



imagination at work

GE Centricity PACS

RA 1000 Technologist Training

Allen Memorial Hospital

What is PACS??

- The Centricity Picture Archiving and Communications System (PACS) provides radiology departments with optimal storage of patient data and radiographic images. In its most basic form, the PACS system is analogous to an electronic file room. Its digital, centralized storage system enables you to access and transmit images from any workstation on the PACS network.
 - In a conventional system, film images and reports are stored in folders that are filed and retrieved manually. Instead of staff members manually carrying films and written reports to a file room, PACS transmits digital electronic images and reports over a high-speed network to centralized storage. After transmission, patient information and images are available simultaneously to many users throughout the facility.

Logging In

A screenshot of a Windows-style dialog box titled "Centricity Login". It features three input fields: "User Name" (a text box), "Password" (a text box with a "Change Pass" button to its right), and "Server" (a dropdown menu currently showing "ISU090"). At the bottom, there are three buttons: "Login", "Clear", and "Quit".

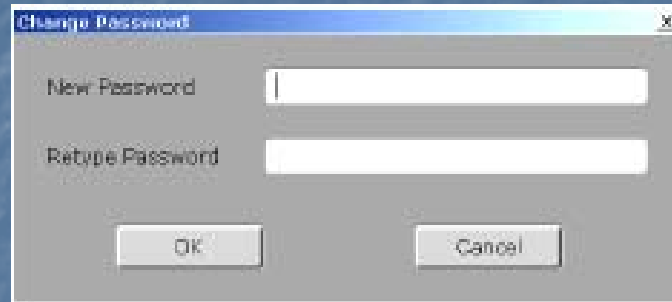
Powering Up the Workstation

- With the Centricity Workstation powered up, the main Windows desktop will contain several icons. You will need to double left click the Centricity desktop icon in order to run the Centricity application.

Logging In

- All personal preferences are tied to the user log-in. With cursor flashing in the User Name box, type in your user name (Your 7 character Mysis log on that begins with an "A"). Tab to the next Password box and type in your password. Press the Enter Key or click Login. Remember that your Password has to be six characters or more, contain a Capital and lower case letter and a number.

Changing your password

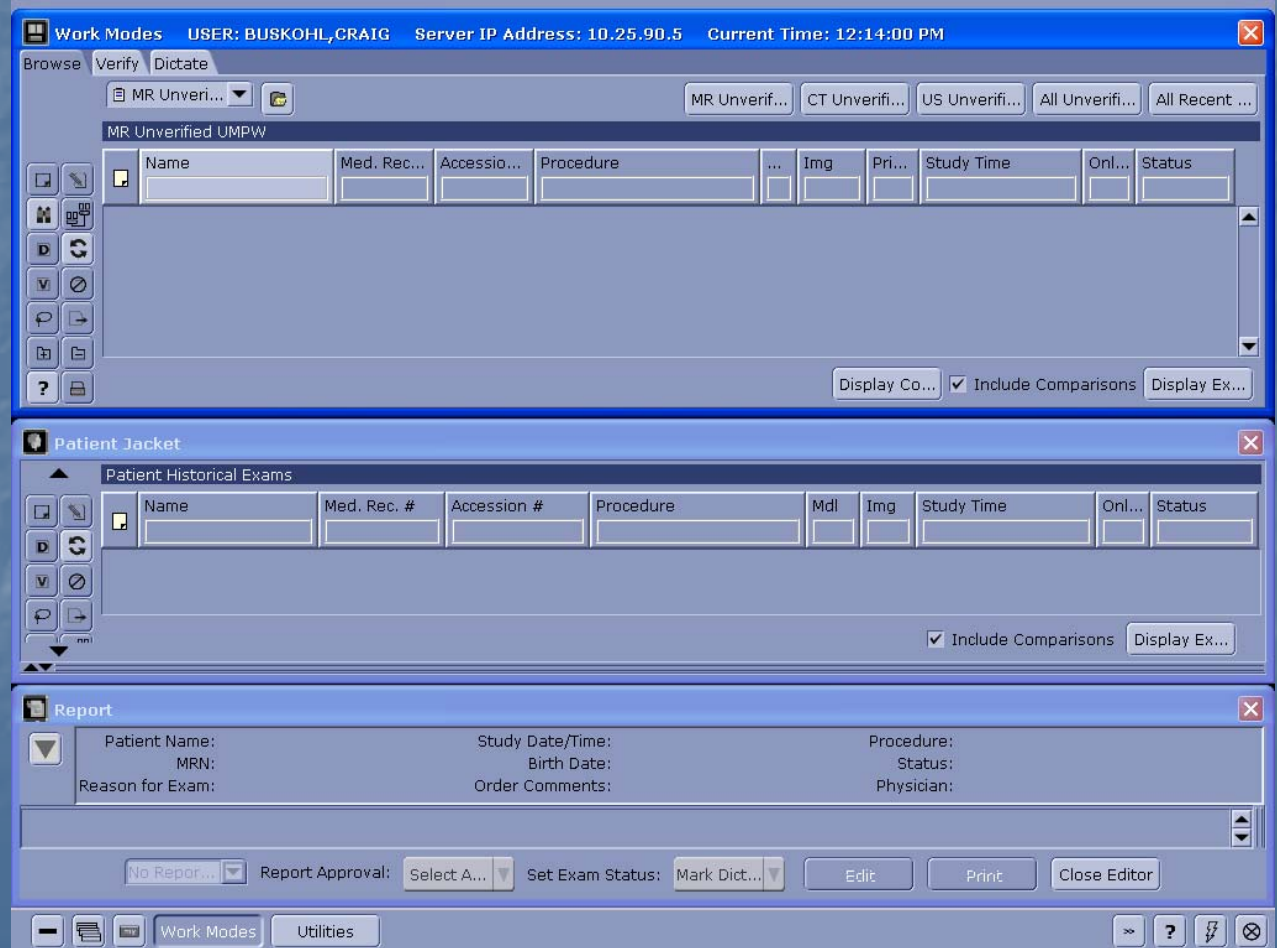


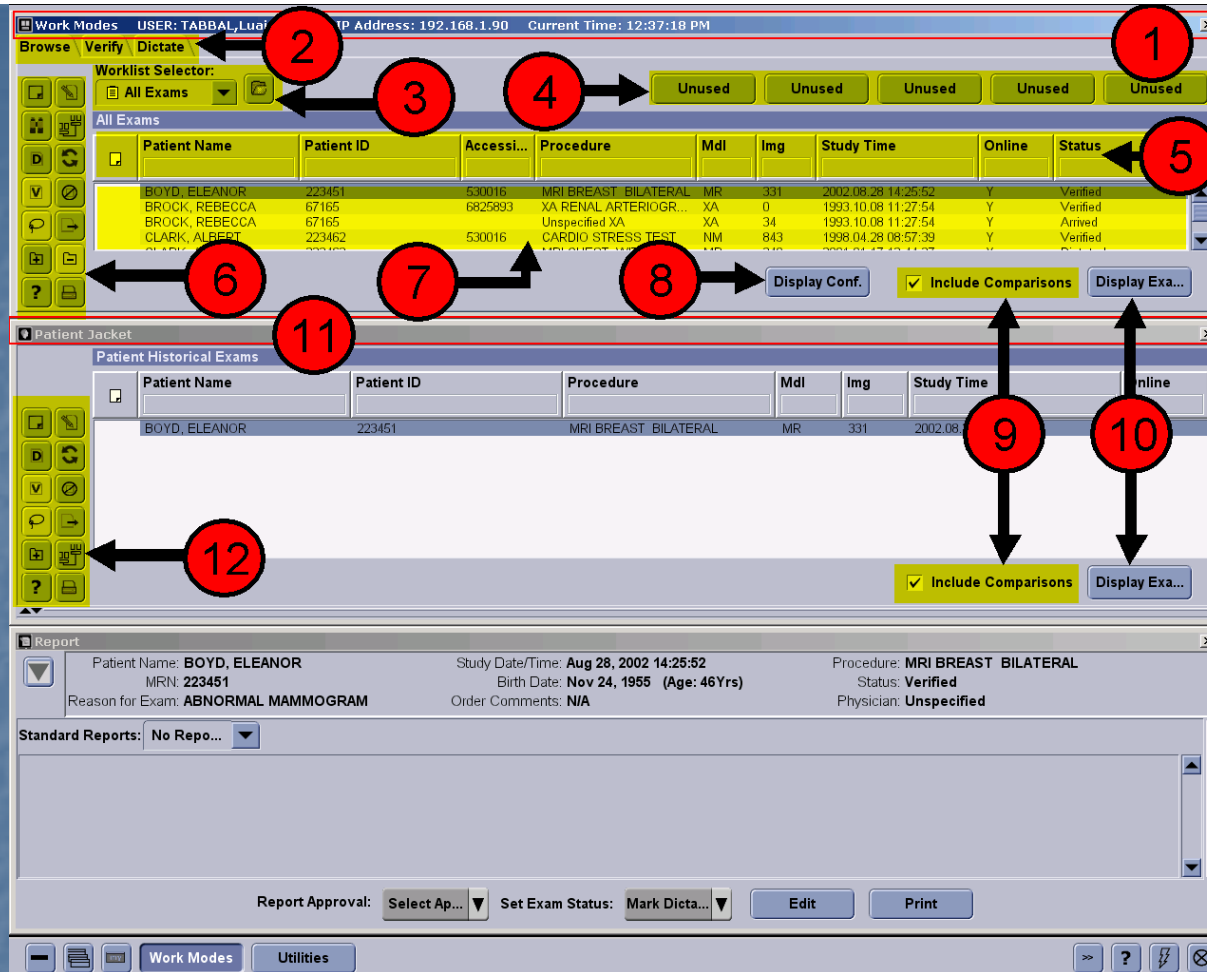
A screenshot of a 'Change Password' dialog box. The dialog has a title bar with the text 'Change Password' and a close button (X). It contains two text input fields: 'New Password' and 'Retype Password'. Below the fields are two buttons: 'OK' and 'Cancel'.

- Your password is good for 90 days
- You will be prompted to change it at that time
- To change your password, click the change password icon and type in a new password following the convention needed for Centricity.

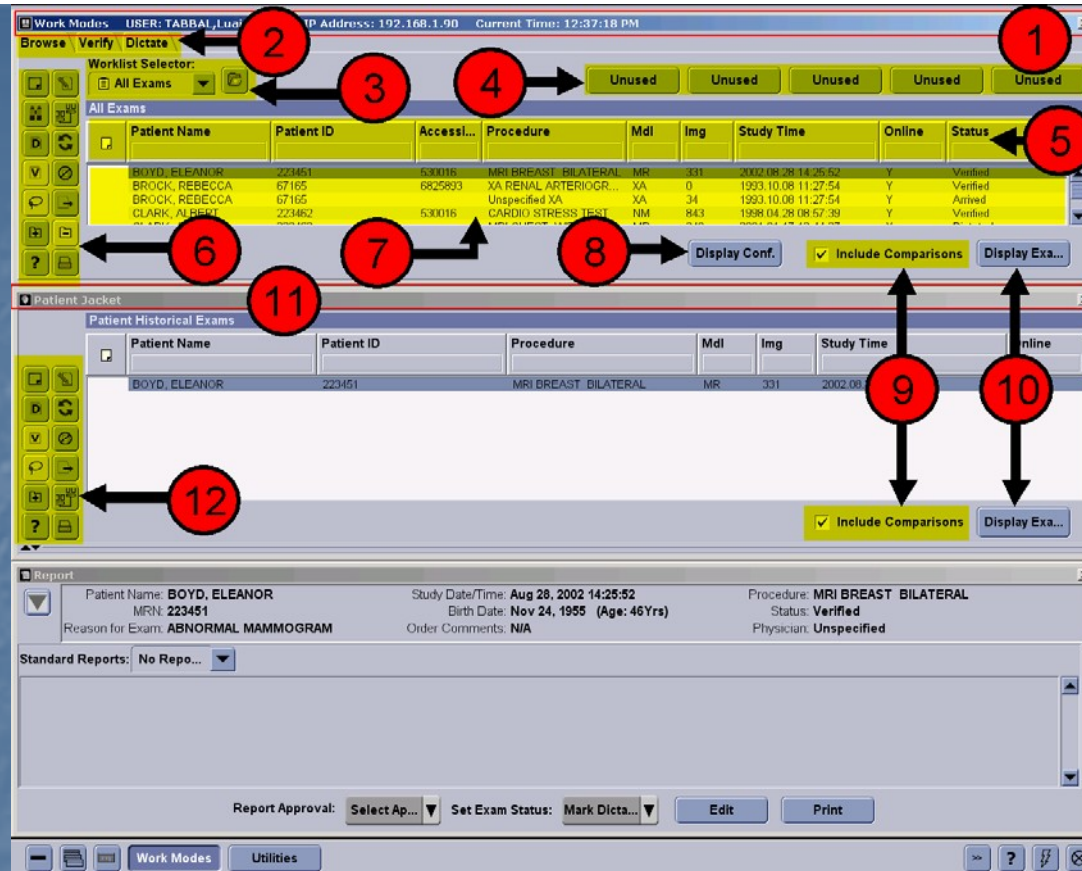
Desktop Appearance

Once a user logs onto the workstation, the GE selected palettes (Work Modes, Patient Jacket and Report) are displayed on the desktop. The major functions for searching and displaying patient exams and reports, as well as setting up user preferences can be accessed through these palettes.

