VistA Imaging System

Advanced Web Image Viewer (AWIV) User Guide

October 2010 – Revision 1
MAG*3.0*105

Department of Veterans Affairs
Office of Enterprise Development
Health Provider Systems

Advanced Web Image Viewer (AWIV) User Guide
VistA Imaging MAG*3.0*105
October 2010

Property of the US Government

This is a controlled document. No changes to this document may be made without the express written consent of the VistA Imaging Office of Enterprise Development group.

While every effort has been made to assure the accuracy of the information provided, this document may include technical inaccuracies and/or typographical errors. Changes are periodically made to the information herein and incorporated into new editions of this document.

Product names mentioned in this document may be trademarks or registered trademarks of their respective companies, and are hereby acknowledged.

VistA Imaging Office of Enterprise Development
Department of Veterans Affairs
Internet: http://www.va.gov/imaging
VA intranet: http://vaww.va.gov/imaging

Revision History

Date	Rev	Notes
Sept 2010	.9	Initial draft; WPR complete H.Suri
Oct 2010	1.0	Updated per WPR. H.Suri

Contents

Preface v
Terms of Use v
Conventions v
Related Information vi
Getting Help vi

AWIV Overview 1
How the AWIV Works 1
Main AWIV Window 2
How the AWIV Handles Images 3

Getting to the AWIV 5

Viewing Images using Abstracts 7
Loading Images 7
Viewing a Study Report 7
Working with Abstracts 7
Resizing Abstracts 7
Changing Font Size 8
Using the Abstracts Toolbar 9
Arranging the Abstracts Horizontally 9

Using the Full Resolution Viewer 11
Changing Image Orientation 11
Changing Image Size 11
Panning Images 13
Adjusting Brightness/ Contrast 13
Inverting an Image 13
Working with Multi-Page Images 14
Working with Multiple Images 14
Resetting an Image 15
Refreshing an Image 15
Removing Images 15

Using the Radiology Viewer 17
Images Available in a Study 17
Changing Series 17
Changing Image Orientation 17
Changing Image Size 17
Getting Diagnostic Quality Images 18
Changing Window/Level 19
Using the Protractor to Measure Angles 19
Using the Ruler Tool 21
Panning Images 21
Resetting an Image 22
Inverting an Image 22
Scrolling Through Images 22
Using the Cine Viewer 23

Using Other Viewers 25
Viewing Documents 25
Viewing Movie Files 25
Closing the AWIV 27
Troubleshooting 29
About the AWIV 29
Message log 29
Glossary 31
Appendix A - Supported File Extensions 33
Appendix B – AWIV Toolbars 35
Full Resolution Viewer Toolbars 35
Radiology Viewer Toolbars 37

Preface

This manual describes the VistA Imaging AWIV. It is intended for clinicians who use VistAWeb and need access to images. This manual assumes that a current version of the AWIV is installed and that users are familiar the Microsoft Windows environment.

Terms of Use

Use of the AWIV is subject to the following provisions:

Caution: Federal law restricts this device to use by or on the order of either a licensed practitioner or persons lawfully engaged in the manufacture or distribution of the product.

The AWIV is not intended for the primary interpretation of radiology exams. When the AWIV is installed on approved and properly maintained hardware, primary interpretation of other image types is permissible by licensed practitioners at their discretion.

The FDA classifies VistA Imaging, and the AWIV (as a component of VistA Imaging) as a medical device. Unauthorized modifications to VistA Imaging, including the AWIV, such as the installation of unapproved software, will athe medical device. The use of an adulterated medical device violates US federal law (21CFR820).

Conventions

This document uses the following conventions:

- Controls, options, and button names are shown in **Bold**.
- A vertical bar is used to separate menu choices. For example: “Click **File | Open**” means: “Click the **File** menu, then click the **Open** option.”
- Keyboard key names are shown in bold and in brackets.
- Sample output is shown in `monospace`.
- When this document is used online, hyperlinks are indicated by blue text.
- Useful or supplementary information is shown in a **Tip**.
- Important or required information is shown in a **NOTE**.

- Critical information is indicated by:

Related Information

Additional information about VistA Imaging and VistAWeb can be found at:

- VistAWeb: http://www.va.gov/vdl/application.asp?appid=147
- VistA Imaging: http://www.va.gov/vdl/application.asp?appid=105

Getting Help

If you encounter any problems using the AWIV, contact your local Imaging Coordinator or support staff. If the problem cannot be resolved locally, use Remedy to place a service request, or contact the National Help Desk at 1-888-596-4357.

AWIV Overview

How the AWIV Works

The VistA Imaging Advanced Web Image Viewer (AWIV) adds image display capabilities to VistAWeb in much the same way that the Clinical Display application adds image display capabilities to CPRS. The AWIV is a web-based application and hence provides a subset of the features of Clinical Display.

