RESOURCE AND PATIENT MANAGEMENT SYSTEM

IHS Pharmacy-Automated Dispensing Interface System (BOP)

Installation Guide and Release Notes

Version 1.0
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Office of Information Technology
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PREFACE

This manual provides information regarding the release and installation of the IHS Pharmacy-Automated Dispensing Interface System package. This package is for RPMS Inpatient Pharmacy 4.5 & 5 and Outpatient Pharmacy 6.0 & 7.0.

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1.0 Release Notes

This release provides an Admission/Discharge/Transfer (ADT) interface to the Omnicell and Pyxis dispensing equipment and includes the follows features.

1. Use of HL7 messaging to transfer information to the equipment.
2. Ability to run a multi-site interface differentiated by different records in the Medical Center Division File (40.8)
3. Ability to start and stop a multi-site interface by its Receiving Facility
4. Ability to show Queued multi-site transactions by Receiving Facility
5. Uniqueness check to TaskMan jobs in use for Troubleshooting Menu
6. Ability to send Outpatient ADT and Inpatient ADT information.
7. Troubleshooting menu (on both the IRM and User Menu – see Menus below)

1.1 Overview

The Automated Dispensing System automated medication dispensing systems requires information from the RPMS database. The Automated Dispensing System interface sends RPMS patient information to the Automated Dispensing System in real-time, as transactions occur.

The network administrator determines the TCP/IP addresses, an IP address for each Automated Dispensing System automated medication dispensing system, and an IP address for each RPMS IHS facility.

When an Automated Dispensing System automated medication dispensing system is installed, Automated Dispensing System site engineers and RPMS staff determine what medications will be dispensed. They then create a table that maps the Automated Dispensing System medication formulary to the RPMS Drug file, using the Internal Entry Number (IEN) of the records in the RPMS Drug file.

RPMS staff determines the types of medications that will be dispensed by the Automated Dispensing System automated medication dispensing system as well the types of patient (inpatients, outpatients)[i].

The next step is to initialize the Automated Dispensing System automated medication dispensing system database with RPMS patients.[ii]

[i] Outpatients can be serviced by location for ADT information only. Locations, such as the emergency room, same day surgery and others can be set up for ADT to be sent. Otherwise outpatient data is not sent.

The final step to beginning live interface activity is started by initializing the BOP Monitor. This process makes sure that a sender and receiver are always ready to receive and transmit HL7 messages across the interface.

1.2 Functionality

1. The BOP QUEUE file holds the data to be sent through the interface. This data is built into an HL7 message and set to the dispensing system using TCP/IP. Puts the data in the queue file into Automated Dispensing System defined HL7 messages and transmits the data to the Automated Dispensing System via TCP/IP protocol. The RPMS system always acts as the client and initiates a connection to the Automated Dispensing System.

2. It is possible to toggle the interface transmissions on or off for inpatient or outpatient activity. These toggles will be in the BOP Site Parameter file.

3. There is a list of "Outpatient Admitting Areas". This list may be used to filter patient information that will be sent to the Automated Dispensing System. If the list is empty and the field Send All Outpatients is set to "no", NO outpatients whose registration activity activates an interface call will be transmitted to the Automated Dispensing System. If there are any entries, no patient will be sent across the interface unless its "ADMITING AREA" is in the list. Since the Admitting Area is only asked if the ADT ACTIVE flag is set to "Yes" in the Record Tracking System Parameters file, the interface operations instructions will discuss this in detail and give examples.

4. Uses TCP/IP[iii] to transmit and receive data.

5. Monitors itself and reliably keeps itself running.

6. Transmits ADT to the Automated Dispensing System automated medication dispensing system real-time.

7. Can be used to transmit patient information in a batch mode to initialize the Automated Dispensing System automated medication dispensing system.

8. Reports on queues into which data is put for transmission. The Queue file (90355.1) will now store the actual transmission data in the "O" node. It will retain the actual HL7 data message that is transmitted.

9. Can be started and stopped by users using easy to access options on their menu.

[ii] This is done with a utility routine described in the Installation part of this document.

iii Makes socket to socket connection, Send and receives HL7 Messages. HL7 messages are structured as followed: $C(11) = first byte == HL7 Message (each segment ends with $C(13)) == and each HL7 message ends with $C(28,13). Each message is followed by an exchange of HL7 Acknowledgements. The TCP/IP process keeps channel opened constantly.

10. Can be parameterized to meet specific site needs.

11. Can work with multiple room/bed coding combinations for patient locations.

12. Self maintains its file with its purge routine.

1.3 Data Transmitted from RPMS

1. ADT: When a patient is admitted, discharged, or transferred an ADT transaction may be sent to the interface for transmission to the Automated Dispensing System (if a patient's location has been setup as an Automated Dispensing System location).

2. Outpatient Demographic Data is sent to the Automated Dispensing System if outpatient locations are included in the site parameters or if the field Send All Outpatients in the parameter file is set to yes..

1.4 Data Received by RPMS

1. "Keep Alive" messages that demonstrate that the interface is active.

2. Acknowledgements for data received from the Automated Dispensing System Interface.

1.5 Database Fields

1. There are parameters for Ward/Room/Bed usage, which differ from one facility to another. There are three methods that are now supported and can be chosen via field 9.1, LOCATION DECODING TYPE. See Appendix G: Wards, Beds and Facilities for more information on Ward/Room/Bed setup and usage.

2. The DEFAULT OUTPATIENT LOCATION (field 9.2) is the free text parameter for the outpatient interface. It is the free text partial match to the Location file (44) name field. This field is used when the outpatient portion of the interface is called and the patient does not have a location. If the SEND ALL OUTPATIENTS is set to yes and there are no values in the OUTPATIENT LOCATION multiple (field 10) and there is no value in DEFAULT OP SEND LOCATION (field 9.3), this value is used as the patient's RPMS location. If this field is left blank when fields 10.1 and 9.3 are also blank, 'AEC' will be the default value.