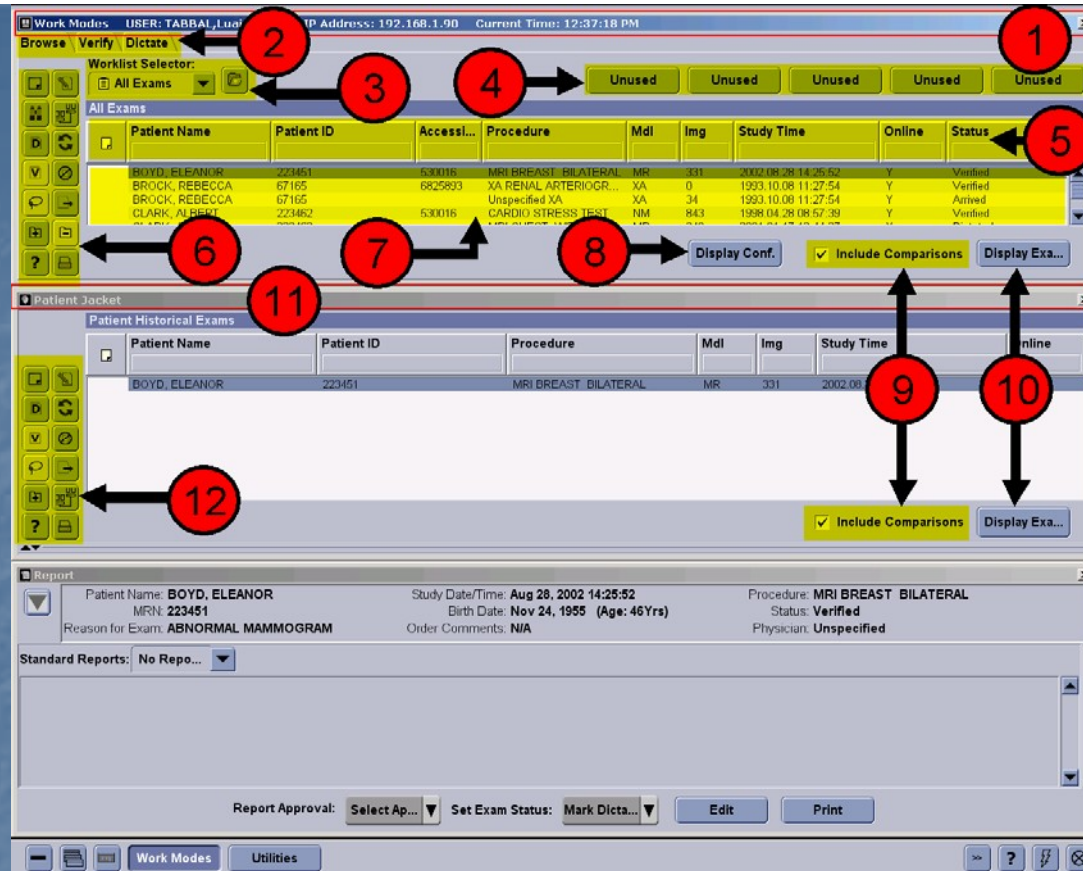




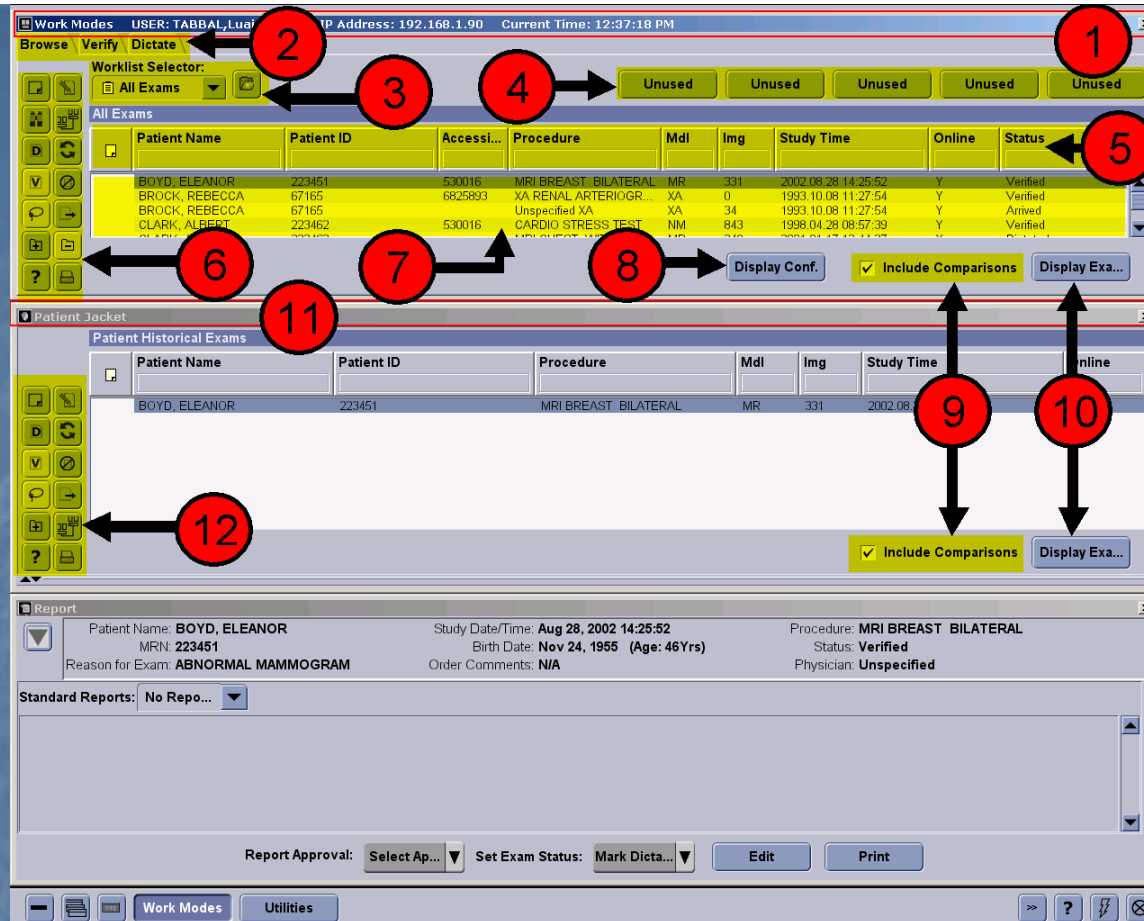
1. Work Modes Palette Title Bar.
2. Modes of operation. Browse Mode is used to find and open any patient in any exam status for review. Verify mode is a technologist function and will only allow exams in an arrived status to be populated. Dictate Mode is for radiologists. Only exams in a verified status will appear in worklists in the Dictate mode.



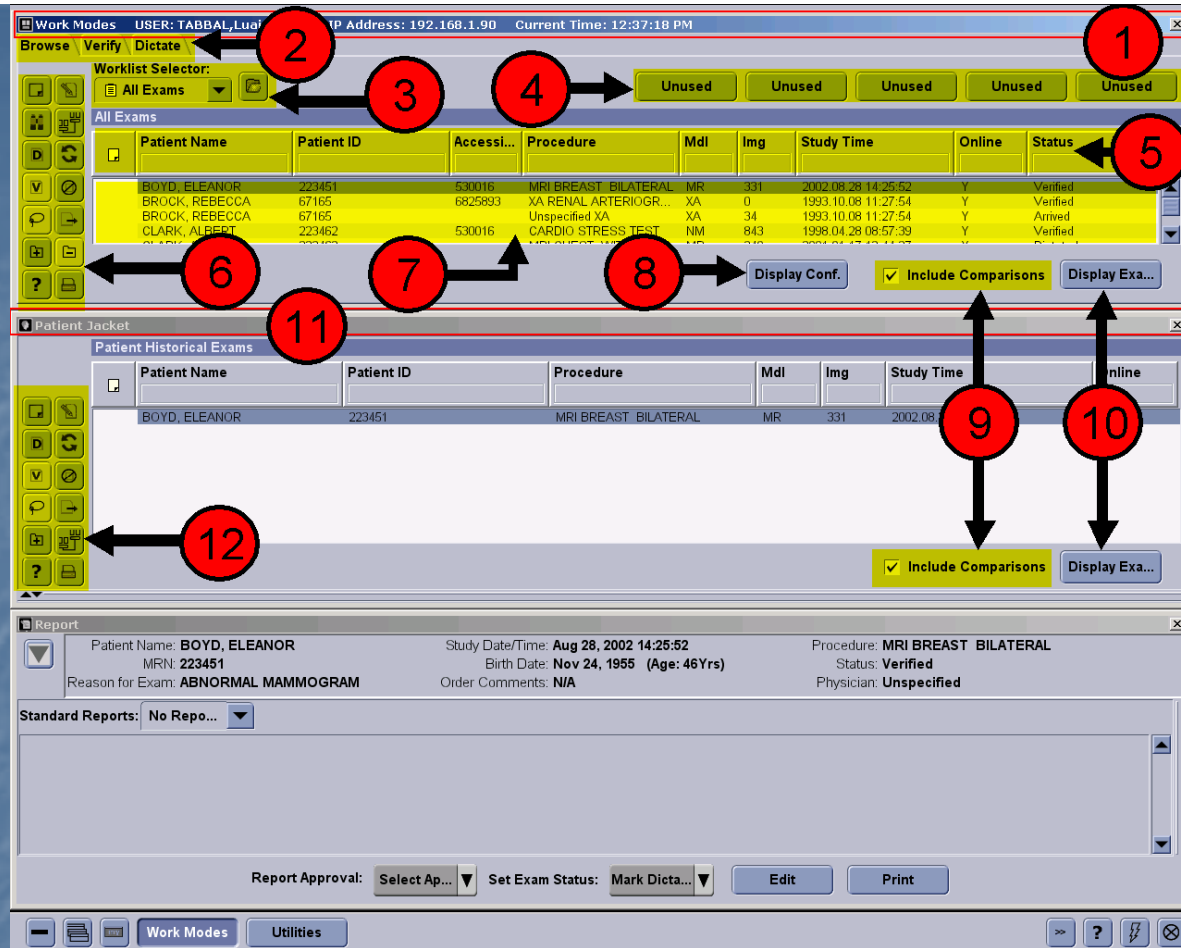
3. Worklist Selector. Allows the user to find and select the various worklists for their facility.
4. Quick Access Tabs. Used to quickly locate the most frequently used worklists, by user and by mode of operation. Five worklists can be defined in each mode.
5. Column headings. Columns can be sorted and filtered to help find patients quickly and easily, except for large worklists such as All Exams and All Recent Exams. The status column lets you check to see to what step in the workflow process a patient has progressed.



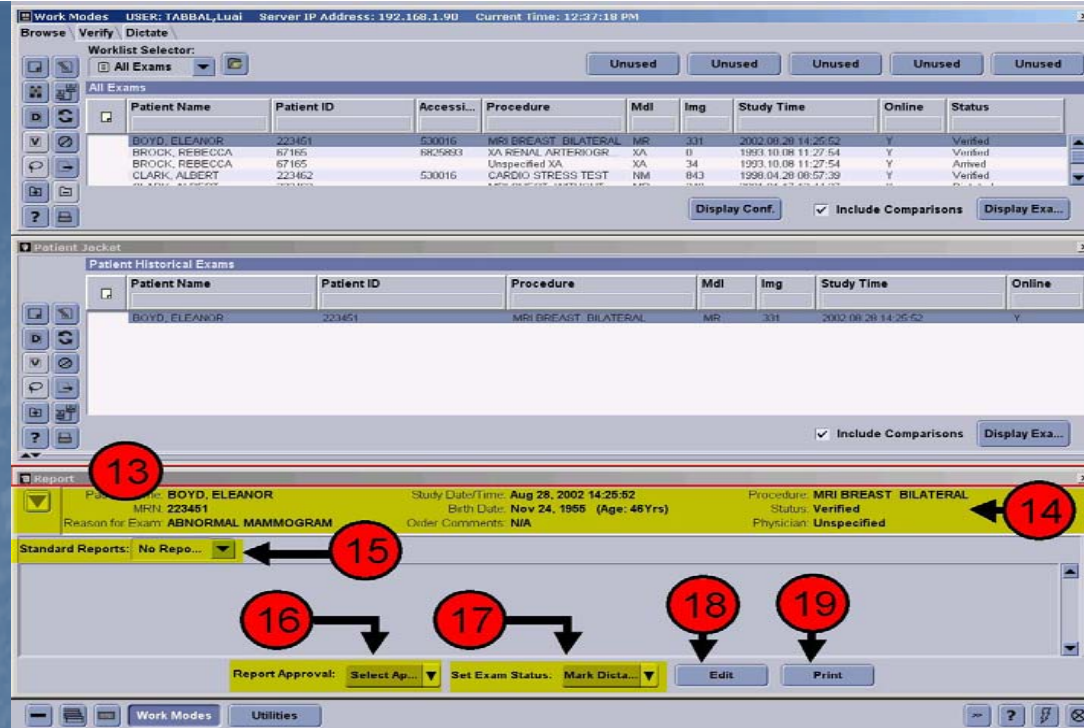
6. Work Modes Palette Icons. Quick buttons you can use to perform various workstation functions such as marking a study verified or dictated, querying an exam or sending an exam to another location. Function is performed for the exam highlighted (selected) in the Work Modes Palette.
7. Worklist. Lists of patients that are grouped together by a common quality, All Unread patients, Unread CT patients, etc. The worklist entry provides valuable patient and exam information.