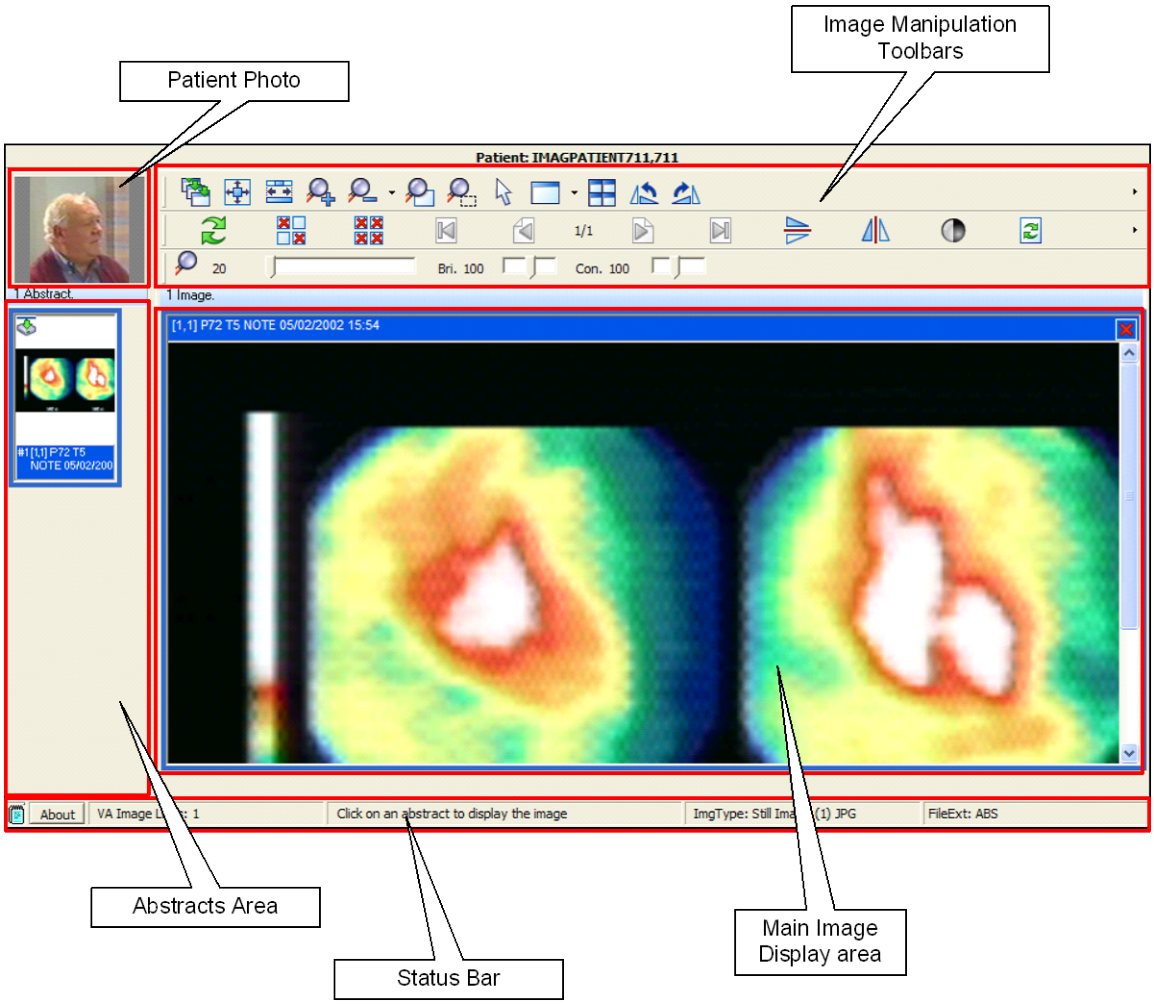
With the AWIV, a user can display images associated with progress notes or radiology reports within the VistAWeb application.

The VistA Imaging AWIV can be launched only from VistAWeb in a VA-approved version of Microsoft Internet Explorer. VistAWeb version 13 or later displays an image icon to allow the user to launch the AWIV. The AWIV retrieves information and images from across the VA WAN. This may affect the performance of the AWIV in displaying images.

Note that certain Clinical Display features (such as filters) and image types (such as EKG images stored on MUSE servers) are not available in the AWIV.

Main AWIV Window

The image below shows the main AWIV Window and the various components of this window.



How the AWIV Handles Images

Most images handled by the AWIV are shown in one of two primary viewers, the "Full Resolution" style viewer, or the "Radiology" style viewer. These two viewers incorporate many of the controls available in the similarly named viewers in Clinical Display. In general, images associated with Progress Notes are shown in the Full Resolution Viewer, and images associated with Radiology are shown in the Radiology Viewer. However, there are exceptions to this.