3. The DEFAULT OP SEND LOCATION (field 9.3) is the default mapping for the Automated Dispensing System. All outpatient locations that are allowed to send ADT information to the Automated Dispensing System must contain a location

'map' value so that the Automated Dispensing System can recognize the location. This field is used if the OP SEND LOCATION(10.1) that belongs to the OUTPATIENT LOCATION multiple (field 10) is not filled in. If both the DEFAULT OP SEND LOCATION(9.3) and the OP SEND LOCATION(10.1) are not filled in, the interface will use the DEFAULT OUTPATIENT LOCATION (9.2) field.

4. The SEND ALL OUTPATIENTS (field 9.4) is a flag used to control what outpatient locations can send to the Automated Dispensing System. If the value is 'Yes' all locations can send their outpatient ADT transactions to the Automated Dispensing System even if they are not defined as an OUTPATIENT LOCATION in the BOP SITE FILE file (90355). To ensure correct location data, the OUTPATIENT LOCATION multiple (field 10) should be filled in with each location that is to send outpatient ADT transactions. If this field is set to 'Yes', however, ADT transaction data will be sent for all outpatient locations, but the only location name that will be sent is the name that is set in the DEFAULT OP SEND LOCATION field.

5. The DEFAULT OP LOCATION POINTER (field 9.5) is the field that superseded the DEFAULT OUTPATIENT LOCATION. This field contains the pointer to the HOSPITAL LOCATION file (44) and is used when the outpatient ADT does not have a location and the SEND ALL OUTPATIENTS flag is yes.

6. The fields below are for multiple field 10. Each location that is to send outpatient ADT information should be entered into the multiple to ensure correct location information. Even if all locations are to send data, it is still appropriate for each location to be entered into these multiple fields. If a location is to send outpatient data, but the location does not have a field 10 entry, the location in field 9.3 (DEFAULT OP SEND LOCATION) will be used. If there is no entry in 9.3, field 9.2 (DEFAULT OUTPATIENT LOCATION) will be used. If there is no entry in field 9.2, then the value "AEC" will be sent.

7. The OUTPATIENT LOCATION (subfield.01) is a free text partial match to the location name in the HOSPITAL LOCATION FILE (44). Since it is the primary item in the outpatient location multiple, it is still required.

8. The OP SEND LOCATION (subfield 1) is the Automated Dispensing System 'map' value that identifies the RPMS location. All outpatient locations that are allowed to send ADT information to the Automated Dispensing System must contain a location 'map' value so that the Automated Dispensing System can recognize the location. If the value is not filled in, the DEFAULT OP SEND LOCATION is used ('AEC').

9. The OUTPATIENT LOCATION POINTER (subfield 2) contains the pointer to the HOSPITAL LOCATION file (44) and is used for determining if the outpatient location can send ADT information to the Automated Dispensing System. This field will internally show as a pointer, but externally the user will see the full

name of the location from the HOSPITAL LOCATION file (44). Note that even though fields 1 and 2 are essentially the same, the user must enter them BOTH.

Note: There is no seeding routine for the Outpatient multiple (10). It is recommended that all outpatient locations be entered into the 10 multiple; however if there are too many locations to be manually entered, we recommend entering at least the locations that have Automated Dispensing System equipment installed at the location. **If the Send All Outpatients flag is set to yes, all outpatient registration information will be sent.** If the location is mapped in the Outpatient multiple (10), that location will be sent. Otherwise, the Default OP Send Location (9.3) will be used. If the Default OP Send Location (9.3) is blank, the Default Outpatient Location (9.2) will be used. If the Default Outpatient Location (9.2) is blank, "AEC" will be sent.

1.6 Security Keys

The security keys BOPZIRM and BOPZMENU have been released with the KIDS package. These keys should be assigned to the users who will have the BOP IRM MENU or BOP USER MENU.

1.7 Process Information

1. The TCP/IP receiver stores the message in a word processing field in the queue file and sends the Automated Dispensing System an acknowledgement. A separate job processes the message queue.

2. The monitor checks the system status and reschedules itself to run in the future according to the number of seconds in field 4.1, MONITOR RESCHEDULING FREQUENCY. It is recommended that this field be set to a value between 300 to 900 seconds. This rescheduling frequency time can be reset manually to 120 seconds in the test account during initial testing.

3. It is important to note that the interface is real time. However, the interface will determine if there is data to be sent. If data is ready, it will be sent. When that is completed, a future job is created in taskman (based on the field Monitor Rescheduling Frequency). That is usually 2 to 10 minutes into the future. When that time has elapsed, the interface will again check to see if data needs to be sent across and processed. Users can look at the FUT option under the Troubleshooting Menu to determine the next time data will be transmitted.

4. The Monitor also checks the queue for incoming messages that require processing. If there are such messages, a background task is started to process

them. The task that processes incoming messages quits when it has completed processing all incoming messages, again to be "M license" economical.

5. Standard RPMS calls in %ZISTCP are used for all TCP/IP socket opens and closes.

6. All background tasks are given names so that they can be easily identified in Task Manager reports.

7. Background tasks are protected from local execution by giving them entry points. They now quit if entered inadvertently from the top.

8. The Monitor stores the most recently created task to start it in the BOP SITE file. By inquiring on the BOP SITE file, the site management can find out the Task scheduled.

9. The field that is used to populate the patient ID is the patient IEN, otherwise known as the DFN. This field is found in segment PID, component 3, sub-component 1.

