RESOURCE AND PATIENT MANAGEMENT SYSTEM

Master Patient Index

(AGMP)

Technical Manual

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Preface

For over 20 years, hospitals and health centers of the Indian Health Service and numerous tribal health programs have utilized an information system called the Resource and Patient Management System (RPMS). The RPMS Master Patient Index (MPI) is a suite of software applications designed to improve quality of care and patient safety in Direct Indian Health Service/Tribal/Urban facilities.

Traditionally, patient records have been maintained separate from those at other facilities. MPI was developed to establish the framework for sharing patient information between sites. The MPI creates a common database that allows patients and healthcare providers to work together to create a unified healthcare plan.

During the initialization to the MPI, each active patient record receives the following:

- Integration Control Number (ICN), also known as an Enterprise Unique Identifier (EUID)

- Treating Facility List (TFL) of the sites where the patient is receiving care.

The creation of the ICN or EUID allows access to MPI patient data and provides a means through a single best record to bring disparate records and facilities together. For example, Patient A is seen at multiple facilities and data is sent to MPI. MPI must link all disparate records into a single best record by using a matching matrix. The matching matrix uses weighted factors in various data fields to determine if the records belong to the same patient.

Benefits of using MPI include an improvement in patient care because providers can share data common to a single patient across the enterprise. Upon implementation of this software package, a site will become part of the network of sites that share key demographic data for patients via HL7 messaging.

The MPI interface transfers patient data via HL7 messages to the MPI database. The RPMS HL7-Optimized (HLO) application and Ensemble production interface work together to send patient admission, discharge, and transfer (ADT) information to the MPI and to receive and store information.

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1.0   Introduction

The Master Patient Index (MPI) is composed of a unique list of patients and a current list of facilities where each patient has been seen. This enables the sharing of patient data between operationally and regionally diverse systems. Each record (or index entry) in the MPI contains a small amount of patient data used to identify individual entries.

An MPI is a dynamic, secured directory of uniquely identifiable persons with links to their medical and insurance data located anywhere within the enterprise. MPI software utilizes a variety of probabilistic and other forms of matching algorithm protocols to evaluate and match identities. The mission of the MPI is to uniquely identify a patient and to link that patient's data throughout the Indian Health Service (IHS) facilities using the Integration Control Number (ICN), also known as the Enterprise Unique Identifier (EUID). The MPI is the authoritative source of a patient's ICN, the enterprise-wide identifier for IHS facilities and the key to accessing a patient's record. The accuracy of patient information and patient identification directly affects clinical, administrative, billing, and interdepartmental processes.

One factor contributing to unreliability of a database is duplicate records. If there are duplicate entries on the MPI for a patient, a physician will not see a complete picture of the care provided at other sites. In addition, inter-facility consults between sites cannot be accomplished. Duplicate entries on the MPI require examination to verify whether they are or are not the same patient with more than one ICN. Therefore, identifying ways to deal with duplicate records is a standard part of the process. One way to begin managing duplicate records is to clean files to reduce the number of duplicate records before they are placed on the MPI. Whether files are reviewed before or after the MPI is implemented, duplicate record management must occur on an ongoing basis once the database is in place.

An MPI can provide comprehensive, accurate patient record information to practitioners at the point of care to enhance patient safety, efficiency, and effectiveness in healthcare delivery for American Indian/Alaska Native (AI/AN) people. The MPI can provide real-time data that can be used for quality improvement measurements.

With the MPI's ability to uniquely differentiate patients who are seen at more than one facility and to provide a list of all facilities at which a patient receives care, the door is open for use by other applications. As IHS moves closer to having one electronic record for each patient and being able to share that record among stakeholders, it is critical that each patient's unique record identity is maintained and that duplicate patient records are eliminated.

This document focuses on identifying the requirements for an interface that enables secure communication of specified data between the RPMS database and the MPI database in a way that easily and quickly enables users of the MPI to obtain updated information about patients and health care providers, and enables RPMS administrators to identify problems, provide maintenance, and support the interface.

This interface includes the following functionality:

- **HL7 A28 Add a Patient Message from RPMS**: Sends patient data to the MPI when the Add a Patient option is used in Patient Registration (AG).

- **HL7 A08 Update a Patient Message from RPMS**: Sends patient data to the MPI whenever cross-referenced fields are edited in Patient Registration (AG) edit screens.

- **HL7 A40 Merge a Patient Message from RPMS**: Sends patient data to the MPI whenever two patients are merged within Patient Merge (BPM).

- **HL7 A01 Check in and Check out Message from RPMS**: Sends patient data to the MPI whenever a patient is checked in or checked out.

- **HL7 A03 Admissions and Discharges Message from RPMS**: Sends patient data to the MPI whenever a patient is admitted or discharged

- **HL7 M05 Location Master File Message from MPI**: Receives treating facility information from the MPI whenever a patient is seen at a new facility or two patient records are linked in the MPI .

2.0   Implementation and Maintenance

2.1   General Information

The Master Patient Index application consists of two parts, which reside in separate Ensemble/HealthShare databases. The RPMS part of the MPI interface, which includes options, security keys, routines, and protocols, uses the AGMP namespace in the RPMS database. The Ensemble part of the interface, which includes classes and an Ensemble production, is located in the AGMPI package in the AGMPI database.

The interface was previously implemented as Patient Registration (AG) version 7.2. Installing the AGMP 1.0 version of the interface replaces the AG 7.2 version.

It is recommended that Patient Merge (BPM) be installed and implemented prior to installing the MPI Interface.

2.2   System Requirements

- Kernel version 8.0 patch 1018 or later
- FileMan version 22 patch 1018 or later
- Ensemble or HealthShare version 2017.2 or later
- Health Level Seven (HL) version 1.6 Patch 1006 or later
- Patient Registration (AG) version 7.1 patch 9 or later
- IHS Dictionaries (Pointers) (AUT) version 98.1 patch 20 or later
- PIMS (PIMS) version 5.3 patch 1016 or later
- IHS VA Support Files (AVA) version 93.2 patch 20 or later
- IHS Dictionaries (Patient) (AUPN) version 99.1 patch 20 or later

2.3   Security Keys

AGMPZMGR. Key for the main AGMPI menu, which contains both the upload menu and the menu to send individual messages. This should be given to site managers or those assigned responsibility for monitoring the MPI messaging module.

Table 2-1 Security keys and the roles they are assigned to

Security Key	Description	Assign To
AGMPZMGR	LOCKS MPI MANAGER MENU	Site managers and anyone responsible for the interface.

2.4   HL7 Messaging

HL7 (Health Level Seven) is a standard protocol that specifies the implementation of electronic data exchange between two computer applications (sender and receiver) in healthcare environments. HL7 allows healthcare institutions to exchange key sets of data from different application systems. Specifically, it the standard defines the following:

- The data to be exchanged

- The timing of the interchange

- The communication of acknowledgments and errors to the sending application

The formats are general in nature and must be configured to meet the needs of the two applications involved. An HL7 interface specification should be written detailing which formats (events, messages, segments, and fields) will be used and which lower-level protocol will be implemented in order for the two applications to interface with one another.

The HL7 protocol defines the content and format of abstract messages and transactions for interface capabilities for various areas, including the following:

- Admission, discharge, and transfer (ADT)

- Order entry

- Query

- Financial applications such as charge, payment adjustments, and insurance

- Ancillary data reporting for laboratory, radiology, pharmacy, etc.