9. Include comparisons checkbox. Indicates if the user would like the system to automatically display a historical exam that is relevant to the current study.
10. Display Exam Icon. Allows the user to open the highlighted exam in the worklist by single-clicking the icon.



11. Patient Jacket Title Bar.
12. Patient Jacket Palette Icons. Quick buttons you can click on to perform various workstation functions such as marking a study verified or dictated, querying an exam or sending an exam to another location. Function is performed for the exam highlighted (selected) in the Patient Jacket Palette.



13. Report Palette Title Bar.

14. Report Header Information

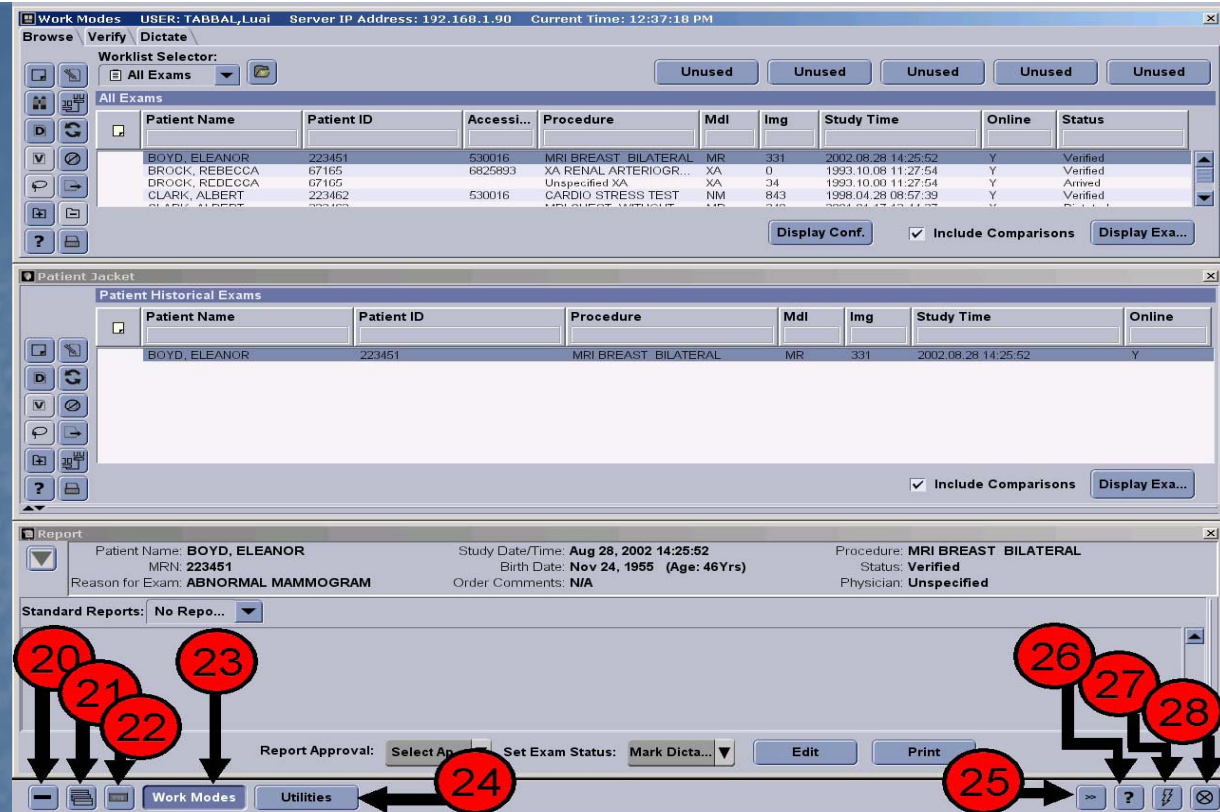
19. Print report Icon. Prints to local printer.

20. Hide all Palettes.

21. Display the three GE default palettes configuration.

22. Display "My Desktop." User defined palette orientation.

23. Work Modes Palette Icon in Workstation Task Bar.



24. Open or hide the Utilities palette.
25. Launch third party applications such as Exam Manager or Internet Explorer.
26. Help Icon. Clicking this icon launches the online operators manual.
27. Quit Icon. Closes the application and returns the user to the Windows Desktop.
28. Log-out Icon. Logs user out of the system, closes the software application and restarts the program, returning user to the login screen.

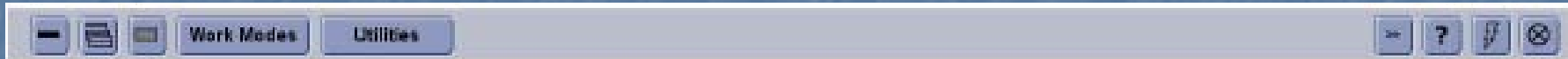
Resizing or Moving a Palette

- To resize a palette (vertically), move the cursor to either the top or the bottom border of the palette. When the cursor becomes a double arrow, click and drag the border to make the palette larger or smaller.
- To move a palette, click in the title bar area of the window and drag it to its new location.






The screenshot displays two overlapping windows from a medical software application. The top window's title bar shows 'Work Modes USER: TABBAL, Lui Server IP Address: 192.168.1.90 Current Time: 3:44:16 PM'. Below the title bar are tabs for 'Browse', 'Verify', and 'Dictate', and a 'Worklist Selector' dropdown set to 'All Exams'. Four 'Unused' buttons are visible. The bottom window has a similar title bar with 'Current Time: 3:46:19 PM'. It also has 'Browse', 'Verify', and 'Dictate' tabs, and a 'Worklist Selector' set to 'All Exams'. Below this is a table titled 'All Exams' with columns for Patient Name, Patient ID, Accession, Procedure, Mdl, Img, Study Time, Online, and Status. A vertical toolbar with various icons is on the left. At the bottom right of the bottom window are buttons for 'Display Conf.', 'Include Comparisons' (checked), and 'Display Exa...'. Red circles highlight the top border of the top window and the title bar of the bottom window.

Patient Name	Patient ID	Accessi...	Procedure	Mdl	Img	Study Time	Online	Status
BOYD, ELEANOR	223451	530016	MRI BREAST BILATERAL	MR	331	2002.08.28 14:25:52	Y	Verified
BROCK, REBECCA	67165	6825893	XA RENAL ARTERIOGR...	XA	0	1993.10.08 11:27:54	Y	Verified
BROCK, REBECCA	67165		Unspecified XA	XA	34	1993.10.08 11:27:54	Y	Arrived
CLARK, ALBERT	223462	530016	CARDIO STRESS TEST	NM	843	1998.04.28 08:57:39	Y	Verified
CLARK, ALBERT	223462		MRI CHEST WITHOUT ...	MR	340	2001.01.17 12:44:27	Y	Dictated
CLARK, BONNIE	223464		CT HEAD CONTRAST	CT	36	2002.08.28 19:22:40	Y	Dictated
CLARK, BONNIE	223464		CT HEAD CONTRAST	CT	0	2004.07.29 09:12:55	N	Ordered
CLARK, BONNIE	223464		Unspecified CT	CT	36	2002.08.28 19:22:40	Y	Arrived
COOKE, CAROLYN	71711		MRA BRAIN WWO CON...	MR	149	1999.09.29 12:30:37	Y	Dictated



The Workstation Task Bar

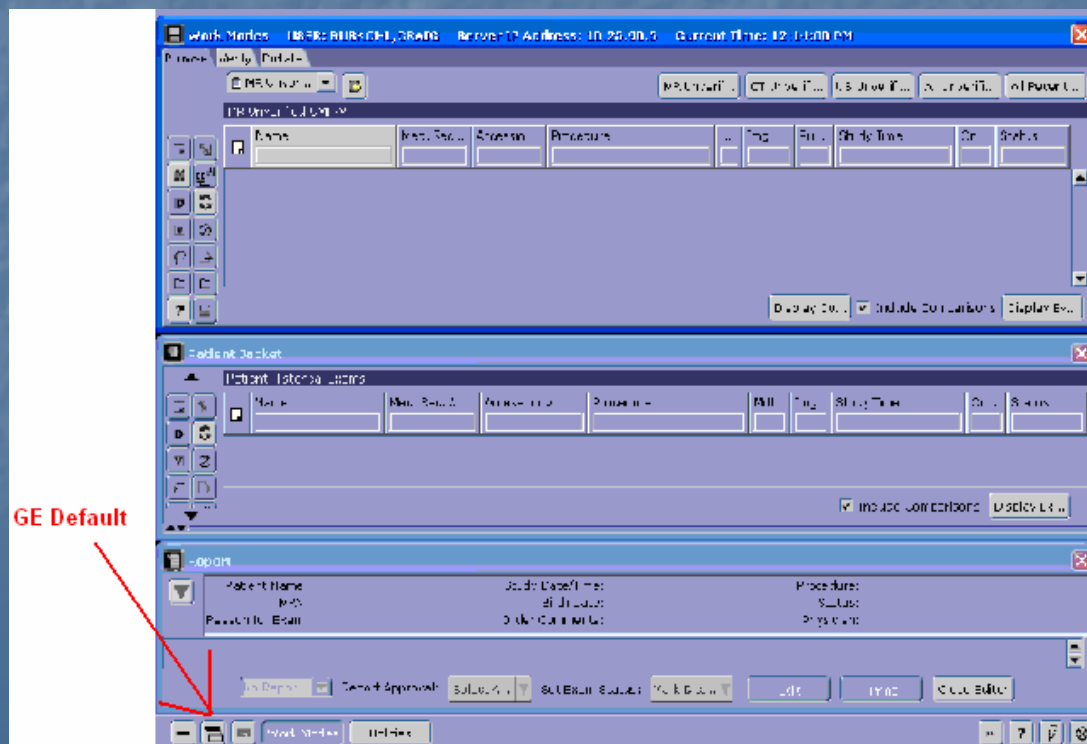


- The Workstation Task Bar contains options to Hide all palettes, display GE Selected Palettes, display My Desktop, open and close Work Modes palette, open and close Utilities palette, launch Third Party Applications, display the Help Menu, Quit Application and Log off User in that order.

- To hide all palettes, click the **Close All Palettes**  icon.
- To display GE selected palettes, click the **Show Selected Palettes**  icon.
- To display the User's saved desktop, click the **My Desktop**  icon.
- To open or hide the Work Mode Palette, click the **Work Modes**  icon.
- To open or hide the Utilities Palette, click the **Utilities**  icon.

Default Palettes

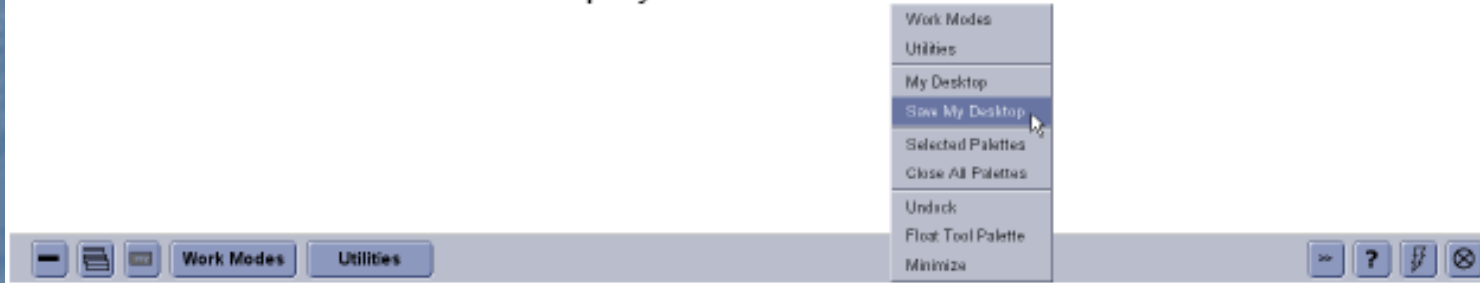
- To display GE Selected Palettes, press the F7 key on the keyboard or click on the  icon in the lower left corner of the monitor. To Hide Selected Palettes press the F9 key on the keyboard or click on the  icon in the lower left corner of the monitor.