IMPORTANT NOTE: The interface is started through the Start Automated Dispensing System Interface option. If the interface is stopped, when it is restarted, the interface will use the field rescheduling frequency from file 90355 to restart the interface. That in turn will automatically start up the other jobs. After an interface shutdown, do NOT restart the interface using BOP MONITOR unless you are certain that there are no current or future BOP MONITOR jobs in TaskMan. For a typical stop and start of the interface, the user must simply STOP the interface. It will automatically be restarted based on the reschedule frequency from the 90355 file.

2.0 Installation Notes

Prefix: BOP

Current Version: 1.0

> **Warning**: Read entire notes file prior to attempting any installation.

2.1 General Information

- Make a copy of this distribution for offline storage.
- Print all notes/readme files.
- It is recommended that the terminal output during the installation be captured using an auxport printer attached to the terminal at which you are performing the software installation. This will insure a printed audit trail if any problems should arise.

2.2 Contents Of Distribution

- bop_0100.k —KID Build
- bop_010i.pdf—Installation guide and Release notes
- bop_010t.pdf—Technical manual
- bop_010u.pdf—User manual

2.3 Required Resources

The following RPMS packages must be installed:

- FileMan v21.0 or higher
- Kernel v8.0 or higher
- PIMS v5.3 or higher
- Inpatient Pharmacy v4.5 or higher
- Outpatient Pharmacy v6.0 or higher
- IHS Third Party Billing System v2.5 or higher

3.0 Installation Issues

3.1 File Access

Note that for a new installation, files 90355 – 90355.44 will require proper access (general read/write for all) and placement (directory, UCI, and block location).

Recommendations for setup of port/socket information.

9501/9502 will be the sender/receiver socket pair for the test environment.

9601/9602 will be the sender/receiver socket pair for the production environment.

Multi-site entities will continue by using 9503/9504, 9505/9506 for test and 9603/9604, 9605/9606 for production.

3.2 Mirrored Systems

If your RPMS system has a mirrored account that is updated on a frequent basis, note that you cannot have two different systems that have the BOP Interface running to the same IP address/socket combo. It is recommended that you add a step to your processing after the mirror has been completed (in the mirrored account) to set the field MONITOR ACTIVE from file 90355 to "OFF". This will prevent the BOP Interface from running in the Mirrored account.

4.0 Installation Instructions

1. It is expected that prior to following these instructions for the production environment, that all sites will follow this process in their test environment first.

2. Get a copy of the installation file and copy it into a directory that is accessible from your M system.

3. Log into your production environment as a programmer at the MUMPS prompt and install package using KIDS installation utilities. It is recommended that the KIDS package be validated and compared to the current system before it is installed. See section 5.0 for sample installation.

4. Use FileMan to edit file # 90355, the BOP SITE file. An example of captioned output from a working system is displayed in Appendix A: Site Parameters'.

    a. Turn off fields in file 90355 that control inpatient transmissions: 2.2 "NEW ORDERS ACTIVE", 2.3 "RENEW ORDERS ACTIVE" and 2.4 "OTHER ORDERS ACTIVE" by entering "NO" for their values. As the VA Site has the ability to choose which types of orders to send across the interface, selecting NO in these fields will denote that these order types are NOT to be sent over the interface.

    b. Ensure that fields 9.1 LOCATION DECODING TYPE, 9.2 DEFAULT OUTPATIENT LOCATION, 9.3 DEFAULT OP SEND LOCATION, 9.5 DEFAULT OP LOCATION POINTER, 10.01 OUTPATIENT LOCATION (multiple of valid outpatient locations that can send ADT information to Automated Dispensing System), 10.1 OP SEND LOCATION, and 10.2 OUTPATIENT LOCATION POINTER are filled in correctly. If 9.2, 9.3 and 10.1 are not filled in, “AEC” will be used as the default value. See New/Old Database Items for more information on the specific database items. See Appendix C: Special Outpatient Parameters for an example with field descriptions. See routine BOPOBS.

    c. Review your setup. Whether or not a record is transmitted depends on whether or not the admitting area names are coordinated with the values of fields 9.1 and 9.2. Admitting areas are in file 44, but must be defined as such in the "TYPE EXTENSION" field, which points to file 40.9.

5. The interface may be started by running the following option “Start the Monitor” [BOP MONITOR]. This task will start up other background jobs that will receive, send and process messages. If the interface is stopped, when it is restarted, the interface will use the field rescheduling frequency from file 90355 to restart the interface. That in turn will automatically start up the other jobs. After an interface shutdown, do NOT restart the interface using BOP MONITOR unless

you are certain that there are no current or future BOP MONITOR jobs in TaskMan.

Note: The interface needs to use an outpatient location that is coordinated with the Automated Dispensing System. The 'Default OP Location' field is used on the Automated Dispensing System, which needs to know what will be sent to it – this is the location of the Automated Dispensing System cabinet that will dispense the medications. If the 'Default OP Send Location' field is deleted on the RPMS database, the first 9 characters of the actual outpatient admitting location will be sent to the Automated Dispensing System. Before deleting the 'Default OP Send Location' field, coordinate with the Automated Dispensing System representative.

5.0 Sample Installation

The IHS Interface System server software is a standard KIDS file that needs to be installed using the KIDS utilities, as demonstrated in the following screens:

1. Load KIDS Distribution.
    a. Select Installation from the Kernel Installation & Distribution System.
    b. Select Load a Distribution from the Installation Menu.
    c. Type bop_0100.k at Enter a Host File Prompt.
    d. Type YES at the "Want to Continue with Load?" prompt.

