McKESSON
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STAR 2000™

STAR RADIOLOGY REFERENCE GUIDE
Mammography HL7 Interface Guide

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Preface

McKesson's Mammography HL7® Interface provides the STAR Radiology system with a generic mammography interface based on HL7 standards and TCP/IP communications. To ensure the standard interface is operational, the interface has been developed in a cooperative effort with Mammography Reporting System (MRS). Other Mammography systems may use this interface if they use the same specifications.

The interface sends orders, revisions, cancellations, add-on orders, and patient demographic updates. When the transcription is received from the Mammography system, STAR Radiology files the results and places the report in the Radiologist Review Queue. Transcription can be modified on STAR Radiology using the editor defined for the STAR Radiology product. Transcription modified on the STAR Radiology is not sent to the Mammography Reporting System. Radiology Final Reports are printed from the STAR Radiology system.

The Mammography HL7 Interface is an add-on feature. If your facility is interested in implementing it, you should submit a work order to McKesson.

This interface is compliant with HL7 version 2.2. Implementation requires MSE Release 2.20 or above, STAR Radiology 15.1 or above, and that the interfaced system is HL7 compliant.

This guide contains technical information about the Mammography HL7 Interface as well as information for the user of the interface.

Documentation Conventions

Documentation for McKesson's STAR 2000™ line of products follows these conventions:

Revisions
Text revisions are indicated by a change bar in the left margin. Paragraphs that contain grammatical changes that do not affect content are not marked.

Canadian Documentation
This volume may include documentation for Canadian users of this product. Complete sections of Canadian text are identified by "CN" and "CN Only."

Key Names
Named keys, such as ENTER, SHIFT, CTRL, and ALT, appear in this document in uppercase (capital) letters. Symbol keys are displayed according to the key name, followed by the symbol on the key in parentheses, such as hyphen (-) and asterisk (*).

Key Chords
Key chords are key entries that require you to hold down one or more keys (typically, CTRL, ALT, or SHIFT) before pressing another key. In this document, key chords are displayed as the names of each key in the chord with a hyphen (-) between each (for example, CTRL-ALT-DEL). You should press the keys in the order indicated.

ENTER
ENTER is a key on a computer keyboard used to complete an entry on a STAR system. (This key may also be referred to as NEW LINE or NL in the STAR System.)

Data Entries
Letters or words you enter in response to the system are displayed in **boldface** letters in this document. For example: Enter **Y** for Yes or **N** for No.

Selecting an Entry
This document often instructs you to "select an entry." The method you use to select an entry depends on whether you are using STAR from a terminal or IBM-compatible personal computer. Entry methods include:

- Entering the option number
- Using your arrow keys to highlight the option and pressing ENTER
- Clicking on the option using a mouse or other pointing device (PC only)

For more information about these options, see the *General Information Volume*.

Prompts
System prompts are displayed at the bottom of many STAR screens when the system requests an entry or displays a message. In this document, these prompts are indented and the text italicized, as shown in the following example

Enter patient name--

Field Characteristics

STAR product documentation provides field explanation codes, in addition to a narrative description for each field on a screen. These codes display the maximum length of your entry in the field, the type of entry you make in the field, and whether the field is required. This information is displayed in the following format:

- DISPLAY ONLY for a field you cannot edit.
- For X-YY-Z field types, where:
  - X is the maximum number of characters permitted in the field:
    - P for a field length determined by a Parameter
    - T for a field length determined by a Table
    - U for a field having an Undefined length
  - YY is the type of entry technique permitted in the field:
    - A for Letters only
    - N for Numerals only
    - C for Characters (including punctuation)
    - AC for Letters and Punctuation only (no numbers)
    - NC for Numerals and Punctuation only (no letters)
    - AN for Numerals and Letters only (no punctuation)
  - Z is the requirement indicator of the field:
    - R if an entry is required to complete the function

      NOTE: Facilities can designate that certain fields be Required. STAR product documentation does not display R for fields designated as Required by a facility.
    - O if an entry is Optional to complete the function
    - C if an entry is Conditionally required or optional
  - For YY-Z field types, where YY is:
    - TABLE LOOKUP for a field that enables you to select from a displayed table. See the *General Information Volume* for more information regarding this entry technique.
    - SPECIAL FORMAT for a field having data entry requirements not conforming to standard format. The field definition contains the specific data entry requirements for the field.
    - DATE for a field subject to the date entry conventions described in the *General Information Volume*.
    - TIME for a field subject to the time entry conventions described in the *General Information Volume*.

    NOTE: For use of the Z position in this format, refer to the explanations for Z under X-YY-Z.

Table of Contents

Introduction

This guide contains technical and user information about the Mammography HL7 Interface, which is accessed through functions available on the STAR Radiology Generic Interface Maintenance Functions Processor. For more information about Maintenance Functions in STAR Radiology, see the *Maintenance Volume* of the *STAR Radiology Reference Guide*.

Chapter 1: Overview/Description

This chapter provides a general description of the Mammography HL7 Interface and the functions available in the Maintenance Functions Processor.

Chapter 2: System Requirements

This chapter provides the hardware and software requirements needed for the Mammography HL7 Interface.

Chapter 3: Installation

This chapter provides the installation steps required to set up the parameters for this interface. McKesson intervention is required for HL7 activation.

Chapter 4: User Functions

This chapter documents the user functions for the Mammography HL7 Interface.

Chapter 5: Technical Notes

This chapter contains information about outgoing and incoming transactions on STAR Radiology.

Chapter 1 - OVERVIEW/DESCRIPTION

NON-TECHNICAL FUNCTIONAL OVERVIEW

NOTE: This interface is an add-on feature and implementation has to be scheduled by submitting a work order. The HL7 Pending updates should not be performed unless this interface is being installed.

This interface provides the STAR Radiology system with a generic mammography interface based on HL7 standards and TCP/IP communications. This is an online, real-time interface that complies with HL7 version 2.2 specifications. This allows information to be accessed virtually immediately.

This standard HL7 interface solution enables your facility to choose the mammography vendor suited to your needs and does not require McKesson to maintain a vendor specific interface.

To ensure that the standard interface is operational, the interface has been developed in a cooperative effort with Mammography Reporting System (MRS). MRS is designed for recording, tracking, and reporting mammography results in full compliance with government regulations. Other Mammography systems may use this interface if they use the same specifications.

FEATURES/FUNCTIONS

The process flow between the STAR Radiology system and the Mammography system is as follows:

1. A Radiology exam is requested for a patient and checked into the Radiology department via the Patient Check-in function in STAR Radiology.

2. At exam check-in, patient information and a new order transaction is sent to the Mammography system containing patient demographics and check-in data. One record is sent for each mammography exam performed on STAR Radiology.

3. When the transcription is received from the Mammography system, the STAR Radiology system files the results and places the report in the Radiologist Review Queue or Radiologist Workflow module.

    - If the report is linked to multiple exams in the Mammography system, the link should automatically be filed in STAR Radiology. If the link is across masters (for example, mammography and ultrasound exams), you must have a cross-master link group built for these two masters in order for it to file correctly.

      If the link groups are not defined, STAR Radiology stores the report with the first exam sent within the interface message.

    - Transcriptions can be modified on STAR Radiology using the editor defined for the STAR Radiology product.

    - When STAR Radiology receives a report that has been edited in the Mammography system, the Released By field is changed to "~~", and the report is queued to the proper radiologist(s) designated by the Read By result.

    - Transcriptions modified on STAR Radiology are not sent to the Mammography system.

    - Transcriptionist productivity is not captured in STAR Radiology for reports transcribed in the Mammography system.

4. Radiology Final Reports are printed from the STAR Radiology system.

5. Additional process flow include revisions, cancellations, add-on orders, and patient demographic updates.

Chapter 2 - SYSTEM REQUIREMENTS

MINIMUM SYSTEM REQUIREMENTS

STAR Radiology

HARDWARE

A separate port must be assigned for each direction of data transmission: one for each outbound interface line and one for each inbound interface line.

SOFTWARE

The minimum software requirements for implementation of this HL7 interface are as follows:

- MSE Release 2.20 or higher.
- STAR Radiology Release 15.1 or higher.
  - The Interface Parameters screen and the HL7 Interface screen must be set up for this interface.

NOTE: The interfaced system must be HL7 compliant.

