

INTRODUCTION

Thank you for choosing **XDR**, the next generation in digital radiographic imaging. The functions and ergonomics of **XDR** have been designed “for dentists, by dentists” to provide you with maximum efficiency and to streamline all of your radiographic imaging procedures.

The first step in setting up your XDR system requires installing **XDR** software on your computer. This should be accomplished by your IT professional or by our **XDR** technical staff. The installation of the sensor drivers will require connecting the radiographic sensor(s) to your PC via a USB port. There is no need to change anything else in your office, including the x-ray generator. If you would like to schedule an appointment with one of our technicians, please call **888-XDR-XRAY**.

Learning how to use **XDR** is quick and easy. The screen resembles a radiographic view box where radiographs are placed and manipulated by clicking and dragging your mouse. A radiograph can be taken with just a single mouse click and clear instructions on the bottom of the screen assist you at every step. You may also place the cursor over any of the buttons and an informational text box will appear. In general, the **Blue** colored text buttons denote a path back to a previous menu while **Red** buttons are features with warnings for irreversible operations, such as deletions.

Whenever this manual discusses the function of a button, please assume this it is initiated by a single left mouse click; exceptions to this rule are clearly noted.

XDR provides ultra clear, high contrast film-like images as well as specialized soft tissue and hard tissue enhancement functions that provide you with the superior imagery needed for effective dental diagnosis. As a final reminder, all clinicians should apply the standard of practice with respect to correct sensor positioning geometry and appropriate x-ray exposure parameters and note the clear presence of standard anatomic landmarks.

Once again, congratulations on your new **XDR** purchase! If you have any questions, please do not hesitate to contact us.

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Section 1: Exposure Settings and Histogram

1.1 Exposure Settings

(Users who are subscribers to XDR's Software Support Program may contact XDR at 888-XDR-XRAY 888-937-9729 to schedule an appointment with a technician to help your office establish the proper exposure settings for your x-ray generator.) Standard exposure is 33%-50% of D-speed film exposure, or equivalent to E speed film exposure.

The application of a proper exposure setting on your x-ray generator is pivotal in obtaining a diagnostic radiograph. To obtain the optimal radiographic image, adjustment for the proper exposure time according to the anatomic location and density of the tissue you are imaging is vital. The proper exposure parameter is determined by the area of interest as well as the gender, weight and age of the patient. Therefore, in general, the posterior teeth will require a higher exposure duration than the anterior teeth; and the maxillary teeth will require a higher exposure than the mandibular teeth.

The table below presents suggested exposure guidelines for the typical range of patients.

Location	Child	Small Adult	Large Adult
Anterior			
Mand. Posterior			
Max. Posterior			

Exposure guide for a 70 Kvp x-ray generator, 6 mA

Note: *The above is a recommendation only. Depending on the density of the area of interest on the individual patient, the exposure time may need to be adjusted for optimal image quality.*

1.2 The Histogram

The **Histogram** is a graphic representation of the pixels that make up the radiograph. Two red lines denote the RANGE. Between these lines, 256 shades of gray are displayed. The black curve within the range describes the distribution of those pixels dependent on their location on the gray scale. The area under that curve represents all of the pixels that make up that image.

As a rule of thumb, the left most range (red line) should be at or about the midpoint (50%) of the entire histogram window. Any time the left hand range is less than 50% (as shown below in Fig 001) the image may need a higher exposure parameter.

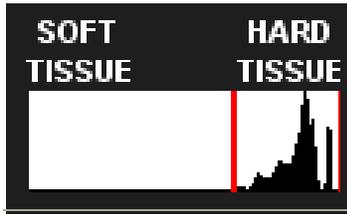


Figure 001: Example of under-exposure

A properly exposed image should have the left hand range at or about the halfway point (50%). Optimal images will have the left hand range between the midpoint (50%) and the extreme left (100%).

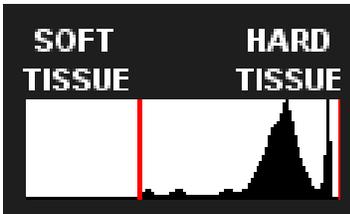


Figure 002: Example of proper exposure

This graphic control display adjusts the range of intensity that will be shown. If artifacts, like a cone cut, bias the data and produce an image that appears too light or too dark, you may use this control to adjust the qualities of the selected image being displayed. The area between the two red bars represents the portion of a captured 12-bit image that is being displayed. By default, this is initially set to encompass the entire range of the original image. Please make sure that all of the image histogram (intensity values) is within the two red lines. You can change the darker, lower data (less dense soft tissue) range by clicking and dragging anywhere near the left end of the red line. The further left you go the more dark data you include in the image display. Similarly, you change the upper range by clicking and dragging anywhere near the right end of the red line. The further right you go the more light data (dense tissue) you include in the image display. Note that the brightness control above does not change the range; it only affects how the image within the current range appears. Also, as with the rotation and contrast/brightness controls, the image will be stored and retrieved with the range setting that was last used prior to saving the exam. Superimposed in the background of this control is a small display of the distribution of intensity values. Use this graphic display to help guide you in properly bracketing the range of brightness values in an image.

Section 2: GETTING STARTED: THE MAIN MENU

2.1 Stand Alone Mode: Not bridged to Practice Management Software.

When starting *XDR* in the stand-alone mode, you are presented with the 'MAIN MENU', indicated at the upper left side of the screen. Clicking the buttons in the 'MAIN MENU' initiates five major operations, as described below.



Figure 003: Main Menu in Stand Alone mode



Figure 004: Exit Button

2.1.1 EXIT:

This button will terminate the *XDR* program completely and return you to your desktop. For your safety, a warning message will come up if there are any **unsaved** radiographs or other video images. You must save these images to the proper patient file before you exit *XDR* or you risk losing the captured images.



Figure 005: Patients Button

2.1.2 PATIENTS:

When using *XDR* in the stand-alone mode (i.e. not bridged to practice management software), the 'PATIENTS' button allows the user to retrieve or create a patient of record by displaying the 'PATIENTS LIST' form described in Section 3.1. It also leads you to the 'PATIENT EXAMS' form (see Figure 032), where you may take

radiographs in a formatted layout for a selected patient. You can also place a patient in the archive by clicking on the **'ARCHIVE UTILITY'** button described in Section 3.1.4.

(When XDR is bridged to the practice management software (PMS), the user will not be able to create a patient, update a patient's information, or archive a patient. All additions or changes of information will be handled by the Bridging process from the PMS and XDR.)



Figure 006: Fast Image Button

2.1.3 FAST IMAGE:

The 'Fast Image' button enables the user to quickly take repeated radiographs, intra-oral camera images, or import images from a file without recalling or creating a patient record. This is for the clinician who needs to capture a radiograph or video image immediately. Please put the unassigned images into the correct patient's file before continuing on to another patient. (In XDR versions prior to 3.0.1, the 'Fast Image' button is only available in Stand Alone mode.)

Clicking on the 'FAST IMAGE' button will bring up the 'FAST IMAGE' pop-up menu shown below in Figure 007 which presents to you several image capture choices: X-ray, Video, Scanner, File, or Paste from Clipboard.



Figure 007: 'FAST IMAGE' popup menu

Selecting the **'X-ray'** option initiates the radiograph capture sequence. The start of the capture sequence begins with appearance of the message, **'PLEASE WAIT'**. After three seconds the message, **'TAKE X-RAY NOW'** will appear. The sensor is now armed and ready to take an x-ray. The user has 5 minutes to expose the sensor before the system times out and puts up the message, **'TIMED OUT'**. If the session becomes timed out, the user must reinitiate the **'X-ray'** function to capture a radiographic image.

Upon exposure, the system will automatically detect the image capture event and display the message, **'PROCESSING X-RAY'**, during which time the radiograph is

captured, transferred to the computer, and processed. The captured radiograph will be enlarged and displayed on the screen.

As the menu items indicate, the user may also capture images from other sources. For example, if the user has a USB enabled or other intra-oral camera with a video capture card installed in the computer, the '**Video**' option will bring up a streaming video window that will enable still frames to be captured. This allows the use of intra-oral cameras to be used in conjunction with **XDR**. Similarly, images from **Scanners** and other **TWAIN** compliant devices (i.e. digital panoramic radiographic systems) as well as images from other **File** sources or images copied to the **Clipboard** may be captured by **XDR**. The image, when minimized, will be located at the lower left of the screen. The user can then place the cursor on the image and hold down the left mouse button to drag it to the final location on the screen.

No matter which mode of fast image is selected, after the first image is captured, the '**FAST IMAGE MENU**' appears (as shown in Figure 008), with the following options:



Figure 008: Fast Image Menu



Figure 009: Exit Fast Image Button

2.1.3.1 EXIT FAST IMAGE:

The '**EXIT FAST IMAGE**' button returns the user to the '**MAIN MENU**' and reactivates all the '**MAIN MENU**' buttons. If there are any captured images that have not been saved to a patient record, the user is warned to save them to the correct corresponding patient's file before initiating another function.



Figure 009: Exit Fast Image Button

2.1.3.2 PRINT:

The '**PRINT**' button brings up the utility for printing hard copies of any captured image on the screen. This is described in greater detail in 4.5.1.



Figure 010: Another Image Button

2.1.3.3 ANOTHER IMAGE:

The '**ANOTHER IMAGE**' button allows the user to immediately capture another image. The user may capture multiple images, and by assigning them to a patient, the user can save all of the captured images. If the '**ANOTHER IMAGE**' button is clicked, the same popup menu as before appears.



Figure 011: Another Image options in the Fast Image Menu

If additional images are captured, the previously captured image is reduced to a smaller image size at the lower left portion of the screen. As more images are captured, they will continue to accumulate at the lower left area of the screen. The user may move these images at any time by placing the cursor on the image while holding down the left mouse button and dragging the images to any location on the screen.



Figure 012: Stop Capture Button

2.1.3.4 STOP CAPTURE:

The '**STOP CAPTURE**' button allows you to stop a radiographic capture sequence. The red colored message, '**CAPTURE STOPPED**', soon appears allowing you to perform a different function. *This button will become inactive (grayed out) after the capture process has been completed or terminated.*



Figure 013: Assign to Patient Button

2.1.3.5 ASSIGN TO PATIENT:

The '**ASSIGN TO PATIENT**' button allows the user to place the images captured during the '**FAST IMAGE**' process into a layout and then save them to the correct corresponding patient's record in the **XDR** database.

Selecting the **'ASSIGN TO PATIENT'** button brings up the **XDR 'PATIENT LIST'**, which is the same dialogue box as the **'PATIENTS'** button in the **'MAIN MENU'**.

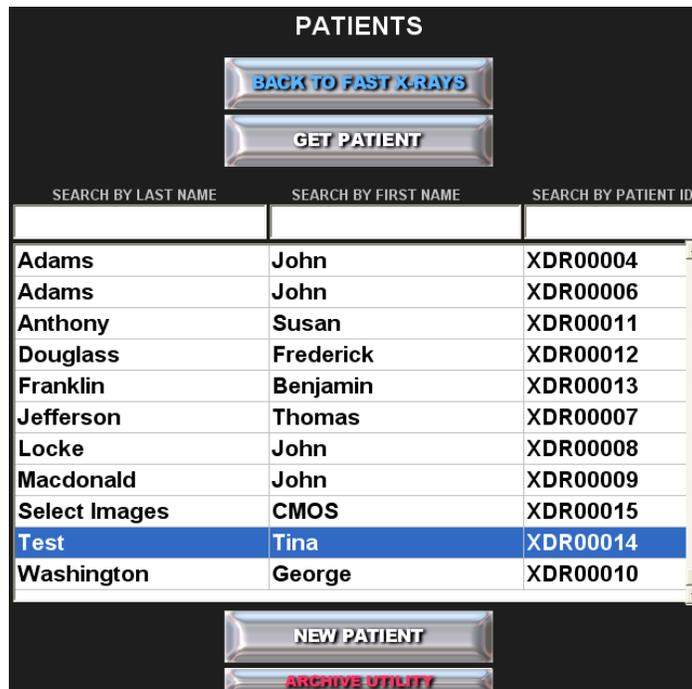


Figure 014: Patients List.

To transfer an image captured via FAST IMAGE, the patient's name must be in the XDR 'PATIENTS' List.

In the 'PATIENT LIST,' the user can select an existing patient or create a new patient record before the images are saved into the corresponding patient's record in the XDR database.

If the system is in stand-alone, and you do not already have the correct corresponding patient's record in the XDR database, click on the 'New Patient' button to create the correct corresponding patient's record.

If the system is bridged, the patient's XDR record must be created through the Practice Management System. Do this by, first inputting the patient's information in the Practice Management System, then launching XDR with a click of the users bridging 'Protocol'.

Select the patient by double clicking with the left mouse button, or by highlighting the patient and selecting **'GET PATIENT'**. This takes the user to the **'PATIENT EXAMS'** screen as seen in Figure 14.

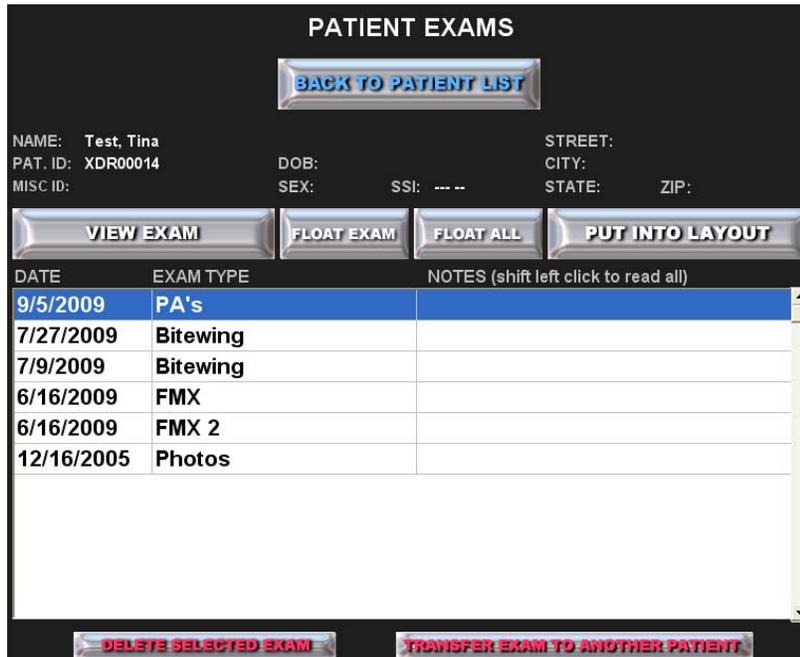


Figure 015: Patient Exams Screen

In the 'Patient Exams' screen, select the 'PUT INTO LAYOUT' button.



Figure 016: Put Into Layout Button

The 'PUT INTO LAYOUT' button takes the user to the 'LAYOUT MENU'.

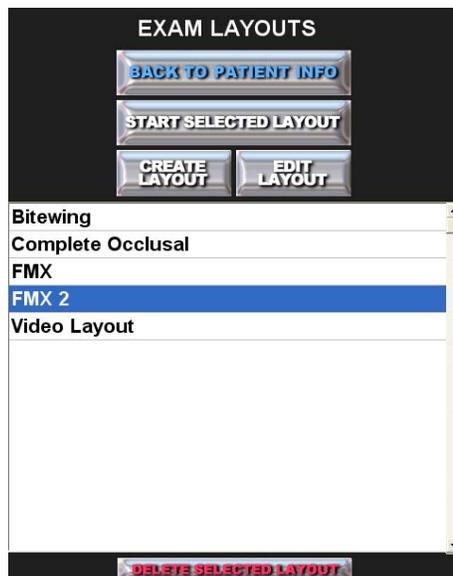


Figure 017: Exam Layouts Menu

Select a layout from the 'EXAM LAYOUTS' menu by double clicking the layout or single clicking and pressing the 'START SELECTED LAYOUT' button. This will open the a window similar to the one seen in Figure 018.

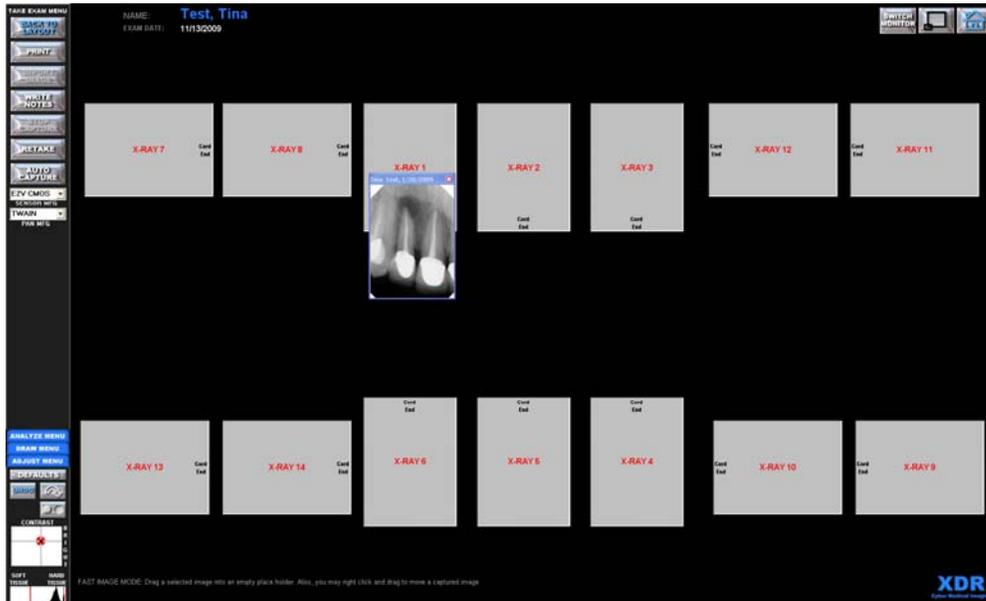


Figure 018: Free Image Placement in Exam

Place the pointer on the image (not the title bar) while holding down the left mouse button and drag the image over the desired image icon in the layout. When the mouse button is released, the image will be placed into the tile. Perform this step for all the images you would like to put into a layout, and then select **'SAVE TO RECORDS'**.

Placing the radiographs into a formatted exam layout, as described above, is very important. With this function, the user may choose to save the captured images from one or more patients or to correct the corresponding patient's record in the **XDR** database. This versatility allows the user to work with more than one patient at a time. However, care should be taken to stay organized by physically grouping related radiographs or images for each corresponding patient.

Please take extreme care to save and assign the correct images to the correct corresponding patient.



Figure 019: Settings Button

2.1.4 SETTINGS:

The **'SETTINGS'** button brings up the **'PROGRAM SETTINGS'** form. The **'SETTINGS'** button allows the user to change operational settings, control display size and sensor type. **See Section 2.3**



Figure 020: Support Website Button

2.1.5 SUPPORT WEBSITE:

This button will take you to the **XDR** software support web page, www.XDRSupport.com. Please call **888-XDR-XRAY (888-937-9729)** to speak with our technical support team to help you with any issues you may be having

with *XDR*. *You must be an annual subscriber to the XDR technical support to receive this service.*



Figure 021: Switch Monitor Button

2.1.6 SWITCH MONITOR:

This button allows users with dual monitors (two monitors connected to a single PC) to switch from displaying *XDR* from the primary monitor to the secondary monitor or visa versa. **(This button will appear in the upper right hand corner of the *XDR* screen at all times.)**



Figure 022: Minimize Button

2.1.7 MINIMIZE *XDR*:

This button allows the user to minimize the *XDR* program on your monitor display in order to view or access other programs or applications. **(This button will appear in the upper right hand corner of the *XDR* screen at all times.)**



Figure 023: Home Button

2.1.8 HOME/MAIN MENU:

This button will bring the user to the '**MAIN MENU**' or Home from anywhere in the program. It will close any open dialogue boxes, radiographs or databases before doing so. The user may find this to be a very convenient way to rapidly navigate back to the '**MAIN MENU**' from anywhere in the program. **(This button will appear in the upper right hand corner of the *XDR* screen at all times.)**

2.2 Bridged Mode: Using *XDR* with a (PMS) Practice Management System.

When *XDR* is set to bridge mode, it will allow the user to launch *XDR* through their Practice Management System. The user will always create the patient, select the patient, and update patient information, all via the Practice Management System.

*(The user may launch **XDR** directly from the desktop or through the PMS and will be presented with the 'MAIN MENU' screen as seen below. The user may access the patients directly through **XDR** and operate all of its functions. When **XDR** is bridged to practice management software (PMS), the user will not be able to create a patient, update a patient's information, or archive a patient through **XDR**. All such functions will need to be performed via the PMS.)*



Figure 24: Main Menu in Bridged Mode



Figure 025: Exit Button

2.2.1 EXIT:

This button will terminate the *XDR* program completely and return you to your desktop. For your safety, a warning message will come up first if there are any **unsaved** captured radiographs or any other type of images. You must save these images to the correct patient's record in the *XDR* database before you exit *XDR* or you may risk losing the images.



Figure 026: Patients Button

2.2.2 PATIENTS:

When using **XDR** in the bridge mode (i.e. connected to practice management software), the '**PATIENTS**' button allows the user to retrieve a patient of record from the **XDR** database by displaying the '**PATIENTS LIST**' form as described in Section 2.1.2. *The user may access the patients directly through **XDR** and operate all of its functions.*

*(When **XDR** is bridged to practice management software (PMS), the user will not be able to create a patient, update a patient's information, or archive a patient. All such functions will need to be performed via the PMS or by switching out of Bridge Mode.)*



Figure 027: Fast Image Button

2.2.3 FAST IMAGE:

The '**Fast Image**' button enables the user to quickly take repeated radiographs, intra-oral camera images, or import images from a file without recalling or creating a patient record. This is for the clinician who needs to capture a radiograph or video image immediately. Please put the unassigned images into the correct patient's file before continuing on to another patient. *(In **XDR** versions prior to 3.0.1, the '**Fast Image**' button is only available in Stand Alone mode.)*

Clicking on the '**FAST IMAGE**' button will bring up the '**FAST IMAGE**' pop-up menu shown below in Figure 028 which presents to you several image capture choices: X-ray, Video, Scanner, File, or Paste from Clipboard.