2. Install KIDS Distribution.
    a. Select Installation from the Kernel Installation & Distribution System
    b. Select Install Package(s) from the Installation Menu.
    c. Type AUTOMATED DISPENSING INTERFACE 1.0 at the "Install Name:" prompt.
    d. Type NO at the "Want KIDS to Inhibit Logons During the Install?" prompt.
    e. Type NO at the "Want to Disable Scheduled Options, Menu Options, and Protocols?" prompt.
    f. Type the name of a print device where you want to print the install message at the "Device:" prompt.

```
>D ^XUP

Setting up programmer environment
Terminal Type set to: C-VT100

Select OPTION NAME: XUPROG
     1   XUPROG          Programmer Options
     2   XUPROGMODE          Programmer mode
CHOOSE 1-2: 1  XUPROG        Programmer Options

Select Programmer Options Option: KIDS  Kernel Installation & Distribution
System

Select Kernel Installation & Distribution System Option: ?

          Edits and Distribution ...
          Utilities ...
          Installation ...

Enter ?? for more options, ??? for brief descriptions, ?OPTION for help text.

Select Kernel Installation & Distribution System Option: INstallation

Select Installation Option: ?

   1      Load a Distribution
   2      Verify Checksums in Transport Global
   3      Print Transport Global
   4      Compare Transport Global to Current System
   5      Backup a Transport Global
   6      Install Package(s)
          Restart Install of Package(s)
          Unload a Distribution

Enter ?? for more options, ??? for brief descriptions, ?OPTION for help text.


Select Installation Option: 1  Load a Distribution
Enter a Host File: c:\temp\bop_0100.k

KIDS Distribution saved on Feb 24, 2005@09:04:51
Comment: Automated Dispensing System Interface v1.0

This Distribution contains Transport Globals for the following Package(s):
   AUTOMATED DISPENSING INTERFACE 1.0
Distribution OK!

Want to Continue with Load? YES//
Loading Distribution...

   AUTOMATED DISPENSING INTERFACE  1.0
Use INSTALL NAME: AUTOMATED DISPENSING INTERFACE  1.0 to install this
Distribution.



   1      Load a Distribution
   2      Verify Checksums in Transport Global
   3      Print Transport Global
   4      Compare Transport Global to Current System
```

```
   5      Backup a Transport Global
   6      Install Package(s)
          Restart Install of Package(s)
          Unload a Distribution

Select Installation Option: install Package(s)
Select INSTALL NAME: AUTOMATED DISPENSING INTERFACE 1.0       Loaded from
Distribution     Loaded from
Distribution  2/24/05@09:06:37
     => Automated Dispensing System Interface v1.0  ;Created on Feb 24,
2005@09:04:51

This Distribution was loaded on Feb 24, 2005@09:06:37 with header of
   Automated Dispensing System Interface v1.0  ;Created on Feb 24,
2005@09:04:51
   It consisted of the following Install(s):
    AUTOMATED DISPENSING INTERFACE  1.0
Checking Install for Package AUTOMATED DISPENSING INTERFACE  1.0

Install Questions for AUTOMATED DISPENSING INTERFACE  1.0

Incoming Files:


   90355     BOP SITE


   90355.1   BOP QUEUE


   90355.2   BOP RECEIVE DRUG


   90355.3   BOP RECEIVE SUPPLY


   90355.35  BOP IV


   90355.4   BOP RECEIVE EXCEPTION


   90355.44  BOP TRANSFER TO DRUG


   90355.5   BOP DRUG

Want KIDS to Rebuild Menu Trees Upon Completion of Install? YES// n  NO


Want KIDS to INHIBIT LOGONs during the install? YES// n  NO
Want to DISABLE Scheduled Options, Menu Options, and Protocols? YES// n  NO

Enter the Device you want to print the Install messages.
You can queue the install by enter a 'Q' at the device prompt.
Enter a '^' to abort the install.

DEVICE: HOME//   VT
```

```
 Install Started for AUTOMATED DISPENSING INTERFACE  1.0 :
               Feb 24, 2005@09:06:49

 Build Distribution Date: Feb 24, 2005

 Installing Routines:
      Feb 24, 2005@09:06:49

 Installing Data Dictionaries:
      Feb 24, 2005@09:06:49

 Installing PACKAGE COMPONENTS:

 Installing SECURITY KEY

 Installing INPUT TEMPLATE

 Installing PROTOCOL

 Installing OPTION
               Feb 24, 2005@09:06:50

 Running Post-Install Routine: POST^BOPINIT

 Updating Routine file...

 Updating KIDS files...

 AUTOMATED DISPENSING INTERFACE  1.0 Installed.
               Feb 24, 2005@09:06:50

 NO Install Message sent

Install Completed


   1      Load a Distribution
   2      Verify Checksums in Transport Global
   3      Print Transport Global
   4      Compare Transport Global to Current System
   5      Backup a Transport Global
   6      Install Package(s)
          Restart Install of Package(s)
          Unload a Distribution

Select Installation Option:
```

6.0 Appendix A: Site Parameters

The BOP Site Parameter File (90355) is used to define how the interface will work. The user may determine:

- if ADT should go to the Automated Dispensing System
- which divisions will be allowed
- if outpatients data should be sent
- which orders are active
- which order types should be sent
- if the interface is active
- IP addresses and their respective sockets (ports) for each hospital division (Each division goes to a different pro-car.) (The pro-car is the Automated Dispensing System interface receiver. It then sends the transmission to the appropriate Automated Dispensing System console.)

6.1 BOP Site Parameters

Name: Your Site Name from the institution file #4

Facility ID: Your Site Number from the institution file #4

Receiving Application: which vendor are you interfacing to. OmniCell or Pyxis

Acknowledgment Time Out: Number of seconds between 5 and 180.

Number of Retries: Number of tries between 5 and 10.

