CDR User Guide

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Getting Help

In the event you require technical support related to your new CDR system, please contact your local distributor (Patterson Dental Supply, Inc. in the United States), or the authorized international dealer for Schick Technologies products in your country or region.

Customers who have purchased products directly from Schick Technologies can reach us at the following number: 1-877-SCHICK-Help (1-877-724-4254).

Before contacting us for technical support, there are a few things you can do to help us expedite your call. Below is a short list of information our support personnel will ask you, so having this information available before you call will help us resolve your questions more efficiently.

- What Windows operating system are you running (Windows 98, NT, 2000, etc.)?
- What numbered version of CDR software are you running (2.6, 2.5, etc). Is it single- or multi-user?
- If your CDR system is networked, does it use a dedicated server (server stores images but is not used for acquisition), a non-dedicated server (server used for image storage and acquisition), or peer-to-peer (no central server)?

Depending on the nature of your call, we may also ask you to check the communication status between your CDR hardware and software. To do this, make sure your sensor and Remote Module are connected, and the cable connection between the Remote Module and your computer is secure. Start CDR, open the System menu, and then click on Sensor and Sensor Info.

If you are using a CDR 2000 USB system, three "Unknowns" in the Sensor Info dialog box often point to an incorrect or corrupt device driver. You may have also received white images in CDR software even though the steps and duration for taking X-rays appeared normal. In this case, use the Diagnostic Utility provided with CDR to reload the USB driver (Windows 98 systems) and to verify other potential problem areas.

It is also important to make sure you have the correct firmware installed in your Remote Module for the version of CDR software you are running. *(Make sure your sensor, Remote Module, and USB cable are connected when checking this information.)* The firmware version number can be verified in the Help menu by clicking on About CDR. Starting with CDR 2.6, you will be automatically prompted in the event there is a mismatch between CDR software and firmware. You can also verify the firmware version manually by clicking the Windows Start menu, Programs, CDR, Upgrade CDR 2000 Remote, and then at the Start screen click the Verify menu.

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1. The Basics

Follow the steps below to take an X-ray using CDR. For additional details on acquiring images (manual acquire and AutoTake), refer to **Section 7**.

STEP 1

Start CDR from the Windows Start button or by clicking on the desktop shortcut to CDR.

STEP 2

A. In the CDR exam window, click > **File** > **New**, or click the New Exam button.

B. In the Patient Information dialog box, enter the appropriate information and select the series.

C. Click **OK**.

STEP 3

A. Place the sensor in the holder, and then place the sheath over sensor and holder. Place the sensor in the patient's mouth with the flat side facing the X-ray tube.

B. Check the X-ray source exposure setting. The proper setting on the X-ray source depends on several factors, among them, the type of tube, the anatomy of the patient, and the location of the sensor in the oral cavity.

STEP 4

CDR USB Systems with AutoTake —

The first empty target frame is pre-selected and flashes green (default setting). Skip ahead to Step 6.

All other CDR Systems —

Select an empty target frame that matches the sensor's location in the patient's mouth. When the frame is highlighted, click on it again. If the system is equipped with a footpedal, press the amber pedal.

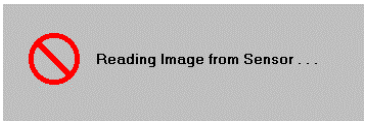
STEP 5

The CDR system is now in image acquisition mode. A “Please Wait” message may appear momentarily.

STEP 6

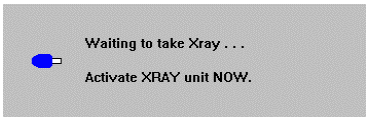
CDR USB Systems with AutoTake —

Activate the X-ray source. “Reading Image from Sensor” appears on the screen momentarily.



All other CDR Systems —

Activate the X-ray source when “Waiting to take X-ray” appears.



STEP 7

CDR USB Systems with AutoTake —

When acquisition is complete, the image appears in the zoom window.

All other CDR Systems —

If AUTO_ACCEPT=YES, the image appears immediately in the zoom window. If AUTO_ACCEPT=NO, the Accept/Reject dialog box appears.

STEP 8

CDR USB Systems with AutoTake —

CDR advances to the next empty frame in the series automatically. To take another X-ray, repeat this procedure starting at Step 6.

All other CDR Systems —

Close the zoom window. The exam window is displayed again with the image. To take another X-ray, repeat this procedure starting at Step 4.

2. CDR System

Computed Dental Radiography (CDR®) is an electronic diagnostic system that acquires, displays, prints, and stores digital X-rays and video images. This section provides a general system overview and describes the conventions used in this manual. In the sections that follow, all of the features of the CDR software program are described, up to and including CDR version 2.5. More detail about new software features can also be found in the "Using New Features" documents, located after the CDR Supplements tab of this binder.

2.1 CDR Sensors

CDR sensors are available in three sizes (0, 1, and 2). Size 0 is suitable for children, and Sizes 1 and 2 are appropriate for adult patients. The sensor is an electronic device, and although it has been designed for durability and long-term reliability, it should be handled with care.

2.2 Sensor Care

Your CDR sensor is designed and tested to withstand years of daily use. To help ensure it provides reliable service, refer to the following tables for guidelines on proper care.

Table 1. CDR Sensor Care Instructions

DO	DON'T
Wipe down Sensor with sterile solution	Don't soak Sensor or its edge-card connector in sterile solution and don't autoclave Sensor
Use our bite holders, tabs, and sterile sheaths with Sensor	Don't clamp Sensor or cable with a hemostat

Table 2. CDR Sensor Cable Care Instructions

DO	DON'T
Carefully uncoil Sensor cable by letting edge-card hang down while holding Sensor. Carefully remove all tangles and sharp bends and make sure cable is completely uncoiled before using Sensor.	Don't create sharp bends and knots when untangling Sensor cable. When completely uncoiled, don't allow Sensor cable to become tangled during use.
Disconnect Sensor from Remote Module by grasping edge-card and pulling it gently from Remote	Don't disconnect Sensor from Remote Module by pulling on Sensor cable
Remove Rinn holder from Sensor by grasping Sensor and gently sliding holder off Sensor	Don't pull on Sensor cable to remove Rinn holder
After using your Sensor, gently coil Sensor cable and place Sensor in its protective case	Don't hang Sensor by its cable, or let Sensor cable dangle near the floor where it can become tangled or near a cabinet drawer where it can be caught or crimped

2.3 Accessories

There are several different *holders* available for the CDR sensors, including Rinn-compatible, endodontic and pedodontic holders. There is also a modified "Snap-a-Ray" holder and a variety of bite tabs as well. Finally, there are holders that clip on the sensor and have tabs that can be gripped with a hemostat.

CAUTION – Never clamp the sensor package or cable with a hemostat or an unmodified "Snap-a-Ray" holder.

Plastic *Sheaths* are available for CDR sensors as an important measure of protection from bacterial exposure. Use CDR Sensor Holder Sheaths (Schick Part Number A2404500) or their equivalent with all CDR sensors.

CAUTION – New sheaths and bite tabs should be used for every patient to provide an important measure of protection against exposure to bacteria. Dispose of sheaths and tabs properly after they have been used.

Table 3. Inserting Bite Tab and Coverall Sensor Sheath

Step	Action
1.	Slide Bite Tab over Sensor.
2.	Slip Sheath over Bite Tab and Sensor.
3.	Replace Sheath and Tab for each new patient and repeat steps 1 and 2.

2.4 Peripherals

Capturing images with the sensor and viewing them on a monitor requires interconnecting hardware (the *Remote Module*, also called the *CDR 2000 Interface* on CDR USB systems). The connection between the CDR 2000 Interface and the computer is made by USB (Universal Serial Bus) cable. When the CDR system is used with the CDRCam2000 intraoral camera, additional hardware may be required. Our website, www.schicktech.com, provides more information on the requirements and typical setup procedures for this device.

2.5 Hardware and Software

The computer requirements for CDR systems include the following:

- Pentium-based PC or better running Windows 9X, Windows NT, Windows 2000, and Windows ME (Windows ME not recommended as the server in a network environment).
- Minimum of 64 MB of RAM and 20 GB of free hard disk space for approximately 40,000 images. Check our website www.schicktech.com for the latest information.)
- Available USB port and Intel chipset required for CDR USB systems. (Refer to our website for a current list of compatible chipsets.)
- Minimum display of 800 x 600 x 256 colors for X-rays. For video images, the minimum display requirement is 800 x 600 x 24-bit color. (Actual settings are defined by the video adapter and/or capture card installed in each system.)

The operation and performance of the CDR software is affected by the amount of free memory. If any programs besides CDR are to be operated with CDR, installing additional RAM is strongly recommended.

2.6 Other CDR Equipment

Schick Technologies offers additional hardware designed to integrate with the CDR system and to make the most of its features.

CDR*Cam* 2000® is the newest hand-held intraoral camera from Schick Technologies. Providing both intraoral and extraoral viewing. Its lightweight design, sleek handpiece profile contour means that the camera is portable, comfortable to hold, and easy to use. CDRCam 2000's patented light source provides clear, long-life, low-power illumination.

CDR*Pan*® is an electronic imaging system that integrates with panoramic machines to acquire, display, store and print digital X-rays. CDRPan will retrofit to the mechanical profile of most types of panoramic machines (drum, cassette, and curved-cassette types) from many popular panoramic equipment manufacturers. Refer to our website for a current list of supported host machines.

2.7 About this Manual

This User Guide has been updated to describe new features and changes made in CDR software since version 2.0. When new or recently updated features are described in text, a short note is provided specifying the software version when the feature appeared or was updated. If you have not upgraded your CDR software since version 2.0, some features discussed in this manual will not be reflected in your software.

To upgrade to a newer version of CDR, please contact us directly or your local CDR dealer or distributor for more information.

2.8 Text Conventions in this Manual

Throughout this manual, some text conventions have been introduced to highlight certain actions (keyboard and mouse), screen locations (toolbar buttons and menu items) and other areas of usage or interest. The following list documents these conventions.

Item	Usage	Example
Keystrokes	Describe keyboard keys	[ENTER]
Screen Text	Describes text found in dialog boxes	" Dentist data unavailable "
Menus and Buttons	Describe menu commands and toolbar button names	**New Exam**
Cautions and Warnings	Emphasize CDR safety issues and maintenance topics requiring special attention	**CAUTION**
Notes	Describe general information that may be of interest to you	*NOTE*
File Names	Describe file names and locations	C:\CDR\XRAYS

3. Installing CDR

3.1 Installing CDR Software

To install CDR software from CD-ROM, insert the disk into the CD Drive. The CD should play a brief intro and then display a menu screen. If the CD doesn't run automatically, click **Start**, **Run**, and then enter **d:\cdrsetup\setup** at the command line (if "d" is the drive letter for the CD player). Click **OK**.