Figure 028: 'FAST IMAGE' popup menu

Selecting the '**X-ray**' option initiates the radiograph capture sequence. The start of the capture sequence begins with appearance of the message, '**PLEASE WAIT**'. After three seconds the message, '**TAKE X-RAY NOW**' will appear. The sensor is now armed and ready to take an x-ray. The user has 5 minutes to expose the

sensor before the system times out and puts up the message, **'TIMED OUT'**. If the session becomes timed out, the user must reinitiate the **'X-ray'** function to capture a radiographic image.

Upon exposure, the system will automatically detect the image capture event and display the message, **'PROCESSING X-RAY'**, during which time the radiograph is captured, transferred to the computer, and processed. The captured radiograph will be enlarged and displayed on the screen.

As the menu items indicate, the user may also capture images from other sources. For example, if the user has a USB enabled or other intra-oral camera with a video capture card installed in the computer, the **'Video'** option will bring up a streaming video window that will enable still frames to be captured. This allows the use of intra-oral cameras to be used in conjunction with **XDR**. Similarly, images from **Scanners** and other **TWAIN** compliant devices (i.e. digital panoramic radiographic systems) as well as images from other **File** sources or images copied to the **Clipboard** may be captured by **XDR**. The image, when minimized, will be located at the lower left of the screen. The user can then place the cursor on the image and hold down the left mouse button to drag it to the final location on the screen.

No matter which mode of fast image is selected, after the first image is captured, the **'FAST IMAGE MENU'** appears (as shown in Figure 029), with the following options:



Figure 029: Fast Image Menu



Figure 030: Exit Fast Image Button

2.2.3.1 EXIT FAST IMAGE:

The **'EXIT FAST IMAGE'** button returns the user to the **'MAIN MENU'** and reactivates all the **'MAIN MENU'** buttons. If there are any captured images that have not been saved to a patient record, the user is warned to save them to the correct corresponding patient's file before initiating another function.



Figure 031: Exit Fast Image Button

2.2.3.2 PRINT:

The 'PRINT' button brings up the utility for printing hard copies of any captured image on the screen. This is described in greater detail in 4.5.1.



Figure 032: Another Image Button

2.2.3.3 ANOTHER IMAGE:

The 'ANOTHER IMAGE' button allows the user to immediately capture another image. The user may capture multiple images, and by assigning them to a patient, the user can save all of the captured images. If the 'ANOTHER IMAGE' button is clicked, the same popup menu as before appears.



Figure 033: Another Image options in the Fast Image Menu

If additional images are captured, the previously captured image is reduced to a smaller image size at the lower left portion of the screen. As more images are captured, they will continue to accumulate at the lower left area of the screen. The user may move these images at any time by placing the cursor on the image while holding down the left mouse button and dragging the images to any location on the screen.



Figure 034: Stop Capture Button

2.2.3.4 STOP CAPTURE:

The 'STOP CAPTURE' button allows you to stop a radiographic capture sequence. The red colored message, 'CAPTURE STOPPED', soon appears allowing you to perform a different function. *This button will become inactive (grayed out) after the capture process has been completed or terminated.*



Figure 035: Assign to Patient Button

2.2.3.5 ASSIGN TO PATIENT:

The 'ASSIGN TO PATIENT' button allows the user to place the images captured during the 'FAST IMAGE' process into a layout and then save them to the correct corresponding patient's record in the *XDR* database.

Selecting the 'ASSIGN TO PATIENT' button brings up the *XDR* 'PATIENT LIST', which is the same dialogue box as the 'PATIENTS' button in the 'MAIN MENU'.

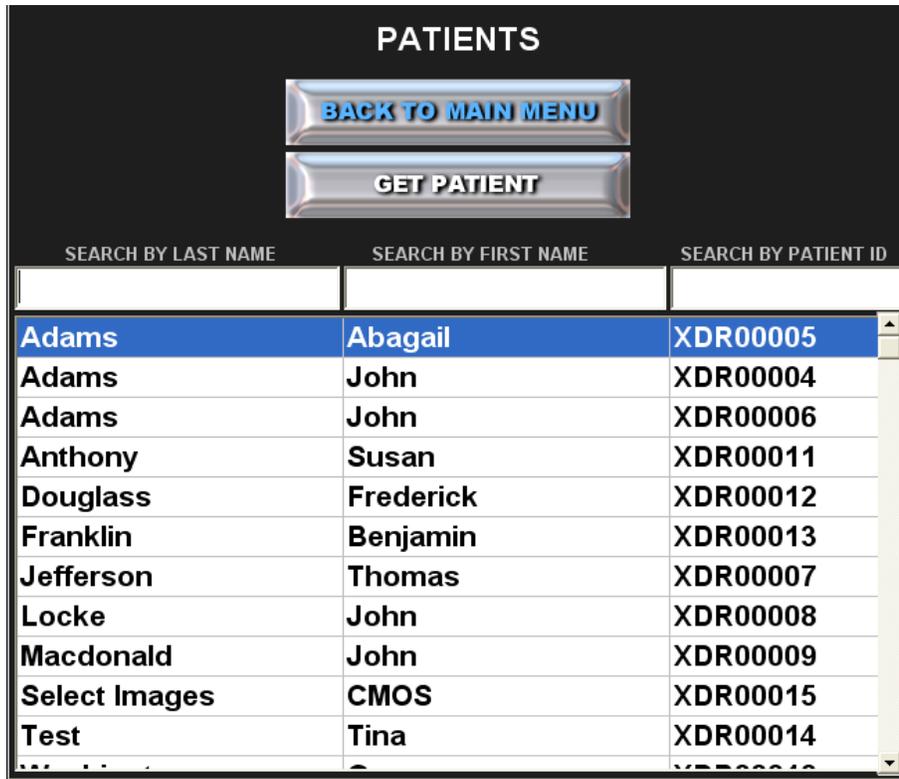


Figure 036: Patients List.

To transfer an image captured via FAST IMAGE, the patient's name must be in the *XDR* 'PATIENTS' List.

In the 'PATIENT LIST,' the user can select an existing patient or create a new patient record before the images are saved into the corresponding patient's record in the *XDR* database.

If the system is in stand-alone, and you do not already have the correct corresponding patient's record in the *XDR* database, click on the 'New Patient' button to create the correct corresponding patient's record.

If the system is bridged, the patient's *XDR* record must first be created through the Practice Management System. Do this by, first, inputting the patient's information in the Practice Management System, and then launching *XDR* with a click of the users bridging 'Protocol'. See Section 2.3.11-13

Select the patient by double clicking with the left mouse button, or by highlighting the patient and selecting 'GET PATIENT'. This takes the user to the 'PATIENT EXAMS' screen as seen in Figure 37.

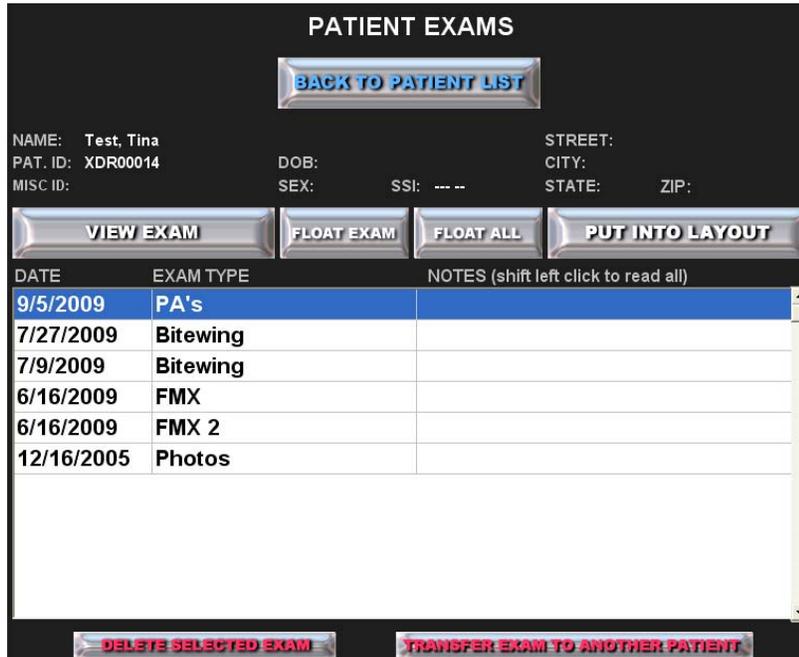


Figure 037: Patient Exams Screen

In the 'Patient Exams' screen, select the 'PUT INTO LAYOUT' button.



Figure 038: Put Into Layout Button

2.2.3.5.1 PUT INTO LAYOUT:

The 'PUT INTO LAYOUT' button takes the user to the 'EXAM LAYOUTS' menu.

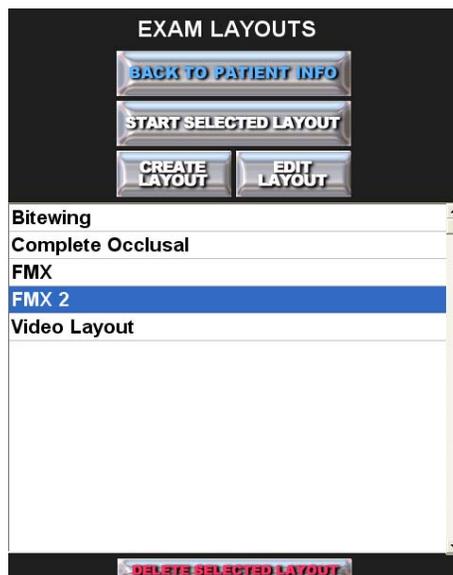


Figure 039: Exam Layouts Menu

Select a layout from the **'EXAM LAYOUTS'** menu by double clicking the layout or single clicking and pressing the **'START SELECTED LAYOUT'** button. This will open the a window similar to the one seen in Figure 040.



Figure 040: Free Image Placement in Exam

Place the pointer on the image (not the title bar) while holding down the left mouse button and drag the image over the desired image icon in the layout. When the mouse button is released, the image will be placed into the tile. Perform this step for all the images you would like to put into a layout, and then select **'SAVE TO RECORDS'**.

Placing the radiographs into a formatted exam layout, as described above, is very important. With this function, the user may choose to save the captured images from one or more patients or to correct the corresponding patient's record in the **XDR** database. This versatility allows the user to work with more than one patient at a time. However, care should be taken to stay organized by physically grouping related radiographs or images for each corresponding patient.

Please take extreme care to save and assign the correct images to the correct corresponding patient.



Figure 041: Settings Button

2.2.4 SETTINGS:

The **'SETTINGS'** button brings up the **'PROGRAM SETTINGS'** form. The **'SETTINGS'** button allows the user to change operational settings, control display size and sensor type. See Section 2.3.



Figure 042: Support Website Button

2.2.5 SUPPORT WEBSITE :

This button will take you to our software support web page, www.XDRSupport.com. Please call 888-XDR-XRAY (888-937-9729) to speak with our support team to help you with any issues you may be having with *XDR*.



Figure 043: Switch Monitor Button

2.2.6 SWITCH MONITOR:

This button will allow users with dual monitors (two monitors connected to a single PC) to switch from displaying *XDR* from the primary monitor to the secondary monitor or visa versa. **(This button will appear in the upper right hand corner of the *XDR* screen at all times.)**



Figure 044: Minimize Button

2.2.7 MINIMIZE XDR:

This button allows the user to minimize or maximize the *XDR* program on your monitor display in order to view or access other programs or applications. **(This button will appear in the upper right hand corner of the *XDR* screen at all times.)**



Figure 045: Home Button

2.2.8 HOME/MAIN MENU:

This button will bring the user to the 'MAIN MENU' or Home from anywhere in the program. It will close any open dialogue boxes, radiographs or databases before doing so. The user may find this to be a very convenient way to rapidly navigate back to the 'MAIN MENU' from anywhere in the program. **(This button will appear in the upper right hand corner of the *XDR* screen at all times.)**

2.3 Program Settings Description

Figure 46: 'BASIC PROGRAM SETTINGS' Form for adjusting display and sensor options.

Figure 47: 'ADVANCED PROGRAM SETTINGS' Form for adjusting display and sensor options.



Figure 048: Display Size

2.3.1 Set the image DISPLAY SIZE:

The user is able to adjust the image display size (the size the image will appear on the computer screen) by sliding the pointer bar on the 'display size' control and

setting it between 20% and 100%. We recommend the user set it at 100% to maximize the utilities of the computer monitor.

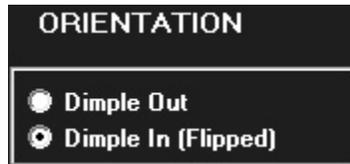


Figure 049: Orientation

2.3.2 Set the RADIOGRAPHIC IMAGE ORIENTATION (Dimple in /Dimple out):

The user can set the orientation of the radiographic images to 'Dimple In' or 'Dimple Out (Flipped)'. This is analogous to the "Dimple" on conventional dental film. 'Dimple Out' is most commonly used.



Figure 050: Monitor Selection

2.3.3 Select the Primary Monitor to SHOW XDR ON:

For the user who has more than one monitor in the operatory, this option will allow the user to choose which monitor to view XDR on. The users can choose Monitor 1 or Monitor 2 to display XDR.



Figure 051: Save Retakes

2.3.4 Save ALL Retakes:

The user can select the 'Save Retakes' option if they would like to save ALL of their retakes. If the user selects 'Save Retakes', the user will have to edit the exam to delete the images they choose not to keep.

If the user does not have the 'Save Retakes' option selected, the user will have to left click on the image they want to keep (a blue outline will appear around the selected image). This will bring the image to the front of the stack of images for that tile. The image last selected and on top of the stack will be saved and all other retakes will be discarded (*be very careful in selecting the saved image because the discarded images cannot be recovered*).

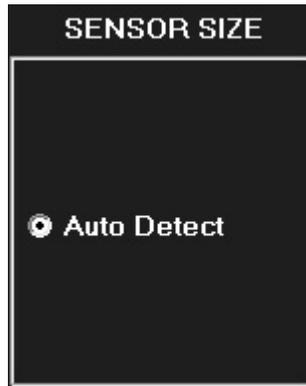


Figure 052: Sensor Size

2.3.5 Select the SENSOR SIZE:

The only option available is '**Auto Detect**'. This is recommended for offices with more than one sized sensor. Any other choice should only be done by an XDR Tech.

*For versions prior to 3.0.1: This option allows the user to select sensor size by clicking one of the options labeled '**AUTO DETECT**', '**SIZE 1 LOW RES**', '**SIZE 1 HIGH RES**' and '**SIZE 2 HIGH RES**'. XDR will also allow the user to change sensor types during an exam.*



Figure 053: Intraoral

2.3.6 Select the INTRAORAL TYPE:

Currently **XDR** interfaces with intraoral sensors from several manufacturers. Be sure to select the correct manufacturer by clicking the correct option labeled '**E2V**', '**SUNI**', '**E2V Type II**', '**RSV**', '**Atmel**', '**EVA**' (DentX), '**SCAN X**', '**Denoptics GXTwain**', '**Rad-icon**', '**E2V CMOS**', or Kodak 5k-6k.

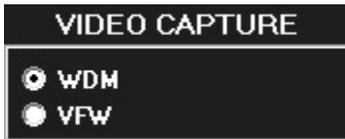


Figure 054: Video Capture

2.3.7 Select the VIDEO CAPTURE window:

Choose either 'WDM' or 'VFW'.

Windows driver model (WDM) is a more robust platform for Microsoft Windows operating systems and offers better user experiences with new imaging hardware for Windows-based PCs.

Video for Windows: (VfW, also referred to as Video Compression Manager (VCM)) was a [multimedia framework](#) developed by [Microsoft](#) that allowed [Microsoft Windows](#) to play [digital video](#).

Please contact your IT technical support or *XDR technical support* if you are unsure about this setting.

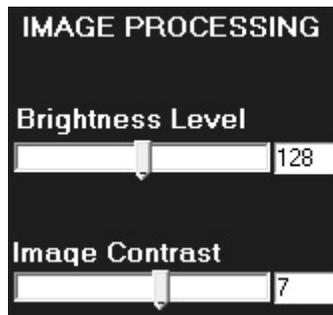


Figure 055: Image Processing

2.3.8 Set the IMAGE PROCESSING Defaults: AUTOMATIC IMAGE PROCESSING:

This option allows the user to set the default appearance of the radiographs. The slider bar labeled '**Brightness Level**' controls the default brightness of a newly captured radiograph. '**Brightness Level**' dynamically adjusts the image brightness depending upon image content (i.e. amount of crown and bridge present). To begin, '**Brightness Level**' should be set at 130. The slider bar labeled '**Image Contrast**' controls the default contrast of newly captured radiographs based on the same information as the '**Brightness Level**'. To begin, Image Contrast should be set at 7.



Figure 056: Image Viewing Options

2.3.9 Other Image Display settings:

AUTOMATIC SPECKLE REDUCTION, SHARPEN, and ADD ULTRA SHARP: The user may check any of the three boxes labeled '**Speckle Reduction**', '**Sharpen**', and/or '**Add Ultra Sharp**' to enhance the contrast, reduce speckle noise or sharpen images automatically as they are captured. Note that these are dynamic reversible enhancements and do not affect the actual stored image data. We do not

recommend the user set any of these filters on by default. We recommend the clinician always view the radiographic images in its native state before applying any filters. We believe the filters should be used by the clinician on a case by case and site-specific basis.



Figure 057: BB Size

2.3.10 Set the BB size for the Unwarp tool:

In the 'Settings' Menu, use the pointer to slide the pointer bar to the correct size (use the left and right arrows for fine adjustment) of the BB used in the 'EZ Grip' (**1.6mm is the current BB size used**). Then click save.



Figure 058: Bridged Radio Button

2.3.11 Select Bridging to Practice Management Software:

The purpose of bridging is to synchronize patient name and ID number in your practice management software with *XDR*. To implement bridging in *XDR*, the user must select **YES**.



Figure 059: Bridge By: Radio Button

2.3.12 The BRIDGE BY option:

This option selects how the users Practice Management Software will communicate with *XDR*. The user should bridge by using the '**PATIENT ID**' (a **unique patient identifier**), unless the Practice Management System is unable to pass this information. If that is the case, then bridge by '**PATIENT NAME**'.



Figure 060: Protocol Radio Button

2.3.13 Select the bridging PROTOCOL:

(XDR supports one way bridging from most practice management systems. This is an advanced feature and is best left to your dental dealer, IT specialist or XDR technical representative to perform the set up.) Select the bridging 'PROTOCOL' that is in the list dependent on your specific PMS. If the user's PMS is Mogo, Trophy, Dentalvision, Eaglesoft (AIM), File Based (i.e. SoftDent), Practiceworks, PerfectByte or PatientBase/DataCon, the user may select these options and bridge directly without using Datagrabber.

If 'DATAGRABBER' is needed: Your IT professional or your XDR technical representative should configure Datagrabber.



Figure 061: OK and Cancel Buttons

2.3.14 OK (Save) or Cancel setting changes:

The 'OK' button applies the changes you selected and exits the dialogue box. The 'CANCEL' button exits a dialogue box without applying any changes you may have selected.

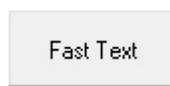


Figure 062: Fast Text

2.3.15 Fast Text:

The Fast Text button allows the user to input phrases they may often use. With the Fast Text feature, the user can type in a phrase and save it to be used anytime text is invoked. This Fast Text feature is specific for each computer. For example, the front desk computers can have their own Fast Text options (such as "Refer tooth # to Endo" or "Pay claim for tooth #".)

When the user clicks on the Fast Text button, the 'Enter Fast Text Items' window appears on the screen as seen in Figure 063.

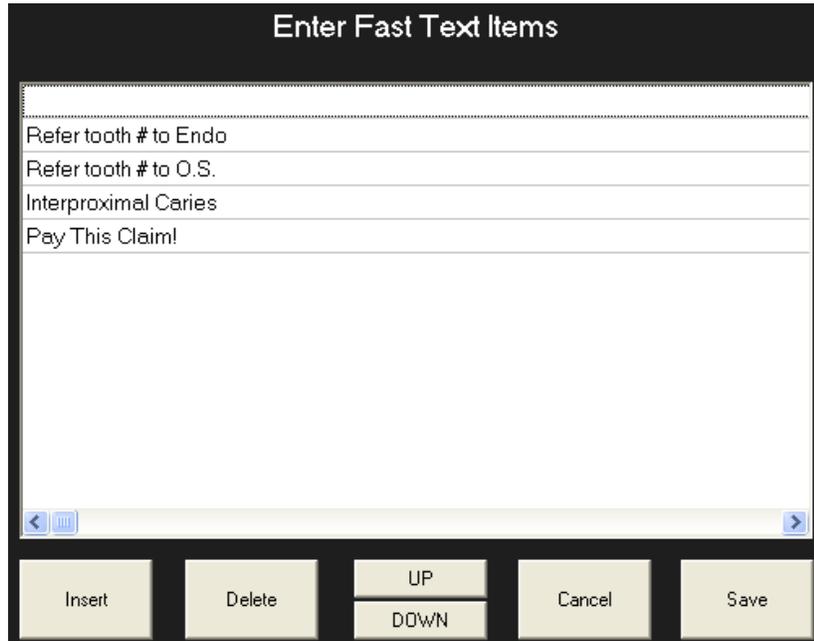


Figure 063: Fast Text window

To create a Fast Text list, type in the phrase on the top line and click insert. The user can highlight the phrase or delete it as well as move the phrase up and down the list. The user can also cancel any changes or save the changes made. Once the user has created a Fast Text list, this list can be used anytime text is invoked (like on the print page, write notes or image annotations in **XDR**) by clicking the right mouse button and selecting a phrase from the Fast Text Menu.