Saving your Favorite Desktop

A user can decide which palettes will open by default, where they will be located and the size of the palettes to display. To set a personal desktop the **Work Modes** palette must be included:


1. Open the palettes most frequently used, size them to meet your needs, and place them where you would like them to appear upon log in.
2. Right click in the blank area of the **Workstation Function Bar** at the top or bottom of the monitor to display a hidden context menu.



3. Select the **Save My Desktop** option from the drop down menu.

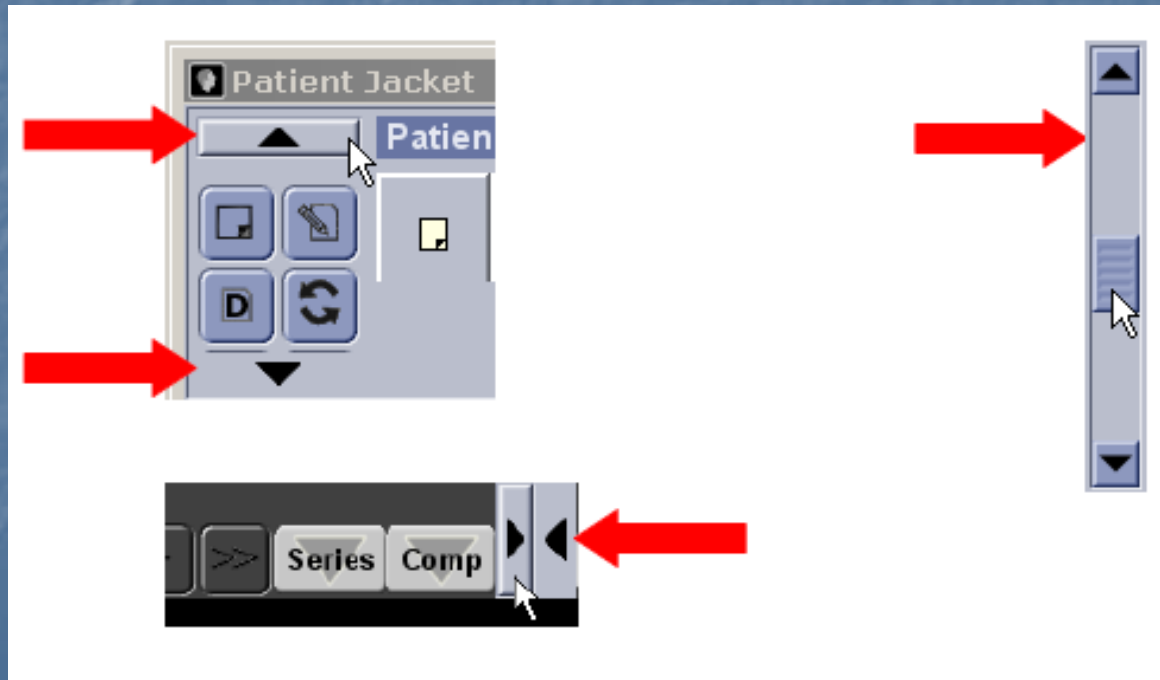
From now on, when the user first logs onto the workstation or closes all opened exams, the palettes will redisplay in this manner. The user can still open or close other palettes as desired.

If the user makes a change to their desktop display, they can quickly reset the palettes back to the preferred configuration by right clicking on the hidden context menu in the



Workstation Function Bar and selecting **My Desktop**, clicking the  icon in the lower left corner of the monitor or by pressing the **F3** key on the keyboard. The desktop will re-hang in the manner the user previously saved as their preference.

Scroll Bars


- Scroll bars are available on many of the palettes when more information is available. Clicking on the arrow or left clicking while dragging the mouse over the bar moves the information into view. Different types of scroll bars are shown below



Help Menu

A Help Menu is available by pressing the F1 key on the keyboard or by clicking the  Help icon. The Help Menu is also available on the Work Modes palette and the Patient Jacket palette. To close the Help Menu, click the  in the upper right corner or click the File menu and select Exit.

Quit the Workstation Application

Click the  Quit icon on the Workstation Task Bar in the lower right corner of any monitor to log-off and close the workstation application and return to the Windows Desktop.

Logging Off

Logout  performs a Quit and Restart, which closes the application and then restarts it. The user is returned to the Log In screen. The purpose of this is to reset the application, if needed.

Quick Access Buttons

Users may select five worklists they want to access frequently and place them on their Quick Access Buttons. These buttons will then act as user shortcuts to those worklists. The user can find these five buttons in the upper right half of the Work Modes Palette, adjacent to the Worklist Selector drop-down menu.

To assign a worklist to one of the Quick Access Buttons:

1. Single-click on the Worklist Selector drop-down menu.
 2. Left click and hold the worklist.
 3. Drag and drop it onto the middle of one of the five Quick Access Buttons.
 4. When the user releases the mouse, the name of the worklist will appear on the button.
- Note: The cursor will have a small rectangle attached to it.

The screenshot shows the software interface with the 'Worklist Selector' dropdown menu open. The 'All Exams' option is selected. A red arrow points from the text 'User Default Worklist' to the 'All Exams' button in the Quick Access Buttons area. Below the buttons is a table of exam data.


Exam ID	Accession	Procedure	Modality	Image	Study Time	Online	Status
1	530016	MRI BREAST BILATERAL	MR	331	2002.08.28 14:25:52	Y	Verified
2	6825893	XA RENAL ARTERIOGR...	XA	0	1993.10.08 11:27:54	Y	Verified
3		Unspecified XA	XA	34	1993.10.08 11:27:54	Y	Arrived
4	530016	CARDIO STRESS TEST	NM	843	1998.04.28 08:57:39	Y	Arrived
5		MRI CHEST WITHOUT...	MR	340	2001.01.17 12:44:27	Y	Dictated
6		CT HEAD CONTRAST	CT	36	2002.08.28 19:22:40	Y	Dictated

Column Headings



The first column to the left of the patient name is an icon that indicates an exam note is attached to this study. The other columns designate the specific type of information displayed in the worklist.

- Patient Name column displays the patient name; last name comma, then first name.
- Patient ID displays the patient medical record number.
- Accession Number is the unique exam identifier used by PACS to identify the separate exams.
- Procedure is the name of the exam (eg., AMH – CT Head w-o).

Worklist Selector:

All Exams  All Exams All Recent .. All Unread ... External Send Queue

All Exams

 Patient Name	Patient ID	Accession Number	Procedure	Mdl	Img	Study Time	Online	Status
 CLARK, ALBERT	223462	530016	CARDIO STRESS TEST	NM	843	1998.04.28 08:57:39	Y	Arrived
CLARK, ALBERT	223462		MRI CHEST WITHOU...	MR	340	2001.01.17 12:44:27	Y	Dictated
CLARK, BONNIE	223464		CT HEAD CONTRAST	CT	36	2002.08.28 19:22:40	Y	Dictated
CLARK, BONNIE	223464		CT HEAD CONTRAST	CT	0	2004.07.29 09:12:55	N	Ordered
CLARK, BONNIE	223464		Unspecified CT	CT	26	2004.07.29 18:00:48	Y	Arrived

Column Headings, cont..

- Mdl refers to the modality (e.g. CT, MR, CR, US, NM).
- Img refers to the number of images in the file for the procedure.
- Study Time begins with the time the exam is ordered. This time will update when the images arrived in PACS. The time appears in the title bar of the exam when it is displayed.
- On Line indicates the archive status of the images:
 - o "Y" means that the images are in the short-term storage.
 - o "N" means the exam is off-line and needs to be fetched (retrieved) from the permanent storage system. "N" also means NO images. All dictated reports will be available if exam is completed.
 - o "I" means the exam is in the process of being fetched.
- Status indicates the stage of completion for the exam (Ordered, Arrived, Verified, Dictated, Transcribed, Completed, Reference only, Read off-line, or Cancelled).

Worklist Selector:

All Exams

All Exams

All Recent ..

All Unread ...

External

Send Queue



All Exams

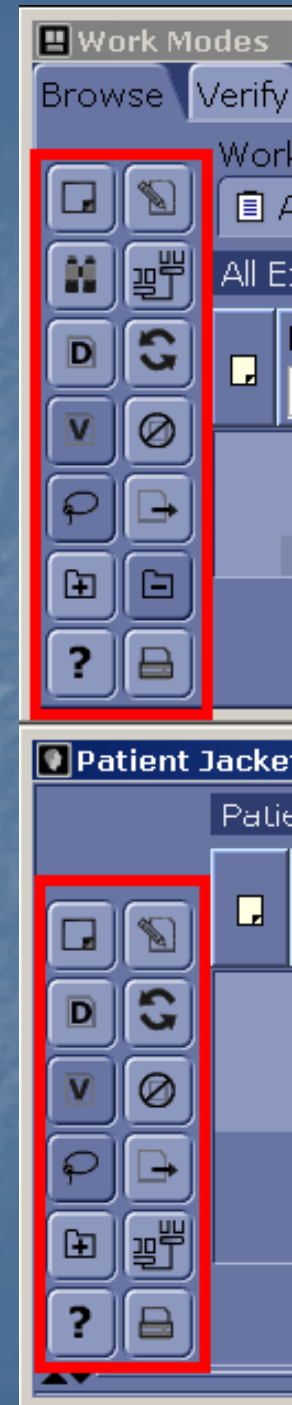
Patient Name	Patient ID	Accession Number	Procedure	Mdl	Img	Study Time	Online	Status
CLARK, ALBERT	223462	530016	CARDIO STRESS TEST	NM	843	1998.04.28 08:57:39	Y	Arrived
CLARK, ALBERT	223462		MRI CHEST WITHOU...	MR	340	2001.01.17 12:44:27	Y	Dictated
CLARK, BONNIE	223464		CT HEAD CONTRAST	CT	36	2002.08.28 19:22:40	Y	Dictated
CLARK, BONNIE	223464		CT HEAD CONTRAST	CT	0	2004.07.29 09:12:55	N	Ordered
CLARK, BONNIE	223464		Unspecified CT	CT	26	2002.08.28 19:22:40	Y	Arrived



Sorting a Column

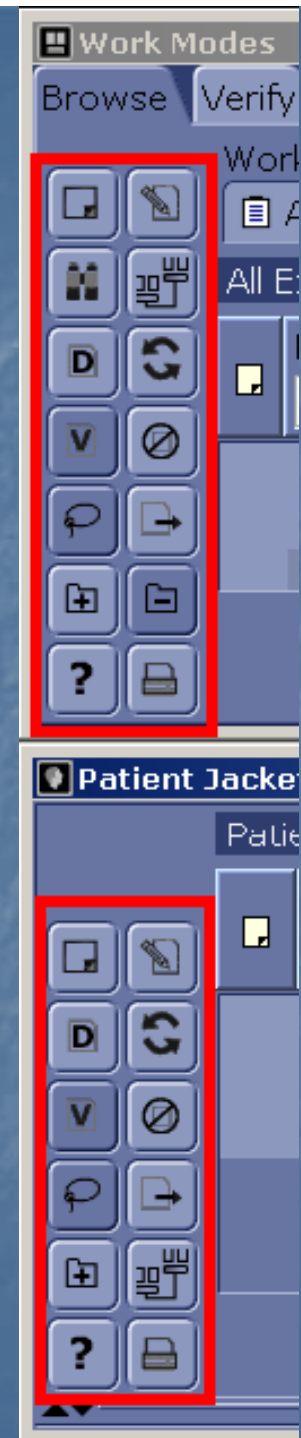
- A user can sort columns to put that column in a particular order. The user can single-click on the column name, and the column will automatically sort. Patient Name column will sort names alphabetically; Study Time column will reverse the received order of the exams.



Function Buttons

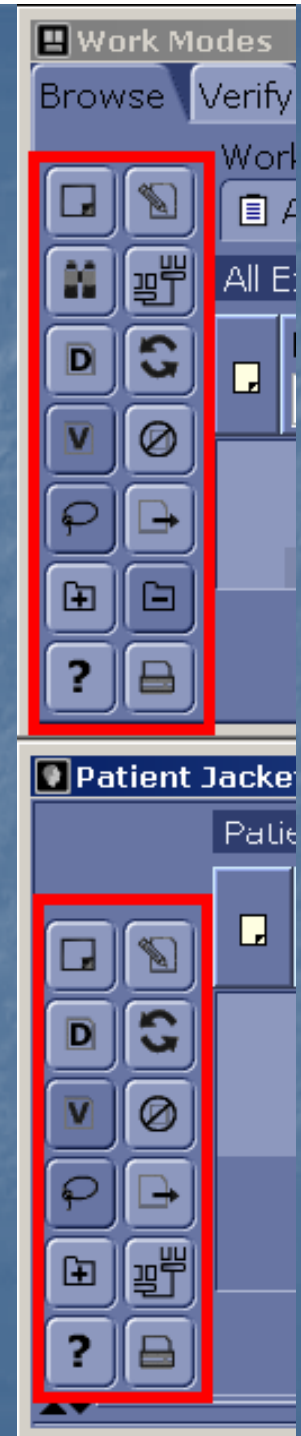
- The Centricity Function buttons are located on the left side of the Work Mode and Patient Jacket palettes.
- Create/View Exam  Notes function button opens the exam note dialog box attached to an active exam in the worklist.
- Report Synch  function button opens the report palette and synchronizes the report to the active exam in the worklist.