To install CDR software from floppy disk, insert the first disk in the floppy drive. Click **Start**, **Run**, and then enter **a:\setup** at the command line. Click **OK**. When prompted, remove the disk and insert the next disk in the sequence. Continue until the files from each disk have been copied.

After CDR is installed, it is listed as a program group on the Windows Start menu.

Table 4. CDR Program Group

Icon	Description
	CDR Diagnostic Utility – verifies whether CDR is configured correctly and if critical files and settings are up-to-date *(CDR USB Systems only)*
	CDR Online Help – Opens Help for CDR
	CDR Options (CDR.INI) – Displays CDR configuration settings
	Install CDR for Windows – Installs or updates the CDR program
	Install CDR Sensor Calibration File – Installs the Sensor file from disk
	Install CDR Video Manager – Installs Video Manager from disk
	Upgrade CDR 2000 Remote – Updates firmware in the Remote Module *(CDR USB Systems only)*
	CDR for Windows 2.5 – Runs the CDR program

3.2 Installing Sensor Calibration File

Provided with every sensor is a disk containing the sensor calibration file. The disk has the sensor's serial number stamped on the label. Each calibration file is unique to the sensor it was shipped with and the file must be installed on every computer systems using that sensor. To install the sensor calibration file, insert the disk in the floppy drive and click on "Install CDR Sensor Calibration File" under the CDR group on the Start menu.

3.3 Where Images are Stored

The location of all CDR data and images is determined by two settings in the `CDR.INI` file (**Section 13**) `XDRIVE` and `XPATH`. `XDRIVE` indicates the drive letter used to store data and images, and XPATH indicates the path to the folder storing that information. For single-users the default drive is "C" and may not be greater than "E". For network users the default is "F", but it can be any drive letter greater than (and including) "C".

3.4 Networking

There are two different versions of the CDR software, single-user and multi-user. To operate CDR on a network, the multi-user version of the CDR software *must* be installed. The single-user version of the software *will not* work on a network. If you have a CDR Network license, the disk will be clearly labeled as such on the front of the disk.

3.4.1 Dedicated Server Networks

In a dedicated server network, the server is used only to store images. The server does not take X-rays, nor is it used as a viewing station for displaying images. All of the workstations in the network are mapped to the server's hard drive, and all of them use the same drive letter to access the server's hard drive.

To install CDR on a server-based network that uses "F" as the network drive, make the following adjustments to the `CDR.INI` file (**Section 13**). (The first time the multi-user version of CDR is installed, these changes are made automatically by the software.)

```
NETWORK=YES
XDRIVE=F
XPATH=F:\CDR\XRAYS
```

With server-based networks, the recommended method is to install CDR on the local hard drive of each computer on the network (*local execution*). This provides the fastest performance for CDR, and if the server fails, CDR can be started from the workstation (although stored X-rays, since they are on the server, would not be accessible). With local execution, custom series and reports must be copied to each local computer (for more

information on custom series and reports, refer to **Sections 6 and 11**). Also, be sure to install the calibration file for each sensor on each workstation used to acquire X-rays.

3.4.2 Non-Dedicated Server Networks

In a non-dedicated server network, one workstation is designated as the server and all the images are stored on its hard drive. In addition, the server can be used to acquire images and display them.

Since the server is used to acquire X-rays, the following command must be added to the server's `AUTOEXEC.BAT` file: `SUBST F: C:\`

> *NOTE:Do not use the above command with Novell NetWare. In a Novell network, the server is dedicated and cannot be used to acquire X-rays.*

To install CDR on a server-based network that uses "F" as the network drive, make the following adjustments to the `CDR.INI` file (**Section 13**). (The first time the multi-user version of CDR is installed, these changes are made automatically by the software.)

```
NETWORK=YES
XDRIVE=F
XPATH=F:\CDR\XRAYS
```

With server-based networks, the recommended method is to install CDR on the local hard drive of each computer on the network (*local execution*). This provides the fastest performance for CDR, and if the server fails, CDR can be started from the workstation (although stored X-rays, since they are on the server, would not be accessible). With local execution, custom series and reports must be entered on each local computer on the network (for more information on custom series and reports, refer to **Sections 6 and 11**). Also, be sure to load the sensor calibration file for each sensor on each computer used to acquire X-ray images.

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4. CDR Fundamentals

The fundamentals of CDR operation can be described by the following functions:

- *Setup* – Creating new patient exams or opening existing ones
- *Acquire* – Capturing digital X-rays and video images
- *Evaluate* – Manipulating images using CDR enhancement tools
- *Print* and *Store* – Printing and storing images

4.1 Setup

Setup includes the selections you will need to make before acquiring images. There are several choices to be made, but CDR's integrated, menu-driven software assists you in finding the best exam fit for each patient and getting you quickly to the image acquisition phase.

When you create a new exam, you are prompted to provide some basic patient information and to choose the type of series. A series is an arrangement of target frames where X-ray and video images are captured and displayed. A series provides the framework for every dental exam; it supplies the location, orientation, and position of each image in relation to the patient's jaw. Several standard series are supplied with your software (Full Mouth Series or Bitewings for example), but you can also create your own.

When you create a new series, CDR provides significant flexibility in helping you customize the series. You have the option to create a completely new series or edit an existing one. After you've created a new series, you can re-use it, change it, make it your default series (which places it at the top of the series list in the Patient Information dialog box), or delete it. For more information on related screens and menus, refer to **Sections 6** and **11**.

4.2 Acquire

Once exam setup is complete, X-ray and video images can be acquired. The sequence for acquiring images is displayed in the CDR exam window by a series of empty target frames, arranged and numbered according to the series and order selections made during setup. For more information on related screens and menus, refer to **Sections 6** and **11**.

4.3 Evaluate

Evaluate includes two related functions. The first consists of reviewing the acquired image and, if desired, comparing it to another, second exposure of the same area, to determine the better quality image. The second function consists of manipulating the image graphically, using the enhancement tools available in CDR. Refer to **Section 8** for a full description of CDR enhancement tools.

4.4 Print and Store

Print and Store perform exactly the functions their names describe: printing the image and storing (saving) the image. An image is saved automatically when accepted and will be displayed in its target frame when the zoom window is closed.

When printing from the main and zoom windows, CDR adds additional options to the Print dialog box. “Patient Info” and “Dentist Info” can be included on the printed page by checking the appropriate checkbox. Other print options will vary from printer to printer, but some are fairly standard: the number of copies to print and print to file are two common options. For more information on related screens and menus, refer to **Section 11** of this manual.

5. CDR Windows

While working with the CDR software, you will become familiar with two CDR windows, the exam window and zoom window, and a special display, QuickZoom®, which appears on the exam window. Both the exam and zoom windows have some common elements, listed below.

- *Menu Bar* – A row near the top of the main and zoom windows containing the names of drop-down menus.
- *Toolbar* –A row of buttons located below the menu bar that accesses several commonly used CDR features. Each button includes an icon and a short text description. Options to turn off toolbar text, to use a smaller button toolbar, or to hide the toolbar entirely, are available also.
- *Image Area* – The viewing area for target frames (exam window), for QuickZoom (exam window), and for a single, zoomed image (zoom window).
- *Status Bar* – A row at the bottom of the main and zoom windows containing CDR system status information, time of day, and additional help.

In addition, CDR 2.5 software has incorporated several additional elements.

- *Exam Tabs* – A row of tabs located along the bottom of the exam window with each tab representing an exam for that patient. A brief description of this feature can be found in **Section 5.1**
- *Mini-Exam Window* – A thumbnail view of the patient exam viewable from the zoom window. A brief description of this feature can be found in **Section 5.3**

5.1 Exam Window

Whenever the CDR program is started, the exam window appears first. Initially, only the menu bar, toolbar, and status bar are shown, but as patient exams are either opened or created, the exam window fills with exam and image information.

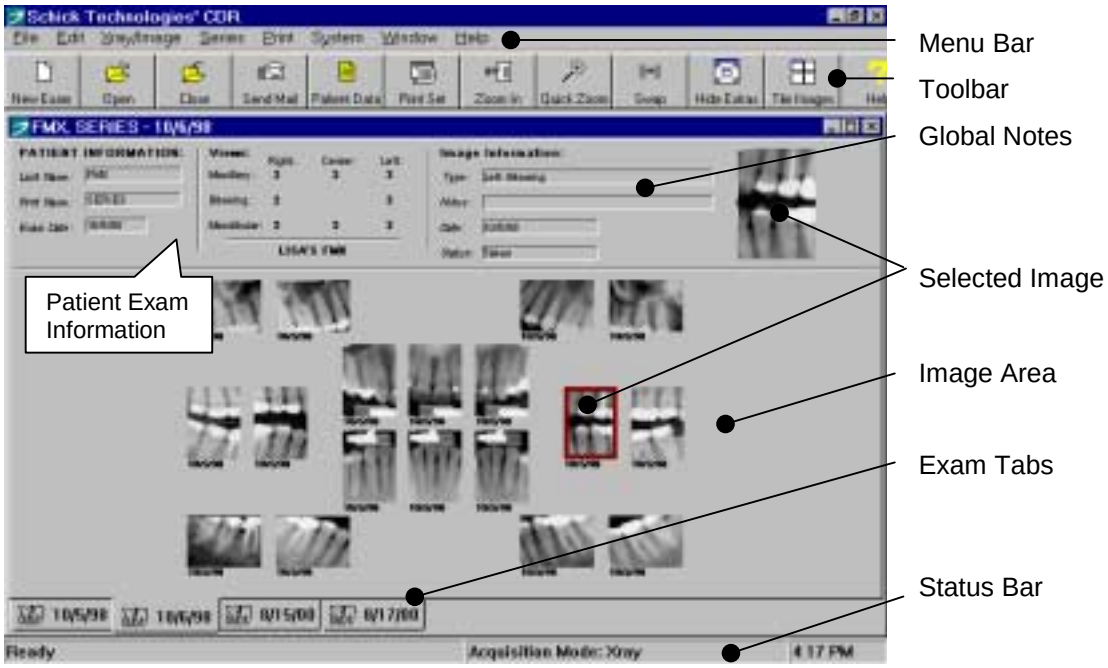

Figure 1. Exam Window

Exam Tabs

When the new tab format is active, a tabbed row will appear along the bottom of the CDR main window. Each tab represents an exam for that patient, shown from the oldest exam at the left to the most current one on the right. If there are more exams than can fit along the row at the bottom of the screen, two arrow keys located at the lower right of the exam window can be used to scroll through the tabs until the desired exam is displayed.