In HL7, information is exchanged using HL7 messages when an event occurs in an application. Each HL7 message consists of one or more HL7 segments. A segment can be thought of as a record in a file. Each segment consists of one or more fields separated by a special character called the field separator. The field separator character is defined in the Message Header (MSH) segment of an HL7 message. The MSH segment is always the first segment in every HL7 message. Each field is assigned an HL7 data type (e.g., numeric, text).

2.4.1   Outbound Patient ADT

The MPI application uses five outbound HL7 message types:

- **ADT A28 Add Person Information** sends patient data to the MPI when the Add a Patient option is used in Patient Registration (AG).

- **ADT A08 Update Patient Information** sends patient data to the MPI whenever cross-referenced fields are edited in Patient Registration (AG) edit screens.

- **ADT A01 Admit/Visit Notification** sends patient data to the MPI whenever a patient is admitted or checked in.

- **ADT A03 Discharge/End Visit** sends patient data to the MPI whenever a patient is discharged or checked out.

- **ADT A40 Merge Patient – Patient Identifier List** sends patient data to the MPI whenever two patients are merged within Patient Merge (BPM).

After the initial installation of the MPI application, there is a patient load of all existing patients with no ICN. All patients are included, because initially no patient will have this field populated. This background job creates an A28 (Add Person Information) message for each patient without an ICN. This initial load is a TaskMan job that sites run at the site. The time required to run this job depends on the number of patients and the system activity. It runs with a low priority.

After the load is completed, new registrations and updates are triggered by certain events in Patient Registration, such as adding/registering a patient, editing patient demographic information, checking a patient in or out, or admitting and discharging a patient. Registration messages can be sent manually as well.

2.4.2   Inbound ACKs

When the MPI receives an ADT message, it sends an ACK (acknowledgment) message synchronously back to the sending RPMS system. This ACK message contains a commit acknowledgment code, which indicates whether the message was received and understood.

Once the central MPI processes the ADT message, it returns an ACK message asynchronously to the RPMS system that sent the ADT message. This ACK message contains an application acknowledgment code, which indicates whether the message was processed. If the ADT was successfully processed, the ACK message also contains the value of the ICN assigned to this patient.

2.4.3   Inbound MFN

When a patient has been added to MPI, the MPI transmits an MFN M05 (Location Master File) message to all associated facilities to update the local Treating Facility List. Associated facilities are all facilities linked in the MPI to a particular patient.

2.4.4   Outbound MFK

When the RPMS system receives an MFN message and updates the Treating Facility List, it transmits an MFK (master file acknowledgment) message back to the central MPI indicating that the MFN message was processed.

2.5   HL7 Message Types

2.5.1   ADT/ACK A28 – Add Person Information

The purpose of the ADT A28 message is to establish a patient on the MPI so that the patient record can be viewed across the enterprise and to allow multiple systems and respective master patient databases to communicate activity related to a person regardless of whether that person is currently a patient on each system. Each system has an interest in the database activity of the others in order to maintain data integrity across an enterprise. To the enterprise systems, the person may be a current patient or a potential future patient.

The person whose data is being sent should be identified in the PID segment using the PID-3 (Patient Identifier List) field. An A28 message requests the establishment of an ICN and stores the patient identifiers (e.g., social security number, claim number, or other unique identifiers) as passed in the PID-3 field. Other identifiers such as deprecated identifiers (e.g., local IEN) can be sent in the PID-4 (Alternate Patient ID - PID) field, which are also stored as an alternative ID on the MPI for that system to include in subsequent communication from the MPI. Each new system needs to register the identifier list and assigning authority with the MPI development group.

2.5.1.1   ADT/ACK A28 Message Structures

Table 2-2 and Table 2-3 detail the structure of the ADT A28 and ACK A28 messages, respectively.

Table 2-2: ADT A28 message structure

ADT^A28 Segments	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PD1]	Additional Demographics
PV1	Patient Visit
[ZPD]	IHS-Specific Patient Information Segment

Table 2-3: ACK A28 message structure

ACK^A28 Segments	Segment Description
MSH	Message Header
MSA	Message Acknowledgment
[ERR]	Error

2.5.1.2 Sample ADT/ACK A28 Messages

Figure 2-1 contains a sample ADT A28 message, which is sent from RPMS to the central MPI.

> **Note:** Only RPMS systems can add patients to the MPI at this time.

```
MSH^~|\&^RPMS-MPI^14752~161.223.91.63:5026~DNS^MPI
^8990~:8899~DNS^20100708094653-0600^^ADT~A28^14752 1198^T~^2.4^^^AL^NE^
EVN^A28^^^^398~DEMO~USER~~~~~~USIHS&&0363~L~~~NI~IHS FACILITY ID -NOT-A-REAL
FACILITY&14752&L^^14752
PID^1^V^V~~~USIHS&&0363~NI~IHS FACILITY ID - NOT-A-REAL FACILITY&14752&L|779358
654~~~USSSA&&0363~SS~IHS FACILITY ID - NOT-A-REAL FACILITY&14752&L|7296~~~USIHS&
&0363~PI~IHS FACILITY ID - NOT-A-REAL FACILITY&14752&L|V~~~USIHS&&0363~NI~IHS FA
CILITY ID - NOT-A-REAL FACILITY&14752&L~~200910205571-0700^^DEMO~MARION~M~~~~L
^DEMO~JEREMIAH~DARRYL~~~~M^19630808^F^DEMO~JEREMIAH~DARRYL^^BOX 123~~KETTLE
RIVER~MN~~~P~|~~MINNEAPOLIS~MN~~~N^^~~|~~|~~|~~^^^^^^^^^^^^^^^|
ZPD^1^997^C^01^UNSPECIFIED^7296~0000109481~516~19316~|7296~0000109482~517~17493
~|
```

Figure 2-1: ADT-A28—Add Person or Patient Information message sent from RPMS to MPI

Figure 2-2 contains a sample ACK A28 commit acknowledgment returned from the central MPI to the sending RPMS.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708094702.267-0700^^ACK~A28^29501^T^2.4^^^
NE^NE
MSA^CA^14752 1198
```

Figure 2-2: ACK-A28—Commit acknowledgment sent from MPI to RPMS

Figure 2-3 contains a sample ACK A28 application acknowledgment sent from the central MPI to the sending RPMS.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708094721-0600^^ACK~A28^23696-se^T^2.4^^^A
L^NE
MSA^AA^14752 1198^^^^DFN=1000592558
```

Figure 2-3: ACK-A28—Application acknowledgment sent from MPI to RPMS

2.5.2 ADT/ACK A08 – Update Patient Information

The A08 trigger event occurs when patient demographic information has changed or has been edited. For example, an A08 event can be used to notify the MPI of a change of the patient's name or address.

> **Note:** Updates to specific patient demographic data will trigger the broadcast of a HL7 ADT A08 message. Because there is no set way of identifying when an edit to patient information is complete, these edit events are marked as needing to be transmitted in the ADT/HL7 PIVOT file (#391.71). The background job AGMP A08 BCKGRND UPDATE TSK, scheduled in TaskMan, periodically broadcasts the HL7 ADT A08 message, containing any changes to data, to the MPI.