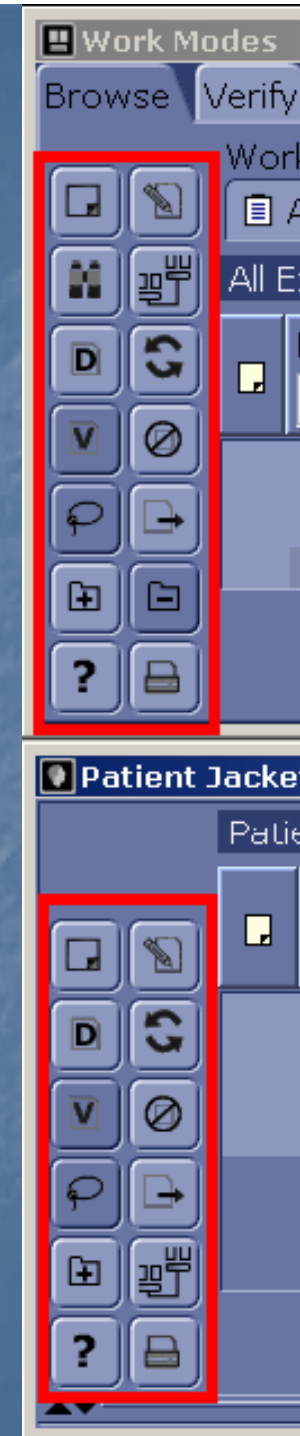
-  This icon allows the user to Send a study to a Remote Workstation (Vitrea). Highlight an exam from either the Work Modes or Patient Jacket palette, and click this icon.
-  If the user is waiting for an order or images to appear on a worklist, they can quickly update the worklist by clicking on the Refresh button. Refresh if an off-line exam has been manually fetched and the user is waiting for the images to appear. Even if the user has filtered the worklist with information, such as patient name, modality, date, etc., the filters will remain in place while the worklist refreshes.




-  Use this icon to change a selected unverified study to the Verified status. This moves your study to the Radiologist's worklist. This tool is available on the Work Modes and Patient Jacket palettes.
-  If a study is already in a verified, dictated, transcribed or completed status, the study can be Unverified. This can be done: (a) if two exams need to be merged via Centricity Exam Manager, or (b) additional images need to be added to a study that has already been verified. This tool is privilege based.
 - 1. Select the study from the Work Modes or Patient Jacket palette.
 - 2. Click the Unverify icon. The status will update to arrived.

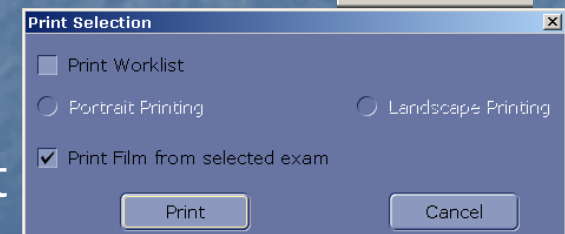
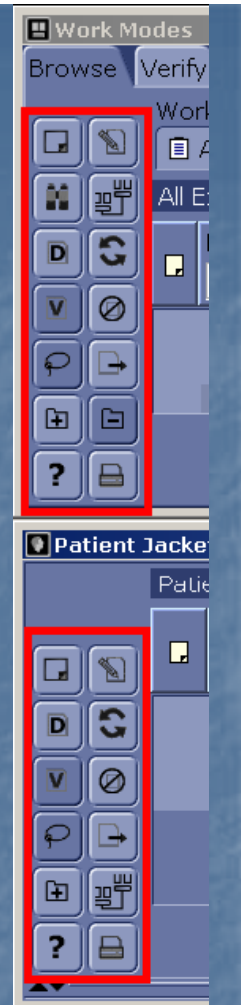


-  The Get Patient functionality allows the user to manually fetch exams from a remote archive to the local short-term storage server.
 1. From the Work Modes or Patient Jacket palette, select the patient.
 2. Click the Get Patient icon. A warning box will appear stating you are about to fetch all historical exams for this patient.
 3. Click OK if you wish to fetch all historical exams.
-  The Send Exam functionality allows users to send an exam to another DICOM receiver. A DICOM receiver could be an Advanced Post Image Processing workstation or another short-term storage device. This can also be used to save an exam in jpeg or tiff format.
 1. Select an exam from the worklist in either the Work Modes or Patient Jacket palette.
 2. Click the Send Exam icon. A dialogue box will open allowing the user to select the DICOM specific receiver needed.
 3. Select the destination from the destination drop-down menu.
 4. Click the OK button to complete the task.



-  The Print icon allows privileged users to print an exam or a worklist from the Work Modes palette. When printing exam images from the Work Modes palette, the only options will be to print all images or significant images. The user will need to open an exam in order to print selected images from that study. To print images:

1. Select the exam.
2. Click the Print icon.
3. Select the Print Film from selected exam checkbox.
4. Click Print.
5. Select either All Images or Significant Images.
6. Select the printer from the drop-down menu.
7. Choose the format options and then click the print button.



Patient Jacket Palette

- When users select an exam in the worklist of the Work Modes palette, the Patient Jacket palette will update to the name of that patient and list all the exams that are available on PACS for that particular patient.

The screenshot shows the 'Patient Jacket' window with a table of 'Patient Historical Exams'. A red arrow points to the fourth row of the table, which is highlighted. Below the table, there is a 'Series' section with a table of image counts and two buttons labeled 'Regions' and 'Images'.

Patient Name	Patient ID	Procedure	Mdl	Img	Study Time	Online
COOKE, CAROLYN	71711	MRA BRAIN W/WO CONTRAST	MR	151	2002.08.28 11:01:40	Y
COOKE, CAROLYN	71711	MRI CHEST WITHOUT CONT...	MR	320	2001.04.10 18:58:53	Y
COOKE, CAROLYN	71711	CHEST PA & LAT	CR	2	1999.09.30 07:41:59	Y
COOKE, CAROLYN	71711	MRA BRAIN W/WO CONTRAST	MR	149	1999.09.29 12:30:37	Y
COOKE, CAROLYN	71711	CT CHEST W/WO CONTRAST	CT	121	1999.08.03 15:32:18	Y

Series	#Images
All images	121
(1a) Localizer	1
(1b) Localizer	1
(2) CHEST R/O METS	63
(102) CHEST R/O METS	56

Report Palette

- When a user selects an exam from a worklist, the corresponding report will appear in the Report Palette. There is a show/hide all fields arrow in the upper left corner of the palette allowing the user to display Essential or Full Information in the header of the Report Palette. The report tab may need to be moved in order to see the typed report.

The screenshot shows a software window titled "Report" with a close button (X) in the top right corner. In the top left, there is a small square icon with an upward-pointing arrow, highlighted by a red arrow and a tooltip that reads "Show/Hide All Fields".

The main area of the window is divided into three columns of text:

Patient Name: COOKE, CAROLYN MRN: 71711	Study Date/Time: Apr 10, 2001 18:58:53 Birth Date: Dec 12, 1945 (Age: 55Yrs)	Procedure: MRI CHEST WITHOUT CONT... Status: Dictated
Exam: EVALUATE FOR METASTASIS Sex: F	Order Comments: N/A Department: MRI	Physician: Unspecified Order No: N/A
Pat Location: Unspecified Pat Residency: Unknown	Ward/Clinic: Unspecified Priority: Routine	Exam ID: 10107 Sched Date/Time: Jul 29, 2004 13:48:52

Below this information is a "Standard Reports:" label followed by a dropdown menu currently set to "No Repo...".

The central part of the window is a large text area containing a white box with the text "Body of Report" in red, indicating where the report content is displayed.

At the bottom, there are several controls: "Report Approval:" with a "Select Ap..." dropdown, "Set Exam Status:" with a "Mark Dict..." dropdown, and two buttons labeled "Edit" and "Print".

Exam Notes

- Exam notes are to be created for **EVERY** exam. History should be obtained and included in the exam note.
- Exams using contrast need to have the type of contrast and amount included.
- If prior studies have been done on the same body part, this information should also be included in the exam note.
- If the Technologist is not logged in, select Create As in the upper right hand corner of the exam note and enter your User Name and Password. This is how the Radiologist will identify who did the examination if any questions arise at a later time.

Exam Notes

- The exam note will appear on the screen every time the exam is opened. Be sure to include only information that is pertinent to the exam. These are also viewed by the referring physician via the web. Do not include information that should not be seen by the patient or referring physician.

Exam Notes

Exam Notes Icon



The Exam Notes icon next to the Patient Jacket icon allows the user to display the Exam Notes box in the selected monitor region associated with the active monitor region. Each monitor region has its own exam notes icon. If privileges are given to a user, selecting this icon will allow the user to read, create and hide exam notes for that study.

Exam Notes provide an enterprise-wide communication system that allows supportive information to be permanently attached to patient images. The notes carry communication between groups such as the Radiologists, Technologists and Emergency Department. Users must be privileged in order to create, hide/delete the exam notes. The notes can be canned for individual groups or the various groups can free text a message to another user. The number of characters in the free text is limited to 1024 characters. There is a maximum of 20 exam notes allowed per exam.

To create an exam note, click on the icon highlighted below.

The screenshot displays a medical software interface with three main windows: 'Work Modes', 'Patient Jacket', and 'Report'.

Work Modes Window: Shows a 'Worklist Selector' with a dropdown menu set to 'All Exams'. Below it is a table of exams. A red arrow points to a small square icon in the left toolbar of this window.

Patient Name	Patient ID	Accession Num...	Procedure	Mdl	Img	Study Time	Onl...	Status
CLARK, GORD								
CLARK, GORDON	40817989	05UMR1915	UMP MRA ABDOMEN W-...	MR	160	2005.06.16 13:41:15	Y	Completed
CLARK, GORDON	40817989	05ARA27432	CHEST PA + LATERAL	CR	0	2005.08.19 18:16:00	N	Completed

Patient Jacket Window: Shows 'Patient Historical Exams' with a table of exams.

Name	Med. Rec. #	Accession #	Procedure	Mdl	Img	Study Time	Onl...	Status
CLARK, GORDON	40817989	05ARA27432	CHEST PA + LATERAL	CR	0	2005.08.19 18:16:00	N	Completed
CLARK, GORDON	40817989	05UMR1915	UMP MRA ABDOMEN W-...	MR	160	2005.06.16 13:41:15	Y	Completed

Report Window: Displays patient information for CLARK, GORDON. MRN: 40817989. Study Date/Time: Jun 16, 2005 13:41:15. Birth Date: Jan 24, 1958 (Age: 47Yrs). Procedure: UMP MRA ABDOMEN W-WO CONT... Status: Completed. Reason for Exam: HTN. 30 ML PROHANCE. Order Comments: N/A. Physician: LIEBSCHER, LAWRENCE.

Standard Reports: [Dropdown] Append rep... [Dropdown]

Report Approval: [Select A...] Set Exam Status: [Mark Dict...] [Edit] [Print]

Exam Notes

Select a canned note or type the necessary information below the subject field and select "Save."

The screenshot shows a software window titled "Exam Notes" with a header bar containing the text "MADDOX, GERRARD CT ABDOMEN / PELVIS SCREENING May 1, 2003 15:23:52". The main area contains several input fields: "Category:" with a dropdown arrow, "Canned Note:" with a text box containing "Please Select Canned Note" and a selection icon, and "Subject:" with a text box containing "ORAL CONTRAST". Below these fields is a large empty text area. At the bottom of the form are buttons for "Create As", "Create by: COLE", "Save", and "Cancel".

Creator	Subject	Date
Thomas,Debbie	Oral Contrast	Feb 25, 2005 11:36:49

Below the table, there is a section with the following text:
Creator: Thomas,Debbie
Date: Feb 25, 2005 11:36:49
Subject: Oral Contrast
Patient unable tolerate oral contrast

At the very bottom of the window are buttons for "Copy", "Print", "Hide", and "Close".

Opening an Examination

An exam can be opened three ways:

1. You can **double-click** on the exam you wish to open
2. Click on the exam, right click and select "Display Exam"
3. Click on the exam and select "Display Exam" in the right corner of the Work Mode Palette

The screenshot displays the 'Work Modes' software interface. At the top, it shows 'USER: BUSKOHL,CRAIG', 'Server IP Address: 10.25.90.5', and 'Current Time: 9:31:19 AM'. Below this is a 'Worklist Selector' with a dropdown menu set to 'All Exams' and several filter buttons: 'MR Unverif...', 'CT Unverifi...', 'US Unverifi...', 'All Unverifi...', and 'All Recent...'. The main area is a table titled 'All Exams' with columns for Patient Name, Patient ID, Accession Num., Procedure, Mdl, Img, Study Time, Onl..., and Status. Two rows are visible, both for 'CLARK, GORDON' with Patient ID '40817989'. The first row has Accession Num. '05' and Procedure 'BLUMEN W-...'. A right-click context menu is open over this row, with 'Display Exam' highlighted. A red arrow points from the text 'Click on the exam, right click and select "Display Exam"' to this menu item. Another red arrow points from the text 'Click on the exam and select "Display Exam" in the right corner of the Work Mode Palette' to a 'Display Ex...' button in the bottom right corner of the table area. Below the 'All Exams' table is a 'Patient Jacket' section with a 'Patient Historical Exams' table. At the bottom is a 'Report' section with fields for Patient Name, MRN, Reason for Exam, Study Date/Time, Birth Date, Age, Procedure, Status, Order Comments, and Physician. The 'Report' section also includes a 'Standard Reports' dropdown and 'Report Approval', 'Set Exam Status', 'Edit', and 'Print' buttons.

