VistA Imaging System

Technical Manual

February 2010 – Revision 26
MAG*3.0*93 and 101

Department of Veterans Affairs
Office of Enterprise Development
Health Provider Systems

VistA Imaging Technical Manual
VistA Imaging 3.0 Patch 54
February 2010

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VistA Imaging Office of Enterprise Development
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Preface

The purpose of this manual is to provide information about the structure and function of the logical components of the Veterans Health Information Systems and Technology Architecture (VistA) Imaging V. 3.0 package (i.e., files, routines, and configuration that comprise the VistA Imaging System). Although this document describes some security functions, sensitive information regarding the VistA Imaging System can only be found in the Security Guide.

This document describes…

- How to implement and maintain the VistA Imaging System, its routines and files, options, and cross-references among files.
- How files are archived and purged.
- The established relations among the VistA Imaging System components and other components inside and outside of the Imaging software.

The VistA Imaging System Technical Manual is part of a suite of manuals that includes a release notes document, security guide, user manuals and installation guides. Information about various VistA Imaging System components (i.e., servers, workstations, and background processors) can be found in the Installation Guide.

The Food and Drug Administration classifies this software as a medical device. As such, it may not be changed in any way. Modifications to this software may result in an adulterated medical device under 21CFR820, the use of which is considered to be a violation of US Federal Statutes.

VA Policy states the following:
Those components of a national package (routines, data dictionaries, options, protocols, GUI components, etc.) that implement a controlled procedure, contain a controlled or strictly defined interface or report data to a database external to the local facility, must not be altered except by the Office of Information (OI) Technical Services (TS) staff. A controlled procedure is one that implements requirements that are mandated or governed by law or VA (Department of Veterans Affairs) directive or is subject to governing financial management standards of the Federal Government and VA or that is regulated by oversight groups such as the JCAHO or FDA. A controlled or strictly defined interface is one that adheres to a specific industry standard, will adversely affect a package and/or render the package inoperable if modified or deleted. For national software that is subject to FDA oversight, only the holder of the premarketing clearance (510(k)) is allowed to modify code for the medical device. The holder of a premarketing clearance is restricted to specifically designated TS staff that are located at the registered manufacturing site and operating in the designated production environment. Modifying FDA regulated software under any other conditions is a severe violation of the Code of Federal Regulations. Local, that is field-based, developers are prohibited from modifying national software that is certified by the FDA.

Revision History	
10 Feb 2010	Patch 93 and Patch 101 updates, general cleanup (rev 26). M. Kaji, D. White, J. Kennedy - Updated sections 3.6.2, 6.3.1, 7.2.1, 7.2.3, 8.2, 11.1.2 for Patch 93. - New sections: 8.2 subsections, 11.1.3.4, 11.1.3.5, 11.1.3.6 for Patch 93. - Updated Sections 3.6.4, 6.3.5, 7.2.1, and Appendix A.5 for Patch 101.
20 Oct 2009	Patch 72 and Patch 54 updates; general cleanup (rev 25). A. McFarren, S. Littles - Updated sections 3.6.1 and 6.3.1 for Patch 72. - Revised content in section 6.2.3 (detail moved to Security Guide); removed outdated information from 15.1, 18.1.1, and 18.1.2.
19 Aug 2008	Patch 95 updates and misc. cleanup (rev 24) A. McFarren, D. Carozza - Updated and formatted patch list in section 3.1 - Updated section 6.3.1 for Patch 95 - Remove obsolete section related to test images and demo mode (6.3.1.1, 6.3.1.2, and 11.3.4.); remove redundant screen shots from Chapter 7; correct outdated content in section 9.5.2.1 (JL)
29 Feb 2008	Patch 59 updates (rev 23) - S. Davis, C. Huesman - Updated sections 6.3.1 and 6.3.3 for Patch 59. - New section Appendix B and B.1 for Means Tests Patch 59.
14 Jan 2008	Patch 76 updates and misc. corrections (rev 22). –A. McFarren, C. Huesman - Clarify MAG_DECOMPRESSOR content in section 6.3.6. - Updated sections 3.6.4 and 3.6.5 for p76
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04 May 2007	Patch 77, 46 and 65 updates (rev 20) – S. Davis, A. McFarren, C. Huesman - Added revision # to revision table, title page, and footer, corrected typo in section 9.5.4.4. - Updated sections 8.2 and 12.5.2 for Patch 77. - New section 12.6 for Imaging site reports Patch 77. - Updated sections 3.1, 3.3, 6.4.1, 6.4.3, 7.2.1, 8.2, 12.3, and 15.1 for Patch 46. - New section 12.5 for CCOW communication Imaging site reports for Patch 46. - Updates sections 3.3, 7.2.1, and 8.7 for Patch 65.
21 Jul 2006	Patch 50 and 20 updates (rev 19) - S. Davis, A. McFarren, R. Coney. - Updated section 12.5.2 for patch 78. - Updated the following sections for patch 20: 1.3, 5.1.1, 5.3.1.5, 6.4.2-3, 9.3.2, 9.3.3.1.1-8, 11.1.1 and 12.5.2. - Updated section 7.2.1 for patch 50.
30 Jun 2006	Patch 51 and 18 updates (rev 18) – A. McFarren, C. Huesman. - Added new section 6.4.6 and updated section 7.2.1 for patch 51. - Updated sections 3.3, 3.6, 5.1.2, 6.4.5, 7.2.1, 8.3, and A.5 for patch 18. - Updated obsolete information in sections 1.4 and 7.2.3
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5 April 2005	Additional Updates (rev 16): - Section 6.1.1 Checksums
28 Mar 2005	Additional Updates (rev 15): - Sections 6.4.1, 7.2.4, 10.2.3.1, 10.2.3.3, and 11.1.2, 16.1.2

Revision History	
9 Mar 2005	Patch 48 Updates (rev 14): - Sections 3.6 Security Keys, 6.1.1 Checksums, 6.4.1 Clinical Workstation Files, 6.4.2 Background Processor Files, 7.2.4 Further Information, 10.2.3.1 Input Array Sent to Import API, 10.2.3.3 Results Array Returned to Status Handler, 11.1.2 Delete Images and Pointers
30 Sept 2004	Patch 8 Updates (rev 13): - Section 3.3 Site Parameters - Section 3.6 Security Keys - Chapter 6 – Section 6.1.1 Routine Descriptions - Section 6.4.1 Clinical Workstation Files - Section 7.2.1 VA FileMan Files - Section 8.2 Imaging System Manager Menu - Section 10.2.3.1 Input Array Sent to Import API - Section 11.3.4 VistA Imaging Display, Demo Mode - Section 11.3.5 VistA Imaging Capture, Test Mode
23 June 2004	Patch 33 Updates (rev 12): - Section 6.4.1 Clinical Workstation Files - Appendix A.1 Clinical Workstation Error Messages - Appendix A.4 Setup Error Messages
30 April 2004	Patch 11 Updates (rev 11): - Chapter 6 Routine Descriptions - Section 7.2.1 VA FileMan Files - Section 8.9 Access to DICOM Gateway RPCs - Section 12.2.2 DICOM RPC Broker Calls
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9 Dec 2003	Patch 10 Updates (rev 9): - Section 7.2.1 VA FileMan Files
5 Nov 2003	Patch 22 Updates (rev 7): - Appendix A.6 VistARad Error Messages
30 Sept 2003	Patch 25 Updates (rev 8): - Section 7.2.1 VA FileMan Files
23 July 2003	Patch 23 Updates (rev 6): - Section 8.2 Imaging System Manager Menu - Section 12.5 MailMan Messaging Patch 27 Updates: - Section 8.2 Imaging System Manager Menu - Section 12.5 MailMan Messaging
7 May 2003	Patch 17 Updates (rev 5): - Section 7.2.1 VA FileMan Files - Section 7.5 Imaging Entity Relationship Diagram and Detailed Information
30 April 2003	Patch 19 Updates (rev 4) to section 8.2 Imaging System Manager Menu
30 Mar 2003	Patch 16 Updates (rev 3): to Appendix A.5 VistARad Installation Error Messages
10 Dec 2002	Patch 9 Updates (rev 2): - Addition of files 2006.035, 2006.036, 2006.59, 2006.5906, 2006.596 - Additional fields for file 2005.2 - Additional security key MAGJ DEMAND ROUTE - Modification to table 3.3 (collapse line-items for DICOM Gateway)
6 Sept 2002	Patch 7 Updates (rev 1): - Created changes pages for Sections 3.6, and 7.2.1. - Chapter 10 – revised

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Chapter 1 Introduction

1.1 Multimedia Patient Record

The VistA Imaging System is an extension to the Veterans Health Information System Technology Architecture (VistA) hospital information system that captures clinical images, scanned documents, motion images, and other non-textual data files and makes them part of the patient's electronic medical record. Electrocardiogram (EKG) waveforms can be displayed as part of the electronic medical record. Image and text data are provided in an integrated manner that facilitates the clinician's task of correlating the data and making patient care decisions in a timely, accurate way.

The system is designed to provide the treating physician with a complete view of patient data and, at the same time, allow consulting physicians to have access to the image and text data. It serves as a tool to aid communication and consultation among physicians -- whether in the same department, in different medical services, or at different sites.

The VistA Imaging System is unique in that management of the medical images is handled by the hospital information system, allowing very close integration of multimedia data with traditional patient chart information.

Clinical users can capture images during procedures or images can be added at a later time, for example during the creation of a report or progress note. Automatic image acquisition can be performed by DICOM gateways. Images can be acquired from commercial radiology Picture Archiving and Communications Systems (PACS) or directly from radiology devices. The transfer of patient demographic and order information to the commercial PACS or radiology device plays a key role in the ability to add these images to the patient's online medical record.

VistA Imaging workstations located throughout the hospital capture and display a wide variety of medical images including:

- Cardiology
- Endoscopy (GI, pulmonary, cystoscopy, arthroscopy, bronchoscopy, etc)
- Ultrasound (vascular, echo cardiology)
- Microscopic (Surgical Pathology, Cytology, Autopsy, Hematology)
- Surgery
- Ophthalmology
- Dental
- Dermatology
- Radiology images
- Nursing
- Podiatry
- Scanned advanced directives, consent forms, and other documents

VistA Imaging VistARad diagnostic workstations are generally located in the Radiology Reading room and are used for softcopy reading of Radiology images. These workstations provide functions for the Radiologist to retrieve and display full-resolution images, associated Radiology reports, and update the Radiology exam status.

1.2 Automated DICOM Image Acquisition

DICOM is the abbreviation for the **D**igital **I**maging and **CO**mmunications in **M**edicine standard. DICOM brings open systems technology to the medical imaging marketplace and enables VistA to communicate directly with commercial medical imaging equipment.

DICOM is a set of networked client/server applications that are implemented on top of TCP/IP. DICOM is part of the VistA networked application suite, along with CPRS, Kernel Broker, MS Exchange, and Windows-based file servers. Similar networking techniques are used for installing and maintaining all of these applications.

1.3 Background Processor

One or more PCs, preferably a file server, are required to manage the storage of Clinical and Administrative images.

1.3.1 Queue Processor

Often a site establishes secondary PC to process GCC (Generic Carbon Copy) and Import queues, but often all queues are processed from a single PC. Once the BP configuration is established the queue processor performs its processes without user intervention.

1.3.2 Purge

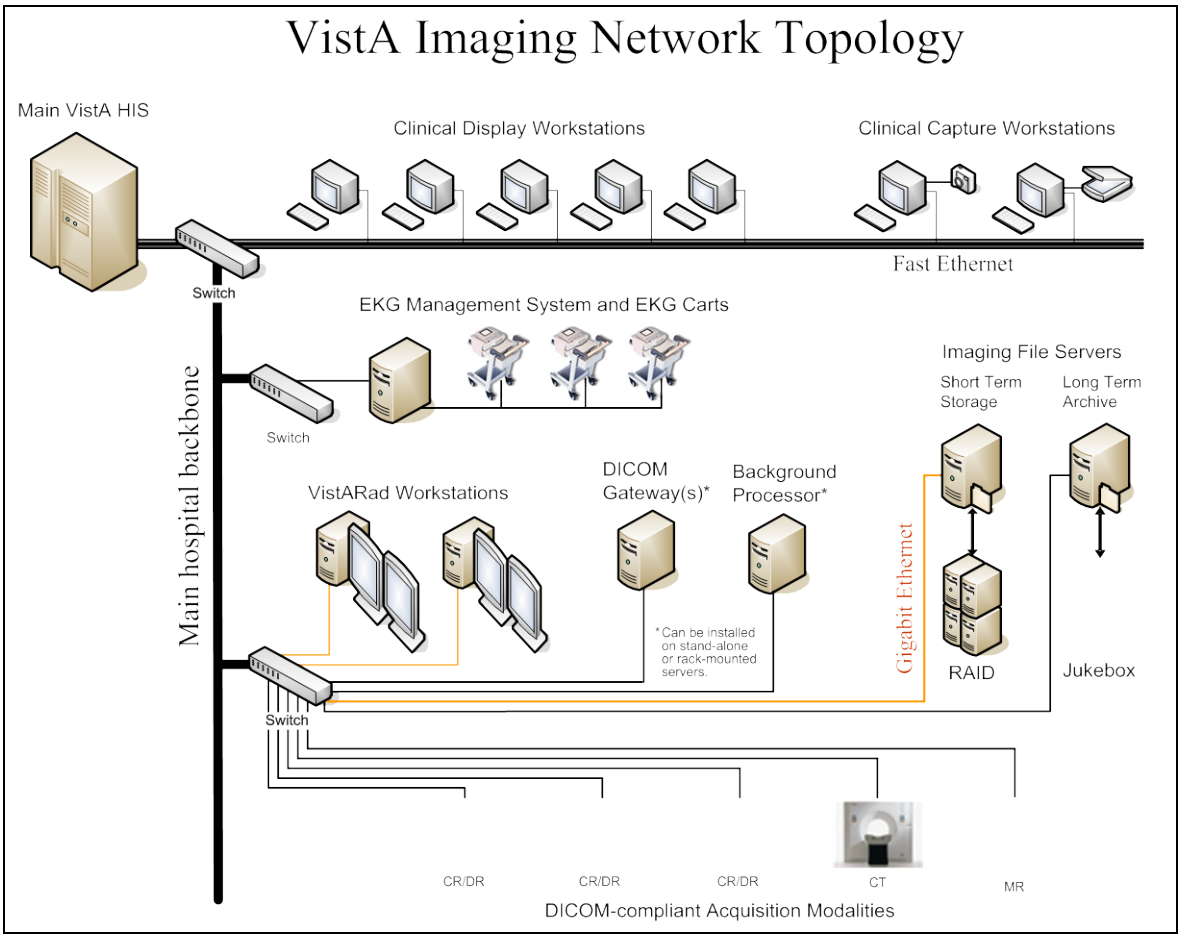
An automatic purge process can be configured when RAID storage becomes low and a regularly schedule purge can be configured to operate during off peak hours.

1.3.3 Verifier

There is Verification process that a site may use ensure the integrity of the Imaging database and the network that supports the images.

1.4 Typical Configuration

The diagram below shows a typical configuration of a VistA Imaging system.



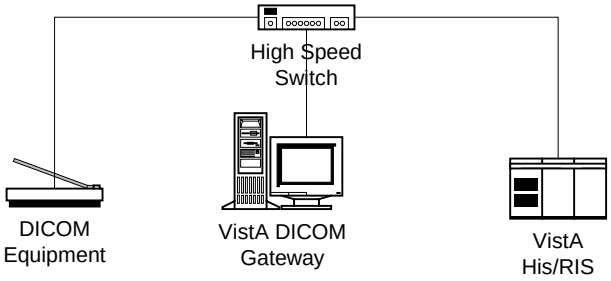
1.5 DICOM Gateway Networking Topology Options

The VistA DICOM Gateways may use either one or two networking interfaces depending upon whether the commercial DICOM devices are directly connected to the main network backbone or are located on separate physical networks.

1.5.1 Commercial DICOM Devices Connected to Main Network Backbone

Some sites may choose to have all devices (workstations, main hospital computer, DICOM imaging producing equipment, etc.) connected to a single high-speed switched network backbone. In this case, the VistA Image Servers, VistA DICOM Gateways, and Background Processor will all connect to the same switch on the high-speed backbone. Clinical and capture workstations will be connected to segments that feed into the backbone.

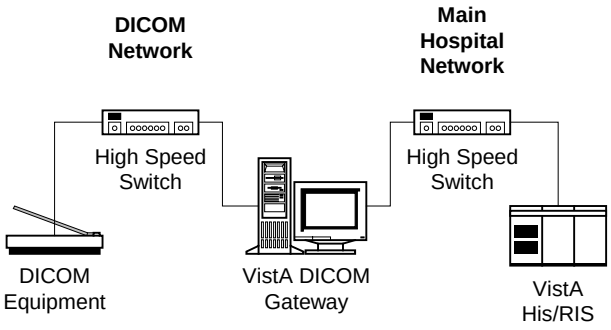
Single High-Speed Switched Network



1.5.2 Commercial DICOM Devices on Separate Physical Networks

Other sites may choose to have a separate dedicated network for the commercial DICOM devices and DICOM gateways. In this case, the VistA DICOM Gateway must have two network interfaces, one to connect to the main hospital network backbone, and the second to connect to the dedicated network for the commercial DICOM devices. This keeps the traffic on the two networks separate.

Separate Dedicated DICOM Network



Chapter 2 Orientation

2.1 Documentation Conventions

The following conventions are used in this manual.

Convention	Description
Bold type	User Keyboard Entry
<**RET**>	Return key or Enter key
<**SHIFT**>	Shift key
<**ESC**>	Escape key
<**Num Lock**>	Top left key on the numeric keypad (above the 7); may also be labeled Numeric Lock; this makes any keypad key activate the number shown on its surface; it is the equivalent of a SHIFT LOCK for alphabetic keys.

2.2 Special Workstation Procedures

Command	Action
Reboot	1. Push the RESET button on the front of the workstation. 2. If there is no RESET button, power the workstation off and then on; the computer will reboot. 3. It will perform a virus check and load all required software; this takes about 30-60 seconds. 4. When the reboot process is complete, you should be able to sign back into the workstation.

2.3 Mouse/Windows Controls

Control	Description
Mouse button click	• The mouse is a device used to point at positions on the screen. • The mouse may have one, two, or three buttons. • The mouse should be held at the end opposite the cord so the fingers can press the buttons. • The buttons are referred to as the "Right Mouse Button", the "Left Mouse Button", and the "Center Mouse Button". When the mouse is rolled around on a flat surface, the arrow cursor on the screen will move correspondingly. • Pressing and releasing a button is called "clicking". You may position the arrow over a portion of the window, such as a button or scroll bar, and then click. This will cause the computer to do something such as display an image, depending on the window. • When the instructions tell you to “press the mouse button,” you can assume that you are to press the left mouse button.
Select	You may also select a rectangular area on the window, by following these steps: 1. Position the arrow cursor so it is over the left upper corner of the area to be selected. 2. Press the left mouse button down and hold it down while you move the mouse to the right lower corner of the rectangle to be selected. 3. Release the mouse button. You will see a dotted rectangle on the window around the area selected.

Control	Description
Drag	If you want to move a window to another area of the window (e.g., to see something on a window that is underneath), follow these steps: 1. Position the cursor over the top colored title area of the window to be moved. 2. Press the left mouse button down and move the mouse until the window is where you want it. 3. Release the mouse button. This is called "dragging" a window.
<=>	You may adjust the size of the window by following these steps: 1. Place your mouse at the edge of the window that you would like to move. 2. When you see the cursor turn into a double ended arrow <=>, hold the left mouse button down, and move the mouse until the image is the width and/or height that you would like. 3. Let go of the left mouse button.

Chapter 3 Implementation and Maintenance

3.1 VistA Package Requirements

The VistA Imaging System is designed to be used in conjunction with the following VistA packages. Kernel, FileMan and RPC Broker are required packages. Other packages will depend on the site's implementation requirements.

- Kernel V. 8.0
- FileMan V. 22
- RPC Broker 1.1 – required for interfacing with the hospital database.
- Consult/Request Tracking V. 3.0-required for capturing images to the Consult/Request Tracking package.
- Medicine V. 2.3 – required for capturing images to the Medicine package.
- Laboratory V. 5.2 – required for capturing images to the Laboratory package.
- Radiology V. 5.0 – required for capturing images to the Radiology package.
- Surgery V. 3.0 – required for capturing images to the Surgery package.
- TIU V. 1.0 – required for capturing images to the Text Integration Utility package.
- PIMS V 5.3 – required for displaying Patient Profile report and patient security lookup.
- Health Summary 2.7 – required for displaying Health Summary report.

The software developers for the following patches have developed callable routines to support GUI applications such as the VistA Imaging System. Please ensure that the following patches are installed for the applications that VistA Imaging will be used with. Patches are available via the National Patch Module on FORUM.

DG*5.3*124	LR*5.2*121	RA*5.0*23
DG*5.3*249	MC*2.3*30	RA*5.0*53
DG*5.3*265	TIU*1.0*1	SR*3.0*66
DG*5.3*276	TIU*1.0*47	XWB*1.1*28
DG*5.3*277	TIU*1.0*63	XWB*1.1*41
GMRC*3.0.51	TIU*1.0*223	XWB*1.1*34

3.2 Hardware and Software Requirements

Contact your Implementation Manager for information about VistA Imaging equipment.

The VistA Imaging software requires that a network be present with sufficient capacity to transport image files in a reasonable amount of time. All network set-ups must be completed **before** VistA Imaging computers can be installed.

3.3 Imaging Site Parameters

Within the VistA Imaging System, a number of sets of tunable parameters are used. The table below indicates which components use which parameters.

Name	Notes	Used by → Back. Proc.	DICOM G/W	Capture	TeleReader	Display	VistARad
IMAGING SITE PARAMETERS (#2006.1)	Stored on VistA Host; general site parameters for Imaging.	Yes	Yes	Yes	Yes	Yes	Yes
IMAGING USER PREFERENCE (#2006.18)	Stored on VistA Host; user- and site-specific parameters for Capture and Display workstations.	-	-	Yes	Yes	Yes	-
MAGJ USER DATA (#2006.68)	Stored on VistA Host; user-specific parameters for VistARad workstations.	-	-	-	-	-	Yes
MAG VISTARAD SITE PARAMETERS (#2006.69)	Stored on VistA Host; site-specific parameters for VistARad workstations.	-	-	-	-	-	Yes
MAG CT PARAMETER (#2006.621)	Stored on VistA Host; contains parameters for performing Hounsfield calculations or TGA-to-DICOM conversions of CT images processed before the installation of Patch 50.	-	-	-	-	-	Yes
MAG CR PARAMETER (#2006.623)	Stored on VistA Host; contains correction parameters for older CR images processed by specific versions of the Fuji Flash IIP consoles.	-	-	-	-	-	Yes
DICOM GATEWAY PARAMETER (#2006.563)	Individual copies stored in `^MAGDICOM` on each DICOM Gateway. Must be accessible even VistA is not accessible.	-	Yes	-	-	-	-
MAG308.INI	Individual copies stored on each Capture and Display workstation; contains workstation specific parameters.	-	-	Yes	Yes	Yes	-
MAGJ.INI	Individual copies stored on each VistARad workstation; contains workstation specific parameters.	-	-	-	-	-	Yes

3.4 Maintenance of Software on DICOM Gateway Workstations

This section is obsolete as of the release of Patch 11. Refer to the Imaging DICOM Gateway Installation Guide for information about software installation and maintenance.

3.5 Changes to IP Addresses or Ports

Any changes to the IP addresses for the VistA servers or changes to the Kernel RPC Broker Listening port(s) will require updating on the VistA Imaging workstations (refer to the Broker Technical and User Manuals).

3.6 Security Keys

There are a number of security keys associated with the VistA Imaging system. The following tables summarize security keys and their function.

3.6.1 General Security Keys

Note: Please be cautious when assigning the following keys; the keys are intended for Imaging Support personnel. Review the descriptions before assigning these keys.

General Security Keys	
MAGDFIX ALL	Allows the holder to perform DICOM CORRECT functions on any entry in the DICOM FAILED IMAGE File (#2006.575). Users who do not hold this key will only be able to correct entries that were captured on their own site's gateway.
MAG DELETE	This key allows the holder to delete images from the IMAGE File (#2005). Pointers in parent packages such as Medicine, Surgery, Lab, Radiology, and TIU will also be deleted.
MAG PREFETCH	This key allows a user to 'PreFetch' or Queue all images for a patient. This means that all images for a patient that are on the jukebox will be copied from the jukebox to the magnetic server cache.
MAG SYSTEM	Given to person(s) managing VistA Imaging Systems. Required to modify site parameters via the Background Processor or to modify workstation parameters via the MAGSYS application. Also enables the display of DICOM header data for radiology images on Clinical Display workstations.

3.6.2 Security Keys for Clinical Display

The following keys are used for display of images and should be limited to appropriate personnel:

Display-related Security Keys	
MAG RAD SETTINGS	User can edit the CT Presets in the Clinical Imaging Display Radiology Viewer window.
MAG ROI	User can print or copy images without having to enter an electronic signature. This key should be assigned only to the HIMS Release of Information Officer.
MAGDISP ADMIN	User can display images associated with the Admin Document specialty. This key should be assigned to one or two designated users.
MAGDISP CLIN	User can display clinical images/documents.
MAG EDIT	The MAG EDIT key is used to correct an image field when an index field is incorrect or incomplete, such as correcting a wrong specialty that was selected. Only users assigned the MAG EDIT key can edit an image. The MAG EDIT key is also required to access the QA Review Utility when performing quality assurance reviews of the scanned images. Only the Chief, HIM or authorized designated personnel e.g., VistA Imaging Coordinator, Scanning Supervisor) should be assigned this key.
MAG PAT PHOTO ONLY	User can view only the patient photo.

3.6.3 Security Keys for Clinical Capture

Note: If the 'CAPTURE KEYS' site parameter has been initialized, the following keys will need to be assigned appropriately.

Capture-related Security Keys	
MAG CAPTURE	Allow capture of images without an associated specialty (i.e. 'NONE' on the Imaging Capture configuration window).
MAG NOTE EFILE	User can electronically file notes without an electronic signature from the Imaging Capture workstation.
MAGCAP ADMIN	Allow capture of images associated with the 'Admin Document' specialty.

Capture-related Security Keys	
MAGCAP CP	Allow capture of Clinical Procedure images.
MAGCAP LAB	User can capture Laboratory images from the Imaging Capture workstation.
MAGCAP MED C	User can capture Cardiology images from the Imaging Capture workstation.
MAGCAP MED G	User can capture GI images from the Imaging Capture workstation.
MAGCAP MED GEN	User can capture Generic Medicine images from the Imaging Capture workstation.
MAGCAP MED H	User can capture Hematology images from the Imaging Capture workstation.
MAGCAP MED HI	User can capture Internal Medicine / Hematology images from the Imaging Capture workstation.
MAGCAP MED I	User can capture Internal Medicine images from the Imaging Capture workstation.
MAGCAP MED N	User can capture Neurology images from the Imaging Capture workstation.
MAGCAP MED P	User can capture Pulmonary / Endoscopy images from the Imaging Capture workstation.
MAGCAP MED PF	User can capture Pulmonary Function Test images from the Imaging Capture workstation.
MAGCAP MED R	User can capture Rheumatology images from the Imaging Capture workstation.
MAGCAP MED Z	User can capture Consult images from the Imaging Capture workstation.
MAGCAP PHOTOID	User can capture Photo ID images from the Imaging Capture workstation.
MAGCAP RAD	User can capture Radiology images from the Imaging Capture workstation.
MAGCAP SUR	User can capture Surgery images from the Imaging Capture workstation.
MAGCAP TIU	User can capture TIU images from the Imaging Capture workstation.

3.6.4 Security Keys for VistARad

The following keys are related to VistARad and should be limited to appropriate personnel:

VistARad-related Security Keys	
MAGJ DEMAND ROUTE	User can access VistARad's on-demand routing capability. On-demand routing can be used to manually send exams to remote sites. For more information, refer to the *VistA Imaging Routing User Guide*.
MAGJ DEMAND ROUTE DICOM	Allows the user to use the on-demand routing function to queue exam images to be routed to selected remote DICOM destinations. This function only works for sites that have been configured for routing of images. An updated Routing agreement needs to be submitted and approved by the VistA Imaging Group before this function can be used.
MAGJ OVERRIDE ANNOTATIONS	Grants to a radiologist user of VistARad access to the menu option 'Override Annotations' when viewing an exam whose status is 'Complete.' This functionality is detailed in the *VistARad User Guide*.
MAGJ SEE BAD IMAGES	User can view images in VistARad that are associated with an exam that has failed the "Patient Safety" database checks.
MAGJ STORE IMAGES	Allows VistARad users to save Voxar images as secondary captures to VistA.
MAGJ SYSTEM MANAGER	Allows access to Voxar-related settings in the VistARad Settings dialog. Grants access to additional data in the Imaging Internal Data display window. This functionality is detailed in the VistARad User Guide and Imaging System Installation Guide. Should only be assigned to VistARad administrators.
MAGJ SYSTEM USER	Allows a user to create and delete site-level hanging protocols, templates, and image presets associated with the VistARad 'sysAdmin' user.
MAGJ VOXAR COPYIMAGE	Allows VistARad users to copy images using Voxar (Enables the **Copy to Clipboard** button in the Voxar Reading manager window; refer to Voxar documentation for more information.)
MAGJ VOXAR EXPORTCAPTURE	Allows VistARad users to export images using Voxar (Enables the three **Export**-related buttons in the Voxar Reading manager window; refer to Voxar documentation for more information.)
MAGJ VOXAR PRINTCOMPOSER	Allows VistARad users to print images using Voxar (Enables the **Print Composer** button in the Voxar Reading manager window; refer to Voxar documentation for more information.)

3.7 Workstation Hardware

Workstations tend to collect dust inside of the chassis. They should be periodically opened and cleaned. The accumulation of dust can lead to heat damage of workstation components. Only a qualified individual should do further hardware maintenance.

The monitors used with the VistARad diagnostic workstations require periodic calibration to maintain the proper grayscale luminance display characteristics necessary for accurate image quality. A program of maintenance for these monitors should be established and administered by the Biomedical Engineering staff. A calibration/maintenance log should be kept, as such documentation may be required for review by regulatory bodies.

3.8 Changes to DICOM Modalities

When DICOM Modalities are added, or operational parameters are to be modified, see the *VistA Imaging DICOM Gateway User Manual* for the procedures to record the appropriate new values for the various parameters.

3.9 Changes to Windows Servers and Security

Any changes to Image server shares or server security require updates to VistA files. See the *VistA Imaging System Installation Guide* for details.

3.10 Microsoft Patch Installation Guidelines

Sites should use the following guidelines for installing Microsoft patches on VistA Imaging Clinical workstations, DICOM gateways, VistARad workstations, and Imaging file servers.

The nature of the Microsoft patch dictates if it should be installed immediately, after validation, or not at all. For any patch that is installed, use steps detailed in "Procedures for Updates" below.

- **Critical security updates -** Install immediately after they are released from Microsoft.
- **Service Packs** - VistA Imaging will verify with solution vendors that there are no known issues and then will field test the service packs at 4 test sites with monitoring from Silver Spring. The field test will last approximately 2 weeks. If no issues arise, all sites will be instructed to install the service pack.
- **Internet Explorer major version upgrades** (i.e. v5.5 to v6) – Are to be handled the same as service pack updates.

  Note: IE-related critical security updates should be installed immediately after they are released from Microsoft.
- **Minor software updates** (media player, etc.) – Do not install unless validated by the VistA Imaging team.

Procedure for updates (critical components)

All updates should be applied methodically to critical Imaging components (file servers, gateways, VistARad Workstations).

1. Ensure that all VistA Imaging components are working properly before installing any updates.
2. Ensure that service packs, non-critical Internet Explorer upgrades, and minor software updates are validated by VistA Imaging (see above).
3. Schedule the installation for a time when system usage is low (in case a reboot is required).
4. Apply each update one at a time.
5. Apply each update to one critical system. Monitor that system for at least 1 day before updating other systems.
6. Do not load updates on all critical systems without first testing on a single system of each type.
7. Report any problems to the National Help Desk immediately.

Notes for Clinical Workstations
For clinical (non-diagnostic) workstations, it is recommended that:

- Microsoft patches should be loaded one at a time, and onto a single workstation only.
- After verifying that the workstation works properly, and that no unexpected issues arise, the patch can be installed on all workstations.

Any problems should be reported to the National Help Desk.

Chapter 4 Security Software Maintenance

4.1 Security and Anti-virus Considerations

VistA workstations are multi-purpose, multi-function medical systems. These workstations usually enable the users to run all of the VA's application software (including VistA Imaging), the Microsoft Office Suite, e-mail, Internet and other commercial products, as needed by the hospital staff. The workstations should be configured to provide medical information security (as specified by the VA's security staff), and they must have the latest version of anti-virus software protecting them.

Windows security features should be used to restrict user access and protect system and other areas that should not be accessed by users. For additional information, see the *VistA Imaging Installation Guide* and the *VistA Imaging DICOM Gateway Installation Manual*.

VistARad Diagnostic workstations must be excluded from automatic software update/inventory tracking packages, and any client software supporting these cannot be installed. For information about removing SMS, please review the *VistA Imaging Installation Guide*.

Chapter 5 Space, Staffing, and Standard Operating Procedures for VistA Imaging

5.1 Infrastructure Resources

5.1.1 Networking

VistA Imaging Clinical Workstations run best with at least a 100 mb/s network, however they can be run over a 10 mb/s network.

The Background Processor (BP) application operates on a windows-based PC. It is recommended that it operate on a file server and that file server has a minimum of a gigabyte of RAM.

The VistA Imaging DICOM Gateway requires a hospital network infrastructure having a backbone that will support Ethernet segments with at least 100 megabits per second throughput. It is best to place the servers and Background Processor on the same switch with the gateways.