Figure 064: Other Advanced Tab Options:

All other settings options in the settings menu ('Print Formats', 'Pan-Ceph', 'Use Default Twain settings', 'Post Images', and any Default settings) should only be set by an IT professional or by our XDR IT specialists.

3 Managing Patient Records

XDR allows the user to create and maintain personal information and radiographs taken for each patient. Access to these patient's records is provided by the 'PATIENTS LIST' form, which is described below. *To maintain database integrity, it is essential that the user never alter the contents of the 'Patients' subdirectory. Any problems saving or retrieving patient data should be immediately reported to XDR Technical Support.*

3.1 Patient List (Stand Alone Mode)

This 'Patients' list appears when the user clicks the 'PATIENTS' button located in the 'MAIN MENU'. This form provides the options shown below.

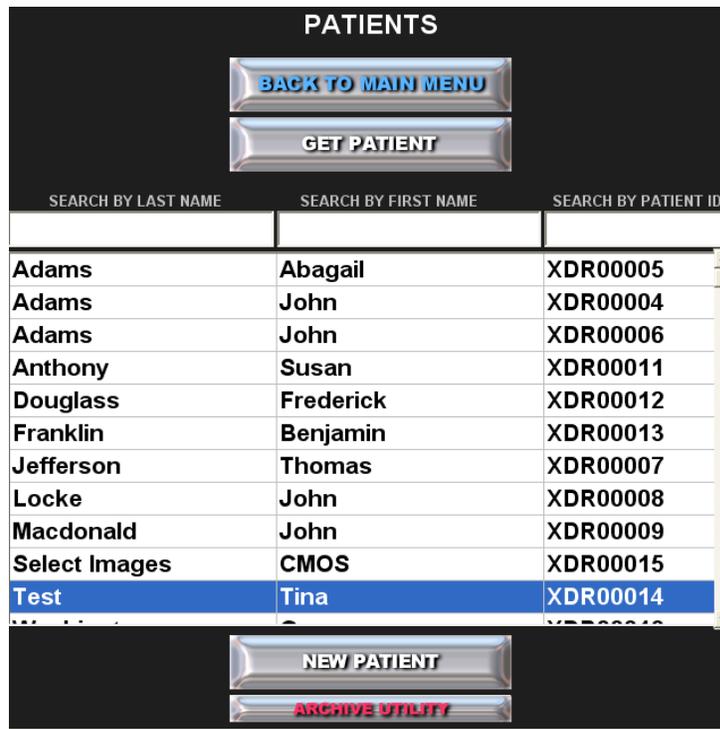


Figure 065: 'PATIENTS LIST' form as seen in Stand Alone for selecting, creating and archiving individual patients from the XDR database. The ARCHIVE UTILITY button is only available when XDR is set to Stand Alone.



Figure 066: Back to Main Menu Button

3.1.1 Back to Main Menu:

The 'BACK TO MAIN MENU' button in the 'PATIENTS' list returns the user to the 'MAIN MENU' (See Figure 024).



Figure 067: Get Patient Button

3.1.2 Select or GET PATIENT:

The 'GET PATIENT' function is used to retrieve the records of an existing patient. This button accesses the record of the patient whose name is highlighted in blue in the **PATIENTS LIST**. (See Figure 065)

The user can search for a specific patient by their last name or patient ID number. **XDR** will search for the desired patient alphabetically when the user types the first few letters of the patient's last name in the small '**SEARCH BY LAST NAME**' box on the top left side of the form. The patient can also be located by scrolling up or down the patient list with the scroll bar. Once the desired patient's name is found, the patient can be selected by highlighting the patient name with a single left mouse click.

The records for the selected patient can be accessed using the '**GET PATIENT**' button or by a *double-left mouse click* on the *highlighted* patient's name in the patient list. Either action will display the '**PATIENT EXAMS**' form (See Figure 065).

DATE	EXAM TYPE	NOTES (shift left click to read all)
9/5/2009	PA's	
7/27/2009	Bitewing	
7/9/2009	Bitewing	
6/16/2009	FMX	
6/16/2009	FMX 2	
12/16/2005	Photos	

Figure 068: Patient Exam form as seen in Stand Alone mode

The '**PATIENT EXAMS**' form lists all exams taken for a patient in chronological order, along with the patient's personal information that has been manually inputted by the user.



Figure 069: New Patient Button

3.1.3 NEW PATIENT:

The 'NEW PATIENT' button is used to create a new patient record by bringing up the **PLEASE ENTER PATIENT INFORMATION** box (See Figure 070).

A screenshot of a patient information form titled "PLEASE ENTER PATIENT INFORMATION". The form is set against a black background with white text and input fields. It includes fields for Last Name, First name, Middle, PAT. ID, SSI, DOB, SEX, MISC ID, STREET, CITY, STATE, ZIP, PHONE (HOME), and PHONE (WORK). At the bottom, there are two buttons: "SAVE PATIENT DATA" and "CANCEL DATA ENTRY".

Figure 70: Patient Information Form
(This form is only available in Stand Alone mode)

To create a new patient, enter the patient's information and select '**SAVE PATIENT DATA**'. As soon as the patient's information has been saved, the new patient record will be added to the **XDR** database. The name of the new patient will immediately appear in the **PATIENT LIST** box in alphabetical order. To cancel a patient's entry, click the '**CANCEL DATA ENTRY**' button.



Figure 071: Archive Utility Button

3.1.4 ARCHIVE UTILITY:

The '**Archive Utility**' button in the '**PATIENTS**' list brings up the 'Archive' Screen as seen in Figure 072. This utility (only found when not in Bridge mode) allows the user to move patients from the Active Patients list to the Archived Patients list in an archive folder. Once moved here, the user will no longer see the patients exams or name in the '**PATIENT LIST**' seen in Figure 65.

ARCHIVE

BACK TO PATIENT LIST

CURRENT ACTIVE PATIENTS			ARCHIVED PATIENTS		
LAST NAME	FIRST NAME	ID	LAST NAME	FIRST NAME	ID
Adams	Abigail	XDR00005	Test	Tina	XDR00014
Adams	John	XDR00004			
Adams	John	XDR00006			
Anthony	Susan	XDR00011			
Douglass	Frederick	XDR00012			
Franklin	Benjamin	XDR00013			
Jefferson	Thomas	XDR00007			
Locke	John	XDR00008			
Macdonald	John	XDR00009			
Select Images	CMOS	XDR00015			
Washington	George	XDR00010			

SEND TO ARCHIVE **RESTORE FROM ARCHIVE**

Figure 072: 'ARCHIVE' form for selecting and archiving inactive patients from the patient list.



Figure 073: Back to Patient List Button

3.1.4.1 BACK TO PATIENT LIST from the 'ARCHIVE':

The '**BACK TO PATIENT LIST**' button returns the user to the '**PATIENT LIST**' form.



Figure 074: Send to Archive Button

3.1.4.2 SEND TO ARCHIVE:

The '**SEND TO ARCHIVE**' button, in the '**PATIENTS**' list, brings up the '**ARCHIVE UTILITY**' form which allows the user to move inactive patient records from the active patient's database into an archive directory by clicking the '**SEND TO ARCHIVE**' button (See Figure 037).



Figure 075: Restore from Archive Button

3.1.4.3 RESTORE FROM ARCHIVE:

This is the reverse of the function above. Any inactive patients in the '**ARCHIVE UTILITY**' can be restored at any time by highlighting the patient name in the Archived Patient list and clicking the '**RESTORE FROM ARCHIVE**' button.

PATIENTS		
BACK TO MAIN MENU		
GET PATIENT		
SEARCH BY LAST NAME	SEARCH BY FIRST NAME	SEARCH BY PATIENT ID
Adams	Abigail	XDR00005
Adams	John	XDR00004
Adams	John	XDR00006
Anthony	Susan	XDR00011
Douglass	Frederick	XDR00012
Franklin	Benjamin	XDR00013
Jefferson	Thomas	XDR00007
Locke	John	XDR00008
Macdonald	John	XDR00009
Select Images	CMOS	XDR00015
Test	Tina	XDR00014

Figure 076: Patients List in Bridge Mode

3.2 Patient List (In Bridge Mode)

This form appears when the user clicks the **'PATIENTS'** button located on the **'MAIN MENU'**. This form provides the options shown below when in bridge mode.



Figure 077: Back to Patient List Button

3.2.1 Back to 'PATIENT LIST' from the 'PATIENT EXAMS':

The **'BACK TO PATIENT LIST'** button returns the user to the **'PATIENT LIST'** form.



Figure 078: Get Patient Button

3.2.2 Select or 'GET PATIENT':

The **'GET PATIENT'** function is used to retrieve the records of an existing patient. This button accesses the record of the patient whose name is highlighted in blue in the **'PATIENT LIST'** (See Figure 040).

The user can search for a specific patient by their last name, first name or patient ID number. **XDR** will search for the desired patient alphabetically when the user types the first few letters of the patient's last name in the small **'SEARCH BY LAST NAME'** box on the top left side of the form. To search for a patient using first name, utilize the same method but use the box labeled **'SEARCH BY FIRST NAME'**. The patient can also be located by scrolling up or down the patient list

with the scroll bar. Once the desired patient's name is found, the patient can be selected by highlighting the patient name with a single left mouse click.

The user can also search for a patient by patient number. To do this, type the unique patient ID number given by the user's Practice Management System into the '**SEARCH BY PATIENT ID**' box on the top right side of the form.

The records for the selected patient can be accessed using the '**GET PATIENT**' button or by a *double-left mouse click* on the *highlighted* patient's name in the patient list. Either action will display the '**PATIENT EXAMS**' form seen in Figure 079.

The screenshot shows a software interface titled "PATIENT EXAMS". At the top center is a button labeled "BACK TO PATIENT LIST". Below this, patient information is displayed in two columns. The left column contains: NAME: Test, Tina; PAT. ID: XDR00014; MISC ID: (blank). The right column contains: STREET: (blank); CITY: (blank); STATE: (blank); ZIP: (blank). Below the patient information are four buttons: "VIEW EXAM", "FLOAT EXAM", "FLOAT ALL", and "NEW EXAM". The main area of the form is a table with three columns: "DATE", "EXAM TYPE", and "NOTES (shift left click to read all)". The table contains six rows of exam data. The first row is highlighted in blue. At the bottom of the form are two buttons: "DELETE SELECTED EXAM" and "TRANSFER EXAM TO ANOTHER PATIENT".

DATE	EXAM TYPE	NOTES (shift left click to read all)
9/5/2009	PA's	
7/27/2009	Bitewing	
7/9/2009	Bitewing	
6/16/2009	FMX	
6/16/2009	FMX 2	
12/16/2005	Photos	

Figure 079: The 'PATIENT EXAMS' form will list all of the exams taken for a patient in chronological order as well as the patient's personal information.

Patient Exams Form

The main feature of the '**PATIENT EXAMS**' form is the '*Exam List Box*' in the bottom white portion of the form. This shows all of the patient's exams (each exam consisting of one or more grouped radiographs and/or video images) for the selected patient on a particular date and any associated progress notes as well as the patient's personal information as illustrated in Figure 080.

3.3 Patient Exams form (in Stand Alone Mode)

Similar to the functionality of the '**PATIENT LIST**' form, the user can select a particular exam by scrolling up or down the list and *single clicking* on the desired exam (which will become highlighted in blue as shown below). The user can, then, select the '**VIEW EXAM**' button or use a *double left mouse click* to open the chosen exam.

PATIENT EXAMS

BACK TO PATIENT LIST

NAME: Test, Tina **UPDATE DATA** STREET:
PAT. ID: XDR00014 DOB: CITY:
MISC ID: SEX: SSI: --- -- STATE: ZIP:

VIEW EXAM **FLOAT EXAM** **FLOAT ALL** **NEW EXAM**

DATE	EXAM TYPE	NOTES (shift left click to read all)
9/5/2009	PA's	
7/27/2009	Bitewing	
7/9/2009	Bitewing	
6/16/2009	FMX	
6/16/2009	FMX 2	
12/16/2005	Photos	

DELETE SELECTED EXAM **TRANSFER EXAM TO ANOTHER PATIENT**

Figure 080: 'PATIENT EXAMS' form for retrieving existing exams or taking new exams (As viewed in Stand Alone Mode.)



Figure 081: Home Button

3.3.1 VIEW EXAM:

This button in the '**PATIENT EXAMS**' form retrieves the selected exam highlighted in the '*Exam List Box*'. The user may also use a *double left mouse click* to open the chosen exam. Images from the selected exam will appear on the screen as

illustrated in Figure 148 of Section 4.3. Note that all the radiographs in the exam will initially appear as smaller images arranged according to the layout chosen by the user.



Figure 082: Home Button

3.3.2 FLOAT EXAM:

Selecting the '**FLOAT EXAM**' button will minimize XDR and open a new window as seen in figure 083. The *XDR Floater* screen will "float" the selected exam on the desktop and will remain on top of any other active software, like the PMS, so the user can simultaneously work with other programs while viewing the patient's images or x-rays on the same monitor. The user can customize the *XDR 'Float Exam'* screen in its vertical and horizontal dimensions to fit any area in the PMS software that is not in use. The *XDR 'FLOAT EXAM'* will remember both the position and size of this customized configuration anytime it is invoked in the future.

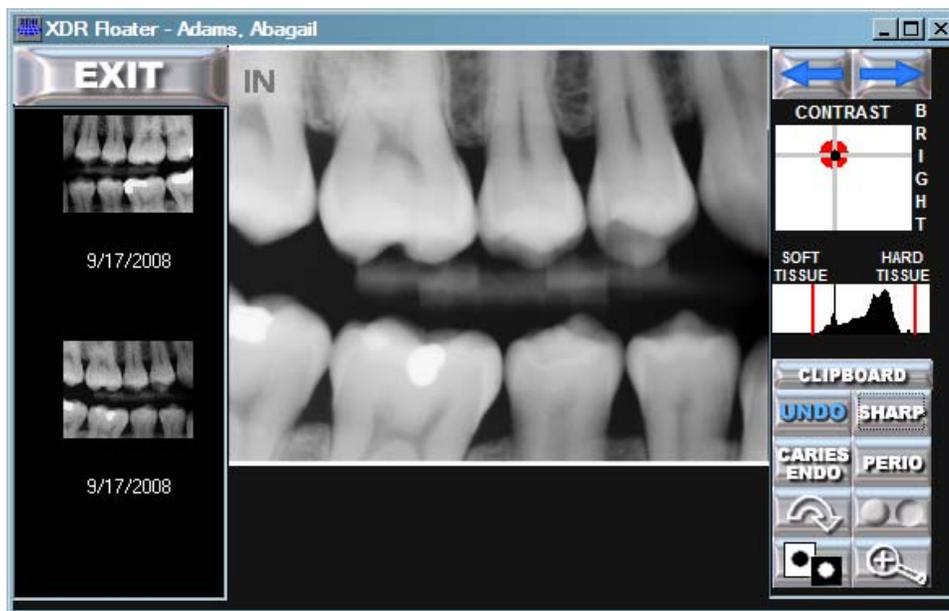


Figure 083: Float Exam Window



Figure 084: Home Button

3.3.3 FLOAT ALL:

Selecting the '**FLOAT ALL**' button will minimize XDR and open a new window as seen in figure 085. The *XDR Floater* screen will "float" all exams on the desktop and will remain on top of any other active software, like the PMS, so the user can simultaneously work with other programs while viewing the patient's images or x-rays on the same monitor. The user can customize the *XDR 'Float All'* screen in its vertical and horizontal dimensions to fit any area in the PMS software that is not in use. The *XDR Floater window* will remember both the position and size of this customized configuration anytime it is invoked in the future.



Figure 085: Float All Window



Figure 086: New Exam Button

3.3.4 NEW EXAM:

This button initiates a new exam for the selected patient by bringing up the **'EXAM LAYOUTS'** form shown in Figure110. This form will present the user with a number of modifiable exam layouts for taking a new exam which is further described in Section 4.1.



Figure 087: Update Data Button

3.3.5 UPDATE DATA:

When *XDR* is set to Stand Alone, the user will see an **'UPDATE DATA'** button in the **'PATIENT EXAMS'** form (See figure080).

The **'UPDATE DATA'** button allows the user to edit or modify the patient's personal information in the **'PATIENT INFORMATION'** form.

PLEASE ENTER PATIENT INFORMATION

CHANGE NAME	Test	Tina	
	Last Name (limit 20 chars)	First name (limit 20 chars)	Middle (limit 20 chars)
PAT. ID:	XDR00014		
	(Leave blank to generate default ID)	(Responsible Party for Minor)	
SSI:		DOB:	SEX:
			MISC ID:
STREET:			
CITY:		STATE:	ZIP:
PHONE:			
	(HOME)		(WORK)
SAVE PATIENT DATA		CANCEL DATA ENTRY	

Figure 88: 'PLEASE ENTER PATIENT INFORMATION' form

The '**PATIENT INFORMATION**' form will appear after selecting the '**NEW PATIENT**' button in the '**PATIENT LIST**' form (As Described in Section 3.1), or by selecting the '**UPDATE DATA**' button in the '**PATIENT INFORMATION**' form.

To enter or change data on the '**PATIENT INFORMATION**' form, click the  button. This button only appears on the '**PATIENT INFORMATION**' form if the user is revising the data for a pre-existing patient. The text of the '**CHANGE NAME**' button is red, indicating that *the user is now modifying important patient personal information that will permanently change the patient's name, ID and important patient information embedded in the patient's radiographs.*

By selecting the '**CHANGE NAME**' button, the text in the white text boxes will change from gray (inactive) to black (active), indicating that the user can now type in these boxes. As a precaution, a warning dialogue box will appear when clicking on the '**CHANGE NAME**' button with an option to '**CANCEL TASK**'.

Attention:

With this option you will be able to permanently change the patient name and ID including information imbedded in the x-ray files. Are you sure you want to do this?

YES: CONTINUE TASK

NO: CANCEL TASK

Figure 89: Change Patient Name and ID Warning Dialogue Box

Select **'YES: CONTINUE TASK'** to make changes to patient information.

Using the 'TAB' key on the keyboard will jump from one text box to the next (use 'alt TAB' to move backwards); or simply left mouse click in the desired text box.

For convenience, personal names, street names and the state are automatically capitalized.

Once the patient's information has been updated, the user will need to click on the **'SAVE PATIENT DATA'** button.

Making any changes to the patient's name or ID number in the text boxes, and then selecting **'SAVE PATIENT DATA'**, will permanently change the patient's name/ID number in all databases including the radiograph files. Therefore, it is very important that the user make these changes with great care.

When creating a patient account for the first time in *XDR*, the *XDR software* will automatically assign a unique patient ID or chart number to each patient. However, if the office assigns its own unique patient ID or chart numbers, the user may enter that number in the 'PATIENT ID' text box to match ID numbers. If you have additional questions about this process please call XDR Tech Support.



Figure 090: Save Patient Data Button

3.3.5.1 SAVE PATIENT DATA:

The **'SAVE PATIENT DATA'** button will permanently save all data appearing in the text boxes into the *XDR* database.



Figure 091: Cancel Data Entry Button

3.3.5.2 CANCEL DATA ENTRY:

If the user decides not to create a new patient record or does not wish to revise patient data, the **'CANCEL DATA ENTRY'** button allows the user to return to the previous menu without making changes.

TRANSFER EXAM TO ANOTHER PATIENT

Figure 092: Transfer Exam To Another Patient Button

3.3.6 TRANSFER EXAM TO ANOTHER PATIENT:

This function allows the user to remedy the problem when an exam is taken under the wrong patient's name. The '**TRANSFER EXAM TO ANOTHER PATIENT**' button allows the user to transfer an individual exam from one patient to another (i.e. from the wrong patient to the correct patient). This task is performed by selecting the exam for transfer by a single left mouse click in the '**PATIENT EXAMS**' form (See Figure 080).

A dialogue box will appear as seen in Figure 093.

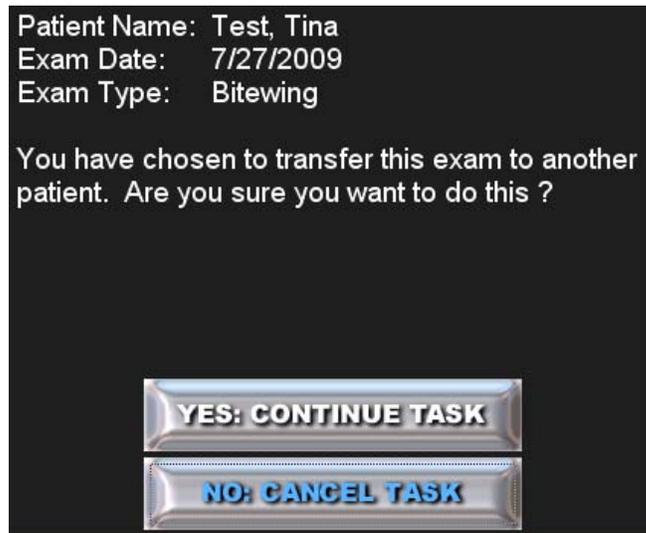


Figure 093: Exam Transfer Dialogue Box

If this is the correct exam to be transferred, select '**YES: CONTINUE TASK**'.