Function Bar

Making an Exam Active

- Use the mouse to click anywhere in a monitor region where the current or historical exam is displayed to make that exam active. The title bar color will change from dark to light (or grey to blue) when the exam or series becomes active.



- Right above the image(s), you will see the patient's name, ID number, and the date and time of the exam. This is called the Title Bar. The title bar can be made smaller to allow more monitor space by double clicking with the left mouse anywhere within the title bar. A double left mouse click will also re-instate the title bar to its original display. Hovering with the cursor over the skinny title bar will reinstate it to original size. This only applies for that monitor region.
- The functions from the title bar that hide when minimized can be found by completing a right click in the skinny title bar.

Monitor Region Format

- Monitor region format refers to the number of virtual monitors that display within a monitor. The user is able to select from pre-designed formats. A drop-down menu on the task bar next to the Function Keys allows users to change the number of monitor regions displayed on that monitor.
- Click the arrow to open the drop-down menu. You will see a list of monitor region choices. Click on any one of the choices. Only the format for the active monitor will change to the selected format.

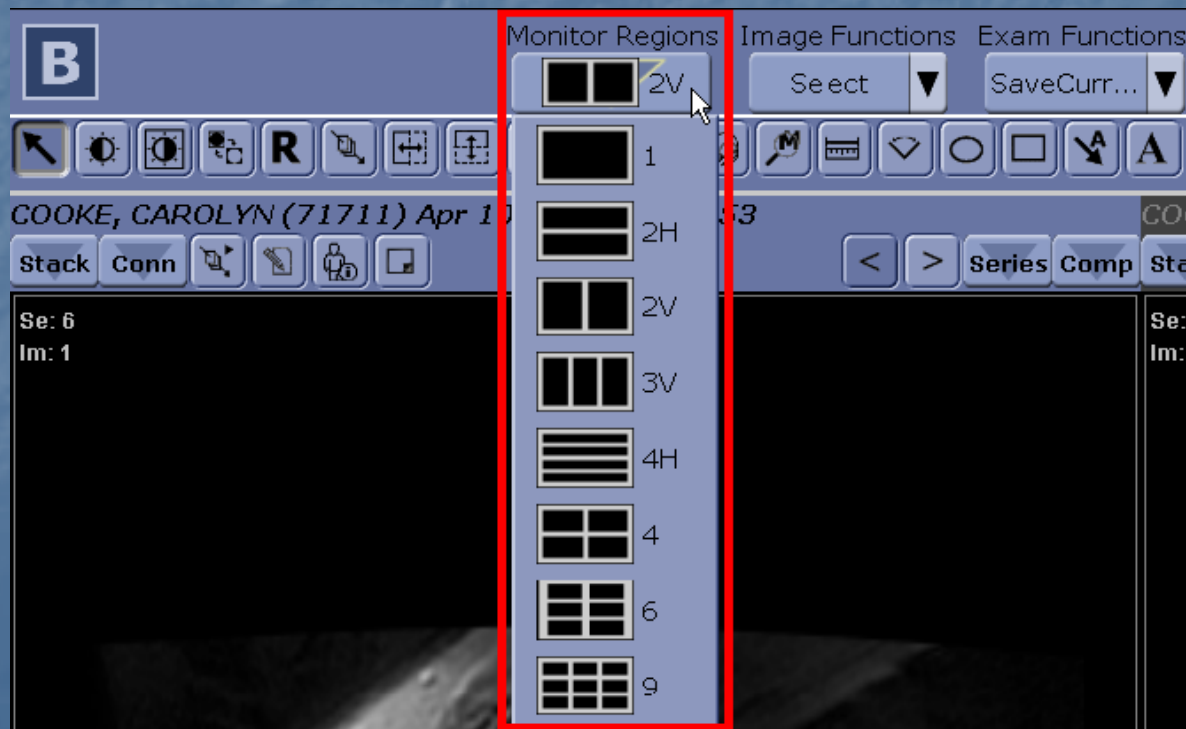

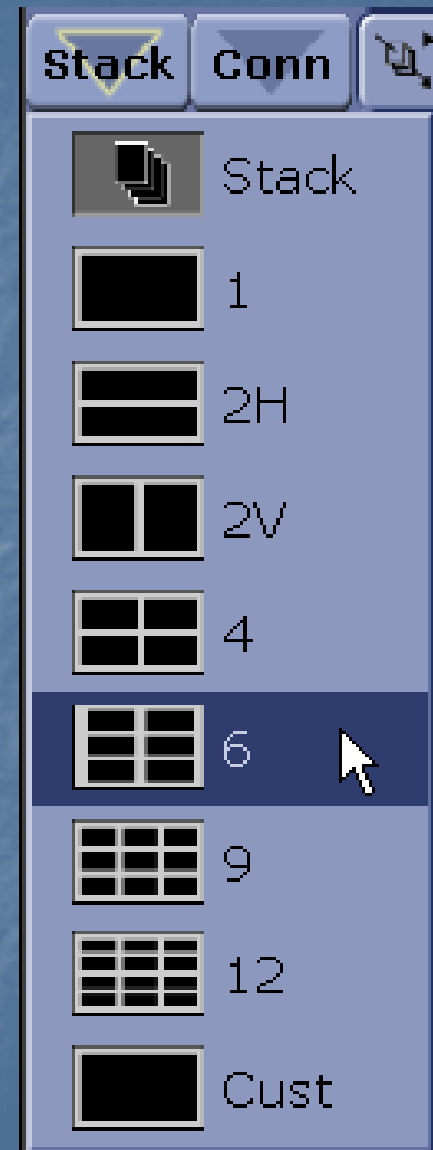


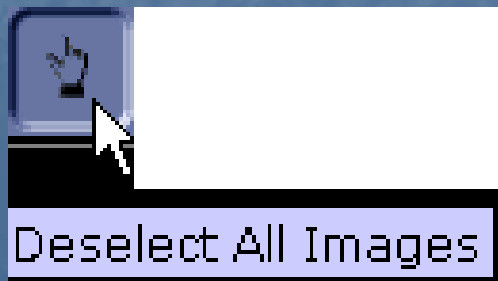
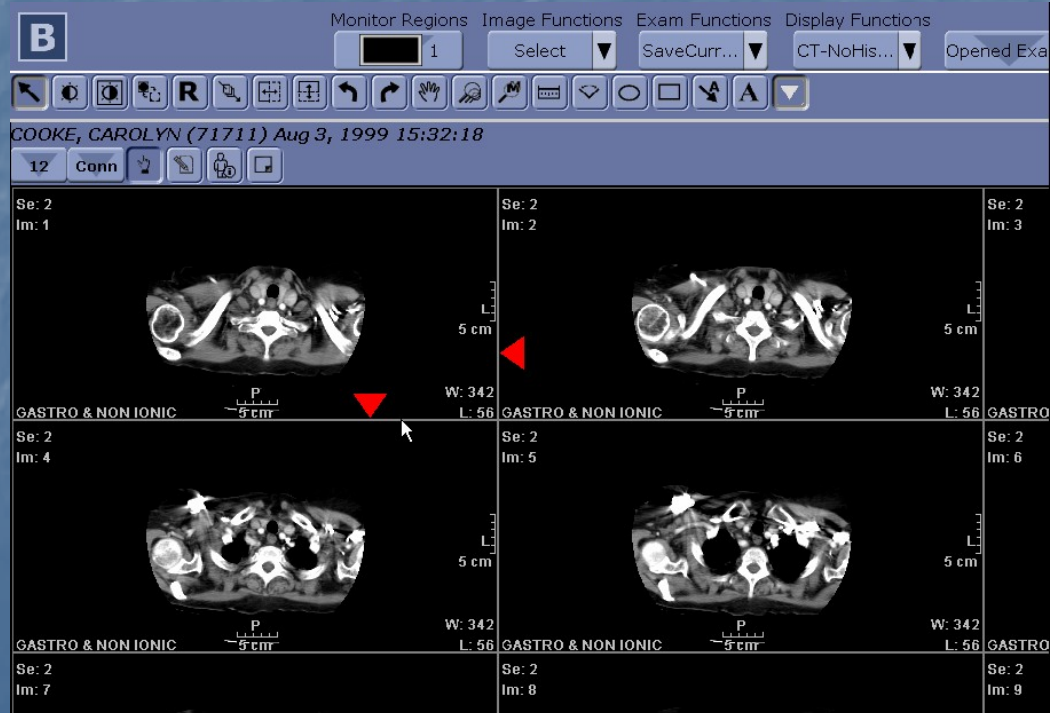
Image Format

- Once the monitor regions have been set, the user can select the image format. Image format is the number of images that will display in a selected monitor region. Each monitor region has an Image Format selector.
- Click in the monitor region to be adjusted. Place the mouse pointer over the Images format Hot Zone button . A drop-down menu will display various Image Format options. Move the mouse to highlight how many images will display in this virtual monitor and then click that choice.
- The custom selection will allow the user to customize the number of images to display in the monitor region.



Selecting/Deselecting Images in Sheet Mode

- SELECT/DESELECT icon is found to the right of the Connect Button.
- To Select All Images, click the Select icon
- Notice that a grey frame surrounds each image indicating the selected image.
- To Deselect All Images, click the Deselect All Images icon. Notice that the grey frame no longer displays around the images.



Selecting Multiple Images

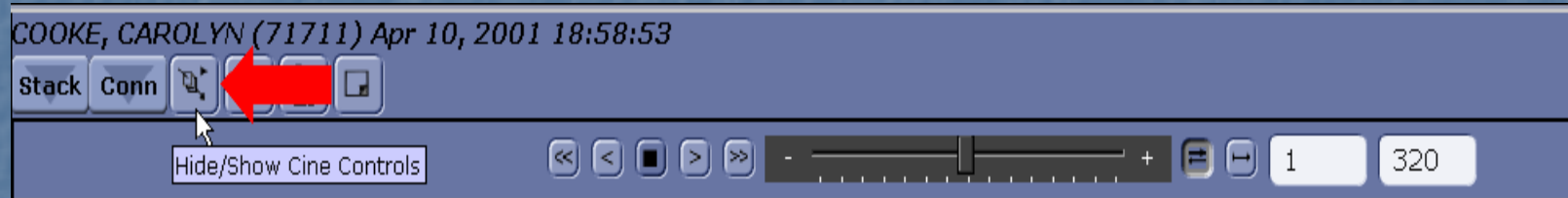
- To select multiple images, click on one image, and while holding down the CTRL key, click on any other image or images.
- To select a range of images, click on the first image the user wants to select, hold down the SHIFT key and then click on the last image to include. This will select all the images between the first image and that last image selected.
- A tool applied to one image will apply to all of the images selected.

Image Navigation in Stack Display

1. Change the image format to Stack by using the Image Format button in the title bar as explained earlier.
2. Single-click on the manual cine tool and move the cursor to any image.
3. Press and hold the mouse button down and move the mouse up and down to cine through the stack of images.

Image Navigation in Auto-Cine

1. Place the images in stack mode.
2. Click the Hide/Show Cine Controls button located right of the Conn button in the Title Bar. The auto-cine controls display at the top of the image.



3. Single-click on the double arrows pointing to the right. This will start paging through the images automatically.
4. Single-click on the box in the middle of the arrow keys to stop the auto cine.
5. Use the slide bar to control the speed of frames per second.
6. Single-click on the HIDE button to turn off the auto-cine application.

Toggling Image Size

- Users can double-click on any image to change it to a full monitor format. The title bar will collapse and the image will focus on the screen. The user will not be able to utilize some of the tools (such as cine, zoom, etc).
- Double clicking on the image will return it to normal size, and the title bar will reappear.

Report Synchronization

The software includes a visual indicator to differentiate Current from Comparison exams that display in the monitor regions.

A Current exam can be identified by italic font.

Report text and functions apply to the Current exam (italicized font) regardless of how many displayed exams are on the monitor(s).

The Report can be synchronized with the images by clicking on the Report Synch Icon.