VistA Imaging VistARad workstations should be on their own separate 1Gb/s network connection to the file servers whenever possible. This is especially important when more than two diagnostic workstations are in use in the radiology department. The VistARad workstations can run acceptably on a 100mb/s network, but speed of image retrieval and display may be compromised.

5.1.2 Space

Each VistA Imaging DICOM Gateway runs on a Windows-based workstation with a monitor having a resolution of 1280x1024 pixels or better. Space is required for the system, its monitor, keyboard and mouse.

The Background Processor also runs on a Windows-based workstation and requires similar physical space.

The VistARad software runs on a Windows-based workstation using one to four monitors having a resolution sufficient for diagnostic reading. An additional workstation running voice dictation software may be present as well. Allow adequate space for the workstation(s), all monitors, keyboards, pointing devices, and dictation devices. In addition, plan for adequate room cooling and for room lighting that is suitable for diagnostic reading requirements.

5.1.3 Power

It is strongly recommended that the power supply to each VistA Imaging server, jukebox, DICOM Gateway, and Background Processor be safeguarded by means of an **U**ninterruptible **P**ower **S**upply (UPS). This will reduce line voltage problems as well as protect against power outages.

5.1.4 Remote Access

In order to allow the VistA Imaging Project Support Staff to gain access to the servers and workstations that are running the VistA Imaging, a copy of either PC-Anywhere (preferred) or Remotely Possible (servers) must be installed on each server or workstation. These should be configured as a *host*. These systems should never be hooked up to a modem.

5.1.5 Security

Remote access must be password protected. Be sure to keep the VistA Imaging Project Support Staff updated when any such passwords are changed.

5.2 Support

5.2.1 IRM Support Staff Requirements

IRM support for VistA Imaging may require one or more staff members, depending on the size of the installation. These staff members must possess knowledge of VistA, Microsoft Windows, networking, and troubleshooting problems with Windows and TCP/IP. These staff members will need administrator privileges and should have a good foundation in Windows to cover troubleshooting, permissions and set-up. Network support will be needed to troubleshoot and maintain routing, wiring and configurations where packet filtering is in use.

Team members should be comfortable with the following areas:

- *User Manager* for Domains
- Setting permissions
- Shares
- *Server Manager* for setting up shares
- *Event Viewer*
- *Ping*, *TraceRT*, *NetStat*, and *DICOM_Echo*
- *TCP/IP troubleshooting techniques*

These staff members will be responsible for supporting Windows-based magnetic and jukebox servers, installing VistA Imaging patches, correcting information in VistA relating to the relationships between patients and images, installing workstations and workstation capture devices, and managing the Background Processor and DICOM gateways. This staff member is responsible for assigning Imaging keys and menus to the users.

VistA package support staff should cover the installation of Imaging KIDS patches and issues like translation tables and journaling. In addition, a staff member with experience in M should be available to assist in editing global variables and using FileMan to make corrections as necessary to correct situations such as the incorrect assignment of an image to a patient.

5.2.2 Biomedical Engineering Support Staff Requirements

Someone experienced in Biomedical Engineering and/or network support will be needed to install and troubleshoot modalities, display and capture workstations, capture devices, network and server systems, and to calibrate diagnostic workstation monitors. The amount of time required for these duties will vary with the size and specifics of the installation.

This staff will be responsible for ensuring that the modalities maintain their connections to the network and are able to communicate with the gateway systems. These staff members should be able to monitor modality traffic and to distribute modality traffic over different gateway processors, depending upon local traffic conditions and circumstances.

5.2.3 ADPAC Staff Requirements for Support for All Medical Services

These staff members will need to know how to use, teach, and support the VistA Imaging system. They should have a close relationship with the IRM staff so that problems may be reported and so that they may be of assistance in the resolution of these problems. The ADPACs will need to assist in implementing and customizing the VistA Imaging System for various specialties. They will need to trouble-shoot issues related to how VistA Imaging System fits into the practice of medicine. They will be the first line of support in the use of the VistA Imaging package and will need to assist the end-users. ADPACs should be able to train key users who can then, in turn, train other users on the VistA Imaging System.

The ADPACs will be responsible for being key advocates of the VistA Imaging system. It is essential that the ADPACs be proactive people. They will need to "walk the hospital" in the morning to be sure that users are not having problems. They will need to check on the modalities to ensure that they are working properly. These staff members may also be called upon to assist in correcting image header information, so that images are properly assigned to the right patients. The correcting of image headers is an event that does not happen often but one that may occur when the modality does not have an automatic worklist capability but requires end-user interaction to provide the patient name, social security number and radiology accession number.

5.3 Daily Activities

Standard practices should be followed, including doing complete backups prior to installation of any new software or patches. For every processor in the suite of equipment for the VistA Imaging system, documentation should be maintained indicating what versions of which software are running and when new versions or patches are installed. In addition, this documentation should include information on the dates of installation, and who participated in the installation of software, patches or updates, and any unusual occurrences at the time of installation. Records should be kept of any problems that occur at the site, their cause and resolution.

5.3.1 IRM Morning Routine

Each morning the standard operating procedure should be to perform the tasks listed below in order to ensure the normal daily operation of the system.

5.3.1.1 Check the Imaging Network

Use Ping and other utilities, such as browsing, to ensure that all servers, gateways and modalities are reachable through the network.

5.3.1.2 Check the Jukebox for Sufficient Platters in the Write Path

Physically check the jukebox and its console to see which platters are currently loaded. Ensure that there are sufficient disks loaded to cover the day's operations and that there are new ones available to be used when needed.

5.3.1.3 Check Current Write Locations for Sufficient Disk Space

Check the disk space on the servers and gateways. If images are accumulating on the Image Gateway and are not being passed to the VistA Imaging Servers, check for gateway problems. Correct any header information to associate images with the correct patient and allow the gateway to get the images in question moved to the VistA Imaging Servers.

5.3.1.4 Check the Event Viewer Trap on Imaging Network

Use the *Event Viewer* (under Administrative Tools) to display alerts. These logs may be filtered to show only warnings and alerts. It is a good practice to periodically save these logs to removable media and flush the logs. This will keep disk space usage to a minimum and still allow for old logs to be viewed.

5.3.1.5 Check the Imaging Background Processor

Use the Queue Manager on the Background Processor to check for failed queues. The Queue Manager should be invoked by using the menu system on the BP Queue processor window.

To check for failed queues, click **Edit | QueueManager | by Queue Status** and browse each queue type. This will give a list of the various failed queue by way of the error message. This information will provide some insight as to what processes are failing and why.

5.3.1.6 Check that the DICOM Image and Text Gateways are Up and Functioning

Look for any error messages in the open windows. For each processor, make sure that there are windows open for listening and accepting images from those modalities that are assigned to that processor. MSM must be up and running on all gateways, as well as the display windows for the various monitoring sessions. If any of these are not running, restart them. Be sure that the VistA HIS is running.

5.3.1.7 Check that the DICOM Image Gateway Modalities are Sending Images

The ADPACs and end-users will generally let the IRM know if the modalities are not able to send or store images, however, it is good practice to check on this at the beginning of the day. Check the queue lengths.

5.3.1.8 Review The Image_In Directory for Incomplete DCM Files

Review the entries in the Dicom\Image_In directory for any files with "_incomplete" appended to the file name. These are incomplete files received by a modality or a PACS interface that the DICOM image gateway could not process. Research the files to see if the entity resent them at a later time or the images were never received. These files will automatically be purged after one hour.

On the main hospital system, check to see if the DICOM Failed Image File (#2006.575) has entries that need correcting. If there are "failed image files", work with the ADPACs and end-users to correct the information in the image headers and to associate these image files with the correct patients.

5.3.1.9 Review the MUMPS Error Traps

Review the MUMPS error traps on all of the DICOM Gateways and the main hospital system. Look for error messages related to the imaging routines (MAG*). If there are any errors that cannot be resolved by the local IRM staff, log a Remedy call so the VistA Imaging support staff may assist in their resolution. However, local IRM staff can easily address most error conditions.

5.4 Maintenance

Do an incremental tape backup of all Imaging servers (new images captured) or update copy media if doing media copies.

5.5 Weekly Activities

Do a full backup of Imaging servers using the procedures in place at your site. For additional information, refer to Appendixes B and C in the *VistA Imaging Installation Guide*.

5.6 Other Periodic Activities

Support for the VistA Imaging systems includes activities for support of Windows-based servers and the VistA System. Backups should be made for all systems. Current patches should be loaded for VistA. Service Packs for Windows and updates to the VistA Imaging software should be installed as they are released.

- Use the Background Processor utilities to re-queue failed entries and to purge the queues.
- Review the monthly Image Site Usage mail message to ensure all workstations have latest software installed.
- Before installing any new software or patches, first do a full backup, including the Registry files.
- For the VistARad diagnostic workstation monitors, calibration should be checked on a scheduled basis, at least monthly—more frequently is preferred. Consult the

recommendations of the monitor manufacturer. Re-calibration should be performed whenever the calibration check reveals a need to do so. Also, whenever any part of the monitor/video driver hardware configuration is altered, a new calibration must be performed. Examples of configuration changes include: re-setting brightness or contrast controls; removing or replacing a monitor; removing or replacing a video board; replacing the system PC; etc.

5.7 Scheduled Down Time for VistA Servers

During a VistA System outage, DICOM Gateways will continue to provide modality worklist functionality and to capture images that are temporarily stored on the gateway. This is important to allow the radiology department to continue to perform studies. If you anticipate that the VistA System must be down, it is best to take the following steps:

- Perform all DICOM fixes before the VistA System goes down. This will free the maximum space for temporary image storage.

During the outage, watch the gateways to be sure they still have adequate space to store images.

Chapter 6 Routine Descriptions

The Food and Drug Administration classifies this software as a medical device. As such, it may not be changed in any way. Modifications to this software may result in an adulterated medical device under 21CFR820, the use of which is considered to be a violation of US Federal Statutes.

VA Policy states the following:

Those components of a national package (routines, data dictionaries, options, protocols, GUI components, etc.) that implement a controlled procedure, contain a controlled or strictly defined interface or report data to a database external to the local facility, must not be altered except by the Office of Information (OI) Technical Services (TS) staff. A controlled procedure is one that implements requirements that are mandated or governed by law or VA (Department of Veterans Affairs) directive or is subject to governing financial management standards of the Federal Government and VA or that is regulated by oversight groups such as the JCAHO or FDA. A controlled or strictly defined interface is one that adheres to a specific industry standard, will adversely affect a package and/or render the package inoperable if modified or deleted. For national software that is subject to FDA oversight, only the holder of the premarketing clearance (510(k)) is allowed to modify code for the medical device. The holder of a premarketing clearance is restricted to specifically designated TS staff that are located at the registered manufacturing site and operating in the designated production environment.

All routines, files and fields of the VistA Imaging package may not be altered except by the OI Technical Services (TS) staff. This software is regulated by the FDA and implements controlled procedures.

6.1 VistA Imaging Routines on the VistA Hospital Information System

6.1.1 Build Checksums

The Calculate and Show Checksum Values [XTSUMBLD-CHECK] menu option can be used as shown below to display a list of checksums for a specified build (KIDS file).

```
Select Programmer Options Option: CALCulate and Show Checksum Values

This option determines the current Old (CHECK^XTSUMBLD) or New (CHECK1^XTSUMBLD)
 logic checksum of selected routine(s).

     Select one of the following:

          1         Old
          2         New

New or Old Checksums: New// 1  Old

This option determines the current checksum of selected routine(s).
The Checksum of the routine is determined as follows:
```

```
1. Any comment line with a single semi-colon is presumed to be
   followed by comments and only the line tag will be included.

2. Line 2 will be excluded from the count.

3. The total value of the routine is determined (excluding
   exceptions noted above) by multiplying the ASCII value of each
   character by its position on the line being checked.

     Select one of the following:

          P         Package
          B         Build

Build from: Build

This will check the routines from a BUILD file.

Select BUILD NAME: MAG*3.0*65       IMAGING

MAGDCRP   value = 5933815
MAGDCTP   value = 6346229
MAGJEX1   value = 25464807
MAGJEX1A  value = 24747878
MAGJEX1B  value = 11594499
MAGJLST1  value = 14901163
MAGJMN1   value = 15056848
MAGJUTL1  value = 16248767
MAGJUTL2  value = 15423285
MAGJUTL3  value = 13396263
MAGJUTL5  value = 15726176
done
```

6.1.2 Package Checksums

The Calculate and Show Checksum Values [XTSUMBLD-CHECK] menu option can be used as shown below to display a list of checksums for all routines in the Imaging Package. Imaging routines are under the MAG namespace.

```
Select Programmer Options Option:  CALCulate and Show Checksum Values

This option determines the current Old (CHECK^XTSUMBLD) or New (CHECK1^XTSUMBLD)
 logic checksum of selected routine(s).

     Select one of the following:

          1         Old
          2         New

New or Old Checksums: New// 1  Old

This option determines the current checksum of selected routine(s).
The Checksum of the routine is determined as follows:

1. Any comment line with a single semi-colon is presumed to be
   followed by comments and only the line tag will be included.

2. Line 2 will be excluded from the count.

3. The total value of the routine is determined (excluding
   exceptions noted above) by multiplying the ASCII value of each
   character by its position on the line being checked.

     Select one of the following:

          P         Package
```

```
          B         Build

Build from: Package


All Routines? No => No

Routine: MAG*

Routine:
230 routines

MAG7RS    value = 12193599
MAG7RSD   value = 5995508
MAG7RSO   value = 4178690
MAG7RSR   value = 4411159
MAG7UDR   value = 4129505
MAG7UFO   value = 3674965
MAG7UM    value = 8130703
MAG7UP    value = 11177267
MAGBAPI   value = 15534632
MAGBAPIP  value = 4631561
MAGBRTE3  value = 5833319
...
...
done
```

6.1.3 Routine Descriptions

To obtain a brief description for all VistA Imaging routines, the First Line Routine Print [XU FIRST LINE PRINT] menu option. Including the second line in the report will show which patches have made changes to the routine. This menu option is part of Programmer Options [XUPROG] under sub-menu Routine Tools [XUPR-ROUTINE-TOOLS].

VistA Imaging routines are under the MAG namespace. The following is an example:

```
Select OPTION NAME: PROGRAMMER OPTIONS  XUPROG     Programmer Options

Select Programmer Options Option: ROUTINE Tools

Select Routine Tools Option: FIRST Line Routine Print

PRINTS FIRST LINES

routine(s) ?   >   MAG*
searching directory ...
routine(s) ?   >

(A)lpha, (D)ate ,(P)atched, OR (S)ize ORDER: A//
Include line 2? NO//
DEVICE: HOME//
```

6.2 DICOM Gateway Routines

The VistA Imaging DICOM Gateway requires a number of M routines. Most of these are part of the VistA Imaging package. However, because the DICOM gateways run as standalone workstations, they must include some routines from other packages. A few routines must run in the manager UCI.

6.2.1 Checksums of VistA Imaging DICOM Gateway Routines

The following listing reflects the VistA Imaging M routines that reside on the VistA Imaging DICOM gateway system.

Routine	Checksum
MAG7UP	35026432
MAGBRTA4	73323436
MAGBRTA5	73969329
MAGBRTA6	12479695
MAGBRTB1	26772420
MAGBRTB2	62448973
MAGBRTB3	21639509
MAGBRTB4	29268889
MAGBRTK	19749419
MAGBRTLR	10848658
MAGBRTP1	30941600
MAGDACP1	64531548
MAGDACP2	5612621
MAGDACP3	41171278
MAGDACR1	33293963
MAGDACR2	16258693
MAGDACR3	55462381
MAGDACU	8269447
MAGDACU0	10807003
MAGDACU1	38544788
MAGDACU2	7237662
MAGDACU3	8904229
MAGDACW1	48007177
MAGDACW2	26199743
MAGDAUD1	21787487
MAGDAUD2	11632745
MAGDAUD3	4475591
MAGDBB	51899412
MAGDBB2	22088679

Routine	Checksum
MAGDCIGL	14772888
MAGDCIRL	19614608
MAGDCMPE	15269197
MAGDCST1	71046946
MAGDCST2	32420227
MAGDCST3	12356196
MAGDCST4	38314573
MAGDCST5	11640174
MAGDCST6	21003965
MAGDDEL	4367093
MAGDDEL1	7861418
MAGDDEL2	31000923
MAGDDEL3	7544616
MAGDDR0	53556787
MAGDDR1	48401978
MAGDDR2	32387608
MAGDDR2A	68048092
MAGDDR3	42865716
MAGDDR7	19337667
MAGDDW0	18480829
MAGDDW1	33149904
MAGDDW2	45331856
MAGDDW3	35962080
MAGDDW4	73618612
MAGDECHO	9429115
MAGDEXC1	41469390
MAGDEXC2	53045931
MAGDFCNS	73892007
MAGDFND0	23608364

Routine	Checksum
MAGDFND1	17372953
MAGDFND2	82916429
MAGDFND3	63710119
MAGDFND4	23741315
MAGDFND5	10032385
MAGDFND9	5028212
MAGDGEX1	76377251
MAGDGEX2	25589452
MAGDGLC	36322745
MAGDHR5	3902302
MAGDHR9	7638917
MAGDHRC	79419990
MAGDHRC0	7715030
MAGDHRC1	32850852
MAGDHRC2	22449295
MAGDHRC3	40850743
MAGDHRC4	71401987
MAGDHRC5	64340735
MAGDHRC6	30040803
MAGDHRC7	15893574
MAGDHRCP	33544282
MAGDHRCU	4706071
MAGDIR3	32120170
MAGDIR4A	9771049
MAGDIR5	7586177
MAGDIR6	64289349
MAGDIR6A	11871966
MAGDIR6B	17588775
MAGDIR6C	33611700

Routine	Checksum
MAGDIR6D	24854094
MAGDIR6E	23447535
MAGDIR6F	19332518
MAGDIR6G	8628791
MAGDIR7	4535461
MAGDIR71	66334845
MAGDIR72	4436051
MAGDIR73	5722083
MAGDIR74	6275398
MAGDIR75	35557528
MAGDIR7C	70785160
MAGDIR7D	20617095
MAGDIR7F	32599821
MAGDIR7G	9410773
MAGDIR7T	38613863
MAGDIRDE	8549629
MAGDIW2A	40090331
MAGDIW3	20270812
MAGDIW3A	86768833
MAGDIW3B	40511860
MAGDIW3C	14730954
MAGDIW4	20553778
MAGDIW6	33599253
MAGDIWB0	5743080
MAGDIWB1	70936816
MAGDIWB2	86161827
MAGDIWB5	94186343
MAGDIWB7	16107756
MAGDIWBA	81638859
MAGDIWBB	69878204
MAGDIWBC	86128746
MAGDIWBD	21590116

Routine	Checksum
MAGDIX	5690876
MAGDIX1	28030316
MAGDLOGI	18187840
MAGDLOGN	69219103
MAGDM2MB	16447591
MAGDMENA	54060598
MAGDMENL	7146964
MAGDMENO	38759789
MAGDMENU	49596722
MAGDMFB	46751723
MAGDMFB1	81544111
MAGDMFB2	48221936
MAGDMFB3	41071819
MAGDMFB4	15205941
MAGDMFB5	25775790
MAGDMFB6	19275620
MAGDMFB7	26178773
MAGDMFB8	13147824
MAGDMFB9	25588255
MAGDMFBA	16186541
MAGDMFBB	50673336
MAGDMFBC	35544731
MAGDMFBD	37898955
MAGDMFBE	69559531
MAGDMFBI	23675432
MAGDMFBM	76440452
MAGDMFBN	5306612
MAGDMFBP	17921307
MAGDMFBS	49061654
MAGDMFBW	44248405
MAGDMFCC	25084521
MAGDMFIC	51798367

Routine	Checksum
MAGDMLGV	73643867
MAGDMLOG	31647401
MAGDMMSG	53806690
MAGDMPPC	8533330
MAGDMSGT	9623232
MAGDOS	5971106
MAGDQR15	16568428
MAGDQRU0	5452504
MAGDQUE0	30499869
MAGDQUE1	29292136
MAGDQUE2	21951411
MAGDQUE3	24604791
MAGDQUE4	27764385
MAGDRPC0	4176279
MAGDSSD	4287052
MAGDSTA1	6477867
MAGDSTAT	68354778
MAGDSTRT	52825843
MAGDTCP	14101280
MAGDTCP1	6918159
MAGDTCP2	69855871
MAGDTCP3	27934440
MAGDTGA	10117098
MAGDTLOG	5398596
MAGDUID1	17581821
MAGDUID2	3785565
MAGDUID4	6700589
MAGDVRSN	21494160
MAGDWLKL	3291181
MAGDWLP2	29541987
MAGDWLP3	3990165
MAGDWLPA	54804968

Routine	Checksum
MAGDWLPB	26022767
MAGDWLPC	51913684
MAGDWLU	14576275
MAGDWLU0	4288023
MAGDWLU1	38702922

Routine	Checksum
MAGDWLU2	33774439
MAGDWLU3	73811680
MAGDWLU4	5869877
MAGM2VC	57774863
MAGM2VCU	89722252

Routine	Checksum
MAGOSDIR	17707114
MAGOSFIL	38021742
MAGOSMSC	50373718
MAGOSTCP	33974021
MAGUE	75297995

6.2.2 DICOM Gateway Routine Descriptions

The MUMPS routines on the DICOM Gateway can be listed using the FIRST ROUTINE LINE DISPLAY routine (%RFIRST). The following is an example of steps required to use the % RFIRST routine to list Imaging routines.

```
>D ^%RFIRST

                    MSM - First Line Display Utility
                           07-APR-00  2:09 PM

Routine selector: MAG*

          253 routines Selected

Routine selector:

Enter output device <4>: <CR>
```

See the previous section for the checksums of the distributed routines.

6.2.3 Kernel RPC Broker Routines

Two RPC Broker routines are incorporated into the DICOM Gateway software. See the *VistA Imaging Security Guide* for more information.

6.3 Non-M Routines Distributed as Executable Files

Executable, DLL and other supporting files, which are distributed, include capture device-specific imaging software and executable imaging software. The routine listing below is by function.

6.3.1 Clinical Workstation Files

The following tables list files installed on a Clinical (Display or Capture) workstation.

c:\Program Files\VistA\Imaging – Main Clinical Display & Capture files		
ABSTRTGA.EXE	HSUMM.TXT	MagScanFilm.EXE
ActiveMILDefault.exe	ImagDEMO.DAT	MagSCREEN.HLP
Annotation Editor Help.cnt	mag308.ini	Magsys.cnt
ANNOTATION EDITOR HELP.HLP	MagDemos.TXT	MAGSYS.EXE
demo12.txt	MagEKGView.hlp	Magsys.hlp
DEMO1802.TXT	**MagImageCapture.exe**	MAGSYS.INI
DEMO2230.TXT	MAGIMAGEDELETE.HLP	MagSysKey.CNT
demo3.txt	**MagImageDisplay.exe**	MAGSYSKEY.HLP
DEMO446.TXT	magimaging.cnt	**MagTeleReader.exe**
demolist.txt	MAGIMAGING.HLP	magupdate.ini
DocScan.cnt	MagMinibld.EXE	magwrks.CNT
DOCSCAN.HLP	magPermissions.bat	MAGWRKS.EXE
ERRLOOK.EXE	MagScan150N.BAT	Magwrks.hlp
ERRLOOK.HLP	MagScan75N.BAT	MEANSTEST.HLP
FRAMGRAB.EXE	MagScanFile.EXE	SCNAPI.DLL
The main application files are shown in bold. *Files ending in '.cnt' and '.hlp' are contents for help files and help files.*		

c:\Program Files\VistA\Imaging\Bmp – Icons used by Clinical Display & Capture		
abscine.bmp	FileOpenError.bmp	Magblack.bmp
absekg.bmp	FullResFileNotFound.bmp	magdoc.bmp
ABSERROR.BMP	FullResFileOpenError.bmp	maghtml.bmp
absjbox.bmp	ImageUnavailable.bmp	magpdf.bmp

c:\Program Files\VistA\Imaging\Bmp – Icons used by Clinical Display & Capture		
abspacg.bmp	jboffln.abs	MotionVideoAbs.bmp
abspaci.bmp	JBOFFLN.bmp	NOTEXIST.BMP
absremote.bmp	JBOFFLN.tga	PRECAP.BMP
BLANK.BMP	magavi.bmp	magBlockedImage.bmp
Blank.tga	magrtf.bmp	magsensitive.bmp
CAPTURE.BMP	magtext.bmp	
ImageQA.bmp	magwav.bmp	
InternalError.bmp	MotionVideo.bmp	

c:\Program Files\VistA\Imaging\Image – Sample images (obsolete)		
These files are no longer distributed as of Patch 8, but may be present on older workstations. These files are no longer used.		
BLACKBOX.TGA	DILB3.BMP	Samples.txt

c:\Program Files\VistA\Imaging\help\client\index.htm – online help files
All files in this directory are help files for the VistA Imaging Display and Capture clients.

C:\Program Files\Vista\Imaging\Lib		
ACE.dll	GEAR32PO.OCX	igMED15a.ocx
AGM.dll	ig_cmyk_profile.icm	igmed15d.dll
BIB.dll	ig_rgb_profile.icm	igmed32s.dll
BIBUtils.dll	igART15a.ocx	IGMed32x.ocx
DL70ACE.dll	igartgui15d.dll	igmult15d.dll
DL70AdobeXMP.dll	igCORE15a.ocx	igMULTIMEDIA15a.ocx
DL70AGM.dll	igCORE15d.dll	igPDF15a.ocx
DL70ARE.dll	igDISPLAY15a.ocx	igPROCESSING15a.ocx
DL70AXE8SharedExpat.dll	igDLGS15a.ocx	igVECT15a.ocx
DL70AXE16SharedExpat.dll	igEFFECTS15a.ocx	igVIEW15a.ocx
DL70BIB.dll	igFORMATS15a.ocx	JP2KLib.dll
DL70BIBUtils.dll	igguidlg15a.dll	kdu_v52R.dll
DL70CoolType.dll	igguiwin15a.dll	MagAnnOCX.ocx
DL70JP2KLib.dll	igJPEG2K15a.ocx	MagAnnTool.dll
DL70PDFL.dll	igLZW15a.ocx	nserver.dll

C:\Program Files\Vista\Imaging\Lib\Resource\PDF\CMap – PDF support files		
78-EUC-H	B5pc-H	KSCms-UHC-H
78-EUC-V	B5pc-UCS2	KSCms-UHC-HW-H
78-H	B5pc-UCS2C	KSCms-UHC-HW-V
78-RKSJ-H	B5pc-V	KSCms-UHC-UCS2
78-RKSJ-V	CNS-EUC-H	KSCms-UHC-V
78-V	CNS-EUC-V	KSCpc-EUC-H
78ms-RKSJ-H	CNS1-H	KSCpc-EUC-UCS2
78ms-RKSJ-V	CNS1-V	KSCpc-EUC-UCS2C
83pv-RKSJ-H	CNS2-H	KSCpc-EUC-V
90ms-RKSJ-H	CNS2-V	NWP-H
90ms-RKSJ-UCS2	ETen-B5-H	NWP-V
90ms-RKSJ-V	ETen-B5-UCS2	RKSJ-H
90msp-RKSJ-H	ETen-B5-V	RKSJ-V
90msp-RKSJ-V	ETenms-B5-H	Roman
90pv-RKSJ-H	ETenms-B5-V	UCS2-90ms-RKSJ
90pv-RKSJ-UCS2	ETHK-B5-H	UCS2-90pv-RKSJ
90pv-RKSJ-UCS2C	ETHK-B5-V	UCS2-B5pc
90pv-RKSJ-V	EUC-H	UCS2-ETen-B5
Add-H	EUC-V	UCS2-GBK-EUC
Add-RKSJ-H	Ext-H	UCS2-GBpc-EUC
Add-RKSJ-V	Ext-RKSJ-H	UCS2-KSCms-UHC
Add-V	Ext-RKSJ-V	UCS2-KSCpc-EUC
Adobe-CNS1-0	Ext-V	UniCNS-UCS2-H
Adobe-CNS1-1	GB-EUC-H	UniCNS-UCS2-V
Adobe-CNS1-2	GB-EUC-V	UniCNS-UTF16-H
Adobe-CNS1-3	GB-H	UniCNS-UTF16-V
Adobe-CNS1-4	GB-V	UniCNS-UTF32-H
Adobe-CNS1-B5pc	GBK-EUC-H	UniCNS-UTF32-V
Adobe-CNS1-ETen-B5	GBK-EUC-UCS2	UniCNS-UTF8-H
Adobe-CNS1-H-CID	GBK-EUC-V	UniCNS-UTF8-V
Adobe-CNS1-H-Host	GBK2K-H	UniGB-UCS2-H
Adobe-CNS1-H-Mac	GBK2K-V	UniGB-UCS2-V
Adobe-CNS1-UCS2	GBKp-EUC-H	UniGB-UTF16-H
Adobe-GB1-0	GBKp-EUC-V	UniGB-UTF16-V
Adobe-GB1-1	GBpc-EUC-H	UniGB-UTF32-H
Adobe-GB1-2	GBpc-EUC-UCS2	UniGB-UTF32-V
Adobe-GB1-3	GBpc-EUC-UCS2C	UniGB-UTF8-H
Adobe-GB1-4	GBpc-EUC-V	UniGB-UTF8-V
Adobe-GB1-GBK-EUC	GBT-EUC-H	UniHojo-UCS2-H
Adobe-GB1-GBpc-EUC	GBT-EUC-V	UniHojo-UCS2-V
Adobe-GB1-H-CID	GBT-H	UniHojo-UTF16-H
Adobe-GB1-H-Host	GBT-V	UniHojo-UTF16-V
Adobe-GB1-H-Mac	GBTpc-EUC-H	UniHojo-UTF32-H

C:\Program Files\Vista\Imaging\Lib\Resource\PDF\CMap – PDF support files		
Adobe-GB1-UCS2	GBTpc-EUC-V	UniHojo-UTF32-V
Adobe-Japan1-0	H	UniHojo-UTF8-H
Adobe-Japan1-1	Hankaku	UniHojo-UTF8-V
Adobe-Japan1-2	Hiragana	UniJIS-UCS2-H
Adobe-Japan1-3	HKdla-B5-H	UniJIS-UCS2-HW-H
Adobe-Japan1-4	HKdla-B5-V	UniJIS-UCS2-HW-V
Adobe-Japan1-5	HKdlb-B5-H	UniJIS-UCS2-V
Adobe-Japan1-6	HKdlb-B5-V	UniJIS-UTF16-H
Adobe-Japan1-90ms-RKSJ	HKgccs-B5-H	UniJIS-UTF16-V
Adobe-Japan1-90pv-RKSJ	HKgccs-B5-V	UniJIS-UTF32-H
Adobe-Japan1-H-CID	HKm314-B5-H	UniJIS-UTF32-V
Adobe-Japan1-H-Host	HKm314-B5-V	UniJIS-UTF8-H
Adobe-Japan1-H-Mac	HKm471-B5-H	UniJIS-UTF8-V
Adobe-Japan1-PS-H	HKm471-B5-V	UniJISPro-UCS2-HW-V
Adobe-Japan1-PS-V	HKscs-B5-H	UniJISPro-UCS2-V
Adobe-Japan1-UCS2	HKscs-B5-V	UniJISPro-UTF8-V
Adobe-Japan2-0	Hojo-EUC-H	UniJISX0213-UTF32-H
Adobe-Korea1-0	Hojo-EUC-V	UniJISX0213-UTF32-V
Adobe-Korea1-1	Hojo-H	UniKS-UCS2-H
Adobe-Korea1-2	Hojo-V	UniKS-UCS2-V
Adobe-Korea1-H-CID	Identity-H	UniKS-UTF16-H
Adobe-Korea1-H-Host	Identity-V	UniKS-UTF16-V
Adobe-Korea1-H-Mac	Katakana	UniKS-UTF32-H
Adobe-Korea1-KSCms-UHC	KSC-EUC-H	UniKS-UTF32-V
Adobe-Korea1-KSCpc-EUC	KSC-EUC-V	UniKS-UTF8-H
Adobe-Korea1-UCS2	KSC-H	UniKS-UTF8-V
AdobeFnt09.lst	KSC-Johab-H	V
B5-H	KSC-Johab-V	vssver2.scc
B5-V	KSC-V	WP-Symbol

C:\Program Files\Vista\Imaging\Lib\Resource\PDF\Font – PDF support files		
AdobeFnt09.lst vssver2.scc	zx_____.mmm	zy_____.mmm

c:\Program Files\VistA\Imaging\Muse – MUSE API support files		
Bti.ini BUTIL.EXE	lfmac80n.dll lfmac80w.dll	LTKRN80N.DLL LTKRN80W.DLL

c:\Program Files\VistA\Imaging\Muse – MUSE API support files		
ccalc32.dll	lfmsp80n.dll	LTTHK80W.DLL
DCMUTL32.DLL	lfmsp80w.dll	LTTWN80N.DLL
lfavi80n.dll	lfpcd80n.dll	LTTWN80W.DLL
lfavi80w.dll	lfpcd80w.dll	LTWND80N.DLL
lfawd80n.dll	lfpct80n.dll	LTWND80W.DLL
lfbmp80n.dll	lfpct80w.dll	museapi.dll
lfbmp80w.dll	lfpcx80n.dll	museapi5a.dll
lfcal80n.dll	lfpcx80w.dll	MUSEAPI5e.dll
lfcal80w.dll	lfpng80n.dll	MUSEAPI7.dll
lfcmp80n.dll	lfpng80w.dll	museapiFAKE.dll (for non-MUSE sites)
lfcmp80w.dll	lfras80n.dll	NWLOCALE.DLL
lfdic80n.dll	lfras80w.dll	PRINTLIB.DLL
lfdic80w.dll	lftga80n.dll	Tabctl32.ocx
lfeps80n.dll	lftga80w.dll	table32.dll
lfeps80w.dll	lftif80n.dll	W3AIF103.DLL
lffax80n.dll	lftif80w.dll	W3BIF106.DLL
lffax80w.dll	lfwfx80n.dll	W3BTRV7.DLL
lffpx7.dll	lfwfx80w.dll	W3CRS106.DLL
lffpx80n.dll	lfwmf80n.dll	W3MIF109.DLL
lfgif80n.dll	lfwmf80w.dll	W3NSL105.DLL
lfgif80w.dll	lfwpg80n.dll	W3NSR103.DLL
lfica80n.dll	lfwpg80w.dll	W3SCMV7.DLL
lfica80w.dll	LTANN80N.DLL	W3UPI104.DLL
lfimg80n.dll	LTANN80W.DLL	WBEXEC.EXE
lfimg80w.dll	LTEFX80N.DLL	WBTRCALL.DLL
lfkodak.dll	LTEFX80W.DLL	WBTRV32.DLL
lflma80n.dll	LTFIL80N.DLL	wcalc32.dll
lflma80w.dll	LTFIL80W.DLL	zlib32.dll
lflmb80n.dll	LTIMG80N.DLL	
lflmb80w.dll	LTIMG80W.DLL	

c:\windows\system32 - Annotation Editor support files. - AccuSoft OCX files.		
igmed32s.dll	imgthumb.ocx	oissq400.dll
IGMed32x.ocx	jpeg1x32.dll	oitwa400.dll
imgadmin.ocx	jpeg2x32.dll	oiui400.dll
imgcmn.dll	oieng400.dll	tifflt.dll
imgedit.ocx	oiprt400.dll	xiffr3_0.dll
imgscan.ocx	oislb400.dll	
imgshl.dll		

6.3.2 Background Processor Files

File Name	Description
Magbtm.exe	Processes queues and configures imaging system files.
MagVerifier.exe	Performs database integrity checks.
MagPurge.exe	Removes old image files and recovers image files on VistA Imaging shares.