2.5.2.1   ADT/ACK A08 Message Structures

Table 2-4 and Table 2-5 detail the structure of the ADT A08 and ACK A08 messages, respectively.

Table 2-4: ADT A08 message structure

ADT^A08 Segments	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PD1]	Additional Demographics
PV1	Patient Visit
[ZPD]	IHS-Specific Patient Information Segment

Table 2-5: ACK A08 message structure

ACK^A08 Segments	Segment Description
MSH	Message Header
MSA	Message Acknowledgment
[ERR]	Error

2.5.2.2   Sample ADT/ACK A08 Messages

Figure 2-4 contains a sample ADT A08 message, which is sent from RPMS to the central MPI.

```
MSH^~|\&^RPMS-MPI^14752~161.223.91.63:5026~DNS^MPI
^8990~:8899~DNS^20100708101516-0600^^ADT~A08^14752 1201^T~^2.4^
^^AL^NE^
EVN^A08^^^^398~DEMO~USER~~~~~~USIHS&&0363~L~~~NI~IHS FACILITY ID -NOT-A-REAL
FACILITY&14752&L^^14752
PID^1^1000592558V803451^1000592558V803451~~~USIHS&&0363~NI~IHS FACILITY ID - NO
```

```
T-A-REAL FACILITY&14752&L|779358654~~~USSSA&&0363~SS~IHS FACILITY ID - NOT-A-REA
L FACILITY&14752&L|7296~~~USIHS&&0363~PI~IHS FACILITY ID - NOT-A-REAL FACILITY&1
4752&L|1000592558V803451~~~USIHS&&0363~NI~IHS FACILITY ID - NOT-A-REAL FACILITY&
14752&L~~200910205571-0700^^DEMO~MARION~M~~~~L^DEMO~JEREMIAH~DARRYL~~~~M^19
630808^F^DEMO~JEREMIAH~DARRYL^^BOX 123~~KETTLE RIVER~MN~~~P~|~~MINNEAPOLIS~MN~~
~N^^~~|~~|~~|~~^^^^^^^^^^^^^^^|
PD1^^^~D~
PV1^1^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
ZPD^1^997^C^01^UNSPECIFIED^7296~0000109481~516~19316~|7296~0000109482~517~17493
~|
```

Figure 2-4: ADT-A08—Update Patient Information message sent from RPMS to MPI

Figure 2-5 contains an example ACK A08 commit acknowledgment returned from the central MPI to the sending RPMS system.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708101519.28-0700^^ACK~A08^29502^T^2.4^^^N
E^NE
MSA^CA^14752 1201
```

Figure 2-5: ACK-A08—Commit acknowledgment sent from MPI to RPMS

Figure 2-6 contains a sample ACK A08 application acknowledgment message sent from the MPI to the sending RPMS system.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708101527-0600^^ACK~A08^23697-se^T^2.4^^^A
L^NE
MSA^AA^14752 1201^^^^DFN=1000592558
```

Figure 2-6: ACK-A08—Application acknowledgment sent from MPI to RPMS

2.5.3   ADT/ACK A01 – Admit/Visit Notification

An A01 event is intended to be used for patient admission or check-ins only. An A01 event is sent as a result of a patient undergoing the admission or check-in process.

2.5.3.1   ADT/ACK A01 Message Structures

Table 2-6 and Table 2-7 detail the structure of the ADT A01 and ACK A01 messages, respectively.

Table 2-6: ADT A01 message structure

ADT^A01 Segments	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PD1]	Additional Demographics
PV1	Patient Visit

ADT^A01 Segments	Segment Description
[ZPD]	IHS-Specific Patient Information Segment

Table 2-7: ACK A01 message structure

ACK^A01 Segments	Segment Description
MSH	Message Header
MSA	Message Acknowledgment
[ERR]	Error

2.5.3.2   Sample ADT/ACK A01 Messages

Figure 2-7 contains a sample ADT A01 message, which is sent from RPMS to the MPI.

```
MSH^~|\&^RPMS-MPI^14752~161.223.91.63:5026~DNS^MPI
^8990~:8899~DNS^20100708102554-0600^^ADT~A01^14752 1204^T~^2.4^^^AL^NE^
EVN^A1^^^^398~DEMO~USER~~~~~~USIHS&&0363~L~~~NI~IHS FACILITY ID -NOT-A-REAL F
ACILITY&14752&L^^14752
PID^1^1000592558V803451^1000592558V803451~~~USIHS&&0363~NI~IHS FACILITY ID - NO
T-A-REAL FACILITY&14752&L|779358654~~~USSSA&&0363~SS~IHS FACILITY ID - NOT-A-REA
L FACILITY&14752&L|7296~~~USIHS&&0363~PI~IHS FACILITY ID - NOT-A-REAL FACILITY&1
4752&L|1000592558V803451~~~USIHS&&0363~NI~IHS FACILITY ID - NOT-A-REAL FACILITY&
14752&L~~200910205571-0700^^DEMO~MARION~M~~~~L^DEMO~JEREMIAH~DARRYL~~~~M^19
630808^F^DEMO~JEREMIAH~DARRYL^^BOX 123~~KETTLE RIVER~MN~~~P~|~~MINNEAPOLIS~MN~~
~N^^~~|~~|~~|~~^^^^^^^^^^^^^^^|
PD1^^^~D~
PV1^1^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^2010-07-08 00:00:00
ZPD^1^997^C^01^UNSPECIFIED^7296~0000109481~516~19316~|7296~0000109482~517~17493
~|
```

Figure 2-7: ADT-A01—Admit/Visit Notification message sent from RPMS to MPI

Figure 2-8 contains a sample ACK A01 commit acknowledgment returned from the MPI to the sending RPMS system.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708102554.749-0700^^ACK~A01^29503^T^2.4^^^
NE^NE
MSA^CA^14752 1204
```

Figure 2-8: ACK-A01—Commit acknowledgment sent from MPI to RPMS

Figure 2-9 contains a sample ACK A01 application acknowledgment sent from the central MPI to the RPMS system.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708102600-0600^^ACK~A01^23698-se^T^2.4^^^A
L^NE
MSA^AA^14752 1204^^^^DFN=1000592558
```

Figure 2-9: ACK-A01—Application acknowledgment sent from MPI to RPMS

2.5.4   ADT/ACK A03 – Discharge/End Visit

An A03 event signals the end of a patient's stay in a healthcare facility. Because the check-out process does not currently trigger the corresponding protocol in RPMS, A03 messages are sent only for inpatient discharge events, not for check-outs.

2.5.4.1   ADT/ACK A03 Message Structures

Table 2-8 and Table 2-9 detail the structure of the ADT A03 and ACK A03 messages, respectively.