This will bring up a '**PATIENT LIST**' form as seen below.

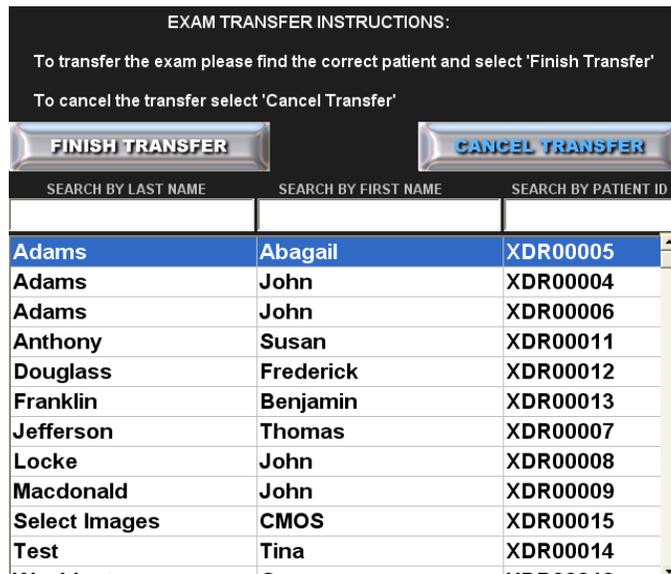


Figure 094: Exam Transfer Instructions Box

Select the correct patient in which to transfer the selected exam; then, click **'FINISH TRANSFER'**.



Figure 095: Delete Selected Exam Button

3.3.7 DELETE SELECTED EXAM:

The **'DELETE SELECTED EXAM'** button, in the **'PATIENT EXAMS'** form (See Figure 080), will delete an exam that is highlighted in the *'Exam List Box'*. This should be done with *extreme caution* because this action is irreversible and is indicated with red text for that reason. As a precaution, a warning dialogue box will appear when this button is clicked along with an option to **'CANCEL TASK'**.

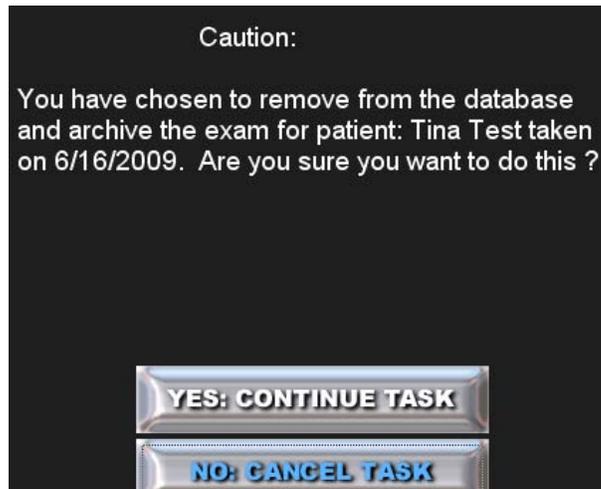


Figure 096: Delete Exam Caution Window

Clicking on the **'YES: CONTINUE TASK'** button will delete the selected exam.

3.4 PATIENT EXAMS form (in Bridge Mode)

Similar to the functionality of the 'PATIENT LIST' form, the user can select a particular exam by scrolling up or down the list and *single clicking* on the desired exam (which will become highlighted in blue as shown below). The user can, then, select the 'VIEW EXAM' button or use a *double left mouse click* to open the chosen exam.

PATIENT EXAMS

BACK TO PATIENT LIST

NAME: Test, Tina STREET:
PAT. ID: XDR00014 DOB: CITY:
MISC ID: SEX: SSI: --- -- STATE: ZIP:

VIEW EXAM **FLOAT EXAM** **FLOAT ALL** **NEW EXAM**

DATE	EXAM TYPE	NOTES (shift left click to read all)
9/5/2009	PA's	
7/27/2009	Bitewing	
7/9/2009	Bitewing	
6/16/2009	FMX	
6/16/2009	FMX 2	
12/16/2005	Photos	

DELETE SELECTED EXAM **TRANSFER EXAM TO ANOTHER PATIENT**

Figure 097: 'PATIENT EXAMS' form for retrieving existing exams or taking new exams (As viewed in Bridge Mode)



Figure 098: View Exam Button

3.4.1 VIEW EXAM:

This button in the 'PATIENT EXAMS' form retrieves the selected exam highlighted in the 'Exam List Box'. The user may also use a *double left mouse click* to open the chosen exam. Images from the selected exam will appear on the screen as illustrated in Figure 148 of Section 4.3. Note that all the radiographs in the exam will initially appear as smaller images arranged according to the layout chosen by the user.



Figure 099: Float Exam Button

3.4.2 FLOAT EXAM:

Selecting the 'FLOAT EXAM' button will minimize and change the look of the 'VIEW EXAM SCREEN' for the chosen exam. The **XDR** screen will "float" the selected exam on the desktop and will remain on top of any other active software, like the PMS, so the user can simultaneously work with other programs while viewing the patient's images or x-rays on the same monitor. The user can customize the **XDR** 'Float Exam' screen in its vertical and horizontal dimensions to fit any area in the PMS software that is not in use. The **XDR** 'FLOAT EXAM' will remember both the position and size of this customized configuration anytime it is invoked in the future.

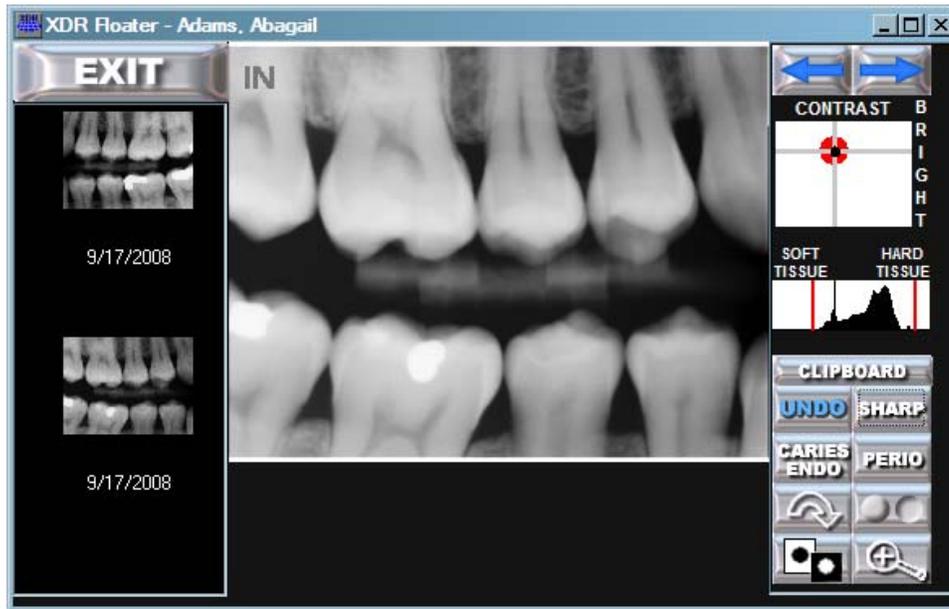


Figure 100: Float Exam-XDR Floater



Figure 101: Float All Button

3.4.3 FLOAT ALL:

Selecting the 'FLOAT EXAM' button will minimize and change the look of the 'VIEW EXAM SCREEN' for the chosen exam. The **XDR** screen will "float" the selected exam on the desktop and will remain on top of any other active software, like the PMS, so the user can simultaneously work with other programs while viewing the patient's images or x-rays on the same monitor. The user can customize the **XDR** 'Float Exam' screen in its vertical and horizontal dimensions to fit any area in the PMS software that is not in use. The **XDR** 'FLOAT EXAM' will remember both the position and size of this customized configuration anytime it is invoked in the future.

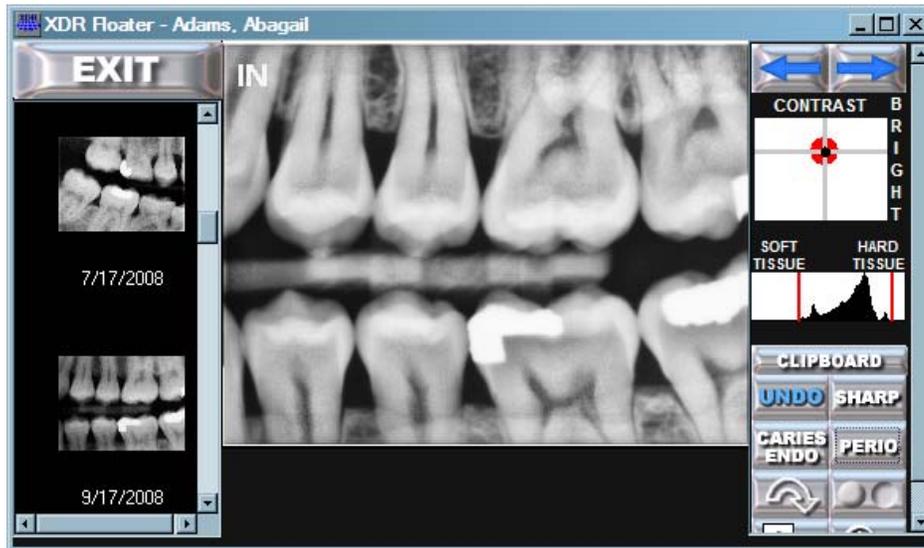


Figure 102: Float All-XDR Floater



Figure 103: Home Button

3.4.4 NEW EXAM:

This button initiates a new exam for the selected patient by bringing up the 'EXAM LAYOUTS' form. This form will present the user with a number of modifiable exam layouts and is further described in Section 4.1.



Figure 104: Home Button

3.4.5 TRANSFER EXAM TO ANOTHER PATIENT:

This function allows the user to remedy the problem when an exam is taken under the wrong patient's name. The 'TRANSFER EXAM TO ANOTHER PATIENT' button allows the user to transfer an individual exam from one patient to another (i.e. from the wrong patient to the correct patient). This task is performed by selecting the exam for transfer by a single left mouse click in the 'PATIENT EXAMS' form (See Figure 105).

EXAM TRANSFER INSTRUCTIONS:

To transfer the exam please find the correct patient and select 'Finish Transfer'

To cancel the transfer select 'Cancel Transfer'

FINISH TRANSFER
CANCEL TRANSFER

SEARCH BY LAST NAME	SEARCH BY FIRST NAME	SEARCH BY PATIENT ID
Adams	Abigail	XDR00005
Adams	John	XDR00004
Adams	John	XDR00006
Anthony	Susan	XDR00011
Douglass	Frederick	XDR00012
Franklin	Benjamin	XDR00013
Jefferson	Thomas	XDR00007
Locke	John	XDR00008
Macdonald	John	XDR00009
Select Images	CMOS	XDR00015
Test	Tina	XDR00014

Figure 107

Select the correct patient in which to transfer the selected exam; then, click **'FINISH TRANSFER'**.



Figure 108: Home Button

3.4.6 DELETE SELECTED EXAM:

The **'DELETE SELECTED EXAM'** button, in the **'PATIENT EXAMS'** form (See Figure 105), will delete an exam that is highlighted in the *'Exam List Box'*. This should be done with *extreme caution* because this action is irreversible and is indicated with red text for that reason. As a precaution, a warning dialogue box will appear when this button is clicked along with an option to **'CANCEL TASK'**.

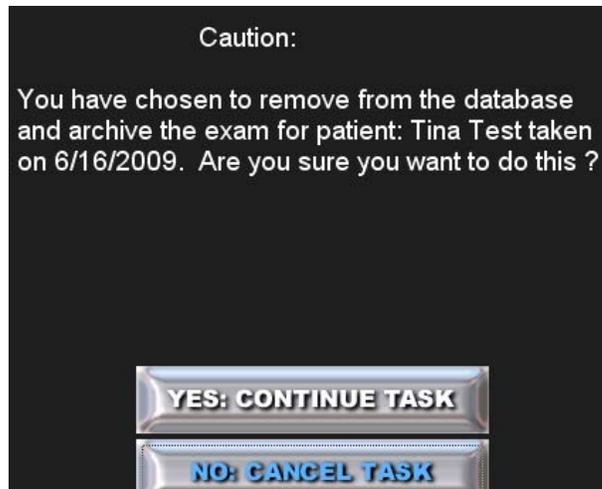


Figure 109: Deleting Exam Caution

Clicking on the **'YES: CONTINUE TASK'** button will delete the selected exam.

Section 4: Managing Exams

The user must create an exam layout in order to take a formatted series of x-rays.

4.1 New Exam

Getting to the 'EXAM LAYOUTS' Menu

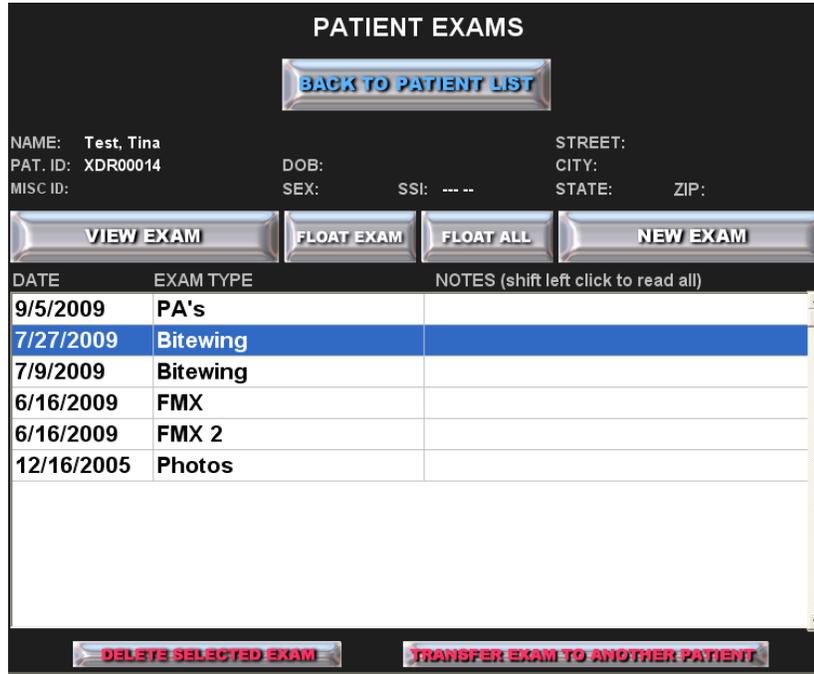


Figure 110: Patient Exams Screen

Click on the 'NEW EXAM' button in any patient's record to display the 'EXAM LAYOUT' menu.



Figure 111: Exam Layouts Window

The **'EXAM LAYOUTS'** form is used to open a formatted radiograph series. The user can create a new formatted radiographic layout or edit an existing formatted radiographic layout.

The user may freely create as many different layouts (i.e. bitewings, FMX) as needed. The layouts are displayed in the **'EXAM LAYOUTS'** window and shared on all networked computers for use. The creation of exam layouts is shown in Section 4.1.4.

4.1.1 Start a layout in the 'EXAM LAYOUT' form

Layouts created by the user will be available for use on any workstation in the office.

To start a layout for an x-ray exam series, highlight the exam layout selected for use, as seen in Figure 112.

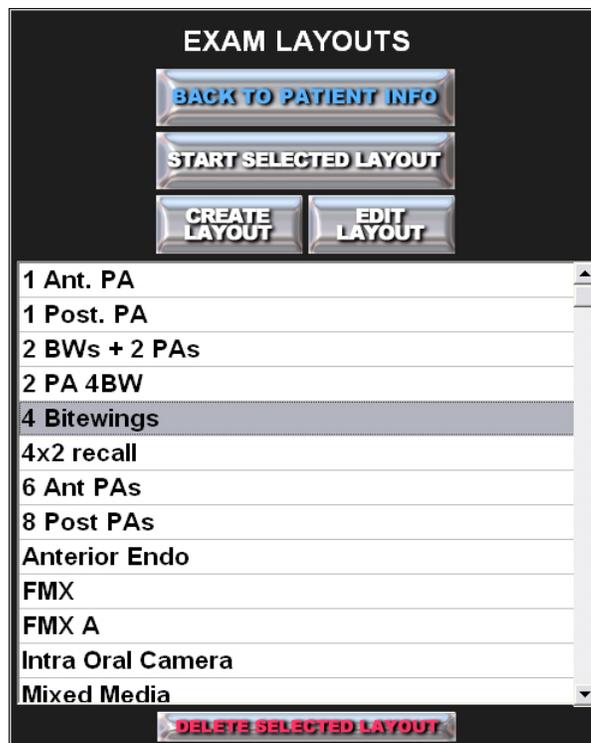


Figure 112: Exam Layouts Window



Figure 113: Back to Patient Info Button

4.1.2 Back to Patient Info:

The **'BACK TO PATIENT INFO'** button is used to exit the **'EXAM LAYOUT'** form. Selecting the **'BACK TO PATIENT INFO'** button in the **'EXAM LAYOUTS'** form returns the user to the **'PATIENT INFO'** form (See Figure 110).



Figure 114: Start Selected Layout Button

4.1.3 Start Selected Layout:

The 'START SELECTED LAYOUT' button will initiate the 'TAKE EXAM MENU' screen as shown in Figure 115.



Figure 115: Take Exam screen (shown is a common 4 Bitewing Layout)

Icons or placeholders will appear on the screen according to the layout the user created and is instantly ready for taking a radiographic exam or adding images from the source needed. For more information on taking exams see Section 4.2.



Figure 116: Home Button

4.1.4 Create Layout:

To create a layout, click on the 'CREATE LAYOUT' button in the 'EXAM LAYOUTS' menu as shown in Figure 117.

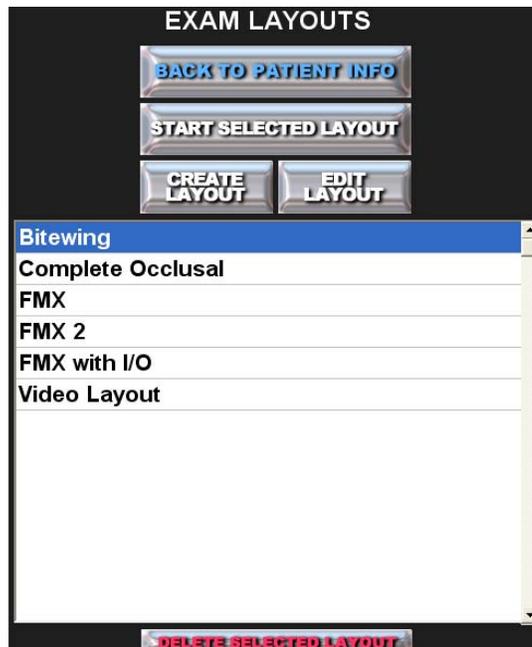


Figure 117: Exam Layouts Window

This will open the '**LAYOUT MENU**' screen as shown in Figure 117 and will enable the user to create a custom formatted layout for the captured radiographs.

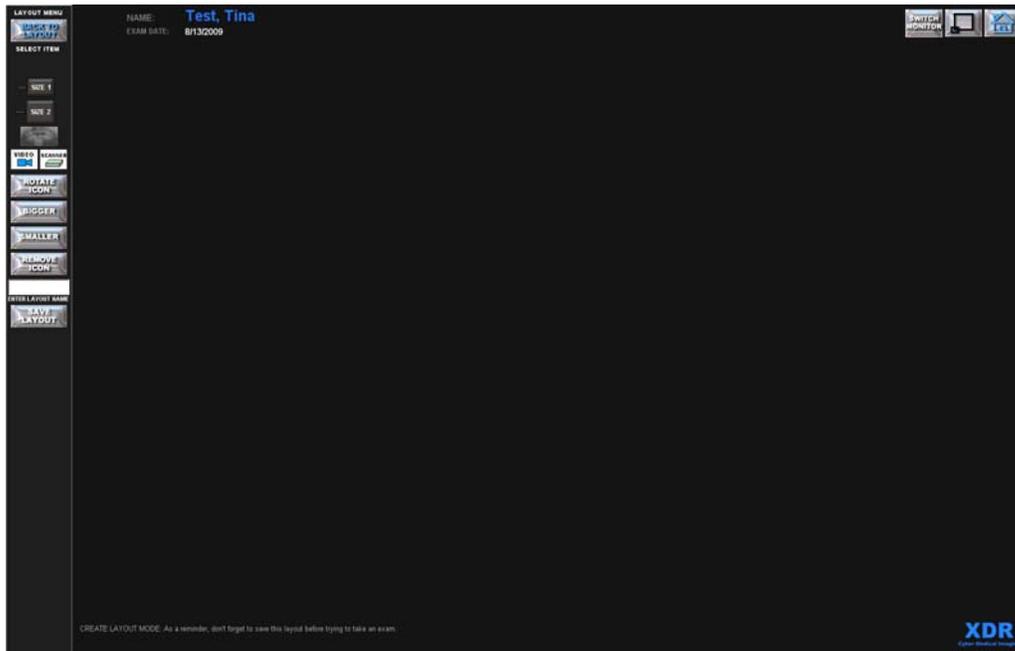


Figure 118: 'LAYOUT MENU' screen ready to create a layout



Figure 119: 'LAYOUT MENU' options

4.1.4.1 Tile Source Selection:

Click on the corresponding icon for the appropriate sized Sensor, Pano, Video (intraoral camera) and/or Scanner(other Twain device) to add a tile to the Layout Screen.