6.3.3 Online Help Files

Online help files are installed with the Clinical workstation, Background Processor, and VistARad software.

The Verifier help file is MAG_BPVerifierUserman.htm and the contents of the MAG_BPVerifierUserman_files subdirectory.

The Background Processor Queue Processor Help file is MAG_BPUserman.htm and the contents of the MAG_BPUserman_files subdirectory. For information about Purge, refer to the Background Processor User Manual.

The clinical workstation help system is located in the Program Files\VistA\Imaging\Help\Client\index.htm subdirectory. A separate help file for TeleReader is located in Program Files\VistA\Imaging\Help\TeleReader.

6.3.4 DICOM Gateway Files

The following tables list files that are part of a DICOM Gateway installation. Files are grouped by folder.

C:\Program Files\VistA\Imaging\DICOM – Primary program files	
File Name	**Description**
dicom_echo.exe	Program that can be used to test network connectivity with DICOM modalities.
DRIVES.EXE	Program that provides information on currently mounted disk drives.
ERRLOOK.EXE	Program that can be used to display the meaning of an MS-Windows error code.
MAG_AbstrTGA.exe	Program that creates “abstract” file from Targa file.
MAG_Compressor_Aware.exe	Program to compress image files before transmission.
MAG_CStore.exe	Program that communicates with the DICOM Gateway to store images.
MAG_DCMtoTGA.exe	Program that converts DICOM images to Targa Images.
MAG_DCM_Copy.exe	Program that copies parts of DICOM files (used for modifying information in image headers).
MAG_MakeLink.exe	Program to create icons.
MAG_Recon.exe	Program to reconstruct a DICOM File from an existing DICOM file and a script file containing header-information.
MAG_Recon.txt	Sample script file to be used with MAG_Recon.exe.
MAG_Telnet.cnt	Table of contents for Help File.
MAG_Telnet.exe	Help File for Telnet client application.
MAG_Telnet.hlp	Telnet client application.
MAG_TGAtoDCM.exe	Program that converts Targa images to DICOM images.

C:\Program Files\VistA\Imaging\DICOM – Primary program files	
File Name	**Description**
MAG_VistA_Send_Image.exe	Program that transmits image files.
msvcr71.dll	Support library for executables compiled with Microsoft C Compiler.
OD.EXE	Program that produces octal dumps of binary files.
PATHMAN.EXE	Program that manipulates the default “path” lookup string.
send_image.exe	Program that transmits image files.
sleep.exe	Program that allows a batch file to “wait” for a couple of seconds.

C:\Program Files\VistA\Imaging\DCMView – DICOM Viewer program files	
File Name	**Description**
MAG_DCMView.exe	Program to display DICOM images.
VIEWER1.ICO	Icon for MAG_DCMView.exe program.

C:\Program Files\VistA\Imaging\MAG_MakeAbs – Abstract generator files	
File Name	**Description**
igcore14a.ocx	Supporting Object Linking and Embedding Control Extension for AccuSoft Toolkit.
igcore14d.dll	Supporting Dynamic Library for AccuSoft Toolkit.
igdisplay14a.ocx	Supporting Object Linking and Embedding Control Extension for AccuSoft Toolkit.
igdlgs14a.ocx	Supporting Object Linking and Embedding Control Extension for AccuSoft Toolkit.
igformats15a.ocx	Supporting Object Linking and Embedding Control Extension for AccuSoft Toolkit.

C:\Program Files\VistA\Imaging\MAG_MakeAbs – Abstract generator files	
File Name	**Description**
igguidlg14a.dll	Supporting Dynamic Library for AccuSoft Toolkit.
igguiwin14a.dll	Supporting Dynamic Library for AccuSoft Toolkit.
igmed14a.ocx	Supporting Object Linking and Embedding Control Extension for AccuSoft Toolkit.
igmed14d.dll	Supporting Dynamic Library for AccuSoft Toolkit.
igprocessing14a.ocx	Supporting Object Linking and Embedding Control Extension for AccuSoft Toolkit.
igview14a.ocx	Supporting Object Linking and Embedding Control Extension for AccuSoft Toolkit.
ig_cmyk_profile.icm	Color set-up information.
ig_rgb_profile.icm	Color Set-up information.
MAG_MakeAbs.exe	Program to create “abstracts” from DICOM objects.
MAG_MakeAbs.ICO	Icon for MAG_MageAbs.exe program.

C:\DICOM – Icon files	
File Name	**Sample**
MAGCStore.ico	
MAGVistA.ico	

C:\DICOM\Abstract – Files used for generic abstracts for certain image types	
File Name	**Description**
MAG_Canned_ECG.bmp	Canned abstract for PDF files
MAG_Canned_PDF.bmp	Canned abstract for ECG files
MAG_WhatEver.bmp	Canned abstract for other types of files that cannot have abstracts generated "on the fly"

C:\DICOM\Cache – Cache database folder	
File Name	**Description**
Cache.dat	Program that has the Cache database for DICOM Gateways.

C:\DICOM\Data1 – Text data folder; additional Data2, Data3, folders may exist *May be stored in other local drives on older systems*	
File Name	**Description**
Init_DICOM.BAT	Program that re-initializes the subdirectories of the directory in which the BAT file is stored.
Search.BAT	Program that scans .TXT files for the occurrence of a specified string.

C:\DICOM\Icons (Letters) – Icon collection	
Sample	**Description**
	Contains various .ico files that can be assigned to desktop shortcuts to make modality-specific functions easier to tell apart. For detailed information, see Appendix A in the DICOM Gateway Installation Guide

C:\DICOM\Icons (VA Logo) – Icon collection	
Sample	**Description**
	Contains various .ico files that can be assigned to desktop shortcuts to make modality-specific functions easier to tell apart. For detailed information, see Appendix A in the DICOM Gateway Installation Guide

<drive>:\DICOM\Dict – Dictionary files, typically stored in a network folder	
File Name	**Description**
CT_Param.dic	Table containing prior settings for conversion parameters. Imported by ^MAGDMFB7.
DataGECT.DIC	Additional data fields to be displayed on DICOM Gateway (General Electric). Imported by ^MAGDIR4.
DataMISC.DIC	Additional data fields to be displayed on DICOM Gateway. Imported by ^MAGDIR4.
Data_CR.DIC	Additional data fields to be displayed on DICOM Gateway. Imported by ^MAGDIR4.
Data_MRI.DIC	Additional data fields to be displayed on DICOM Gateway. Imported by ^MAGDIR4.
Element.DIC	DICOM Element dictionary. Imported by ^MAGDMFB2.
HL7.DIC	VistA HL7 dictionary. Imported by ^MAGDMFB7.
Instrument.dic	List of image producing instruments, distributed as Instrument.Sample. Imported by ^MAGDMFB8
Modality.dic	Image processing rules for modalities, distributed as Modality.Sample. Imported by ^MAGDMFB8
PortList.dic	Socket port definition for DICOM services, distributed as PortList.Sample. Imported by ^MAGDMFB9
Route.dic	Image processing rules for automatic routing. Imported by ^MAGBTRB1.
SCP_List.DIC	Provider application parameters. Imported by ^MAGDMFB9.

<drive>:\DICOM\Dict – Dictionary files, typically stored in a network folder	
File Name	**Description**
SCU_List.DIC	List of Service Class User Applications, distributed as SCU_List.Sample. Imported by ^MAGDMFB9.
Template.DIC	Macros for event message templates. Imported by ^MAGDMFB3.
UID.DIC	UID dictionary. Imported by ^MAGDMFB4.
WorkList.DIC	Worklist dictionary, distributed as WorkList.Sample. Imported by ^MAGDMFB8.

6.3.4.1 Sample Files

For the purpose of testing that the software is properly installed, a number of sample files are included in the distribution kit.

6.3.4.1.1 Sample DICOM Images

The sample images that are available for the DICOM gateway can be used to perform trial image transmissions.

File	Description
BabyFace.dcm	Ultrasound image (640x480 pixels)
BoneScrw.dcm	CR image (2048x2577 pixels)
Carotid.dcm	Ultrasound image (640x480 pixels)
EyeCLens.dcm	(640x560 pixels)
EyeClot.dcm	(640x560 pixels)
EyeLens.dcm	(640x560 pixels)
EyeSttch.dcm	(640x560 pixels)
Fillings.dcm	IO image (811x644 pixels)
GoldGate.dcm	Picture of the Golden Gate Bridge in San Francisco, labeled as modality type OT (other) (640x480 pixels).

File	Description
Implant.dcm	IO image (811x644 pixels)
PaceMkr.dcm	CR image (1716x1910 pixels)
Retina.dcm	(640x480 pixels)
Roots.dcm	IO image (811x644 pixels)
Skull.dcm	CR mage (2048x2577 pixels)
Spine.dcm	CR image (2048x2495 pixels)
test.txt_new	Sample command file, used for modifying information in image headers.

6.3.4.1.2 Sample HL7 Data Streams

The following sample HL7 streams are available.

File	Description
`Baltimore.gbl`	Small data set
`Boston.gbl`	Large data set

6.3.5 VistARad Workstation Files

Files that are installed on a VistARad workstation are listed below. Files are grouped by folder.

Folder **C:\Documents and Settings\<username>\Desktop**

- **MAG_VistARad_Patch101** – desktop shortcut

Folder **C:\Documents and Settings\<username>\Start Menu\Programs\VistA Imaging Programs**

- **MAG_VistARad_Patch101** – start menu shortcut

Folder **C:\Program Files\VistA\Imaging\MAG_VistARad**

- **MAG_Vistarad.exe** – VistARad main executable file
- **DimFileX.ocx** – dynamic link library executable (DLL for short) for Dome ActiveX control
- **DimplX.ocx** – DLL for Dome ActiveX control
- **DXShared.dll** – DLL for Dome ActiveX control

- **RPCBrokerCom.dll** – DLL for Broker ActiveX control
- **Bapi32_40.dll** – DLL for Broker ActiveX control
- **VA_DelphiUtils.dll** – DLL for password decryption to gain access to image share
- **VA_DICOM.dll** – DLL for accessing DICOM files
- **LayoutSelect.dll** – VistARad core functionality DLL (core DLL)
- **RpcDbAccessCom.dll** – core DLL
- **SliceCalc.dll** – core DLL
- **TargaFile.dll** – core DLL
- **VA_CaseManager.dll** – core DLL
- **VA_GridCtrl.dll** – core DLL
- **VA_HPModule.dll** – core DLL
- **VA_ImgLdrCtrl.dll** – core DLL
- **VA_Manager.dll** – core DLL
- **VA_Shared.dll** – core DLL
- **VA_StackViewCtrl.dll** – core DLL
- **VA_TeachingFiles.dll** – core DLL
- **VA_Vistarad.dll** – core DLL
- **MAGJ.INI** – VistARad settings
- **template.dcm** –internally used to create DICOM files
- **MAG_Dicom_Attributes.lst** – used for internal reference
- **MAG_Special_Attributes.lst** – used for internal reference
- **Mag_DicomTags.txt** – used for internal reference
- **Mag_statusdatasettings.txt** – used for internal reference
- **modality.txt** – used for internal reference
- **HPConfig.xml** –used for internal reference
- **radlextree.xml** –internally used for Teaching Files feature
- **MAG_VistARad_User_Guide.pdf** – VistARad help
- **MAG_vrad_QSG.pdf** – VistARad help
- **MAG_Vrad_Quick_Ref.pdf** – VistARad help
- **MAG_vrad_Shortcuts.pdf** – VistARad help

Folder **C:\WINDOWS\system32**

- **dimpl8.dll** – DLL for Dome ActiveX control

Redistributable packages for necessary runtimes (typically installed in **C:\WINDOWS\system32** and/or **C:\WINDOWS\WinSxS**)

- **Microsoft OLE 2.40 for Windows NT(TM) and Windows 95(TM) Operating Systems**
- **Visual C++ 8.0 ATL (x86) WinSXS MSM**
- **Visual C++ 8.0 CRT (x86) WinSXS MSM**
- **VC User gdiPlus RTL X86**

6.3.6 MAG_Decompressor Files

The following files are installed only on systems that are recipients of routed files that use compression. For more information, refer to the *Routing User Guide*.

Mag_Decompressor files are installed in: C:\Program Files\VistA\Imaging\MAG_Decompressor

awj2k.dll (not distributed by VistA Imaging; purchased from Aware Inc.)
MAG_Decompressor.exe (distributed by Imaging)

Chapter 7 VistA Imaging System M Files

The Food and Drug Administration classifies this software as a medical device. As such, it may not be changed in any way. Modifications to this software may result in an adulterated medical device under 21CFR820, the use of which is considered to be a violation of US Federal Statutes.

VA Policy states the following:

Those components of a national package (routines, data dictionaries, options, protocols, GUI components, etc.) that implement a controlled procedure, contain a controlled or strictly defined interface or report data to a database external to the local facility, must not be altered except by the Office of Information (OI) Technical Services (TS) staff. A controlled procedure is one that implements requirements that are mandated or governed by law or VA (Department of Veterans Affairs) directive or is subject to governing financial management standards of the Federal Government and VA or that is regulated by oversight groups such as the JCAHO or FDA. A controlled or strictly defined interface is one that adheres to a specific industry standard, will adversely affect a package and/or render the package inoperable if modified or deleted. For national software that is subject to FDA oversight, only the holder of the premarketing clearance (510(k)) is allowed to modify code for the medical device. The holder of a premarketing clearance is restricted to specifically designated TS staff that are located at the registered manufacturing site and operating in the designated production environment.

All routines files and fields of the VistA Imaging package may not be altered except by the OI Technical Services (TS) staff. This software is regulated by the FDA and implements controlled procedures. The only exception is data changes made in accord with Chapter 8 of this manual.

7.1 Introduction

The VistA Imaging System is based on the use of VA FileMan as an object-oriented database management system to store single or sequential images, and other multimedia object types.

This chapter first itemizes the various files that are used by the Imaging System (Clinical Capture\Display, Background Processor\Verifier, and VistARad) and then describes how to obtain more detailed information about the files. Some of the files are used on the DICOM Image and Text Gateways and will reside on those systems and not on the VistA hospital system.

7.2 VA FileMan Files that are Part of the VistA Imaging System

7.2.1 VA FileMan Files

File	Name	Stored in
2005	IMAGE	^MAG(2005,D0,...
2005.01	-->EXPORT LOCATION	-->5,D1,...
2005.0106	-->ROUTING TIMESTAMP	-->4,D1,...
2005.011	-->LONG DESCRIPTION	-->3,D1,...
2005.0111	-->ROUTING LOG	-->6,D1,...
2005.04	-->OBJECT GROUP	-->1,D1,...
2005.210	--> PRESENTATION STATE	-->210,D1,...
2005.001	IMAGING STUDY	^MAG(2005.001,D0,...
2005.02	OBJECT TYPE	^MAG(2005.02,D0,...
2005.21	-->ACTIONS	-->1,D1,...
2005.24	-->CHILD CLASS	-->3,D1,...
2005.021	IMAGE FILE TYPES	^MAG(2005.021,D0,...
2005.03	PARENT DATA FILE	^MAG(2005.03,D0,...
2005.1	IMAGE AUDIT	^MAG(2005.1,D0,...
2005.11	-->EXPORT LOCATION	-->5,D1,...
2005.1106	-->ROUTING TIMESTAMP	-->4,D1,...
2005.111	-->LONG DESCRIPTION	-->3,D1,...
2005.1111	--> ROUTING LOG	-->6,D1,...
2005.14	-->OBJECT GROUP	-->1,D1,...
2005.2	NETWORK LOCATION	^MAG(2005.2,D0,...
2005.201	-->EMAIL	-->5,D1,...
2005.4	IMAGE HISTOLOGICAL STAIN	^MAG(2005.4,D0,...
2005.41	MICROSCOPIC OBJECTIVE	^MAG(2005.41,D0,...
2005.81	MAG DESCRIPTIVE CATEGORIES	^MAG(2005.81,D0,...
2005.82	IMAGE INDEX FOR CLASS	^MAG(2005.82,D0,...
2005.83	IMAGE INDEX FOR TYPES	^MAG(2005.83,D0,...
2005.84	IMAGE INDEX FOR SPECIALTY/SUBSPECIALTY	^MAG(2005.84,D0,...
2005.85	IMAGE INDEX FOR PROCEDURE/EVENT	^MAG(2005.85,D0,...
2005.852	--> SPECIALTY	--> 1,D1,...

File	Name	Stored in
2005.86	IMAGE ACTIONS	^MAG(2005.86.D0,...
2005.865	-->TYPE	-->2,D1,...
2005.87	IMAGE LIST FILTERS	^MAG(2005.87,D0,...
2005.88	MAG REASON FILE	^MAG(2005.88
2006.03	IMAGE BACKGROUND QUEUE	^MAGQUEUE(2006.03,D0,...
2006.031	IMAGE BACKGROUND QUEUE POINTER	^MAGQUEUE(2006.031,D0,...
2006.032	JUKEBOX	^MAGQUEUE(2006.032,D0,...
2006.033	OFFLINE IMAGES	^MAGQUEUE(2006.033,D0,...
2006.034	IMPORT QUEUE	^MAG(2006.034,D0,...
2006.0341	-->IMAGE DATA	-->1,D1,...
2006.035	SEND QUEUE	^MAGQUEUE(2006.035,D0,...
2006.036	ROUTING STATISTICS	^MAGQUEUE(2006.036,D0,...
2006.03601	-->DETAILS	-->1,D1,...
2006.04	ACQUISITION DEVICE	^MAG(2006.04,D0,...
2006.041	ACQUISITION SESSION	^MAG(2007.041,D0,...
2006.1	IMAGING SITE PARAMETERS	^MAG(2006.1,D0,...
2006.11	-->MULTI NAMESPACE	-->4,D1,...
2006.112	-->FILE TYPES	-->2,D1,...
2006.17	MUSE VERSIONS	^MAG(2006.17,D0,...
2006.18	IMAGING USER PREFERENCE	^MAG(2006.18,D0,...
2006.1867	-->PATIENT LIST	-->"PATLIST",D1,...
2006.19	IMAGING USERS	^MAG(2006.19,D0,...
2006.191	-->ADDITIONAL NAMESPACE	-->1,D1,...
2006.5	PACS MESSAGE	^MAGDHL7(2006.5,D0,...
2006.502	-->MESSAGE SEGMENTS	-->1,D1,...
2006.51	DICOM DATA ELEMENT DICTIONARY	^MAGDICOM(2006.51,D0,...
2006.514	-->ENUMERATED VALUE	-->1,D1,...
2006.511	DIAGNOSTIC INFO FIELD	^MAGDICOM(2006.511,D0,...
2006.5112	-->TAG	-->1,D1,...
2006.52	DICOM MESSAGE TEMPLATE DICTIONARY	^MAGDICOM(2006.52,D0,...
2006.5204	-->MESSAGE	-->1,D1,...

File	Name	Stored in
2006.53	DICOM UID DICTIONARY	^MAGDICOM(2006.53,D0,...
2006.5305	-->UID	-->1,D1,...
2006.531	EXTENDED SOP NEGOTIATION	^MAGDICOM(2006.531,D0,..
2006.532	DICOM SOP CLASS	^MAG(2006.532,D0,...
2006.539	DICOM UID SPECIFIC ACTION	^MAGDICOM(2006.539,D0,...
2006.5391	-->PURPOSE	-->1,...
2006.54	PDU TYPE	^MAGDICOM(2006.54,D0,...
2006.55	DICOM WORKLIST PATIENT	^MAGDWLST(2006.55,D0,...
2006.552	-->PATIENT	-->1,D1,...
2006.5522	-->-->MEDICAL ALERT	-->-->1,D2,...
2006.56	DICOM WORKLIST STUDY	^MAGDWLST(2006.56,D0,...
2006.562	-->STUDY	-->1,D1,...
2006.5621	-->-->PATIENT HISTORY	-->-->2,D2,...
2006.5622	-->-->APPOINTMENT SCHEDULE	-->-->1,D2,...
2006.563	DICOM GATEWAY PARAMETER	^MAGDICOM(2006.563,D0,...
2006.5631	-->DATA PATH	-->“DATA PATH”,D1...
2006.5632	-->PROFILE	-->“PROFILE”,D1...
2006.5634	-->INSTALLATION	-->“INSTALL”,D1...
2006.564	DICOM QUEUE	^MAGDICOM(2006.564,D0,...
2006.5641	DICOM GATEWAY MACHINE ID	^MAGDICOM(2006.5641,D0,...
2006.565	EXPORT DICOM RUN FILE	^MAGDICOM(2006.565,D0,...
2006.57	DICOM HL7 SEGMENT	^MAGDICOM("HL7",D0,...
2006.5701	-->ELEMENT	-->1,D1,...
2006.571	DICOM RAW IMAGE	^MAGDICOM(2006.571,D0,..
2006.5711	DICOM M2MB RPC QUEUE	^MAGDINPT(2006.5711,D0,..
2006.5712	DICOM FIXED QUEUE	^MAGDINPT(2006.5712,D0,..
2006.5713	DICOM UNKNOWN MODALITY	^MAGDINPT(2006.5713,D0,..
2006.5714	DICOM INCOMPLETE OBJECT	^MAGDINPT(2006.5714,D0,...
2006.5715	CURRENT IMAGE	^MAGD(2006.5715,D0,...
2006.5719	DICOM ERROR LOG	^MAGDINPT(2006.5719,D0,..
2006.572	EXAMINATION COMPLETE	^MAGDINPT(2006.572,D0,..
2006.573	GE PACS QUERY/RETRIEVE	^MAGDGEQR(2006.573,D0,..

File	Name	Stored in
2006.5732	DICOM QUERY RETRIEVE RESULT	^MAGQR(2006.5732,D0,...
2006.57321	-->TAG	-->1,D1,...
2006.5733	QUERY/RETRIEVE STATISTICS	^MAG(2006.5733,D0,...
2006.57331	-->LOCATION	-->1,...
2006.574	DICOM IMAGE OUTPUT	^MAGDOUTP(2006.574,D0,..
2006.5744	-->IMAGE	--> -->1,D1,...
2006.575	DICOM FAILED IMAGES	^MAGD(2006.575,D0,...
2006.57526	-->RELATED IMAGES	-->"RLATE",D1,...
2006.5761	DICOM MESSAGE STATISTISTICS	^MAGDAUDT(2006.5761,D0,...
2006.57611	-->MESSAGE	-->1,D1,...
2006.5762	DICOM INSTRUMENT STATISTICS	^MAGDAUDT(2006.5762,D0,...
2006.57621	-->LOCATION	-->1,D1,...
2006.5762111	-->-->INSTRUMENT	-->-->1,D2,... CONSNON>
2006.57621	-->INSTRUMENT	-->1,D1,...
2006.5763	DICOM PACS STATISTICS	^MAGDAUDT(2006.5763,D0,...
2006.57631	-->ACCESSION NUMBER	-->1,D1,...
2006.576311	-->-->EVENT	-->-->1,D2,...
2006.5764	DICOM LOCAL INSTRUMENT STATISTICS	^MAGDICOM(2006.5764,D0,...
2006.57641	-->DATE	-->1,D1,...
2006.577	DICOM FIFO QUEUE	^MAGDICOM(2006.577,D0,...
2006.5771	-->QUEUE LETTER	-->1,D1,...
2006.58	DICOM LOG	^MAGDMLOG(D0,...
2006.5801	-->TEXT	-->1,D1,...
2006.5802	-->LINE	-->2,D1,...
2006.581	INSTRUMENT DICTIONARY	^MAGDICOM(2006.581,D0,...
2006.582	MODALITY TYPE DICTIONARY	^MAGDICOM(2006.582,D0,...
2006.5821	CT CONVERSION PARAMETERS	^MAGDICOM(2006.5821,D0,...
2006.583	MODALITY WORKLIST DICTIONARY	^MAGDICOM(2006.583,D0,...

File	Name	Stored in
2006.5831	DICOM HEALTHCARE PROVIDER SERVICE	^MAGDICOM(2006.5831,D0,...
2006.5839	DICOM GMRC TEMP LIST	^MAGDICOM(2006.5839,D0,...
2006.584	TCP/IP PROVIDER PORT LIST	^MAGDICOM(2006.584,D0,...
2006.5841	TELEREADER ACQUISITION SERVICE	^MAG(2006.5841,D0,...
2006.5842	TELEREADER ACQUISITION SITE	^MAG(2006.5842,D0,...
2006.5843	TELEREADER READER	^MAG(2006.5843,D0,...
2006.5849	TELEREADER READ/UNREAD LIST	^MAG(2006.5849,D0,...
2006.585	USER APPLICATION	^MAGDICOM(2006.585,D0,...
2006.5852	-->SOP CLASS	-->1,D1,...
2006.58522	-->-->TRANSFER SYNTAX	-->-->1,D2,...
2006.586	PROVIDER APPLICATION	^MAGDICOM(2006.586,D0,...
2006.5863	-->SOP	-->1,D1,...
2006.58633	-->-->TRANSFER SYNTAX UID	-->-->1,D2,...
2006.587	DICOM TRANSMIT DESTINATION	^MAG(2006, 587,...
2006.59	ROUTING RULE	^MAGDICOM(2006.59,D0,...
2006.5901	-->RAW TEXT	-->1,D1,...
2006.5902	-->ACTION	-->ACTION,D1,...
2006.5903	--> -->PARAMETER	--> -->1,D2,...
2006.5904	-->CONDITION	--> -->1,D2,...
2006.5905	--> -->TIMEFRAME	--> -->1,D2,...
2006.5906	ROUTE LOAD BALANCE	^MAGRT(2006.5906,D0,...
2006.59061	-->PARENT	-->1,D1,...
2006.596	ACTION QUEUE STATUS	^MAGDICOM(2006.596,D0,...
2006.5961	-->THREAD	-->1,D1,...
2006.598	DICOM ERROR MESSAGE QUEUE	^MAGD(2006.598,D0,...
2006.599	DICOM Error Log	^MAGD(2006.599,D0,...
2006.621	MAG CT PARAMETER	^MAG(2006.621,D0,...
2006.623	MAG CR PARAMETER	^MAG(2006.623,D0,...

File	Name	Stored in
2006.63	MAG RAD LIST DATA ELEMENTS	^MAG(2006.63,D0,...
2006.631	MAG RAD LISTS DEFINITION	^MAG(2006.631,D0,...
2006.6311	-->COLUMNS	-->1,D1,...
2006.6312	-->SORT	-->2,D1,...
2006.634	MAGJ ZLIST SEARCH FILE	^MAG(2006.634,D0,...
2006.65	MAG RAD PRIOR EXAM LOGIC	^MAG(2006.65,D0,...
2006.66	-->PRIOR CASE MATCHING CPT GROUP	-->1,D1,...
2006.67	MAG RAD CPT MATCHING	^MAG(2006.67,D0,...
2006.674	-->BODY PART	-->1,...
2006.675	-->MODALITY	-->2,...
2006.68	MAGJ USER DATA	^MAG(2006.68,D0,...
2006.682	-->VR-WS	-->VR-WS,D1,...
2006.6821	-->-->DATA	-->-->VR-WS,D1,1,...
2006.6823	-->-->KEYS	-->-->VR-WS,D1,2,...
2006.683	-->VR-HP	-->VR-HP...
2006.6831	-->-->DATA	-->-->VR-HP,D1,1,...
2006.6832	-->-->KEYS	-->-->VR-HP,D1,2,...
2006.69	MAG VISTARAD SITE PARAMETERS FILE	^MAG(2006.69,D0,...
2006.8	BP WORKSTATIONS	^MAG(2006.8,D0,...
2006.81	IMAGING WINDOWS WORKSTATIONS	^MAG(2006.81,D0,...
2006.82	IMAGING WINDOWS SESSIONS	^MAG(2006.82,D0,...
2006.821	-->ACTIONS	-->"ACT",D1,...
2006.823	-->ERRORS	-->"ERR",D1,...
2006.83	DICOM WORKSTATION	^MAG(2006.83,D0,...
2006.87	DICOM GATEWAY INFORMATION	^MAG(2006.87,D0,...
2006.95	IMAGE ACCESS LOG	^MAG(2006.95,D0,...
2006.96	IMAGE INDEX CONVERSION	^MAGIXCVT (2006.96,D0...

7.2.2 More Detailed Information

More detailed information about these files can be obtained using the FileMan option LIST FILE ATTRIBUTES. The Data Dictionaries are considered part of the online documentation for this software application. It may be necessary to print the Data Dictionaries in order to support the package at your site.

The Data Dictionaries for VistA Imaging files may be printed using the VA FileManager's option LIST FILE ATTRIBUTES under the DATA DICTIONARY UTILITIES menu as follows:

```
VA FileMan 22.0

Select OPTION: DATA DICTIONARY UTILITIES
Select DATA DICTIONARY UTILITY OPTION: LIST FILE ATTRIBUTES
 START WITH WHAT FILE: // IMAGE
             GO TO WHAT FILE: // IMAGE
              Select SUB-FILE: <RET>
Select LISTING FORMAT: STANDARD// BRIEF
ALPHABETICALLY BY LABEL? NO// YES
DEVICE:
```

The Data Dictionary will now print on the user's specified device.

7.2.3 Input Templates

The distribution contains the following input templates:

FILE #2005 MAG IMAGE INDEX EDIT
FILE #2006.1: MAG PURGE PARAMETERS
FILE #2006.1: MAG SITE PARAMETERS
FILE #2006.1: MAG MUSE PARAMETERS
FILE #2005.2: MAG ENTER/EDIT NETWORK LOC
FILE #2005.2: MAG ENTER/EDIT MUSE NETWORK
FILE #2005.575: MAGD-ENTRY
FILE #2005.575: MAGD-UPDT
FILE #2005.88: MAG REASON EDIT
FILE #2006.8: MAG EDIT BACKGRND WORKSTA
FILE #2006.631: MAGJ LIST EDIT
FILE #2006.65: MAGJ PRIOR EDIT

7.2.4 Further Information

Every individual object (i.e., an image, audio clip, waveform, or scanned document) is an entry in the Image File (#2005), where the object's attributes are managed. In addition, three auxiliary files are used:

- Object Type
- Network Location
- Parent Data

The objects are then related to the patient's VistA text data (medicine, surgery, laboratory, radiology reports or progress notes) through the use of pointers, both forward from the VistA

package file to the Image file, and backwards from the Image file to the VistA package file. Software allows new objects to be added and displayed.

Several additional files are used by the system. These include:

- Imaging Workstations file that contains information about every workstation on the network.
- Image Histologic Stain file, and a Microscopic Objective file used by anatomic pathology.
- Imaging Site Parameters file.
- Background Queue files which are necessary to manage abstract creation, automatic file migration (movement of image/object files between optical disk jukebox and magnetic disk), file copies.
- Image Access Log file used to track system utilization.
- User Preferences File that stores personal preferences for the software configuration of the workstation.
- Image List Filters File that stores personal filters for each user, and public filters for all users
- Image File Types File that lists all image formats that VistA Imaging supports.
- Parameters that are specific for each individual DICOM Gateway Computer.
- Master Files that drive the operation of the DICOM Gateway.
- Modality Worklist file that contains the scheduled activities for the various modalities that acquire images.
- Incoming Images.

Images that need manual intervention before they can be entered into the VistA HIS.