Work Nodes: SMPB, CapSoftWare Server IP Address: 3.20.73.211 Current Time: 10:33:10 AM

Browse:

Worklist Selector: | Patient Name | Patient ID | Order # | Procedure | Mdi | Img | Stud... | Online | Status | PACS E |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| BA | | | | | | | Y | | |
| *BARON, SHELBY MM* | *46324* | *230528* | *MR BRAIN* | *MR* | *131* | *1999...* | *Y* | *Dictated* | *230528* |
| GALLY, VICTOR MM | 62766 | | MR BRAIN | MR | 172 | 1999... | Y | Completed | |
| PAG, YONGME | 587004 | | Unspecified PT | PT | 6 | 2002... | Y | Completed | |

Include Comparisons

Patient Jacket

NOT MATCH CURRENTLY OPENED EXAM **

Patient Name	Patient...	Order #	Procedure	Mdi	Img	Acquisition Date	Orl...	Status	PACS Ex...	Study T
<i>BARON, SHELBY MM</i>	<i>46324</i>		<i>Unspecified CT</i>	<i>CT</i>	<i>31</i>	<i>2003.02.06 15:...</i>	<i>Y</i>	<i>Dictated</i>		<i>1999.03</i>
BARON, SHELBY...	46324	230528	MR BRAIN	MR	131	2003.02.06 1...	Y	Dictated	230528	1999.0...
BARON, SHELBY MM	46324		MR BRAIN	MR	220	2003.02.06 15...	Y	Dictated		1999.01

Include Comparisons

Series

Series	#Images
(1) LOCALIZER	1
(2) AXIAL FPE	30
Significant Images	4

Report

Patient Name: **BARON, SHELBY MM** Study Date/Time: **Mar 4, 1999 15:43:21** Procedure: **Unspecified CT**

MRN: **46324** Birth Date: **Sep 15, 1971 (Age by study: 27Y)** Status: **Dictated**

Reason for Exam: **NO** Order Comments: **NA** Physician: **Unspecified**

Send Reports: **** NOT MATCH CURRENTLY OPENED EXAM**

The Opened exam is *Italicized*.

The report of the *Selected* Exam is displayed.

The user will be warned that the report does not match with the currently displayed images although the information is in synch with the highlighted exam in the historical Jacket.

Patient Jacket Icon

The Patient Jacket icon next to the Report Synch icon, allows the user to display the Patient Jacket Palette in the monitor region associated with the active title bar. Each monitor region has its own Patient Jacket icon. This will allow the user to see the patient's exam history in PACS and display the historical studies not listed under the Comp button.



Image Navigation Buttons



- Single and double arrow Buttons on the right side of the Title Bar will allow the user to navigate through the images. There is a PREVIOUS and NEXT IMAGE button, a PREVIOUS and NEXT PAGE button, a SERIES button, and a COMP (for comparison exams) button.
- Previous and Next Page buttons (double arrows) only show up in Sheet and not in Stack image format.
- If the IMAGE or PAGE button is light gray, this indicates that there are more images to view.
- If the IMAGE or PAGE button is dark gray, this indicates that there are no more images to view. Click on the IMAGE or PAGE button to display the previous or next image or page of images.
- The Right and Left arrows on the keyboard will move one image at a time. The Page Up and Page Down keys will move one page at a time.

Series Hot Zone Button






- Single-click in any monitor region. In the Series List, the series that displays in that particular monitor region is indicated by a dark grey checkmark. A light grey checkmark indicates the series that display in other monitor regions.
- Checkmarks are not displayed when the thumbnails are visible. However, the series in that particular monitor region is bold and other open series are italicized.

The image displays two screenshots of a software interface, likely a medical imaging viewer, showing a Series List. The top screenshot shows the Series List with a dark grey checkmark next to '(2) CHEST R/O METS (63 images)'. The bottom screenshot shows the Series List with thumbnails visible, and the Series List button is highlighted with a mouse cursor.

Top Screenshot:

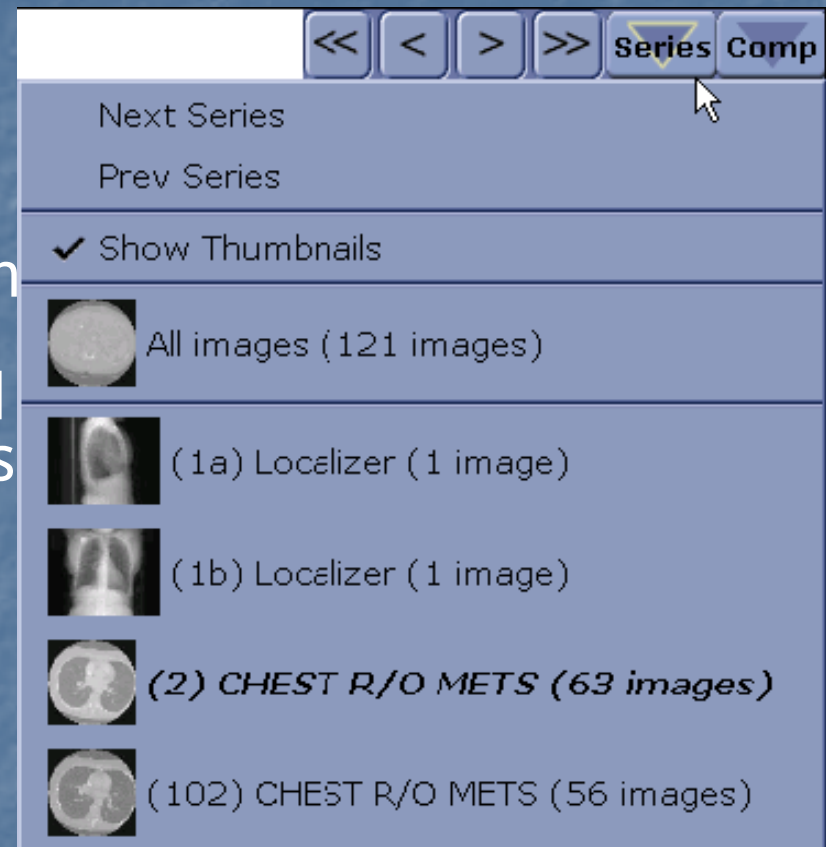
- Navigation buttons: <<, <, >, >>, Series (highlighted), Comp
- Next Series
- Prev Series
- Show Thumbnails
- All images (121 images)
- ✓ (1a) Localizer (1 image)
- (1b) Localizer (1 image)
- ✓ **(2) CHEST R/O METS (63 images)**
- (102) CHEST R/O METS (56 images)

Bottom Screenshot:

- Navigation buttons: <<, <, >, >>, Series (highlighted), Comp
- Next Series
- Prev Series
- ✓ Show Thumbnails
-  All images (121 images)
-  (1a) Localizer (1 image)
-  (1b) Localizer (1 image)
-  **(2) CHEST R/O METS (63 images)**
-  (102) CHEST R/O METS (56 images)

Series Button

- Once monitor regions and the image format for each region has been set, the user can select which series should display in each monitor region. Each monitor region has a Series button listing all the series associated with the displayed exam. The user can place the series into the monitor region by clicking on the desired series. When "Show Thumbnails" is selected, a representative thumbnail image from the middle of that particular series will display ahead of the series description and number of images in the series if the user has that option selected.

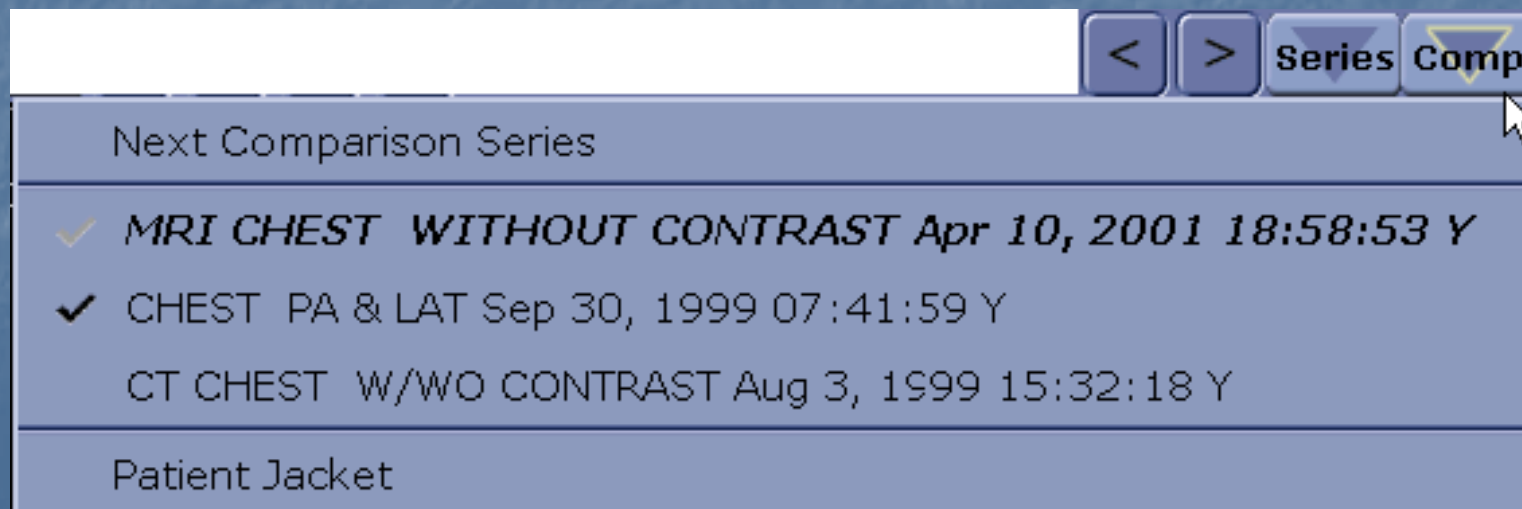


Series Button


- To replace one series with another series, move the mouse over the Series hot zone button located to the right of the title bar.
- The list of series for this exam displays. The series currently displayed in that region is shown with a bold checkmark when thumbnails are not displayed, or with bold and italicized font when thumbnails are displayed. Other series that display in other areas of the monitor(s) are shown with light colored checkmarks when the thumbnails are not displayed. Move the cursor over the series to be displayed. Click the left mouse. That series will display in that image region.

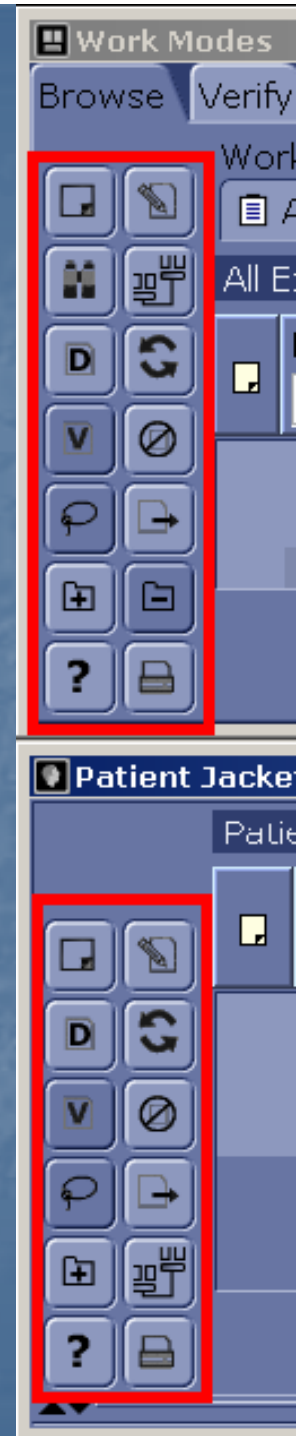
Comp Button

- To replace an exam with a comparison exam, move the mouse over the Comp button. A list of comparison exams (by body parts) is displayed as well as the option for the patient jacket palette. The exam currently displayed in that region is designated with a bold check mark and italic print. Comparison exams that display in other areas of the monitor(s) are shown with light colored checkmarks. Move the cursor over the reference exam to display, then click. That exam will display in that specific monitor region.

