section 1.1 for Inbound DFT message Update Section 3.13 for Inbound Processing, DFT-P03 sample message Update Section 4.6 PV1 for PV1.46 Patient Balance, Section 4.20 for Inbound column Add Section 6 for how to structure the message for sending/receiving between RMC and other system via HTTPS transport	LNO	VKM, SMV	05/04/2015
Rev. C	Add ACC segment into Section 4 Update Section 3.13 for DFT messages	LNO	SRN	06/23/2015
Rev. D	Add Outbound SIU to Section 1.2 and 3.10 Update SCH, AIS, RGS segments Add PID.6 for Mother's Maiden Name to PID segment Update RACE table for PID.10 of PID segment Add IN1.45 for Insurance Verification Status to IN1 segment	LNO	SRN	07/21/2015
Rev. E	Add the Name of Coding System for Diagnosis code and default value when it is blank for Inbound message	LNO	EMN	09/11/2015
Rev. F	Support referring, reading, consulting's assigned facility Limit number of consulting physicians are sent Add GT1.8 Guarantor Date of Birth Update Sections: 3.2.1, 3.5, 3.6, 3.7, 13.14, 4.6, 4.15, 4.19, 4.20, 4.26, 5.1, 7.2. Add Section 7.3 for Addendum	LNO	EMN	10/16/2015
Rev. G	Support receiving/sending any number of diagnosis codes Add status order code 150 – 159 for exam completed Add EVN segment to SIU message Update Section 3.10.3, Section 4.15	LNO	EMN	12/24/2015
Rev H	Add Inbound Processing for MFN message Update PID, IN1, MFI, MFE, STF, ZLI segments	LNO	EMN	02/15/2016
Rev I	Update 3.14 Vaccination segments and sample VXU^V04 message Add 4.30 NK1 segment Update 4.18 GT1.2 sequence Add 3.13.2: Populate ACC segments corresponds to active insurances Add 4.31 ZVI segment, 4.32 AUT segment, 4.33 PRB segment Update 4.19 Seq 42, 4.18 Seq 20	LNO	EMN	08/23/2016

Rev J	Update 3.6.3, 3.11 for receiving active and inactive insurances Update 4.10 Seq 18, 29 for processing multiple accession numbers Update 4.17 Seq 3 for Procedure Code and Description Update test SIU messages with SCH.26, SCH.27 Updated BAR message with IN1.1 Update ORU message (RTF) with PID3.1	LNO	EMN	09/09/2016
Rev K	Update Section 4.18 GT1.9, Section 4.5 PID.8, Section 4.19 IN1.43 for sex status	LNO	SMV	11/04/2016
Rev L	Updated Section 3.6.3 for study types and procedure codes inbound processing changes.	MII	SMV	1/23/2017
Rev M	Added additional sample messages to Sections 3.6.4 and 3.8.3.	MII	EMN	3/01/2017
Rev N	Added section header and updated table to reflect	EMN	MII	3/23/2017
Rev O	- Update allow receiving different types of line break - Update PID.10 for RACE, Ethnicity - Add 2.4 Section for storing value in uppercase or case sensitive - Update 4.5 PID, 4.10 OBR, 4.14 OBX, 4.26 STF for case sensitive - Update 4.14 OBX.11 to allow receiving signed addendum - Update 4.15 SCH and 4.17 AIS for receiving SIU message to update/insert appointment - Update 4.10 OBR for assigned facility for referring physician requires setup as Referring Facility	LNO	MII	8/22/2017
Rev P	• Updated header and footer. • 4.26 to reflect Last Name is required, first and middle are optional and user status handling. • 4.17.1 COMPLETED to COMPLETE. • 4.10 updated limitation on history and clinical notes. • 4.11 updated limitation on comments. • 4.16 Updated for Resource Name on Inbound • 4.14 to reflect support for Prior Reports and Study Form • 3.81 Handling of text reports when Global and/or Facility templates exist. • 4.1, 4.9 and 4.10 for referring physician assigned facility • 3.5.1 New A23 added • 3.10 Removed EVN segment from table • 3.10.3 Added new sample SIU • 4.21 Added DG1.2 • 3 for ACK/NACK • 3.3 for filtering patient IDs that were previously merged	EMN	MI	5/02/2018

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	• 3.13.1 for financial transaction handling • 3.8.3 Sample ORUs replaced			
Rev Q	• Section 1 Added TM for Gateway • Section 3.3 Added Sample A08 with PRB and DG1 with A08 table updated	EMN	MI	5/7/2018
Rev R	• P 65 typo • 3.13.1 Ins segs ignored inbound on DFT • 3.7 Updated MFN • 4.27 PRA segment added	EMN	MI	5/10/2018
Rev S	• Added info for SCH.15 and that dept and room must exist on all segments we map to these values • Fixed formatting • Added STF.4 and STF.5 for suffix and prefix • Modified STF.10 for all supported numbers • Added STF.18 for user notes • 4.19 - IN1.45 only read from DFT	EMN	MI	5/11/2018
Rev T	• Replaced ORU RTF/WORD/PDF sample messages with hyperlinks to same messages stored online	SMV	SMV	7/30/2018
Rev U	• Revised document to fit standard product documentation template • Edited formatting for consistency	JZG	LHG	8/3/2018
Rev V	• Added documentation that PDF is not supported for Diagnostic Reports inbound	EMN	SM	9/21/2018
Rev W	• Minor spelling mistakes • Reviewed documentation for completeness	SM	JZG	12/6/2018
Rev X	• Update statement in regard to MFN and password exchange	SM	LLG	5/10/2019
Rev Y	• Added ZA/ZP to ORC-5 status mappings • Modified priority in OBR-27 and SCH-11 to mention custom priorities are accepted value • Fixed value for guarantor country • Modified AIS-4 to reflect appointment date/time • Removed all instances of RS_SendEntireReport with SEND_ENTIRE_REPORT and updated description • Fixed 'O' in employment status • Updated inbound MFI fields to 'O' • Updated PRA.2 inbound field to 'O'	MI	SM	11/09/2021
Rev Z	• Removed RamSoft Status column from Status Mappings • Fixed HTM typo to HTML in inbound/outbound OBX.3.2	MI	SM	04/12/2023

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Rev 2.0	• Removed outbound columns except for outbound only segments • Fixed formatting • Fixed typos	MI	SM	7/25/2024