7.3 File List

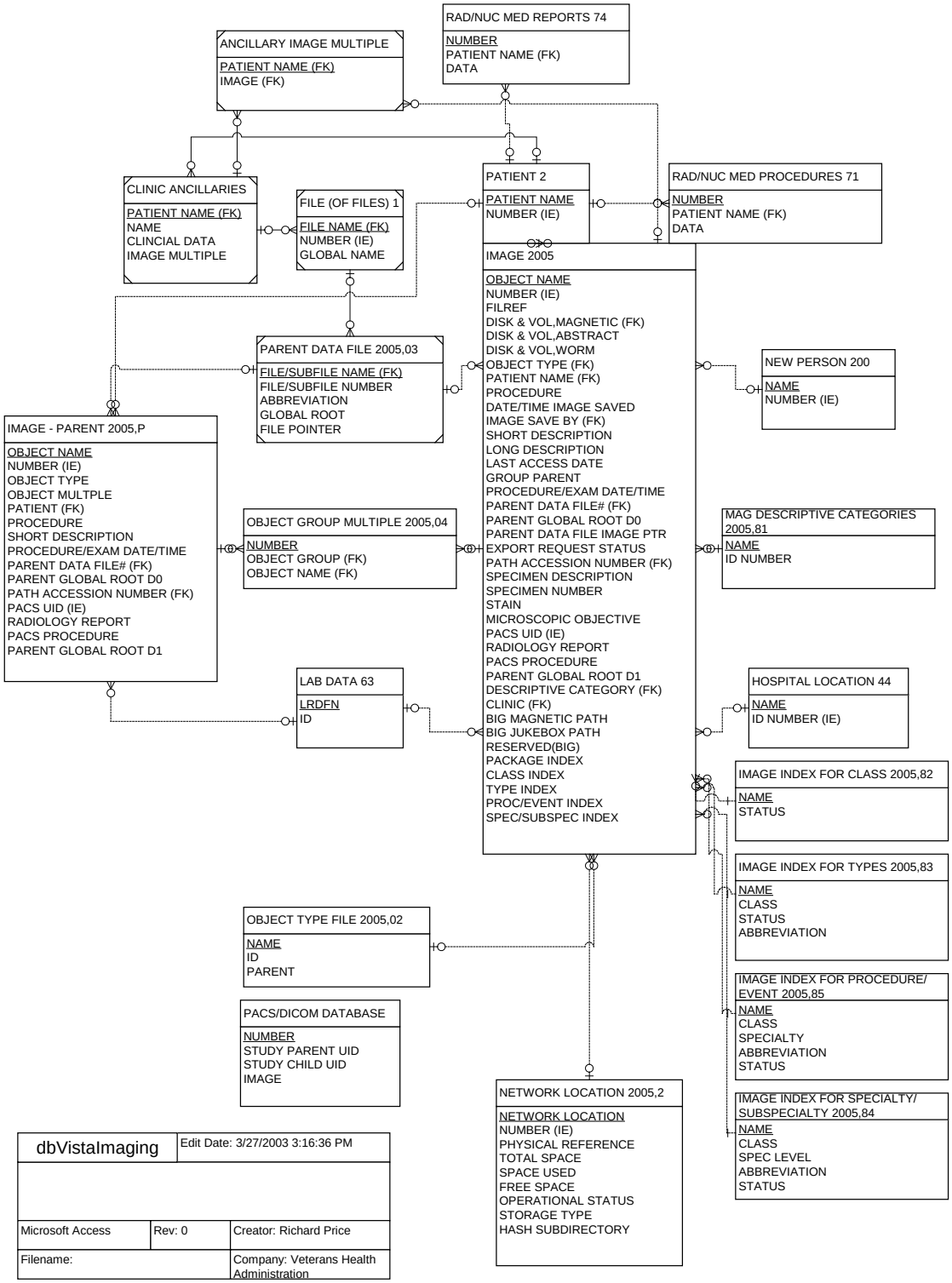
The VistA Imaging System files are in the 2005 through the 2006.999 numbering space. Full file and field documented attributes on any Imaging files can be obtained using the LIST FILE ATTRIBUTES sub-menu option located in the 'Data Dictionary Utilities menu.

```
VA FileMan 22.0
Select OPTION: DATA DICTIONARY UTILITIES
Select DATA DICTIONARY UTILITY OPTION: LIST FILE ATTRIBUTES
 START WITH WHAT FILE: DICOM FAILED IMAGES// 2005  IMAGE       (7495 entries)
      GO TO WHAT FILE: IMAGE//
      Select SUB-FILE:
Select LISTING FORMAT: STANDARD//
DEVICE:   UCX LOGIN    Right Margin: 80//
```

7.4 File Security

VistA Imaging recommends no access to any Imaging files by any end-user other than IRM personnel. Please review the Security manual to get a detail listing of all FileMan protections on all Imaging files. All updating of Imaging files is done via the GUI interface or by the Imaging System Manager menu (locked by the MAG SYSTEM security key) on the VistA hospital system. However, the recommended method is to use the VistA Imaging Background Processor application (GUI).

Imaging Entity Relationship Diagram and Detailed Information



A detailed File Diagram can be obtained using the FileMan's menu option 'MAP POINTER RELATIONS'.

- Select 'DATA DICTIONARIES UTILITIES' from the FileMan menu.
- Select 'MAP POINTER RELATIONS' menu option.
- Respond to the 'PACKAGE NAME' prompt with IMAGING.

7.5 Global Journaling

Journaling of the VistA Imaging global is mandatory. MAG* should be journaled.

During a scheduled VistA (hospital) servers downtime, it is highly recommended to coordinate any data restore activities related to the VistA Imaging System with the IRM staff.

7.6 VistA System Outages

During a VistA System outage, DICOM Gateways will continue to provide modality worklist functionality and to capture images that are temporarily stored on the gateway. This is important to allow the radiology department to continue to perform studies. If you anticipate that the VistA System must be down, it is best to take the following steps:

- Perform all DICOM fixes before the VistA System goes down. This will free the maximum space for temporary image storage.
- During the outage, watch the gateways to be sure they still have adequate space to store images.

Chapter 8 Exported Options

8.1 Introduction: INI File Setup and Configuration of Workstations

INI files are DOS files with the extension .INI (such as WIN.INI and MOUSE.INI) that contain initialization information for programs. Initialization refers to the parameters that control the way a program is initially launched. They also customize the application to accommodate workstation-specific characteristics, such as the type of capture hardware installed (Refer to *VistA Imaging System Installation Guide* for further details). The INI files are set up initially when the software is first installed on the workstation.

Note: Entries for these files should be made via the MAGSYS.EXE routine located in directory Program Files\VISTA\IMAGING.

8.2 Imaging System Manager Menu

The Imaging System Manager menu contains system manager functions. Access to these menu options requires the Imaging System Menu IMAGSYS MENU security key and FileMan access of "@."

Menu Diagram for Imaging System Menu [MAG SYS MENU]

```
   IX      Image Index Conversion Menu ...
   LS      Edit Network Location STATUS
   TR      Telereader Menu ...
           Ad hoc Enterprise Site Report
           Delete Image Group
           Enter/edit Reason
           Imaging Database Integrity Checker Menu ...
           Imaging Site Reports ...
```

You can enter ?? at the prompt for a description of each menu option.

Options indicated by "**"should be performed using the Background Processor. See the *Background Processor User Manual* for more information.

For detailed information about the 'Telereader Menu …' option, refer to the TeleReader Configuration document.

For detailed information about the "Ad hoc Enterprise Site Report" option and the "Imaging Site Reports" option, refer to Chapter 12.

MAG REASON EDIT

This option allows adding/editing of reasons for actions performed on images (copying, printing, etc.) stored in the MAG REASON file (#2005.88).

MAG REASON EDIT [MAG SYS MENU]

This menu option allows adding/editing of reasons for actions performed on images (copying, printing, etc.) stored in the MAG REASON file (#2005.88). The Reason codes and definitions shown are samples only.

```
   IX     Image Index Conversion Menu ...
   LS     Edit Network Location STATUS
   TR     Telereader Menu ...
          Ad hoc Enterprise Site Report
          Delete Image Group
          Enter/edit Reason
          Imaging Database Integrity Checker Menu ...
          Imaging Site Reports ...
```

From the MAG REASON EDIT [MAG SYS MENU] select the “Enter/edit Reason” menu option.

```
Select Imaging System Manager Menu Option: Enter/edit Reason
```

At the prompt "Select MAG REASON:" enter a reason number to display an existing reason; or a ? to display a list of all MAG REASON numbers currently stored.

```
Select MAG REASON: ?
 Answer with MAG REASON, or NUMBER, or CODE
 Do you want the entire 13-Entry MAG REASON List? yes  (Yes)
   Choose from:
   1            Clinical care for the patient whose images are being downloaded
 1  -Copy-Print-
   2            Clinical care for other VA patients  2  -Copy-Print-
   3            For use in approved research by VA staff  3  -Copy-Print-
   4            For approved teaching purposes by VA staff  4  -Copy-Print-
   5            For use in approved VA publications  5  -Copy-Print-
   6            Authorized release of medical records or health information (ROI
)  6  -Copy-Print-
   7            Corrupt image  7  -Delete-
   8            Low quality image  8  -Delete-Status-
   9            Wrong case/exam/accession number  9  -Delete-Status-
   10           Wrong note title  10  -Delete-
   11           Wrong patient  11  -Delete-
   12           Image is incorrectly included in an image group  12  -Status-
   13           All images were removed from the group  13  -Delete-

         You may enter a new MAG REASON, if you wish
         Answer must be 3-70 characters in length.
```

A new MAG REASON is added by entering the name of a new MAG REASON at the prompt.

```
Select MAG REASON: Reference
  Are you adding 'Reference' as a new MAG REASON (the 14TH)? No// yes  (Yes)
   MAG REASON CODE: L14// To refer to the patient image as reference material.
?
     Enter unique code of the reason (from 1 to 999999). Codes of local reasons
     must be preceded by letter L.
   MAG REASON CODE: L14// L14
REASON: Reference//
```

MAG CLIENT VERSION REPORT

MAG CLIENT VERSION REPORT [MAG REPORT MENU] This option prints the list of workstations and clients that are in need of updates. When the new version of the VistA server code is distributed, those clients may continue, but they are not supported.

```
   IX     Image Index Conversion Menu ...
   LS     Edit Network Location STATUS
   TR     Telereader Menu ...
          Ad hoc Enterprise Site Report
          Delete Image Group
          Enter/edit Reason
          Imaging Database Integrity Checker Menu ...
          Imaging Site Reports ...

Select Imaging System Manager Menu Option: Imaging Site Reports ...  ??
```

From the Imaging System Menu [MAG SYS MENU], the user will enter "Imaging Site Reports" at the prompt.

```
   IX     Image Index Conversion Menu ...
   LS     Edit Network Location STATUS
   TR     Telereader Menu ...
          Ad hoc Enterprise Site Report
          Delete Image Group
          Enter/edit Reason
          Imaging Database Integrity Checker Menu ...
          Imaging Site Reports ...

Select Imaging System Manager Menu Option: Imaging Site Reports
```

At the prompt, the user will enter "Imaging Site Report".

```
          Document Count
          Image Type Count by User
          Imaging Clients Version Report
          MEANS TEST
          Package Index Contains 'Note'

Select Imaging Site Reports Option: Imaging Clients Version Reportort

     Select one of the following:

          V         Site-Client-Version-Workstation Name
          W         Site-Workstation Name-Client

Report Sort Mode: v  Site-Client-Version-Workstation Name

DEVICE: HOME// w  WORK  PRINTER ROOM

Do you want your output QUEUED? No// no  (No)
```

At the prompt, the user will enter "V" and a report similar to the sample report below will be displayed.

```
            LIST OF WORKSTATIONS AND CLIENTS THAT HAVE TO BE UPDATED
            ========================================================
                                 SALT LAKE CITY

                                                                       Page 2
                                                          Client     Last
Client      Client Version  Workstation Name               Date     Logon    Type
----------  --------------  -------------------------  --------  --------  ----
CAPTURE     2.5.0.7         ISW-XXX1                   03/09/99  04/27/99
CAPTURE     2.5.0.9         ISW-XXX2                   06/21/99  07/09/99
CAPTURE     2.5.0.10        ISW-XXX4                   11/17/99  11/24/99
Enter RETURN to continue or '^' to exit:
                                                                       Page 3
```

8.3 Imaging VistARad System Options

The VistARad System Options Menu is used to set site parameters that control VistARad's basic behaviors and performance, to create custom exam lists, and to review and manage VistARad's prefetch and CPT (Current Procedural Terminology) code matching capabilities.

Menu Diagram for MAGJ MAIN

```
Select OPTION NAME: MAGJ MAIN       VistARad System Options

   SITP   E/E VistaRad Site Parameters
   ELIS   E/E VistaRad Exam Lists
   PLIS   Print VistaRad List Definition
   EPRF   E/E VistaRad PreFetch Logic
   IPRF   Inquire Prefetch Logic
   PPRF   Print VistaRad Prefetch Logic Table
   ECPT   E/E VistaRad CPT Matching Set
   ICPT   Inquire VistaRad CPT Matching Set
   PCPT   Print VistaRad CPT Matching Logic Table
```

8.4 Imaging MAG WINDOWS Menu

The menu option MAG WINDOWS should be assigned as a secondary menu option to end-users who need access to VistA Imaging. This menu outlines all the RPC used by VistA Imaging.

8.5 Imaging VistaRad MAGJ VISTARAD WINDOWS

The menu option MAGJ VISTARAD WINDOWS should be assigned as a secondary menu option to end-users who need access to VistA Imaging VistARad. This menu outlines all the RPCs used by VistARad.

8.6 Imaging MAG JB OFFLINE Menu option

This menu option is not part of any menu and is discussed in chapter 9 of this manual; section Removing Jukebox Media - Offline Images.

8.7 Imaging DICOM Menu

The VistA Imaging DICOM Gateway itself does not use VA Kernel software, and as a result, does not use any Options. However, on the VistA hospital system the following menu does relate to the DICOM Gateways. See the *Imaging DICOM User Manual* for full instructions on the usage of this menu.

Menu Diagram for MAGD DICOM MENU

```
Select Dicom Menu Options Option: [MAGD DICOM MENU]

     ECTP Edit CT PARAMETER File [MAGD CT PARAMETER EDIT]
     ICTP Display MAGD CT PARAMETER entries  [MAGD CT PARAMETER INQUIRY]
     ECRP Edit CR PARAMETER File  [MAGD CR PARAMETER EDIT]
     ICRP Display MAGD CR PARAMETER entries  [MAGD CR PARAMETER INQUIRY]
     Correct Clinical Specialities DICOM File Entries [MAGD FIX CLINSPEC DICOM FILE]
     Correct RAD-DICOM File Entries   [MAGD FIX DICOM FILE]
     Clean Up DICOM Gateway (DICOM Destinations) [MAGD REMOVE GATEWAY XMIT]
     Clean Up DICOM Gateway (Failed Images) [MAGD REMOVE GATEWAY FAILED]
     List Unread Studies  [MAGD LIST UNREAD STUDIES]
     Print Dicom Failed Image File Entries [MAGD PRINT DICOM FILE]
     Rename DICOM Gateway (DICOM Destinations) [MAGD RENAME GATEWAY XMIT]
     Rename DICOM Gateway (Failed Images) [MAGD RENAME GATEWAY FAILED]
     Validate DICOM Correct Information [MAG DICOM CORRECT VALIDATE]

Select Dicom Menu Options Option:
```

8.8 Imaging Menu Options Documentation

A full description for all the of Imaging's VistA menu options can be obtained by using FileMan print menu option.

```
Select OPTION: print FILE ENTRIES

OUTPUT FROM WHAT FILE: OPTION//
SORT BY: NAME//
START WITH NAME: FIRST// MAG
GO TO NAME: LAST// MAGZ
  WITHIN NAME, SORT BY:
FIRST PRINT FIELD: [CAPTIONED

Include COMPUTED fields:  (N/Y/R/B): NO//  - No record number (IEN), no Computed
 Fields
DISPLAY AUDIT TRAIL? No//   NO
Heading (S/C): OPTION LIST//
START AT PAGE: 1//
DEVICE:
```

8.9 Access to DICOM Gateway RPCs

The VistA system grants access to Remote Procedures based on a relation between certain menu options and the RPCs in question. The DICOM Gateway uses two classes of RPCs: those that can be called by any user of the DICOM Gateway ("view-only access") and those that can only be called by end-users with "full access". In order to support this distribution of privileges, the following two menu options are present in the VistA system and should be assigned to the appropriate personnel:

MAG DICOM GATEWAY VIEW
MAG DICOM GATEWAY FULL

Chapter 9 Archiving, Purging, and Backup

9.1 Introduction

This chapter explains how to archive and purge VistA Imaging files and VistA Imaging FileMan entries. Image files are part of the patient's record and must be preserved for the required number of years. Image files may be kept online indefinitely. As image files get older and have not been accessed recently, they reside on the optical disk jukeboxes where they are still accessible to users, but access is less rapid. Some sites have taken platters out of jukeboxes for shelf storage, but these are reloaded when needed by a user.

9.2 Archiving and Purging of Image FileMan Entries

Entries in the Image file should NOT be purged or archived.

9.3 Archiving and Purging of Image Files

9.3.1 Automatic Image File Migration

The imaging workstation stores the full-size image file on the server when the image is captured. An abstract may be created by the capture workstation, or by placing an entry in the Abstract queue. An entry is placed in the JUKEBOX queue. The background processor then copies the images to the jukebox.

After a period of time during which an image is not accessed:

1. The full-size image will be deleted from the magnetic file server. It will still be accessible to users from the jukebox.

2. Next, the abstract will be deleted from the magnetic file server. If a subsequent request is made to display the full-size image or the abstract, that file will be copied back to the magnetic file server.

Because images are stored temporarily on the magnetic servers, these are referred to as VistA magnetic cache.

9.3.2 Image File Deletion

There is a Background Processor purge utility that clears disk space within the VistA Imaging shares. This space is necessary for newly captured files from Imaging modalities and the DICOM gateways. Space is also needed for files that are copied from the jukebox archive when images are viewed on Imaging display workstations.

Each file on every VistA Imaging shares is evaluated to determine if it should be purged, as follows:

- The file name must consist of the local namespace followed by the number which coincides with its IMAGE file (#2005) internal entry number. If the corresponding IMAGE file entry does not exist, the image file is unconditionally purged from the VistA Imaging shares.

- The file location is checked against the IMAGE file (#2005) settings. If the IMAGE file entry has no current magnetic cache pointers set for this image, then the IMAGE file entry is updated, and the file is not purged. If no Jukebox pointer is set, then a Jukebox copy process is queued.

- If the image file in the VistA Imaging shares is not where the IMAGE file (#2005) specifies it to be, then the location pointed to by the IMAGE file is checked. If a proper image file is found, then the redundant image will be otherwise purged.

- The image is next characterized as PACS or non-PACS by checking if a PACS node is set in the IMAGE file (#2005) entry. If so, the PACS purge criteria parameters will be used in evaluating this image.

- If the image (a) is found to be at a magnetic location other than that specified by the IMAGE file (#2005) entry, (b) is not found at an IMAGE file alternate site, (c) is confirmed of size non-zero on the jukebox, then the file will be removed from the VistA Imaging shares.

9.3.3 Purging the Background Processor's Queue File

Failed and unprocessed queues are purged during the install procedures of the VistA Imaging System. Using the BP Edit|Queue Manager option on the main Background Processor form, one can update and manage queue file growth. After selecting a queue type and a queue status value, a list of the queues from eldest to most current will be shown with their status. The list will end at the current queue pointer. These reflect unprocessed (nil) and failed queues.

The user has the option of requeuing, purging or saving them to a file. These records reflect requests to move files to and from the jukebox with the exception of Abstracts and deletes.

Normally, a site would not consider requeuing jukebox-to-hard disk copies (JBTOHD queue) as these files usually reflect old requests that, for the most part, will no longer be useful. The Jukebox copies (JUKEBOX queue) may be requeued, however, the Purge process will automatically requeue those that are not currently archived on the jukebox.

The Queue Set button will request a listing of all queues both failed and yet to be processed of the queue type selected. The list maybe perused and the current pointer reset to the one selected by the user. (See *Background Processor User Manual* for more details).

9.3.3.1 Additional Background Processor's Utilities

See the *Background Processor User Manual* and online help for more detailed information about the Background Processor.

9.3.3.1.1 Background Processor Image and File Entry Verifier

As a separate executable, it is necessary to launch the Verifier application from the Programs menu, unless you set up a desktop shortcut. The executable is installed by default in the program files/vista/imaging/backproc subdirectory.

The process examines each non-group entry within the selected range of IMAGE file (#2005) entries. It searches each network magnetic and jukebox share indicated by each IMAGE file (#2005) entry for all extensions of the indicated filename. For each, it does the following:

- When more than one jukebox share contains images of the same file name, the Verifier will aggregate those files on a current jukebox share entry location in JUKEBOX file (#2006.032). It will update the references in the IMAGE file (#2005) entry. The Activity column of the Verifier will display this activity as "Aggregate".

- If any extension of the image file is missing from the referenced jukebox share and is both referenced and available on the VistA Imaging Shares, then the Verifier will copy it to the jukebox share and update the appropriate jukebox IMAGE file (#2005) references.

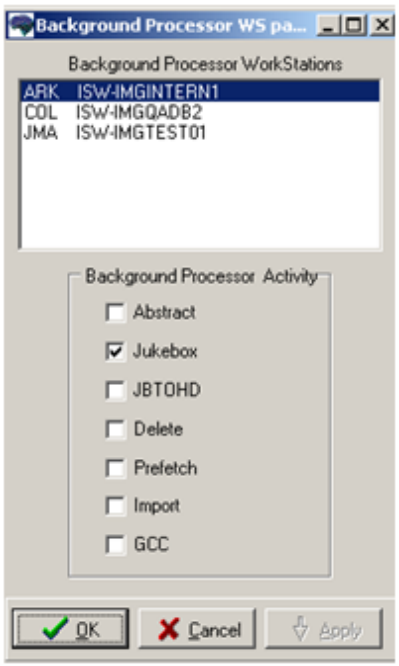
- If the VistA Imaging Shares references in the Imaging File (#2005) entry are not accurate and the appropriate files are available at another network location, then the VistA Imaging Shares references are updated.

- If there is no TGA or ABS file on the network, but a BIG file exists, then the Verifier will create the missing file(s) at the current network write location, aggregate it to the jukebox, and update the image file jukebox references.

9.3.3.1.2 Edit Background Processor Workstation Parameters

Select **Edit | BP Workstation Manager| BP Workstation Queues** from the BP main window.

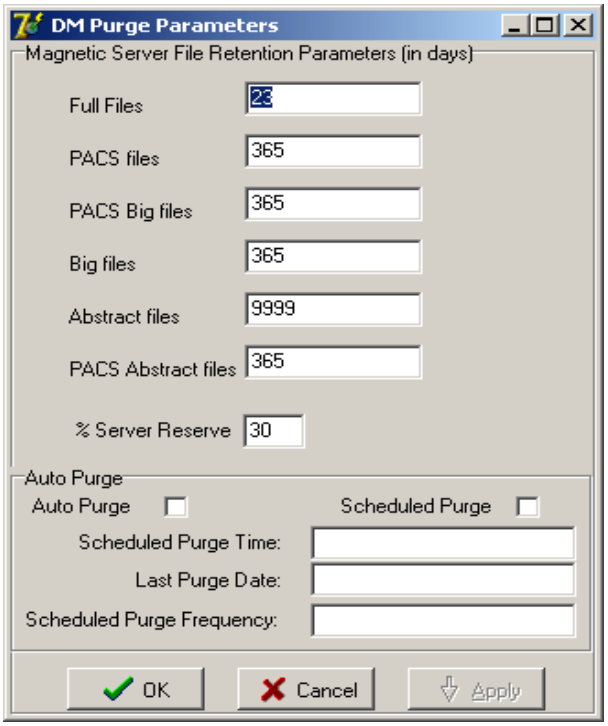
Select the Background Processor to be configured by clicking or scrolling to select it.



This window provides display and edit capability of the individual BPWS parameters (what each WS is elected to process) in addition to the toggling on/off the auto write location update feature system wide. Note that the form will not allow two BPWS to be assigned the same activity. This supports the queue file integrity. The parameters are updated after OK|Cancel|Apply. Any active BPWS will use the new set of parameters at the top of the next cycle.

9.3.3.1.3 Background Processor Purge Configuration

The Purge Parameters window is accessed by selecting the **Edit | Purge Parameters Option** on the main menu of the Background Processor window.



This window will allow the user to determine the longitudinal distribution images on the VistA Imaging Shares. Factors to be considered in setting these parameters are the size of the local VistA Imaging Shares, the rate of acquisition of new images, the average length of time between patient visits, the local use of pre-fetch, and the regularity with which the purge will be run.

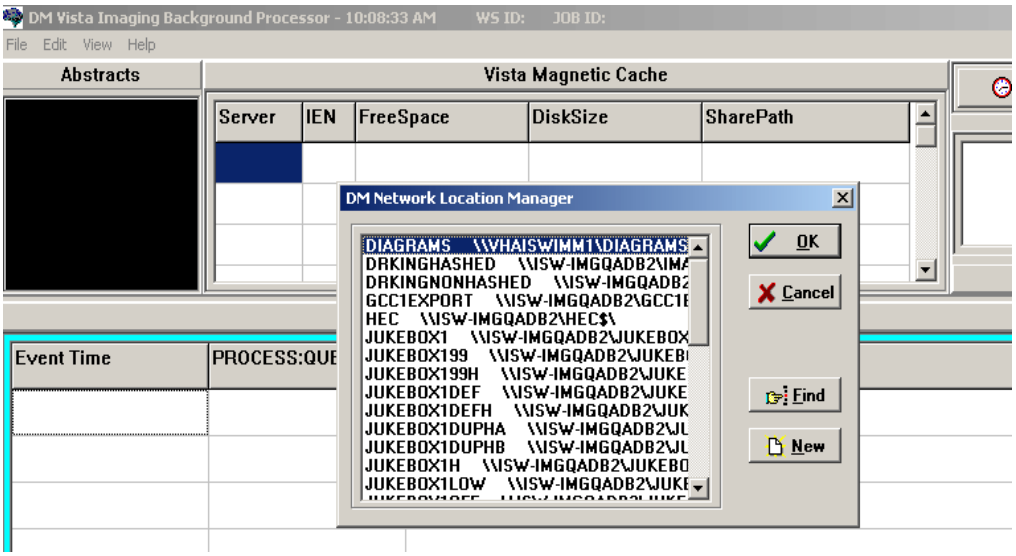
- The Abstract files are small and it is suggested to keep them on the VistA Imaging Shares. PACS and Abstract files should be kept on the RAID indefinitely.

- PACS Big files are large and take a lot of storage space. After the radiology studies are read, most viewing will be done on the clinical workstations where the big files are not necessary. Therefore, the “PACS Big files” parameter can be set smaller than the “FULL files” and “PACS files” parameters.

9.3.3.1.4 Network Location Manager: Adding a New Magnetic or Jukebox Storage Location

From the main Background Processor window, select the **Edit | Network Location Manager** option.

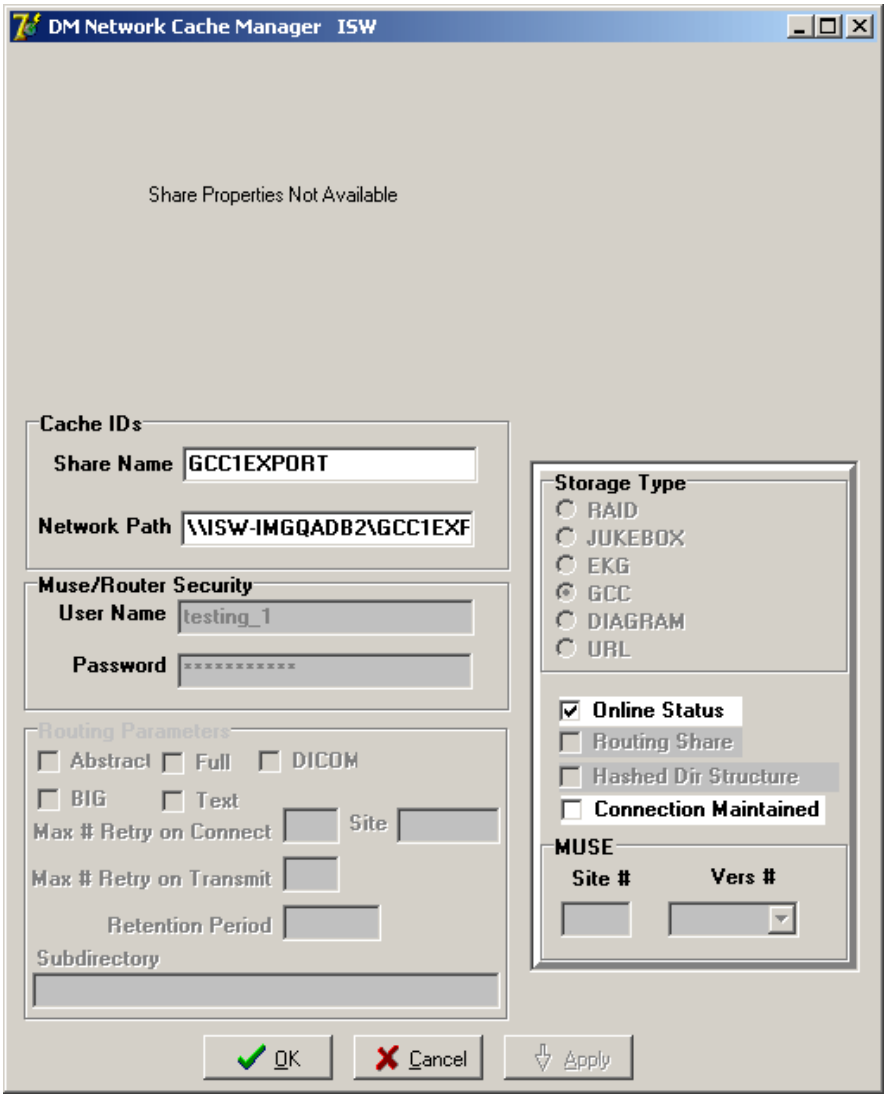
The Background Processor provides an easy way to add a new magnetic or jukebox storage location.



Select a location to update, search the list by the share name, or select New to add a new share.

9.3.3.1.5 Network Location Manager: Checking Free Space of Servers

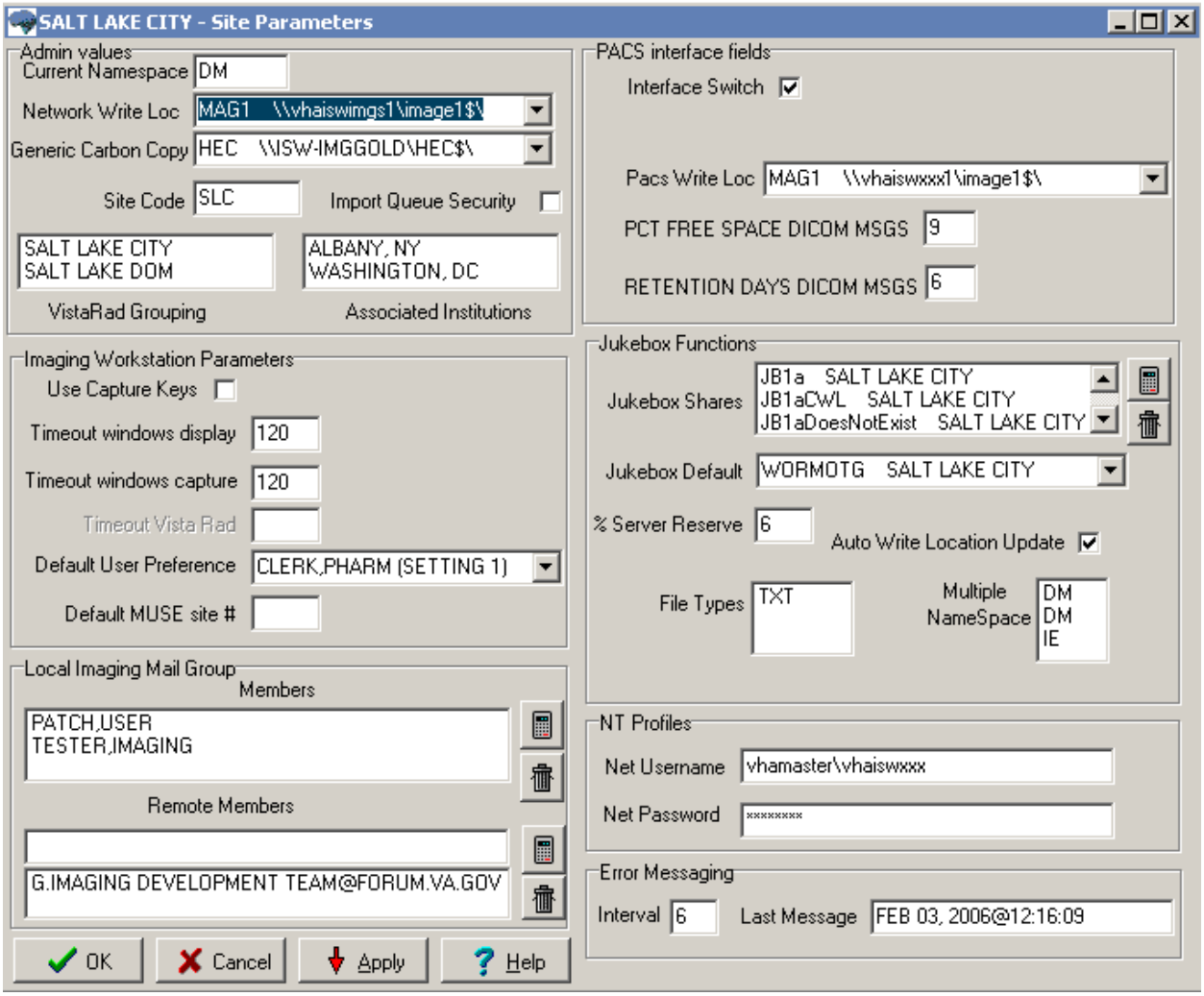
To access this menu on the Background Processor, select **Edit | Network Location Manager**.



When an existing share is selected, the magnetic share utilization is displayed graphically. Both the free and used space on the share are shown. This provides a quick check of storage space availability.

9.3.3.1.6 Background Processor Imaging Site Parameter Edit Functions

To access the site parameter edit functions, select **Edit | Imaging Site Parameters** on the Background Processor main menu.