Table 2-8: ADT A03 message structure

ADT^A03 Segments	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PD1]	Additional Demographics
PV1	Patient Visit
[ZPD]	IHS-Specific Patient Information Segment

Table 2-9: ACK A03 message structure

ACK^A03 Segments	Segment Description
MSH	Message Header
MSA	Message Acknowledgment
[ERR]	Error

2.5.4.2   Sample ADT/ACK A03 Messages

Figure 2-10 contains a sample ADT A03 message, which is sent from RPMS to the central MPI.

```
MSH^~|\&^RPMS-MPI^14752~161.223.91.63:5026~DNS^MPI
^8990~:8899~DNS^20100708105736-0600^^ADT~A03^14752 1210^T~^2.4^^^AL^NE^
EVN^A2^^^^398~DEMO~USER~~~~~~USIHS&&0363~L~~~NI~IHS FACILITY ID -NOT-A-REAL F
ACILITY&14752&L^^14752
PID^1^1000592558V803451^1000592558V803451~~~USIHS&&0363~NI~IHS FACILITY ID - NO
T-A-REAL FACILITY&14752&L|779358654~~~USSSA&&0363~SS~IHS FACILITY ID - NOT-A-REA
L FACILITY&14752&L|7296~~~USIHS&&0363~PI~IHS FACILITY ID - NOT-A-REAL FACILITY&1
4752&L|1000592558V803451~~~USIHS&&0363~NI~IHS FACILITY ID - NOT-A-REAL FACILITY&
14752&L~~200910205571-0700^^DEMO~MARION~M~~~~L^DEMO~JEREMIAH~DARRYL~~~~M^19
630808^F^DEMO~JEREMIAH~DARRYL^^BOX 123~~KETTLE RIVER~MN~~~P~|~~MINNEAPOLIS~MN~~
```

```
~N^^~~|~~|~~|~~^^^^^^^^^^^^^^^^|
PD1^^^~D~
PV1^1^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^2010-07-09 00:00:00
ZPD^1^997^C^01^UNSPECIFIED^7296~0000109481~516~19316~|7296~0000109482~517~17493~|
```

Figure 2-10: ADT-A03—Discharge/End Visit message sent from RPMS to MPI

Figure 2-11 contains a sample ACK A03 commit acknowledgment returned from the central MPI to the sending RPMS system.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708105747-0600^^ACK~A03^23699-se^T^2.4^^^AL^NE
MSA^CA^14752 1210
```

Figure 2-11: ACK-A03—Commit acknowledgment sent from MPI to RPMS

Figure 2-12 contains a sample ACK A03 application acknowledgment sent from the central MPI to the sending RPMS system.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708105740.532-0700^^ACK~A03^29505^T^2.4^^^
MSA^AA^14752 1210^^^^DFN=1000592558
```

Figure 2-12: ACK-A03—Application acknowledgment sent from MPI to RPMS

2.5.5   ADT/ACK A40 – Merge Patient - Patient Identifier List

When a merge is performed using the BPM Patient Merge application, an A40 message is triggered and sent to the MPI.

2.5.5.1   ADT/ACK A40 Message Structures

Table 2-10 and Table 2-11 detail the structure of the ADT A40 and ACK A40 messages, respectively.

Table 2-10: ADT A40 message structure

ADT^A40 Segments	Segment Description
MSH	Message Header
EVN	Event Type
PID	Patient Identification
[PD1]	Additional Demographics
MRG	Merge Patient Information
PV1	Patient Visit

Table 2-11: ACK A40 message structure

ACK^A40 Segments	Segment Description
MSH	Message Header
MSA	Message Acknowledgment
[ERR]	Error

2.5.5.2   Sample ADT/ACK A40 Messages

Figure 2-13 contains a sample ADT A40 message, which is sent from RPMS to the central MPI.

```
MSH^~|\&^RPMS-MPI^14752~161.223.91.63:5026~DNS^MPI
^8990~:8899~DNS^20100708111857-0600^^ADT~A40^14752 1216^T~^2.4^^^AL^NE^
EVN^A40^^^^398~DEMO~USER~~~~~~USIHS&&0363~L~~~NI~IHS FACILITY ID -NOT-A-REAL
FACILITY&14752&L^^14752
PID^1^1000592558V803451^1000592558V803451~~~USIHS&&0363~NI~IHS FACILITY ID - NO
T-A-REAL FACILITY&14752&L|779358654~~~USSSA&&0363~SS~IHS FACILITY ID - NOT-A-REA
L FACILITY&14752&L|7296~~~USIHS&&0363~PI~IHS FACILITY ID - NOT-A-REAL FACILITY&1
4752&L|1000592558V803451~~~USIHS&&0363~NI~IHS FACILITY ID - NOT-A-REAL FACILITY&
14752&L~~200910205571-0700^^DEMO~MARION~M~~~~L^DEMO~JEREMIAH~DARRYL~~~~M^19
630808^F^DEMO~JEREMIAH~DARRYL^^BOX 123~~KETTLE RIVER~MN~~~P~|~~MINNEAPOLIS~MN~~
~N^^~~|~~|~~|~~^^^^^^^^^^^^^^^|
MRG^V~~~USIHS&&0363~NI~IHS FACILIY ID&14752&L|3966~~~USIHS&&0363~PI~IHS FACILIY
 ID&14752&L^^^^^^^DEMO~AUDREY~~~~~~L|
```

Figure 2-13: ADT-A40—Merge Patient - Patient Identifier List message sent from RPMS to MPI

Figure 2-14 contains a sample ACK A40 commit acknowledgment returned from the central MPI to the sending RPMS system.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708112130-0600^^ACK~A40^23700-se^T^2.4^^^AL^NE
MSA^CA^14752 1216
```

Figure 2-14: ACK-A40—Commit acknowledgment sent from MPI to RPMS

Figure 2-15 contains a sample ACK A40 application acknowledgment sent from the MPI to the sending RPMS system.

```
MSH^~|\&^MPI^8990^RPMS-MPI^14752^20100708112130-0600^^ACK~A40^23700-se^T^2.4^^^AL^NE
MSA^AA^14752 1216^^^^DFN=1000592558
```

Figure 2-15: ACK-A40—Application acknowledgment sent from MPI to RPMS

2.5.6   MFN/MFK M05 – Location Master File

The purpose of the MFN M05 message is to transmit information about the facilities where the patient has been seen, to allow the RPMS system to maintain its treating facility list. When the central MPI receives an ADT message, it sends an MFN message to each facility where the patient has a record, not just to the facility that sent the ADT message. The MFN message contains a list of facility station numbers, the patient's local ID (DFN) at each facility, and the ICN assigned to the patient. The local RPMS uses this information to update the Treating Facility List (#391.91) file.

2.5.6.1   MFN/MFK M05 Message Structures

Table 2-12 and Table 2-13 detail the structure of the MFN M05 and MFK M05 messages, respectively.

Table 2-12: MFN M05 message structure

MFN^M05 Segments	Segment Description
MSH	Message Header
MFI	Master File Identification
MFE	Master File Entry

Table 2-13: MFK M05 message structure

MFK^M05 Segments	Segment Description
MSH	Message Header
MSA	Message Acknowledgment
MFI	Master File Identification
[MFA]	Master File Acknowledgment

2.5.6.2   Sample MFN/MFK M05 Messages

Figure 2-16 contains a sample MFN M05 message, which is sent from the central MPI to RPMS.

```
MSH^~|\&^MPI^8990^^14752^20100708112132-0600^^MFN~M05^29503^D^2.4^^^AL^NE
MFI^TFL^^REP^^^AL^MRG
MFE^MAD^7207563-2209001-0^2018-01-03 14:48:17^11111~8042~~1000012345~ICN
MFE^MAD^7207563-2209001-1^2018-01-03 14:48:17^22222~8051~~1000012345~ICN
MFE^MAD^7207563-2209001-2^2018-01-03 14:48:17^99999~8439~~1000012345~ICN
```

Figure 2-16: MFN-M05—Location Master File message sent from MPI to RPMS

Figure 2-17 contains a sample MFK M05 application acknowledgment sent from RPMS to the central MPI.