Mammography System

Hardware and software requirements for the mammography vendor need to be obtained from that vendor.

Chapter 3 - INSTALLATION

INSTALLING THE MAMMOGRAPHY HL7 INTERFACE

The Mammography HL7 Interface is an add-on feature and requires a work order for installation. The installation steps in this section are done by the installer. Certain parameter settings are done after consulting with the hospital staff and certain installation steps can only be done by the installer and are not defined in this document.

Defining the Mammography HL7 Interface in STAR Radiology

To implement the Mammography HL7 Interface, the McKesson installer uses the Interface Parameter Maintenance function to define the interface parameters for the system to communicate data to the interfaced system. This function allows users to define the characteristics of the interface. If there are multiple interface lines, each line must be defined using this function.

Access this function by selecting Interface from the Maintenance Functions screen. Then select Interface Control - Generic Interface and the appropriate department. After selecting the department, select the Interface Parameter Maintenance option.

For the Mammography Interface, there must be one Inbound Interface line and one Outbound Interface line from STAR Radiology to the Mammography system. Select either Inbound or Outbound Parameter Maintenance accordingly. After you choose this option, the following prompt is displayed:

Enter communication code --

Enter **MMO** as the code for outbound definition and **MMI** for inbound definition. The system displays the Parameter Maintenance Processor screen for the Mammography HL7 Interface.

If you enter a code that does not exist, the following prompt is displayed:

Add this code 'code'? (Y/N) [Y]--

The default is *Yes*. If you enter **Y** or press ENTER, the system displays the Parameter Maintenance Processor screen. If you enter **N**, the system displays the original *Enter communication code* prompt.

The data transmission from STAR Radiology to the Mammography system is driven by the parameters and values set in the Interface Parameter Maintenance screens.

NOTE: Changes made to these parameters do not take effect until the parameters are filed and the interface is reactivated.

DEFINING OUTBOUND PARAMETERS

The following screen is displayed for Outbound Parameter definition in STAR Radiology:

```
           General Hospital Outbound Parameter Maintenance Processor
                                                 Tue Sep 07, 2004 09:52 am
Communication Code: MMO              Updated last by: #32763 on 01/13/04 1434
 1 Description           2 Facilities     3 Port     4 HIS
   MAMMOGRAPHY OUTBND      A                157        Horizon Clinicals
 5 Protocol Pgm   6 Error Pgm   7 Error Log   8 Products   9 Audit   10 Days
   LR^AHL7CT        ^AHL7TCPE     AXMEXER000      X            Yes        7
11 Inc Trans Pgm    12 Incoming Transactions
   ^CCHIS1
13 Historize        14 Same Internal #       15 HL7
   Yes                                         Yes









Enter field number or '/' starting field number--
```

Field Explanations

1. DESCRIPTION (19-C-R)
This field contains a free-text descriptive name of the interface (for example, MMO for the Mammography Outbound Interface). This name is displayed on the system list and must be unique for each interface.

2. FACILITIES (TABLE DISPLAY-R)
This field identifies the facilities serviced by the interface. When you access this field, the system displays a table of available facilities for your system. Enter the option number(s) of the facilities for which data should be communicated over this HL7 interface. To select a range of facilities, enter the option numbers of the first and last facility in the range, separated by a hyphen (-). To remove a selected facility, enter the option number of the facility to be removed preceded by a hyphen (-).

3. PORT (2-N-R)
This field identifies the port number to which the interfaced system is attached. This port is defined in the system using the Port Modification Utility. For more information about this utility, refer to the *MultiSTAR Software Environment for Unix Operations Guide*.

4. HIS
This field displays the health information system for this interface.

5. PROTOCOL PGM (16 C-R)
This field identifies the program that manages the interface queue. For outbound HL7 interfaces in STAR Radiology, this is LR^AHL7CT.

6. ERROR PGM
This field contains the program to run if an error occurs. For this interface, the program is ^AHL7TCPE.

7. ERROR LOG
This field identifies the system report to which the error messages generated by this interface should print. When you access this field, the system displays a table of defined reports. For STAR Radiology interfaces, select AXMEXER000.

8. PRODUCTS
This field identifies which STAR products communicate over the interface. For this interface, this field contains X.

9. AUDIT
This field identifies whether or not to turn on the audit.

10. DAYS
This field determines the amount of time, in days, to retain the audit information.

11. INC TRANS PGM
This field determines which program is used to determine the STAR transactions containing triggering events for transmitting transactions over the interface. For this interface, this field needs to be set to ^CCHIS1.

12. INCOMING TRANSACTIONS
Not applicable for this interface.

13. HISTORIZE
Although not applicable for this interface, should be set to **Yes**.

14. SAME INTERNAL #
Not applicable for this interface.

15. HL7 (1-A-R)
This field identifies whether this is an HL7 compliant interface. The Mammography Interface is an HL7 compliant interface. Enter **Y** for Yes in this field.

When you complete these fields, the system prompts you to accept the screen. Enter **Y** to accept the contents of the screen. Enter **N** to continue editing the screen. After the screen is accepted, the system displays the following screen:

```
         General Hospital Outbound Parameter Maintenance Processor
                                                Tue Sep 07, 2004 09:52 am
Communication Code: MMO              Updated last by: #32763 on 01/13/04 1434
HL7 Parameters
 1 STX Character   2 ETX Character   3 Receiver Binary   4 Sending Application
   11                28                 Yes                HBOX
 5 Receiving Application  6 Query Level          7 Number of Result Query Lines
   MMO                      Single
 8 Result Query Lines                           9 Minor Error Halt
                                                  Yes
10 HL7 Version           11 NULL/Not Present Support    12 Encode
   2.2                      No
13 HBOCHI                14 HL7 Queue/Audit Routine









Enter field number or '/' starting field number--
```

Field Explanations

1. STX CHARACTER (3-C-R)
This field contains the character for the start of text message header. Enter the numeric value for the ASCII character set. The system displays the ASCII character in brackets ([ ]) to the right of your entry; if the character set is not a printable ASCII character, the system displays only your entry.

2. ETX CHARACTER (3-C-R)
This field contains the character for the end of text message header. Enter the numeric value for the ASCII character set.

3. RECEIVER BINARY (1-A-R)
This field identifies whether the start of text character from the receiver is a binary character. Enter **Y** if this is a binary character. Enter **N** if this is a non-binary (printable) character. For the Mammography HL7 Interface, set this field to **Yes**.

4. SENDING APPLICATION (15-C-R)
This field identifies the STAR Application that originates this message transmitted over this HL7 interface. The interface places this code in the MSH header segment. McKesson recommends HBOX code for STAR Radiology.

5. RECEIVING APPLICATION (15-C-R)
This field identifies the system receiving this message transmitted over this HL7 interface. This code must be unique for each receiving application. For Mammography systems, the code used is MMO.

6. QUERY LEVEL (1-A-R)
This field determines whether the system should use single level or double level queries. For the Mammography Interface, enter **S** to use single-level query since all order/check-in information needed to send the check-in and exam information resides on the STAR Radiology system.

7. NUMBER OF RESULT QUERY LINES (1-N-R)
This field identifies the number of query lines available for this interface.

8. RESULT QUERY LINES (40-C-R)
This field identifies each query line available for this interface. The system rotates through these query lines, one query at a time, to accommodate traffic over this interface.

9. MINOR ERROR HALT (1-A-R)
This field determines whether the interface should halt or continue to communicate data in the event of a minor error. Errors are classified as either fatal or minor. In the HL7 interface, the only fatal error occurs when protocol numbers are not synchronized. Enter **Y** to halt this interface in the event of all system errors. Enter **N** to only halt this interface in the event of a fatal error.

10. HL7 VERSION (6-C-R)
This field identifies the version of the HL7 standards. Enter 2.1 or 2.2 of the HL7 standard versions.