The Background Processor automatically monitors free space on the shares where newly captured images are being stored (current write location). When a current write location has too little free space, the Background Processor will automatically set the current write location to another share with more space. These actions are controlled by a few site parameters:

The "% Server Reserve" parameter indicates the percentage of free space that must be available on a server before a write location will be switched to it. Critical operations messages will be sent to the mail group specified under "Local Imaging Mail Group" when Imaging's VistA magnetic cache has disk space reserves below the % Server Reserve level. When AutoPurge is configured and no online share meets the critical % Server Reserve criteria, a purge will automatically be launched and no messages will go out.

These “PCT FREE SPACE DICOM MSGS” and “RETENTION DAYS DICOM MSGS” site parameters are used to trigger automatic deletion of DICOM text messages.

When the percentage of free space on the DICOM gateway drops below the threshold specified by “PCT FREE SPACE DICOM MSGS”, DICOM messages older than the number of days specified in the “RETENTION DAYS DICOM MSGS” are deleted.

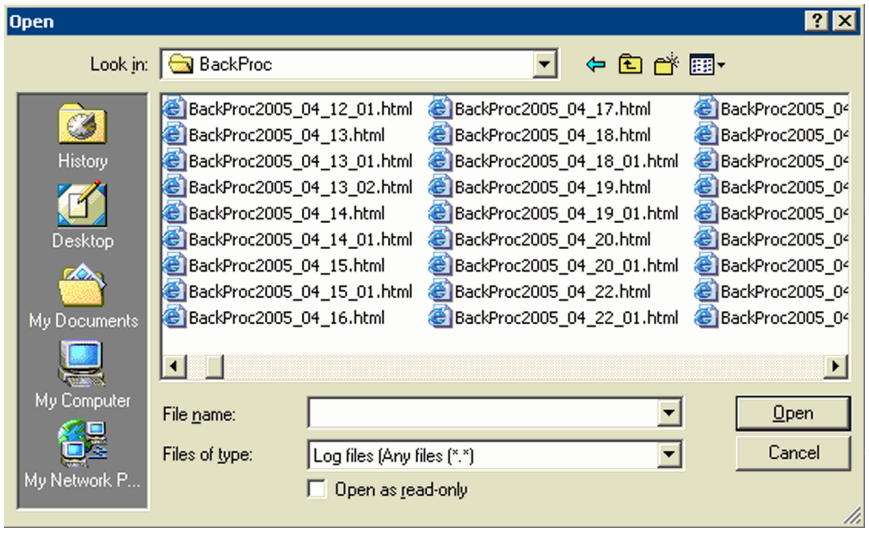
It is suggested to keep old DICOM text messages on the system for 30 days. The space threshold is typically set to 25% minimum free space. When these settings are used, every time the free disk space drops below 25%, all the DICOM text messages over 30 days old are be deleted.

Note: If the RETENTION DAYS DICOM MSGS is set to a number larger than the disk capacity, automatic deletion would occur. For example, if the disk could hold a year’s worth of messages and the parameter were set to 400 days, free space would not be recovered because none of the messages would be old enough to delete.

9.3.3.1.7 Background Processor: Open Log Functions

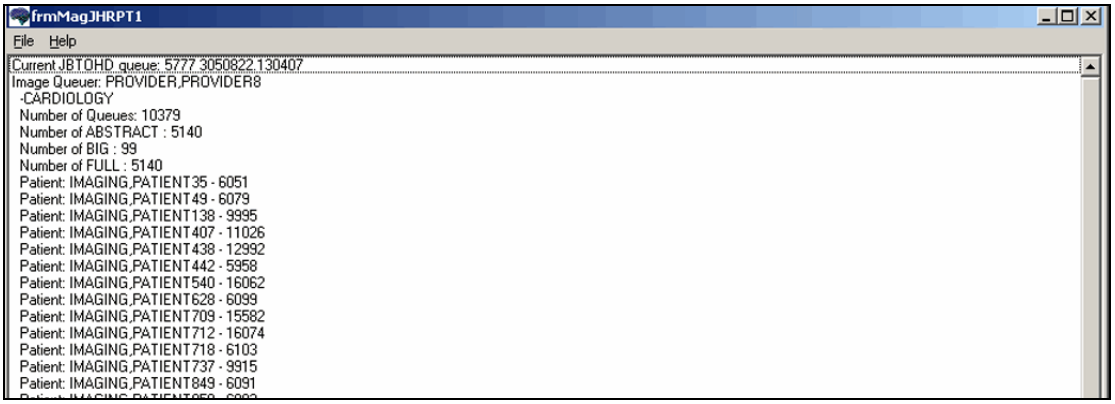
The Open Log window is accessed by selecting **File | Open Log** option on the main menu of the Background Processor window.

The Open Log provides access to the Queue, Purge and Verifier output files for the Background Processor, Queue Processing and Purge activities. Selecting a file opens an edit session that provides search and print functions as a management tool. Event logs often contain information that will assist in troubleshooting.



9.3.3.1.8 Check Status of Backlogged Jukebox to Hard Drive Copies

On the Background Processor main menu, select the **View | JBTOHD Report** option. Then select **File | New** in the report window.



The JBTOHD queue display is sorted by the individual that queued the entry. It displays the number and types of queues. It displays the patient along with the queue Internal Entry Number (IEN) to facilitate advancing the queue pointer.

9.4 Imaging Server and Jukebox Backup Information

Sites should establish weekly and daily schedules for backing up images from the VistA Imaging network servers and Jukebox unit(s). A copy of the backed up media should be kept off site. Full backups and incremental backups are recommended. For further information, refer to the "Backups" section of Appendix B of the *VistA Imaging System Installation Guide*.

9.5 DICOM Related Backup and Purge

As the software in the VistA Imaging DICOM Gateway is being used, information is created and stored. If left alone, this information would accumulate in an unbounded fashion and would eventually exceed any reasonable storage capability.

A number of entities are purged automatically as the software is being used, based on retention parameters that can be set using the software itself.

The storage of images takes a lot of space, and, as a result, images are typically only stored temporarily on the magnetic disks that are connected to the various workstations and servers. For long-term storage, images are typically copied to a jukebox, and then removed from their temporary cache storage.

9.5.1 Growing entities

The VistA Imaging software creates the following entities:

- Image files (pixel data) temporarily stored on VistA magnetic cache servers
- Image Background Queue (^MAGQUEUE(2006.03,i,…))
- Modality Worklist Entries (^MAGDWLST(2006.56, i, …))
- DICOM and PACS Messages (^MAGDHL7(2006.5,i,…))
- DICOM Failed Images (^MAGD(2006.575,i,…))
- DICOM Incomplete Images (^MAGD(2006.593,i,…))
- DICOM Error Log (^MAGD(2006.599,i,…))
- Error log on DICOM Gateways

9.5.2 Jukebox Archive

9.5.2.1 File Migration

As a part of normal procedure, captured images are copied to long term storage. The process that copies these files observes the following rules:

- Long-term storage media should be non-rewritable optical media.
- The process validates the name of the jukebox volume against the name stored in the VistA Jukebox queue file (^MAGQUEUE(2006.032,i,0)).
- Overwrites are not allowed.
- All image-related files (“Full”, “Big”, and “Abstract”) are copied to jukebox.
- Site-specified additional file types are copied to jukebox.(“TXT” is part of the default install setting).
- If a file copy fails, additional attempts are made to copy the file. This is controlled by a site parameter whose default is three attempts.

9.5.2.2 Removing Jukebox Media - Offline Images

The VistA Imaging System is capable of tracking images on platters that have been removed from the jukebox. This is sometimes necessary when all platters in all of slots in the jukebox are full, and a new jukebox has not been purchased or installed. Some sites use this option to archive platters on a first in, first out manner instead of buying additional hardware. By removing a platter, the images on the platter are marked offline. The clinical display software

will display an “Archived Image” abstract (thumbnail) for any offline images. If the user clicks on the abstract, a message-box will appear with offline image and associated platter information. If the user chooses to view that image, they can notify an imaging system manager so the platter can be put back into the jukebox. System Managers can also be notified automatically with an email message whenever an offline image is accessed. The OFFLINE IMAGE TRACKERS mail group is installed on the system during the VistA Imaging KIDS installation. System managers that would like to receive notifications should add themselves to the mail group. The procedure below outlines the steps necessary to track offline images.

9.5.2.3 Taking Images Offline

1. Go to DEX Administrator.
2. Click on **View | Reports**, then choose **Media Files**.
3. Click **Next**.
4. Select the media (platter) that will be taken offline. (Multiple select is allowed)
5. Click **Finish**.
6. When the report is available, save it to a file (use Save As) - Be sure to save as type Text (*.txt)
7. Move file to VistA System (ftp; use ASCII mode, not binary mode)
8. Run M option MAG JB OFFLINE (shown below); this procedure will require a FileMan access of “@”.

```
Select Option:  MAG JB OFFLINE

Offline Image Menu

   1  Take images offline (Remove Jukebox Platter)
   2  Put images back online (Insert Jukebox Platter)

  OPTION:  1

Enter file to read offline images from: J1_0087.TXT

Here goes nothing...

J1_0087A.....................................................
.............
J1_0087B.........................................

Done.
```

9.5.2.3.1 To Check Which Platters are Offline

```
Select Option:  MAG JB OFFLINE

Offline Image Menu

   1  Take images offline (Remove Jukebox Platter)
   2  Put images back online (Insert Jukebox Platter)

  OPTION:  2
```

```
Enter the name of the platter being inserted: ?
Do you want to see a list of all offline platters? y

J1_0085A
J1_0085B
J1_0086A
J1_0086B
J1_0087A
J1_0087B
J1_0143A
J1_0143B
J1_0144A
J1_0144B
```

9.5.2.3.2 To Put Images Back Online

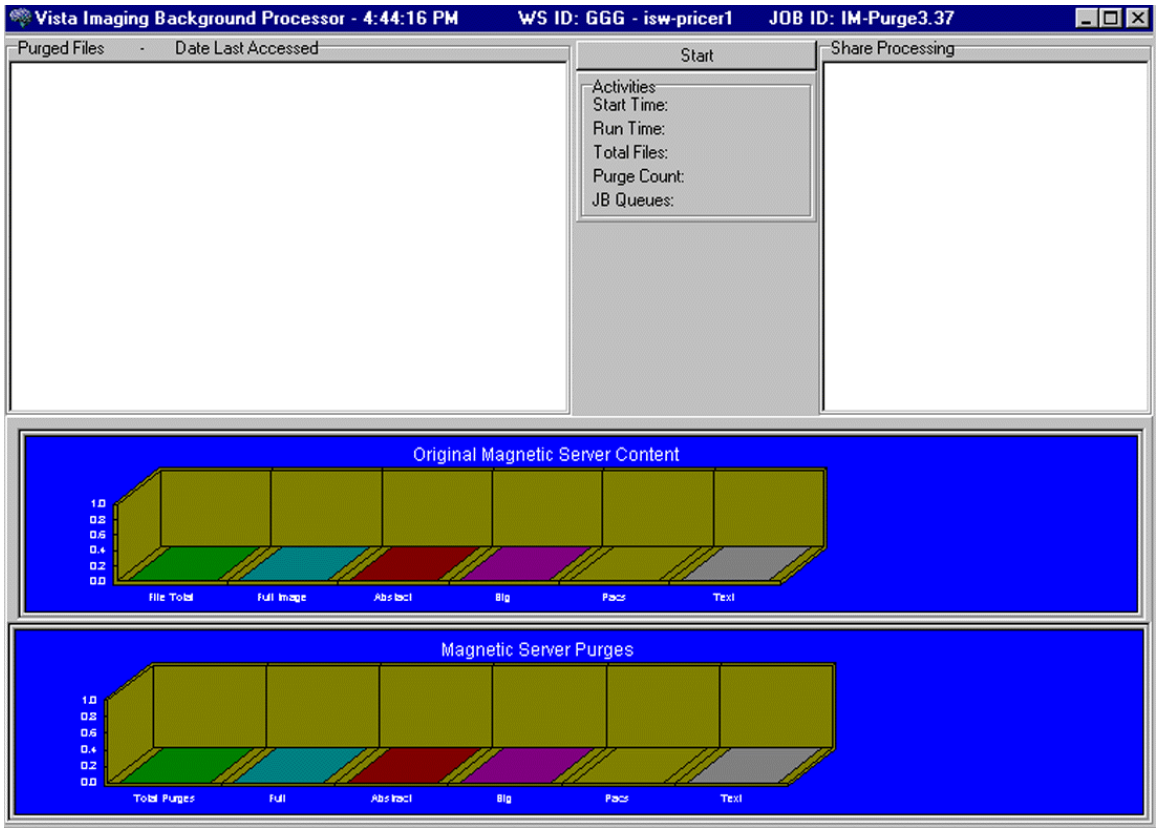
```
Offline Image Menu

   1  Take images offline (Remove Jukebox Platter)
   2  Put images back online (Insert Jukebox Platter)

  OPTION: 2

Enter the name of the platter being inserted:
J1_0085A.....................................................
.............................................................
.............................................................
......
Done.
```

9.5.3 Purge Image Files from VistA Magnetic Cache

The Background Processor Purge software purges image files from the VistA Magnetic Cache, depending upon certain criteria set by the site.

To operate this software:

Start the BP Purge software. Select the **File | Purge** option.



The title bar displays the current time, the workstation (WS) network computer name, and, on DSM host systems, the VMS job name.

The display box in the upper left quadrant shows the files that will be purged and the date of last access by user application. All listed items are captured in the current Purge.log file. The display is cleared after every 50 items to conserve application memory.

Click on the **Start** button to initiate the purge.

The Activities display (immediately below the start button) shows the time of execution and gives running totals for the VMC files evaluated, the number purged, and the number that were queued to be copied to the Jukebox (JB) because they could not be confirmed on the jukebox.

The Share Processing display lists each online, non-routed, magnetic type share in the Network Location File (#2005.2). These are input values for each step of the purge process and they are appended with a Purged status as they are successfully processed.

The two graphical displays reflect the runtime categorization of image files evaluated and purged as the purge process progresses. Note that the vertical axis units change over the processing period. Also, the units tend to differ between the two graphs.

Steps in the purge process are:

1. The processor initially gets the information from VistA including site parameters governing file aging criteria and online magnetic file server shares.

2. The hierarchical directory structures on each imaging server share are traversed. For each file in each directory, the date of last access is compared against the VistA site file aging criteria for that file type.

3. Files meeting VistA purge criteria are removed from the Imaging magnetic server share and the VistA Image database is updated Image File (#2005) to indicate the current location of the files on the jukebox.

4. If the image file being evaluated resides on an imaging server share other than the one indicated in the VistA Image database Image File (#2005), then the file on the unreferenced share is purged regardless of the date of last access as long as the file is present at its referenced location.

5. If there is no corresponding VistA Image database Image File (#2005) entry for this file, the file is purged regardless of age criteria.

6. For sites with a jukebox, if the VistA Image database Image File (#2005) is synchronized with the imaging magnetic cache, but there is no reference to the file's location on the jukebox, then a jukebox copy is queued and the file is left in place on the magnetic server.

7. A site parameter exists for evaluating radiology image files to be held regardless of age if the specific file is related to a radiology package entry with the "NOPURGE" node set.

8. Sites that have no jukebox still must clear space on their magnetic servers. When removing a file from the imaging server, these sites may use the site parameter **No JB Delete Entry** to choose to either:

   - Remove the file server cache references in the VistA Image database Image File (#2005), or…

   - Delete the entire entry in the VistA Image database Image File (#2005)

   Note: A monthly verification process may be added to validate the file server references in the VistA Image database Image File (#2005).

9.5.4 Entities that Are Purged at the Discretion of the Site Supervisor

9.5.4.1 Purge Old Modality Worklist Entries

Old entries may be purged by selecting the option "**Purge old Modality Worklist Entries**" from the "**Text Gateway**" menu.

The subroutine that is called for this menu-option (`ENTRY^MAGDDEL1`) removes entries in `^MAGDWLST(2006.55,…)` that were time-stamped more than a certain number of days (the default is the number of days specified in `^MAGDICOM(2006.563,1,"DELETE DAYS")`) before the current date.

9.5.4.2 Purge Old DICOM Message Files

Old files and directories may be purged by selecting the option "**Purge old DICOM message files**" from the "**Text Gateway**" menu.

The subroutine that is called for this menu-option (`DICOM^MAGDDEL2`) removes files and directories that were time-stamped more than a certain number of days (the default is the number of days specified in `^MAGDICOM(2006.563,1,"DELETE DAYS")`) before the current date.

Names of directories that may play a role in this context are stored in `^MAGDICOM(2006.563,1,"DATA PATH",…)`.

9.5.4.3 Purge PACS Messages

Old messages may be purged by selecting the option "**Purge old HL7 transaction global nodes**" from the "**Text Gateway**" menu; these messages are stored in global ^MAGDHL7(2006.5.

The subroutine that is called for this menu-option (`HL7^MAGDDEL3`) removes entries in `^MAGDHL7(2006.5,…)` that were time-stamped more than the number of days specified in `^MAGDICOM(2006.563,1,"DELETE DAYS")` before the current date.

9.5.4.4 Process DICOM Failed Images

Entries are removed from this file by using the Correct RAD-DICOM File Entries [MAGD FIX DICOM FILE] or the Correct Clinical Specialties DICOM File Entries [MAGD FIX CLINSPEC DICOM FILE] menu options. Using this menu will mark the entries as corrected and will be reprocessed by the VistA DICOM Image Gateway. Entries are stored in global ^MAGD(2006.575.

9.5.4.5 Removal of DICOM Incomplete Images

Entries in this file will automatically be removed after an hour's time span; entries are temporary stored in global ^MAGD(2006.593.

9.5.4.6 DICOM Error Log

This file should not be purged. It records incomplete files received and images requested to be deleted from the DICOM Failed Image file. Entries are stored in global ^MAGD(2006.599.

9.5.4.7 MSM Error log

See the *VistA Imaging DICOM Gateway User Manual* for instructions on how to view and purge entries from the MSM Error Log located in global ^UTILITY("%ER",+$H.

Chapter 10 Callable Routines/Application Programmer Interfaces (APIs)

10.1 Notifications

10.1.1 VA Policy

VA Policy states the following:

Those components of a national package (routines, data dictionaries, options, protocols, GUI components, etc.) that implement a controlled procedure contain a controlled or strictly defined interface or report data to a database external to the local facility must not be altered except by the Office of Information (OI) Technical Services (TS) staff. A controlled procedure is one that implements requirements that are mandated or governed by law or VA (Department of Veterans Affairs) directive or is subject to governing financial management standards of the Federal Government and VA or that is regulated by oversight groups such as the JCAHO or FDA. A controlled or strictly defined interface is one that adheres to a specific industry standard, will adversely affect a package and/or render the package inoperable if modified or deleted. For national software that is subject to FDA oversight, only the holder of the premarketing clearance (510(k)) is allowed to modify code for the medical device. The holder of a premarketing clearance is restricted to specifically designated TS staff that are located at the registered manufacturing site and operating in the designated production environment.

Note: Any party interested in interfacing with the VistA Imaging software will need to contact the VistA Imaging developers.

10.1.2 FDA Policy

FDA Policy states the following:

The Food and Drug Administration (FDA) classifies this software as a medical device. As such, it may not be changed in any way. Modifications to this software may result in an adulterated medical device under 21CFR820, the use of which is considered to be a violation of US Federal Statutes.

10.2 VistA Imaging Import API

10.2.1 Terms of Use

Note: The Import API, as a part of the VistA Imaging software, is regulated as a medical device. The Import API cannot be used without a written agreement between the VistA Imaging HSD&D group and the party wishing to use the Import API.

To secure an agreement for the use of the Import API, the following criteria must be met:

1. Any products built or interfaced using the VistA Imaging Import API must be tested with VistA Imaging. Testing will be performed by the VistA Imaging team with assistance from field sites and the calling package. This testing must demonstrate that there are no adverse interactions affecting the safety, efficacy or performance of the VistA Imaging software or the devices interfaced to VistA Imaging.

2. Any changes to packages/product(s) using the VistA Imaging Import API must be reported to the VistA Imaging Project Office for review and testing before release. Retesting of VistA Imaging with the product(s) is required with any change.

3. Documentation that imported reports/objects meet VHA, regulatory, and quality requirements must be on file with the Vista Imaging Project Office prior to any clinical use. Sample imported reports/objects shall be provided initially to the VistA Imaging Project Office by the package using the API. Sites installing the VistA Imaging API must comply with all VistA Imaging requirements and are responsible for filing all required documentation with the VistA Imaging Project Office, including image quality and data forms and sample reports/objects from any interfaced device.

4. Additional requirements may apply to non-VA software using the Import API.

10.2.2 Overview

The Import API is used by the Clinical Procedures package to automatically import image files into VistA Imaging. Image files can originate from a medical device (instrument) or a network or local drive. Once image files are imported, they are available for display from the VistA Imaging Clinical Display application.

When the Import API is accessed as an M routine, importing images is a two step process:

> **STEP 1:** The calling program initiates the import process by sending an input array to the Import API. The Import API uses the input array to create an entry in the Import Queue File and returns a status array to the calling program.
>
> **STEP 2:** After the entries in the Import Queue File are processed (by the Background Processor residing on the network), the Import API reports back to the calling program in a result array.

10.2.3 Data Used by the Import API

When the Import API is used, the calling program is responsible for providing an input array to the Import API. The calling program must be able to accept the queue status array and results array returned by the Import API.

Note: For implementation-dependent information about how this data should be presented, refer to the Import API Implementation Notes section.

10.2.3.1 Input Array Sent to Import API

Note: Patch 17 introduced Image Index Files and Index Fields in the Image File (#2005). The INDEX Fields (IXTYPE, IXSPEC, IXPROC, IXORIGIN) are now implemented in the Import API. These fields take the place of the Document Category (DCCTG). The use of DCCTG will be discontinued in a future release and will remain supported until then. Applications using the Import API are urged to start using the Index fields as soon as possible for the Image Filter functions of Imaging Display Patch 8 to operate correctly.

The following table summarizes the data that can be sent to the Import API.

- Required fields are indicated with an asterisk (*).
- In addition to required fields, the input array must contain values for:

  IXTYPE and/or any other index fields (IXSPEC, IXPROC, IXORIGIN). If IXTYPE is sent the procedure fields (PXDT,PXIEN,PXPKG) can also be sent

  -or-

  DOCCTG (document category) and DOCDT (document date).

  -or-

  PXDT (procedure date), PXIEN (procedure IEN), and PXPKG (procedure package).

  Note : Sites are urged to discontinue use of the DOCCTG and DOCDT as soon as possible and use the index fields (IXTYPE, IXSPEC, IXPROC, IXORIGIN) instead.

  When support of DOCCTG and DOCDT is discontinued, IXTYPE will be a required field with or without an associated procedure. This differs from the current design of either a Document Category or a Procedure but not both.

  If an associated procedure (TIU Note) is sent in the input array, all three procedure fields are required: PXIEN, PXPKG, PXDT.

  ** If IXTYPE is sent in the Input Array, DCCTG cannot be sent.

Data ID	Description
ACQD*	Acquisition Device: 'Computer Name' of Device (Domain Name for non-NT)
ACQL	Hospital Location: Pointer to VistA Hospital Location File
ACQS*	Acquisition Site: Pointer to VistA Institution File
CMTH	Call Method: A Method to call that will generate the image(s) (Note: Either an 'Image Array' or a 'Call Method' is required).
DFLG	Delete Flag: '1' if images should be deleted after successful processing (The default is '0', No Deletion).
DOCCTG	This will be discontinued in a future patch. Document Category: Pointer to VistA MAG DESCRPTIVE CATEGORIES file.

Data ID	Description
DOCDT	This will be discontinued in a future patch. Document Date: (FileMan External or Internal Date)
IXTYPE**	Image or Document TYPE. Pointer to IMAGE INDEX FOR TYPES File or the full name of the Index Type.
IXSPEC	Image or Document SPECIALTY/SUBSPECIALTY. Pointer to IMAGE INDEX FOR SPECIALTY/SUPSPECIALTY File or the full name of the Index Specialty
IXPROC	Image or Document PROCEDURE/EVENT. Pointer to IMAGE INDEX FOR PROCEDURE/EVENT File or the full name of the Index Proc/Event.
IXORIGIN	Image or Document ORIGIN. Set of Codes. Possible values are : VA, NON-VA, DOD, FEE. If a value for this is not sent, it will default to VA.
GDESC	Short Description for the Image or Image Group (60 chars)
IDFN*	VistA Patient DFN
ITYPE	Image Type: The type of image (must be supplied if file extension supports different kinds of images -- see details of Image Type below)
PASSWORD	Encrypted Password
PXDT	Procedure Date/Time (FileMan External or Internal Date Time)
PXIEN	Procedure IEN
PXPKG	Procedure Package
STSCB*	Status Handler: "Tag^Routine" of initiating package. Imaging will call this to return the resulting status of the Import process.
TRKID*	Tracking ID = PackageID_;_unique identifier Example: "DOC;453"
TRTYPE	Transaction Type: 'NEW' or 'MOD' or 'DEL' (TRYTPE is for Future use. Any value is ignored, it defaults to 'NEW'.)
USERNAME	Username

10.2.3.2 Queue Array Returned by Import API

The following table summarizes the queue results array that is returned by the Import API to the calling program after receipt of the input array.

Array Node- Data Type	Description
`QUEUERESULTS (0) Status^Message`	If status is '0', an error occurred. If status is an integer greater than '0', then the process succeeded and an entry has been made in the Import Queue File. The integer returned is the Queue Number that was assigned, and the appended message is "Data has been Queued."
`QUEUERESULTS (1...n) Error Messages`	If Status = 0 then nodes(1...n) will contain all error messages that occurred during validation.

Example of a successful queue (no other nodes are defined):

```
QUEUERESULTS (0)="111^Data has been Queued."
```

Example of unsuccessful queue:

```
QUEUERESULTS (0)="0^Required parameter is null"
QUEUERESULTS (1)="Tracking ID is Required. !"
QUEUERESULTS (2)="Status Handler is Required. !"
QUEUERESULTS (3)="Acquisition Site is Required. !"
```

10.2.3.3 Results Array Returned to Status Handler

After image files are imported and new entries have been added to the Image File (#2005), the Import API will call the status handler to return the results in an array.

The status handler routine is supplied by the calling application. VistA Imaging will call this status handler routine to report the status of the image import. The status handler must be an 'M' routine that has an array as its only parameter. Processing must begin at a tagged entry point in the M routine.

The results provided will include:

- Status Code and optionally an Error Message
- TrackingID
- Queue Number
- List of warnings (if warnings occur during processing)

Example of a Status Handling routine: "`ERR^CPRTN`**"**

The Status Handler will be called by VistA Imaging in the following manner:

```
D @(STSCB_"(.RESULTSARRAY)")
```

Example of the RESULTSARRAY is as follows:

```
RESULTSARRAY (0)= "0^Unable to access image"    << Status ^ message
RESULTSARRAY (1)=1209                           << Tracking Number
RESULTSARRAY (2)=3                              << Queue Number
RESULTSARRAY (3..N)="Image file not deleted"    << warnings or messages
```

Results Array: returned to the Status Handler routine of the application

Array Node- Data Type	Description
`RESULTSARRAY (0) Status^Message`	If status is '0^message', then an entry was not made in the Image File, and the message describes the problem that occurred. If status is '1^message', then an Entry has been made in the Image File, and the image files have been successfully copied to the Server. If status is '2^message', then an Entry has been made in the Image File, image files have been successfully copied to the Server and there are warnings or messages in nodes 3…n.

Array Node- Data Type	Description
RESULTSARRAY (1) Tracking Number	This is a unique identifier created by the package calling the interface. For example: Doc;494. The identifier may contain alphanumerics or symbols.
RESULTSARRAY (2) Queue Number	This is a number provided by VistA Imaging that can be used for internal tracking of the process by support staff.
RESULTSARRAY (3..N)Warnings	Warnings will be present if: A group of Images was to be imported, and only some of the Images could be copied Delete Flag (provided in the input array) is true, and Imaging couldn't delete the original image file, after copying it to the Imaging Network Server.

Note: The behavior of the interface is 'All or None' related to image import. If any image fails to be copied then any image entries created during processing the queue entry will be deleted.

10.2.4 Import API Implementation Notes

10.2.4.1 Calling the M Routine

The M routine MAGGSIUI is called at the IMPORT entry point from VistA. This routine call makes an entry in the Import Queue File.

Example of a call:

```
D IMPORT^MAGGSIUI(.MAGRY, .IMAGES, .MAGIX)
```

IMPORT^MAGGSIUI parameters are:

MAGRY = the results array, described in section 10.2.3.3 above.
IMAGES = the array of images to be imported, described in section 10.2.4.2.
MAGIX = input array of data, described in section 10.2.4.3.

When the internal M Routine is used, the input parameters will be validated, formatted, and then placed in the Import Queue file to be processed asynchronously in the background. This frees the foreground process to continue operating. There is a separate system on the VistA Imaging network that performs the required operations on the Import queue file entries.

The results array parameter, MAGRY, is returned from the MAGGSIUI call. This array includes the unique Background Processor Queue Number assigned to the task. This Queue Number can be used to call the Queue Status API from the application's M program, as follows:

```
> S X=$$STATUS^MAGQBUT3(Queue Number)
> S X=$$STATUS^MAGQBUT3(Tracking ID)
```

The possible return values from this call are:

```
"0^Error message"
"1^Success"
"2^Pending"
```

10.2.4.2 * Image Array (.IMAGES)

.IMAGES is an array of fully qualified file names corresponding to the images to be imported and stored in VistA Imaging. Each entry contains the full path of the Image using UNC notation, and optionally a short description of the Image as the second '^' piece. If the array entry does not contain a short description as the 2nd '^' piece, the API will generate a default image short description from the information provided (for example the procedure and procedure date or the document type).

VistA Imaging stores images either as single image by itself or a group of related images. All images in the IMAGES array will be saved as a group of images unless the array only contains one image, in which case it will be saved as a single image.

Example of IMAGES array entries:

```
IMAGES(1)="\\image server\image share\filename.ext^image description"
IMAGES(2)="\\image server\image share\filename2.ext"
IMAGES(3)="\\image server\image share\filename3.ext^image description"
IMAGES(4)="\\image server\image share\filename4.ext"
```

It will also be possible in the future to supply a "call method" in the IMAGES array.

10.2.4.3 * Image Array (.MAGIX)

The MAGIX input array is an array of predefined M 'nodes' and data. The possible 'nodes' in the Input Array correspond to the entries in the table in the Input Array as described in section 10.2.3.1.

Example:

```
MAGIX("ACQD")="COMPUTER AT EDS"
MAGIX("ACQL")=99
MAGIX("ACQS")=688
MAGIX("DOCCTG")=19
MAGIX("DOCDT")="05/05/1999"
MAGIX("IDFN")=1033
MAGIX("STSCB")="TESTCB^MAGGSIUI"
MAGIX("TRKID")="GK;101"
```

Chapter 11 Error Recovery, Troubleshooting, and Testing

11.1 Error Recovery

11.1.1 Server or Disk Drive Failure

When a server or disk drive fails, the VistA Imaging System allows immediate action to be taken so that system operation may continue. The following steps should be taken when a server or drive has failed:

- Use the Network Location Manager menu option on the Background Processor and place the share(s) "OFFLINE". If these are magnetic drives, their images will be automatically pulled from your jukebox.
- If the Image Network Write Location or PACS Image Write Location field in the Imaging Site Parameters file (#2006.1) points to a device that is down, edit it to point to a location that is operational. Use the Edit/Site Parameters menu option on the Background Processor.
- When your server or disk drive has been repaired, edit the Operational Status field (#5) of the Network Location file (#2005.2) to "ONLINE".
- Run the Verifier software on your magnetic shares to synchronize any pointers changed during the failure, and archive unprocessed files to the jukebox.

11.1.2 Delete Image and Pointers

Images can be deleted using the VistA Imaging Display application. When an image is deleted, the image itself and all "derivative" images (such as abstracts) are deleted from the image servers. Additionally, the Image File entry for the image, and any pointers to applications (Laboratory, Medicine, etc.) for that image, are deleted as well. To delete images, a user must have the MAG DELETE security key. For Clinical Display users with this key, there will be a Delete in the main menu of the Image List and Radiology Viewer windows. The Delete option will also be available in pop-up menus for images and abstracts.

If the entry is an Image Study Group then the MAG SYSTEM security key is required along with the MAG DELETE key.

The following occurs once an image has been flagged for deletion:

- An entry is made in the Background Queue file and will be processed on a first-in-first-out basis by the Background Processor.
- The Image Audit File (#2005.1) will record the information on the deleted image entry.
- An entry will be made in the Image Access Log to indicate that an image was deleted.

- The image entry will be deleted from the Image File (#2005) and any pointed to entries will also be updated.
- All DOS files relating to the image will be deleted from the Imaging server(s), but not from the jukebox.

ATTENTION: Caution Must Be Taken when Granting the Image Deletion Key.

Note: Anyone who holds the Image Deletion Key is allowed to delete any image, regardless of who created the image in question.

When images are deleted, a reason code must be entered to note why the image was deleted. Sites can optionally add site-specific reason codes by using the MAG REASON EDIT System Manager Menu option, which is explained in Section 8.2 of this document.

11.1.3 Correcting Image Capture Errors

When an image is captured under the wrong patient, it is **strongly recommended** that you use the following procedure to make the needed correction—provided that the images still reside on the Radiology modality, or a hard copy of the image is still available:

1) Correct the patient information on the modality, then resend the image; **or**, if a hard copy (X-Ray film) of the image is available, digitize the image

2) Review the new images acquired

3) Follow the instructions in the section above to delete the incorrect images

If the above approach is not feasible then contact the Imaging Support staff to assist in correcting the images. The steps they will use are covered below.

Two (2) types of errors can be made during image capture:

- An image is captured that the user did not want to save. This type of error is corrected by the image and pointer deletion procedure described above.
- The user identified the patient incorrectly and therefore saved patient B's images with patient A's text record. Presently, this second type of error must be corrected manually by imaging system manager staff using the following procedure.