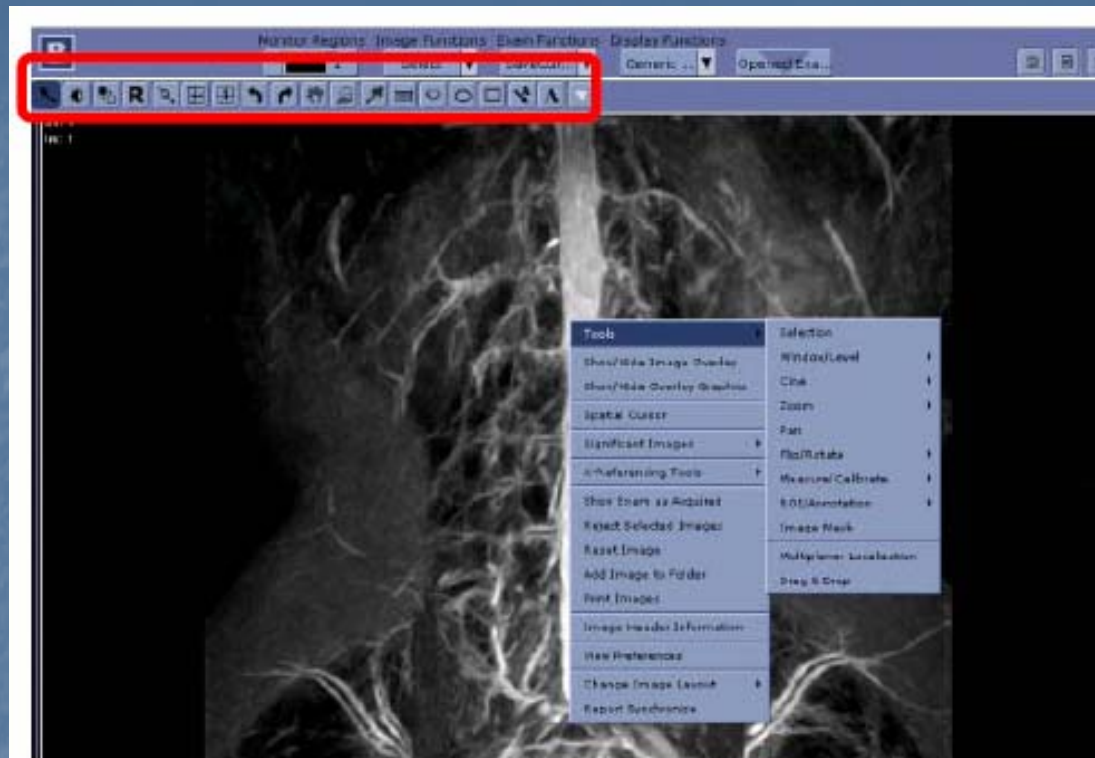


When a study has been sent to PACS from the modality, the workflow of the technologist is to Verify the exam thus assuring that all the images are available and ready for the Radiologist to interpret. Once the study has been opened and all images accounted for, the technologist will mark the exam Verified from the Exam Function menu. This is also the last opportunity for the technologist to make any changes (that were not made on the modality) to the images such as annotations and window/level values. The exam then goes to the Radiologists Unread list.

- Use this icon  to change a selected unverified study to the Verified status. This tool is available on the Work Modes and Patient Jacket palettes.

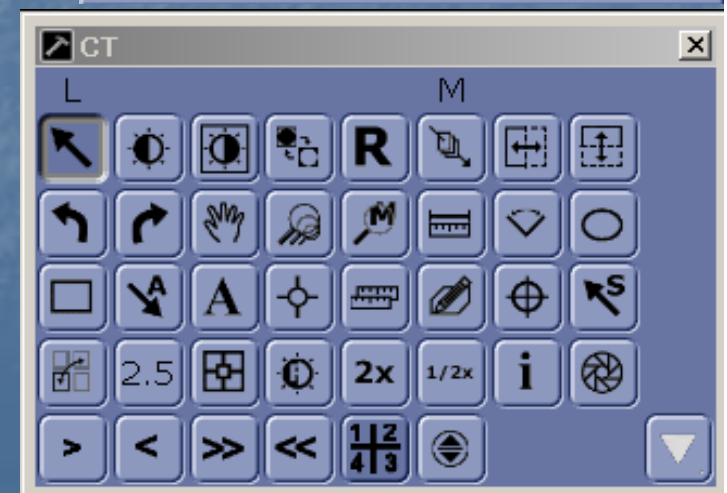
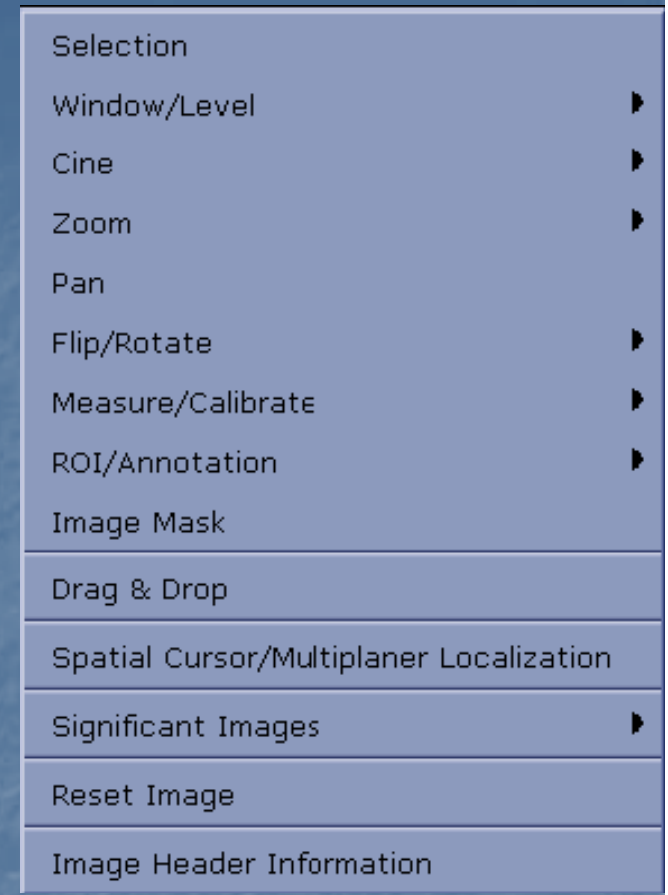


Tool Selection



- The user has several options with regard to the tool bar.
- The user may Anchor the tool bar at the bottom of the Function Bar.
- Right click in an image to have palette with icons display. The user can also right click on an image to have the verbal representation viewable for a left click tool selection (Context Manager).
- Use the “Display tool icons in tool palette” checkbox in Utilities > Preferences > Display Preferences menu to toggle between displaying icons and text in the Tool Palette.


- If the user has not anchored the Tool Palette, Right click over an image to display the modality specific standard tool palette.
- In order to select a tool, the user can click on the pictorial representation. The engaged tool icon will look as if it were a depressed button.
- Click on the down arrow button of the standard tool palette to display the extended tool palette. This will give you access to all of the image manipulation tools available for your use.
- To close the tool bar, Click on the X in the top right corner of the Tools Window


















Mouse Button Defaults



- To change the middle or left mouse button to a different tool, click on the “M” or “L” and drag it over the tool of choice. Release the mouse button in the middle of the icon and the “M” or “L” will display above your selection.
- The system will only allow “State Tools” to be designated as the default tool. State tools, when selected; require further user interaction to manipulate the selected image such as zoom, measure and window/level. The system default is “L” mouse as the Selector Tool and “M” mouse as the Cine Tool.
- Action tools will affect all selected images without additional user interaction. The Invert Grey Scale is an example of an action tool.



Description and Use of Individual Tools


-  Selection tool allows the user to manipulate selected images with the other tools. This is the Left Mouse default. Click once on the Selection Tool, then once on any image. This will put a light grey border around the image and allow the user to apply any tool function to that image. Some tools need to have an image selected before they will work on that image. If you try to use a tool not selected on an image, an alert message will display prompting you to select an image first.
- To select multiple images, click on one image and then while holding down the CTRL key, click on any other image or images.
- To select a range of images, click on the first selected image, hold down the SHIFT key, and click on the last image to select. This will select all the images between the first and last selected images. A tool applied to one image will be applied to all selected images.

-  This tool allows user to adjust the window/level values of selected images. To select the tool, single click on the icon. Move the cursor over the image. Press and hold the mouse button down then move the mouse up or down to change the contrast or left to right to change the brightness.
-  Resets selected images back to last saved window/level value.
-  Window/Level ROI tool allows the user to draw a ROI on an image and the w/l within the ROI changes based on the anatomy contained within the window. The values are displayed in the lower left corner of the monitor region.
-  Inverts the Gray Scale on selected image(s). This will invert the black and whites on images. Click once on this tool to invert the image(s). A second click will return the image(s) back the original display.



- Four tools are used to change the orientation of the displayed image. Select the image(s) that need to be re-orientated and then click on the appropriate tool.
-   Rotates selected image(s) 90 degrees to the right or left.
-  Flips selected image(s) 180 degrees top to bottom or left to right 180 degrees. 
-  Resets changes made to images back to the last saved value.
-  This tool allows the user to cine (scroll) through images. This is the Middle Mouse default selection.
-  Scroll Lock feature will allow the user to lock the scroll function of the mouse. Once the scroll is locked, the user no longer has to click and drag for the images to move in cine mode. Sliding the mouse in either direction will activate cine.
-   This tool allows user to move forward or backward one image at a time.
-   This tool allows user to move forward and backward by pages.






- The Pan Tool allows the user to pan the image in the monitor region.
-  Single click on the tool and move the cursor to the image. Press and hold the left mouse button down and move the mouse around.
- While holding the left mouse button down and the Pan tool selected, press and hold the SHIFT key down. Move the mouse and the image will zoom.
- While holding the left mouse button down and the Pan tool selected, press and hold the ALT key down. Moving the mouse will window/level the image.
-  This tool allows the user to Zoom the image. Single click on the tool and move the cursor to an image. Press and hold the left mouse button down and move the mouse up and down to magnify the image. Single click on the tool and move the cursor to an image. Press and hold the left mouse button down and pull the mouse towards the user to make the image smaller. Holding the shift key down at the same time will pan the image. Holding the Alt key down at the same time will window/level the image.




-  Magic glass is used as a magnifying glass. Single click on the icon and move the cursor to an image. Press and hold the left mouse button down. A box will appear with the area within the box magnified. The magnification factor will be displayed in the upper right corner of the magic class. With the left mouse button depressed, single right-click to magnify the entire image. With the magic glass tool selected, holding down the Alt key will change the window level.
-  Measurement tool allows the user to make distance measurements. Single click on the icon and move the cursor to an image. Press and hold the left mouse button down on the area where the measurement is to start, Click and drag the mouse to the end of the measurement and release the mouse. A line will appear to mark the measurement.
- To resize a measurement, select it with selection tool or by holding down the CTRL key and boxes will appear on each end of the line. Click and hold the mouse on one of the boxes. Drag the mouse to resize the measurement. Release the mouse at the end point.

-  This tool allows the user to place an arrow on image. Select this tool and move the mouse to the area on the image you wish to place the arrow. Click and hold the left mouse button down to place the arrow. Drag the mouse in the direction that the user wishes the tail of the arrow to be drawn. Release the mouse.
- Multiple arrows are placed on an image. To delete an arrow, click on the Selection tool and then on the arrow. Boxes will appear on either ends of the arrow, click on a box and hit delete on the keyboard.

- **A** This tool allows the user to add Text Annotation to an image. Select this tool and move the mouse to the area on the image you wish to place the text. Press and drag the mouse to draw a box. Type desired text in the box.
- To change the font size of the text, select the text first with the Selection tool. Click on Change Annotation Font in the Image Function tab; select the text format/size choice, Click OK. The selected text will change.
- To reposition an annotation, select the annotation with the Selection tool. Press and hold the mouse on the annotation and drag it to the desired area.
- To resize a text annotation, select the text with the Selection tool. Boxes will appear at the four corners of the text. Click and hold the mouse on a box and drag the mouse to create the desired size.
- To delete a text annotation, select the text with the Selection tool. Boxes will appear at the four corners of the text. Click on the box then press Delete on the keyboard.

-  Oval, Rectangular or Irregular shaped Regions of Interest (ROI) measurement tools. Select the ROI of interest and move the mouse to the area to be measured. Click and drag the mouse to create the ROI, release the mouse. The following are displayed:
 - Area – the total area of the Region of Interest displayed in either millimeters or pixels
 - Max – The maximum pixel density value of all of the pixels included in the ROI
 - Min – The minimum pixel density value of all of the pixels included in the ROI
 - X – The mean or average pixel value for the ROI
 - SD - The standard deviation of the pixel values, in other words how spread out the values are.
 - These measurements display in the lower right hand corner of the screen.
-  This tool displays pixel lens value of the X and Y-axis for the pixel at the point of the cursor. Select the tool and as the mouse moves around the image, the measurement will display in the upper middle area of the image.

-  This tool allows the user to define a specific zoom factor (ZF). Right click on the icon to enter desired ZF. Four Zoom Factors are stored in the icon. Left click on the images to apply a Zoom factor.
-  Zooms selected image(s) by 2 times the image size shown on monitor tool.
-  Zooms selected image(s) by 1/2 image size shown on monitor tool.
-  Spatial Cursor shows a point on cross-referenced planes and/or synchronizes navigation and cursor locations among stack views of different image series with opposing planes (such as CT/PET) when series share the same frame of reference.
-  Multi-Planar Localizer identifies the same point on images in orthogonal views that are cross-referenced to each other. Select the tool and move the mouse to the area of interest. The tool will take the images to the same plane, same point in all cross-referenced series.

-  This is the Image Information Tool. This tool shows the DICOM Header Information for the selected image. Select an image, Click on this tool and the image information will display. This information is also printed by Clicking on the Print box located at the bottom of the page.
-  Fit to Display Region Tool will resize the image to fill the monitor much like the Reset function.
-  Mask or add a shutter to the image. Using one of the ROI tools, draw an ROI on the image. Select the mask tool and apply it to the image. The area outside of the ROI will turn black.

Logging Out

- Logging out will close the program, restart the applications and return to the login screen so the workstation is ready for the next user to login. The user will single click on the icon. A dialog box will display a message asking if the user wants to logout. If so, the user should click on “Yes.”
- Quitting will log the user out. A dialog box will appear asking if the user wishes to quit the program. If so, click on Yes and the application will return to the Windows Desktop.