ADT Active: Enter YES if sending admission information. Enter NO if not sending admission information

ADT Send Inpatient: Enter YES if sending Inpatient ADT information

ADT Send Outpatient: Enter YES if sending Outpatient ADT information

Admit Diagnosis: Enter Yes if sending the free text 'short admit diagnosis'.

Send PRN: Enter Yes if sending PRN orders.

Send Continuous: Enter Yes if sending continuous orders.

Send One-Time: Enter Yes if one-time orders are to be sent.

Send Fill-On-Request: Enter Yes if sending fill on request orders.

Send On-Call: Enter Yes if sending on call orders.

New Orders Active: Enter Yes if sending new orders.

Renew Orders Active: Enter Yes if sending re-new orders.

Other Orders Active: Enter Yes if sending other orders.

Send Formulary: Enter Yes if updates to the drug file are to go to the remote system.

Processing ID: P The processing id is always set to "P"

Version ID: 2.3 The version id is for the version of the HL7 standard interface document followed.

P-O Interface Domain: Enter the domain name for your site. From ^XMB("NETNAME")

This will be different in test versus live. Remember when you put the data into live to change this field!

Interface Vendor: Enter 'O' for OmniCell or 'P' for Pyxis

Base Allergy: Enter Other Allergy/Adverse Reaction

Location Decoding Type: Enter the appropriate style for room bed to be sent to the Automated Dispensing System.

Send All Outpatients: If yes, all outpatient transactions will be sent regardless of location. Note: If this field is set to yes, but the Location is not found in the Outpatient Location multiple (below), the Outpatient ADT information will be sent, but the Location associated with it will be the Default OP Send Location (above).

Default Outpatient Location: If outpatients are to be sent what is the default location.

Default OP Send Location: Default map value agreed with Automated Dispensing System. Used when Location cannot be found in the Outpatient Location multiple (below).

Default OP Location Pointer: Pointer to Hospital Location file (44).

6.1.1 Multiple For Outpatient Areas

To ensure best data, enter all outpatient locations that will send ADT information.

> **Note**: if Send All Outpatients is set to Yes, but a location is not defined below, the transaction will be sent using the Default OP Send Location

Outpatient Location: The free text partial match to the .01 field in file 44 outpatient location that can send to the Automated Dispensing System.

OP Send Location: Enter the 'map' value for the outpatient location that will be sent to the Automated Dispensing System.

OP Location Pointer: The pointer to file 44 for the outpatient location that can send to Automated Dispensing System. Externally the user will see the full name of the location from file 44.

Monitor Active: This field controls whether the BOP interface continues to run.

Set this to OFF. When ready to begin testing or go-live, do the following:
1. Do Connectivity Check (CALL^%ZISTCP) see Appendix J: Troubleshooting
2. If you have connectivity, change Monitor Active to ON
3. Use BOP MONITOR to start up interface
4. Run Pre-seed ^BOPTSD. This has to be run from the mumps level.

Monitor Rescheduling Frequency: Frequency to check the interface monitor-300 to 900 seconds.

Stop: Used to stop the interface.

6.1.2 Multiple Receiving Facilities

Receiving Facility: Enter the name for the receiving facility (from Medical Center Division file #40.8)

Channel Active: Enter Yes if sending to the Automated Dispensing System.

Accept Transactions: Enter Yes if accepting transactions for sending to the Automated Dispensing System.

Client or Server: Enter CLIENT if your side is to initiate contact with the Automated Dispensing System.

Enter SERVER if your side is to listen to the Automated Dispensing System.

IP Address: Enter the ip address of the Automated Dispensing System. (determined by information systems)

Send Socket: Enter the socket number that will be used to send to the Automated Dispensing System.

Receive Socket: Enter the socket number that will be used to receive from the Automated Dispensing System.

6.2 Sample BOP Site Parameters

```
OUTPUT FROM WHAT FILE: 90355 BOP SITE PARAMETERS
NAME: IHS                              FACILITY ID: 100
  RECEIVING APPLICATION: AUTOMATED DISPENSING SYSTEM       ACKNOWLEDGEMENT
TIME OUT: 30
  NUMBER OF RETRIES: 5                  SEND PRN: YES
  SEND CONTINUOUS: Y                    SEND ONE-TIME: YES
  SEND FILL-ON-REQUEST: YES             SEND ON-CALL: YES
  PROCESSING ID: P                      VERSION ID: 2.2
  SEND FORMULARY: YES
  ADMIT DIAGNOSIS: YES                  SEND DISCHARGE ICD9 DIAGNOSIS: YES
  ADT ACTIVE: YES                       NEW ORDERS ACTIVE: YES
  RENEW ORDERS ACTIVE: YES              OTHER ORDERS ACTIVE: YES
  INTERFACE VENDOR: AUTOMATED DISPENSING SYSTEM

RECEIVING FACILITY: HOSPITAL DEMO       CHANNEL ACTIVE: YES
  IP ADDRESS: 204.161.113.217           SEND SOCKET: 3000
  LISTEN SOCKET: 9003                   ACCEPT TRANSACTIONS: YES
  CLIENT OR SERVER: SERVER
  MONITOR ACTIVE: ON                    MONITOR RESCHEDULING FREQUENCY: 300
  MONITOR CURRENT TASK: 66106           STOP: INTERFACE ACTIVE
OUTPATIENT LOCATION: ER
      P-O INTERFACE DOMAIN: your.domain.gov
  LOCATION DECODING TYPE: NU-ROOM-BED IN ROOM-BED
  DEFAULT OUTPATIENT LOCATION: ER       SEND ALL OUTPATIENTS: NO

STOP: INTERFACE ACTIVE
```

7.0 Appendix C: Special Outpatient Parameters

Special Outpatient Parameters from the Site Parameter File
Each location that is to send outpatient ADT information should be entered into the OUTPATIENT LOCATION multiple (field 10 and its subfields) to ensure correct location information. Even if all locations are to send data, it is still appropriate for each location to be entered into these multiple fields. If a location is to send outpatient data but the location does not have a field 10 entry, the location in field 9.3 (DEFAULT OP SEND LOCATION) will be used. If there is no entry in 9.3, field 9.2 (DEFAULT OUTPATIENT LOCATION) will be used. If there is no entry in field 9.2, then the value "AEC" will be sent.