11.1.3.1 Delete Incorrect Image Pointers from Incorrect Patient's Record

1. Use the edit option of File Manager to access the image field of the parent package (e.g., radiology, cardiology, laboratory, etc.) for the incorrect patient.
2. Identify and write down the names of the images that were incorrectly placed in this file.
3. Delete these entries.

11.1.3.2 Add Correct Image Pointers to Correct Patient's Record

1. Use the edit option to select the correct patient's report file.

2. Edit the image field and enter the exact same image names that were deleted from the incorrect patient.

11.1.3.3 Verify Correction

Ask the user to examine the image of the correct and incorrect patients, and determine whether the correction was done properly.

11.1.3.4 QA Review Utility

In Clinical Display or Clinical Capture, users who have the MAG SYSTEMS or MAG EDIT security keys have access to the QA Review Utility. This utility allows users with the appropriate security key to specify date ranges and perform quality assurance checks on captured images from specified users.

The QA Review Utility also allows the reviewers of the images to change the image indexes by using the Image Index Edit Utility.

11.1.3.5 Image Index Edit Utility

The Image Index Edit Utility is available to users who have the MAG SYSTEMS or MAG EDIT security keys. Through this utility, an authorized user can select an image and modify the indexing terms for the image.

11.1.3.6 QA Review Reports

The QA Review Reports are available to users who have the MAG SYSTEMS or MAG EDIT security keys. The reports are run for a specified date range and for specific users. The reports give details for users to scan for the date range, status, number of entries and pages, and a percentage representing the total number of images reviewed.

11.2 Troubleshooting / Error Messages

Users may encounter several types of errors as they use the VistA Imaging System. Some of these errors are…

- **Processing errors**: which means that the VistA Imaging System failed to complete a processing task.

- **Data errors:** which means that the VistA Imaging System attempted to use data that was incomplete or formatted incorrectly.

- **Command errors:** which means that users and other programs that interact with Imaging issued commands that conflicted with other commands or with the VistA Imaging System processing state.

A table of error messages, descriptions and causes or solutions is provided in Appendix A of this document and in the *VistA Imaging Error Message Guide*.

11.3 Test Software Available for Troubleshooting

11.3.1 Introduction

When setting up a workstation, it is often necessary to use software to test isolated workstation functions. A number of executables are available for testing:

- Network connectivity
- Connectivity to the Kernel RPC Broker
- Ability to display images
- Connectivity to image servers
- Network timing tests

These executables are described in the following sections.

11.3.2 PING, TRACERT

The PING and TRACERT commands are available in the DOS directory on the workstations. Using these commands can help determine if the IP address supplied in the HOSTS or LMHOST file is reachable, or if a possible routing problem exists. The local PC support person in IRM can assist with the usage of these commands and the local network IP addressing scheme.

11.3.3 RPCTEST.EXE

The RPCTEST.EXE file is located in the Program Files\VISTA\BROKER directory. This file can be used to test the Broker Client Manager connection to the VistA servers. Once this file is executed, the VistA Access/Verify Code Window should display. If it does not, one or a combination of the following could be happening:

- The TCP Listener is not running on the VistA hospital system.
- An invalid IP address or listening port number was configured during the Broker Client Manager software installation on the workstation.

Note: Please review the Kernel RPC documentation on the usage of this executable file and installation of the RPC Client Manager software.

11.3.4 VistA Imaging Capture, Test Mode

The VistA Imaging Capture software has a Test mode that allows testing of input devices (scanners, video capture boards, etc.). The Test mode features…

- Testing of the capture functions without a connection to the VistA servers.
- No requirement to identify patients.

In addition, the image test file will not be saved. This mode is helpful when interfacing and testing new equipment.

To set the application to test mode, select **Test Mode** from the **Configuration | Configuration Settings | All Settings** menu.

Note: See the Capture online help for additional information.

Chapter 12 External Relations

12.1 HL7 Messages

The Text gateway processes the following HL7 message types to construct and maintain the Modality Worklist Database:

MSH	Message header
ADT	Admission, Discharge, Transfer
SCH	Patient Appointment and Scheduling Segment
MFN	Master File Notification
ORM	Order Message
ORU	Observational Result – Unsolicited

12.2 Broker Calls

12.2.1 Imaging Broker Calls

All VistA Imaging remote procedure calls are documented in the Remote Procedure file (#8994) and can be viewed using FileMan Print or Inquire menu options. VistA Imaging remote procedures use the MAG namespace.

```
FileMan 22

Select OPTION: PRINT FILE ENTRIES
OUTPUT FROM WHAT FILE: REMOTE PROCEDURE
SORT BY: NAME//
START WITH NAME: FIRST// MAG
GO TO NAME: LAST// MAGZ
  WITHIN NAME, SORT BY:
FIRST PRINT FIELD:
FIRST PRINT FIELD: [CAPTIONED]
Include COMPUTED fields:  (N/Y/R/B): NO//  - No record number (IEN), no Computed Fields
Heading (S/C): REMOTE PROCEDURE LIST  Replace
START AT PAGE: 1//
DEVICE:
```

12.2.2 DICOM RPC Broker Calls

The VistA Imaging DICOM Gateway software uses the following Kernel RPC Broker calls.

Note: The column "View Only Access" contains the RPCs accessible to an end-user who has the MAG DICOM GATEWAY VIEW menu assigned. The column "Full Access" contains the RPCs that are available when a user has the MAG DICOM GATEWAY FULL menu assigned.

View-only Access	Full Access	Remote Procedure
Yes	Yes	MAG DICOM AUDIT COUNT
-	Yes	MAG DICOM AUDIT PURGE
Yes	Yes	MAG DICOM AUDIT RANGE
Yes	Yes	MAG DICOM CHANGE HL7 POINTER
Yes	Yes	MAG DICOM CHECK AE TITLE

View-only Access	Full Access	Remote Procedure
Yes	Yes	MAG DICOM CORRECT VALIDATE
Yes	Yes	MAG DICOM ET PHONE HOME
Yes	Yes	MAG DICOM FILEMAN GET
Yes	Yes	MAG DICOM FIND LOCATION
Yes	Yes	MAG DICOM GET BASIC IMAGE
Yes	Yes	MAG DICOM GET DOMAIN
Yes	Yes	MAG DICOM GET GATEWAY INFO
Yes	Yes	MAG DICOM GET HIGHEST HL7
Yes	Yes	MAG DICOM GET IMAGE GROUP
Yes	Yes	MAG DICOM GET IMAGING TYPES
Yes	Yes	MAG DICOM GET MACHINE ID
-	Yes	MAG DICOM GET NEXT QUEUE ENTRY
Yes	Yes	MAG DICOM GET PATIENT
Yes	Yes	MAG DICOM GET PLACE
Yes	Yes	MAG DICOM GET RAD RPT INFO
Yes	Yes	MAG DICOM GET SERVICE INFO
Yes	Yes	MAG DICOM GET UID ROOT
Yes	Yes	MAG DICOM GET UID TABLE
Yes	Yes	MAG GET DICOM XMIT ORIGIN
Yes	Yes	MAG DICOM GET VERSION
-	Yes	MAG DICOM HL7 POINTER ACTION
Yes	Yes	MAG DICOM IMAGE AUDIT GET
-	Yes	MAG DICOM IMAGE PROCESSING
Yes	Yes	MAG DICOM INCORRECT IMAGE CT
Yes	Yes	MAG DICOM LIST GLOBAL VARIABLE
Yes	Yes	MAG DICOM LOOKUP RAD STUDY
Yes	Yes	MAG DICOM LOOKUP STUDY
-	Yes	MAG DICOM NETWORK STATUS
Yes	Yes	MAG DICOM PACS CUTOFF DATE
Yes	Yes	MAG DICOM PACS MINIMUM SPACE
-	Yes	MAG DICOM PURGE HL7
-	Yes	MAG DICOM QUEUE IMAGE
-	Yes	MAG DICOM QUEUE INIT
-	Yes	MAG DICOM ROUTE EVAL LOG
-	Yes	MAG DICOM ROUTE EVAL START
-	Yes	MAG DICOM ROUTE EVAL STOP
-	Yes	MAG DICOM ROUTE GET PURGE
-	Yes	MAG DICOM ROUTE GET TRANS ID
Yes	Yes	MAG DICOM ROUTE LIST DESTI
-	Yes	MAG DICOM ROUTE LOCK TRANSMIT
-	Yes	MAG DICOM ROUTE LOG XMIT
-	Yes	MAG DICOM ROUTE NEXT FILE
-	Yes	MAG DICOM ROUTE PURGE DONE
-	Yes	MAG DICOM ROUTE REMOVE OBSO
-	Yes	MAG DICOM ROUTE REQUEUE
-	Yes	MAG DICOM ROUTE STATUS

View-only Access	Full Access	Remote Procedure
Yes	Yes	MAG DICOM ROUTE TRANSACT STS
Yes	Yes	MAG DICOM ROUTE VALID DEST
-	Yes	MAG DICOM SET PACS PARAMS
Yes	Yes	MAG DICOM STORE GATEWAY INFO
Yes	Yes	MAG DICOM TEXT AUDIT GET
-	Yes	MAG DICOM TEXT PROCESSING
-	Yes	MAG DICOM UPDATE GATEWAY NAME
-	Yes	MAG DICOM UPDATE SCU LIST
Yes	Yes	MAG DICOM VALID LOCATIONS
Yes	Yes	MAG DICOM VISTA AE TITLE
Yes	Yes	MAG DICOM WORKSTATION VERSION
Yes	Yes	MAG IMAGE CURRENT INFO
Yes	Yes	MAG NEW SOP INSTANCE UID
Yes	Yes	MAG RAD GET NEXT RPT BY DATE
Yes	Yes	MAG RAD GET NEXT RPT BY PT
Yes	Yes	MAG STUDY UID QUERY
Yes	Yes	MAG VISTA CHECKSUMS
Yes	Yes	MAGG VERIFY ESIG
Yes	Yes	SC PATIENT LOOKUP
Yes	Yes	XUS DIVISION GET
Yes	Yes	XUS DIVISION SET
Yes	Yes	XUS INTRO MSG

12.3 Windows Messaging

In order to communicate with CPRS, windows messages are exchanged on the workstation. The VistA Imaging System must be launched from the CPRS menu option to enable the exchange of these messages.

If CCOW is enabled, VistA Imaging Clinical Display will synchronize patient and user context with other CCOW applications (such as CPRS) using CCOW. If CCOW is unavailable, VistA Imaging Clinical Display will continue to synchronize with CPRS when launched from CPRS using Windows messages.

12.4 Database Integration Agreements

Database Integration Agreements are defined for each application we interface. In some instances, APIs were created for Imaging's use. Other applications have allowed VistA Imaging to execute routines outside of the Imaging namespace. API's exist with the radiology, surgery, medicine, registration, and TIU packages.

Online documentation is available on Forum. To obtain the current list of DBIAs where VistA Imaging is a subscriber…

1. Sign on to the FORUM system.

2. Select the DBA menu.
3. Select the Integration Agreement Menu.
4. Select the Subscriber Package Menu.
5. Choose the “Print Active by Subscribing Package” option.
6. Respond with “MAG” to the “START WITH SUBSCRIBING PACKAGE: FIRST//” prompt.
7. Enter “MAGZ” in response to the “GO TO SUBSCRIBING PACKAGE: LAST//’ prompt.
8. Select the device for printing.

To obtain the current list of active DBIAs where VistA Imaging is a custodian…

1. Sign on to the FORUM system.
2. Select the DBA menu.
3. Select the Integration Agreement Menu.
4. Select the Custodial Package Menu.
5. Choose the “Active by Custodial Package” option.
6. Enter **Imaging** for the package prompt.
7. Select the device for printing.

12.5 CCOW Communication

When available, the VistA Imaging Clinical Display client uses CCOW to synchronize patient and user context with other applications such as CPRS.

The TeleReader application requires CCOW to synchronize patient and user context with other applications such as CPRS and VistA Imaging Display. TeleReader cannot work if CCOW is unavailable, TeleReader will close if CCOW is not functioning properly.

12.6 Mailman Messaging

This section describes the types of MailMan messages that are sent to a site’s MAG SERVER mail group.

The MAG SERVER mail group is established when VistA Imaging is installed. MAG SERVER initially contains the addresses of the person that installed VistA Imaging and of the VistA Imaging development team.

- Typical members of this group should be key IRM support staff, radiology managers, and/or ADPACS.

- Text pagers can be added to the MAG SERVER mail group as a "Remote Member", provided that the domain portion of the remote mail member address is defined in the DOMAIN File (#4.2).

Note: The "G.IMAGING DEVELOPMENT TEAM@FORUM.VA.GOV" is a required member of this group.

The members of the MAG SERVER mail group (aka the Local Imaging Mail Group) can be edited as described in Chapter 6 of the Background Processor User Manual.

12.6.1 "Image Cache Critically Low" Messages

The Image Cache Critically Low message is generated automatically when the Background Processor is unable to update the network write location within the VistA Magnetic Cache. This happens when the low level mark has been reached and the current location has only 5% (default value) of its capacity available at the time this message is generated.

The following is a sample Image Cache Critically Low Message:

```
Subj: Image Cache Critically Low at OAKMONT.VA.GOV  [#118174]
18 Sep 2000 15:22:38 -0600 (CST)  12 lines
From: <IMAGUUSER.ONE@SITE1.VA.GOV>  In 'CRITICAL' basket.  Page 1
---------------------------------------------------------------------------
SITE: SITE1.VA.GOV
DATE: SEP 18, 2000@15:22:38 CST
SENDER: Imaging Background Processor
The 3 Imaging cache servers will require operator intervention to ensure
continued availability.  The following MAG SERVER members are being
notified:
IMAGUSER,TWO
IMAGUSER,THREE
G.IMAGING DEVELOPMENT TEAM@FOR
The next notifications will occur in: 6 hours.
```

This mechanism ensures that the remaining cache locations can be manually referenced during the free space recovery process (BP Purge) that the VistA Imaging System Manager MUST initiate. It is advised that while the purge is running the Auto Write Location update process be turned off, and that the Network Write Location and the PACS Write Location be manually updated to different locations. For more information, see Chapter 6 in the *Background Processor User Manual*.

12.6.2 "Image Site Usage" Messages

When VistA Imaging is installed, a process used to generate monthly Image Site Usage messages is established. Image Site Usage messages contain information about VistA Imaging statistics

(images displayed, images captured, etc.) and the software and patch versions installed. The information in these messages is used for the VistA Imaging VISN (Veterans Integrated Service Network) Performance Monitor Report.

Image Site Usage messages are automatically generated at 4:01 AM (VistA System time) on the first day of each month, and will be sent to the MAG SERVER mail group. They can also be generated on demand as described on the next page.

A sample monthly Image Site Usage message is shown below.

```
Subj: Monthly Image Site Usage: DEM0.SITE(Apr 2005)[#19] 01 May 05 04:00 49 lines
From: IMAGUSER,ONE  In 'IN' basket.   Page 1
-------------------------------------------------------------------------------
SITE: IMGDEM01.MED.VA.GOV
Reporting Period: Apr 01, 2005 – Apr 30, 2005
DATE: MAY 01, 2005@04:00:39 EST
DOMAIN: IMGDEM01.MED.VA.GOV
2005 ENTRIES: 1942
2006.81 ENTRIES: 94
 WS DIS VERS:  3.0.0.1^1
 WS DIS VERS:  3.0.2.3^4
 WS DIS VERS:  3.0.7.10^8
 WS DIS VERS:  3.0.7.10^Microsoft Windows 2000 .5.0.2195^1
 WS DIS VERS:  3.0.7.7^1
 WS DIS VERS:  3.0.8.13^1
 WS DIS VERS:  3.0.8.20^1
 WS CAP VERS:  3.0.0.1^1
 WS CAP VERS:  3.0.7.10^1
 WS CAP VERS:  3.0.7.10^Microsoft Windows 2000 .5.0.2195^1
 WS VR VERS:  3.0.38^2
 WS VR VERS:  3.0.38^Win NT.4.0.1381^1
 WS VR VERS:  3.0.40^1
 WS VR VERS:  UNK^1
VistaRad Version: 3.0T20
DICOM Error Log:0
DICOM FAILED IMAGES:83
Queue File count: 19
Unprocessed Queue entries: 19
28 day Image Workstation Sessions: 3162
28 day Image Workstation Patients: 4658
28 day Image Workstation Images: 14093
28 day Image Workstation Captures: 923
28 day VistaRad WS Display:
28 day VistaRad WS Interpretations:
28 day average daily routed images: 0
BP VERS NUM DATE: <xxx>
Vista Image Version/Build: 3.0^19^3030414
DICOM Gateway Version:  3.0;IMAGING;**1,7,8,3**;30-August-2002^1
Image file namespace(s): DM
From, FileMan Date="3040201", D0="0".
Until, FileMan Date="3040228", D0="7477".
RESOLUTION: SCR_OK^1024^768^24^PC^2
RESOLUTION: SCR_OK^1024^768^32^PC^9
RESOLUTION: SCR_OK^1152^864^32^PC^3
RESOLUTION: SCR_OK^1280^1024^32^PC^21
```

```
RESOLUTION: SCR_OK^1400^1050^32^PC^2
…
…
DICOM CAPTURE: CR^12^Computed Radiography^1
DICOM CAPTURE: CT^500^Computed Tomography
IMPORT API: <xxx>
IMPORT API: <xxx>
CLIN CAPTURE: XRAY^151
OTHER CONSENTS: PRE-ANESTHESIA CONSENT^1
CONSENT FORMS: 0
Image file group parents: 150
Image file objects: 1792
```

```
Image file deletes: 12
Document Images (TIF): 123
Document Groups (TIF): 12
Unique Image patients captured: 55
Unique Image patients display: 33
Unique Image patients All: 56
ADVANCE DIRECTIVE SCANNED ADMINISTRATIVE CLOSURE: 0
ADVANCE DIRECTIVE UNSCANNED MANUAL CLOSURE: 25
ADVANCE DIRECTIVE - UMC - ADVANCED DIRECTIVE: 2
ADVANCE DIRECTIVE - UMC - ADVANCE DIRECTIVE FORM: 23
ADVANCE DIRECTIVE SCANNED MANUAL CLOSURE: 8
ADVANCE DIRECTIVE SCANNED MANUAL CLOSURE: 6
ADVANCE DIRECTIVE - SMC - ADVANCE DIRECTIVE: 8
IMAGING PACKAGE INSTALLATION HX: 13^IMAGING^3.0P1^MAY 17,2002^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 14^IMAGING^3.0P7^AUG 09,2002^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 15^IMAGING^3.0P19^APR 14,2003^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 17^MAGJ RADIOLOGY^P3.0T10^JUL 30,2000^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 18^MAGJ RADIOLOGY^P3.0T15^JUL 19,2001^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 19^MAGJ RADIOLOGY^P3.0T17^JAN 04,2002^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 20^MAGJ RADIOLOGY^P3.0T18^JAN 04,2002^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 21^MAGJ RADIOLOGY^P3.0T19^FEB 07,2002^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 22^MAGJ RADIOLOGY^P3.0T20^FEB 27,2002^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 23^MAGJ RADIOLOGY^P3.0T5^AUG 07, 1999^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 24^MAGJ RADIOLOGY^P3.0T6^AUG 07, 1999^TESTER,ONE
IMAGING PACKAGE INSTALLATION  HX: 25^MAGJ RADIOLOGY^P3.0T9^JUL 30, 2000^TESTER,ONE
LOCAL NETWORK LOCATIONS: 0^NETWORK LOCATION^PHYSICAL REFERENCE^TOTAL SPACE^SPACE
USED^FREE SPACE^OPERATIONAL STATUS^STORAGE TYPE^HASH
LOCAL NETWORK LOCATIONS: 1^LOCAL^C:\IMAGE\^^^^On-Line^MAGNETIC^YES
LOCAL NETWORK LOCATIONS: 2^MAG1^\\IMGQADB\IMAGE1$\^9080608^^10160^On-Line^MAGNETIC^
LOCAL NETWORK LOCATIONS: 3^MAG1H^\\imgqadb\image1$\^9080608^^1016440^On-
Line^MAGNETIC^YES
…
```

The following sections explain how an Ad Hoc (on demand) version of an Image Site Usage message can be generated, describe the contents of a typical Site Usage message, and outline how automatic Image Site Usage message generation can be disabled.

12.6.2.1 Ad Hoc Image Site Usage Messages

To generate an on-demand version of the Imaging Site Usage message, perform the following steps.

1. Access the Imaging System Manager Menu [MAG SYS MENU] and run the Ad Hoc Enterprise Site Report option.

```
Select OPTION NAME: MAG SYS MENU       Imaging System Manager Menu

  IX     Image Index Conversion Menu ...
  LS     Edit Network Location STATUS                              **
         Ad hoc Enterprise Site Report
         Delete Image Group
         Imaging Database Integrity Checker Menu ...               **
         Imaging Site Reports

Select OPTION NAME: AD HOC       Ad hoc Enterprise Site Report
```

2. At the next two prompts, enter the date range that you want the report to cover. The prompts will default to the previous month.

```
Enter starting Date: APR 01 2003// <ENTER> (APR 01, 2003)
Enter ending Date: APR 30 2003//  <ENTER> (APR 30, 2003)

Creating ad-hoc report over the period 1-Apr-2003 until 30-Apr-2003.

  IX     Image Index Conversion Menu ...
  LS     Edit Network Location STATUS                              **
         Ad hoc Enterprise Site Report
         Delete Image Group
         Imaging Database Integrity Checker Menu ...               **
         Imaging Site Reports

Select OPTION NAME:
```

3. After the report is generated, it will be sent in a MailMan message to the MAG SERVER mail group. The subject of the message will be "Ad Hoc Image Site Usage."

12.6.2.2 Contents of an Image Site Usage Message

The contents of the Image Site Usage message are described in the following table. Note that some entries in the message are dependent on the Imaging components and patches installed—for example, entries specific to VistARad workstations will not be present at sites that do not use VistARad.

Entry Name	Description
Site	The name of the medical center for which the message was generated.
Reporting Period	The time period covered by the report. Note that for Ad-Hoc reports, the date range specified by the user is indicated (which may be greater than the date range of the available data).
Date	The date the message was generated.
Domain	The VistA mail domain name where the message was generated.
2005 Entries	The number of entries in the IMAGE File (#2005), based on the value in the IMAGE File header.
2006.81 Entries	The total number of Clinical Display and Clinical Capture workstations, as indicated in the IMAGING WORKSTATIONS File (#2006.81).
WS DIS VERS	An array showing installations of the VistA Imaging Clinical Display software. The array contains the following values: VERSION ^ OPERATING_SYSTEM ^ #INSTALLED An entry will be generated for each unique combination of VERSION and OPERATING_SYSTEM, for all Display workstations that have been accessed in the last 180 days.

Entry Name	Description
WS CAP VERS	An array showing installations of the VistA Imaging Clinical Capture software. The array contains the following values: VERSION ^ OPERATING_SYSTEM ^ #INSTALLED An entry will be generated for each unique combination of VERSION and OPERATING_SYSTEM, for all Capture workstations that have been accessed in the last 180 days.
WS VR VERS	An array showing installations of the VistARad workstation software. The array contains the following values: VERSION ^ OPERATING_SYSTEM ^ #INSTALLED An entry will be generated for each unique combination of VERSION and OPERATING_SYSTEM, for all VistARad workstation that have been accessed in the last 180 days.
VistARad Version	The most recently installed version of VistARad. For the installation history of all instances of VistARad, refer to the "Imaging Package Installation HX" field.
DICOM Error Log	The total number of unresolved DICOM errors present in the DICOM ERROR LOG File (#2006.599) on the date the report was generated.
DICOM Failed Images	The total number of entries in the DICOM FAILED IMAGES File (#2006.575) on the date the report was generated.
Queue File Count	The total number of entries in the IMAGE BACKGROUND QUEUE File (#2006.03), including failed entries that will not be processed without user intervention. (Successfully processed entries are deleted from the file.)
Unprocessed Queue Entries	The total number of unprocessed entries currently in the IMAGE BACKGROUND QUEUE File (#2006.03).
N day Image Workstation Sessions	The number of login sessions that occurred on all workstations (Display, Capture, and VistARad) for the period of the report.
N day Image Workstation Patients	The number of patient lookups performed on Display and Capture workstations for the period of the report.
N day Image Workstation Images	The total number of images accessed from all Clinical Display and Capture workstations for the period of the report.
N day Image Workstation Captures	The number of images acquired using Capture workstations for the period of the report.

Entry Name	Description
N day VistARad WS Display	An array containing information for studies displayed on all VistARad workstations for the period of the report. The array contains the following values: STUDIES ^ IMAGES ^ PATIENTS ^ RAD/NONRAD ^ ROUTED/LOCAL ^ STUDIES_PER_MODALITY STUDIES: The number of studies displayed. IMAGES: The number of images displayed. PATIENTS: The number of patient records accessed. RAD/NONRAD: The number of studies displayed by radiologists and non-radiologists, respectively. ROUTED/LOCAL: The number of routed and non-routed exams displayed, respectively. STUDIES_PER_MODALITY: An array of modalities and the numbers of displayed studies for each modality.
N day VistARad WS Interpretations	An array containing information for studies interpreted using all VistARad workstations for the period of the report. The array contains the following values: STUDIES ^ IMAGES ^ PATIENTS ^ RAD/NONRAD ^ ROUTED/LOCAL ^ STUDIES_PER_MODALITY STUDIES: The number of studies interpreted. IMAGES: The number of images interpreted. PATIENTS: The number of patient records accessed. RAD/NONRAD: The number of studies interpreted by radiologists and non-radiologists, respectively (the value for non-radiologist interpretations should always be 0). ROUTED/LOCAL: The number of routed and non-routed exams interpreted, respectively. STUDIES_PER_MODALITY: An array of modalities and the numbers of interpreted studies for each modality.
N day average daily routed images	The average number of studies routed per day.
BP Vers. Num. Date	An array showing installations of the Background Processor client software. The array contains the following values: CLIENT_VERSION ^ OPERATING_SYSTEM ^ #INSTALLED ^ BUILD_DATE An entry will be generated for each unique combination of VERSION and OPERATING_SYSTEM for all Background Processor workstations.
VistA Image Version/Build	The most recent VistA Imaging KIDS installation, presented in an array with the following values: RELEASE ^ PATCH ^ INSTALL_DATE

Entry Name	Description
DICOM Gateway Version	An array showing installations of the DICOM Gateway workstation software. The array is based on the contents of the DICOM WORKSTATION File (#2006.83), and contains the following values: VERSION;PACKAGE_NAME;PATCHES;BUILD_DATE ^ #_INSTALLED
Image file namespace(s)	The unique 1-, 2-, or 3-character filename prefix used for images stored at this site. If multiple prefixes are used by a site, each prefix will be shown.
From FileMan Date Until FileMan Date	Fields that provide information which may be helpful to support staff when the report contains unexpected values.
Resolution	Reports the number of workstations and the resolutions being used by their monitors. CLASS ^ COLUMNS ^ ROWS ^ BITS ^ TYPE ^ COUNT CLASS: Indicates if the monitors in this group have acceptable or unacceptable display capabilities. COLUMNS^ROWS: The number or vertical and horizontal pixels. BITS: The bit-depth. TYPE : The workstation type (PC or Thin Client (TC)). COUNT: The number of workstations.
DICOM Capture	An array showing the modality and number of images acquired by all DICOM Image Gateways during the reporting period. The array contains the following values. MODALITY_ABBR ^ IMAGES_ACQUIRED ^ MODALITY_NAME ^ GROUPS_ACQUIRED An entry will be generated for each modality that images are acquired from.
Import API	Provides a count of images and image groups that were acquired by the Import API, broken down by sending application (origin). SOURCE_APP ^ #IMAGES ^ #GROUPS Only present for sites that use the Import API.
Clin Capture	An array showing the PROCEDURE Field (#2005,6) and number of images acquired by all Capture workstations during the reporting period. The array contains the following values. PROC_FIELD ^ IMAGES_CAPTURED An entry will be generated for each procedure field entry that images are captured for.

Entry Name	Description
Other Consents	An array showing the number of captured consent forms , based on the contents of the SHORT DESCRIPTION field (#2005,10) for the report period. SHORT_DESC_FIELD^ IMAGES An entry will be generated for each SHORT DESCRIPTION field value containing the word “consent”. (For example, CONSENT and INFORMED CONSENT would be shown in two different entries).
Consent Forms	The number of consent forms captured for the report period.
Image file group parents	The number of image group parent entries added to the IMAGE File (#2005) during the report period.
Image file objects	The number of entries (excluding group parent entries) added to the IMAGE File (#2005) during the report period.
Image file deletes	The number of entries deleted from the IMAGE File (#2005) during the report period. Note that this value indicates only those entries that were both added AND deleted within the report period.
Document Images (TIF)	The number of scanned document images acquired during the reporting period.
Document Groups (TIF)	The number of scanned document groups acquired during the reporting period.
Unique Image Patients Captured	The number of individual patients that had new images added (using VistA Imaging) during the report period.
Unique Image Patients Display	The number of individual patients that had images displayed using Clinical Display or VistARad during the report period.
Unique Image Patients All	The total number of individual patients that had images displayed or captured during the report period.
Advance Directive Scanned Administrative Closure	<for future use>
Advance Directive Unscanned Manual Closure	The number of signed Advance Directive notes that do not have attached scanned documents.
Advance Directive – UNC - *title*	The number of Advance Directive notes without attached scanned documents, broken down by TIU note title.

Entry Name	Description
Advance Directive Scanned Manual Closure	The number of signed Advance Directive notes that have attached scanned documents.
Advance Directive – SMC - *title*	The number of Advance Directive notes with attached scanned documents, broken down by TIU note title.
Imaging Package Installation HX	An array showing the installation history of the VistA Imaging KIDS software. The array is based on the Package File (#9.4), and contains the following values: SEQ_NUM ^ PACKAGE ^ VERSION ^ DATE ^ INSTALLER SEQ_NUM: Installation sequence. PACKAGE: The package being installed. "Imaging" is used for the VistA Imaging KIDS packages; "MAGJ Radiology" refers to pre-3.0 Imaging installations of the VistARad software. VERSION: The version number of the software. DATE: The date the software was installed. INSTALLER: The user account used to install the software. Entries will be generated both for current and pre-existing software versions.
Local Network Locations	Each line shows information about a NETWORK LOCATION File (#2005.2) entry defined at the site. The first line (the one that begins with 0) is a header line that show the names of the values reported in subsequent lines. Subsequent lines show 2005.2 entries that: • Have a Storage Type other than 'Export' or 'Diagram' • Are on-line • Are not 'Routing' shares.

12.6.2.3 MAGREPSTART and MAGREPSTOP

The MAGREPSTART and MAGREPSTOP options can be run to stop and restart the generation of monthly Image Site Usage messages. MAGREPSTART and MAGREPSTOP are not part of any menu, and should be assigned to a system manager or IRM before they need to be executed.

Note: Image Site Usage messages are used to fulfill FDA requirements related to medical device monitoring MAGREPSTART and MAGREPSTOP should only be run at the direction of the VistA Imaging Group. Use of these options is not necessary under normal conditions.

Note: If the generation of monthly Image Site Usage messages is suspended using MAGREPSTOP, no monthly messages will be generated until the process is restarted using MAGREPSTART.

12.7 Imaging Site Reports

Imaging Site Reports is an ad hoc reporting tool used to evaluate user productivity and details of the variety of images being created by the VistA Imaging application. The audience for these reports will be the managers of the VistA Imaging application.