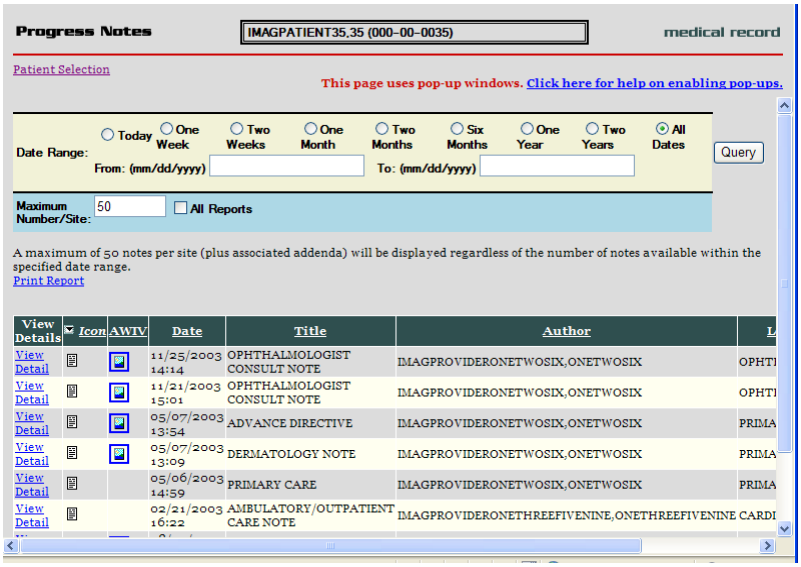
The AWIV uses outside viewers to handle certain types of images and non-image objects. For example, Word documents are opened in Microsoft Word if Word is available. For a detailed list of image types and the viewer associated with each type, see Appendix A.

This page is intentionally blank.

Getting to the AWIV

The AWIV can be launched from within VistAWeb. To launch the AWIV and display images, you will first need to select the patient and record that is associated with the remote images you want to view. The following steps summarize how this is done when VistAWeb is launched in a standalone mode directly from a browser. If you launch VistAWeb from CPRS, the specific steps you use will vary. For specific information on how to launch VistAWeb from CPRS, see the VistAWeb User Guide at http://www.va.gov/vdl/application.asp?appid=147.

1. Start VistAWeb.
2. In VistAWeb, select the site that you want to access.
3. Log in to the site when you are prompted to do so.
4. Select a patient.
5. Use the list on the left side of the page to view the Progress Notes or Radiology reports for the selected patient.
6. Use the controls at the top of the page to query for the records you want to view. A list of records is displayed.
7. Records with associated images will have an image icon in the AWIV column. Click the icon to launch the AWIV.



8. The AWIV window will open and images will be presented as abstracts on the left side of the window. To view images, click abstracts as described in the following section.

This page is intentionally blank.

Viewing Images using Abstracts

Loading Images

When the AWIV window first opens, it will display abstract placeholders until the abstracts themselves can be retrieved.

You can click abstracts and work with them while they are being retrieved. The abstracts do not have to be fully loaded.

To display images associated with abstracts,

1. On the left side of the AWIV window, locate the abstract for the image you want to load.
2. Click the desired abstract. A progress icon with a yellow arrow indicates that the image is being retrieved.
3. Wait until the progress icon turns green , at which point the image is loaded in the main image display area.

Viewing a Study Report

To view the associated progress note or study report, right-click an abstract and click **Study Report**. The report or progress note will display in the Study Report window.

Working with Abstracts

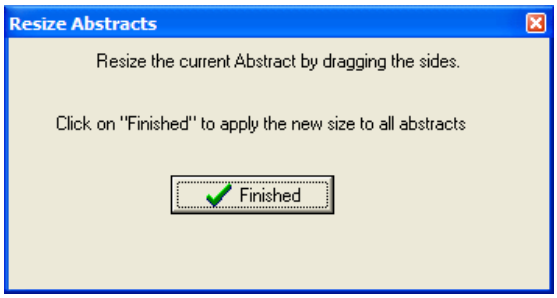
You can use the functions described below to change how abstracts are displayed.

NOTE: Any changes made to the abstracts as described below apply only to the current session and will not be saved for subsequent sessions.

Resizing Abstracts

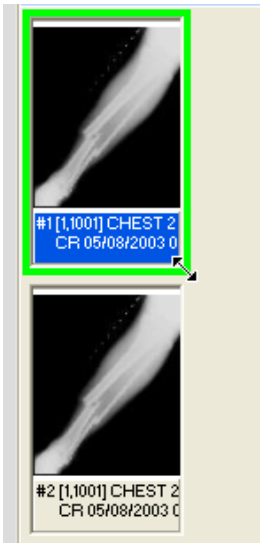
To resize abstracts,

1. Right-click any abstract.
2. Click **Resize the abstracts…** A message box is displayed.



NOTE: Do not click **Finished** until after resizing images.

3. Resize the abstract by dragging the highlighted edges or a corner of the abstract to desired size. See image below.



4. Click **Finished** in the pop-up window when you have finished resizing the abstract, to resize all abstracts in the study selected.