```
MSH^~|\&^RPMS-MPI^14752~161.223.91.63:5026~DNS^MPI
^8990~:8899~DNS^20100708112501-0600^^MFK~M05^14752 1220^T~^2.4^^^AL^NE^
MFI^TFL^^REP^^^AL
MFE^MAD^29503-1000606878-0^2010-07-09 00:00:00^7296~14752~~1000592558~ICN
MFA^MAD^14752^20100708^S
```

Figure 2-17: MFK-M05—Application acknowledgment sent from RPMS to MPI

2.6   HL7 Escape Characters

HL7 encoding characters, if found within a data field, are automatically replaced with the proper escape sequence. The escape sequences used in MPI messaging are ^ = \F\, ~ = \S\, | = \R\, \ = \E\, & = \T\.

2.7   Obtaining Data Dictionary Listings

Technical information about files and the fields in files is stored in data dictionaries. Use the List File Attributes option on the Data Dictionary Utilities submenu in FileMan to print formatted data dictionaries.

2.8   AGMPI.PatientRegistration Production

The PatientRegistration production within the AGMPI package transports HL7 messages between the MPI and the RPMS system. It interacts with the RPMS database via the HLO globals ^HLB and ^HLA.

HL7 messages are retrieved from the RPMS system via the HLOGlobalInbound adapter. The adapter loops through the ^HLB "QUEUE" node, determining which messages are to be sent to the receiving facility by pulling information from the ^HLB and ^HLA global nodes. An HL7 message is formed and sent to the calling service. The service receives the HL7 message and determines whether the message is a valid message (using the AGMPI.RPMS.HL7 schema). If the message is valid, it is sent to the HL7 routing engine where the message is routed using the RPMS routing rule. ACK (acknowledgment) reply messages from the MPI are stored back into the RPMS ^HLB and ^HLA global nodes.

Messages are sent from the MPI to RPMS in real time. If the HL7 message is valid (using the AGMPI.MPI.HL7 schema), the Ensemble production places the messages into the ^HLB and ^HLA global nodes via the HLOGlobalOutbound adapter. If the received message is an MFN, the Ensemble production will send an acknowledgment message to the MPI.

3.0 Routines

3.1 Routines Description

Table 3-1 Routines

Routine Name	Description
AGMP1E00	Environmental check routine
AGMP1P00	Pre- and post-install routine
AGMP1P01	Pre- and post-install routine for patch 1
AGMPACK	A28/A08 ACK processor
AGMPADT	A01/A03 ACK processer; A01/A03/A28 message generator
AGMPBGP	Inbound message processor
AGMPCHK	Utilities for verifying the site's institution numbers
AGMPCLAS	Utilities for transporting classes via KIDS
AGMPEDIT	AGMP parameters editor
AGMPHL1	Extension to AGMPHLO routine
AGMPHLO	MPI HL7 message generator
AGMPMFN	MFN message processor
AGMPMICN	Missing ICN background process
AGMPOPT	Utilities for opting out of and opting in to the MPI application
AGMPPID	PID segment builder
AGMPPIVT	Pivot table processor
AGMPPRST	Ensemble production status checker
AGMPPURG	HLO message purge
AGMPRPT1	MPI reports

Routine Name	Description
AGMPRPT2	MPI reports
AGMPSMSG	Options for sending messages manually
AGMPVQQ	VQQ ACK processor (deprecated)

4.0   Classes

4.1   Classes Description

Table 4-1 Classes

Class	Description
AGMPI.Adapters.AlertInbound	Ensemble adapter reading application alerts logged since the last alert email was sent
AGMPI.Adapters.HLOGlobalInbound	Ensemble adapter reading HL7 messages from the RPMS ^HLB and ^HLA global nodes
AGMPI.Adapters.HLOGlobalOutbound	Ensemble adapter writing HL7 messages to the RPMS ^HLB and ^HLA global nodes
AGMPI.AlertEmailAddress	Persistent class containing the alert email addresses
AGMPI.Alerts.AlertItem	Persistent class containing application alerts
AGMPI.Alerts.AlertLog	Persistent class containing the alerts that have been sent (via email)
AGMPI.Install.Installer	Installer class to create AGMPI database and namespace and to set up mappings
AGMPI.Install.PostInstall	Performs post-install steps in the AGMPI namespace
AGMPI.Install.PreInstall	Performs pre-install steps in the AGMPI namespace
AGMPI.Install.ProductionSettings	Persistent class for storing Ensemble production settings during installation
AGMPI.MPIAlertRouting	Routing class for alert messages
AGMPI.MPIMessageRouting	Routing class for messages received from the MPI system
AGMPI.Operations.MPI	Business operation sending HL7 messages to the MPI system
AGMPI.Operations.RPMS	Business operation sending HL7 messages to the RPMS system via the AGMPI.Adapters.HLOGlobalOutbound adapter
AGMPI.PatientRegistration	Ensemble production class
AGMPI.Process.AlertProcess	Business process logging the alert and determining whether to send an e-mail in response to the alert
AGMPI.RPMSMessageRouting	Routing class for sending messages to the MPI system
AGMPI.Services.Alert	Business service for sending logged application alerts

Class	Description
AGMPI.Services.MPI	Business service receiving HL7 messages from the MPI system
AGMPI.Services.RPMS	Business service receiving HL7 messages from the RPMS system
AGMPI.Task.StatusCheck	Ensemble task to report status information about the production to RPMS

4.2   Method List

4.2.1   AGMPI.Adapters.AlertInbound.OnTask

This method reads in logged application alerts that have not yet been emailed. It is invoked from the associated business service.

- Input Parameter Description:
    - None
- Output Description:
    - Returns an alert message to the business service that initiated the method.

4.2.2   AGMPI.Adapters.HLOGlobalInbound.OnTask

This method reads the HL7 information from the ^HLB and ^HLA global nodes. It is invoked from the associated business service.

- Input Parameter Description:
    - None
- Output Description:
    - Returns the HL7 message(s) to the business service that initiated the method

4.2.3   AGMPI.Adapters.HLOGlobalInbound.GetFilemanDateTime

Returns a date and time in FileMan format.

- Input Parameter Description:
    - Number of days to add to the current date/time.
- Output Description:
    - Returns the current date/time plus an offset number of days in FileMan format.

4.2.4   AGMPI.Adapters.HLOGlobalOutbound.FileMessage

This method writes HL7 information into the ^HLB and ^HLA global nodes as messages are received. It is invoked from the associated business operation.

- Input Parameter Description:
  - None
- Output Description:
  - Returns the HL7 message(s) written to the ^HLB and ^HLA global nodes

4.2.5   AGMPI.Adapters.HLOGlobalOutbound.GetNewIENA

Obtains an unused IEN for the ^HLA global (file 777), using the same algorithm as $$NEWIEN^HLOF777().

- Input Parameter Description:
  - None
- Output Description:
  - Returns an unused IEN for the ^HLA global.

4.2.6   AGMPI.Adapters.HLOGlobalOutbound.GetNewIENB

Obtains an unused IEN for the ^HLB global (file 778), using the same algorithm as $$NEWIEN^HLOF778A().

- Input Parameter Description:
  - None
- Output Description:
  - Returns an unused IEN for the ^HLB global.

4.2.7   AGMPI.Adapters.HLOGlobalOutbound.GetFilemanDateTime

Returns a date and time in FileMan format.

- Input Parameter Description:
  - Number of days to add to the current date/time.
- Output Description:
  - Returns the current date/time plus an offset number of days in FileMan format.

4.2.8   AGMPI.Adapters.HLOGlobalOutbound.SendAlert

Triggers an Ensemble alert message.

- Input Parameter Description:
  - Text of the alert.
- Output Description:
  - None

4.2.9   AGMPI.Install.Installer.setup

This method generates the code that creates the AGMPI database and namespace and sets up mappings. This method was generated automatically by Ensemble.

- Input Parameter Description:
  - The input parameters were specified by Ensemble and should not be altered.
- Output Description:
  - Status of the code generation

4.2.10   AGMPI.Install.Installer.SetupDefaults

This method is a placeholder for any defaults that need to be set up. This method was generated automatically by Ensemble.

- Input Parameter Description:
  - The input parameters were specified by Ensemble and should not be altered.
- Output Description:
  - Status

4.2.11   AGMPI.Install.PostInstall.RunTask

This method performs post-install tasks that must be run in the AGMPI namespace.

- Input Parameter Description:
  - None
- Output Description:
  - Status

4.2.12   AGMPI.Install.PreInstall.RunTask

This method performs pre-install tasks that must be run in the AGMPI namespace.

- Input Parameter Description:

    - None
- Output Description:

    - None

4.2.13   AGMPI.Operations.MPI.OnMessage

This method overrides the standard OnMessage() method for the EnsLib.HL7.Operation.TCPOperation class. It disables journaling in order to save journal space, then calls the parent method.

- Input Parameter Description:

    - Ensemble request message