Figure 120: Size 1 X-Ray Sensor Button

Tile A: Size 1 Intraoral Sensor – Used to specify which E2V Sensor size to arm if both are plugged in or if a different Sensor MFG is select will function the same as the Size 2 button



Figure 121: Size 2 X-Ray Sensor Button

Tile B: Size 2 Intraoral Sensor – Used to specify which E2V Sensor size to arm if both are plugged in or if a different Sensor MFG is select will function the same as the Size 1 button



Figure 122: Pan\Ceph Button

Tile C: Pan/Ceph Image – Used to for Panoramic or Cephalometric X-Rays



Figure 123: Video Button

Tile D: Intra-Oral/Video Images – Used with most Intra-Oral Cameras for Snap Shots



Figure 124: Scanner Button

Tile E: Scanner/Twain Device – Used with some Intra-Oral Cameras and for Scanned Documents

Create the layout to reflect the corresponding film mount you would use for the series.

Also click on the icon that represents the sensor size you would use. Move the tile anywhere within the blank '**LAYOUT MENU**' screen by *left clicking* on the tile/placeholder and dragging it to the desired location.

The numbers on the image icons will determine the sequence the tiles will be launched. This is most important for the sequence the user prefers for exams while using '**Auto Capture**' mode during a radiographic exam. See Figure 125.

These layouts can be created on any computer in the office that has **XDR** installed. Once a layout is created, named and saved, it will be available at every workstation in your office.

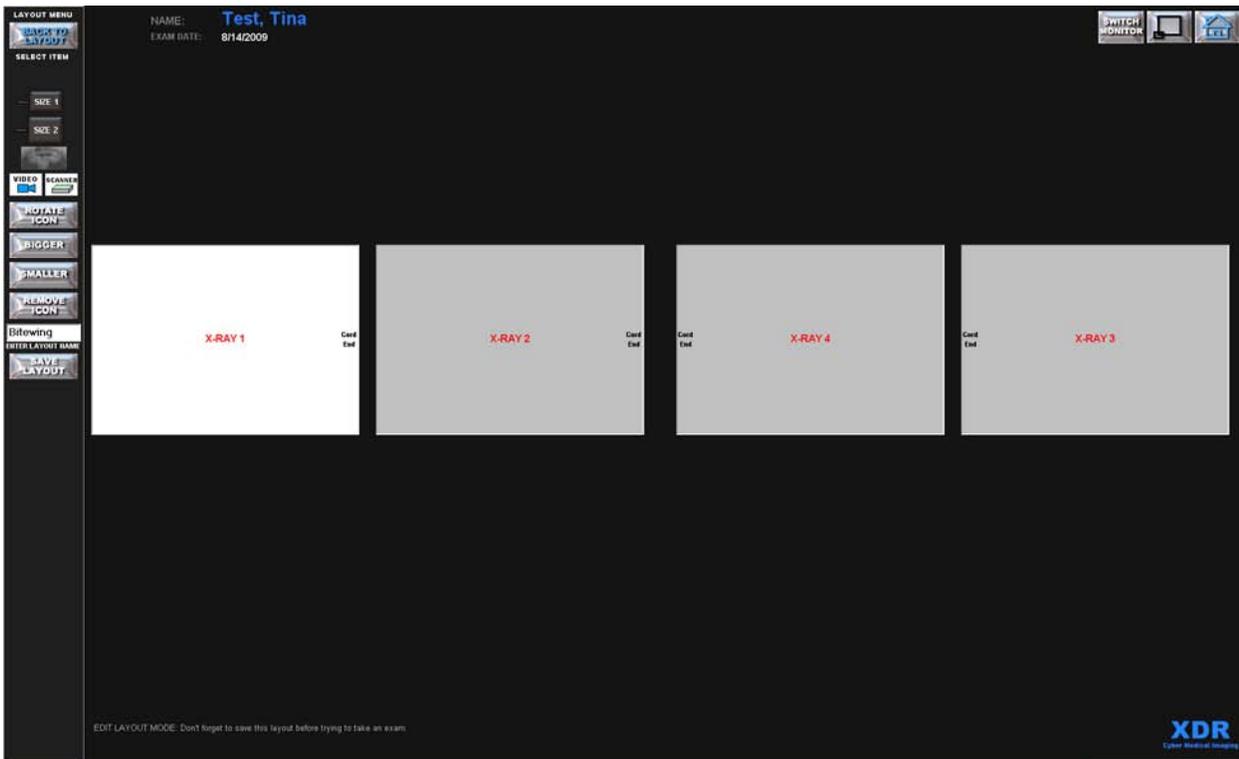


Figure 125: Example of a four posterior Bitewing Layout. This example shows four horizontal size 2 sensor icons that have been placed into a standard Bitewing format. Radiographs captured using this layout will be stored in these positions.

The Bitewing Layout sequence (shown in Figure 125) will start by first arming **X-RAY 1**, the right side posterior molar bitewing x-ray, followed by position **X-RAY 2**, the right side premolar bitewing x-ray, followed by position **X-RAY 3**, the left side posterior bitewing x-ray, and finally **X-RAY 4**, the left side premolar bitewing x-ray. As show in this four bitewing series, the black cord end that is on the sensor icon will allow the user to determine the correct orientation of the captured radiograph. In general, all posterior views using the size 2 sensors in a horizontal orientation will have the cord end pointing towards the patient's midline.

Note the orientation of **'CORD END'** labels on the sensor icons below.

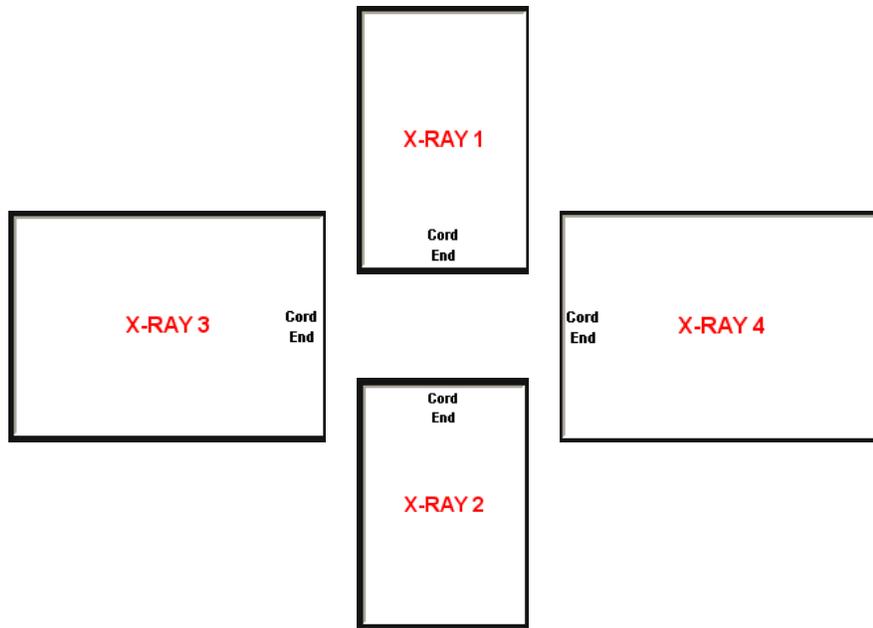


Figure 126: Sample X-Ray Tile layout

For horizontal sensor placement, the sensor **'CORD END'** will always be towards the patient's midline.

For vertical sensor placement, the sensor **'CORD END'** will always be towards the patient's occlusal plane.

If the sensor is placed in the patient's mouth with the correct **'CORD END'** orientation as shown, the captured x-ray image should automatically have the correct orientation.

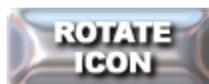


Figure 127: Rotate Icon Button

4.1.4.2 ROTATE ICON:

To change the **'CORD END'** orientation, click the **'ROTATE ICON'** button repeatedly until the **'CORD END'** is in the desired orientation. This is used by the software to determine which direction is up when displaying captured images.



Figure 128: Bigger and Smaller Buttons

4.1.4.3 Bigger or Smaller Icon:

Make the icons/placeholders Bigger and Smaller in your layout. Increase or decrease the gray icon or radiograph placeholder size within the layout by clicking on the **'BIGGER'** and **'SMALLER'** buttons. When either button is clicked, the icon's top left corner will stay in place while the height and width decrease or increase. The final size of the icons will determine the size of the image thumbnails, as they will be seen in the layout and on the Print Page.



Figure 129: Remove Icon Button

4.1.4.4 REMOVE ICON:

To remove an x-ray tile or radiograph placeholder, highlight the placeholder by left clicking. The placeholder will turn white. Then click the '**REMOVE ICON**' button.

The numbers on the gray x-ray radiograph placeholders will determine their sequence of capture in the '**AUTO CAPTURE**' mode. When removing a placeholder, the numbers will adjust to the removal of x-ray tiles.



Figure 130: Save Layout Button with Layout Name Text Box

4.1.4.5 SAVE LAYOUT:

The user must name the new layout and then save it for future use (i.e. Bitewing, FMX, BWX). Type the chosen name of the layout in the white text box above the '**SAVE LAYOUT**' button, then click the '**SAVE LAYOUT**' button.

This will return the user to the '**EXAM LAYOUTS**' menu. The name of the new layout will appear on the exam layout list for future use as shown in Figure 131.

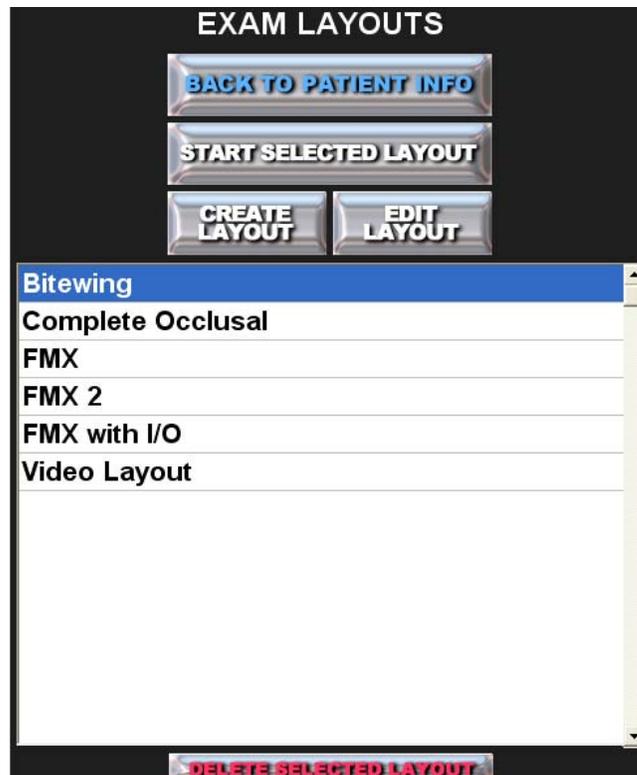


Figure 131: Exam Layouts screen

The names in the layout list will be in alphanumerical order. The user should be consistent in the naming of the layouts.



Figure 132: Back To Layout Button

4.1.4.6 BACK TO LAYOUT:

Exit the layout menu at any time without saving a layout by clicking on the 'BACK TO LAYOUT' button.

4.1.4.7 Examples of Layouts:

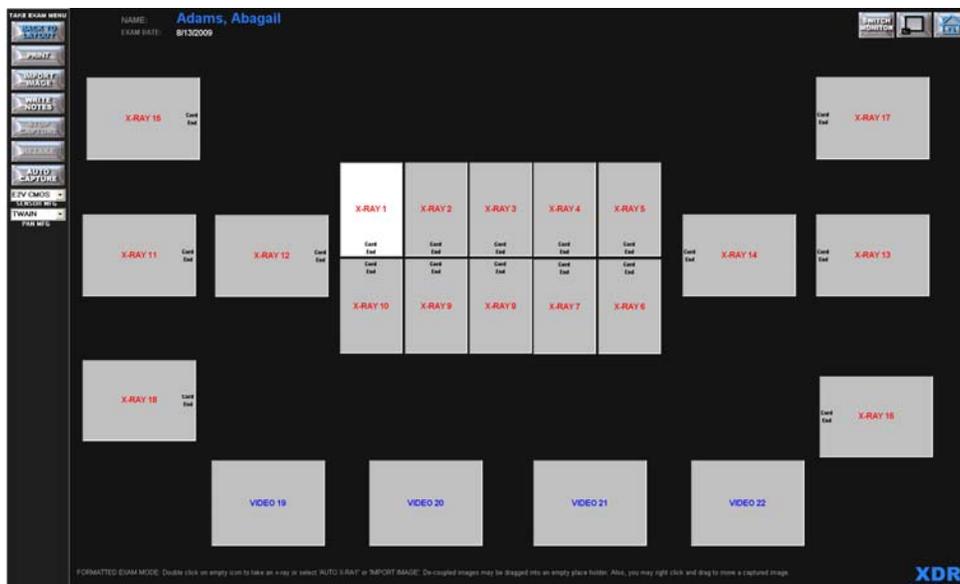


Figure 133: An example of a custom layout showing size 1 placeholders from **X-Ray 1** through **X-Ray 10**, Size 2 sensor placeholders from **X-Ray 11** through **X-Ray 18**, and 4 Intra-Oral images from **Video 19** through **Video 22**.

Note: There is only one size 2 PA in each quadrant. Taking the pre-molar PA with the size 1 sensor in the vertical position helps with patient comfort. You can capture every tooth in the mouth with the size 1 sensor in the vertical position.

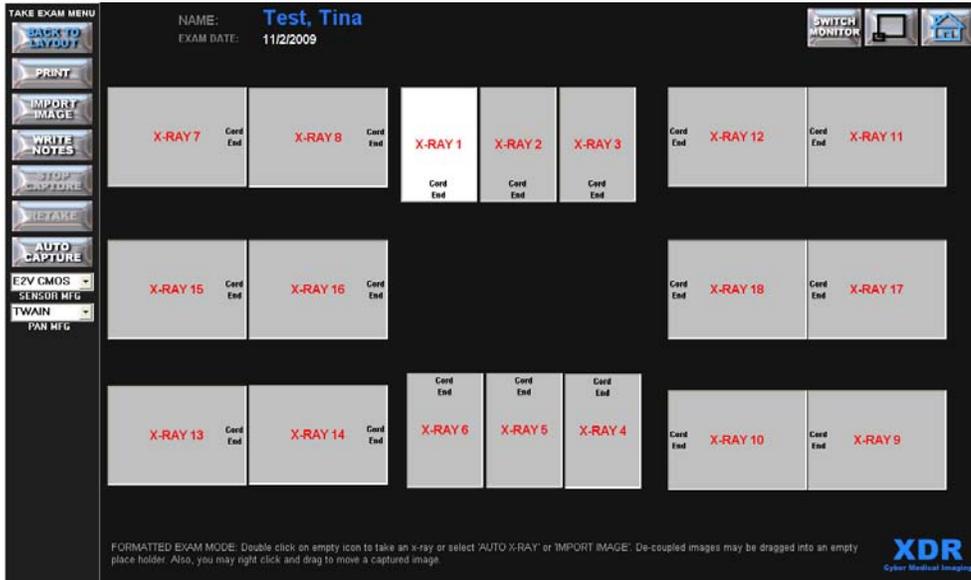


Figure 134: An example of a more traditional custom layout showing size 1 placeholders from **X-Ray 1** through **X-Ray 6** (for patient comfort and ease of placement), and Size 2 sensor placeholders from **X-Ray 7** through **X-Ray 18**.



Figure 135: Edit Layout Button

4.1.5 EDIT LAYOUT:

Click on the **'EDIT LAYOUT'** button in the **'EXAM LAYOUT'** menu (See Figure 131). This will take the user to the **'LAYOUT MENU'** screen for the selected layout (See Figure 136).

The **'EDIT LAYOUT'** button is very similar to the **'CREATE LAYOUT'** button, with the exception that it allows you to modify an existing layout.

Select **'EDIT LAYOUT'** to add, remove, rearrange or resize image icon placeholders in an existing layout without having to create a completely new layout. The user can also select **'EDIT LAYOUT'** to rename an existing layout.



Figure 136: Screen showing a bitewing 'LAYOUT MENU' ready for editing



Figure 137: Delete Selected Layout Button

4.1.6 DELETE SELECTED LAYOUT:

The user can delete all layouts that are no longer needed from the 'EXAM LAYOUTS' list. Highlight the layout you wish to delete with a single click of the left mouse button.



Figure 138: Exam Layouts Window

Then, select the 'DELETE SELECTED LAYOUT' button. This will delete the layout that is highlighted in the 'EXAM LAYOUTS' list.

As with all irreversible actions, such as a deletion, a warning box will appear to allow you to cancel the task.

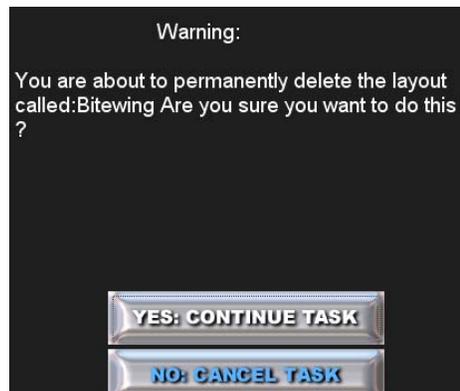


Figure 139: Exam Deletion Warning Window

Select '**YES: CONTINUE TASK**' and the exam layout you have selected for deletion will be deleted.

4.2 Take Exam Screen

Take an x-ray or capture an image

Click on the **'NEW EXAM'** button in the **XDR 'PATIENT EXAMS'** list.

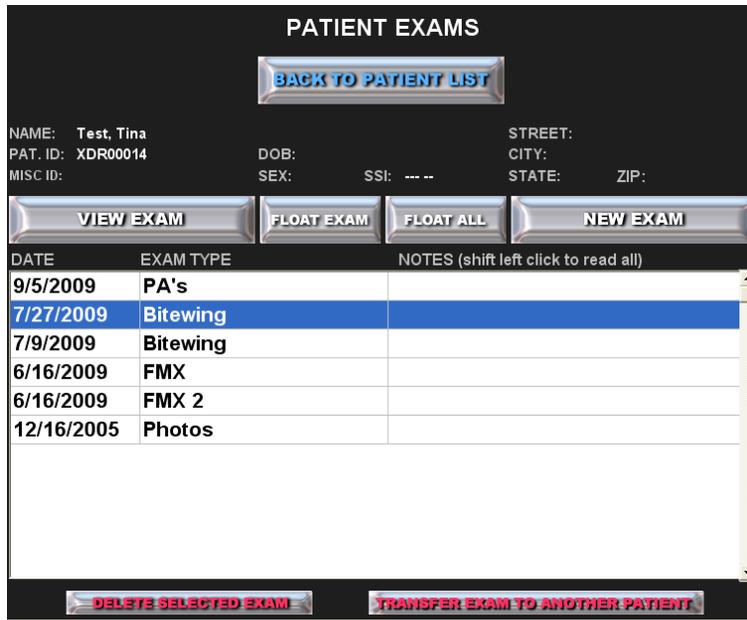


Figure 140: Patient Exams Screen

The **'NEW EXAM'** button will take the user to the **'EXAM LAYOUTS'** menu. Select a desired layout and go to the **'TAKE EXAM MENU'** screen Figure 141.

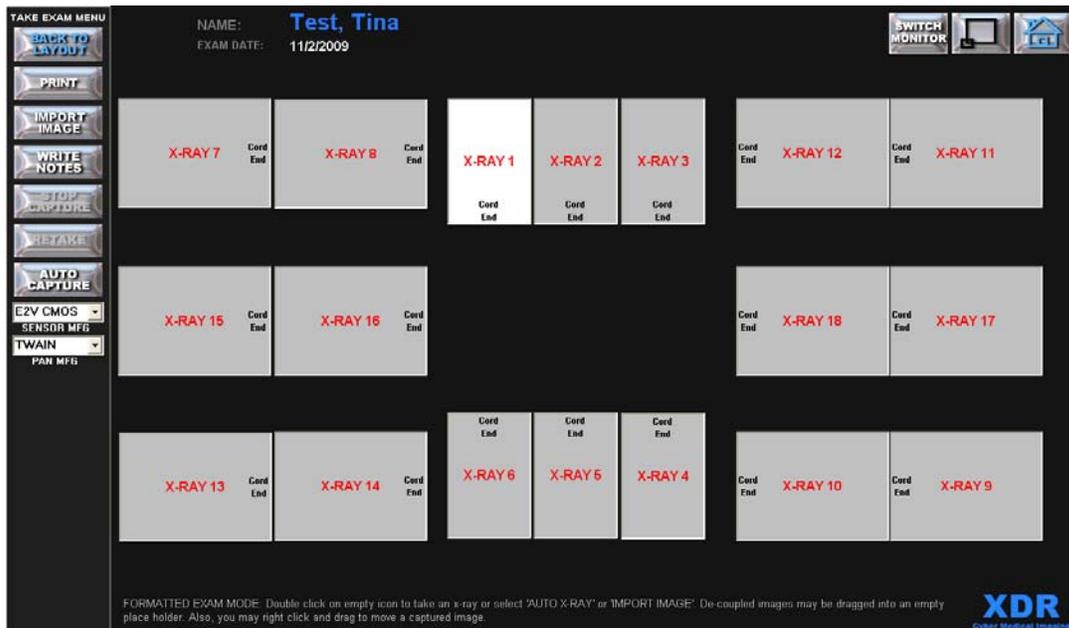


Figure 141: Example showing an exam layout in the **'TAKE EXAM MENU'** screen used to capture a formatted FMX series of radiographs.