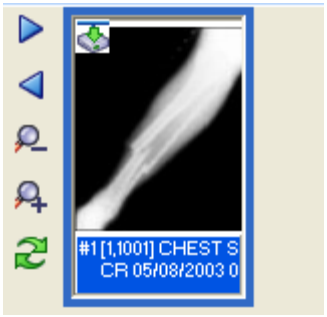
Changing Font Size

To change the size of the Image title font displayed,

1. Right-click an abstract.
2. Click **Font Size.**
3. Select one of the available font sizes to resize the font.

Using the Abstracts Toolbar

To show the abstracts toolbar, right-click an abstract and click **Toolbar**.



Using the abstracts toolbar, you can:

- Navigate abstracts using Previous and Next .
- Resize abstracts using Zoom In and Zoom Out .
- Refresh abstracts using Refresh .

Arranging the Abstracts Horizontally

In the AWIV window, abstracts are arranged vertically by default. To temporarily display abstracts horizontally, right-click an abstract, click **Scroll** | **Horizontal**.

This page is intentionally blank.

Using the Full Resolution Viewer

The AWIV uses the Full Resolution Viewer for most non-DICOM images. The Full Resolution Viewer can be recognized by its three toolbars displayed at the top of the image area. (The Radiology Viewer has two toolbars at the top and one at the side).

The following sections explain how to work with images in the Full Resolution Viewer. For information about the Radiology Viewer, see page 17.

Changing Image Orientation

To change the orientation of an image,

- To flip the image vertically, click **Flip Vertical** .
- To flip the image horizontally, click **Flip Horizontal** .
- To rotate the image counter clockwise, click **Rotate Counter Clockwise 90** .
- To rotate the image clockwise, click **Rotate Clockwise 90** .

Changing Image Size

Changing an image size in the Full Resolution Viewer includes resizing an image, zooming, using the mouse magnifier and resetting the image. Below are instructions on how to use each of these functions.

To resize an image

- To fit the image in the window, click **Fit Image to Window** .
- To fit the entire image width in the window, click **Fit Image width** .

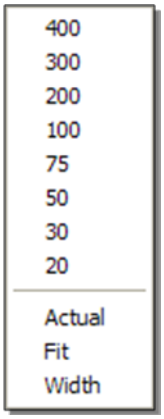
To zoom in or out incrementally

- To zoom in on an image, click **Zoom In** .
- To zoom out of an image, click **Zoom Out** .

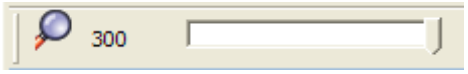
To zoom to a specified value

1. Click the arrow on the **Zoom Out/Zoom Menu** .

2. Choose one of the available settings.



To use the Zoom Slider

1. Click the Zoom slider 

2. Drag the bar until desired zoom level is reached for the image.
3. Alternatively, click the arrows on the left and right of the slider bar.

To use the Zoom in on Selected Area Tool

1. Click **Zoom In on Selected Area** on the toolbar.
2. Drag the mouse to define a rectangular area that contains the image feature you want to magnify.
3. Release the left mouse button. The selected area will be enlarged to fit the available display area.

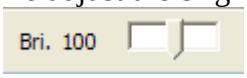
To use the Mouse Magnifier Tool

1. Click **Mouse Magnifier** .
2. Point to an area in the image and drag the mouse. A magnification area will display and will move as you drag the mouse.
3. Release the left mouse button. The magnified area will disappear on its own.

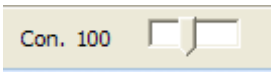
Panning Images

To pan an image that is larger than the display area, left-click in the image and drag to view the desired part.

Adjusting Brightness/ Contrast

- To adjust the brightness of an image, click the Brightness slider 

and drag to achieve desired brightness level.

- To adjust the contrast of an image, click the Contrast slider 

and drag to achieve desired contrast level.

Inverting an Image

To invert an image, click **Invert Image** on the toolbar.

Working with Multi-Page Images

When multiple pages are available in a single image, the scroll buttons are enabled. To scroll through multiple pages, use the scroll buttons on the toolbar.

- Click to go to the next page.
- Click to go to the previous page.
- Click to go to the first page.
- Click to go to the last page.

Working with Multiple Images

When multiple images are available, you can choose to display one or all of the available images in the main image display area by clicking the abstracts. There are several associated functions available in the AWIV while working with multiple images, which are described below.

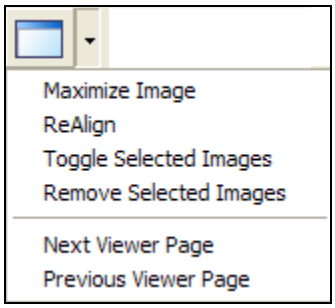
To change layout

- To tile images currently displayed in the main image display area, click **Tile Images** on the toolbar.
- To maximize an image, click the arrow on the **Maximize Image (Layout utils.)** on the toolbar, and click **Maximize Image**.
- To control how many images are displayed at one time in the main image display area, click the arrow on the **Maximize Image (Layout utils.)** and then choose one of the available layouts.