Every tab consists of the following items: the date of the exam; an icon that signifies X-ray, Panoramic, or Video exam (image history does not have an icon associated with it), and the Tool tip (appears when you move the cursor over the tab). If exam tabs are not active when you open or create a new exam, click **Window** > **Hide Elements** > **Hide Exams Tabs**. This will remove the checkmark next to the Hide Exam Tabs option and will display exam tabs.

5.2 QuickZoom Display

QuickZoom is a special CDR feature that "zooms" or magnifies the images in an exam, allowing each image to appear at its zoomed size. Using QuickZoom is a valuable timesaver, eliminating the repetition of opening each image separately to view it in greater detail.

QuickZoom can be activated several different ways, by clicking on the **QuickZoom** button on the toolbar, by selecting **QuickZoom** from the **Xray/Image** menu, or by using the mouse and right-clicking on the target frame.

QuickZoom is particularly useful with exams containing several X-rays – full mouth series exams for example. Three zoom settings, 1:1, 2X, and 4X, are available when QuickZoom is active. Moving the cursor across each target frame displays that image in its zoom setting.

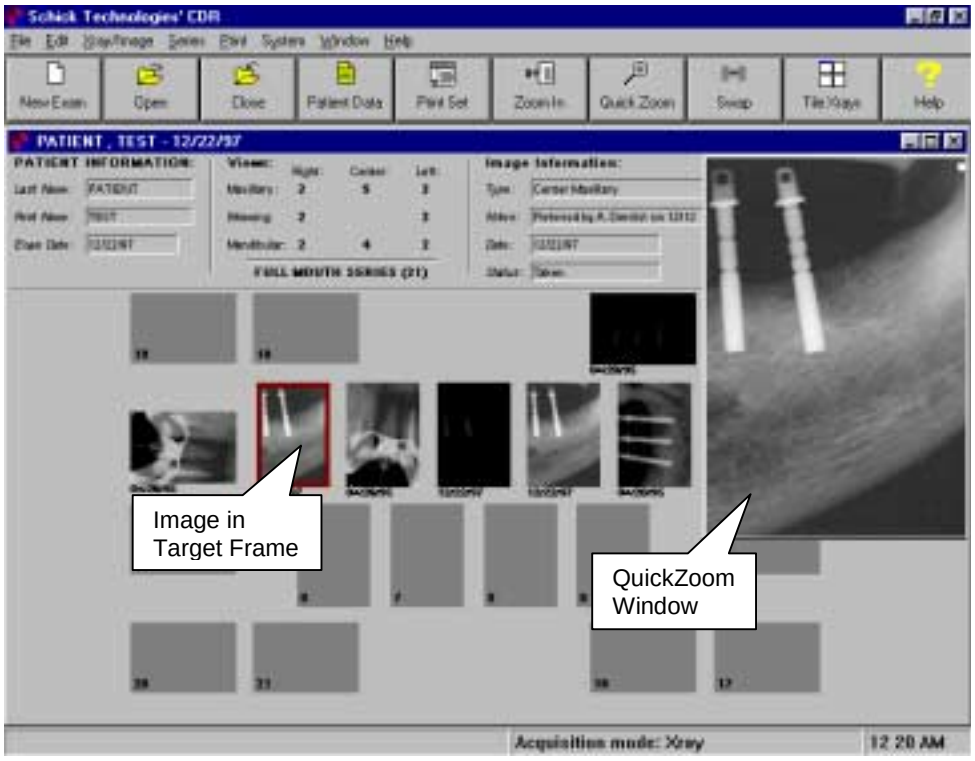

Figure 2. QuickZoom Display

5.3 Zoom Window

The zoom window supplies the image enhancement tools in CDR. These tools employ graphic elements (for example, color, brightness, contrast, orientation, and magnification) and diagnostic aids (measurements, pixel values, and notes). Refer to **Section 8** for more information on these tools.

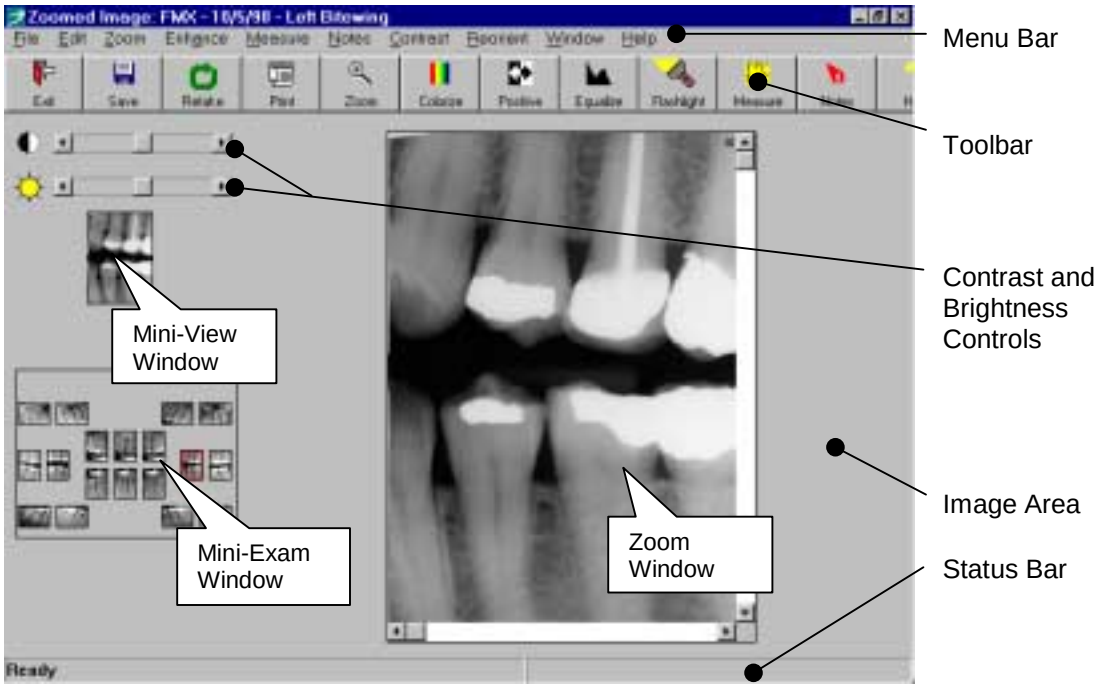

Figure 3. Zoom Window

Mini-Exam Window

The mini-exam window provides the capability to take X-rays and evaluate them from a single location inside CDR. **Figure 3** shows that the mini-exam window is really just that — a smaller version of the patient exam, displaying all of the images "mini-size."

The mini-exam window can be used to keep track of images already in the current exam and to select a target frame for the next image. If AutoTake mode is on during X-ray acquisition, CDR will capture the image in the current target frame and then automatically advance to the next frame in the series. If the mini-exam window is not active when you open an image in a zoom window, click **Window** > **Display Exam**.

5.4 Menus

All CDR commands are provided in drop-down menus located along the top of the screen. To open a drop-down menu using the mouse, simply click on the menu name on the menu bar. To open the menu using the keyboard, press and hold down the [Alt] key and type the letter that is underlined in the menu name (also known as the *access key*). For instance, holding down the [Alt] key and pressing the "F" will open the "File" menu because the F in File is underlined. To clear a menu listing, press the [Esc] key or click anywhere on the screen outside of the menu.

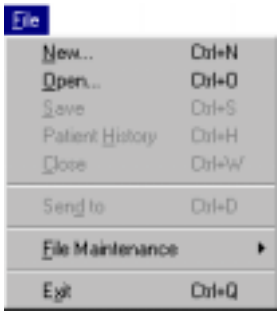

Figure 4. Sample Pull-down Menu

After opening a drop-down menu, any command can be selected by either clicking on it with the mouse, entering the command letter in the command name, or by pressing the down arrow until the command is highlighted and then pressing [Enter].

Some menu commands will appear as "dimmed" on the menu bar, meaning the selection is disabled. This is one of the ways CDR ensures that you make valid choices that can be performed by the CDR program. Other commands may be dimmed because the command itself is not active or represents a future function not currently available.

Some commands can be activated by holding down the [Ctrl] key and by pressing the letter corresponding to the command. These are *shortcut keys* and they can be useful timesaving devices.

A complete list of CDR shortcuts is provided in **Section 14.1** .

5.5 Toolbars

The CDR windows make generous use of toolbar buttons to expedite the selection of features and to streamline exam setup and editing tasks. Using toolbar buttons is optional because every feature started by a toolbar button can also be started from a menu. In addition, there are no functional differences between starting a CDR feature from a toolbar button or a drop-down menu. They work exactly the same way.

5.5.1 Normal Size Toolbars

The exam window toolbar, shown below, consists of buttons for the most commonly used features in that window. The toolbar can be hidden from view and restored when needed by clicking **Hide Elements** then **Hide Toolbar** in the **Window** menu. Hiding **Exam Information** hides the current patient's information area, image and exam information, and the thumbnail image. Clicking on **Hide All Extras** hides the current exam information and the toolbar buttons.

Figure 5. Exam Window Toolbar

The zoom window toolbar, shown below, consists of buttons for the most commonly used features in that window. The toolbar can be hidden from view and restored when needed by clicking **Display Toolbar** in the **Window** menu. Clicking on **Hide Extras** hides the mini-view window and the toolbar buttons.

Figure 6. Zoom Window Toolbar

5.5.2 Small Button Toolbars

You may prefer to view the buttons as icons only, without the descriptions that appear underneath the picture. Changing the `CDR.INI` file (**Section 13**) by setting `BigButtons=No` will display the following icon-only exam window and zoom window toolbars the next time the CDR program is run.

Figure 7. Exam Window Small Button Toolbar

Shown from left to right the buttons are: New, Open, Save, Send Mail, Patient Information, Select Series, Print, Zoom-In, Quick Zoom, Swap, Hide Extras, Tile X-rays, and Help.

Figure 8. Zoom Window Small Button Toolbar

Shown from left to right the buttons are: Save, Retake, Print, Zoom Mode, Zoom Window, Zoom Full, Pan, Colorize, Positive, Equalize, Flashlight, Measure, Grid, Insert Notes, and Help.

The tables on the following pages match every toolbar button (both normal and small button sizes) with a menu item that performs the same function.

A complete list of CDR toolbar buttons is provided in **Section 14.2** .

5.6 ToolTips, Menu Item Tips, and Status Messages

5.6.1 ToolTips

ToolTips provide short descriptions of toolbar buttons in the exam and zoom windows. Whenever the cursor moves over a button, CDR displays a short description of its function.

ToolTips can be especially useful when the small button toolbar is active. When this style of toolbar is used, the names of the buttons are hidden to minimize the area used by the toolbar and to maximize the size of the screen for viewing images. Even if the small buttons seem unfamiliar, ToolTips can be used to identify each button just by moving the cursor over it.