Upon entry of Outpatient ADT information, here are the steps that are taken:

1. The code will use the location for the transaction and get the name of the location from the Hospital Location File (#44).

2. The code will go through all entries in the Outpatient Location multiple (#10) to see if there are any Outpatient Location entries (field #1) that contain a partial match entry that matches the name from the Hospital Location File. This partial match entry must be the entry in the Automated Dispensing System Mapping Table. If a match is found, the #1 field will be sent as the partial match, and OP Send Location (field #2) will be sent as the Location pointer.

3. If there are no matches, we will next take the entry in the Default OP Send Location (#9.3). If this entry exists and there is ever a situation where a match is not found in the #10 multiple, this will be the location that is sent in the HL7 message as the partial match field, and Default OP Location Ptr (#9.5) will be sent as the Location pointer.

4. If there are no matches in multiple 10 and field 9.3 is also blank, the Default Outpatient Location (#9.2) will be sent.

5. Finally, if all of the above fields are blank, the string "AEC" will be sent.

```
DEFAULT OP SEND LOCATION: AEC// ??
```

This is the location that the Automated Dispensing System cabinet will associate the patient with. For outpatients, it is the service that is going to provide services to the patient at the moment that services are scheduled. The string that is entered into this field is partial matched against the medical center's list of services.

Examples are 'AEC', 'ER' or 'CLINIC'.

NOTE: The interface needs to use an outpatient location that is coordinated with the Automated Dispensing System. The 'Default OP Send Location' field (#9.3) is used on the Automated Dispensing System, which needs to know what will be sent to it - this is the location of the Automated Dispensing System robot that will dispense the medications. If the 'Default Outpatient Location' field (#9.2) is deleted on the RPMS database, the first 9 characters of the actual outpatient admitting location will be sent to the Automated Dispensing System. Before deleting the 'Default Outpatient Location' field (#9.2) coordinate with the Automated Dispensing System representative.

```
Select OUTPATIENT LOCATION: ADM// ?
 Answer with OUTPATIENT LOCATION
Choose from:
   AEC
   ADM

     You may enter a new OUTPATIENT LOCATION, if you wish
     Answer must be 1-9 characters in length.

Select OUTPATIENT LOCATION: ADM//
  OUTPATIENT LOCATION: ADM//
  OP SEND LOCATION: ADMIS//
  OUTPATIENT LOCATION POINTER: ADMISSIONS//
```

The OUTPATIENT LOCATION (#.01) can be an abbreviation of the location.

The OP SEND LOCATION (#1) is the mapped field in the Automated Dispensing System map.

The OUTPATIENT LOCATION POINTER (#2) is the full name of the location from the HOSPITAL LOCATION file (44).

NOTE: This multiple describes a table of valid outpatient locations. Any location that contains any of the entries in this field will be keyed on to send registration data to the Automated Dispensing System cabinet.

8.0 Appendix D: Package Creation

The following shows the screens that will be created when making the release to move the packages from a test account into production.