1x1	1x2	1x3	1x4
2x1	2x2	2x3	2x4
3x1	3x2	3x3	3x4
4x1	4x2	4x3	4x4

Using Viewer Pages

If images are laid out across multiple pages, use the **Previous Viewer Page** and the **Next Viewer Page** options under **Maximize Image** to switch between pages.



To apply actions to all images

To apply selected actions to all images currently displayed in the main image display area:

1. Click **Apply Actions to all Images** on the toolbar.
2. Select the action to perform on all images from one of the toolbar options, to apply the action to all images currently displayed in the main image display area.

Resetting an Image

To undo any changes made to an image click **Reset** .

Refreshing an Image

To refresh/ reload an image, click **Refresh** on the toolbar.

Removing Images

To remove some or all images from the main image display area

- To remove a single image, click in the upper right corner of the image.
- To remove multiple images CTRL-Click the images to remove and then click **Remove Selected Images** on the toolbar.
- To remove all images, click **Remove All Images** on the toolbar.

This page is intentionally blank.

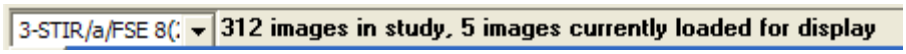
Using the Radiology Viewer

The AWIV uses the Radiology Viewer for DICOM radiology images. The Radiology Viewer can be recognized by two toolbars at the top and side of the image display area. (The Full Resolution Viewer has three toolbars.)

The following sections explain how to work with images in the Radiology Viewer. For information about the Full Resolution Viewer, see page 11.

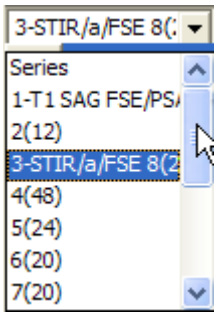
Images Available in a Study

If there are multiple images, the information bar above the image displays, the number of images available in that study as shown in the image below.



Changing Series

To go to a particular series of images, use the dropdown menu in the information bar above the image to select a series.



Changing Image Orientation

To change the orientation of an image,

- To flip the image vertically, click **Flip Vertical** .
- To flip the image horizontally, click **Flip Horizontal** .
- To rotate the image to the left, click **Rotate Left** .
- To rotate the image to the right, click on **Rotate Right** .

Changing Image Size

Changing an image size includes resizing an image, zooming, using mouse magnifier and resetting the image. Below are instructions on how to use each of these functions.

To resize an image

- To fit the image in the window, click **Fit Image to Window** .
- To fit the entire image height in the window, click **Fit Image Height** .
- To fit the entire image width in the window, click **Fit Image width** .
- To view the image in its original size, click **Actual Size** .

To use the Zoom Slider

1. Click the **Zoom** slider

.
2. Drag the bar until desired zoom level is reached for the image.
3. Alternatively, click the arrows on the left and right of the slider bar.

To use the Zoom In on Selected Area tool

1. Click **Zoom In on Selected Area** on the toolbar.
2. Drag the mouse to define a rectangular area that contains the image feature you want to magnify.
3. Release the left mouse button. The selected area will be enlarged to fit the available display area.

To use the Mouse Magnifier tool

1. Click **Mouse Magnifier** on the toolbar.
2. Point to an area in the image and drag the mouse. A magnification area will display and will move as you drag the mouse.
3. Release the left mouse button. The magnified area will disappear on its own.

Getting Diagnostic Quality Images

If there are both reference and diagnostic quality versions of an image available, the AWIV will display the reference quality image by default. This is done to reduce the time needed for images to load across the WAN.

When reference-quality images are displayed in the main image window, the yellow bar displayed near the bottom of the window indicates that this is a reference quality image with the phrase “Reduced size – Reference quality image.”

If you need to get the diagnostic quality image,

1. Right-click an abstract.
2. Select "Get Diagnostic Image." A progress icon with a yellow arrow indicates that the image is being retrieved.
3. Wait for the diagnostic image to display.

Changing Window/Level

You can change the window/level of an image using the mouse. You can also use the auto-window/level tool to base window/level values on a selected area in an image.

To change window/level with the mouse

Point to the image you want to adjust and drag using the right mouse button.

- Drag up or down to change window (window width) values.
- Drag left or right to change level (window center) values.

To use the Auto Window/ Level tool

4. Click Auto Window/Level in the toolbar near the top of the window.
5. In the image you want to adjust, drag the mouse to define a rectangular area that includes the tissue you want to base the window/level on.
6. When the drag is completed, the new window/level values will be applied to the entire image.
7. Continue using the Auto-window/level tool, or disable it by choosing another tool.

To change window/level using toolbar sliders

You can also click Win. / Lev.