11. NULL/NOT PRESENT SUPPORT
Not applicable for this interface.

12. ENCODE
Not applicable for this interface.

13. HBOCHI
Not applicable for this interface.

14. HL7 QUEUE/AUDIT ROUTINE
Not applicable for this interface.

When you complete these fields, the system prompts you to accept the screen. Enter **Y** to accept the contents of the screen. Enter **N** to continue editing the screen. After the screen is accepted, the system displays the following prompt:

Set Product Specifications? (Y/N)—

Enter **Y** and the system prompts you for which product you want to set specifications. This corresponds to the Products field from the initial screen. Select the product and the following screen is displayed.

```
        General Hospital Outbound Parameter Maintenance Processor
                                                Tue Sep 07, 2004 09:52 am
Communication Code: MMO              Updated last by: #32763 on 01/13/04 1434
Radiology Interface

 1 Incoming Tx   2 Incoming Pgm     3 Outgoing Tx               4 Outgoing Pgm
   OR,OU,CO        ^XZGI              CA,NO,OT,RE                 ^AHL7XO

 5 Error Log       6 Error Pgm      7 SIM Department(s)
   122               AHL7TCPE         RAD

 8 HL7 Outbound Message             9 HL7 Outbound Tables


10 Result Menu Name for Normal Codes









Enter field number or '/' starting field number--
```

Field Explanations

1. INCOMING TX (TABLE LOOKUP-O)
This field displays the STAR transactions containing triggering events for transmissions to STAR Radiology over this interface, as defined in the Incoming Transaction field on the first screen of the communication definition.

2. INCOMING PGM (9-C-O)
This field indicates the program used to process incoming transactions. Press ENTER to accept the default program.

3. OUTGOING TX (TABLE LOOKUP-O)
This field identifies STAR transactions containing trigger events for transmission to systems over this interface.

When you access this field, the following prompt is displayed:

Enter new `-` to alter outgoing transactions [Base Transactions]--

Enter individual codes separated by a vertical bar (|), as shown in the following example:

Enter new `-` to alter outgoing transactions [Base Transactions]-- CA|NO|OT|RE

You can also enter a hyphen (-) to display a menu of Transaction Codes for the system. Enter the option numbers of the transactions that trigger a data transmission.

To remove a selected transaction, enter the option number preceded by a minus sign (-).

4. OUTGOING PGM (9-C-R)
This field identifies the program used to process outgoing transactions. Enter the name of the program preceded by a carat (^),or press ENTER to accept the default program.

5. ERROR LOG (TABLE DISPLAY-O)
This field identifies the report name to which error messages generated by this interface should print. When you access this field, the system displays a table of defined reports. Select the desired report.

For more information about defined reports in the system, refer to the Print Spooler Functions chapter in the *MultiSTAR Software Environment for UNIX Operations Guide.*

6. ERROR PGM (16-C-R)
This field identifies the program used to process errors. Press ENTER to use the default error program.

7. SIM DEPARTMENT(S) (TABLE DISPLAY-O)
This field identifies the SIM departments for which the interface transaction should be processed. Select STAR Radiology departments.

8. HL7 OUTBOUND MESSAGE (SPECIAL FORMAT-O)
This field identifies the version of the messages to be transmitted over this interface. You can only edit this field for HL7 type interfaces.

When you access this field, the system displays a table of events and the messages associated with each event. The events displayed are based on your entries in the Outgoing Transactions field.

Messages for each event are defined by McKesson according to the HL7 standard. You can modify the version of the message transmitted by placing your cursor on the message line and entering the number of the version to use, or enter a hyphen (-) to display and select from a list of versions for the message.

9. HL7 OUTBOUND TABLES (TABLE DISPLAY-O)
The HL7 Interface can download STAR tables to an interfaced system or device, thus enabling a higher degree of connectivity and minimizing communications traffic. This field identifies the STAR Radiology tables to be transmitted over this HL7 interface. The system processes all additions, revisions, and deletions of outbound tables through the interface.

NOTE: If you define outbound tables, you must download them to the interfaced device before going live with this interface.

10. RESULT MENU NAME FOR NORMAL CODES
This field identifies the name of the result menu for Radiologist menu. You are able to find this name by accessing Result Menu option from Utilities option under

Maintenance. Select Radiologist from the table selection and the name of the menu displays on the top line of the screen.

When you complete this screen, the system asks you to accept it. When you accept the screen, the system displays *Filed!* and returns you to the Interface menu.

DEFINING INBOUND PARAMETERS

The following screen is an example of the Inbound Interface Parameter Maintenance screen in STAR Radiology:

```
         General Hospital Inbound Parameter Maintenance Processor
                                                Tue Sep 07, 2004 09:52 am
Communication Code: MMI              Updated last by: #32763 on 01/07/04 1358
 1 Description          2 Facilities  3 Port  4 Status    5 Protocol Routine
   MAMMOGRAPHY IN         A             172     Active      ^AHL7IBR
 6 Lab SIM Departments      7 Rad SIM Departments      8 Rx SIM Departments
                              RAD
 9 Interface Audit Report Name    10 Audit Zblock     11 Audit Global
   AXMEXER000-INTERFACE ERROR REPOR                       Yes
12 Dump Queue Report Name         13 Queue Zblock     14 DCU Ports

15 Outgoing Transactions          16 Outgoing table/s 17 Format Routine  18 PCM

19 Incoming Transactions          20 Incoming table/s 21 Process Routine 22 HL7
   X                                                                     Yes
23 Line Out                       24 IMNET









Enter field number or '/' starting field number--
```

Field Explanations

1. DESCRIPTION (19-C-R)
This field contains a free-text descriptive name of the interface (for example, MMI for the Mammography Inbound Interface). This name displays on thesystem list and must be unique for each interface.

2. FACILITIES (TABLE DISPLAY-R)
This field identifies the facilities serviced by the interface. When you access this field, the system displays a table of available facilities for your system. Enter the option number(s) of the facilities for which data should be communicated over this HL7 interface. To select a range of facilities, enter the option numbers of the first and last facility in the range, separated by a hyphen(-). To remove a selected facility, enter the option number of the facility to be removed preceded by a hyphen (-).

3. PORT (2-N-R)
This field identifies the port number to which the interfaced system is attached. This port is defined in the system using the Port Modification Utility. For more information

about this utility, refer to the *MultiSTAR Software Environment for UNIX Operations Guide*.

4. STATUS (DISPLAY ONLY)
This field displays the status of the interface as either Active or Inactive. This field cannot be edited.

5. PROTOCOL PGM (16-C-R)
This field identifies the program that manages the interface queue. For inbound HL7 interfaces in STAR Radiology, this is ^AHL7IBR.

6. LAB SIM DEPT
Not applicable for this interface.

7. RAD SIM DEPT
This field contains the Radiology departments for which the interface is being defined.

8. Rx SIM DEPT
Not applicable for this interface.

9. INTERFACE AUDIT REPORT NAME (TABLE DISPLAY- O)
This field identifies the system report to which the error messages generated by this interface should print. When you access this field, the system displays a table of defined reports. For STAR Radiology interfaces, select AXMEXER000.

10. AUDIT Z-BLOCK
Not applicable for this interface.

11. AUDIT GLOBAL (1-A-R)
This field determines whether the system should create an audit global of inbound and outbound messages. Enter **Y** to create the audit global; enter **N** if you do not want to create the audit global. You must enter **Y** if you want to view an audit trail of inbound and outbound messages using the HL7 Audit Inquiry function.

12. DUMP QUEUE REPORT NAME
Not applicable for this interface.

13. QUEUE ZBLOCK
Not applicable for this interface.

14. DCU PORTS
Not applicable for this interface.

15. OUTGOING TRANSACTIONS
Not applicable for this interface.

16. OUTGOING TABLES
Not applicable for this interface.

17. FORMAT ROUTINE
Not applicable for this interface.

18. PCM
This field should be set to **No**.

19. INCOMING TRANSACTIONS (TABLE DISPLAY-O)
This field identifies the STAR transactions containing triggering events for transmissions to STAR systems over this interface. When you access this field, the system displays a menu of Transaction Codes for the system. Enter the option number(s) of the transactions that trigger a data transmission over this interface. This field should contain X.

20. INCOMING TABLES
Not applicable for this interface.

21. PROCESS ROUTINE
Not applicable for this interface.

22. HL7 (1-A-R)
This field identifies whether this is an HL7 compliant interface. The Mammography Interface is an HL7 compliant interface. Enter **Y** for Yes in this field.

NOTE: If you do not enter **Y** in this field, you cannot access the remaining screens used to define communications for an HL7 interface.