- Output Description:

    - Ensemble response message

4.2.14   AGMPI.Operations.RPMS.OnMessage

This method overrides the standard OnMessage() method for the EnsLib.HL7.Operation.Standard class. It disables journaling in order to save journal space, then calls the parent method.

- Input Parameter Description:

    - Ensemble request message
- Output Description:

    - Ensemble response message

4.2.15   AGMPI.Services.Alert.OnProcessInput

This method accepts an alert message from the adapter and sends it to the EmailAlert business operation.

- Input Parameter Description:

    - Alert message
- Output Description:

    - None

4.2.16   AGMPI.Services.MPI.OnProcessInput

This method accepts an HL7 message, disables journaling to save journal space, then calls the parent method to process the message.

- Input Parameter Description:
  - HL7 message object
- Output Description:
  - Left over data

4.2.17   AGMPI.Services.RPMS.OnProcessInput

This method received an HL7 object, sets some HL7 object information, validates the message, and passes it to the RPMS routing engine.

- Input Parameter Description:
  - Inboundmessage: HL7 message object
- Output Description:
  - Returns the HL7 message(s) to a business process.

4.2.18   AGMPI.Task.StatusCheck.OnTask

This method writes information about the MPI production to a global to be read by the production check task in RPMS.

- Input Parameter Description:
  - None
- Output Description:
  - Status

4.2.19   AGMPI.Task.StatusCheck.SendEmail

This method sends an email containing production status information to the recipient list configured in the EmailAlert adapter.

- Input Parameter Description:
  - None
- Output Description:
  - Message indicating why the email could not be sent

4.2.20   AGMPI.Task.StatusCheck.GetStatusString

This method obtains the error text from a status object.

- Input Parameter Description:

  – Status object

- Output Description:

  – Error text

5.0   Schemas

5.1   Schema Description

Table 5-1 Schemas

Schema	Description
AGMPI.MPI.HL7	Schema for HL7 messages received from the central MPI. Based on HL7 2.4.
AGMP.RPMS.HL7	Schema for HL7 messages being sent to the central MPI. Based on HL7 2.4.

6.0   Files

6.1   File List

Table 6-1: Files and contents

File #	Filename	Description
9002021.01	AGMP PARAMETERS	Contains parameters affecting the behavior of the AGMP application
9002021.02	AGMP CLASS TRANSPORT	Contains packed class definitions, which can be distributed via KIDS

6.2   File Access

Table 6-2: Files and access

File #	Filename	GL	RD	WR	LYG	DD	DEL
9002021.01	AGMP PARAMETERS	^AGMP(9002021.01,	@	@	@	@	@
9002021.02	AGMP CLASS TRANSPORT	^AGMPCLS(	@	@	@	@	@

6.3   Cross References

9002021.01 (AGMP PARAMETERS)

.01 HOME SITE

B regular cross reference

9002021.011 (MPI STATUS HISTORY SUB-FIELD)

.01 STATUS CHANGE DATE/TIME

B regular cross reference

9002021.02 (AGMP CLASS TRANSPORT)

.01 PACKAGE NAME

B regular cross reference

9002021.022 (XML SUB-FIELD)

.01 XML

B regular cross reference

9002021.023 (CLASS SUB-FIELD)

.01 CLASS

B regular cross reference

6.4   Table File

File: 9002021.01 AGMP PARAMETERS

Global: ^AGMP(9002021.01,

Table 6-3: Fields in file 9002021.01 AGMP PARAMETERS

Field #	Field Name	Subscript	Piece	Type
.01	HOME SITE	0	1	F
.02	ENABLED	0	2	S
.03	UPLOAD TYPE	0	3	S
1	MPI STATUS HISTORY	1	0	M

File: 9002021.02 AGMP CLASS TRANSPORT

Global: ^AGMPCLS(

Table 6-4: Fields in file 9002021.02 AGMP CLASS TRANSPORT

Field #	Field Name	Subscript	Piece	Type
.01	PACKAGE NAME	0	1	F
1.02	RPMS STATUS	1	2	S
1.03	RPMS DATE/TIME INSTALLED	1	3	D
10	XML	10	0	W
11	CLASS	2	0	M

7.0   External Relations

7.1   Callable Routines

There are no callable routines in this package. All entry points and routines are called internally.

7.2   Published Entry Points

There are no published entry points in this package.

7.3   Exported Options

Table 7-1: Exported options and descriptions

Option Name	Description
AGMP A08 BCKGRND UPDATE TSK	Background task that traverses the pivot table and generates an ADT A08 for each updated patient
AGMP ACK BCKGRND TSK	Background task that processes inbound messages (ACKs and MFNs)
AGMP EDIT SITE PARAMETERS	Edit AGMP parameters
AGMP HLO A28 ADD PATIENT	Generate an ADT A28 message manually
AGMP HLO MPI MANAGER OPTIONS	Contains all AGMP options
AGMP HLO PROCESS MFN	Process an MFN M05 message manually
AGMP HLO RESEND MSG	resend an HL7 message
AGMP HLO SEND A01/A03	Generate an ADT A01 or A03 message manually
AGMP HLO SEND A08 UPDATE	Generate an ADT A08 message manually
AGMP HLO SEND A40	Generate an ADT A40 message manually
AGMP MPI EVENT/TYPE/ACK RPT	Report of messages of a given type (e.g., ADT) and event (e.g., A28) – disabled in patch 1 because it can display full SSNs
AGMP MPI ICN REPORT	Report of the number of patients without ICNs assigned and, optionally, a list of those patients
AGMP MPI MESSAGE TOTALS	Report of the number of MPI messages in the inbound and outbound queues

Option Name	Description
AGMP MPI MISSING ICN TSK	Background task that generates an ADT A28 message for each patient that doesn't have an ICN assigned
AGMP MPI MSG ERR SEG RPT	Report of central MPI errors reported in inbound acknowledgments – disabled in patch 1 because it can display full SSNs
AGMP MPI MSG ERR SEG TSK RPT	Task that reports central MPI errors reported in inbound acknowledgments
AGMP MPI PURGE HLO MSGS	Background task that purges old HL7 messages
AGMP MPI RPT MSGS BY DATE	Report of messages in a given date range
AGMP MPI RPTS AND DEBUG MENU	Contains AGMP reporting options
AGMP MPI UNSUCCES MSGS	Report of unsuccessful messages in a given date range
AGMP MPI UNSUCCESSFUL MFE	Report of unsuccessful Treating Facility List updates
AGMP PROD STATUS TSK	Background task that monitors the status of the Ensemble production

7.4   External Entry Points

This package calls the following documented entry points:

Table 7-2: External entry points and description

Entry Point	Description
PTLKNKIL^AG	Lookup patient
$$HLDATE^HLFNC	Create an HL7 formatted date
$$HLNAME^HLFNC	Get HL7 formatted name
$$HLPHONE^HLFNC	Get HL7 formatted phone
$$ADDSEG^HLOAPI	Add an HL7 message segment
$$NEWBATCH^HLOAPI	Start a new batch message
$$NEWMSG^HLOAPI	Create a new HL7 message

Entry Point	Description
SET^HLOAPI	Set a field in an HL7 segment
$$SENDONE^HLOAPI1	Send one HL7 message
$$RSEND^HLOAPI3	Resend a message
$$NEXTSEG^HLOPRS	Get next segment
$$STARTMSG^HLOPRS	Begin processing a message
DEM^VADPT	Call to get PID demographic data
KVA^VADPT	Kill certain local variables
$$ADDR^VAFHLFNC	Create an HL7 formatted address
$$SITE^VASITE	Get station number for a given DUZ(2)
$$DIR^XBDIR	Interface to ^DIR
C^XBFUNC	Center a string
$$DT^XLFDT	Get the current date
$$FMADD^XLFDT	Add to a FileMan date
$$FMTE^XLFDT	Get formatted date
$$HTFM^XLFDT	Convert format from $H to FileMan
$$NOW^XLFDT	Get the current date/time
$$HLNAME^XLFNAME	Get formatted name
$$CJ^XLFSTR	Center justify a string
$$ADD^XPDMENU	Add options to a menu
BMES^XPDUTL	Insert a blank line before a message
SETUP^XQALERT	Set up alert call for mail group
EN^XQOR	Unroll protocols so subscribers will get unwrapped
$$NS^XUAF4	Get facility info

Entry Point	Description
$$STA^XUAF4	Get station number
$$PROD^XUPROD	Report whether this is a production account
RESCH^XUTMOPT	Reschedule
$$VERSION^%ZOSV	Return Caché version
UNWIND^%ZTER	Unwind the stack for the error trap
^%ZIS	Get device
HOME^%ZIS	Establish IO* variables for home device
^%ZISC	Close device
^%ZTLOAD	Queue a task

8.0   Internal Relations

All users should be given access to the appropriate options and keys to those options, as needed. All of the options stand alone.

9.0   Mail Group

There is one mail group for this application: G.AGMP MPI. The users in this mail group receive notifications of errors via Veterans Administration (VA) alerts generated on both outbound and incoming messages.

The users in this group need the ability to review these messages and possibly take action and reprocess or resend messages.

10.0   Parameters

The AGMP application has one user-editable parameter: ENABLED. This parameter can be edited via the EDIT option on the MPI Manager Options menu. If this value is changed to DISABLED, then the entire MPI application is disabled. This option is intended for sites that wish to "opt out" of the central MPI. No messages will be generated for new patients, edited patients, or visits, and the central MPI application will not be updated. As a result, a site wishing to re-enable the AMGP application *must* open a help desk ticket and coordinate with the AGMP and MPI support teams *before* changing this setting to ENABLED.