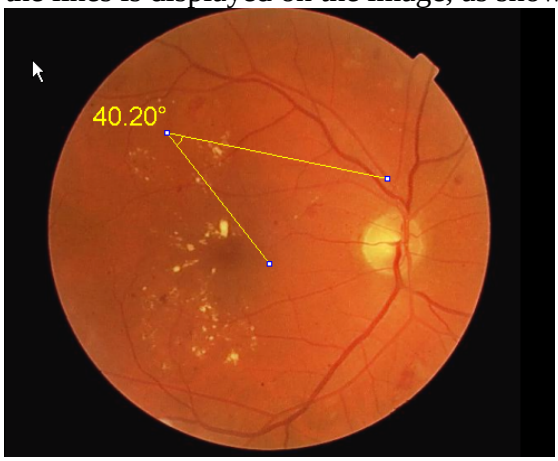
on the toolbar and change window/level by dragging with the left mouse button or by using the slider.

Using the Protractor to Measure Angles

To measure an angle

1. To enable the option, click Protractor .

2. Once the option is selected, click the mouse on the image, to begin measuring the angle.
3. Drag mouse to stop point and click once again to draw the line.
4. Select desired area and draw an angled line to measure angle. The angle between the lines is displayed on the image, as shown below.



To change the angle after making an angle selection

1. Click the Use Protractor **Ruler Pointer**
2. Select the line to extend in the angle.
3. Drag the line to desired location.
4. Re-measure angle.

NOTE: You can delete an angle measurement by clicking the **Reset Image** button.

Using the Ruler Tool

To measure a feature in an image

1. Click **Ruler** on the toolbar.
2. Click on the image to start measuring.
3. Drag to desired area to get a measurement (see image below).

NOTE: The ruler is available only if the applicable sizing information is available in the DICOM image header.

Panning Images

To pan an image with the mouse

To pan an image that is larger than the display area, left click and drag to view desired part of the image.

To use the pan window

To pan an image using a pan window,

1. Click **Pan Window** in the tool bar above the image.
2. Click and drag the rectangular box that appears in the pan window to move to the desired area in the image.

Resetting an Image

To undo any changes made to an image click **Reset** to restore the original image.

Inverting an Image

To invert an image, click **Invert Image** on the toolbar.

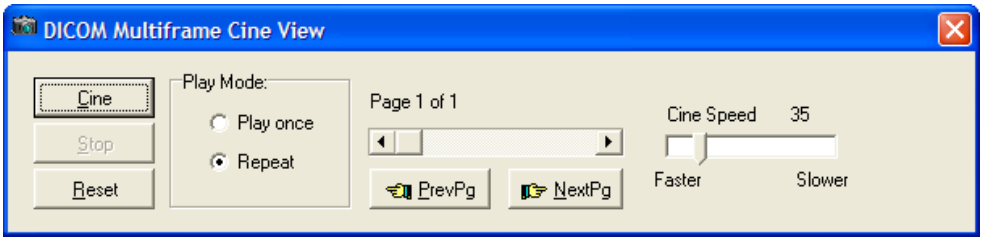
Scrolling Through Images

If multiple images are available in the study, you can scroll through these images by using the scroll tools available to the left of the image.

- Click to go to next image.
- Click to go to previous image.
- Click to go to the first image in the study.
- Click to go to the last image in the study
- Click to play the images as a slide show.
- To change the speed of the slide show, drag the smaller slider at the bottom of the scroll tools. Speed increases as you drag from top to bottom.
- You can also scroll through images using the long vertical slider bar. Drag the slider from top to bottom to go to the next image.

Using the Cine Viewer

When DICOM multi-frame images are loaded in the Radiology Viewer, a special toolbar will display automatically. You can use this to work with multi-frame images as described below.



- To play the study, click **Cine**.
- To stop play, click **Stop**.
- To returns to the first page in the study, click **Reset**.
- To repeat play, select the **Repeat** option in the Play Mode area.
- To play once, select the **Play once** option in the Play Mode area.
- To change the play speed, click and drag the **Cine Speed** slider.
- To go to the previous page in the study, click **PrevPg**. Alternatively, use the page slider.
- To go to the next page in the study, click **NextPg**. Alternatively, use the page slider.

This page is intentionally blank.

Using Other Viewers

Viewing Documents

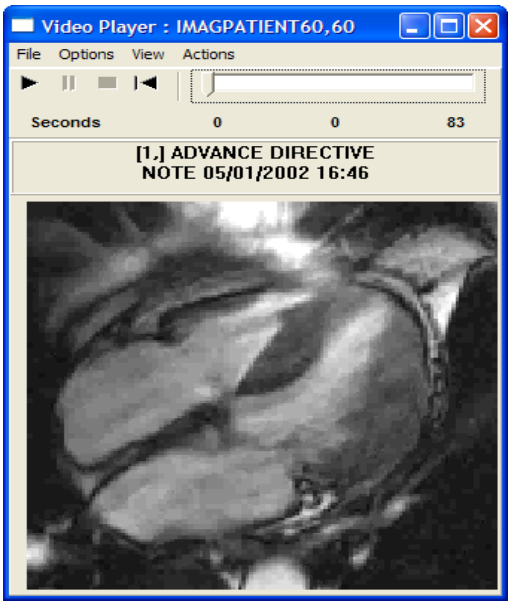
If a progress note or radiology report has a Word .doc file or .avi movie file associated with it, the AWIV will launch the appropriate outside viewer when abstracts for these files are selected.