23. LINE OUT
Not applicable for this interface.

24. IMNET
Not applicable for this interface.

When you complete these fields, the system prompts you to accept the screen. Enter **Y** to accept the contents of the screen. Enter **N** to continue editing the screen. After the screen is accepted, the system displays the following screen:

```
             General Hospital Inbound Parameter Maintenance Processor
                                                  Tue Sep 07, 2004 09:52 am
Communication Code: MMI              Updated last by: #32763 on 08/07/04 1358
HL7 Interface Definition
 1 STX Character     2 ETX Character  3 Receiver Binary  4 Sending Application
   11                  28               Yes                 MAM
 5 Receiving Application  6 Query Level          7 Number of Result Query Lines
   HBOX                   Single
 8 Result Query Lines                           9 Minor Error Halt
                                                  No
10 HL7 Version 11 HBOCHI     12 Price From      13 Multiple Merge Segments
   2.2                          SIM File          No
14 Broadcast ADT Changes 15 Ack Audit 16 Encode 17 NULL/Not Present Support
   No                                             No
18 Inbound Messages    19 Outbound Messages   20 Outbound Tables   21 GUI HL7?
   See Table             See Table              See Table            No
22 HL7 Queue/Audit Routine




Enter field number or '/' starting field number--
```

Field Explanations

1. STX CHARACTER (3-C-R)

This field contains the character for the start of text message header. Enter the numeric value for the ASCII character set. The system displays the ASCII character in brackets ([ ]) to the right of your entry; if the character set is not a printable ASCII character, the system displays only your entry.

2. ETX CHARACTER (3-C-R)

This field contains the character for the end of text message header. Enter the numeric value for the ASCII character set.

3. RECEIVER BINARY (1-A-R)

This field identifies whether the start of text character from the receiver is a binary character. Enter **Y** if this is a binary character. Enter **N** if this is a non-binary (printable) character. For the Mammography Interface, set this field to **Yes**.

4. SENDING APPLICATION (15-C-R)

This field identifies the Mammography system that transmits HL7 messages to STAR Radiology. The interface places this code in the MSH header segment. McKesson recommends the code MAM for the Mammography system.

5. RECEIVING APPLICATION (15-C-R)

This field identifies the system receiving messages transmitted over this HL7 interface. This code must be unique for each receiving application. For STAR Radiology, use code HBOX.

6. QUERY LEVEL (1-A-R)
This field determines whether the system should use single-level or double-level queries. For the Mammography Interface, enter **S** to use single-level query since all order/check in information needed to send the check-in and exam information resides on the STAR Radiology system.

7. NUMBER OF RESULT QUERY LINES (1-N-R)
This field identifies the number of query lines available for this interface.

8. RESULT QUERY LINES (40-C-R)
This field identifies each query line available for this interface. The system rotates through these query lines, one query at a time, to accommodate traffic over this interface.

9. MINOR ERROR HALT (1-A-R)
This field determines whether the interface should halt or continue to communicate data in the event of a minor error. Errors are classified as either fatal or minor. In the HL7 interface, the only fatal error occurs when protocol numbers are not synchronized. Enter **Y** to halt this interface in the event of all system errors. Enter **N** to only halt this interface in the event of a fatal error.

10. HL7 VERSION (6-C-R)
This field identifies the version of the HL7 standards. Enter 2.1 or 2.2 of the HL7 standard versions.

11. HBOCHI
Not applicable for this interface.

12. PRICE FROM
Not applicable for this interface.

13. MULTIPLE MERGE SEGMENTS
Not applicable for this interface.

14. BROADCAST ADT CHANGES
Not applicable for this interface.

15. ACK AUDIT
This field identifies whether the acknowledgments are stored in an audit or not. This should be set to **Yes** for the Mammography Interface.

16. ENCODE
Not applicable for this interface.

17. NULL/NOT PRESENT SUPPORT (1-A-R)
This field identifies whether the receiving application supports null and not present as defined in the HL7 specifications. Enter **Y** if the receiving application supports null or not present. This should be set to **No** for the Mammography Interface.

18. INBOUND MESSAGES
This field identifies the inbound HL7 message for Inbound interface. For the Mammography inbound interfaces, this contains the HL7 message "ORU."

19. OUTBOUND MESSAGES
Not applicable to for this interface.

20. OUTBOUND TABLES
Not applicable for this interface.

21. GUI HL7
This field is set to **No** for the Mammography Interface.

22. HL7 QUEUE/AUDIT ROUTINE
Not applicable for this interface.

When this screen is completed, the system prompts you to accept it. Enter **Y** to accept the screen. When you accept the screen, the system displays *Filed!* and returns you to the menu.

DEFINING MAMMOGRAPHY HL7 PARAMETERS

The purpose of this function is to define the exams associated with mammography to ensure that only those exams cross the interface.

The data transmission from STAR Radiology to the Mammography system is driven by the parameters and values set up in the Mammography HL7 Parameters Processor.

To access this screen from the STAR Radiology main menu, select Administration, Maintenance, Interface, and Interface Control - Generic Interface. The Radiology department selection screen is displayed.

Select the appropriate department, and then select Mammography HL7 Parameters. The following screen is displayed:

```
            General Hospital Mammography HL7 Parameters Processor
                                                Tue Sep 07, 2004 09:52 am


 1 Interface Outbound Line Definition
   MMO

 2 Mammography Master Exam(s)             3 Mammography Exam(s)
   See Table









Enter field number or '/' starting field number--
```

NOTE: Changes made to these parameters do not take effect until the parameters are filed, and the interface is reactivated.

Field Explanations

1. INTERFACE OUTBOUND LINE DEFINITION (3-C-R)
This field contains the definition designated in Outbound Interface Parameter Maintenance. Only selected exams should cross the interface, and this field lets the protocol program know which line is the correct interface line.

2. MAMMOGRAPHY MASTER EXAM (TABLE DISPLAY-R)
When selected, this field displays a table of master exams. Use this table to identify which master exams are valid mammography exams. When you select a master exam, all exams associated with that master are flagged as valid mammography exams. Once a patient has been checked in, the interface compares all exams checked in against this field and field 3. If the exam checked in has been selected in field 2 or field 3, a record is sent across the interface.

3. MAMMOGRAPHY EXAM(S) (TABLE DISPLAY-R)
When selected, this field displays a table of individual exams. Use this table to identify which exams are valid mammography exams. This field is very similar to the Mammography Master Exam(s) field except you select individual exams. Only exams that have not been selected directly or through their master exams are displayed in this field.

NOTE: The Mammography Master Exam(s) field and the Mammography Exam(s) field are both set up as optional fields as they are designed to complement each other. When using the Mammography HL7 Interface, complete either field or both fields.

TESTING GUIDELINES

Test Outline

Before testing occurs, the mammography interface lines must be defined and activated for the Test system.

1. Generate HL7 messages from STAR Radiology system (at Check-in, Order Revision) to send them to the Mammography system. The fields in the PID and ORC segments must be populated by the STAR Radiology system.

2. Ensure that these transactions are being received by the Mammography system and there are no interface errors. These can be verified by selecting the HL7 Audit Inquiry function.

3. Once the Mammography system generates the transactions coming back to STAR Radiology, verify the information is filed correctly.

    - The Transcriptionist, Transcription Start Date and Time, Transcription Stop Date and Time, Read By, and Report fields should be filled in from the transactions received from the Mammography Interface. Verify these fields under Activity Tracking.

    - The transactions received from the Mammography Interface should update the results in the EDE and should be available for the Radiologist Queue.

    - Verify the report can be accessed by the Radiologist, accessed in Patient Inquiry, and can be printed to the Final Report printer.

4. The HL7 audit functions should be utilized to verify the transactions are being received from the Mammography system.

Chapter 4 - USER FUNCTIONS

MAMMOGRAPHY HL7 USER FUNCTIONS

This chapter describes user functions such as activating and deactivating the Mammography HL7 Interface, displaying interface errors, and interface parameter maintenance.