BOP Package Creation

```
Select BUILD NAME: AUTOMATED DISPENSING INTERFACE  1.0

                            Edit a Build                          PAGE 1 OF 4
Name: AUTOMATED DISPENSING INTERFACE 1.0                TYPE: SINGLE PACKAGE
---------------------------------------------------------------------------

                      Name: AUTOMATED DISPENSING INTERFACE  1.0

          Date Distributed: FEB 7, 2005


               Description:                              Delete Routine
                                                          after install
 Environment Check Routine:                               Y/N:

       Pre-Install Routine:                               Y/N:

      Post-Install Routine: POST^BOPINIT                  Y/N:

Pre-Transportation Routine:
___________________________________________________________________________


Edit a Build                             PAGE 2 OF 4
Name: AUTOMATED DISPENSING INTERFACE  1.0                TYPE: SINGLE PACKAGE
---------------------------------------------------------------------------
                           File List  (Name or Number)

      BOP SITE
      BOP QUEUE
      BOP RECEIVE DRUG
      BOP RECEIVE SUPPLY
      BOP IV
      BOP RECEIVE EXCEPTION
      BOP TRANSFER TO DRUG
      BOP DRUG









___________________________________________________________________________


Edit a Build                               PAGE 3 OF 4
Name: AUTOMATED DISPENSING INTERFACE  1.0            TYPE: SINGLE PACKAGE
---------------------------------------------------------------------------
                            Build Components

PRINT TEMPLATE              (0)
SORT TEMPLATE               (0)
INPUT TEMPLATE              (1)
FORM                        (0)
FUNCTION                    (0)
DIALOG                      (0)
BULLETIN                    (0)
```

```
MAIL GROUP                    (0)
HELP FRAME                    (0)
ROUTINE                      (27)
OPTION                       (15)
SECURITY KEY                  (2)
PROTOCOL                      (2)
LIST TEMPLATE                 (0)
HL7 APPLICATION PARAMETE      (0)
HL LOWER LEVEL PROTOCOL       (0)
HL LOGICAL LINK               (0)
REMOTE PROCEDURE              (0)


Build Components

Input Template:

BOP SITE PARAM    FILE #90355                    SEND TO SITE


Routines:

BOPBAN                                             SEND TO SITE
BOPBAT                                             SEND TO SITE
BOPCAP                                             SEND TO SITE
BOPCLN                                             SEND TO SITE
BOPCP                                              SEND TO SITE
BOPCP2                                             SEND TO SITE
BOPDRGF                                            SEND TO SITE
BOPEXCP                                            SEND TO SITE
BOPINIT                                            SEND TO SITE
BOPKIL                                             SEND TO SITE
BOPMTR                                             SEND TO SITE
BOPOBS                                             SEND TO SITE
BOPR                                               SEND TO SITE
BOPR1                                              SEND TO SITE
BOPRNEW                                            SEND TO SITE
BOPRNEW1                                           SEND TO SITE
BOPSET                                             SEND TO SITE
BOPSHO                                             SEND TO SITE
BOPSLK                                             SEND TO SITE
BOPT1                                              SEND TO SITE
BOPT2                                              SEND TO SITE
BOPT3                                              SEND TO SITE
BOPTBS                                             SEND TO SITE
BOPTCP                                             SEND TO SITE
BOPTD                                              SEND TO SITE
BOPTSD                                             SEND TO SITE
BOPTU                                              SEND TO SITE
BOPSET                                             SEND TO SITE
BOPSHO                                             SEND TO SITE


Options:

BOP ACTIVATE FACILITY           SEND TO SITE
```

```
BOP CHECK TRANSACTIONS           SEND TO SITE
BOP DEACTIVATE FACILITY          SEND TO SITE
BOP FUTURE TASK LIST             SEND TO SITE
BOP IRM MENU                     SEND TO SITE
BOP MONITOR                      SEND TO SITE
BOP PATIENT DISPLAY              SEND TO SITE
BOP PURGE                        SEND TO SITE
BOP RUN TASK LIST                SEND TO SITE
BOP SHOW                         SEND TO SITE
BOP SITE                         SEND TO SITE
BOP STOP                         SEND TO SITE
BOP TRANSMIT ONE PATIENT         SEND TO SITE
BOP TROUBLESHOOT MENU            SEND TO SITE
BOPMENU                          SEND TO SITE

Security Keys:
BOPZIRM
BOPZUSER

Protocols:
BOP DG ADT
BOP SDAM

Install Questions


                           Required Builds



    Package File Link...: AUTOMATED DISPENSING INTERFACE

Track Package Nationally: NO
```

9.0 Appendix E: Protocols

The following protocols are used to trigger the sending of the ADT HL7 messages.

9.1 BOP DG ADT

This protocol is attached to the BDGPM MOVEMENT EVENTS protocol during the post-init portion of the install and is fired during inpatient ADT events. After installation, a sequence number should be set for the BOP DG ADT entry on the BDGPM MOVEMENT EVENTS protocol. Select a number in the range of 100-199.

```
Select OPTION: INQUIRE TO FILE ENTRIES

OUTPUT FROM WHAT FILE: PROTOCOL//
Select PROTOCOL NAME: BOP DG ADT       BOP Inpatient ADT Event Protocol

NAME: BOP DG ADT
  ITEM TEXT: BOP Inpatient ADT Event Protocol
  TYPE: action                          CREATOR: MANAGER,SYSTEM
  ENTRY ACTION: D ADT^BOPCAP            TIMESTAMP: 59940,44046
```

```
Select OPTION: ENTER OR EDIT FILE ENTRIES

INPUT TO WHAT FILE: PROTOCOL//
EDIT WHICH FIELD: ALL// ITEM      (multiple)
EDIT WHICH ITEM SUB-FIELD: ALL// ITEM
   THEN EDIT ITEM SUB-FIELD:
THEN EDIT FIELD:

Select PROTOCOL NAME: BDGPM MOVEMENT EVENTS          MOVEMENT EVENTS V 5.3
  ITEM: BOP DG ADT                        SEQUENCE: 151
```

9.2 BOP SDAM

This protocol is attached to the BSDAM APPOINTMENT EVENTS protocol during the post-init portion of the install and is fired during outpatient ADT events. After installation, a sequence number should be set for the BOP SDAM entry on the BSDAM APPOINTMENT EVENTS protocol. Select a number greater than 50.

```
Select OPTION: INQUIRE TO FILE ENTRIES

OUTPUT FROM WHAT FILE: PROTOCOL//
Select PROTOCOL NAME: BOP SDAM

NAME: BOP SDAM
  ITEM TEXT: BOP Outpatient ADT Event Protocol
  TYPE: action                          CREATOR: MANAGER,SYSTEM
  ENTRY ACTION: D SDAM^BOPOBS           TIMESTAMP: 59940,44093
```

```
Select OPTION: ENTER OR EDIT FILE ENTRIES

INPUT TO WHAT FILE: PROTOCOL//
EDIT WHICH FIELD: ALL// ITEM      (multiple)
EDIT WHICH ITEM SUB-FIELD: ALL// ITEM
   THEN EDIT ITEM SUB-FIELD:
THEN EDIT FIELD:

Select PROTOCOL NAME: BSDAM APPOINTMENT EVENTS
  ITEM: BOP SDAM                        SEQUENCE: 50
```

10.0 Appendix G: Wards, Beds and Facilities

There are fields in the BOP Site Parameter File to control how the interface will send ward, bed and facility data. If these parameters are not set up by the installing staff, the system will set them up automatically according to defaults as below:

- A Type field determines how ward, bed and facility are extracted from VADPT information. There are currently 5 types. The default type uses the standard 3 fields from VADPT information.

- Another field, Automated Dispensing System domain was added so that code can be written in the interface that is specific to one site, using a name that will probably be the same as the sites Internet domain name – and is used as the default by looking at ^XMB("NETNAME").