```
                        MASTER PATIENT INDEX

                          DEMO HOSPITAL

                     EDIT AGMP SITE PARAMETERS

EDIT AGMP SITE PARAMETERS
Select whether to enable or disable the MPI application:

     Select one of the following:

          E          Enabled
          D          Disabled

MPI Application Status: Enabled//
```

Figure 10-1: Parameters

11.0   Menu Diagram

Figure 11-1 displays the main MPI menu and the RPT menu.

```
                              PATIENT REGISTRATION
                             NOT-A-REAL FACILITY
                            MPI Manager Options

   EDIT    EDIT AGMP SITE PARAMETERS
   ADD     SEND A28 ADD PATIENT
   MRG     SEND A40 MERGE PATIENTS
   UPD     SEND A08 UPDATE
   MFN     PROCESS MFN AND SEND MFK
   VST     SEND A01/A03 MESSAGE
   RS      RESEND HL7 MESSAGE
   RPT     MPI Reports and Debug option ...

Select MPI Manager Options Option: RPT  MPI Reports and Debug option

                              PATIENT REGISTRATION
                              NOT-A-REAL FACILITY
                          MPI Reports and Debug option


   MFE     MPI Unsuccessful MFE Report
   DAT     MPI Messages by Date
   TOT     MPI Queue and msg Totals
   ICN     MPI Missing ICN Report
   UN      MPI Print Unsuccessful Messages

Select MPI Reports and Debug option Option:
```

Figure 11-1: Menu Diagram for MPI and RPT menus

12.0   Protocols and Links

12.1   Protocols

Four protocols have been added to enable AGMPI to subscribe to registration, admission and discharge, check-in and check-out, and update events. Table 12-1 provides further information about the protocols.

Table 12-1: Protocols in the AG MPI application

New Protocol	Parent Protocol	Sequence Number	Description
AGMP MPI REGISTRATION	AG REGISTER A PATIENT	40	Sends registration information to the MPI.
AGMP MPI ADMIT DISCHARGE	BDGPM MOVEMENT EVENTS	140	Sends admit or discharge information to the MPI.
AGMP MPI CHEC KIN CHECKOUT	BSDAM APPOINTMENT EVENTS	40	Sends check in or check out information to MPI.
AGMP MPI UPDATE	AG UPDATE A PATIENT	40	Sends update information to the MPI.

12.2 Links

The HLO application uses logical links when building the message header (MSH) segment of the HL7 message. The NODE stored in the HL LOGICAL LINK file for AGMP is MPI.