To access the Interface Maintenance Processor, first select the Interface option from the Maintenance Processors menu. The following screen is displayed:

```
                    General Hospital Interface Processor
                                          Tue Sep 07, 2004 09:52 am

                    Interface Maintenance Processors
( 1) General Interface Parameters
( 2) HL7 Interface Maintenance
( 3) Interface Control - Clinipac Interface
( 4) Interface Control - Generic Interface
( 5) Interface Control - Lanier
( 6) Interface Control - Mammography
( 7) Interface Control - Old Interface









Enter option number --
```

Select Interface Control - Generic Interface and the appropriate department, and the following screen is displayed:

```
                 General Hospital Maintenance Functions Processor
                                                    Tue Sep 07, 2004 09:52 am
Maintenance Functions Input Options

            Option No. Option
            ---------------------------------------
                1       Interface Control
                2       Display Interface Errors
                3       PATIENT CARE to CLINSTAR Audit
                4       CLINSTAR to PATIENT CARE Audit
                5       Interface Parameter Maintenance

                6       HL7 Interface Functions
                7       Communication Line Status

                8       Image Manager Cold Feed Interface Functions
                9       Mammography HL7 Parameters
               10       Speech Recognition HL7 Parameters




Enter option number--
```

The rest of this chapter describes the user functions on the Maintenance Functions Processor that pertain to the Mammography HL7 Interface.

Interface Control

This function enables you to either activate or inactivate the Mammography HL7 Interface after it has been installed. It also allows you to modify the various characteristics of the Interface. When you select the Interface Control option, a screen similar to the following is displayed:

```
                General Hospital Interface Control Processor
                                                  Tue Sep 07, 2004 09:52 am
Interface Control Input Options

            Option No.  Option
            ----------------------------------------
                1       Outbound Interface Control
                2       Inbound Interface Control

                3       Outbound Parameter Maintenance
                4       Inbound Parameter Maintenance









Enter option number--
```

When you enter an option number to select a function, the following prompt is displayed:

Enter communication code--

Enter the appropriate communication code, or enter a hyphen (-) for a table lookup for all the interfaces defined for this system.

If you enter a code for an interface that is not installed, the system displays the following message:

Error: Invalid!

NOTE: The last two functions, Outbound Parameter Maintenance and Inbound Parameter Maintenance, are described in "Chapter 3 - INSTALLATION". These functions are used when installing the Mammography HL7 Interface.

OUTBOUND INTERFACE CONTROL

Use this function to activate or inactivate the outbound interface. When you select this option and enter the communication code, the status of the interface is displayed as either Active or Inactive.

Activating the Outbound Interface

If the status of the outbound interface is Inactive, the system displays the following prompt:

Start the interface? (Y/N)--

If you enter **Y**, the system displays the following message:

Are you SURE you want to START the interface?--

If you enter **Y**, the system displays the following message and returns you to the previous screen:

Interface STARTING!

If you enter **N** to elect not to activate the interface, the system returns you to the previous screen, and the interface remains inactive.

Inactivating the Outbound Interface

If the status of the outbound interface is Active, the system displays the following prompt:

Halt the interface? (Y/N)--

If you enter **Y**, the system displays the following message:

Are you SURE you want to HALT the interface?--

If you enter **Y**, the system displays the following message and returns you to the previous screen:

Interface HALTING!

If you enter **N** to elect not to halt the interface, the system returns you to the previous screen and the interface remains active.

INBOUND INTERFACE CONTROL

Use this function to activate or inactivate the inbound interface. When you select this option and enter the communication code, the status of the interface is displayed as either Active or Inactive.

Activating the Inbound Interface

If the status of the inbound interface is Inactive, the system displays the following prompt:

Activate the MAMMOGRAPHY IN (Y/N)? --

If you enter **Y** to activate the interface, the system displays the following message:

MAMMOGRAPHY IN will be activated! Accept? (Y/N)--

If you accept, the system activates the interface and displays the following prompt:

Enter communication code, or `-` to list--

If you enter **N** to elect not to activate the interface, the interface remains inactive and the following prompt is displayed:

Enter communication code, or `-` to list--

Inactivating the Inbound Interface

If the status of the inbound interface is Active, the system displays the following prompt:

Inactivate the MAMMOGRAPHY IN (Y/N)? --

If you enter **Y** to inactivate the interface, the system displays the following message:

MAMMOGRAPHY IN will be terminated! Accept? (Y/N)--

If you accept, the system terminates the interface and displays the following prompt:

Enter communication code, or `-` to list--

If you enter **N** to elect not to halt the interface, the interface remains active and the following prompt is displayed:

Enter communication code, or `-` to list--

Press period (.) and ENTER to return to the Maintenance Functions Input Options menu.

Display Interface Errors

This function displays any interface errors that may have occurred on the date selected. When you select this option, the system prompts you for the appropriate interface code. After you select the interface code, the system displays the following prompt:

Enter date to review [today]--

Enter the date for which you want to view the errors in either a MMDDYY or MM/DD/YY format or press ENTER for the default of today's date. If there are no errors for that date, the following message is displayed:

None to display!

You are returned to the date prompt. If there are any interface errors for the selected date, a screen similar to the following is displayed:

```
              General Hospital Display Interface Errors Processor
                                                Tue Sep 07, 2004 09:52 am
                         Interface Error Log
Date =   06/20/04

      TC   Trans Dte/Tme   Patient #    Account #   Name
      NW   06/30/04        00003155     9715400002  WILLIS,BILL E
```

Errors displayed are for outgoing transactions only and are caused by records not having fields that are required or are not formatted correctly.

HL7 Interface Maintenance

From the Maintenance screen, select Interface and then Interface Control - Generic Interface. Select the appropriate department and the HL7 Interface Functions option. Use this function to define HL7 specific information and to view audit for the interface.

```
              General Hospital HL7 Interface Functions Processor
                                                  Wed Jan 26, 2011 04:33 pm
HL7 Interface Functions Input Options

             Option No.  Option
             ----------------------------------------
                 1       HL7 Queue Inquiry
                 2       HL7 Audit Inquiry
                 3       HL7 Error Inquiry
                 4       Errors/Audit Report Options

                 5       HL7 Table Processing Functions

                 6       HL7 Audit Re-send

                 7       HL7 User Maintenance
                 8       Remove Top Record from Interface




Enter option number--
```

Select the HL7 Queue Inquiry option to display a list of all of the interfaces defined on the system, as well as the number of transactions in the queue for each interface. Select the mammography interface queue that you would like to view. The system displays the following prompt:

Display in (C)hronological or (R)everse chronological order? [C]--

Select **C** or press ENTER to view the transactions in chronological order, or select **R** to view the transactions in reverse chronological order. The following screen shows the transactions displayed in chronological order:

```
               General Hospital HL7 Queue Inquiry Processor
                                                  Tue Sep 07, 2004 09:52 am

Page:01                       Queued Messages for MMO
( 1) 06/19 0701 ORDER MESSAGE (ORM-O01-09)           [A1]
( 2) 06/19 0701 ORDER MESSAGE (ORM-O01-09)           [A2]
( 3) 06/19 1502 ORDER MESSAGE (ORM-O01-09)           [A3]
( 4) 06/19 1600 ORDER MESSAGE (ORM-O01-09)           [A4]
( 5) 06/19 2001 ORDER MESSAGE (ORM-O01-09)           [A5]
( 6) 06/19 2001 ORDER MESSAGE (ORM-O01-09)           [A6]
( 7) 06/20 0301 ORDER MESSAGE (ORM-O01-09)           [A7]
( 8) 06/20 0701 ORDER MESSAGE (ORM-O01-09)           [A8]
( 9) 06/20 0701 ORDER MESSAGE (ORM-O01-09)           [A9]









Enter choice--
```

Select a transaction to see the segment(s) contained in the message. In the following example, the first transaction from the screen above has been selected:

```
                General Hospital HL7 Queue Inquiry Processor
                                                  Tue Sep 07, 2004 09:52 am
Message:  on 06/19 0701
Page:01                             Segments
( 1) MSH-07 MESSAGE HEADER
( 2) PID-07 PATIENT IDENTIFICATION
( 3) ORC-08 COMMON ORDER
( 4) OBR-05 OBSERVATION REQUEST









Enter choice—
```

The ORM message for the Mammography Outbound Interface consists of the MSH, PID, ORC, and OBR segments, which are displayed in the screen above. The A08 message for Mammography Outbound Interface consists of MSH and PID. When you select each segment, the transaction data that is being sent across the interface is displayed.

For more detailed explanations of these segments, see “Chapter 5 - TECHNICAL NOTES”.