5.6.2 Menu Item Tips

Selections in CDR's drop down menus are described in the status bar located below the exam and zoom windows. By scrolling through each menu item, a short description of the selection appears in the status bar

5.6.3 Status Messages

Status messages provide information on the currently selected acquisition mode, the readiness of the CDR system to acquire images, and other helpful reminders. This information, like menu item tips, can be found in the status bar.

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6. Exams

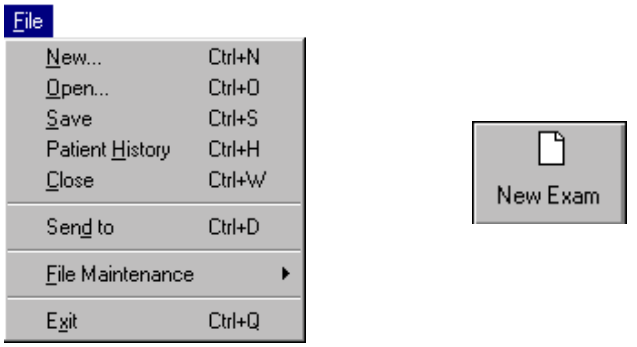
Opening patient exams and creating new ones are two of the most common CDR tasks. In both cases, CDR makes frequent use of command buttons in the dialog boxes to browse and retrieve patient information and to access features found in other dialog boxes. In setting up an exam series especially, CDR simplifies the steps needed to retrieve an available series or create a custom one.

6.1 New

WHAT DOES IT DO?

Creates new patient exams.

WHERE CAN I FIND IT?



File Menu Toolbar Button

HOW DO I USE IT?

To start a new exam, select **New** from the **File** menu, or press the [Ctrl + N] keys, or click the **New Exam** button on the exam window toolbar.

At the Patient Information dialog box, first and last names are mandatory and can be filled by numbers as well as letters. As characters are entered into the name text boxes, CDR automatically formats them to upper case style.

If the exam is intended for a new patient with no previous CDR exams, the first and last name information must be entered manually. If previous CDR exams exist for the patient, clicking the **List** button can retrieve that information. When the **List** button is clicked, all of the text boxes pertaining to that patient are filled automatically. The ID Number box is optional and the Exam Date will default to the current day's date.

6.2 Series

CDR includes several types of series intended to cover the most common types of exams performed by dental professionals. These exam series (Full Mouth, Checkup, Bitewings, Checkup, Vertical and Horizontal Endo) are selected from the Patient Information dialog box and are appropriate for many dental examinations.

> Please Note – A series can be edited *before* images are acquired. After the images are taken, a different series cannot be used to change the current one.

X-rays in a series can be flipped from one side of the exam window to the other by clicking **Flip** from the **Series** menu. When X-rays are flipped, the patient's left is shown on the left side of the screen. This method differs from the predominant one where X-rays on the patient's left side are displayed on the right side of the screen. This is the default setting and organizes the exam on the screen as you were looking directly at the patient. To enable Series Flip at the start of CDR, make the following change in the CDR section of `CDR.INI` file (**Section 13**): `SERIES_FLIP=YES.`

A series may not always provide an exact match for the type of examination needed. At other times, only a few specific exposures are required, rather than more comprehensive exams. In these cases, edit the series to fit the exam, as described in the following paragraphs.

6.2.1 Editing a Series (Current exam)

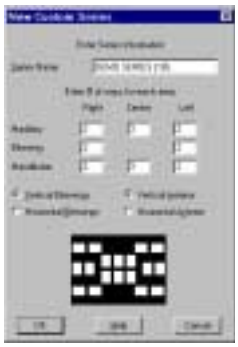
WHAT DOES IT DO?

Edits the series for the current CDR exam.

WHERE CAN I FIND IT?

Patient Information Dialog Box

(Arrow Pointing to Edit Series Button)



Edit Exam Series Dialog Box

HOW DO I USE IT?

To change a series for the current exam, perform the steps in A or B.

Method A: Using the Edit Series Button

- Start a new patient exam (**File** > **New**), and enter patient information in the Patient Information dialog box.
- Select the type of series and use the scroll arrows to review all the series available on your system.
- Click **Edit Series** to customize that series for the current exam. Click OK.

Method B: Using the Series Edit Menu Option

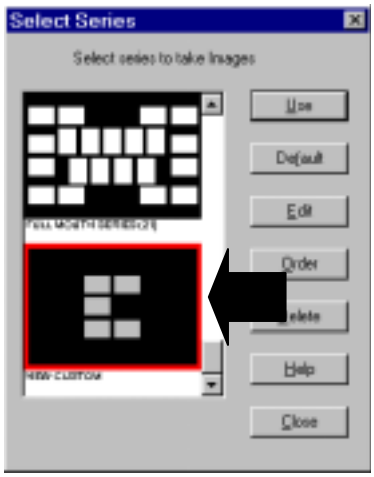
- Start a new patient exam (**File** > **New**), and enter patient information in the Patient Information dialog box.
- Select the type of series and use the scroll arrows to review all the series available on your system.
- Click on the **Series** menu and select **Edit** to customize that series for the current exam. Click OK.

6.2.2 Editing a Series (Current and / or New exam)

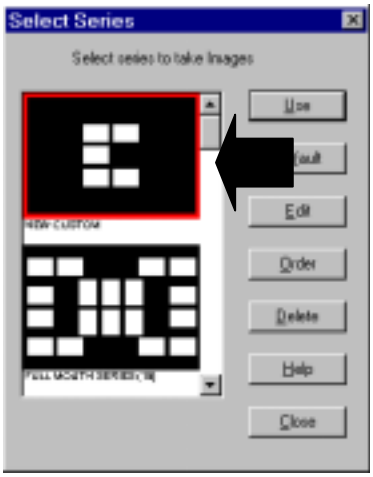
WHAT DOES IT DO?

Edits the series for current and / or new exams.

WHERE CAN I FIND IT?



On Select Series Dialog Box (Series in gray– changes only current series)



On Select Series Dialog Box (Series in white – modifies series for new exams)

HOW DO I USE IT?

For an alternate method of editing a series for the current exam (assuming no images have been taken yet), perform the following steps.

- Start a new patient exam (**File** > **New**), and enter patient info in the Patient Information dialog box.
- Select the type of series and use the scroll arrows to review all the series available on your system. Click OK.
- Click on the **Series** menu. There will be two versions of the current series: one with white target frames and one with gray. Select the version with **gray** frames. Select **Edit** to customize that series for the current exam.
- Click OK, and then click Close.

To modify a series for new exams, perform the following steps.

- Start a new patient exam (**File** > **New**), and enter patient info in the Patient Information dialog box.
- Select the type of series and use the scroll arrows to review all the series available on your system.
- Click on the **Series** menu. There will be two versions of the current series: one with white target frames and one with gray. Select the version with **white** frames. Select **Edit** to customize that series for the current exam.
- Click OK. Click Close (which enables new exams to use the modified series).

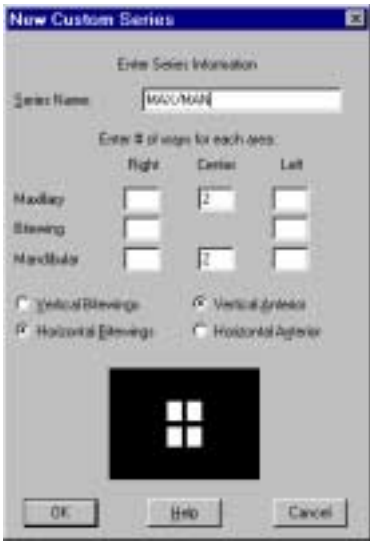
6.2.3 Creating a New Standard Series

WHAT DOES IT DO?

Creates new standard series for intra-oral X-rays.

WHERE CAN I FIND IT?

Series Menu



New Standard Series Dialog Box

HOW DO I USE IT?

To create a new standard series, click on the **Series** menu and select the **New Standard Series** option. A dialog box opens, which is used to set up the new series.

Unlike an edited series, a new standard series does not use any of the existing series as a starting point, but is created completely new. The name of the series and the number and orientation of the target frames are all defined in the dialog box for the new series.

To customize the series, several text boxes are available to define the number of X-rays to be taken in each area of the mouth. As the numbers are entered, the pattern of target frames is adjusted in the series window. Bitewing and anterior areas can also be oriented in either a vertical or horizontal direction. CDR immediately verifies the selections made at this dialog box and will issue a message if the number is invalid. It also displays the maximum number of X-rays permitted in each area.

If you need help on editing a standard series after you've created it, refer to **Sections 6.2.1** or **6.2.2**.

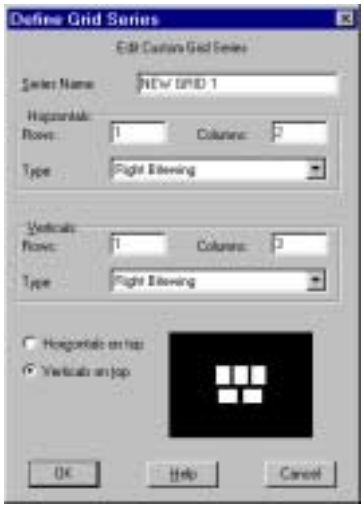
6.2.4 Creating a New Grid Series

WHAT DOES IT DO?

Creates new grid series for intraoral X-rays. *(Feature updated in CDR 2.5)*

WHERE CAN I FIND IT?

Series Menu



New Grid Series Dialog Box

HOW DO I USE IT?

To create a new grid series, click on the **Series** menu and select the **New Grid Series** option. A dialog box opens, which is used to set up the new series.

A grid series can be customized for a maximum of two different target types. This means that, for example, if you choose Right Bitewing as the type for horizontal view boxes, all of the horizontals will be of this type. The same is true of verticals. If you choose Center Maxillary for vertical text boxes, all of the verticals will be of this type.

When several images of a specific region in the mouth are required, creating a grid series is an efficient way to set up the exam and acquire the images needed. To ensure exact coverage, the target areas can be oriented vertically and horizontally.

Although the grid series can be created for any reason, it is especially valuable in endodontic dentistry where multiple evaluations of a specific area are important.

Like the standard series, a grid series is created before images are acquired and cannot be changed afterwards. The grid series can be assigned any name up to 39 characters, but the series will be easier to identify and retrieve when its name is short and descriptive.

Also like the standard series, CDR controls the maximum number of target frames in either a horizontal or vertical orientation. A message box will be issued if the entered value exceeds that maximum number.

If you need help on editing a grid series after you've created it, refer to **Sections 6.2.1** or **6.2.2**.