12.7.1 Document Counts Report

This is a report of the IMAGE file (#2005) of Image Types for an 'Acquisition Site' and a 'From' and 'To' Date/Time Image Saved date range. The report will give totals for each Acquisition Site, Object Type, for each user, within the Acquisition Site and date range. A grand total of images within the Acquisition Site and date range are given at the end of the report.

```
Select Imaging Site Reports Option: Document Count
* Previous selection: ACQUISITION SITE from A to ZZZ
START WITH ACQUISITION SITE: A//
GO TO ACQUISITION SITE: ZZZ//
  * Previous selection: DATE/TIME IMAGE SAVED from Jan 1,2000 to Feb 6,2007@24:0
0
  START WITH DATE/TIME IMAGE SAVED: Jan 1,2000//   (JAN 01, 2000)
  GO TO DATE/TIME IMAGE SAVED: Feb 6,2007//   (FEB 06, 2007)
DEVICE: ;999;9999  TELNET
Document Count
Sort Criteria: ACQUISITION SITE from A to ZZZ,  DATE/TIME IMAGE SAVED from Jan 1,2000
DATE/TIME IMAGE    OBJECT
SAVED              TYPE       TYPE INDEX         IMAGE SAVE BY
--------------------------------------------------------------------------------

        ACQUISITION SITE: ACQUISITION 1
MAR 10,2000  08:00 DOCUMENT   ADVANCE DIRECTI    VISTAIMAGING,FOUR
APR  3,2000  17:31 DOCUMENT   ADVANCE DIRECTI    VISTAIMAGING,ONE
APR  3,2000  17:36 DOCUMENT   FLOWSHEET          VISTAIMAGING,ONE
APR  3,2000  17:57 DOCUMENT   MEDICAL RECORD     VISTAIMAGING,ONE
APR  3,2000  18:01 DOCUMENT   MISCELLANEOUS D    VISTAIMAGING,ONE
APR  3,2000  18:07 DOCUMENT   DIAGRAM            VISTAIMAGING,ONE
APR  3,2000  18:07 DOCUMENT   DIAGRAM            VISTAIMAGING,ONE
APR  3,2000  18:10 DOCUMENT   FLOWSHEET          VISTAIMAGING,ONE
APR  3,2000  18:14 DOCUMENT   MISCELLANEOUS D    VISTAIMAGING,ONE
APR  3,2000  18:18 DOCUMENT   MISCELLANEOUS D    VISTAIMAGING,ONE
APR  3,2000  18:23 DOCUMENT   CONSENT            VISTAIMAGING,ONE
APR  3,2000  18:28 DOCUMENT   MEDICAL RECORD     VISTAIMAGING,ONE
AUG  2,2000  10:01 DOCUMENT   ADVANCE DIRECTI    VISTAIMAGING,ONE
SEP 28,2000  11:41 DOCUMENT   CONSULT            VISTAIMAGING,TWO
SEP 28,2000  11:50 DOCUMENT   CONSULT            VISTAIMAGING,TWO
MAY 31,2001  11:42 DOCUMENT   MISCELLANEOUS D    IMAGING,TEAM
AUG 21,2001  17:54 DOCUMENT   ADVANCE DIRECTI    VISTAIMAGING,TWO
```

```
AUG 21,2001  18:53 DOCUMENT   MISCELLANEOUS D    VISTAIMAGING,TWO
APR 11,2002  11:10 DOCUMENT   VISIT RECORD       VISTAIMAGING,THREE
APR 11,2002  11:10 DOCUMENT   VISIT RECORD       VISTAIMAGING,THREE
AUG 14,2002  19:21 DOCUMENT   ALLIED VETERAN     TESTER,IMAGING
AUG 14,2002  19:21 DOCUMENT   ALLIED VETERAN     TESTER,IMAGING
APR 17,2003  17:31 DOCUMENT   ADVANCE DIRECTI    VISTAIMAGING,TWO
APR 17,2003  17:40 DOCUMENT   CONSENT            VISTAIMAGING,TWO
APR 17,2003  17:48 DOCUMENT   ADVANCE DIRECTI    VISTAIMAGING,TWO
APR 17,2003  17:50 DOCUMENT   CONSENT            VISTAIMAGING,TWO
MAY 17,2004  19:17 DOCUMENT                      VISTAIMAGING,ONE
SEP 16,2004  06:42 DOCUMENT                      VISTAIMAGING,FIVE
NOV 17,2004  09:45 DOCUMENT   IMAGE              VISTAIMAGING,ONE
NOV 17,2004  09:46 DOCUMENT   IMAGE              VISTAIMAGING,ONE
NOV 17,2004  09:47 DOCUMENT   IMAGE              VISTAIMAGING,ONE
NOV 22,2004  09:12 DOCUMENT   MEANS TEST (10-    VISTAIMAGING,FIVE
NOV 22,2004  09:12 DOCUMENT   MEANS TEST (10-    VISTAIMAGING,FIVE
NOV 22,2004  12:29 DOCUMENT   MEANS TEST (10-    VISTAIMAGING,FIVE
NOV 22,2004  12:29 DOCUMENT   MEANS TEST (10-    VISTAIMAGING,FIVE
                   --------
SUBCOUNT           35
                   --------
COUNT              35
```

12.7.2 Image Count by User Report

This is a report of the Image file (#2005) of Image Types for an ‘Acquisition Site’ and a 'From' and 'To' Date/Time Image Saved date range. The report will give totals for each Acquisition Site, Object Type, for each user, within the Acquisition Site and date range. A grand total of images within the Acquisition Site and date range are given at the end of the report.

```
Select Imaging Site Reports Option: image Type Count by User
* Previous selection: ACQUISITION SITE from A to ZZZ
START WITH ACQUISITION SITE: A//
GO TO ACQUISITION SITE: ZZZ//
  * Previous selection: DATE/TIME IMAGE SAVED from Jan 1,2000 to Apr 11,2006@24:
00
  START WITH DATE/TIME IMAGE SAVED: Jan 1,2000//   (JAN 01, 2000)
  GO TO DATE/TIME IMAGE SAVED: Apr 11,2006//   (APR 11, 2006)
    * Previous selection: IMAGE SAVE BY from A to ZZZZ
    START WITH IMAGE SAVE BY: A//
    GO TO IMAGE SAVE BY: ZZZZ//
      * Previous selection: OBJECT TYPE from A to ZZZZ
      START WITH OBJECT TYPE: A//
      GO TO OBJECT TYPE: ZZZZ//
DEVICE: ;999;999  TELNET
Image Type Count by User
Sort Criteria: ACQUISITION SITE from A to ZZZ,  DATE/TIME IMAGE SAVED from Jan 1,2000 to Apr
11,2006@24:00,  I
-------------------------------------------------------------------------------------------------

        ACQUISITION SITE: ACQUISITION SITE 1

              VISTAIMAGING,ONE

DOCUMENT
SUBCOUNT                      8

STILL IMAGE
SUBCOUNT                     23

XRAY
SUBCOUNT                     17

XRAY GROUP
SUBCOUNT                     37

XRAY JPG
SUBCOUNT                      2
SUBCOUNT                     87
```

```
              CAMP,ONEHUNDREDONE

STILL IMAGE
SUBCOUNT                      1

XRAY GROUP
SUBCOUNT                      1
SUBCOUNT                      2

              CAMP,SIX

XRAY GROUP
SUBCOUNT                      1
SUBCOUNT                      1

              VISTAIMAGING,TWO

DOCUMENT
SUBCOUNT                      2

XRAY
SUBCOUNT                      2

XRAY GROUP
SUBCOUNT                      2
SUBCOUNT                      6

              VISTAIMAGING,THREE

TEXT
SUBCOUNT                    111

XRAY
SUBCOUNT                   2848

XRAY GROUP
SUBCOUNT                     49
SUBCOUNT                   3008

              VISTAIMAGING,FOUR

DICOM IMAGE
SUBCOUNT                      3

DOCUMENT
SUBCOUNT                      1

PATIENT PHOTO
SUBCOUNT                      2

XRAY GROUP
SUBCOUNT                      1
SUBCOUNT                      7

              VISTAIMAGING,FIVE

ADOBE
SUBCOUNT                      3

DICOM IMAGE
SUBCOUNT                     69

DOCUMENT
SUBCOUNT                     16

MOTION VIDEO
SUBCOUNT                      5

PATIENT PHOTO
SUBCOUNT                      2

STILL IMAGE
SUBCOUNT                     81
```

```
XRAY
SUBCOUNT                 1181

XRAY GROUP
SUBCOUNT                   77
SUBCOUNT                 1434

              IMAGING,TEAM

DOCUMENT
SUBCOUNT                    1

XRAY
SUBCOUNT                    1

XRAY GROUP
SUBCOUNT                    1
SUBCOUNT                    3

              VISTAIMAGING,SIX

DICOM IMAGE
SUBCOUNT                    2

DOCUMENT
SUBCOUNT                    5

STILL IMAGE
SUBCOUNT                    1

XRAY
SUBCOUNT                    1
SUBCOUNT                    9

              VISTAIMAGING,SEVEN

COLORSCAN
SUBCOUNT                    5

STILL IMAGE
SUBCOUNT                   50

XRAY GROUP
SUBCOUNT                   17
SUBCOUNT                   72

              POSTMASTER

XRAY
SUBCOUNT                    1
SUBCOUNT                    1

              VISTAIMAGING,EIGHT

XRAY
SUBCOUNT                    6

XRAY GROUP
SUBCOUNT                    1
SUBCOUNT                    7

              TESTER,IMAGING

DOCUMENT
SUBCOUNT                    2

STILL IMAGE
SUBCOUNT                    4

XRAY
SUBCOUNT                    6

XRAY GROUP
SUBCOUNT                    8
```

```
SUBCOUNT                    20
SUBCOUNT                  4657
COUNT                     4657
```

12.7.3 Means Test Report

This is a report of the Image file (#2005) sorted by 'Acquisition Site', 'From' and 'To' Date/Time Image Saved date range, Export Location = ALL (including null), and Index Type From 'MEANS' to 'MEANSZ'. Report detail will include: Acquisition Site, Patient Name, SSN, Index Type, Date/Time Image Saved, and Export Location.

```
Select Imaging Site Reports Option: MEANS TEST

Right Margin for this report is 132

* Previous selection: ACQUISITION SITE from A to ZZZ
START WITH ACQUISITION SITE: A//
GO TO ACQUISITION SITE: ZZZ//
  * Previous selection: DATE/TIME IMAGE SAVED from Jan 1,1960 to Jun 6,2006@24:0
0
  START WITH DATE/TIME IMAGE SAVED: Jan 1,1960//   (JAN 01, 1960)
  GO TO DATE/TIME IMAGE SAVED: Jun 6,2006//   (JUN 06, 2006)
DEVICE: ;999;999  TELNET
MEANS TEST
Sort Criteria: ACQUISITION SITE from A to ZZZ,  DATE/TIME IMAGE SAVED from Jan 1,1960 to Jun
6,2006@24:00,
PATIENT                           SSN    TYPE INDEX
                                                                    Date       EXPORT LOCATION
-------------------------------------------------------------------------------------------------

        ACQUISITION SITE: ACQUISITION SITE 1
RRRRR,AAAAAAAA                    R0000  MEANS TEST (10-10EZ)     01/01/1900
RRRRR,AAAAAAAA                    R0000  MEANS TEST (10-10EZ)
RRRRR,AAAAAAAA                    R0000  MEANS TEST (10-10EZ)
                                         ----------------------------------------
SUBCOUNT                                 3
RRRRR,AAAAAAAA                    R0000  MEANS TEST (10-10EZ)               MAG1-SLC
                                         ----------------------------------------
SUBCOUNT                                 1
                                         ----------------------------------------
SUBCOUNT                                 4
                                         ----------------------------------------
COUNT                                    4
```

12.7.4 Package Index Contains 'Note' Report

This is a report of the Image file (#2005) sorted by 'Acquisition Site, 'From' and 'To' Date/Time Image Saved date range, Short Description, and Package index containing 'NOTE'. Report detail will include: Acquisition Site, Patient Name, SSN, Short Description, Date/Time Image Saved, and Image Saved by. Sub-counts and counts are given per Scanned By, with Short Description, within Patient.

```
Select Imaging Site Reports Option: Package Index Contains 'Note'

Right Margin for this report is 132

* Previous selection: ACQUISITION SITE from A to ZZZ
START WITH ACQUISITION SITE: A//
GO TO ACQUISITION SITE: ZZZ//
  * Previous selection: DATE/TIME IMAGE SAVED from Jan 1,1960 to Jun 6,2006@24:0
0
  START WITH DATE/TIME IMAGE SAVED: Jan 1,1960//   (JAN 01, 1960)
  GO TO DATE/TIME IMAGE SAVED: Jun 6,2006//   (JUN 06, 2006)
DEVICE: ;999;999  TELNET
```

```
Package Index Contains 'Note'
Sort Criteria: ACQUISITION SITE from A to ZZZ,  DATE/TIME IMAGE SAVED from Jan 1,1960 to Jun 6,20
PATIENT                              SSN    DOC
-------------------------------------------------------------------------------------------

       ACQUISITION SITE: ACQUISITION SITE 1
VIPATIENT,ONE                         V0000  Diagram Neuro Dermatomes
                                             ------------------------------------------------
SUBCOUNT                                     1
VIPATIENT,TWO                           V1111  ADVANCE DIRECTIVE
                                             ------------------------------------------------
SUBCOUNT                                     1
VIPATIENT,ONE                         V0000  Advance Directive
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             MICU Flowsheet
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             AFIP Kidney Biopsy Rpt
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             Geriatrics Referral
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             Diagram
                                             OPTHOMOLOGY
                                             OPTHOMOLOGY
                                             ------------------------------------------------
SUBCOUNT                                     3
                                             Post Anesthesia Flowsheet
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             Nursing MICU Admission
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             Audiological Evaluation
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             Pre-anesthesia Consent
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             Manometry Rpt
                                             ------------------------------------------------
SUBCOUNT                                     1
                                             Home based health care visit
                                             NURSING NOTE
                                             NURSING NOTE
                                             NURSING NOTE
                                             NURSING NOTE
                                             NURSING NOTE
                                             NURSING NOTE
                                             ------------------------------------------------
SUBCOUNT                                     7
VIPATIENT,THREE                              V3333  ADVANCE DIRECTIVE
                                             ------------------------------------------------
SUBCOUNT                                     1
VIPATIENT,FOUR                          V4444  CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             ------------------------------------------------
SUBCOUNT                                     2
                                             CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             ------------------------------------------------
SUBCOUNT                                     7
                                             CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             CATH  May 02, 2001
                                             ------------------------------------------------
SUBCOUNT                                     3
```

```
                                            CATH  May 02, 2001
                                            ---------------------------------------------------
SUBCOUNT                                    1
VIPATIENT,FIVE                              V5555  General Note
                                            ---------------------------------------------------
SUBCOUNT                                    1
VIPATIENT,TWO                            V1111  Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            Ophthalmology
                                            ---------------------------------------------------
SUBCOUNT                                    11
INTERESTING,CASES                     I7312  OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
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                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            OPTHOMOLOGY
                                            ---------------------------------------------------
SUBCOUNT                                    31
VIPATIENT,SIX                            V6666  ADVANCE DIRECTIVE
                                            ADVANCE DIRECTIVE
                                            ---------------------------------------------------
SUBCOUNT                                    2
VIPATIENT,SEVEN                          V7777  NURSING NOTE
                                            NURSING NOTE
                                            ---------------------------------------------------
SUBCOUNT                                    2
VIPATIENT,TWO                            V1111  CONSULT NURSE MEDICAL WOUND SPEC INPT
                                            CONSULT NURSE MEDICAL WOUND SPEC INPT
                                            ---------------------------------------------------
SUBCOUNT                                    2
                                            CONSULT NURSE MEDICAL WOUND SPEC INPT
                                            ---------------------------------------------------
SUBCOUNT                                    1
VIPATIENT,THREE                             V3333  PCC ESTABLISHED INTERMEDIATE
                                            PCC ESTABLISHED INTERMEDIATE
```

```
                                            PCC ESTABLISHED INTERMEDIATE
                                            ---------------------------------------------------
SUBCOUNT                                    3
VIPATIENTSIX,PATIENT                          S6666  NURSING NOTE
                                            ---------------------------------------------------
```

```
SUBCOUNT                                1
VIPATIENT,EIGHT                      V8888  DERMATOLOGY NOTE
                                        DERMATOLOGY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        DERMATOLOGY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                1
VIPATIENT,NINE                     V9999  ADVANCE DIRECTIVE
                                        ----------------------------------------------------
SUBCOUNT                                1
                                        INFORMED CONSENT
                                        ----------------------------------------------------
SUBCOUNT                                1
VIVAPAT,ONE                      V0987  ADVANCE DIRECTIVE
                                        ADVANCE DIRECTIVE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        INFORMED CONSENT
                                        INFORMED CONSENT
                                        ----------------------------------------------------
SUBCOUNT                                2
INTERESTING,CASES                I7312  DERMATOLOGY NOTE
                                        DERMATOLOGY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        DERMATOLOGY NOTE
                                        DERMATOLOGY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        ADVANCE DIRECTIVE
                                        ADVANCE DIRECTIVE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        ADVANCE DIRECTIVE
                                        ----------------------------------------------------
SUBCOUNT                                1
VIVAPAT,TWO                      V3412  WOUND/OSTOMY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                1
                                        WOUND/OSTOMY NOTE
                                        WOUND/OSTOMY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        WOUND/OSTOMY NOTE
                                        WOUND/OSTOMY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        WOUND/OSTOMY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                1
WOUND,TWO                        W3027  WOUND/OSTOMY NOTE
                                        WOUND/OSTOMY NOTE
                                        WOUND/OSTOMY NOTE
                                        WOUND/OSTOMY NOTE
                                        WOUND/OSTOMY NOTE
                                        WOUND/OSTOMY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                6
WOUND,THREE                      W7321  WOUND/OSTOMY NOTE
                                        WOUND/OSTOMY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
VIPAT,NINE                       V1478  Uncompressed TIF
                                        ----------------------------------------------------
SUBCOUNT                                1
VIPATIENT,FOUR                     V4444  OPHTHALMOLOGIST CONSULT NOTE
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
```

```
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        ----------------------------------------------------
SUBCOUNT                                4
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        ----------------------------------------------------
SUBCOUNT                                3
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        OPHTHALMOLOGIST CONSULT NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
VIPAT,QWE                            V2345  Color TIF Test
                                        ----------------------------------------------------
SUBCOUNT                                1
                                        Color TIF Test Uncompressed
                                        ----------------------------------------------------
SUBCOUNT                                1
                                        Color TIF Test 2 Uncompressed
                                        ----------------------------------------------------
SUBCOUNT                                1
                                        Color TIF Test 2 Compressed (jpg)
                                        ----------------------------------------------------
SUBCOUNT                                1
TEST,PATIENT                         T3333  PCC TELEPHONE NOTE
                                        ----------------------------------------------------
SUBCOUNT                                1
VIPATIENT,FOUR                          V4444  CARDIOLOGY NOTE
                                        CARDIOLOGY NOTE
                                        ----------------------------------------------------
SUBCOUNT                                2
                                        ----------------------------------------------------
SUBCOUNT                                140
                                        ----------------------------------------------------
COUNT                                   140
```

Chapter 13 Internal Relations

13.1 Dependencies

13.1.1 Entry/Exit Logic

The VistA Imaging System contains no options that rely on entry or exit logic from other options.

13.1.2 Synchronization

13.1.2.1 Clinical, Diagnostic, and Background Processor Workstations

The VistA Imaging software installed on the VistA Hospital Information System must be synchronized with compatible versions of the software installed on the individual workstations.

13.1.2.2 DICOM Modalities and PACS

The main purpose of the VistA Imaging DICOM Gateway is to act as an interface between external equipment and the VistA Hospital Information System. For each gateway function, in order for that function to be operational, the equipment on both sides of the interface must be up-and-running. In order to test and verify the operational status of equipment, see the *VistA Imaging DICOM Gateway User Manual* for a description of the programs **Ping** and **DICOM_Echo.**

13.1.3 Radiology Protocols (DICOM)

The VistA Imaging DICOM gateway is dependent on Radiology protocols being active. VistA Imaging must be a subscriber to these protocols. Review the following protocols; the highlighted protocol is the VistA Imaging protocol subscriber. Please review the DICOM Installation manual under section 'VistA - PACS Radiology Interface Setup Instructions' for a step-by-step procedure to setup the protocols.

ATTENTION: This is only pertinent if a VistA Imaging DICOM gateway configuration has been defined.

```
NAME: RA REG                            ITEM TEXT: Rad/Nuc Med exam registered
  TYPE: event driver                    CREATOR: 0
  PACKAGE: RADIOLOGY/NUCLEAR MEDICINE
 DESCRIPTION:   This protocol is triggered whenever a Radiology/Nuclear
 Medicine exam is registered.  It executes code that creates an HL7 ORM message consisting of
PID, ORC, OBR and OBX segments.  The message contains all relevant information about the exam,
including procedure, time of registration, procedure modifiers, patient allergies, and clinical
history.
ITEM: MAGD SEND ORM
  ENTRY ACTION: Q                       TIMESTAMP: 57877,43203
  SENDING APPLICATION: RA-SERVER-IMG     MESSAGE TYPE RECEIVED: ORM
  EVENT TYPE: O01                       PROCESSING ID: PRODUCTION
  VERSION ID: 2.1                       GENERATE/PROCESS ACK ROUTINE: Q
  SUBSCRIBERS: MAGD SEND ORM

NAME: RA RPT
  ITEM TEXT: Rad/Nuc Med report released/verified
  TYPE: event driver                    CREATOR: 0
 DESCRIPTION:   This protocol is triggered whenever a Radiology/Nuclear
 Medicine report enters into a status of Verified or Released/Not Verified.  It executes code
that creates an HL7 ORU message consisting of PID, OBR and OBX segments.  The message contains
```

```
relevant information about the report, including procedure, procedure modifiers, diagnostic code,
interpreting physician, impression text and report text.
ITEM: MAGD SEND ORU
  ENTRY ACTION: Q                        TIMESTAMP: 57877,43203
  SENDING APPLICATION: RA-SERVER-IMG      MESSAGE TYPE RECEIVED: ORU
  EVENT TYPE: R01                        PROCESSING ID: PRODUCTION
  VERSION ID: 2.1                        GENERATE/PROCESS ACK ROUTINE: Q
  SUBSCRIBERS: MAGD SEND ORU


NAME: RA CANCEL                          ITEM TEXT: Rad/Nuc Med exam cancellation
  TYPE: event driver                     CREATOR: 0
  PACKAGE: RADIOLOGY/NUCLEAR MEDICINE
 DESCRIPTION:   This protocol is triggered whenever a Radiology/Nuclear
 Medicine exam is cancelled.  It executes code that creates an HL7 ORM message consisting of PID,
ORC, OBR and OBX segments.  The message contains all relevant information about the exam,
including procedure, time of cancellation, procedure modifiers, patient allergies and clinical
history.
ITEM: MAGD SEND ORM
  ENTRY ACTION: Q                        TIMESTAMP: 57877,43203
  SENDING APPLICATION: RA-SERVER-IMG      MESSAGE TYPE RECEIVED: ORM
  EVENT TYPE: O01                        PROCESSING ID: PRODUCTION
  VERSION ID: 2.1                        GENERATE/PROCESS ACK ROUTINE: Q
  SUBSCRIBERS: MAGD SEND ORM


NAME: RA EXAMINED                        ITEM TEXT: Rad/Nuc Med examined case
  TYPE: event driver                     CREATOR: 0
  PACKAGE: RADIOLOGY/NUCLEAR MEDICINE
 DESCRIPTION:   This protocol is triggered whenever a Radiology/Nuclear
 Medicine exam has reached a status where GENERATE EXAMINED HL7 MSG is Y at that (or at a lower)
status.  This message contains all relevant information about the exam, including procedure, time
of registration, procedure modifiers, patient allergies, and clinical history.
ITEM: MAGD SEND ORM
  ENTRY ACTION: Q                        TIMESTAMP: 57877,43203
  SENDING APPLICATION: RA-SERVER-IMG      MESSAGE TYPE RECEIVED: ORM
  EVENT TYPE: O01                        PROCESSING ID: PRODUCTION
  VERSION ID: 2.1                        GENERATE/PROCESS ACK ROUTINE: Q
  SUBSCRIBERS: MAGD SEND ORM
```

13.1.4 Radiology Protocols (VistARad)

VistA Imaging VistARad can be set to automatically prefetch archived images for prior radiology exams. Prefetch is activated by subscribing to the RA REG protocol—the VistARad client protocol is MAGJ PREFETCH SEND/ORM. Review the example RA REG protocol below; the bolded protocol is the VistARad protocol subscriber. The Installation Guide has a step-by-step procedure to set up the protocol.

```
NAME: RA REG                             ITEM TEXT: Rad/Nuc Med exam registered
  TYPE: event driver                     CREATOR: IMAGUSER,ONE
  PACKAGE: RADIOLOGY/NUCLEAR MEDICINE
 DESCRIPTION:   This protocol is triggered whenever a Radiology/Nuclear
 Medicine exam is registered.  It executes code that creates an HL7 ORM message
 consisting of PID, ORC, OBR and OBX segments.  The message contains all
 relevant information about the exam, including procedure, time of
 registration, procedure modifiers, patient allergies, and clinical history.
ITEM: MAGD SEND ORM
  ENTRY ACTION: Q                        TIMESTAMP: 58864,51844
  SENDING APPLICATION: RA-SERVER-IMG     TRANSACTION MESSAGE TYPE: ORM
  EVENT TYPE: O01                        VERSION ID: 2.1
  RESPONSE PROCESSING ROUTINE: Q
SUBSCRIBERS: MAGD SEND ORM
SUBSCRIBERS: MAGJ PREFETCH/SEND ORM
```

13.1.5 Patient Movement Protocol (DICOM)

The VistA Imaging DICOM gateway is dependent on the Patient Movement (DGPM MOVEMENT EVENTS) protocol being active. VistA Imaging must be a subscriber to this event protocol. The following is an example of this event protocol; the highlighted protocol is the Imaging protocol subscriber. ATTENTION: This is only pertinent if a VistA Imaging DICOM gateway configuration has been defined. Please review the DICOM Installation manual under section 'VistA - PACS Radiology Interface Setup Instructions' for a step-by-step procedure to setup the protocols.

```
NAME: DGPM MOVEMENT EVENTS              ITEM TEXT: MOVEMENT EVENTS v 5.0
  TYPE: extended action                 CREATOR:
  PACKAGE: REGISTRATION
 DESCRIPTION:
  At the completion of a patient movement the following events take place through this option:

 1. The PTF record is updated when a patient is admitted, discharged or transferred.

 2. The appointment status for a patient is updated to 'inpatient' for admissions and
'outpatient' for discharges.  Admissions to the domiciliary have an 'outpatient' appointment
status.

When a patient is admitted, dietetics creates a dietetic patient file entry and creates an
admission diet order.   When a patient is discharged, all active diet     orders are

discontinued.  If a patient is absent or on pass, the diet orders are suspended.
Inpatient Pharmacy cancels all active orders when a patient is admitted, discharged or on
unauthorized absence.  A patient can not be given Unit Dose meds unless s/he is admitted to a
ward.  The patient can receive IV meds; however.

When a patient is transferred, an inpatient system parameter is used to determine whether or not
the orders should be cancelled.  When a patient goes on authorized absence, the inpatient system
parameter is used to determine whether the orders should be cancelled, placed on hold or no
action taken.

When a patient returns from authorized absence any orders placed on hold will no longer be on
hold.

 5. With ORDER ENTRY/RESULTS REPORTING v2.2,   MAS OE/RR NOTIFICATIONS may be displayed to USERS
defined in an OE/RR LIST for the patient. These notifications are displayed for admissions and
death discharges.

  FILE LINK: GMRD MAIN MENU MIS MANAGER
ITEM: DG MEANS TEST DOM                 SEQUENCE: 8
ITEM: DGJ INCOMPLETE EVENT              SEQUENCE: 6
ITEM: DGOERR NOTE                       SEQUENCE: 7
ITEM: DGPM TREATING SPECIALTY EVENT     SEQUENCE: 1
ITEM: SD APPT STATUS                    SEQUENCE: 2
ITEM: ORU AUTOLIST
ITEM: ORU PATIENT MOVMT
ITEM: FHWMAS
ITEM: GMRADGPM MARK CHART
ITEM: IB CATEGORY C BILLING             SEQUENCE: 10
ITEM: VSIT PATIENT STATUS
ITEM: SC PCMM INPATIENT ACTIVITY
ITEM: SC ASSIGN PC TEAM ON DISCHARGE
ITEM: YS PATIENT MOVEMENT
ITEM: VAFH HL7 INPATIENT CAPTURE        SEQUENCE: 3
ITEM: VAFC HL7 INPATIENT CAPTURE        SEQUENCE: 4
ITEM: MAGD DHCP-PACS ADT EVENTS
ITEM: IVM FINANCIAL QUERY FOR ADMISSION
  TIMESTAMP: 57986,52890
```

Chapter 14 Package-wide Variables

The VistA Imaging System does not contain any package-wide variables.

Chapter 15 Online Documentation

15.1 Online Help

Online help is available from the Help menu for Clinical Display, Clinical Capture, MagSys (clinical workstation configuration manager), Background Processor, Verifier, VistARad, and TeleReader software.

Chapter 16 Site-Specific Implementation

16.1 Site-Specific Implementation

16.1.1 Radiology Report Transcription Service

Local routines that automatically upload radiology reports from a transcription service should be reviewed and/or modified to ensure that proper consideration has been made for VistA Imaging. When an image is captured via the DICOM Image Gateway and the radiology case number does not have an existing radiology report entry (in file #74), then the VistA Imaging software creates a report stub entry for that case number with limited information. (See box below -- example of radiology report stub entry made by Imaging.) Please note that the stub report entry has an image pointer stored in the IMAGE field, no report status is on file and the activity log indicates that images were collected. The VistA Imaging System executes a Radiology Package API called CREATE^RARIC to create this entry. The Radiology Patient File (#70) is also updated with the report pointer in the Report Text field.

Imaging has experienced problems when the auto-upload routine updates the REPORT TEXT field (#17) in the Radiology Patient file. Often the problems result from the program not expecting the Report file entry to exist at the time of the upload. However, the DICOM image capture process guarantees that at the time the transcribed reports are uploaded to the system, a Report file entry already exists, although no Report text nodes exist. Differences in implementations of the local upload programs at various sites have led to other problems as well. Therefore, if your site uses such a program for uploading and/or updating the Radiology report, you must carefully review all aspects of its functionality in light of the changes introduced by the VistA Imaging System.

```
DAY-CASE#: 031500-6666                  PATIENT NAME: IMAGPATIENT,ONE
  EXAM DATE/TIME: MAR 15, 2000@13:28    CASE NUMBER: 6666
  DATE REPORT ENTERED: MAR 15, 2000
IMAGE: IMAGPATIENT,ONE  666-58-5533  FOOT 3 OR MORE VIEWS
 CLINICAL HISTORY: pt s/p multiple 1st ray sx w/ continued pain. Please x-ray weight bearing
right foot.
LOG DATE: MAR 15, 2000@13:59            TYPE OF ACTION: IMAGES COLLECTED   COMPUTER USER:
POSTMASTER
```

Example: Radiology Report stub entry made by the VistA Imaging application.

16.1.2 HL7 Message Text File

VistA Imaging is a subscriber to the Radiology protocols that create HL7 messages. When Radiology protocols are executed, entries are created in the HL7 Message Text file (#772). The purging of this file is handled by the menu option for this application. Sites are requested to review the purging parameters for this file. Use menu option 'Purge Message Text File Entries' under the HL7 Main menu.

16.1.3 Incomplete DICOM Files Received on the DICOM Image Gateway

During the processing of DICOM files on the DICOM image gateway, it is possible for a modality or a PACS interface to send an incomplete file (possibly just header information

without the image information). The image processing routine will log these entries in a temporary file (M global) and check periodically to see if the entire file has been received. If, after an hour's time span, the file is still incomplete, the entry is removed from the temporary file (M global) and the file is renamed by appending "_incomplete" to the filename. These files do remain in the DICOM\IMAGE_IN directory and will require site personnel to research the possible failure. In addition, these files will require manual intervention for file maintenance (deletion). Please see the *VistA Imaging DICOM User Manual* for additional information.

Chapter 17 Database Integrity Checking

For detailed information on integrity checking, refer to the *Imaging System Verifier User Manual*.

Chapter 18 Remote Image Views

18.1 Configuration for Remote Image Views

The Remote Image Views functionality uses a Network Location entry that points to the VistA Site Service to determine the server and port of remote VistA databases. This Network Location entry is present at all sites running Patch 45 or later. By default, this Network Location is enabled.

The URL defined in the VistA Site Service Network Location must be accessible to all clients attempting to access remote images.

18.1.1 Enabling/Disabling Remote Image Views for Site

To enable/disable Remote Image Views for your entire site, you may do so by changing the Operational Status of the NETWORK LOCATION File (#2005.1). Setting the Operational Status to On-Line enables Remote Image Views for your entire site. Setting the Operational Status to Off-Line disables Remote Image Views for your entire site. Enabling and disabling this option does **not** prevent remote sites from accessing your data. This only prevents users at your local site from accessing remote data.

```
If you would like to disable Remote Image Views at your local site, you may do so by modifying
the Operation Status field of the VISTASITESERVICE NETWORK LOCATION.

VA FileMan 22.0

Select OPTION: ENTER OR EDIT FILE ENTRIES

INPUT TO WHAT FILE: NETWORK LOCATION// NETWORK LOCATION
                                       (60 entries)
EDIT WHICH FIELD: ALL// OPERATIONAL STATUS
THEN EDIT FIELD:

Select NETWORK LOCATION: VISTASITESERVICE
http://med.va.gov/VistaWebSvcs/SiteService.asmx

OPERATIONAL STATUS: On-Line// ?
     Code the Network Location ONline/OFFline status
     Choose from:
       0        Off-Line
       1        On-Line
OPERATIONAL STATUS: On-Line// ??


To allow clients at your site to use Remote Image Views, set the VISTASITESERVICE Operational
Status to On-Line.  If you would like to disable Remote Image Views at your site, set the
Operational Status to Off-Line.
```

18.1.2 Updating VistA Site Service URL

The remote image viewing capability uses a VistA Site Service to determine the server details of remote VistA systems. The following describes how to change the URL for this service if necessary.

```
If the VistA Site Service URL needs to be changed, you will need to edit the Physical Reference
field for the VISTASITESERVICE entry in the NETWORK LOCATION File.

Example Fileman session:

VA FileMan 22.0


Select OPTION: ENTER OR EDIT FILE ENTRIES

INPUT TO WHAT FILE: NETWORK LOCATION// NETWORK LOCATION
                                        (60 entries)
EDIT WHICH FIELD: ALL// PHYSICAL REFERENCE
THEN EDIT FIELD:

Select NETWORK LOCATION: VISTASITESERVICE
http://med.va.gov/VistaWebSvcs/SiteService.asmx

PHYSICAL REFERENCE: http://vhaann26607.v11.med.va.gov/VistaWebSvcs/SiteService.asmx
          Replace ??


You can modify the value for the Physical Reference field to the new URL of the VistA Site
Service.
```

Appendix A Error Messages

A.1 Clinical Workstation Error Messages

Error Message	Cause(s)/Solutions
You don't have the proper Security Keys to capture LAB images.	The USE CAPTURE KEY field in the Imaging Site Parameters file (#2006.1) has been turned on and the user has not been assigned the proper key. Please review the Security Key section in the VistA Imaging Security Guide.
Error in connecting to Server \\servername\image\	Possible causes: • The workstation has not been set up properly. • The account used to access the server has not been given the proper security level or has not been set up properly. • The listed server is down. Find the associated error number and use the Help | Error Code Lookup option in Imaging Display.
AutoUpdating is disabled. Network Configuration file doesn't exist.	The MAGNET.INI file is not on the Network Update directory. Auto Update is not configured properly. 1. Contact network administrator and request that a copy of the MAGNET.INI file be placed in the Network Update directory. 2. Review the VistA Imaging System Installation Guide for proper configuration of Auto Update.
AutoUpdating disabled. The network update directory doesn't exist.	Cannot connect to the directory or it does not exist. • User does not have privileges to the distribution directory. • Workstation log-on profile does not connect to Network Update directory. • Contact network administrator.