MSH SEGMENT

If you select the MSH segment, the following screen is displayed:

```
                General Hospital HL7 Queue Inquiry Processor
                                                  Tue Sep 07, 2004 09:52 am
Message:  on 06/19 0701
Segment: MSH - MESSAGE HEADER
1  508-01   FIELD SEPERATOR             |
2  509-01   ENCODING CHARACTERS         ;~\&
3  6-01     SENDING APPLICATION         HBOX
4  512-01   SENDING FACILITY            A
5  9-01     RECEIVING APPLICATION       MAM
6  513-01   RECEIVING FACILITY          A
7  10-01    DATE/TIME OF MESSAGE        200308261025
8  8-01     SECURITY                  *
9  12-04    MESSAGE TYPE                ORM;O01;09
10 3-04     MESSAGE CONTROL ID          ""
11 14-01    PROCESSING ID               T
12 15-01    VERSION ID                  2.2
13 633-05   SEQUENCE NUMBER           *
14 699-01   CONTINUATION POINTER      *
15 Z0174-01 ACCEPT ACKNOWLEDGEMENT TY   AL
16 Z0175-01 APPLICATION ACKNOWLEDGEME *
17 Z0176-01 COUNTRY CODE              *


           F1Prev Page F2Next Page F5Resend F6 Reset  F7  Exit   ?
```

In this screen, the first column is the sequence, the second column is the data element code, the third column is the data element name, and the last column contains the data in the segment.

PID SEGMENT

The second segment of the ORM message is the PID segment. If you select this segment, the following screen is displayed:

```
                General Hospital HL7 Queue Inquiry Processor
                                                    Tue Sep 07, 2004 09:52 am
Message:  on 06/20 0701
Segment: PID - PATIENT IDENTIFICATION
1  572-01   SET ID - PATIENT ID
2  581-01   PATIENT ID (EXTERNAL ID)    00003155
3  34-01    PATIENT ID (INTERNAL ID)    000003037;;;A
4  38-04    ALTERNATE PATIENT ID        0033
5  41-01    PATIENT NAME                WILLIS;BILL;E;""
6  582-01   MOTHERS MAIDEN NAME         ""
7  43-01    DATE OF BIRTH               19500718
8  42-01    SEX                         M
9  597-01   PATIENT ALIAS
10 44-01    ETHNIC GROUP (RACE)         ""
11 20-01    PATIENT ADDRESS             123 HONEY LANE;"";ATLANTA;GA;21121;"";>
12 26-01    COUNTY CODE
13 49-01    PHONE NUMBER - HOME         ""
14 50-01    PHONE NUMBER - BUSINESS
15 464-01   LANGUAGE - PATIENT          ENGLISH;E
16 46-01    MARITAL STATUS              M
17 45-01    RELIGION                    "";""
18 35-01    PATIENT ACCOUNT NUMBER      9715400002;;;A

           F1Prev Page F2Next Page F5Resend F6 Reset  F7  Exit   ?
```

This segment contains patient-specific information and the data is generated by the data elements defined in this segment for this interface. Some of the fields may be blank; this means that they are not required for this interface, and STAR Radiology may not have that particular information for this patient.

ORC SEGMENT

The next segment in this message is the ORC segment. If you select this segment, a screen similar to the following is displayed:

```
                  General Hospital HL7 Queue Inquiry Processor
                                                  Tue Sep 07, 2004 09:52 am
Message:  on 06/20 0701
Segment: ORC - COMMON ORDER
1  714-01   ORDER CONTROL               NW
2  732-05   PLACERS ORDER # (OBR)       0000008484A7691;HBOX
3  733-05   FILLERS ORDER # (OBR)       8484;HBOX
4  717-06   PLACER GROUP #
5  718-07   ORDER STATUS                STAT CHECKIN
6  719-01   RESPONSE FLAG               N
7  735-08   QUANTITY/TIMING
8  721-01   PARENT
9  722-01   DATE/TIME OF TRANSACTION    200308261025
10 723-06   ENTERED BY
11 724-01   VERIFIED BY               *
12 539-07   ORDERING PROVIDER (OBR)
13 726-01   ENTER'S LOCATION
14 727-01   CALL BACK PHONE NUMBER    *
15 Z0180-02 ORDER EFFECTIVE DATE/TIME
16 Z0181-03 ORDER CONTROL CODE REASON
17 Z0379-01 ENTERING ORGANIZATION     *
18 Z0380-02 ENTERING DEVICE

               F1Prev Page F2Next Page F6 Reset  F7  Exit   ?
```

This segment contains order information for the patient. The information is generated by the data elements defined in this segment.

OBR SEGMENT

The next segment in this message is the OBR segment. If you select this segment, a screen similar to the following is displayed:

```
                General Hospital HL7 Queue Inquiry Processor
                                                    Tue Sep 07, 2004 09:52 am
Message:  on 06/20 0701
Segment: OBR - OBSERVATION REQUEST
1  520-05   SET ID - OBSERVATION REQU *
2  732-02   PLACERS ORDER # (OBR)       0000008484A7691; HBOX
3  733-03   FILLERS ORDER # (OBR)       8484;HBOX
4  523-03   UNIVERSAL SERVICE IDENTIF   7691;MM MAMMOGRAM BILAT;RAD;6101 DIFFUS
5  524-01   PRIORITY                  *
6  529-03   REQUESTED DATE/TIME       *
7  530-02   OBSERVATION DATE/TIME       200308261025
8  531-01   OBSERVATION END DATE/TIME *
9  532-03   COLLECTION VOLUME         *
10 533-03   COLLECTION IDENTIFIER     *
11 534-02   SPECIMEN ACTION CODE      *
12 535-01   DANGER CODE               *
13 536-01   RELEVANT CLINICAL INFORMA
14 537-02   SPECIMEN RECEIVED DATE/TI *
15 538-02   SPECIMEN SOURCE             ;;;;B
16 539-02   ORDERING PROVIDER (OBR)   32;ADAIR;FRANK;M;MD
17 540-01   ORDER CALL-BACK PHONE NUM *
18 541-01   PLACERS FIELD #1          *

              F1Prev Page F2Next Page F6 Reset  F7  Exit   ?
```

The OBR segment contains the order detail information for the patient. This information is generated by the data elements defined in this segment for this interface.

Interface Parameter Maintenance

The Interface Parameter Maintenance option is used to define the characteristics of the interface. When you select this option, the following screen is displayed:

```
                General Hospital Interface Control Processor
                                                  Tue Sep 07, 2004 09:52 am
Interface Control Input Options

            Option No.  Option
            ---------------------------------------
                1       Outbound Interface Control
                2       Inbound Interface Control

                3       Outbound Parameter Maintenance
                4       Inbound Parameter Maintenance









Enter option number--
```

Depending on which interface you are modifying, inbound or outbound, the system prompts you to select the interface line definition. For more details on these options, see “Interface Control” on page 4-4.

Mammography HL7 Parameters

Select this option to define the exams associated with mammography and physician tables. The following screen is displayed:

```
          General Hospital Mammography HL7 Parameters Processor
                                                Tue Sep 07, 2004 09:52 am


 1 Interface Outbound Line Definition
   MMO

 2 Mammography Master Exam(s)             3 Mammography Exam(s)
   See Table









Enter field number or '/' starting field number--
```

The purpose of this screen is to define the exams associated with mammography to ensure that only these exams cross the interface. This screen also allows tables to be defined for conversions between the STAR Radiology system and the Mammography system. For a detailed explanation of this screen, please see “Chapter 3 - INSTALLATION”.

Chapter 5 - TECHNICAL NOTES

PROCESS FLOW OVERVIEW

This chapter contains detailed information about message layouts and segments for outbound and inbound transactions on the Mammography HL7 Interface. This subsection is an overview of the process flow between the STAR Radiology system and the Mammography system.

The OBR segment contains order information that is sent to mammography in the ORM message. The Mammography system populates the data element fields for Transcriptionist code, Reading Radiologist Code, Transcription Start Date and Time, and Transcription Stop Date and Time. The transcription is sent in the OBX segment.

Upon receiving the ORU message from the Mammography system, STAR Radiology sends an MSA Acknowledgment message indicating that the result/observation transaction has been received.

Information received from the Mammography system via the inbound interface transaction is processed as follows:

- The information sent is applicable to a specific check-in and is stored for each exam in the check-in. STAR Radiology users are responsible for the revision of any data from the Mammography system which does not apply to a particular exam.

- The Transcriptionist, Transcription Start Date and Time, Transcription Stop Date and Time, Reading Radiologist, and transcribed Report are sent from the Mammography system and stored in the corresponding field for the exam. This data can be edited through Exam Data Entry and is available for review through Patient Inquiry.