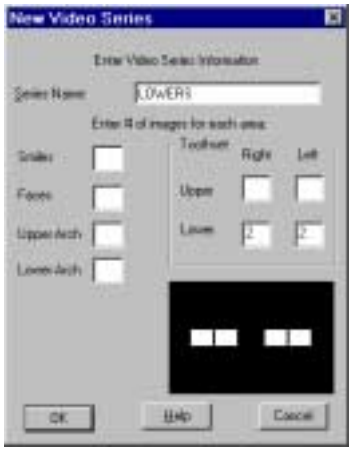
6.2.5 Creating a New Video Series

WHAT DOES IT DO?

Creates new series for video images. *(New feature in CDR 2.5)*

WHERE CAN I FIND IT?

Series Menu



New Video Series Dialog Box

HOW DO I USE IT?

To create a new standard series, click on the **Series** menu and select the **New Video Series** option. A dialog box opens, which is used to set up the new series.

CDR can capture video in an intra-oral X-ray series, but using video series for video images helps you organize your different types of CDR exams.

For example, when you create a video series, CDR makes it easy to find that series the next time you want to use it. When starting a new exam for a patient, just click on the button for Video exam when CDR asks you to select an exam type, and CDR will list all the video series available on your system.

You may also found that displaying exam tabs are helpful when scrolling through exams for a particular patient. Each tab has an icon that identifies the kind of exam it is. A Video series has a camera on the tab to distinguish it from intraoral and panoramic exams, which have their own icons.

If you need help on editing a video series after you've created it, refer to **Sections 6.2.1** or **6.2.2**.

6.2.6 Creating a New Panoramic Series

WHAT DOES IT DO?

Creates new series for panoramic images. *(New feature in CDR 2.5)*

WHERE CAN I FIND IT?

Series Menu

New Panoramic Series Dialog Box

HOW DO I USE IT?

To create a new standard series, click on the **Series** menu and select the **New Panoramic Series** option. A dialog box opens, which is used to set up the new series.

CDR can capture panoramic images in an intra-oral X-ray series, but using a panoramic series for panoramic images helps you organize your different types of CDR exams.

For example, when you create a panoramic series, CDR makes it easy to find that series the next time you want to use it. When starting a new exam for a patient, just click on the button for Panoramic exam when CDR asks you to select an exam type, and CDR will list all the panoramic series available on your system.

Also, if you've found that using exam tabs helps you when you scrolling through exams for a particular patient, you've already noticed that each tab has an icon that identifies the kind of exam it is. A Panoramic series has a stylized jaw on the tab to distinguish it from intraoral and video exams, which have their own icons.

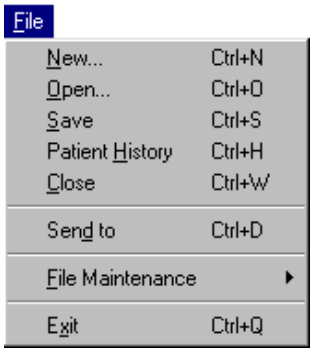
If you need help on editing a panoramic series after you've created it, refer to **Sections 6.2.1** or **6.2.2**.

6.3 Open

WHAT DOES IT DO?

Opens patient exams.

WHERE CAN I FIND IT?



File Menu

Toolbar Button

HOW DO I USE IT?

To open an existing exam, select **Open** from the **File** menu, or press the [Ctrl + O] keys, or click the **Open** button on the exam window toolbar.

To see all the exams for a patient, as well as the exam dates and the type of series used, check the box next to “Show all exams for all patients”. (Otherwise, only one entry per patient is shown.) Open the desired exam by highlighting it and then clicking OK or double-click on the patient names to see if there are other exams present.

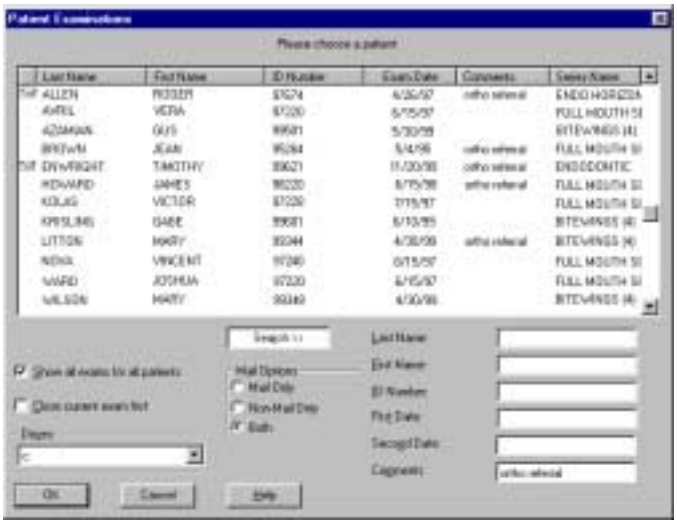
Sorting Patient Exams

Above the exams in the Patient Examination dialog box are headings (Last Name, First Name, ID Number, Series Name) that can be used for sorting. Clicking once on the heading sorts the items in that column alphabetically with any numbered entries listed first. Clicking the heading a second time reverses the sort.

Searching Patient Exams

Searches for patient names, ID numbers, exam dates, and exam comments can be performed using those items as keywords. It is also possible to qualify the search by including or excluding images received using CDR Mail. The Search feature is initially hidden when the Patient Examination dialog box appears, but clicking on **Search >>** will display the keyword search boxes and other options.

SAMPLE



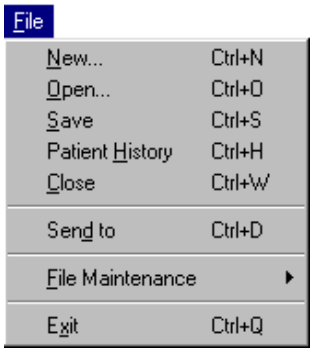
Patient Examination Dialog Box

6.4 Save

WHAT DOES IT DO?

Saves exam changes.

WHERE CAN I FIND IT?



File Menu

Save Button

HOW DO I USE IT?

When changes are made to the exam window, CDR automatically saves them, so it is not necessary to click on **Save** to retain changes.

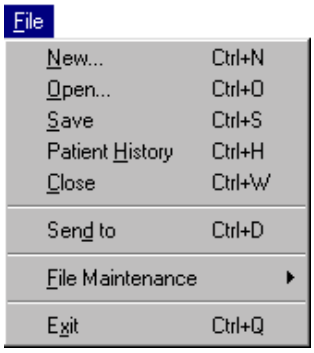
Once new images are acquired or imported, the exam window can be closed safely without **Save** and with no loss of information. Other examples of changes that are saved automatically include changes to the position of the images and changes to the size or order of the target frames.

6.5 Patient History

WHAT DOES IT DO?

Lists all the exams for a specific patient.

WHERE CAN I FIND IT?



File Menu

HOW DO I USE IT?

To retrieve previous exams for a patient, enable the Exam Tabs feature (CDR 2.5 and later) or select the Patient History option from the File menu.

Exam Tabs

When this feature is active, each time an exam is opened for a selected patient, a row of tabs -- corresponding to all of the exams for that patient -- is displayed. To open another exam for the current patient, click on the tab. (**Figure 1** provides an example.)

The row of tabs can be turned on and off during a CDR session using the **Window** > **Hide Elements** > **Hide Exam Tabs** option.

Patient History

To open any exam for the current patient, click on the **File** menu, and then select **Patient History**. When the Examination Dates dialog box appears, click on “Show All Exams”.

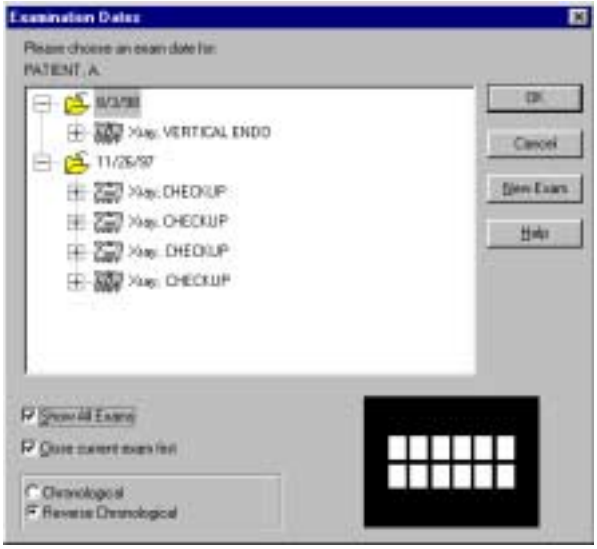
Highlighting the exam date folder and clicking **OK** will open the first exam in that folder

Each time the Examination Dates dialog box opens, a plus or minus sign can be seen at the left of each exam folder — meaning there is either more information that can be displayed (+) or all of the information is already shown (-).

Depending on your preferences, exams can be displayed either in chronological or reverse chronological (most recent exam) order. To open the exam, select it, and then double-click on either the exam date or description. (You can also click **OK** on the dialog box.) Only one exam can be opened at a time.

To keep the current patient exam open when retrieving a previous exam, clear the "Close current exam first" checkbox on the Examination Dates dialog box. This box is checked by default as a way of keeping the number of exams open at the same time to a minimum.

SAMPLE



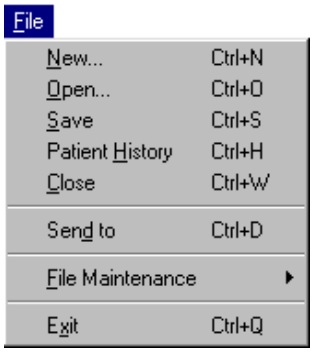
Examination Dates Dialog Box

6.6 Close

WHAT DOES IT DO?

Closes patient exams.

WHERE CAN I FIND IT?



File Menu

Toolbar Button

HOW DO I USE IT?

To close an exam, select **Close** from the **File** menu, or press the [Ctrl + W] keys, or click the **Close** button in the exam window.

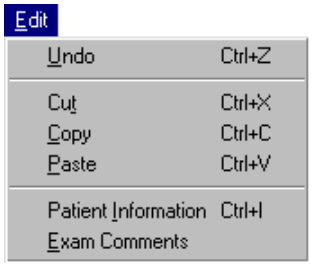
CDR images are saved automatically when they are acquired. In the event a patient exam is closed accidentally, all CDR images in that exam are saved and will appear when the exam is reopened.

6.7 Patient Information

WHAT DOES IT DO?

Displays patient information and exam comments.

WHERE CAN I FIND IT?