Error Message	Cause(s)/Solutions
AutoUpdating disabled. Workstation isn't configured for Auto Updating.	No update directory in the MAG308.INI file under section SYS_AUTOUPDATE for variable DIRECTORY. Run MAGASET.EXE from the Network Update directory. This will automatically define the DIRECTORY entry in the MAG308.INI file for the current workstation.
AutoUpdating canceled. No Updates available.	The MAGSETUP.EXE file does not reside in the Network Update directory. Contact the network administrator and request a copy of the MAGSETUP.EXE file be placed on the Network Update directory.
Abstract not found.	Possible causes: • The abstract was removed from the server. • The abstract was not generated, or could not be written to the share. • Network problems. • Mapped Image share • Permission to access the share is not granted. Diagnostic process and corrective action: • Check file and folder permissions for the image shares. • Check to see if the files exist on the shares.
ERROR_ACCESS_ DENIED	Possible causes: • Account or share permissions are not set up properly. • Account password was changed on the server, but not updated in the Imaging Site Parameters file (#2006.1).

Error Message	Cause(s)/Solutions
Error connecting to server.	Possible causes: • Incorrect configuration. Diagnostic process and corrective action: • Check for error number in the message history window. Look it up using the Error Lookup option on the Imaging Display help menu. • Use ping or tracert to check the availability of the file server.
0 Images on file.	Possible causes: • Normal condition. Diagnostic process and corrective action: • This refers to images, not EKGs! A patient can have one without the other. Check "user preferences" to see if "always display EKG window" is selected. Click the EKG button to display the EKGs.
The File Does Not Exist - Notify IRM.	Possible causes: • Missing or inaccessible file. Diagnostic process and corrective action: • Check to see if the file pointed by the database exist and is accessible.

Error Message	Cause(s)/Solutions
Launching Imaging from CPRS causes RPC Broker dialog for access/verify code.	Possible Causes: • Incorrect configuration. Diagnostic process and corrective action: • AutoSignon or multiple signon is not enabled for the site (Kernel System Parameters file (#8989.3)) or the user (New Person file (#200)). • DEFAULT AUTO SIGN-ON can not be set to “Disabled” in Kernel site parameters file.
Error Accessing Group Image - See VistA Error Log.	Possible causes: • Database inconsistency. Diagnostic process and corrective action: • This error is found on the clinical display when you try to delete an "Abstract not Found" entry. The software identifies this entry as a group image and because you cannot expand the group, it cannot be deleted.
No MUSE Servers available.	Possible causes: • No MUSE servers are configured in the Network Location file (#2005.2). • All MUSE servers in the Network Location file are configured as off-line. Diagnostic process and corrective action: • Add the MUSE Servers to the Network Location file. • Bring the MUSE servers back On-Line in the Network Location file.

Error Message	Cause(s)/Solutions
No MUSE Servers available. Select a failed connection to see the error code.	Possible causes: • The application failed to connect to the all of the MUSE Servers. • MUSE servers are down. Diagnostic process and corrective action: • Click on a specific connection to see the error details.
No Muse EKGs on File for this patient	Possible causes: • Patient ID (SSN) entered does not match MUSE patient ID. • The Patient has no Muse EKGs on file. Diagnostic process and corrective action: • Verify that the entered patient ID (SSN) is identical in the MUSE and VistA databases.
Error connecting to MUSE Server \\<ServerName>\ <ServerShare>: status =53	Possible causes: • The network path was not found. • Permission problem on share. • MUSE server down. Diagnostic process and corrective action: • Be sure you can ping the server. • Ensure that the Physical Reference field in the Network Location file (#2005.2) is defined correctly.

Error Message	Cause(s)/Solutions
Error connecting to MUSE Server \\<ServerName>\ <ServerShare>: status =104	Possible causes: • Error message displayed when user selects a failed connection in the EKG selection list. The MUSE API flag is not enabled. Diagnostic process and corrective action: • This requires a call to GE so they can enable the API by installing a VOL000\system\sysinf\MUSEAPI.FIX file. • If this file was created with Notepad, be sure that it is not named MUSEAPI.FIX.TXT. Notepad adds a .txt extension when it creates a file.
Invalid File : MUSEAPI.DLL Call IRM to get an updated file.	Possible causes: • The MUSE API files were not installed correctly. • The MUSE API files are not installed. Diagnostic process and corrective action: • Call IRM for help • Reinstall VistA Imaging.

A.2 Background Processor/Jukebox Error Messages

Error Message	Cause(s)/Solutions
'CC:createcontext("MAG WINDOWS") could not be established!'.	The user who is logging into the background processor does not have the MAG WINDOWS security key assigned. Assign the MAG WINDOWS security key to this user.
'Broker Connection to server could not be established!'.	VistA RPC Broker is not currently in a listening state. OR The application has timed out. 1. Close the application and restart. 2. Check with the VistA system manager for the status of the Broker listener.
'Source File does not exist: '+“Filepath”.	The VistA Imaging file reference was not updated. The verifier will update. NO action is necessary.
Background processor is halting most mornings.	Symptom: • Background processor inoperable. Possible Causes: • RPC time-out. Diagnostic Process and Corrective Action: • It is likely that the tape backup procedure is stopping the job that controls the link between the BGP and the HIS system. Check the backup procedure for code that kills VMS jobs. • Restart the Background processor.
Broker error - sign on not completed.	Symptom: • Error message displayed. Possible Causes:

Error Message	Cause(s)/Solutions
	• Network Timeout. Diagnostic Process and Corrective Action: • The broker connection timed out on the current process. Close the BGP window, re-logon (VistA access/verify), and start a new BGP session. The problem appears to be related to the completion of the VistA backup job.
Unable to copy to Jukebox. Not enough write cache available.	Symptom: • Informational message displayed. Possible Causes: • Temporary condition. Diagnostic Process and Corrective Action: • This message is informational, indicating that the memory set aside to cache data to be written to the jukebox is temporarily full. This causes the BGP software to pause sending data to the write cache. This process will automatically restart as the jukebox writes the data backlog to optical, since this will free memory in the write cache. Check for corruption in the database: Stop the BGP and stop the DE Jukebox service E:\dex\bin\dbcache /report Check for inconsistencies E:\dex\bin\dbcache /fixall Restart the DE jukebox service and check that cache begins to clear. Then, restart the BGP. The background processor idles (goes to "sleep') waiting for space to be made available on IMM2. Check for Disk Extender errors on IMM2. Check local network connectivity. The disks are probably not full. Clear the ReadCache (via DEAdmin) because if it and the WriteCache total to more than 90%, then it's the ReadCache that

Error Message	Cause(s)/Solutions
	may be preventing the WriteCache from being accessed (no headroom). Check to see that the new media has been added, online, and inserted into the write path. From IMM2, check network continuity: DIR \\VHAxxxJB1\IMAGE1 Is any media jammed in the jukebox shelf or drive? Was any password changed? Ultimately, shutdown, power-off/on, boot both the server and the jukebox. Make sure the jukebox robotics have settled and all LEDs are green. Then start IMM2. Watch start-up screens for errors.
DOS ERROR The Disk is Full.	Symptom: • Error message displayed. Possible Causes: • DX Cache Inconsistency. Diagnostic Process and Corrective Action: • Chances are that the disk is NOT full, but that the jukebox has a cache inconsistency. On IMM2, do the following: D:\DEX\BIN>dbcache /report then, if errors exist, D:\DEX\BIN>dbcache /fixall • Check to see if there is free space available on media in the write path.
Could not connect to the DiskExtender service.	Symptom: • Error message displayed. Possible Causes: • SCSI Failure

Error Message	Cause(s)/Solutions
	• Power Failure • Incorrect shutdown Diagnostic Process and Corrective Action: • If starting the DE console fails, check the DE event log: D:\DEX\LOGS\event.txt Chances are, the cache is corrupt and needs to be fixed: D:\DEX\BIN>dbcache /report D:\DEX\BIN>dbcache /fixall Then, restart the DE console, invoke the DE Administrator and use the 'stoplight' to start the services. Then, the background processor should be restarted (if it had errored out). Also check that the SCSCI interface board is properly seated in its slot.
The RPC server is unavailable - Error code 1722.	Symptom: • Error message displayed. Possible Causes: • Power Failure • SCSI error Diagnostic Process and Corrective Action: • If starting the DE console fails, check the DE event log: E:\DEX\LOGS\event.txt When DE service tries to start - there are repetitive "going to sleep/thread woke up/Drive thread waiting for initialization" messages and attempts to reinitialize the database. This may go on for several minutes and finally fail. This is indicative of a hardware failure, too. --- Chances are, the cache is corrupt and needs to be

Error Message	Cause(s)/Solutions
	fixed: E:\DEX\BIN>dbcache /report E:\DEX\BIN>dbcache /fixall Then, restart the DE console, invoke the DE Administrator and use the 'stoplight' to start the services. Then, the background processor should be restarted (if it had error-ed out).
Unable to retrieve images from jukebox	Symptom: • Error message displayed. Possible Causes: • Authorization Failure Diagnostic Process and Corrective Action: • Check the Net Username and Net Password in the IMAGING SITE PARAMETERS File (#2006.1). This grants access to the magnetic shares. Another problem with accessing images from the jukebox is due to a limitation with the Diskextender software 3.20.90. It will only grant access to the account in the 2006.1 fields pertaining to the Net User Name and Net Password if that same account exists locally on the Jukebox server (IMM2). Also check that the SCSI board is properly seated in its slot.
JBSleep (JBTOHD) Jukebox is currently offline	Symptom: • Error message displayed Possible Causes: • Incorrect Configuration • Authorization Failure • DX is not running. Diagnostic Process and Corrective Action:1) 1. Check to see that Disk Extender services are

Error Message	Cause(s)/Solutions
	running. Check the Disk Extender event log. 2. Check that the person who logged into this workstation (background processor) has rights and permissions on the jukebox server and the image server. This can be tested with: C:\>DIR \\VHAxxxJB1\IMAGE1 3. Check the background processor log… C:\vista\BackProc for what it's trying to do. If it's trying to write to a hashed location, the settings in 2006.032 must be set correctly. There should be a WORMOTG and a WORMOTGH write location. You must also turn off hashing in FileMan. You can check this with the file causing the error: C:\>DIR . . .\IMAGE1\HA\08\04\HA080431.TXT and then… C:\>DIR . . . \IMAGE1\HA080431.TXT The file will exist in only one of these locations. If it's at the root (IMAGE1), then hashing has to be turned on. Contact the National Help Desk for assistance.
TGA: not copied. 39: There is not enough space on the disk.	Symptom: • Error message displayed. Possible Causes: • Disk Full Diagnostic Process and Corrective Action: 4. Check the background processor to see that it's having trouble writing to the jukebox or writing to magnetic. 5. Go to IMM2 and open the Disk Extender Administration. 6. Check that media exist in the Media Path.

Error Message	Cause(s)/Solutions
	7. Check that enough media exist in the Write Path.
Jukebox Error=27. Unhandled move error.	Symptom: • Displayed Error message. Possible Causes: • Cache corruption Diagnostic Process and Corrective Action: • A file in the write cache may be corrupt. Rename the corrupt Cache file, and then run the DBCACHE utility in the \DEX\BIN folder.
Remote procedure call failed; did not execute; Error code 1727	Symptom: • Jukebox is not accessible. Possible Causes: • Jukebox failure Diagnostic Process and Corrective Action: • A platter may not have successfully mounted or the service is not running. You may also probably see: "could not collect partition information". This error usually occurs during start-up and is normal, as the jukebox has not finished inventorying the platters. Worst case, use the DEX Console to take the jukebox offline, then back online, setting "inventory" for only the platters preceding and following (and including) the problem platter. The jukebox should recover.

Error Message	Cause(s)/Solutions
Could not collect partition info; handle invalid; Error code 6.	Symptom: • Jukebox is not accessible. Possible Causes: • Jukebox failure Diagnostic Process and Corrective Action: • The service is not started.
Not enough file server space.	Symptom: • Warning message Possible Causes: • Disk space reaching low limits. Diagnostic Process and Corrective Action: • Disk space on the image servers is probably getting low. You must do a purge operation from the BGP. 1) Stop BGP. 2) Edit->Purge Parameters. 3) File->Purge. 4) Click "Start" button in top middle of the screen. You will see 2 graphs. The top shows the candidates to be purged. The bottom shows the free space made available.
Jukebox copy not overwritten.	Symptom: • Informational message Possible Causes: • Normal condition

Error Message	Cause(s)/Solutions
	Diagnostic Process and Corrective Action: • This is a normal condition after a purge. The error message is actually notification that the pointer has been reset. Run the verifier to confirm the consistency of the files on the jukebox and the pointers on the VistA HIS (#2005).
Menus are being rebuilt. Please try again later.	Symptom: • Warning message Possible Causes: • HIS is busy. Diagnostic Process and Corrective Action: • You will also get a message: List index out of bounds (0). This error is a result of the BGP losing connection with the HIS. The user must restart the BGP. This scenario occurs when the BGP cannot communicate with the Broker process on the HIS system. The Broker process is locked out by a higher priority job, backups are being run that lock the system for several minutes, etc.
'EBrokerError:'+ Filename	RPC is not available. Or Application timeout. Restart application.
'EBrokerError:'+ IEN	RPC is not available. Or Application timeout. Restart application.
'This Workstation is not yet configured!'.	1. There is no database entry for this workstation. Use the BP Workstation menu and select: Edit| Add BP workstation menu option.

Error Message	Cause(s)/Solutions
	2. The Workstation has not been assigned any Queue types to process. Use the BP Workstation menu and select: Edit||BP Workstation Parameters.
' Invalid jukebox volume name: '+ “Drive/path “+ “Volume name”.	The jukebox share label is not consistent with the VistA Jukebox file volume name. 1. Check the volume name in the site configuration (Edit|Site Imaging Site Parameters – Jukebox default) 2. Check the network properties of the Jukebox share validate that the label is ‘DEX’.

A.3 DICOM Gateway Error Messages

Information about DICOM Gateway Error messages is available in the *Imaging System Error Message Guide.*

A.4 Clinical Display/Capture Setup Error Messages

The following errors are possible during the MAGINSTALL.EXE file execution. When the MAGINSTALL file is transported via FTP, it should be in binary format (or possible file corruption may occur).

Error Message	Notes
Incorrect Windows version.	Review the installation manual regarding the application's Windows compatibility.
Invalid executable file.	Possible corrupted MAGINSTALL.EXE file.
Type of executable file was unknown.	Possible corrupted MAGINSTALL.EXE file.
Attempt was made to load a second instance of an executable file containing multiple data segments that were not marked for read-only.	Possible corrupted MAGINSTALL.EXE file.
Dynamic Link Library (DLL) file was invalid.	One of the DLLs required to run this application was corrupt.
[2] Imaging Display	The Imaging Display application is open. Close the application and click retry.
[1] Imaging Capture	The Imaging Capture application is open. Close the application and click retry.

A.5 VistARad Error Messages

Error messages associated with the VistARad application are listed below. Messages are listed alphabetically. This list is not exhaustive. It omits some messages which are informational, supply their own remediation instruction, or are otherwise self-evident. If a message not on this list appears and requires further explanation, please contact the National Help Desk.

Error Message	Cause(s)/Solutions
Case #nnn is already locked by you, perhaps at another workstation.	A user has attempted to lock an exam that is already locked in their name. This could occur from two different logons from different workstations; or, it could result from a failed connection that left an process hanging without a connected client.
Case %s: all images failed to load.	No images for the selected case could be found. If any valid headers are located, one or more "dummy" thumbnails may be displayed in the Preview window, but no actual images are available. Close the exam, then attempt to re-open it. If the problem persists, contact the local Imaging Coordinator.
Case #nnn is Locked by [Name/Unknown]; Status Update will NOT be allowed.	Between the time that the exam was opened and locked, and the time the exam was closed for update, the Exam lock information had changed, making the exam not updateable. If this occurs, check for problems in the lock table or with the Broker connection.
Case #nnn locked by [name], not locked by [user]--No Status update performed	Between the time that the exam was opened and locked, and the time the exam was closed for update, the lock information either was killed, or over-written with another user's information.
Case #nnn was previously locked by [Radiologist]. The lock is now assigned to you.	The radiologist that previously had the lock likely had the M session abnormally terminated.

Error Message	Cause(s)/Solutions
Case %s: no valid headers found.	Images in the exam do not have valid headers and cannot be processed properly. The exam load is considered successful. You can display images by loading the "IMG_INVALID_TEXT" stack in the Preview window into the Viewer; the exam can be locked for interpretation.
Case %s: some image(s) are missing.	Some images and/or headers could not be found. The exam load is considered incomplete. Depending on what is missing, one or more placeholders will be used in the Preview and Viewer windows. The exam cannot be locked or interpreted. Close the exam, then attempt to re-open it. If the problem persists, contact the local Imaging Coordinator.
Case %s: some image(s) have invalid or missing headers.	The headers for some images in the case could not be found. Images that can be processed properly will be displayed normally; images that could not be processed due to missing header data will be loaded into the Preview window only with an "IMG_INVALID_TEXT" label. The exam can be locked and interpreted.
Case with number xxx will not be loaded, Error 0x %x.	A VistARad internal error occurred while opening the exam.
Could not send files to MIRC Server at <Host Name> and Port <Port Number> with AE Title <AE Title>.	Ensure that the MIRC server configuration information is correct, that the MIRC server is online, and that it can receive messages.
Current Case Not Accessible for Updating	A user request to close an exam cannot be processed because the data does not have valid information that correctly identifies a Radiology study. Check the exam data stored in the Radiology database.
Current Case not accessible to close--no action taken	A user request to close an exam cannot be processed because the data does not have valid information for the Radiology study. Check the exam data stored in the Radiology database.

Error Message	Cause(s)/Solutions
Don't know how to read this image element.	An unexpected value was found in the last DICOM tag listed in the Viewport Info tab of the Hanging Protocol Definition dialog. The hanging protocol definition cannot be saved. Verify that the image header is populated properly for the DICOM tag in question.
Error occurred while performing search.	The VistARad client was not able to contact the VistARad host. Check for status details at the bottom of the manager window.
Error Reading File MAGJ.INI	MAGJ.INI not present in expected location (C:\Program Files\Vista\Imaging\MAG_ VistARad). The software will start, but users will not be able to display local copies of routed exams or use integrated voice dictation functions until the problem is resolved.
Error reading settings. VistARad will exit.	The client was unable to retrieve monitor information from the VistARad back end on the VistA Host. Verify that the VistA Host is accessible and running.
Error retrieving monitor information (Error:%d). VistARad will exit.	The VistARad client could not retrieve monitor information stored on the VistARad back end. System queried back end for monitor information but gets no response. Verify that a connection is present and that the VistA system is up and running.
Exam is for Station (nnn); you are logged on to #mmm". Exam is NOT Locked.	The exam being opened is exam registered at a consolidated site that is a not the user's logon site (division). The exam can be displayed but its status cannot be updated.
Exam Manager failed to Initialize. VistARad will exit.	The client was unable contact VistARad back end on the VistA Host. Verify that the VistA Host is accessible and running, and that the correct KIDS version is installed.

Error Message	Cause(s)/Solutions
Exam Status for Case #nnn CANNOT be updated; current status remains: [Status]	The status update cannot proceed because there is insufficient information in the radiology record to allow the status to advance. If this occurs frequently, then the site has not properly performed VistARad system setup regarding Radiology Exam Status codes definition—refer to Chapter 3 in the *VistA Imaging Installation Guide*.
Failed to read in xxx preset definition of the current or system user correctly.	There was a problem processing the specified image preset definition. Do not use the specified image preset until the problem is resolved.
Failed to read in xxx template definition of the current or system user correctly.	There was a problem processing the specified template definition. Do not use the specified template until the problem is resolved.
Failed to retrieve a preset xxx for user xxx	There was a problem retrieving preset information from the VistARad back end. Verify that a connection is present and that the VistA system is up and running.
For Case #nnn, current Status is [status]; Status Update will NOT be allowed	Between the time the exam list indicated an exam was lockable and the time the exam was opened, the exam status had changed, making the exam not lockable. If this happens frequently, exam list compile intervals specified in VistARad Site Parameters file (#2006.69) may need to be adjusted.
For MAGJ STUDYDATA (TX="_TXID_") invalid params passed to rpc call.	Invalid request for key image and/or presentation state data was received on the VistA host; could indicate a database problem with the exam or images in the exam being looked at.
HP creation failed, error code xxxx	An application error prevented creation of the hanging protocol; record the error code and contact Customer Support.

Error Message	Cause(s)/Solutions
HP named xxx could not be read in correctly.	There was a problem processing the specified hanging protocol definition. Do not use the specified hanging protocol until the problem is resolved.
Insufficient memory; cannot load all text files, thumbnails and/or key images. Load aborted for case(s) XXX.	Exit and restart VistARad to clear any potential memory issues. Attempt to reload the exam in question. Contact your Imaging Coordinator if the error persists.
Invalid Request (ListType=xxx)	An attempt to compile an exam list failed. The exam list definition in MAG RAD LISTS DEFINITION file (#2006.631) may be corrupted. The exam list definition should be fixed or disabled.
Invalid transaction (TX="_TXID_") requested by MAGJ STUDYDATA RPC call.	Invalid request for key image and/or presentation state data was received on the VistA host; could indicate a database problem with the exam or images in the exam being looked at.
Modality type xxx not found in the configuration file.	hpconfig.xml does not contain information for the modality associated with the active exam. Verify that modality for the exam in question is being correctly identified and that hpconfig.xml file stored in the VistARad application folder is present and not corrupt.
Modality xxx not found. Please contact your system administrator"	The hpconfig.xml file does not contain information for the modality associated with the active exam. Verify that modality for the exam in question is being correctly identified and that hpconfig.xml file stored in the VistARad application folder is present and not corrupt.
No data supplied for History List update/delete.	The client software performed an invalid request to update the History list.
No modality in this stack of images	The exam being opened does not contain modality information.

Error Message	Cause(s)/Solutions
No Update Allowed for Case #nnn--current status is [Status]	Between the time that the exam was opened and locked, and the time the exam was closed for update, the Exam Status information had changed, making the exam not updateable. This can occur if a data entry operation was performed in Radiology package while the exam was being read.
Image loading has been paused: not enough memory to load all images at once. Use the Preview window's List view mode to load and/or purge selected image sets.	Using the Preview window in List View mode, click "Purge" on one or more (partially) loaded series to free their memory. Then click "Resume" on the series of interest that was paused.
Request Contains Invalid Case Pointer (nnn^nnn^nnn^nnn).	A user request to open an exam cannot be processed because the data does not have valid information that correctly identifies a Radiology study. Check the exam data stored in the Radiology database.
Resource limit exceeded! Close some images	The maximum number of DIMPLX controls allowed by the operating system has been exceeded. Use the layout controls in VistARad to reduce the number of visible viewports.
Startup problem: cannot launch background case loader. Startup problem: cannot launch background cleaner. Startup problem: cannot create image load/display objects.	Exit and restart VistARad; contact customer support if this error persists.
The current History List may not be updated by the current user.	The client software performed an invalid request to update the History list.

Error Message	Cause(s)/Solutions
The Exam file for this exam has patient [Pat1]; the corresponding Report file has patient [Pat2]. This is a serious problem--immediately report it to Radiology management and Imaging support!	The exam failed a "Patient Safety" check.
This exam has no report entry for associating images; no images can be accessed.	There is no Radiology Report link for the images in the exam being opened. Could be normal; or, a database problem (e.g., induced by deleting a Report without first correcting images).
This exam has problems in the Radiology files, with two different Case Numbers referenced Ref1 and Ref2. This is a potentially serious problem—immediately report it to Radiology management and Imaging support staff!	The exam failed a "Patient Safety" check.
This exam has problems in the Radiology Report file, with two different report entries referenced Ref1 and Ref2. This is a potentially serious problem--immediately report it to Radiology management and Imaging support staff!	The exam failed a "Patient Safety" check.
This exam is linked to Report entry #nnn, but some of its images may be linked to Report entry #mmm. This is a potentially serious problem--immediately report it to Radiology management and Imaging support staff!	The exam failed a "Patient Safety" check.
This exam is registered for [Pat1]; however, it is linked to images for patient [Pat2]. This is a serious problem--immediately report it to Radiology management and Imaging support staff!	The exam failed a "Patient Safety" check.

Error Message	Cause(s)/Solutions
The resolution of the display is not suitable for displaying diagnostic quality images. VistARad will exit.	This message appears if monitor resolution width is less than 1024, or if monitor resolution height is less than 700, or if monitor bit depth is less than 8.
Unable to access HISTORY File for deleting records; try again later.	A delete or other update operation cannot be performed because the current M process cannot lock the file for the user.
Unable to get/update user data (USER_name) for MAGJ USER DATA RPC call.	The system could not retrieve data from the MAGJ USER DATA file (#2006.68).
Unable to open device 'IMAGING WORKSTATION'	Attempt to display a VistARad report fails because the host system cannot open the device for host file output. Fix the device file entry.
Unable to retrieve images for Case #nnn	Probably a database problem; the system expected to find images, but did not find any.
Unable to update Interpreting Radiologist:[Explanation provided]	The Status Update cannot proceed because the user fails Radiology package user security checks.
Update failed	There was a problem saving preset information to the VistARad back end. Verify that a connection is present and that the VistA system is up and running.
Updates not allowed at this site--no action taken	After the exam was closed and locked, the back end “Enable Status Update” setting has been disabled.
VistARad cannot run in a terminal services client environment. VistARad will exit.	VistARad cannot be launched using a remote desktop connection or terminal services client.

Error Message	Cause(s)/Solutions
VistARad is already running. Exiting application.	Another instance of VistARad is running on the workstation. If that instance cannot be accessed from the Windows Taskbar, you may need to kill the process named "VistARad Viewer" using the Windows Task Manager; you may need to end the MAG_Vistarad.exe process from within the Processes tab of the Windows Task Manager. Then re-launch VistARad.

Appendix B Means Tests

B.1 Sending Means Tests to the HEC

The following is the current list of 'Image Types' that need to be sent to the HEC (Health Eligibility Center):

- MEANS TEST (10-10EZ)
- MEANS TEST (10-10EZR)*
- MEANS TEST (10-10F)

* The (HEC) has requested that a third type of Means Test (EZR) be copied to them. Sites need to add the MEANS TEST (10-10EZR) Image Index Type to the Image Actions File (#2005.86) to allow the transfer of this type of Means Test.

- A qualified person at the site needs to use FileMan to edit the IMAGE ACTIONS FILE (#2005.86); select the TYPE field (#5); and choose HEC COPY at the Image Action name field prompt.
- You can also log a Remedy ticket and have VistA Support guide you through this process.

An example of adding a new Index Type to be sent to HEC is shown below. User entries are shown in **bold**.

```
D P^DI

VA FileMan 22.0

Select OPTION: ENTER OR EDIT FILE ENTRIES

INPUT TO WHAT FILE: IMAGE ACTIONS
EDIT WHICH FIELD: ALL// TYPE    (multiple)
   EDIT WHICH TYPE SUB-FIELD: ALL//  <ENTER>
THEN EDIT FIELD: <ENTER>

Select IMAGE ACTIONS NAME: HEC COPY
Select TYPE: MEANS TEST (10-10F)// ?  <ENTER>   or type two question marks and press <ENTER>
    Answer with TYPE
   Choose from:
   MEANS TEST (10-10EZ)
   MEANS TEST (10-10F)
                You may enter a new TYPE, if you wish
    Answer with IMAGE INDEX FOR TYPES NAME, or CLASS
 Do you want the entire 57-Entry IMAGE INDEX FOR TYPES List? Yes   <ENTER>

 Choose from:
 List has been shortened for this example

   ADVANCE DIRECTIVE
   BILLS
   COMMITMENT
   DD214 ENLISTED RECORD & RPT OF SEP
   ELIGIBILITY/VA FORM 10-7131
   FINANCIAL WORKSHEET
   HEALTH INSURANCE CARDS
   IMAGE
```

```
   LEGAL DOCUMENTS
   MEANS TEST (10-10EC)
   MEANS TEST (10-10EZ)
   MEANS TEST (10-10EZR)
   MEANS TEST (10-10F)
   MEDICAL CERTIFICATE

    Select TYPE: MEANS TEST (10-10F)// MEANS TEST
     1   MEANS TEST (10-10EZ)
     2   MEANS TEST (10-10F)
CHOOSE 1-2: <ENTER>
     1   MEANS TEST (10-10EC)
     2   MEANS TEST (10-10EZ)
     3   MEANS TEST (10-10EZR)
     4   MEANS TEST (10-10F)
CHOOSE 1-4: 3  MEANS TEST (10-10EZR)
 Are you adding 'MEANS TEST (10-10EZR)' as a new TYPE (the 3RD for this IMAGE ACTIONS)? No// Yes
Select TYPE: <ENTER>

Select IMAGE ACTIONS NAME:  <ENTER>

To check the new file entry:

Select OPTION: INQUIRE TO FILE ENTRIES

OUTPUT FROM WHAT FILE: IMAGE ACTIONS//  <ENTER>
Select IMAGE ACTIONS NAME:  HEC COPY
ANOTHER ONE: <ENTER>
STANDARD CAPTIONED OUTPUT? Yes//  <ENTER>
Include COMPUTED fields:  (N/Y/R/B): NO// <ENTER>
  - No record number (IEN), no Computed Fields

NAME: HEC COPY                          ACTIVE: NO
  TAG: HEC                              ROUTINE: MAGGSPP
  DESC: Means Test document images will be copied to the Health Eligibility Center (HEC)
TYPE: MEANS TEST (10-10EZ)
TYPE: MEANS TEST (10-10F)
TYPE: MEANS TEST (10-10EZR)

Select IMAGE ACTIONS NAME: <ENTER>
```

Note: Sites would only want to add/expand on what gets sent to the Health Eligibility Center (HEC) upon a direct request from the Health Eligibility Center (HEC) to do so. This is usually a rare occurrence, and all sites will be notified if this occurs.

Glossary

Annotation	The ability to attach notes to images.
Architecture	The design of the components of a computer, network, or software system.
Archive	The long-term storage of data or images.
Audit trail	Record of activity on a particular file or computer.
Background processing	Simultaneous running of a "job" on a computer while working on another job. Examples would be printing one document while working on another, or the software may do automatic saves while you are working on something else.
Brightness	The balance of light and dark shades in an image.
Composite video	TV signal that sends color, vertical and horizontal signals together.
Contrast	Range between the lightest and darkest tones in an image.
DHCP	**D**ecentralized **H**ealth **C**are **P**rogram (obsolete meaning)
DHCP	**D**ynamic **H**ost **C**onfiguration **P**rotocol (current meaning)
DICOM	**D**igital **I**maging and **Co**mmunications in **M**edicine. A medical imaging standard, DICOM is standard for Radiology equipment and is being adopted by the other members of the medical imaging community.
Digital camera	A camera that transforms a picture into a system of numbers. The picture can then be manipulated pixel (dot) by pixel, and stored and transmitted as a file.
File protection	Techniques for preventing files from being erased.
File server	A machine where shared software and data files are stored.
Frame grabber	A device that translates a frame from a video image into a still digitized image.
Gray scale	The range of shades of black in an image. The more shades recognized by the device, the clearer and sharper the image will be.

High resolution	An image or a display that has more pixels per inch than a conventional display/
Image	The computerized representation of a picture, or graphic.
Image abstract	A "thumbnail" version of an image, which requires less computer processing resources to display than the actual image.
Image group	A group of images associated with a medical examination.
Image processing	The translation of an image into a digital computer language so that it may be manipulated in size, color, clarity, or to enhance portions of it.
Image resolution	The fineness or coarseness of an image.
Imaging system	Collection of units that work together to capture and recreate images.
Jukebox	A device that holds multiple optical discs and can swap them in and out of the drive as needed.
Level	The pixel value (brightness) of a greyscale image that is displayed at 50% brightness.
Multimedia	Combining more than one media for the dissemination of information (i.e., text, graphics, full video motion, audio).
Off-line	Something that is not available for access on the system.
Online	Something that is available for access on the system.
Optical disc	A direct access storage device that is written to and read by laser light. Optical discs can store more data per unit of surface area than magnetic media. Many optical discs are Write Once Read Many (WORM).
Pan	To view different parts of the image that extend beyond the borders of the screen by moving the image.
Pixel	The individual dots that define a picture.
Resolution	Measure of output quality (dpi—dots per inch) or halftone quality (lpi—lines per inch).

Retrieval	The ability to search for, select, and display a document or image from storage.
RGB	Red, Green, Blue. The colors used in varying combinations and intensities on monitors, TV screens, and other color displays.
Scanner	A device that converts a hardcopy image into machine-readable code.
Server	A computer that is dedicated to one task.
Storage media	The physical device onto which data is recorded.
TWAIN	An interface standard for scanners, cameras and other input devices. A TWAIN driver is generally supplied by the equipment vendor.
User preferences	The preferences that each user sets in the User Preferences window that control the circumstances and ways in which the Imaging package displays images.
Video camera	Camera that records full-motion video.
Video digitizer	A device that changes a video picture into a digital computer language.
VistA	Veterans Health Information System Technology Architecture. VistA replaces DHCP.
VistA Magnetic Cache (VMC)	The files servers' setup as shares in the network location file for newly captured and recently access clinical images.
Window	A rectangular area on a screen (sometimes within another window) that contains controls, such as drop-down boxes, icons, scroll-bars and/or buttons.
Workstation	A high-powered machine for a single user, typically used for computer-aided design or complex analysis.
Write Once Read Many (WORM)	Once written to the disc, data is only available for reading and cannot be altered.
WYSIWYG	"What you see is what you get." The feature of seeing images and text exactly as they will look when printed or transmitted.
Zoom	To enlarge an image or a portion of an image.

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