HL7 MESSAGE LAYOUTS

The following message layouts are required for the Mammography HL7 Interface. Segment layouts can be found immediately following this section.

Outbound Records

Outbound transactions are those that originate from STAR Radiology.

There are three events that transmit an outbound order message from STAR Radiology to the Mammography system: New Order, Order Revision, and Order Cancellation. Patient information and order information are included in each message. Add-on orders are filed as New Order messages.

There are also two events that transmit an outbound patient update from STAR Radiology to the Mammography system. They are the Demographic data update and the Name/Unit number revision.

ORM - GENERAL ORDER MESSAGE

The ORM message is triggered during STAR Radiology Patient Check-in. If the exam is designated in the Mammography HL7 Parameters to be sent to the Mammography system, then an order message is sent. Otherwise, an order message is not sent to the Mammography system; however, it may be sent to other external systems in the enterprise.

The main segments of information consists of the Message, Patient Information, and Order information.

For each ORM message, the following segments are transmitted:

```
MSH                         Message Header
        [{NTE}]             Notes and Comments (for Header)
[
        PID                 Patient Identification
                [{NTE}]     Notes and Comments (for Patient ID)
        [{AL1}]             Allergy
        [PV1]               Patient Visit
]
 {
        ORC                 Common Order
        [OBR]               Observation Request Segment (Order Detail)
                [{NTE}]     Notes and Comments (for Detail)
                [
                  {
                   OBX      Observation/Result
                        [{NTE}] Notes and Comments (for Results)
                  }
                ]
 }
```

ORM Notes

The NTE segment is optional and can be included in the ORM message in four places.

The PID segment is required for each new order and is related to a particular patient.

The PV1 segment is optional and is present mainly to permit transmission of patient visit information.

STAR Radiology may not populate all the fields in these segments. It is the responsibility of the Mammography system to parse out the data that they may not be able to store in their database.

A08 - UPDATE PATIENT INFORMATION

An A08 message is triggered when patient information is modified for a mammography patient. A mammography patient is one who has had an order message sent to the Mammography system.

For each A08 message, the following segments are transmitted:

MSH		Message Header
	[{NTE}]	Notes and Comments (for Header)
[PID]		Patient Identification
	[{NTE}]	Notes and Comments (for Patient ID)
[PV1]		Patient Visit
	[{NTE}]	Notes and Comments (for Patient Visit)
[DG1]		Diagnosis
	[{NTE}]	Notes and Comments (for Diagnosis)

A08 Notes

The NTE segment is optional and can be included in the A08 message in four places.

The PID segment is required and is related to a particular patient.

The PV1 segment is optional and is present mainly to permit transmission of patient visit information.

STAR Radiology may not populate all the fields in these segments. It is the responsibility of the Mammography system to parse out the data that they may not be able to store in their database.

Inbound Records

Inbound transactions are generated by a foreign vendor and are routed to STAR Radiology.

The Mammography system responds to the ORM message from STAR Radiology with an MSA acknowledgment which indicates if the transaction was received successfully by the Mammography system.

ORU - UNSOLICITED RESULT MESSAGE

The ORU message (unsolicited result message) is triggered by the completion of the report on the Mammography system.

For each ORU message, the following segments are transmitted:

MSH	Message Header
[{NTE}]	Notes and Comments (for Header)
[	
PID	Patient Identification
[{NTE}]	Notes and Comments (for Patient ID)
[PV1]	Patient Visit
]	
{	
[ORC]	Common Order
OBR	Observation Request Segment (Report ID)
[{NTE}]	Notes and Comments
{	
[OBX]	Observation/Result
[{NTE}]	Notes and Comments (for Results)
}	
}	

ORU Notes

The NTE segment is optional and may or may not be included.

This message is generated on the Mammography system and is transmitted inbound to the STAR Radiology system.The Mammography system should have trigger events to send a record for the interface.

For each patient order (OBR segment), more results may be transmitted depending upon the number of observations generated by the order. Each result can consist of one or more result segments (OBX). Comments may be transmitted either with the OBR or any of the result segments.

Upon receiving the ORU message, STAR sends an acknowledgment message (MSA) to the Mammography system indicating that the transaction was received.

HL7 SEGMENT DEFINITION

This section contains the data elements in each segment that are used by STAR Radiology.

Column Definitions

The tables contain several columns, which are defined as follows:

SEQ
This column contains a sequence ID which is used to identify the position of the data field within the segment. The identifier is a positive, non-zero integer.

LEN
This column indicates the maximum number of characters that one occurrence of the data field may occupy in any message.

DT
This column identifies the type of data in this field and indicates the restrictions on the contents of the data field. The following data types are found in any segment:

ST - STRING	Any display characters are allowed. String data is left justified with trailing blanks optional.
DT - DATE	Contains the date of the event and always includes a 4 digit year.
TS - TIME STAMP	Contains the exact time of an event, including the date and time.
ID - CODED VALUE	The value of this field follows the formatting rules for an ST field, except that it is drawn from a table of legal values. Examples of ID fields include physician, religion, and sex.
CN - CODE & NAME	Contains the code and/or name that corresponds to this element.
CM - COMPOSITE	A field that is a combination of other meaningful data fields. Each portion is called a component.
NM - NUMERIC	A field that contains a numeric value.

R/O/C
This column indicates the option available in a data element. The designations are as follows:

R Indicates this data element is required, and the message segment cannot be transmitted without the presence of this field.

O Indicates this data element is optional, and the message segment can be transmitted with or without the presence of this field.

C Indicates this data element is conditional. The message segment can be transmitted with or without the presence of this field. This is dependent on the trigger event or the presence of another piece of data in the segment.

RP/#
This column indicates if this is a repeating field. The designations are as follows:

N No repetition

Y The field may repeat an indefinite or site-determined number of times. The "#" indicates the number of times this field can repeat.

TBL#
This column contains the table number as assigned by the HL7 Executive Committee.

ITEM #
This column contains the item number associated with the element.

ELEMENT NAME
This column contains the unique identifying name of the field.

Outbound Records

Outbound transactions are those that originate from STAR Radiology.

MSH01 - MESSAGE HEADER SEGMENT

The MSH segment defines the intent, source, destination, and some specifics of the syntax of a message

SEQ	LEN	DT	R/O	RP/#	TBL#	ITEM#	ELEMENT NAME
1	1	ST	R			00001	Field separator
2	4	ST	R			00002	Encoding characters
3	15	ST				00003	Sending application
4	20	ST				00004	Sending facility
5	30	ST				00005	Receiving application
6	30	ST				00006	Receiving facility
7	26	TS				00007	Date/time of message
8	40	ST				00008	Security
9	7	CM	R		0076	00009	Message type
10	20	ST	R			00010	Message control ID
11	1	ID	R		0103	00011	Processing ID
12	8	ID	R		0104	00012	Version ID
13	15	NM				00013	Sequence number
14	180	ST				00014	Continuation pointer
15	2	ID			0155	00015	Accept acknowledgment type
16	2	ID			0155	00016	Application acknowledgment type
17	2	ID				00017	Country code

Field Explanations

(Required fields only)

1. FIELD SEPERATOR

The separator between the segment ID and the first real field. Recommended value is (|).

2. ENCODING CHARACTERS

These characters define the sub-field delimiters used by all segments in the HL7 message. STAR uses a colon (:) as the field delimiter and a semicolon (;) as its primary

sub-field delimiter, thus the use of semicolon is preferred. If necessary, any delimiter may be passed by the sending application.

9. MESSAGE TYPE
The interface uses this field to determine if the message is acceptable and to determine the program to process the HL7 message.

10. MESSAGE CONTROL ID
The number or other identifier that uniquely identifies the message. The receiving system echoes this ID back to the sending system in the MSA segment.

11. PROCESSING ID
In your Live ID (ID 1), this field indicates that the sending application is passing data from its production system. Any value other than a "P," which indicates the production ID, is considered an error (in the Live ID). In any non-production STAR ID, any value is valid.

12. VERSION ID
The HL7 version number is used to determine that the sending application and this interface are communicating under the same HL7 criteria.

PID - PATIENT IDENTIFICATION SEGMENT

The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that is not likely to change frequently.