```
Select OPTION: INQUIRE TO FILE ENTRIES



OUTPUT FROM WHAT FILE: HL LOGICAL LINK//
Select HL LOGICAL LINK NODE: MPI
     1   MPI
     2   MPIVA
     3   MPIVA DIR
CHOOSE 1-3: 1  MPI
ANOTHER ONE:
STANDARD CAPTIONED OUTPUT? Yes//    (Yes)
Include COMPUTED fields:  (N/Y/R/B): NO//  - No record number (IEN), no
Computed
 Fields

NODE: MPI                              LLP TYPE: TCP
  DEVICE TYPE: Persistent Client       STATE: Enabled
  AUTOSTART: Disabled                  TIME STARTED: JUL 02, 2012@10:50:11
  TIME STOPPED: JUL 02, 2012@10:50:11  SHUTDOWN LLP ?: NO
  QUEUE SIZE: 10                       TCP/IP ADDRESS: 10.154.33.14
```

```
    TCP/IP SERVICE TYPE: CLIENT (SENDER)   PERSISTENT: NO
    TCP/IP PORT (OPTIMIZED): 5200
```

Figure 12-1: HL LOGICAL LINK

13.0   Purging

Three tasks can be scheduled to purge old AGMP messages to reclaim database space and prevent keep the application running efficiently. The TaskMan task AGMP MPI PURGE HLO MSGS OPTION purges successfully processed HLO messages from RPMS. The TaskMan VAFH PIVOT PURGE task purges old entries from the pivot table. The Ensemble task AGMPI Message Purge Task purges old Ensemble messages from the AGMPI namespace. Instructions for scheduling these tasks can be found in *Master Patient Index Interface (AGMP) Installation Guide and Release Notes*.

14.0   How to Generate Online Documentation

The namespace is AG. All parameters, routines, options, etc., begin with AG.

This section describes some of the methods by which users can generate dental technical documentation. Online technical documentation pertaining to the Patient Registration MPI Interface software can be generated through the use of several Kernel options. These include, but are not limited to, the following:

- %INDEX

- Menu Management

- Inquire Option

- Print Option File

- VA FileMan

- Data Dictionary Utilities

- List File Attributes

Entering question marks at the "Select...Option" prompts also provides users with valuable technical information. For example, typing a single question mark (**?**) lists all options that can be accessed from the current option. Typing two question marks (**??**) lists all options accessible from the current one, showing the formal name and lock for each.

Typing three question marks (**???**) displays a brief description for each option in a menu, whereas an option name preceded by a question mark (?OPTION) shows extended help, if available, for that option.

For a more exhaustive option listing and further information about other utilities that supply online technical information, consult the *DHCP Kernel Reference Manual*.

14.1   %INDEX

This option analyzes the structure of a routine to determine in part if the routine adheres to RPMS Programming Standards. The %INDEX output can include the following components:

- Compiled list of errors and warnings

- Routine listing

- Local variables

- Global variables

- Naked globals

- Label references

- External references

By running %INDEX for a specified set of routines, you are afforded the opportunity to discover any deviations from RPMS Programming Standards that exist in the selected routines, and to see how routines interact with one another (for example, which routines call or are called by other routines).

To run %INDEX for the Patient Registration MPI Interface package, specify the **AGMP** namespace at the "Routine(s)?>" prompt.

14.2   Inquire Option

This menu management option provides the following information about a specific option:

- Option name

- Menu text

- Option description

- Type of option

- Lock (if any)

In addition, all items on the menu are listed for each menu option. To secure information about Patient Registration MPI Interface options, specify the AG namespace.

14.3   Print Option File

This utility generates a listing of options from the Option file (#19). You can choose to print all of the entries in this file, or you can specify a single option or range of options. For a list of Patient Registration MPI Interface options, refer to Section 9.0.

14.4   List File Attributes

This VA FileMan option enables you to generate documentation pertaining to files and file structure. Using the standard format of this option yields the following data dictionary information for a specified file:

- File name and description

- Identifiers

- Cross-references

- Files pointed to by the file specified

- Files that point to the file specified

- Input, print, and sort templates

In addition, the following applicable data is supplied for each field in the file:

- Field name, number, title, and description
- Global location
- Help prompt
- Cross-references
- Input transform
- Date last edited
- Notes

Using the Global Map format of this option generates an output that lists the following information:

- All cross-references for the file selected.
- Global location of each field in the file.
- Input, print, and sort templates.

14.5   Class Reference

Class documentation is generated by Ensemble for all classes. The reference gives general information about a class, in addition to listing and describing all of the class's properties, parameters, and methods.

To view the class documentation, open the Ensemble Documentation and select *Class Reference* from the menu bar. Select the AGMPI namespace from the drop-down menu at the top left, then select the class from the left frame.

14.6   Production Configuration

Specific settings for the production may be viewed via **Ensemble's Management Portal**.

In **Ensemble's Management Portal**, click the **Ensemble** button on the left, choose the AGMPI namespace, and then click **Configure,** then **Production** to navigate to the Production Configuration page.

Clicking on a business host in the left frame will display that host's settings in the right frame.

Glossary

Callable Entry Point

Place in a routine that can be called from an application program.

Cross-reference

An indexing method whereby files can include presorted lists of entries as part of the stored database. Cross-references (x-refs) facilitate lookup and reporting.

Entry Point

Entry point within a routine that is referenced by a "DO" or "GOTO" command from a routine internal to a package.

File

A set of related records or entries treated as a single unit.

FileMan

The database management system for RPMS.

Global

In MUMPS, "global" refers to a variable stored on disk (global variable) or the array to which the global variable may belong (global array).

INDEX (%INDEX)

A Kernel utility used to verify routines and other MUMPS code associated with a package. Checking is done according to current ANSI MUMPS standards and RPMS programming standards.

Kernel

The set of MUMPS software utilities that function as an intermediary between the host operating system and application packages, such as Laboratory and Pharmacy. The Kernel provides a standard and consistent user and programmer interface between application packages and the underlying MUMPS implementation. These utilities provide the foundation for RPMS.

Menu

A list of choices for computing activity. A menu is a type of option designed to identify a series of items (other options) for presentation to the user for selection. When menu-type options are displayed, the prompt includes the name of the menu preceded by the word "Select" and followed by the word "option," as in "Select Menu Management option" (the menu's "Select" prompt).

Namespace

A unique set of two to four alpha characters assigned by the database administrator to a software application.

Option

An item on a menu that provides an opportunity for users to select it, thereby invoking the associated computing activity. Options may also be scheduled to run in the background, non-interactively, by TaskMan.

Queuing

Requesting that a job or message be processed at a later time rather than within the current session.

Routine

A program or sequence of instructions called by a program that may have some general or frequent use. MUMPS routines are groups of commands that are saved, loaded, and called as a single unit via a specific name.

Variable

A character or group of characters that refers to a value. MUMPS recognizes two types of variables: local variables and global variables. Local variables exist in a partition of the main memory and disappear at sign-off. Global variables are stored on disk, potentially available to any user, and most persist across computing sessions. Global variables usually exist as parts of global arrays.

Acronym List

Acronym	Term Meaning
ACK	HL7 acknowledgment
ADT	Admit, Discharge, Transfer
AGMP	Namespace for the Master Patient Index RPMS application
EUID	Enterprise Unique Identifier
HLO	Health Level Seven Optimized
HL7	Health Level Seven
ICN	Integration Control Number
IHS	Indian Health Service
IEN	Internal Entry Number. A unique number used to identify a record within a file.
MFK	Master File Acknowledgment
MFN	Master File Notification
MPI	Master Patient Index
MUMPS	Massachusetts General Hospital Utility Multi-Programming System
RPMS	Resource and Patient Management System
TFL	Treating Facility List

Contact Information

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