It is always best to have your entire radiographic armamentarium, including the sensor and holder, ready before the seating the patient.

The user will be ready to take a series of radiographs in a formatted layout by one of two options.

The first option allows the user to capture each radiographic image “*manually*” by double clicking on a blank (gray) x-ray radiograph icon, which will initiate the capture sequence. The on-screen instructions remind the user of this option. This method allows the user to take radiographs in any order the radiographic icons are activated.

The capture sequence begins with the appearance of the message: **‘PLEASE WAIT’**. After three seconds the message **‘TAKE X-RAY NOW’** appears with an audio chime that indicates the system is ready to take an x-ray. Upon exposure, the system displays the message **‘PROCESSING X-RAY’**, during which time the radiograph is captured, transferred to the computer and processed. Within 3 seconds, the completed radiograph is displayed on the screen. You have 5 minutes to take an exposure before the system times out and puts up the message **‘TIMED OUT’**. If the session becomes timed out, the user must reinitiate this function to capture an image.



Figure 142: Auto Capture Button

4.2.1 AUTO CAPTURE:

The second option allows the user to take the entire radiographic series in an *automated* arming option that corresponds to the numbering sequence determined by the layout selected. By default, the auto capture will start from position 1. However, the user may choose any icon to start, and then click the **‘AUTO CAPTURE’** button to begin the automated sequence. For instance, if one was preparing to take a FMX on a patient who is edentulous on the maxilla, one may choose to start the series from the mandibular teeth and skip the maxillary teeth.

XDR will sequentially execute the numbered capture sequence for each placeholder displaying the series of capture status messages as it proceeds.

Immediately after a radiograph is captured the image appears in an expanded view for a few moments before going to the tile assigned. The next tile is armed and the process begins again.

If any radiograph is presented full size on the screen, another set of menu bars appears on the left hand side of the screen. This allows manipulation of the full sized image. The operation of these additional image controls in this menu will be further explained in Section 5.

For either capture mode (manual or auto capture), it is not necessary to fill every radiographic icon with a captured radiograph. The user can save either a full or a partial exam by clicking the **‘SAVE TO RECORDS’** button in the upper left hand corner of the **‘TAKE EXAM’** menu. Note that this button will display **‘BACK TO LAYOUTS’** if no radiographs have been taken as shown in Figure 141.

After saving the exam images, the program will return to the **‘PATIENT INFO FORM’**.

Note: *If a radiograph is taken in the wrong place, do not worry. With the image in its 'small' state use a right mouse click and drag the image to the desired position.*



Figure 143: Stop Capture Button

4.2.2 STOP CAPTURE:

With either capture method, manual or auto capture, the image capturing process is aborted if no x-ray exposure occurs for over 5 minutes, or if the '**STOP CAPTURE**' button is selected.

When the '**STOP CAPTURE**' button is selected in the '**AUTO CAPTURE**' mode, the program will proceed to the next blank radiographic icon and will skip this image capture.

The user can reactivate the '**AUTO CAPTURE**' mode by clicking on the '**RESUME CAPTURE**' button or proceed to take the remainder of the images in the manual mode.

The '**AUTO CAPTURE**' button will be inactive ('grayed out') if the sensor is active while waiting for an x-ray exposure.



Figure 144: Retake Button

4.2.3 RETAKE:

The '**RETAKE**' button is only active after an x-ray image has been captured. To '**RETAKE**' an image, the user must highlight the image they would like to '**RETAKE**' by left clicking. Once the image to be retaken is highlighted, click on the '**RETAKE**' button. This will arm the sensor for another image. The newly captured radiographs will appear in front and slightly offset from the original radiograph. The total number of images may not exceed 40. Multiple retakes will appear as a 'stack' of images, but only the image selected to be on top (outlined in blue) will be saved if the save retakes option is not selected in the settings.



Figure 145: Print Button

4.2.4 Print:

Clicking the '**PRINT**' button will bring up a menu of printing options (See section 4.3.1).



Figure 146: Home Button

4.2.5 Import Image:

To import a 'foreign' image into the exam, select the patient and click the **'NEW EXAM'** button. Next, select a layout from the **'EXAM LAYOUTS'** menu.

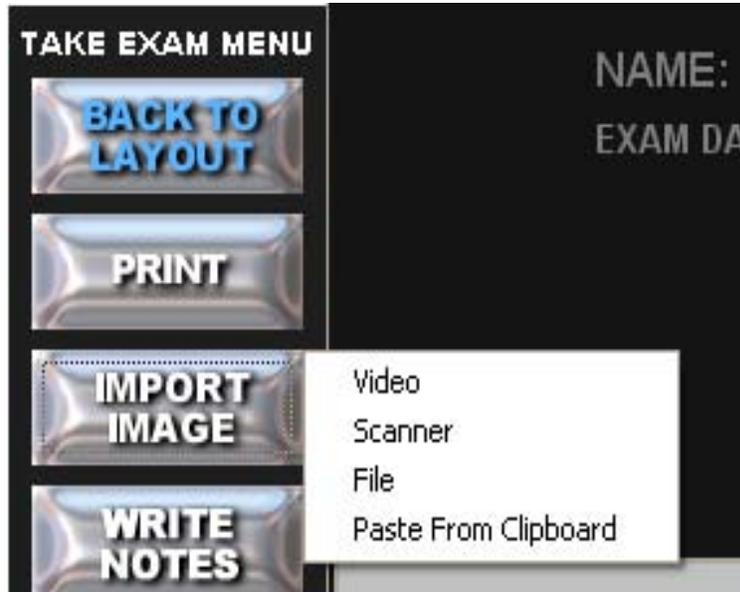


Figure 147: Import Image Options

Click on the desired placeholder or image icon and click the **'IMPORT IMAGE'** button. This will bring up a standard XDR dialogue box displaying the following options: **'Video'**, **'Scanner'**, **'File'** and **'Paste from Clipboard'** (See Figure 147).

Select the desired image choice. The image will be placed into the selected placeholder (outlined in blue).



Figure 148: Write Notes Button

4.2.6 Write Notes:

To write and save a text description (up to 256 characters) for an exam, click the **'WRITE NOTES'** button in the **'EDIT EXAM MENU'**. This will bring up a text entry form into which you can type your notes as shown in Figure 149.

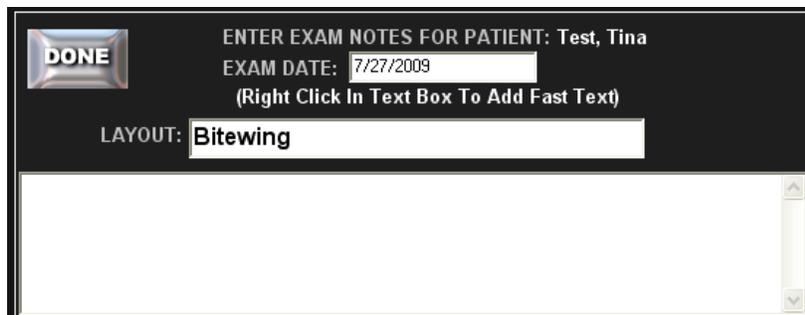


Figure 149: Exam Notes Input Interface

Clicking the **'DONE'** button will close the text entry form. Click **'SAVE CHANGES'** to save your notes. The notes will be saved with the exam and can later be re-read.



Figure 150: Sensor and Pan MFG Selection

4.2.7 Sensor MFG/Pan MFG Selection:

The **'Sensor MFG'** Drop down list is used to select the type of Sensor that will be used for taking an exam. This option should only be changed if the Dental Office has more than one type of Intra Oral X-Ray sensor used. The options are: E2V Type 1, SUNI, E2V Type 2, RSV, ATMEL, EVA, ScanX, Denoptics-GXTwain, Rad-icon, E2V CMOS, and Kodak 5K-6K. If unsure about which option should be selected, contact XDR Technical Support.

The **'PAN MFG'** Drop down list is used to select the type of Pan Device used when taking Pan/Ceph Exams. This option is normally never changed since most offices only have one type of Pan Machine. The options are: TWIN, DXIS, and ScanX. . If unsure about which option should be selected, contact XDR Technical Support.

4.3 View Exam Menu

In the **'VIEW EXAM MENU'**, the user can detach the images from the exam and create **'COPIED IMAGES'**, view images, adjust images, draw or write notes on the images or save copies of annotated images.

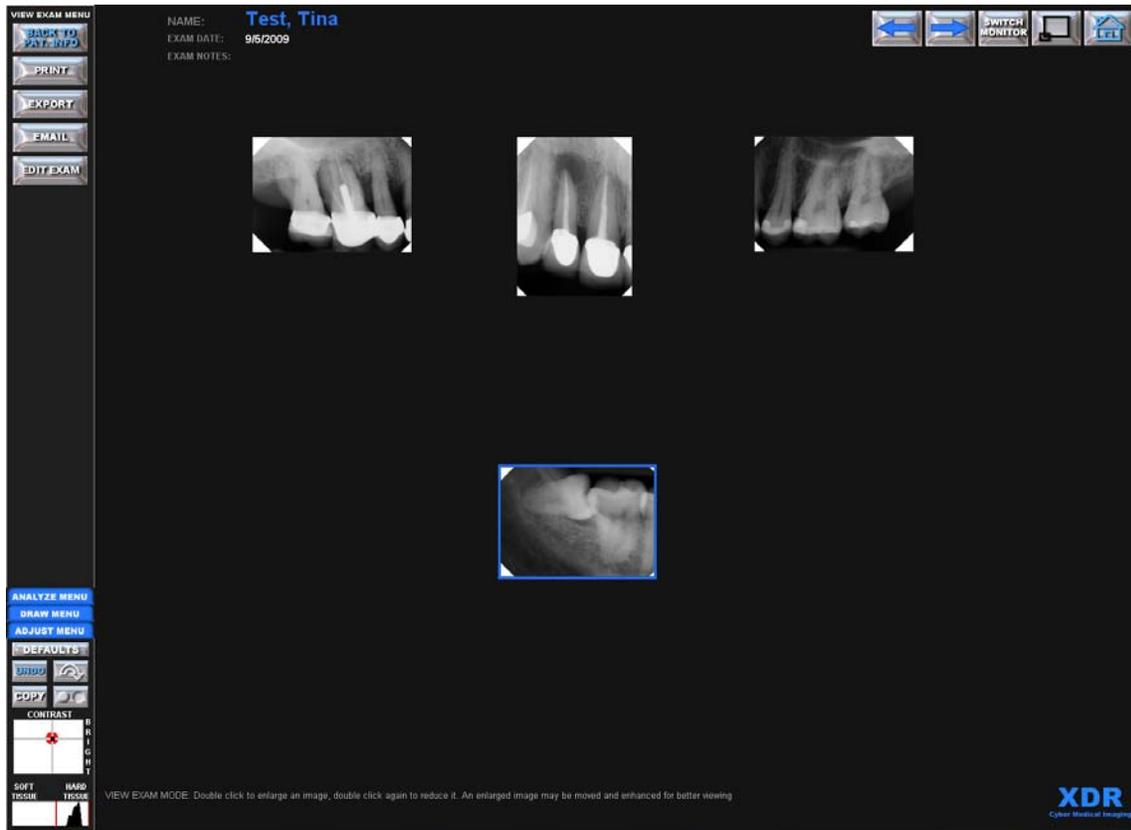


Figure 151: View Exam Menu Screen



Figure 152: Print Button

4.3.1 PRINT:

To Print an image, highlight the desired image with a *single left click*. Select the **'PRINT'** button. A drop down menu appears from which you may select the type of printing page layout you would like to use (See Figure 153).

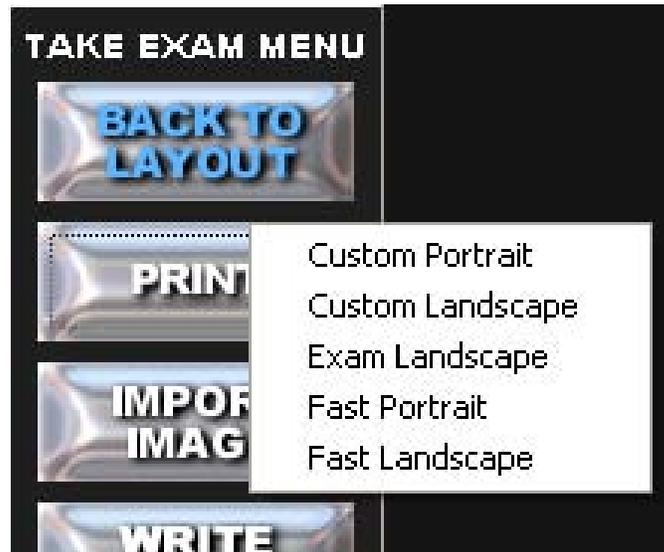


Figure 153: Print from Take Exam menu

4.3.1.1 Custom Portrait and Custom Landscape

Selecting **'Custom Portrait'** or **'Custom Landscape'** brings up a blank page to set up as your printing page.

Reminder: If printing in the Landscape format, you must to go into preferences and select landscape on your printer before printing.

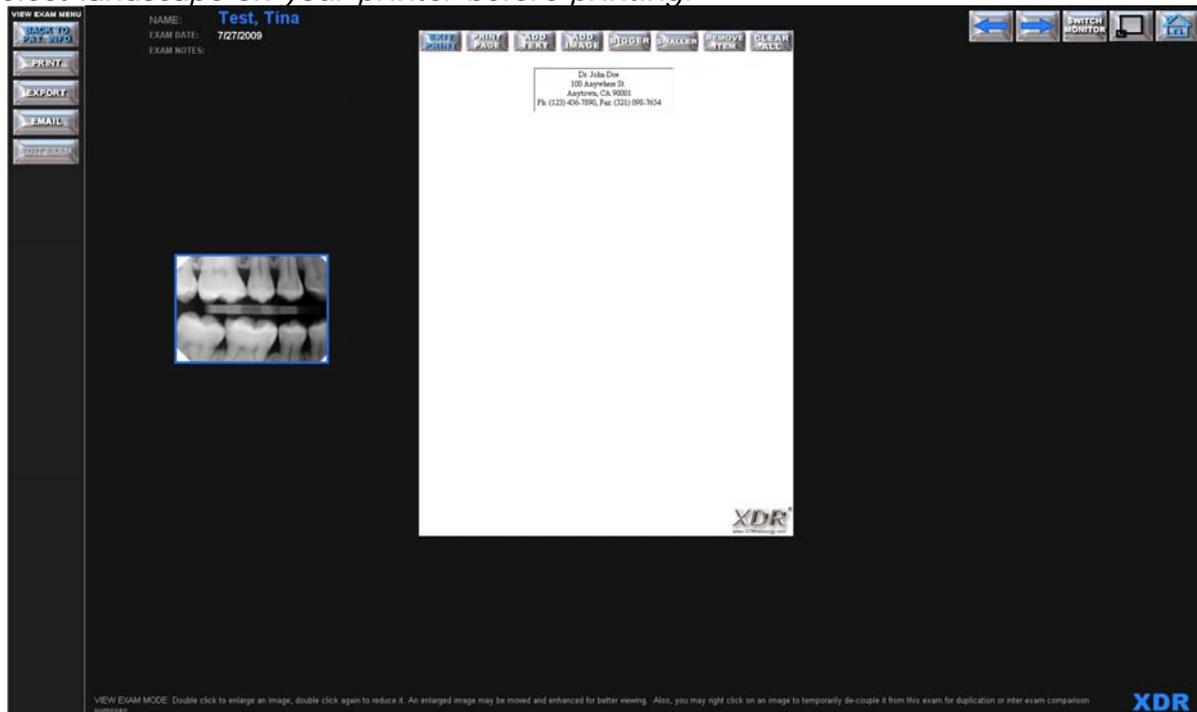


Figure 154: Custom portrait printing page

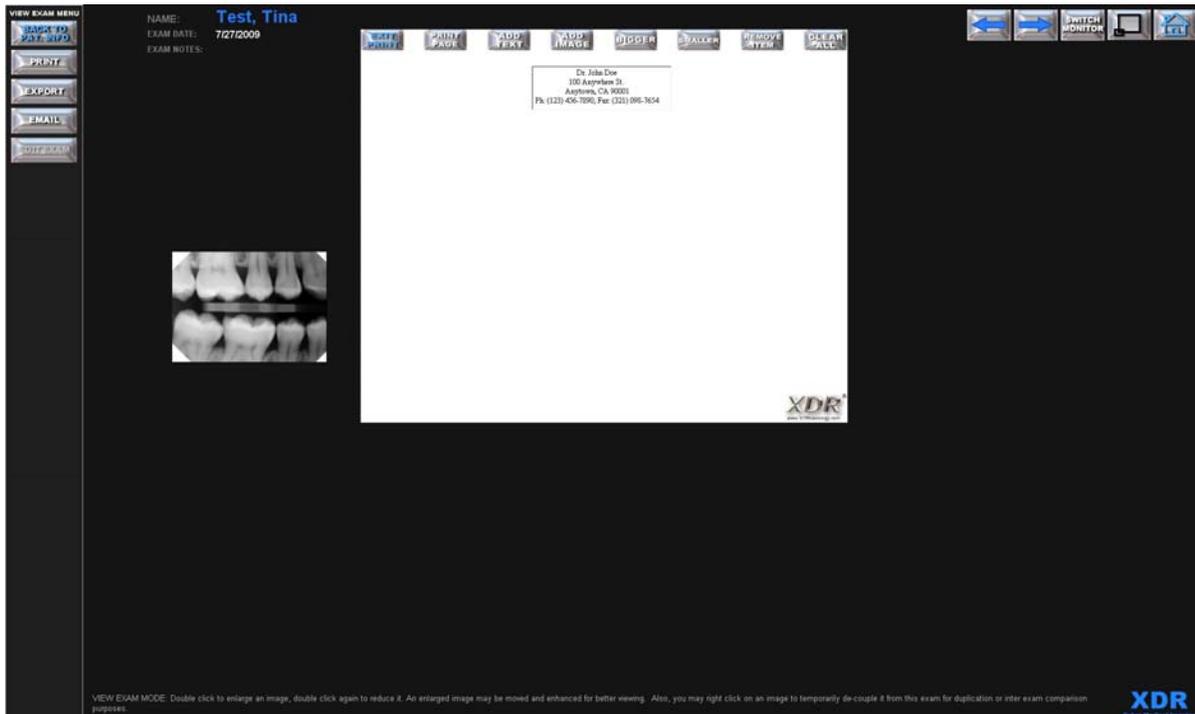


Figure 155: Custom Landscape printing page

4.3.1.2 Exam Landscape

The exam landscape option places all of the images in the selected exam onto a print page.

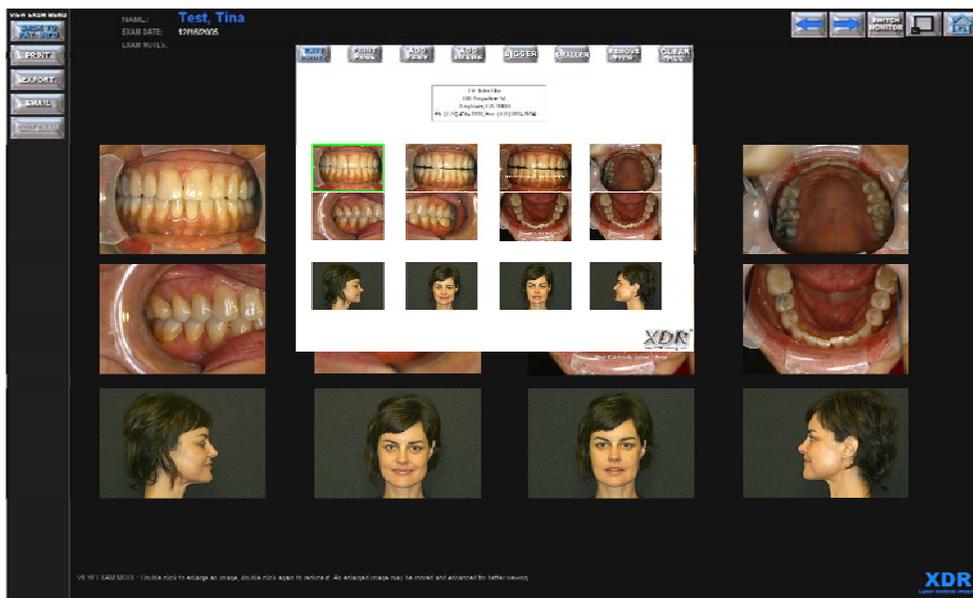


Figure 156: Example of a Landscape printing page for a mixed extra-oral and intra-oral exam.

4.3.1.3 Fast Portrait and Fast Landscape

Fast Portrait and Fast Landscape options automatically puts the selected image onto a print page with a text box.

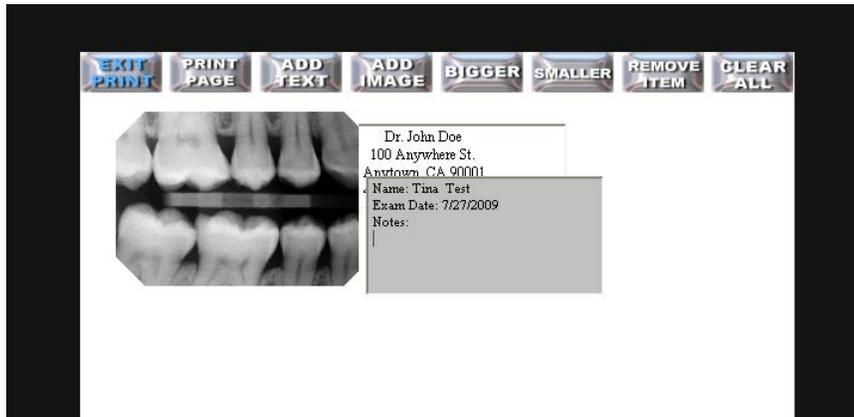


Figure157: Example of an image and a text box automatically appearing in the printing page. *Left click* and drag the image and text box to your desired location on the print page.