Edit Menu

Toolbar Button

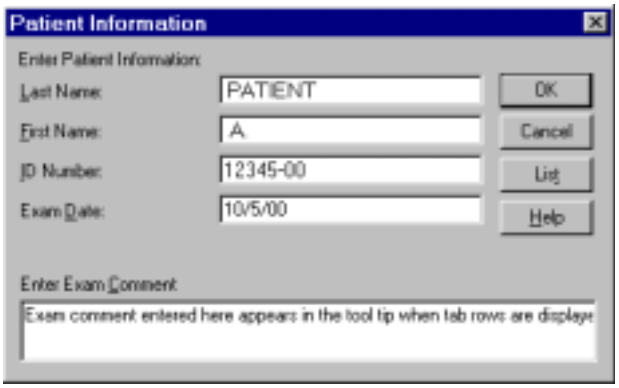
HOW DO I USE IT?

Open an exam for one of your current patients. Select **Patient Information** from the **Edit** menu or use the [Ctrl + I] shortcut keys.

In Patient Information dialog box, you can edit the patient information and comments for the current exam. In some situations, when there is more than exam for a patient, you may want to carry a change through all the exams for that patient.

For example, a name change is one item that could be applied to every exam for a particular patient. When you change patient name or ID information, CDR will ask whether you want the rest of the exams for that patient to be updated as well. If you answer “Yes”, CDR will automatically update the patient’s records without any additional instructions from you. If you answer “No”, CDR will only update the current exam.

SAMPLE



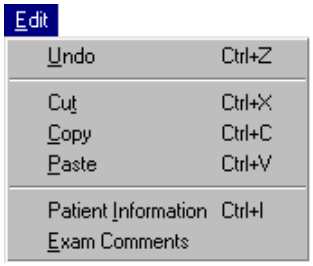
Patient Information Dialog Box

6.8 Exam Comments

WHAT DOES IT DO?

Displays exam comments. *(Feature updated in CDR 2.5)*

WHERE CAN I FIND IT?



Edit Menu

HOW DO I USE IT?

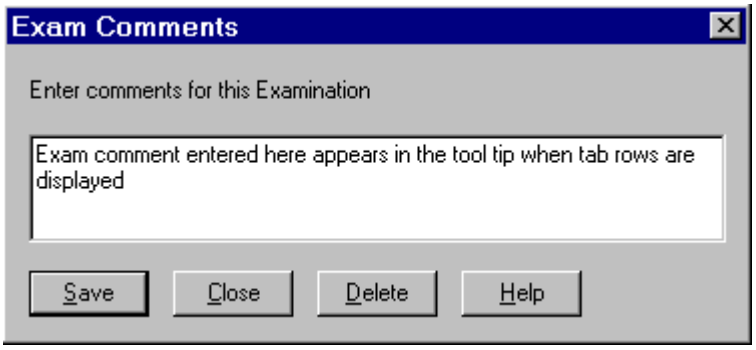
Open an exam for one of your current patients and select **Exam Comments** from the **Edit** menu. Selecting **Patient Information** provides the same option to add exam comments, but also includes other patient information fields that can be modified.

Using exam comments consistently can also expedite searches for a particular exam. Although CDR's other search fields are far more common (patient name, ID, or exam date), you can search by exam comments when other information is not known or is missing.

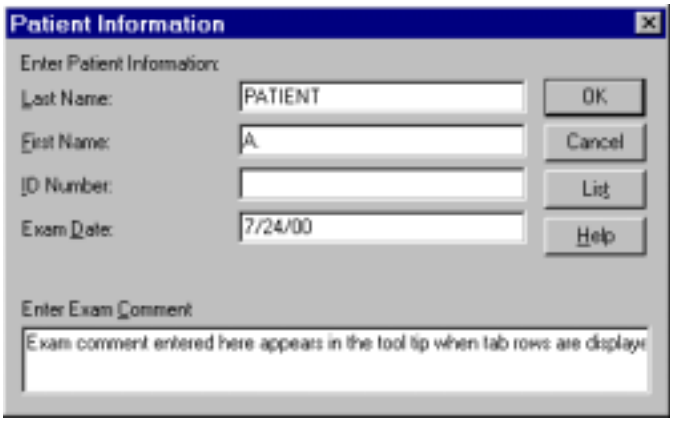
There are two ways to add comments in an exam.

- If you are creating a new exam, use the "Enter Exam Comment" text box located near the bottom of the Patient Information dialog box.
- If you have an exam currently open, use either the Patient Information or Exam Comments dialog boxes to add, modify, or delete comments.

SAMPLES



Exam Comments Dialog Box



Exam Comments in the Patient Information Dialog Box

7. Acquiring X-rays

To acquire X-rays, the following information is required – patient information, type of exam (X-ray or video) and type of series (such as Full Mouth Series). All of these selections are made in the Patient Information dialog box each time a new exam is created.

7.1 Selecting the Target Frame

Images can be acquired in any order, but it is important to select a target frame that matches the sensor's position in the patient's mouth. Selecting a target frame for acquisition outlines it with a red border. To navigate the target frames (change the selected frame), do one of the following.

Perform One of These Actions. . .			**Then Do This . . .**
At Keyboard	With Mouse	With Footpedal	In CDR
Press [spacebar], [Page Up], or [Page Down]	Left-click on any target frame	Depress green pedal	Acquire image (**Section 7.2** or **7.3**

7.2 Acquiring Images

After the target frame is selected, acquire an image by doing one of the following. Then, activate the X-ray source.

Perform One of These Actions. . .			**Then Do This . . .**
At Keyboard	With Mouse	With Footpedal	At X-ray Source
Press [Insert] or [Enter]	Double-click on target frame	Depress amber (or red) pedal	Activate to take X-ray

7.3 Auto-Acquiring Images (AutoTake™)

AutoTake™ is available on CDR USB systems running CDR 2.5 or higher with Remote Modules upgraded to firmware 27 or higher.

After the target frame is selected (frame will flash green by default), activate the X-ray source to acquire an image. No other step is needed.

Perform One of These Actions. . .			**Then Do This . . .**
At Keyboard	With Mouse	With Footpedal	X-ray Source
—	—	—	Activate to take X-ray

7.4 Accepting, Retaking, and Rejecting X-rays

X-rays can be either accepted immediately upon acquisition or reviewed first in a separate zoom window. (When AutoTake is active, images are acquired automatically.) The `AUTO_ACCEPT` line in the `CDR.INI` file (**Section 13**) controls which one of these options is used. Each time an X-ray image is acquired, it will be displayed according to the `AUTO_ACCEPT` setting.

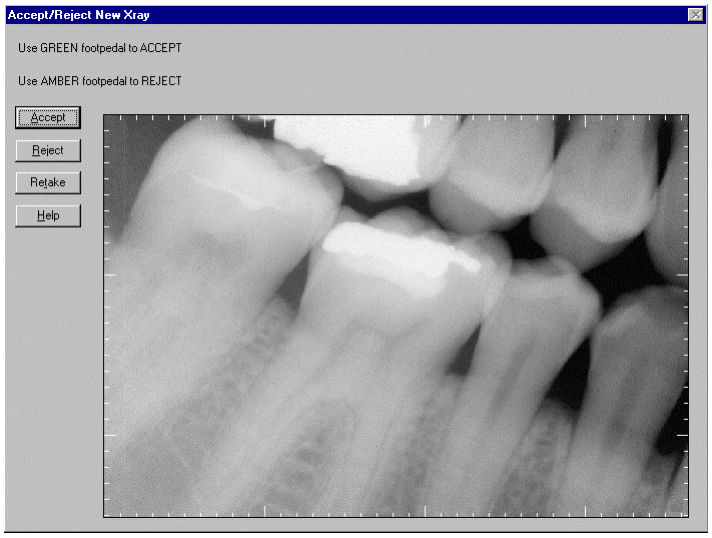
Every time you acquire an image, you can review it first before accepting it when the AUTO_ACCEPT line in the CDR.INI file is set to NO.	
AUTO_ACCEPT=NO ⬅	

Figure 9. Accepting/Rejecting Image Display

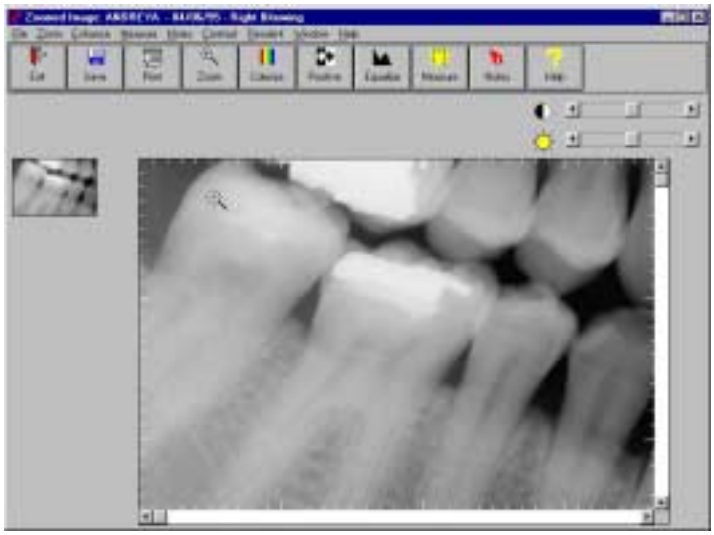
Every time you acquire an image, you can accept it immediately when the AUTO_ACCEPT line in the CDR.INI file is set to YES.	
AUTO_ACCEPT=YES ⬅ (This is the default setting.)	

Figure 10. Accepting Image on Acquisition Display

When AUTO_ACCEPT=YES, the image is displayed in the CDR zoom window. The image can be manipulated using any of the graphic tools described in detail in **Section 8**, or you can click the **Exit** button to close the zoom window and acquire the next X-ray.

When AUTO_ACCEPT=NO, the image is displayed in the Accept/Retake Screen window.

- Clicking **Accept** (or pressing the green foot pedal) accepts the image.
- Clicking **Reject** (or pressing the amber foot pedal) discards the image.
- Clicking **Retake** holds the image in the Accept/Retake window and sets the system to acquire a second image to compare with the first. Select either the first or second image (one of the two images must be accepted) and that image will be displayed on the exam window. Double-click on the image to evaluate it in the zoom window.

7.5 Positioning CDR Sensors

The orientation of the sensor is indicated on the computer screen by a small square of inverse pixels. When the image is zoomed, either by QuickZoom or by using one of the zoom settings in the zoom window, these pixels can be seen in one corner of the image.

There are two ways to view the orientation of images on the screen: the default (normal orientation) and the alternate (flipped left/right orientation).