The field may be described in more detail as below:

The LOCATION DECODING TYPE is necessary because different facilities use room/bed and Nursing Unit in different formats. Type 1 indicates that NU-Room-Bed are stored in the Room-Bed field. With Type 2, the NU is stripped of all "-"'s.

```
     Choose from:
       0        DEFAULT
       1        NU-ROOM-BED IN ROOM-BED
       2        STRIP NU OF -'S
WARDLOCATION-ROOM-BED
LOCATION-ROOMBED
NUROOM-BED OR NU-ROOM-BED
```

11.0 Appendix J: Troubleshooting

The first steps taken to determine if the interface is running should be to use the options on the BOP TROUBLESHOOT menu. Check FUT for future tasks and find out if the future jobs are being built. Check RUN for running tasks. You should see a BOPRNEW task, a BOPRNEW1 task, and a BOPT1 task.

One can check the BOP QUEUE file (90355.1) to determine if the transactions are current.

Look at ^BOP(90355.1,0. Get piece 3, which is the last record created. Look at ^BOP(90355.1,#,0). Piece 1 is a date/time stamp in the format of 3040625.111111 to show 06/25/04 at 11:11:11.

The "AS" cross reference is used to determine the records that need to be sent. One can look at ^BOP(90355.1,"AS",0<ret> to find out what records are in the queue to be transmitted. If there are no records in the "AS",0 cross reference and the last record in ^BOP(90355.1 is current, then the interface is running.

One other check that should always be done is to check the RPMS error monitor. If there is a problem with the first record ready to be transmitted, the rest of the transactions will not cross. In addition, the error will be created for that first record each time the future job is rescheduled, so you will see the same error every 3 to 5 minutes.

To get the interface past that "bad" first record, either a user or an IRM member may go into the troubleshoot menu and select CHK. If you can see that the same number shows up over and over again (through at least one iteration of a new future job being created), then when you are asked if you want to remove the "AS" cross reference, you may answer yes. That should allow the interface to get past the "bad" record and process all other records.

After removing the "AS" cross reference for the first record, if an error continues to occur, please contact the OIT Help Desk immediately.

Sometimes it may be appropriate to stop both sides of the interface Restarting the vendor system, then restarting the RPMS system will reset both systems and restart transmissions. Follow the process below:

1. Stop the job that is transmitting and the Monitor. There is a flag in the BOP Site file that can be used to stop the Monitor (The field is called Monitor Active. Make sure that field is set to OFF). The transmitter needs to be stopped by a programmer in programmer mode. You may have to wait a few minutes to ensure that all jobs have completed.

2. If the background jobs are still running, a programmer must go into the system and stop the jobs manually. The mumps utility to check the system status is %SS (to check if a job is running).

3. Contact the Automated Dispensing System Support Center. Have your Automated Dispensing System customer ID available. The Automated Dispensing System representative will dial in to stop the interface and will reboot the Automated Dispensing System if necessary. Please ask the Automated Dispensing System representative to remain on-line until you complete Step 4.

4. Before restarting the interface on the RPMS sytem, it is recommended that one use the CALL^%ZISTCP process described below to clear out the ip/socket combo used for the interface. If there are "ghost" jobs left on RPMS, using the CALL^%ZISTCP API will usually clear them out.

5. Restart the Monitor on the RPMS system.

Otherwise, the following can help to analyze the problem:

1. The transmission job is not running

   If the interface does not seem to be transmitting data to the vendor system, it may be because the monitor is not running. Check to see if the monitor has been scheduled. Use the BOP TROUBLESHOOT MENU to determine if the Future job exists and also if the Running jobs exist. If the Troubleshoot options says that there are no future jobs and no running jobs, then use the option BOP MONITOR to restart the interface. ONLY USE THE BOP MONITOR OPTION IF NO FUTURE OR RUNNING JOBS EXIST.

2. Check TCP/IP connections

   If the interface does not seem to be transmitting data to the vendor system, it may be a TCP/IP connectivity issue. Symptoms that indicate this kind of problem usually can be seen in the transmission files. Records will not be marked with the acknowledge flag and the vendor system will not have the patients on file that should be there.

Follow this procedure.

1. Stop the job that is transmitting and the Monitor. There is a flag in the system parameters that can be used to stop the Monitor. The transmitter needs to be stopped by a programmer.

2. Contact the Automated Dispensing System Support Center. Have your Automated Dispensing System customer ID available. The Automated Dispensing System representative will dial in to stop the interface and will reboot

the Automated Dispensing System if necessary. Please ask the Automated Dispensing System representative to remain on-line until you complete Step 4

3. Go to the RPMS machine and use the following code:

   (Example: vendor IP address = 111.22.33.44, port = 6000)

   D CALL^%ZISTCP("111.22.33.44",6000) W POP

   If POP = 0 a successful connection was made. Restart the RPMS Monitor. The systems should start communicating again. Have the Automated Dispensing System representative verify that data is being received from the RPMS system and is being passed to the Automated Dispensing System Console.

   If you get POP=0, which is a successful connection, you must close that connection when you are finished before you can try to restart the interface. Type the following to close the connection:

   D CLOSE^%ZISTCP

   If POP=1 there is not connectivity. At this point, advanced troubleshooting will be required to identify the exact cause of the communication problem. The Automated Dispensing System support personnel will assist in identifying the nature of the problem, and will contact the appropriate Automated Dispensing System or OIT personnel to resolve the issue.

12.0 Contact Information

If you have any questions or comments regarding this distribution, please contact the OIT Service Center by:

Phone: (505) 248-4371 or
(888) 830-7280

Fax: (505) 248-4363

Web: http://www.rpms.ihs.gov/TechSupp.asp

Email: ITSCHelp@mail.ihs.gov