Figure 158: Export Button

4.3.2 Export

Clicking on the 'EXPORT' button will bring up a menu of exporting options.

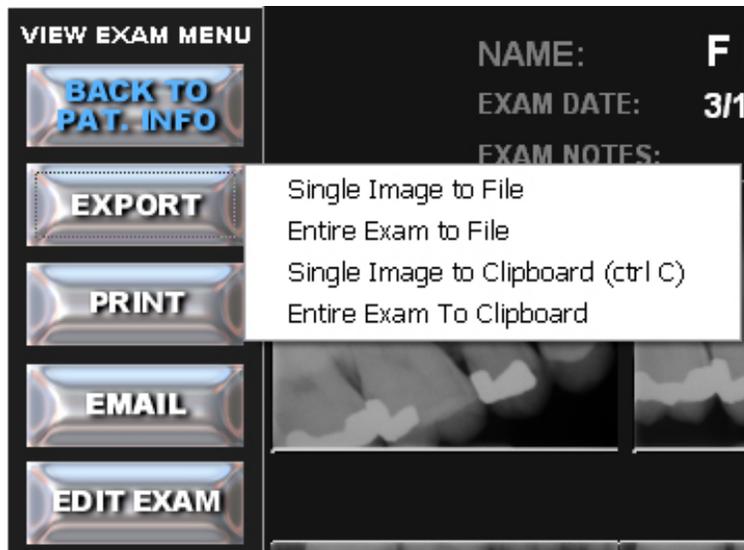


Figure159: Export image options list

The 'EXPORT' button allows the user to export any image in an exam by bringing up a standard Windows file export dialogue box.

Select an image for exporting by clicking on it (blue outline). Images may be exported in BMP, JPEG, Raw (16-bit raster scan) or **XDR's** internal image format. Images can also be copied to the clipboard to be pasted and used in a word documents or emails.

Images can be exported individually and entire exams can be exported as a single image or as multiple files.

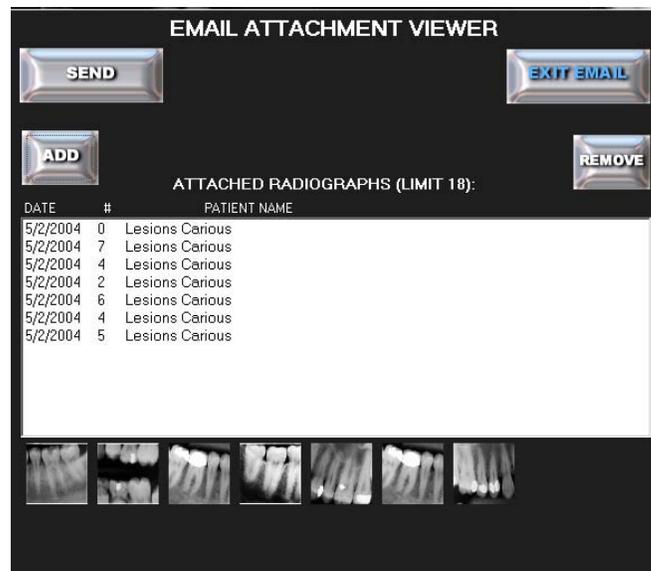


Figure 160: Email Button

4.3.3 EMAIL:

With *XDR*, one can compile email attachments and send an email through the default program installed on their computer (e.g. Microsoft Outlook and Microsoft Outlook Express). The attached emails will be in standard 8-bit JPEG file format. These images must be from a previously saved exam. **You must have an existing email account with an Internet Service Provider (ISP) and have configured a Windows Email Program with the appropriate account information before you can use this function. If you only access your email via a web browser the 'EMAIL' button will not function**

To start this utility, first retrieve a radiographic exam of an existing patient. This brings up the '**VIEW EXAM MENU**' shown in Figure 159. Click the '**EMAIL**' button, which will bring up the '**Email Attachment Form**' as shown in Figure 161. Like the Print Form, this form is freely movable by clicking and dragging. Similarly, you 'attach' or add radiographs to your email by highlighting an image and then clicking the '**ADD**' button on the Email Form. The attachment list will indicate the patient name and exam date for the attached image. To remove a particular image attachment, click on the image icon of the desired x-ray to highlight it, and then click the '**REMOVE**' button. Attachments are optional in sending email.



DATE	#	PATIENT NAME
5/2/2004	0	Lesions Carious
5/2/2004	7	Lesions Carious
5/2/2004	4	Lesions Carious
5/2/2004	2	Lesions Carious
5/2/2004	6	Lesions Carious
5/2/2004	4	Lesions Carious
5/2/2004	5	Lesions Carious

Figure 161: The '**Email Attachment Form**' for composing attachments

After you have completed the above, click the '**SEND**' button. This will bring up your default email form with the images already attached. All you need to do next is compose your email message, enter the recipient's email address, and send the email. Click the '**EXIT EMAIL**' button if you wish to abort sending an email. If you have adjusted or enhanced an image, it will be processed and attached as it appears on your screen.



Figure 162: Edit Exam Button

4.3.4 EDIT EXAM: See Section 4.4

Clicking on the 'EDIT EXAM' button will take you to the 'EDIT EXAM MENU'.

4.4 Editing Exams

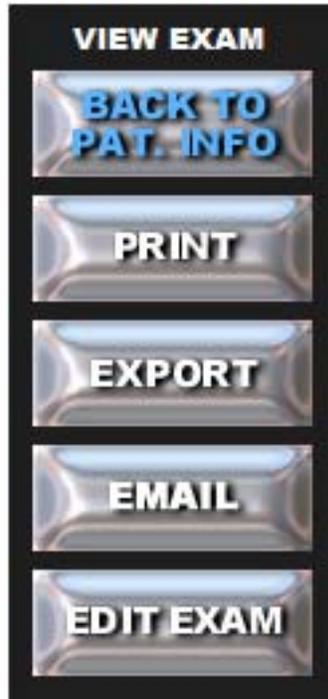


Figure 163: View Exam Menu Options

Click on the 'EDIT EXAM' button in the 'VIEW EXAM' menu as shown in Figure 163. This will initiate the 'Edit Exam' mode.

The user is then presented with a warning dialogue box as shown in Figure 164.

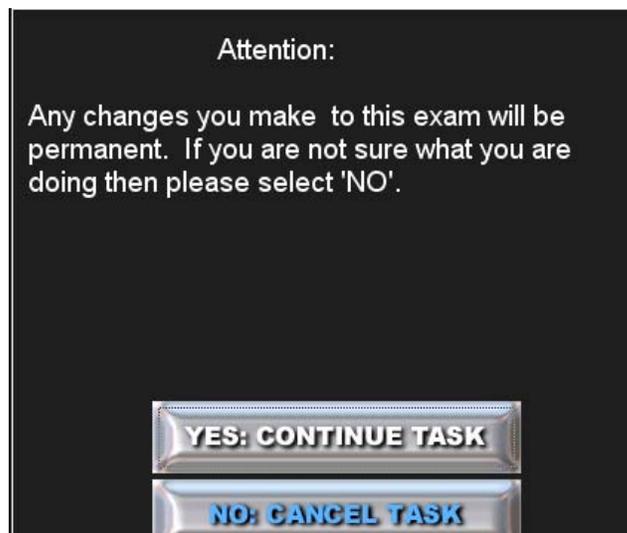


Figure 164: Enter Edit Exam Mode Warning

Select **'YES: CONTINUE TASK'**.

This will bring up the Edit Exam Window. The look should be nearly identical to View Exam Window with few import differences. The buttons on the left have changed to allow editing of the exam and the ability to save a copy of edits to a particular image has been taken away from the Adjust Menu.



Figure 165: Edit Exam Window



Figure 166: Save Changes Button

4.4.1 Save Changes:

The **'SAVE CHANGES'** button is used once the user has edited the exam to save the changes made. After clicking on Save Changes the user will be taken back to the **'PATIENT EXAMS'** window.



Figure 167: Add Image Button

4.4.2 Add Image:

The **'ADD IMAGE'** button will add an image to an existing exam. Clicking once on the **'ADD IMAGE'** button will present the user with a sub-menu as seen in Figure 168.

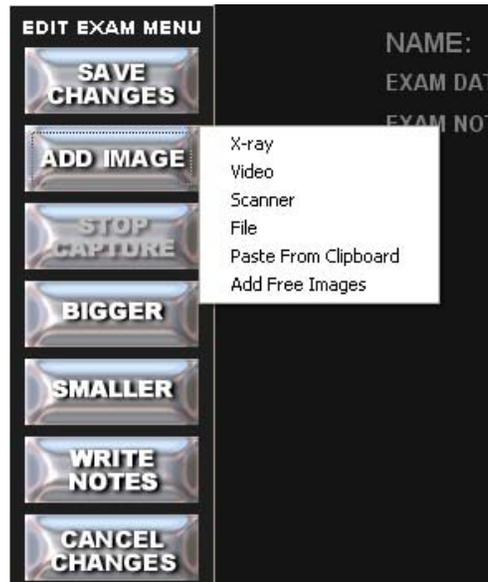


Figure 168: Add Image Sub-menu Options

Select the type of image you would like to add to the exam from the drop down menu.

Selecting the '**X-ray**' option will allow the user to add another radiograph. By selecting the x-ray option, the user will arm the default X-Ray Sensor type or the last type used. This will start a radiograph capture sequence with the appearance of the message: '**PLEASE WAIT**'. After three seconds the message '**TAKE X-RAY NOW**' will appear. The sensor is now armed and ready to take an x-ray. The user has 5 minutes to expose the sensor before the system times out and displays the message '**TIMED OUT**'. If the session times out, the user must reinitiate this function. To capture an x-ray click the '**ADD IMAGE**' button again and select the '**X-Ray**' option. Upon exposure, the system will automatically detect the exposure event. The user will see the message '**PROCESSING X-RAY**', during which time the radiograph is captured, transferred to the computer and processed. The image will be displayed on the monitor.

Adding Additional Images to an existing Exam

As the menu items indicate, the user may also add images from other sources.

For example, if the user has a USB enabled intra-oral camera connected to the computer, the '**Video**' option will bring up a streaming video window that will enable still frames to be captured by the user's computer.

This allows the use of intra-oral cameras to capture images directly into a **XDR** exam.

Similarly, images from **Scanners** and other TWAIN compliant devices (i.e. digital panoramic systems) as well as images from other **File** sources or images copied to the **Clipboard** may be captured directly by **XDR** into an exam.

The user can also select '**Add Free Images**'. See Appendix I: Part A

As images are captured, the previously captured images are reduced to a smaller image size at the lower left portion of the screen.

The images will continue to accumulate at the lower left portion of the computer screen as they are captured. The user may move these images at any time by clicking and dragging them to any final location on the screen.

Remember to select **'SAVE CHANGES'** to save the added images to your selected exam.

XDR allows the user to add images from multiple modalities into a single exam, (i.e. intra-oral radiographs, panoramic radiographs, intra-oral camera images, extra-oral digital camera images, etc.)



Figure 169: Stop Capture Button

4.4.3 STOP CAPTURE:

If adding an X-ray was started, then by selecting **'STOP CAPTURE'** the image capturing process is aborted. If not in the process of adding an X-ray, the **'STOP CAPTURE'** button will remain inactive (Greyed out).



Figure 170: Bigger and Smaller Buttons

4.4.4 BIGGER or SMALLER:

Increase or decrease all of the images size within the layout by clicking on the **'BIGGER'** and **'SMALLER'** buttons. When either button is clicked, the image's top left corner will stay in place while the height and width decrease or increase. The final size of the image thumbnails will determine the size of the images as they are seen the next time opening the exam or on the Print Page.



Figure 171: Write Notes Button

4.4.5 WRITE NOTES:

To write and save a text description (up to **256** characters) for an exam, click the **'WRITE NOTES'** button in the **'EDIT EXAM MENU'**. This will bring up a text entry form into which you can type your notes.

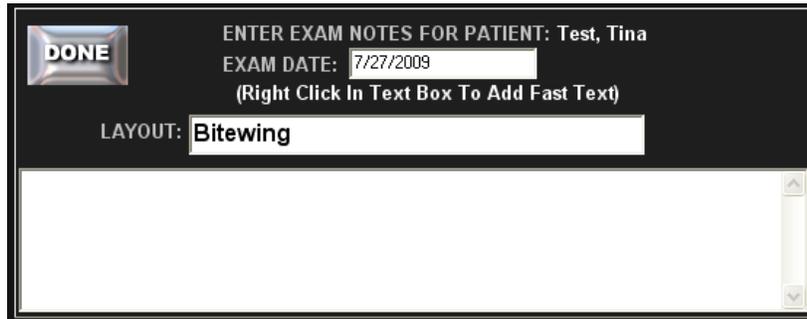


Figure 172: Write Notes Input Interface

Clicking the **'DONE'** button will close the text entry form. Click **'SAVE CHANGES'** to save your notes. The notes will be saved with the exam and can later be re-read.



Figure 173: Cancel Changes Button

4.4.6 CANCEL CHANGES:

The **'CANCEL CHANGES'** button will exit the **Edit Exam** mode without saving any changes made to the exam.



Figure 174: Analyze, Draw, and Adjust Menu Display

4.4.7 Analyze, Draw, and Adjust Menus:

This subject matter will be covered in the following section, Section 5. However, a key point to notice is that in the Edit Exam mode, there is **no Copy button** in the Adjust Menu. This means that if the user edits the individual images while in the Edit Exam mode, they will not be able to save a copy of the changes made.

Section 5: Menu Tools and Imaging Filters

5.1 Adjust Menu (From View Exam)

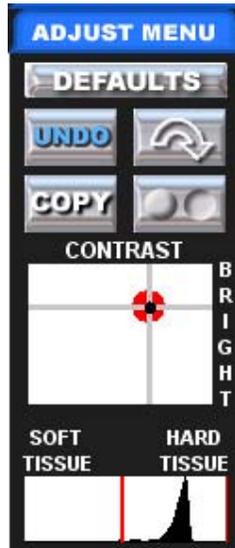


Figure 175: Adjust Menu

When a full-sized radiograph appears on your screen's work area, you may adjust the viewing parameters of that image using controls on the 'ADJUST MENU' located on the lower left side of the screen.

If more than one image is full sized, you need to select the image for adjustment by clicking once anywhere within the image (the selected image will have a blue outline). The uses and functions of these controls are explained below.

Note: If unsaved radiographs are adjusted, they will be saved with the viewing parameters you most recently used (but may be readjusted once they are retrieved and viewed in the enlarged state).



Figure 176: Defaults Button

5.1.1 DEFAULTS button

The 'DEFAULTS' button will set the image to the default image settings. If the default brightness and contrast settings have been changed since the image was taken, it will apply the new defaults.



Figure 177: Undo Button

5.1.2 UNDO:

This button returns the image to its original saved state or to its program default values if it is a newly captured image.



Figure 178: Rotate Image Button

5.1.3 ROTATE an image:

This button will rotate the selected image by 90 degrees each time it is clicked. By pressing the button repeatedly, you can re-orient the image in any way you wish. You can rotate newly captured images or retrieved images. The final orientation in which the image was saved will always be displayed.



Figure 179: Copy Button

5.1.4 COPY an image (In the View Exam Screen):

The 'COPY' button allows the user save a copy of edits made to individual images such as changes made with the Draw Menu or with filters. You will be presented with a warning box telling you that you are about to add an annotated image to the existing exam. Select 'YES: CONTINUE TASK' to finish adding the copy of the original image.

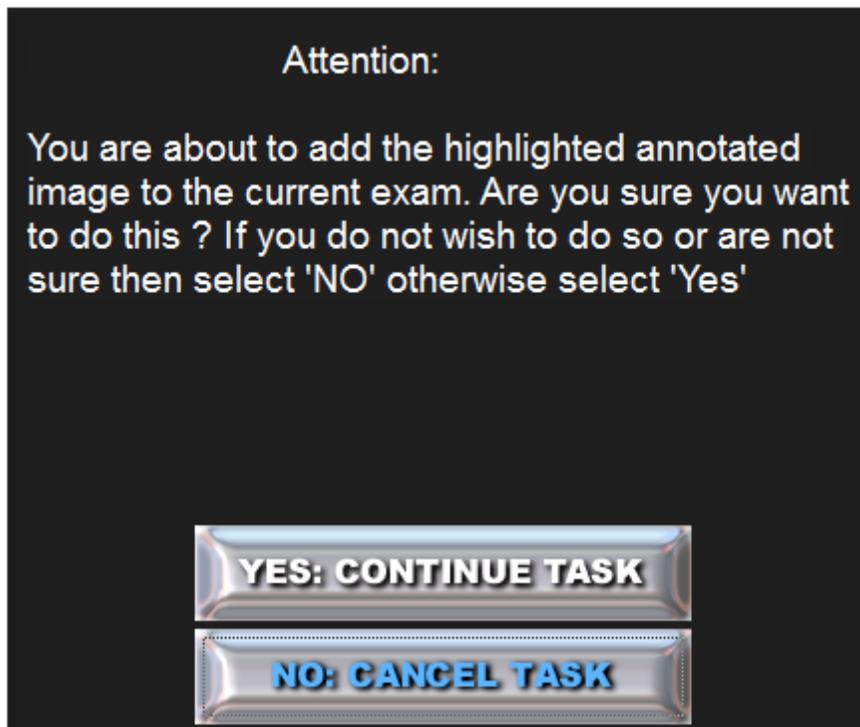


Figure 180: Copy Warning



Figure 181: Change Dimple Setting Button

5.1.5 Flip an image (Dimple IN and Dimple OUT):

By default, all captured images are displayed with the image analogous to an x-ray film's dimple facing out. This button inverts the selected image to display the image with the dimple in. If the user wishes to always display captured images in the 'dimple' in orientation, this can be set in the 'Settings' option on the 'Main Menu'.

5.1.6 Adjust the Contrast and Brightness of an Image:

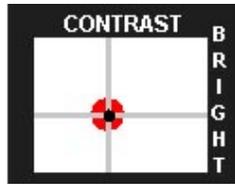


Figure 182: Contrast and Brightness Cross Hair Adjustment

Brightness and Contrast – This dynamic dual axis graphic control display provides simultaneous control over the brightness and contrast of the selected enlarged image with a single mouse movement. To engage the control, you click and drag the small red and black target circle and crosshair in the center of the white box. The horizontal position of the circle controls the selected image contrast and the vertical position controls the image brightness. Higher contrast is achieved by moving the target to the right, and higher brightness is achieved by moving the target towards the top. The image will always be stored and retrieved with the brightness and contrast setting used at the time the exam was saved. You can readjust the image after it is retrieved while never altering the original image.

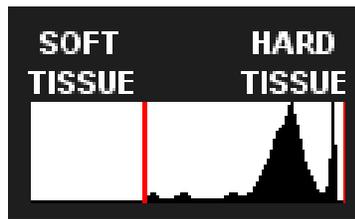


Figure 183: Histogram

5.1.7 Histogram

This graphic control display adjusts the range of intensity that is shown. If artifacts, like a cone cut, bias the data and produce an image that appears too light or too dark, you may use this control to adjust the qualities of the selected image being displayed. The area between the two red bars represents the portion of a captured 12-bit image that is being displayed. By default, this is initially set to encompass the entire range of the original image. Please make sure that all of the image histogram (intensity values) is within the two red lines. You can change the darker, lower data (less dense soft tissue) range by clicking and dragging anywhere near the left end of the red line. The further left you go the more dark data you include in the image display. Similarly, you change the upper range by clicking and dragging anywhere near the right end of the red line. The further right you go the more light data (dense tissue) you include in the image display. Note that the brightness control above does not change the range; it only affects how the image within the current range appears. Also, as with the rotation and contrast/brightness controls, the image will be stored and retrieved with the range setting that was last used prior to saving the exam. Superimposed in the background of this control is a small display of the distribution of intensity values. Use this graphic display to help guide you in properly bracketing the range of brightness values in an image.

5.2 Draw Menu

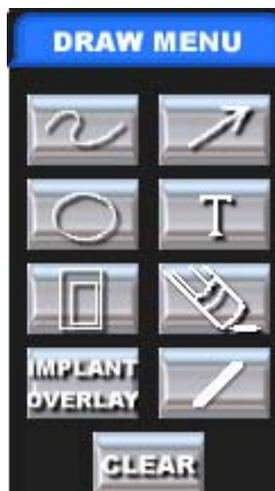


Figure 184: Draw Menu



Figure 185: Free Hand Button

5.2.1 Draw Free Hand:

This button allows the user to draw free hand, using the cursor, on the enlarged image in its enhanced or un-enhanced state. Start by clicking the button with the cursor and placing the black cross hair on the image. Click and drag the cursor along the line you wish to draw and release the mouse button to end the drawing. The resultant image with the free hand line drawing, along with any of the other draw menu annotations, can be saved in the same exam as the original image. Click the **'COPY'** button, in the **'VIEW EXAM MENU'**, to save the annotated image. It will be tiled behind the original un-annotated image.