Clicking Word documents will open the document in a Microsoft Word window.

If you close the AWIV and select another patient in VistAWeb, the .doc file with information for the previous patient remains displayed.

Viewing Movie Files

If a selected patient image is a motion video clip, it will open in the Video Player window as shown below.

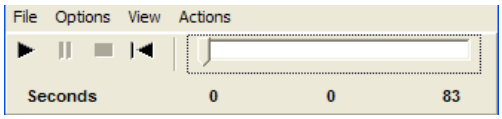


- Click to play.
- Click to pause play.
- Click to stop playing.
- Click to rewind.
- Click and drag the slider to browse the video clip, frame by frame.

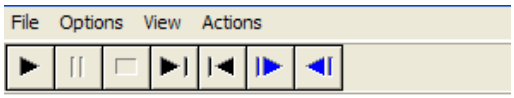
- Click **View | Set Start Point** to set start point.
- Click **View | Set End Point** to set end point.
- Click **Options | Video Loop** to continuously play all or part of the file.

You can choose to display or hide the progress bar in the video player, by clicking **Options | Show Progress Bar**

- With the progress bar



- Without the progress bar



Closing the AWIV

To close the AWIV window, click in the upper right hand corner of the AWIV Window or click either of the Close buttons at the top and bottom of the AWIV window.

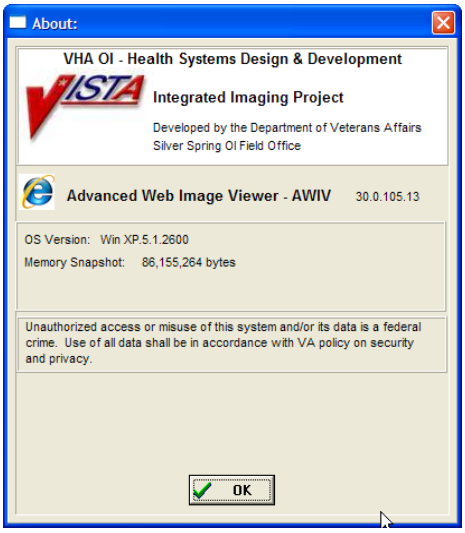
NOTE: The AWIV will close automatically when a different patient is selected in VistAWeb.

This page is intentionally blank.

Troubleshooting

About the AWIV

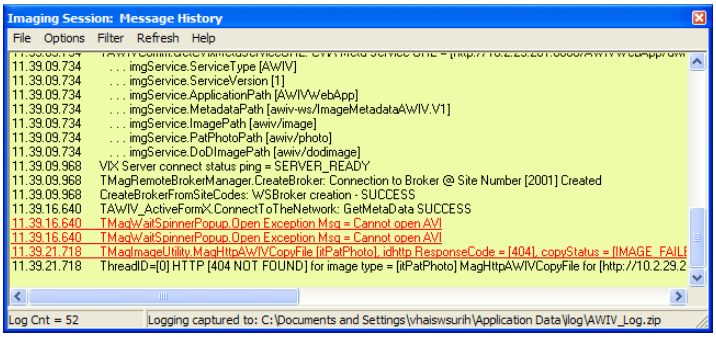
To display version and memory usage information about the AWIV, click the **About** button located in the lower left corner of the AWIV window.



Message log

The Message History window is used to view system messages for debugging purposes.

To open this window, click **Message History** in the lower left corner of the AWIV window to view message history as shown in the image below.



To exit the message history window, click in the top right corner of the Message History window or click **File | Exit.**

This page is intentionally blank.

Glossary

Acronym /Term	Definition
AWIV	Advanced Web Image Viewer
CPRS	Computerized Patient Record System
DICOM	Digital Imaging and Communications in Medicine
EKG	Electrocardiogram
FAQ	Frequently Asked Questions
FDA	Food and Drug Administration
HIMS ROI	Health Information Management Services Release of Information (department)
ID	Identifier or Identification
Multi-frame	A DICOM image that contains multiple two-dimensional pixel planes in a single file. When the file is displayed, each plane (frame) is presented as a separate image. This separation is automatically handled in the Radiology Viewer.
MUSE	A third party cardiology information system used to store and manage ECG/EKG (electrocardiogram) images. If a VA facility stores their ECG images in MUSE, they will not be accessible to the AWIV.
TGA	Targa (image type)
US	United States
VA	Veteran Affairs
VistA	Veterans Health Information System and Technology Architecture
VistAWeb	VistAWeb is an intranet web application used to review remote stored VistA and Health Data Repository (HDR) patient information; see http://vista.med.va.gov/vistaweb/index.htm for details about VistAWeb

This page is intentionally blank.