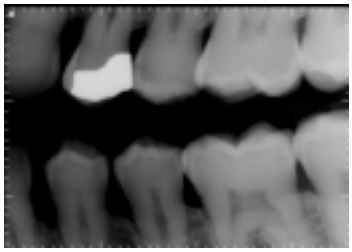
Viewed normally, images in a standard full mouth series appear on the screen as if you were facing the patient. The patient's right appears on the left side of the screen; the patient's left, on the right side of the screen. When the alternate setting is selected (by clicking **Flip** from the **Series** menu bar), the images are re-arranged so that the patient's left is now on the left side of the screen.

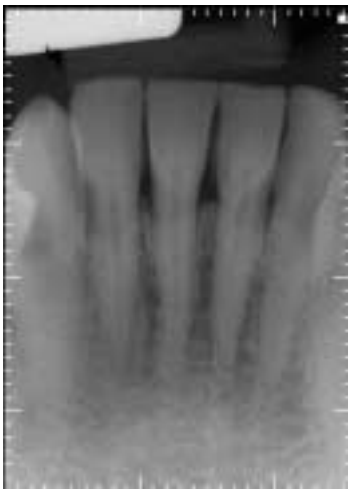
In Table 5, images are shown in *normal orientation*.

7.6 Sensor Orientation

The orientation of the sensor is indicated on the computer display by a small square of inverse pixels. These pixels will be seen in one corner of the Zoom Window, Facing the flat part of the sensor, with the cable extending the right, the inverse pixels are located on the bottom right as shown in the following figure.

Table 5. CDR Sensor to Image Orientation

Sensor Location	Sensor Orientation	Image Location	Inverse Pixels and Image Orientation
Right side of patient		Left side of exam window	 *Normal Orientation of Right Bitewing*
Left side of patient		Right side of exam window	 *Normal Orientation of Left Bitewing*
Upper anterior of patient jaw		Upper middle of exam window	 *Normal Orientation of Center Maxillary Periapical*

Sensor Location	Sensor Orientation	Image Location	Inverse Pixels and Image Orientation
Lower anterior of patient jaw		Lower middle of exam window	 *Normal Orientation of Center Mandibular Periapical*

7.7 Getting the Best Image Quality

There are three key elements to getting great images with CDR:

- Calibration
- Exposure
- Placement

7.7.1 Calibration

The calibration file for each sensor must be installed and available to every workstation where the sensor is used. The calibration file is supplied on the floppy disk that was shipped with your sensor and can be identified by the format, `ST12345.COR`, where the "`12345`" corresponds to the serial number of the sensor.

7.7.2 Exposure

CDR sensors are very sensitive to X-rays; more sensitive than film to X-rays. This is one of CDR's important advantages over film since it allows for a reduction in radiation when using the system. For this same reason, however, small variations in exposure can produce visible differences in image quality because the sensors are so sensitive.

In addition, the X-ray setting may need to be changed depending on sensor placement and the distance between the X-ray source and the sensor. With film, the X-ray source was left on a single setting. With the CDR system, small adjustments may be needed based on the sensor's location in the patient's mouth.

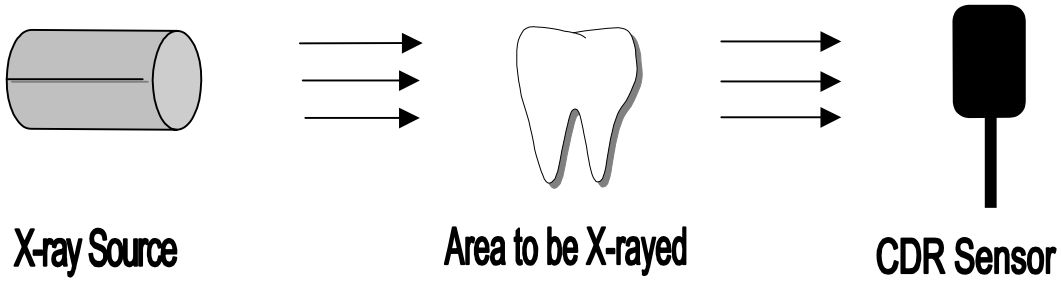
Before taking the X-ray, properly aligning the sensor is very important (see Figure 11), as is using the right holder or bite tab. Over a period of time, you will learn what the best setting is for your X-ray source.

After taking the X-ray, use the **Pixel Value** command in the **Measure** menu to measure the pixels in the darkest areas of the image. The darkest pixels should have a value between 92 and 99%. If they are not dark enough, the image can be retaken at a higher exposure.

7.7.3 Placement

The distance between the X-ray source and the sensor is extremely important. The intensity of X-rays decreases with the square of the distance. Therefore, if the sensor is twice as far from the X-ray source, the amount of X-rays reaching the sensor will be reduced by a factor of four.

This effect can be minimized by using a "long cone" tube or a longer collimator. A longer cone, for example, reduces the effect of distance. Although the increase in tube length means an increase in exposure duration, this is actually an advantage because a typical X-ray source offers few settings for short exposures. More choices are available if the exposure duration is longer.



Optimum position: Source, sensor, and area to be X-rayed are parallel

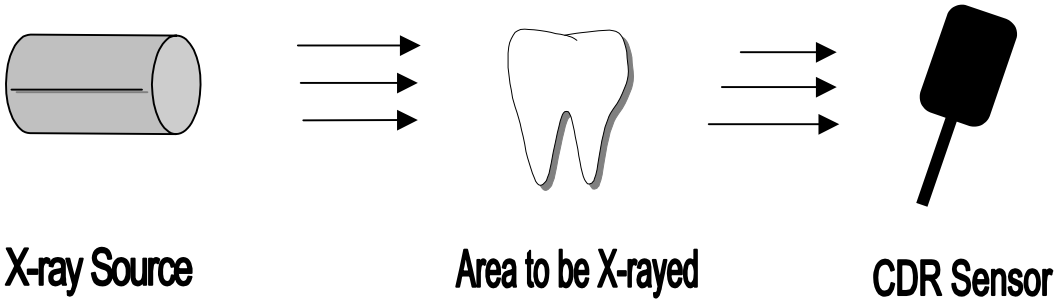


Image appears longer than actual size: Sensor not parallel with source

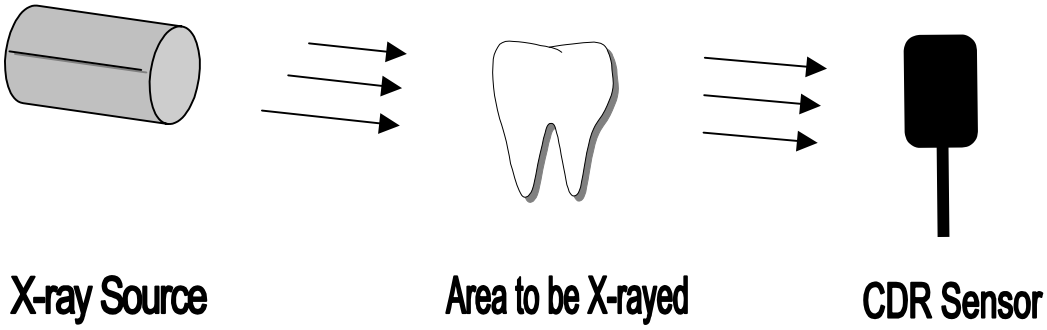


Image appears shorter than actual size: Source not parallel with sensor

Figure 11. Some Alignment Effects on Image Quality

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8. Evaluating X-rays

After X-rays are acquired, they can be manipulated and enhanced using features in the CDR zoom window. When using these features remember that CDR changes the attributes of the image – its contrast, color, or brightness – not the image itself.

For this reason, images that appear too dark or too light when acquired will not benefit from the enhancement features in the zoom window. In these cases it is best to re-acquire the images by changing the exposure setting at the X-ray source: increase the exposure when the images are too light, decrease the exposure when they are too dark.

To save memory while using CDR software, close each zoom window when its image is not being used for evaluation or and whenever new images will be acquired. To open, exit, and save changes in the zoom window, refer to the following tables.

Table 6. Opening an Image in a Zoom Window

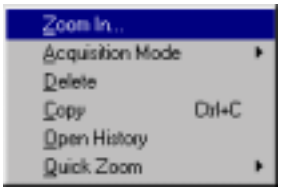
Perform One of these Actions . . .			
Double-click on the image	Click on the image once, right click, and then click on **Zoom In**	Click the **Zoom In** button	Click on the **Xray /Image** menu and then on **Zoom In**
			

Table 7. Exiting the Zoom Window

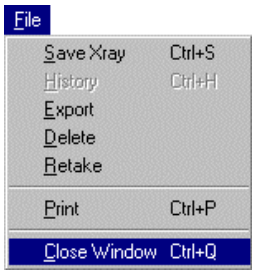
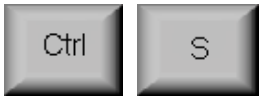
Perform One of these Actions . . .		
Click the **Exit** button	Press the [Ctrl + Q] keys	Click on the **File** menu and then on **Close Window**
		

Table 8. Saving Changes in the Zoom Window

Perform One of these Actions . . .		
Click the **Save** button	Press the [Ctrl + S] keys	Click on the **File** menu and then on **Save Xray**
		

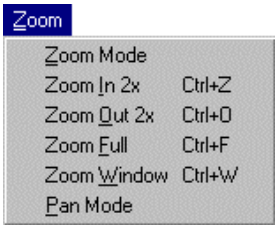
8.1 Zoom

WHAT DOES IT DO?

Magnifies the entire image, using either pre-set or user-defined settings.

WHERE CAN I FIND IT?

Zoom Button



Zoom Menu

HOW DO I USE IT?

Click on the **Zoom** button or select **Zoom Mode** from the **Zoom** menu. Click the left mouse button to increase the zoom setting and to provide greater detail. Click the right mouse button to decrease the zoom setting, shrinking the image back to its original setting (also called Zoom Full).

SAMPLE

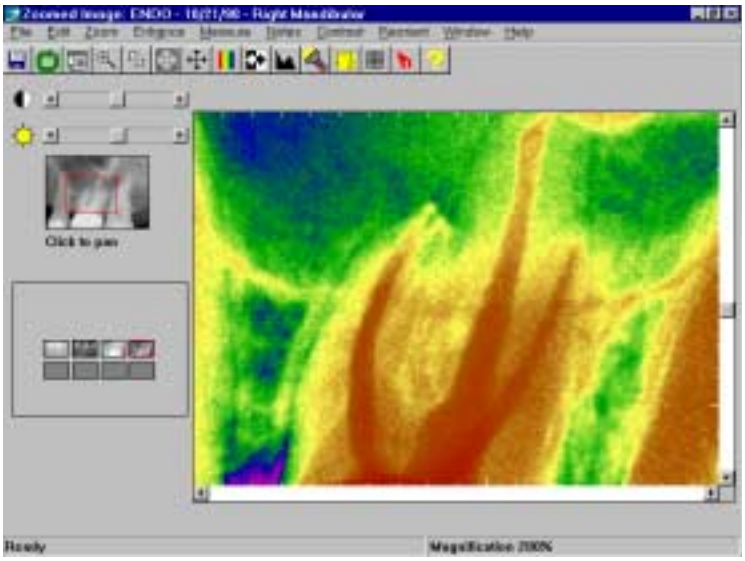


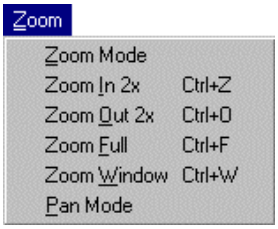
Figure 12. Using the Zoom Feature

8.2 Zoom Area

WHAT DOES IT DO?