Figure 186: Arrow Button

5.2.2 Draw an Arrow on an image:

This button allows the user to draw an arrow with the cursor on the enlarged image in its enhanced or un-enhanced state. Start by clicking the button with the cursor and bringing the black crosshair to the image. Click and drag the cursor along the length of the arrow you wish to draw (the arrow head will appear at the terminus of the line). The resultant image with the arrow drawing, along with all of the other draw menu functions, can be saved in the same exam as the original image. Click on the **'COPY'** button, in the **'VIEW EXAM MENU'**, to save the annotated image. It will be tiled behind the original un-annotated image.



Figure 187: Circle Button

5.2.3 Draw a Circle on an Image:

This circle button allows the user to draw a circle, of any size, with the cursor on the enlarged image either in its enhanced or un-enhanced state. Start by clicking the button with the cursor and bringing the black crosshair to the center of the

object of interest to be encircled. Click and drag the cursor from the center of the object of interest out to its edge. The resultant image with the encircled object, along with all of the other draw menu functions, can be saved in the same exam as the original image. Click on the **'COPY'** button, in the **'VIEW EXAM MENU'**, to save the annotated image. It will be tiled behind the original un-annotated image.



Figure 188: Text Button

5.2.4 Write Text on an image:

This button allows the user to place text on the enlarged image, using the cursor and keyboard, in its enhanced or un-enhanced state. Click the button with the cursor, then bring the black crosshair near the object to be noted in the image. Click and drag from the upper left hand corner to the lower right corner of the text box. Then, click within the text box, type your notation and hit the 'Enter' key when you are done. The resultant image with the text, along with all of the other draw menu functions, can be saved in the same exam as the original image. Click on the **'COPY'** button, in the **'VIEW EXAM MENU'**, to save the annotated image. It will be tiled behind the original un-annotated image.



Figure 189: Crop Button

5.2.5 Crop an image:

This button allows the user to crop a portion of the enlarged image either in its enhanced or unenhanced state. Start by clicking the button with the cursor and bringing the black crosshair near the object to be cropped. Then, click and drag from the upper left corner down to the lower right corner of the object. The resultant cropped image can be further annotated, with all of the other draw menu functions, and saved in the same exam as the original image. Click on the **'COPY'** button, in the **'VIEW EXAM MENU'**, to save the cropped image. It will be tiled behind the original un-cropped image.



Figure 190: Implant Overlay Button

5.2.6 IMPLANT OVERLAY:

This button allows the user to place pre-scanned implant overlays of your choice over the image. Start by left clicking the implant overlay button with the cursor and choosing the implant type of choice. The light blue colored overlays will appear over the enlarged image. The overlays can be moved horizontally or vertically with a left mouse click and drag, and rotated with a right mouse click and drag. The implant overlay will dynamically resize according to the unidirectional or bi-directional scaled grid (with or without the grid being displayed). When the desired implant overlay image has been oriented over the chosen area, click the implant overlay button again. This will set the overlay in place, at which time the light blue color will change to white. If you would like the overlay to appear in black, change the pen color before setting the overlay on the image. The resultant image with the implant overlay, along with any other draw menu annotations, can be saved in the same exam as the original image. Click the **'COPY'** button, in the **'VIEW**

EXAM MENU', to save the annotated image. It will be tiled behind the original unannotated image.



Figure 191: Color Choice Button

5.2.7 Change the Pen Color:

This button allows the user to change the color of the draw, overlay and text functions to black or white. Before using any of the annotation or text functions, click on the desired color choice before continuing use of the selected function.



Figure 192: Clear Button

5.2.8 CLEAR:

This button allows the user to clear all previously drawn or text annotated information from the selected image.

5.3 Analyze Menu



Figure 193: Analyze Menu



Figure 194: Caries Endo Button

5.3.1 CARIES ENDO Filter:

This button is a specialized automatic image enhancement modality used to expand the middle to upper portion of the gamma range. This modality will accentuate anatomic features within this brightness range, which tends to be hard tissue structures of moderate to high radiographic density (i.e. carious and endodontic lesions). We suggest you use this modality to first identify suspect regions of the image, then toggle back to the normal display, repeating as many times as necessary to confirm one's observations. This is a temporary adjustment and will not affect how the image is stored. However, if the user wants to save the **'CARIES ENDO'** enhanced image, click on the **'COPY'** button in the **'VIEW EXAM MENU'**. It will be tiled behind the original unenhanced image.



Figure 195: Perio Button

5.3.2 PERIO Filter:

This button is a specialized automatic image enhancement modality used to expand the lower (darker) portion of the gamma range. This modality will accentuate anatomic features within this darker range, which tend to be soft tissue structures of low radiographic density (i.e. gingival tissue or other soft tissue areas). Similar to the **'CARIES / ENDO'** function, we suggest using this modality by toggling back and forth between the enhanced and normal image. This is a temporary adjustment and will not affect how the image is stored. However, if the user wants to save the **'PERIO'** enhanced image, click on the **'COPY'** button in the **'VIEW EXAM MENU'**. It will be tiled behind the original unenhanced image.



Figure 196: Sharp Button

5.3.3 SHARP Filter:

This button will sharpen the selected image. This is a temporary adjustment and will not affect how the image is stored. However, if the user wants to save the **'SHARP'** image, click on the **'COPY'** button in the **'VIEW EXAM MENU'**. It will be tiled behind the original unenhanced image.



Figure 197: Magnifying Button

5.3.4 Magnifying Tool:

This modality allows a close up view of the selected image. A magnified portion of the image will appear within the original image 'window'. A small navigational window in the upper left of your screen shows what portion of the original image is displayed as indicated by a **red box**. You can change the magnified display area by clicking and dragging the small **red box** in the 'navigation' window over to the region of interest. This is only an extemporaneous adjustment, and will not affect how the permanent image is stored. To save a copy, click on the **'COPY'** button in the **'VIEW EXAM MENU'**. It will be tiled behind the original unenhanced image.

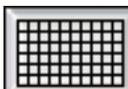


Figure 198: Scaling Button

5.3.5 Scaling function:

This modality enables you to superimpose a measurement grid on top of the radiograph. When you first click this button, you are presented with the following dialogue box that allows you to choose a standard grid or an angled grid. The **'STANDARD GRID'** lines are oriented vertically and horizontally with 1 mm grid lines. The **'ROTATED GRID'** has the grid lines oriented at an arbitrary user selected orientation and allows size calibration in one or two directions. When you select the **'ROTATED GRID'**, you are presented with the following **'BI-DIRECTIONAL SCALING'** dialog box (See Figure 199):

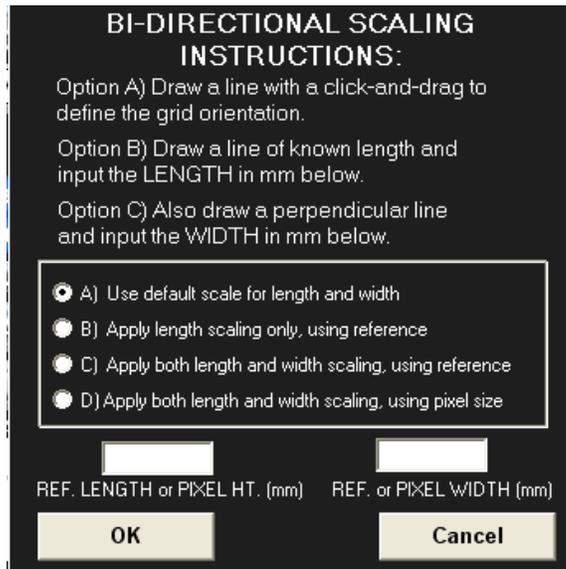


Figure 199: Bi-Directional Scaling Window

The **BI-DIRECTIONAL SCALING** dialog box showing options for: A) Use default scale for length and width, B) Apply length scaling only, using reference, C) Apply both length and width scaling, using reference, D) Apply both length and width scaling, using pixel size.

As indicated, the user must draw a line on the radiographic image in the desired direction (by clicking and dragging the mouse producing a green line) and define the orientation of the mm grid. If the user selects the 'default' scaling Option 'A', the standard 1mm grid will not correct for any geometric distortion of the image. If the user selects the 'unidirectional scaling' Option 'B', then the user must indicate the length of the line (in mm) that will be drawn on an object of known length in the radiograph.

Therefore, you must have some reference object in the image of a known length (i.e. endodontic file), upon which to draw the line of specified length on the radiograph after you select 'OK'. This will rescale the displayed grid to this known length and all subsequent measurements made on this image will be accurate, relative to the axis referring to the length of your fiduciary object. In Option 'C', a second axis of scaling can be inputted if it is known (i.e. the length and diameter of a dental implant pilot drill).

Again, this function will rescale the rotated grid to both the known length and width of the reference object, and all subsequent measurements made on this scaled image will be accurate relative to the length, width and direction of these rescaled values. To save a copy, click on the **'COPY'** button in the **'VIEW EXAM MENU'**. It will be tiled behind the original unenhanced image.



Figure 200: Measure Button

5.3.6 Measurement:

This modality enables your cursor to act as a 'click and drag' measuring device. After you click this control, every single-click within the radiographic image will be

marked and connected by a **green** line. The mark will indicate the distance in millimeters from the first mouse click (which will be marked '0 mm'). You can terminate the series of connected lines by double-clicking on the last point. *To measure an object in the image, click on the desired starting point with a single left mouse click before dragging the green line to the terminus of the object to be measured with a double mouse click. For a non-linear or curved object, the direction of the green measurement line can be change by a single click of the mouse.*

To start measuring a new set of line segments merely repeat the same process. Click the '**Measure**' button again to return the cursor to the normal click and drag mode. To save a copy, click on the '**COPY**' button in the '**VIEW EXAM MENU**'. It will be tiled behind the original unenhanced image.



Figure 201: Unwarp Button

5.3.7 UNWARP an image:

This button is a unique **XDR** patented automatic image correction tool for projective distortion of a radiographic image due to elongation. To implement this function, a specially modified sensor holder (i.e. Snap-A-Ray or Ezee-Grip) must be used for image capture. An imbedded fiducial object in the sensor holder must project an un-obscured small roundish radiopaque image on the radiograph. The user must use a single left mouse click to locate the object, and then click on the '**UNWARP**' button to implement the automatic correction of the distorted image. This is a temporary image adjustment and will not affect how the image is stored. However, if the user wants to save the "**UNWARP**'ed" (undistorted) image, click on the '**COPY**' button in the '**VIEW EXAM MENU**'. It will be tiled behind the original unenhanced image.



Figure 202: Reverse Grey-Scale Button

5.3.8 Reverse Gray Scale or Invert:

This modality reverses the brightness values of the display (i.e. whites go to blacks and blacks go to whites). The same data is presented, but sometimes the clinician may find it easier to identify certain anatomic features if the intensity scale is reversed. This is a temporary adjustment and will not affect how the image is stored.

Appendix I: Common Processes

While these processes are described in parts throughout the manual, we thought the user might find it useful to have them together in one section

Part A: Combine images from different exams (Free Images)

Decoupling Radiographs from an Exam

The user may also make copies of existing radiographs and or images from different exams and save them into a new layout.

To combine images, the user will simply make copies of radiographs or images from one exam, go to the next exam, make copies of images from the second exam, and place all of the images into a new exam layout.

Open the first exam by double clicking the 'PATIENT EXAMS' form, or by highlighting the exam with a single click and selecting the 'VIEW EXAM' button (See figure 203).

PATIENT EXAMS

BACK TO PATIENT LIST

NAME: Test, Tina STREET:
PAT. ID: XDR00014 DOB: CITY:
MISC ID: SEX: SSI: --- -- STATE: ZIP:

VIEW EXAM **FLOAT EXAM** **FLOAT ALL** **NEW EXAM**

DATE	EXAM TYPE	NOTES (shift left click to read all)
9/5/2009	PA's	
7/27/2009	Bitewing	
7/9/2009	Bitewing	
6/16/2009	FMX	
6/16/2009	FMX 2	
12/16/2005	Photos	

DELETE SELECTED EXAM **TRANSFER EXAM TO ANOTHER PATIENT**

Figure 203: Patient Exams Window

In the **'VIEW EXAM MENU'**, use the right mouse button and click once anywhere on the selected image.



Figure 204: View Exam Screen

Note that a labeled banner now appears on the top of the selected image indicating that it is a copy of the selected image from the existing exam series as seen below.



Figure 205: Free Image as created by right clicking an image in View Exam Mode

This is referred to as a **'FREE IMAGE'**.

When the user exits this exam, the copied image will remain on the screen with a labeled banner of the patient's name and date of exam.

Click on the **'NEW EXAM'** button.

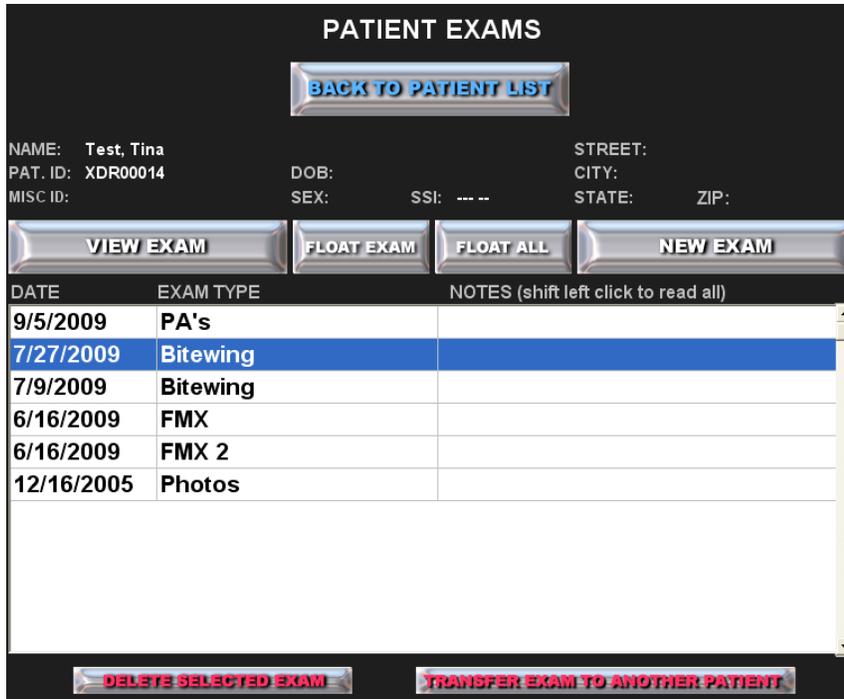


Figure 206: Patients Exams Window

Select a layout from the **'LAYOUT MENU'** as seen in Figure 207.

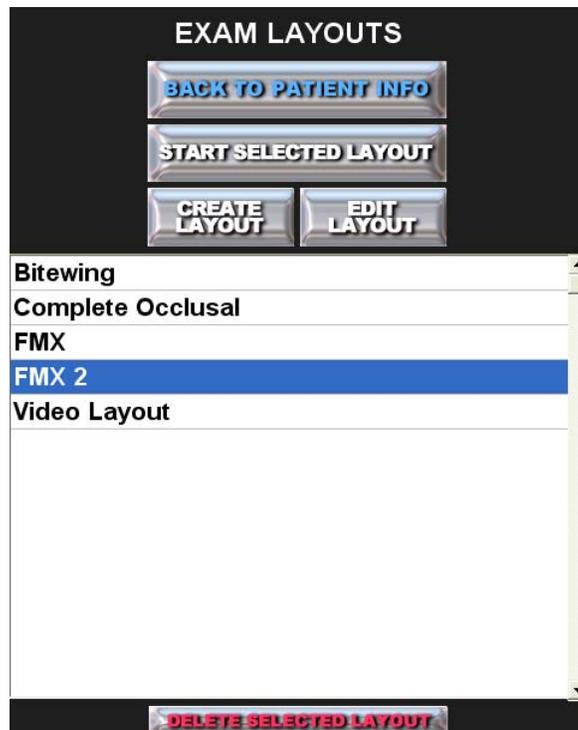


Figure 207: Exam Layouts Menu

This will take the user to the **'TAKE EXAM MENU'**. (See Figure 208)

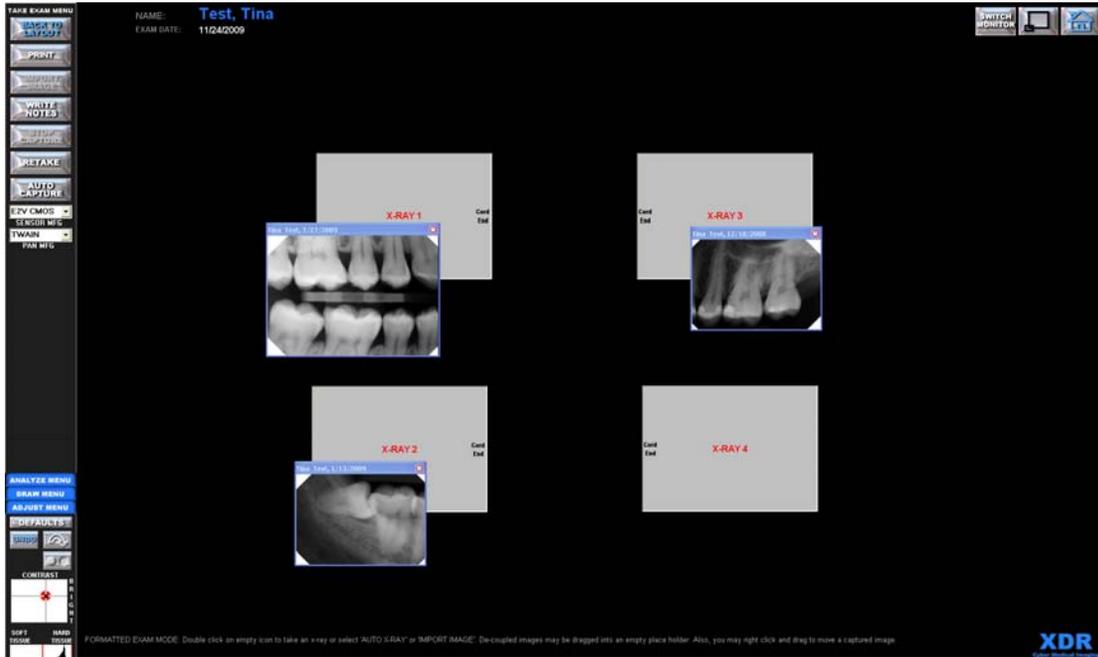


Figure 208: Freed images being combined into one exam

Left click on the copied images and drag them over the image icon (space saver), as seen in Figure 208.

When the user lets go of the left mouse button, the image will be pulled into the image icon in the layout.

The user can type in the **'WRITE NOTES'** text box to record notes referencing this exam as a composite of other exams (See Section 4.2.6).

NOTE: This versatility allows the user to make copies of existing images from any previously stored exam and temporarily add them to a collection of images on the user's current screen.

For the user to remove a temporarily decoupled copied image, click on the small **'X'** located on the top right of the banner, or remove all such images by returning to the **'Main Menu'**.



Figure 209: Click on the red "X" to remove the copied image

Copied images will not delete other images and will replace all images in their proper exam once the user is finished with them.

(This feature is analogous to removing several mounted x-ray films from a patient's chart and viewing them on a light box simultaneously.)

Part B: Retrieve Deleted Exams or Images

Deleted images and exams are either renamed in the patient's subfolder on the server, or moved to the Archive Folder. When this happens, all information on placement and size is gone. In order to retrieve the images, a new exam must be started and have the images imported from the correct folder.

We recommend contacting **XDR** Technical Support to help you retrieve deleted exams. This task is performed by the **XDR** technical staff as part of our Software Support Program. For users who are on the Software Support Program, please call **XDR** Technical Support at 888-937-9729.

Appendix II: Infection Control

How do I execute Infection Control and eliminate Cross Contamination?

Heat sterilization will severely damage the intra-oral sensor unit, and render it irreversibly inoperable.

Thus, alternate methods of contamination control should be employed. The American Dental Association (ADA) and the Center for Disease Control (CDC) have established guidelines regarding barrier technique for infection control. The ADA has specifically recommended the use of protective coverings for x-ray equipment and films. We recommend that the clinician encase the sensor, and even the portion of the cable contacting the patient, in a clean disposable plastic cover with each patient use. As a further precaution, the sensor should be disinfected according to the recommendations of the ADA or the CDC on heat sensitive equipment. The same barrier technique should be practiced for the computer keyboard, mouse or any object that might come in contact with the patient and the operator. The sensor holder (e.g. Rinn or Snap-a-Ray) should be sterilized between patients according to the ADA and CDC recommended heat or cold sterilization procedures.

XDR provides you with a set of sensor barriers. ALWAYS put a barrier on the sensor prior to inserting the sensor in someone's mouth.

NEVER USE ALCOHOL!

Appendix III: Sensor Care and Storage

Sensor plate

- Do not use alcohol on the sensor plate or cord. It causes casing and coatings to harden and lose protective qualities.
- Do not place on hard surfaces.
- Guard against patients' biting the sensor plate.

Cord

- Guard against patients' biting the cord. Over time, this can cause damage to the cord causing poor image quality.
- Keep a wide radius of curvature (no tighter than a quarter); even when hanging it up (preferably use two hooks) which includes carrying it around your neck or lightly looped in your hand.
- Do not yank the cord out of the sensor plate (a top cause of damage).
- If you are storing the sensor in a drawer, make sure it is entirely inside, so the drawer does not close on the cord.

Caution:

- Never expose the sensor USB plug to liquids.**
- Never place the sensor in a heat sterilizer.**
- Never kink the sensor cord.**
- Avoid pulling hard on the sensor cord where it attaches to the sensor**
- Avoid shock, like dropping the sensor on hard surfaces.**