Appendix A - Supported File Extensions

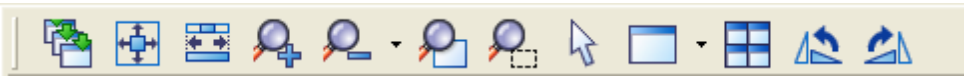
Extension	Description	Associated Viewer
756	Historical 756	Radiology Viewer or Full Resolution Viewer depending on image type.
ABS	Abstract file	Abstract area
ASC	ASCII text file	Not Supported
AVI	Motion video	Video Player
BIG	X-ray file 2000K	Radiology Viewer
BMP	Bitmap	Full Resolution Viewer
BW	Black and white	Radiology Viewer or Full Resolution Viewer depending on image type.
DCM	DICOM	Radiology Viewer
DOC	MS Word document	MS Word
HTM	Web HTM document	Not Supported
HTML	Web HTML document	Not Supported
JPG	JPEG full color	Full Resolution Viewer
MHT	MIME HTML web page archive	Not Supported
MHTML	MIME HTML web page archive	Not Supported
MP3	Motion video MPEG-3	Not Supported
MP4	Motion video MPEG-4	Not Supported
MPEG	Motion video MPG	Not Supported
MPG	Motion video MPG	Not Supported
PAC	X-ray PAC image	Radiology Viewer
PDF	Adobe PDF	Full Resolution Viewer
RTF	Rich text format	MS Word
TGA	TARGA image	Radiology Viewer
TIF	Tagged Image File Format	Full Resolution Viewer
WAV	Audio wave file	Not Supported

This page is intentionally blank.

Appendix B – AWIV Toolbars

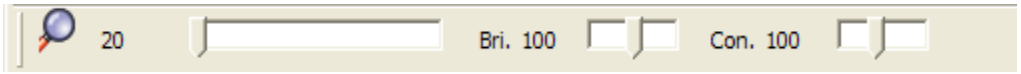
Full Resolution Viewer Toolbars

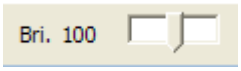
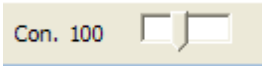
The Full Resolution Viewer has three toolbars. Each toolbar is shown below with a description of each button on the toolbar.



	Apply	Applies the actions to all images.
	Fit Image to Window	Resizes the image to fit in the viewing window.
	Width	Fits the image to the width of the viewing window.
	Zoom In	Incrementally magnifies the image.
	Zoom Out	Decreases image magnification with each click.
	Mouse Magnifier	Allows the user to select a portion of the image to magnify using a mouse click.
	Zoom (Selected Area)	Allows the user to click an area to zoom in on the image. The image point selected zooms in or out with the movement of the mouse.
	Pointer	Changes the mouse back to a pointer.
	Image Layout	Allows the user to specify the image size and layout. A drop down list appears when selected with options for the user to select.
	Tile Images	Tiles the images.
	Rotate Image Counter Clockwise	Rotates the Image 90 degrees counterclockwise.
	Rotate Image Clockwise	Rotates the Image 90 degrees clockwise .

	Refresh Images	Refreshes current image.
	Remove Selected Images	Removes the selected image from the Full Resolution Viewer pane.
	Remove all images	Removes all of the images from Full Resolution Viewer pane.
	Flip Vertical	Flips the image vertically.
	Flip Horizontal	Flips the image horizontally.
	Invert Image	Inverts the image.
	Reset Image	Adjusts the image to its original size.



	Increases or decreases magnification.
	Increases or decreases brightness.
	Increases or decreases contrast.

Radiology Viewer Toolbars

The Radiology Viewer has a toolbar that can be used to manipulate images.

	Reset Images	Resets the image to its original settings.
	Fit Image to Window	Resizes image to fit to the window.
	Fit Image to height.	Resizes image to fit to the height of the window.
	Fit Image to width.	Resizes image to fit to the width of the window.
	Actual Size	Resets the image to the actual size.
	Flip Vertical	Flips the image vertically.
	Flip Horizontal	Flips the image horizontally.
	Rotate Left	Rotates the image to the left.
	Rotate right	Rotates the image to the right.
	Invert Image	Inverts the image.
	Pan Image with mouse.	Pans image on mouse click.
	Mouse Magnifier	Magnifies image on mouse click.
	Zoom	Zooms in on the selected area.
	Ruler	Measures on mouse click.
	Protractor	Measures angle on mouse click.
	Ruler/Protractor pointer	Moves lines drawn.
	Auto Window Level	Window control.

	Pan Window	Opens the pan window.
		Changes Window/ Level values of the image.
		Zooms in or out of the image.