SEQ	LEN	DT	R/O	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI				00104	Set ID - patient ID
2	16	CK				00105	Patient ID (External ID)
3	20	CM	R	Y		00106	Patient ID (Internal ID)
4	12	ST				00107	Alternate patient ID
5	48	PN	R			00108	Patient name
6	30	ST				00109	Mother’s maiden name
7	26	TS				00110	Date of birth
8	1	ID			0001	00111	Sex
9	48	PN		Y		00112	Patient alias
10	1	ID			0005	00113	Race
11	106	AD		Y/3		00114	Patient address
12	4	ID				00115	County code
13	40	TN		Y/3		00116	Phone number - home
14	40	TN		Y/3		00117	Phone number - business

SEQ	LEN	DT	R/O	RP/#	TBL#	ITEM#	ELEMENT NAME
15	25	ST				00118	Language - patient
16	1	ID			0002	00119	Marital status
17	3	ID			0006	00120	Religion
18	20	CK				00121	Patient account number
19	16	ST				00122	SSN - patient
20	25	CM				00123	Driver's lic num - patient
21	20	CK				00124	Mother's identifier
22	1	ID			0189	00125	Ethnic group
23	25	ST				00126	Birth place
24	2	ID				00127	Multiple birth indicator
25	2	NM				00128	Birth order
26	3	ID		Y	0171	00129	Citizenship
27	60	CE			0172	00130	Veterans military status

Field Explanations

(Required fields only)

3. PATIENT ID (Internal Number)
The value in this field uniquely identifies the patient in STAR.

5. PATIENT NAME (last;first;middle;entitle)
The last name in the record is compared to patient's last name (identify by Unit #) on STAR in order to verify that the unit number is associated with the proper patient.

18. PATIENT ACCOUNT NUMBER (nnnnnnnnnnnn;;;;STAR facility)
This is formatted as acct#;;;;facility indicator (one character). It is absolutely necessary that the facility indicator be sent with the account number. If no facility indicator is present, STAR cannot process the incoming header record.

ORC - COMMON ORDER SEGMENT

The ORC segment is required in both the order (ORM) and order Acknowledgment (ORR) messages. This may contain the optional OBR segment for additional order information.

SEQ	LEN	DT	R/O	RP/#	TBL#	ITEM#	ELEMENT NAME
1	2	ID	R		0119	00215	Order control
2	75	CM	C			00216	Placer order number
3	75	CM	C			00217	Filler order number

SEQ	LEN	DT	R/O	RP/#	TBL#	ITEM#	ELEMENT NAME
4	75	CM				00218	Placer group number
5	2	ID			0038	00219	Order status
6	1	ID			0121	00220	Response flag
7	200	TQ				00221	Quantity/timing
8	200	CM				00222	Parent
9	26	TS				00223	Date/time of transaction
10	80	CN				00224	Entered by
11	80	CN				00225	Verified by
12	80	CN				00226	Ordering provider
13	80	CM				00227	Enters location
14	40	TN		Y/2		00228	Call back phone number
15	26	TS				00229	Order effective date/time
16	200	CE				00230	Order control code reasons
17	60	CE				00231	Entering organization
18	60	CE				00232	Entering device
19	80	CN				00233	Action by

OBR - OBSERVATION REQUEST SEGMENT

The OBR segment is used to transmit information specific to an order for a diagnostic study or observation, physical exam, or assessment. When observations are successfully completed (i.e. when mammography is ready to transmit the transcribed report to STAR Radiology), the inbound transaction includes the observation request segment (OBR) followed by the observation result (OBX) segment.

SEQ	LEN	DT	R/O	RP/#	TBL #	ITEM#	ELEMENT NAME
1	4	SI	C			00237	Set ID - Observation Request
2	75	CM	C			00216	Placer Order Number
3	75	CM	R			00217	Filler Order Number +
4	200	CE				00238	Universal Service ID
5	2	ID				00239	Priority
6	26	TS	C			00240	Requested Date/time
7	26	TS	C			00241	Observation Date/Time #
8	26	TS	C			00242	Observation End Date/Time #
9	20	CQ				00243	Collection Volume *
10	60	CN		Y		00244	Collector Identifier *
11	1	ID			0065	00245	Specimen Action Code *
12	60	CE				00246	Danger Code
13	300	ST	C			00247	Relevant Clinical Info.
14	26	TS				00248	Specimen Received Date/ Time *
15	300	CM			0070	00249	Specimen Source *
16	80	CN		Y		00226	Ordering Provider
17	40	TN		Y/2		00250	Order Callback Phone Number
18	60	ST				00251	Placer field 1
19	60	ST				00252	Placer field 2
20	60	ST				00253	Filler Field 1 +
21	60	ST	C			00254	Filler Field 2 +
22	26	TS				00255	Results Rpt/Status Chng - Date/Time
23	40	CM				00256	Charge to Practice +

SEQ	LEN	DT	R/O	RP/#	TBL #	ITEM#	ELEMENT NAME
24	10	ID	C		0074	00257	Diagnostic Serv Sect ID
25	1	ID			0123	00258	Result Status +
26	200	CM				00259	Parent Result +
27	200	TQ		Y		00221	Quantity/Timing
28	150	CN		Y/5		00260	Result Copies To
29	150	CM				00261	Parent Number +
30	20	ID			0124	00262	Transportation Mode
31	300	CE		Y	0124	00263	Reason for Study
32	60	CM				00264	Principal Result Interpreter +
33	60	CM		Y		00265	Assistant Result Interpreter +
34	60	CM		Y		00266	Technician +
35	60	CM		Y		00267	Transcriptionist +
36	26	TS				00268	Scheduled Date/Time +

The items in this table that are followed by a plus sign (+) are not created by the placer (STAR Radiology). They are created by the filler (Mammography system) and valued as needed when the OBR segment is returned as part of a report.

The items that are followed by an asterisk (*) are only relevant when an observation is associated with a specimen. These may not be applicable for the Mammography HL7 interface.

Fields 7 and 8 (flagged with #) are the physiological relevant times.

Inbound Records

Inbound transactions are generated by the Mammography system and are routed to STAR Radiology.

Regarding the inbound OBR segment, if a physician code is sent in OBR.32 (Principal Result Interpreter), then this value is used as the Reading Radiologist. If no value is sent in OBR.32, then OBR.16 (Ordering Provider) is used as the Reading Radiologist. This applies to all releases of MRS.

MSA - MESSAGE ACKNOWLEDGMENT

SEQ	LEN	DT	R/O	RP/#	TBL#	ITEM#	ELEMENT NAME
1	2	ID	R		0008	00018	Acknowledgment Code
2	20	ST	R			00010	Message Control ID
3	80	ST				00020	Text Message
4	15	N				00021	Expected Sequence Number
5	1	M			0102	00022	Delayed Acknowledgment Type
6	100	ID CE				00023	Error Condition

OBX - OBSERVATION RESULT SEGMENT

The Mammography system sends the diagnostic report via an OBX segment (Observation Result Segment). The OBX data segment contains information about a specific request for a diagnostic service, clinical observation, physical exam, or assessment.

SEQ	LEN	DT	R/O	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	O			00569	Set ID - Observational Simple
2	2	ID	R		0125	00570	Value Type
3	80	CE	R			00571	Observation Identifier
4	20	ST	C			00572	Observation Sub-ID
5	65536	*	C			00573	Observation Value
6	60	CE				00574	Units
7	60	ST				00575	Reference Pages
8	10	ID		Y/5	0078	00576	Abnormal Flags
9	5	N				00577	Probability
10	5	M			0080	00578	Nature of Abnormal Test
11	2	ID	R		0085	00579	Observe Result Status
12	26	ID				00580	Date Last Obs Normal Values
13	20	TS				00581	User Defined Access Checks

SEQ	LEN	DT	R/O	RP/#	TBL#	ITEM#	ELEMENT NAME
14	26	ST				00582	Date/Time of the Observation
15	60	TS				005583	Producer's ID
16	60	CE CN				00584	Responsible Observer

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Topic	Poor	Fair	Good	Excellent
Organization of information	❑	❑	❑	❑
Accuracy of information	❑	❑	❑	❑
Completeness of information	❑	❑	❑	❑
Clarity of information	❑	❑	❑	❑
Amount of overview information	❑	❑	❑	❑
Explanation of processes	❑	❑	❑	❑

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