Magnifies a user-defined area of the image.

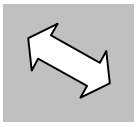
WHERE CAN I FIND IT?



Zoom Menu

HOW DO I USE IT?

Select **Zoom Window** from the **Zoom** menu. Press and hold down the left mouse button then move it in the desired direction. This will size the viewing area. Release the button to define the zoom window, which is magnified immediately.



When the zoom window is active, a thumbnail display of the image appears in a small viewing box called the Mini-View window. As the zoom magnifications change, a red rectangle in the mini window re-sizes, defining the magnified area.

Zoom window areas enable you to be more flexible in defining the area you wish to magnify. By creating a zoom area, you define exactly the area you wish to see at higher magnification.

SAMPLE

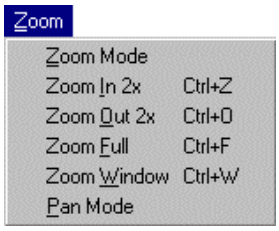
See Figure 12 for sample

8.3 Pan Area

WHAT DOES IT DO?

Provides navigation inside the image at any zoom setting.

WHERE CAN I FIND IT?



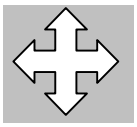
Zoom Menu

HOW DO I USE IT?

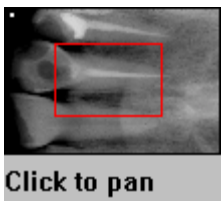
Select a pre-set zoom setting from the **Zoom** menu or adjust the magnification manually using the mouse buttons. Select **Pan Mode** from the **Zoom** menu and position the pan cursor on the image.

Left clicking re-positions the cursor, displaying the image at its zoomed setting. Right-clicking toggles from pan to zoom mode, permitting the zoom setting to be increased or decreased. To resume pan mode, select it from the **Zoom** menu again.

Panning can also be accomplished inside the mini-view window, using scroll bars and keyboard controls (listed on Table 9).



Pan Cursor



Viewable Area

SAMPLE

See Figure 12 for sample.

Table 9. Pan Mode Keystrokes

Keystrokes		Scroll Bar Equivalent
↑		Scroll arrow up
↓		Scroll arrow down
←		Scroll arrow left
→		Scroll arrow right
Home		Move to upper left corner
End		Move to bottom right corner
Ctrl	↑	Vertical scroll bar up
Ctrl	↓	Vertical scroll bar down
Ctrl	←	Horizontal scroll bar left
Ctrl	→	Horizontal scroll bar right

8.4 Enhance

Under the **Enhance** menu there are several features that can be used to manipulate the appearance of the image graphically. Some of these features, like **Colorize** and **Positive**, toggle on and off, meaning one click applies the effect, the next click removes it. Of the remaining features, **Sharpen**, **Equalize**, and **Spot Remover**, are applied by clicking just once, and clicking on **Highlight** will display its own set of options, discussed in the following paragraphs.

8.4.1 Colorize

WHAT DOES IT DO?

Applies a color layer to the image by mapping 8-bit grayscale pixel values to a 24-bit color range.

WHERE CAN I FIND IT?

Colorize Button

Enhance Menu

HOW DO I USE IT?

Click on the **Colorize** button or select **Colorize** from the **Enhance** menu. Then use the contrast and brightness sliders to modify the color.

When you apply this enhancement to an X-ray, you'll notice significant color contrast between different elements of the image. Because some differences can be easier to distinguish in color, colorizing provides another means to identify potential problem areas during examinations.

8.4.2 Positive

WHAT DOES IT DO?

Inverts the gray shades of the image – negative images appear as positive, and positive images as negative.

WHERE CAN I FIND IT?

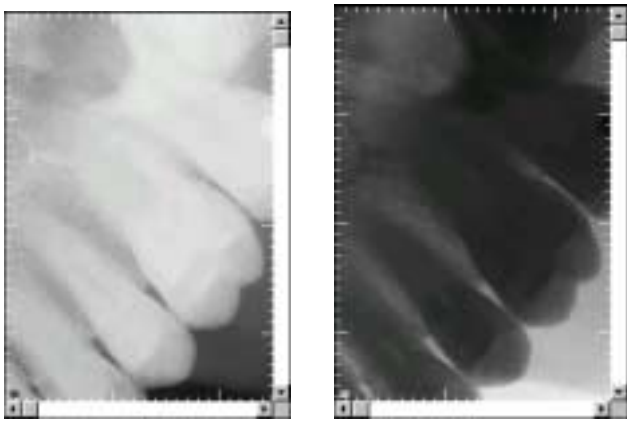
Positive Button

Enhance Menu

HOW DO I USE IT?

Click on the **Positive** button or select **Positive** from the **Enhance** menu. Clicking the button toggles the feature on and off. Choosing the menu item once, then selecting it again, performs the same action.

SAMPLE



Negative Positive

Figure 13. Using the Positive Feature

8.4.3 Sharpen

WHAT DOES IT DO?

Applies an edge filter to the entire image.

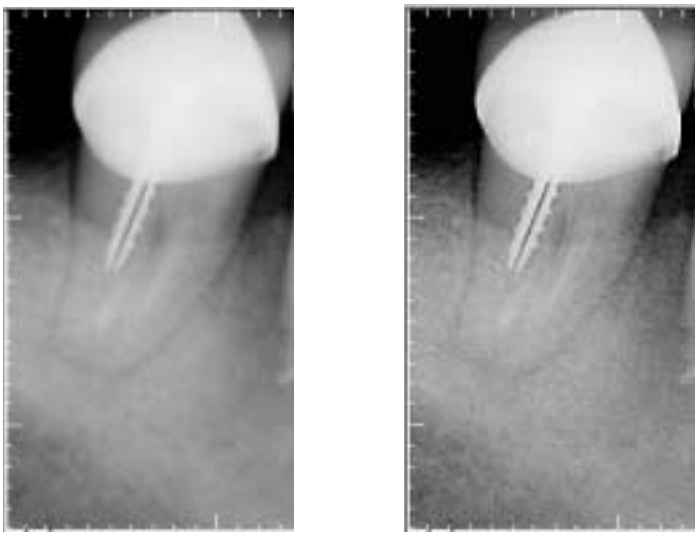
WHERE CAN I FIND IT?

Enhance Menu

HOW DO I USE IT?

Select **Sharpen** from the **Enhance** menu. To increase sharpness, choose the menu item again.

SAMPLE



Before Sharpening | After Sharpening

Figure 14. Using the Sharpen Feature

8.4.4 Spot Remover

WHAT DOES IT DO?

Removes fixed pattern noise from an image.

WHERE CAN I FIND IT?

Enhance Menu

HOW DO I USE IT?

First, click **Positive** from the toolbar to change the negative image to a positive. (If the image is already positive, begin with the following instruction.) Second, select **Spot Remover** from the **Enhance** menu to remove the noise (spots) from the image. Then, click on Positive to revert the image to its negative. If the spots were caused by fixed pattern noise, they should have been removed.

If images continue to display spots or lines that Spot Remover does not eliminate, the calibration file for the current sensor may be missing, in the wrong file location, or not the correct file for that sensor.

To make sure the calibration file is installed, go to the **System** menu and select **Sensor** then **Sensor Info**. Check the Sensor serial number and the Calibration File date. The Sensor Serial Number should match the information on the calibration file disk exactly. If the Calibration File Date reads “Unknown” it means that the file is missing or is not in the `\CDR\OBJ` directory – the location CDR expects to find it. To correct the problem, reload the file from disk, restart CDR, and check sensor info again.

SAMPLE

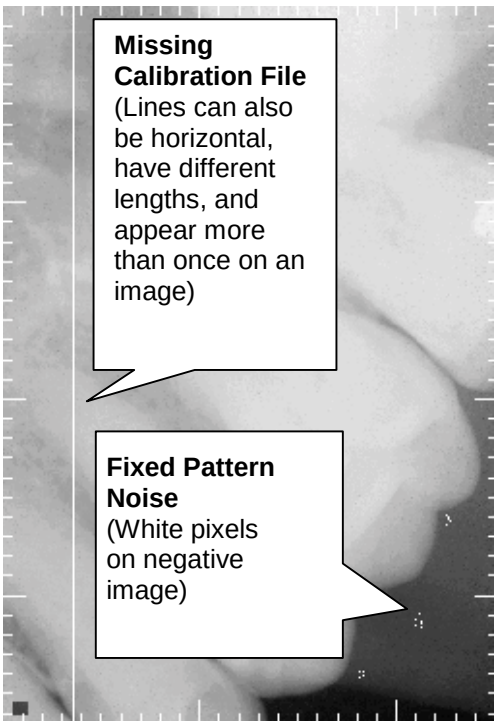


Figure 15. Using the Spot Remover Feature

8.4.5 Equalize

WHAT DOES IT DO?

Stretches the contrast of an image, and can be used to enhance some light X-rays to produce darker, more discernible images.

WHERE CAN I FIND IT?

Equalize Button

Enhance Menu

HOW DO I USE IT?

Locate the darkest area of an image and measure some of the pixels using the **Pixel Value** tool in the **Measure** menu The values should be between 92 and 98% (black). If they are not, using the Equalize feature can help to improve the image.

To apply Equalize, click on the **Equalize** button or select **Equalize** from the **Enhance** menu. When used appropriately, this feature can be a valuable tool for exposures where the darkest pixels are not all black.

> *NOTE:If all images are underexposed, increase the settings on the X-ray source so that the darkest areas of an image are nearly all black. Equalize should not be used to routinely compensate for underexposed images since they may become "pixilated" or "noisy" after applying this feature, As with film, exposures in different areas of the mouth may require different X-ray settings.*

8.4.6 Emboss

WHAT DOES IT DO?

Applies a relief filter to an X-ray, giving it a three-dimensional appearance. *(New feature in CDR 2.5)*

WHERE CAN I FIND IT?

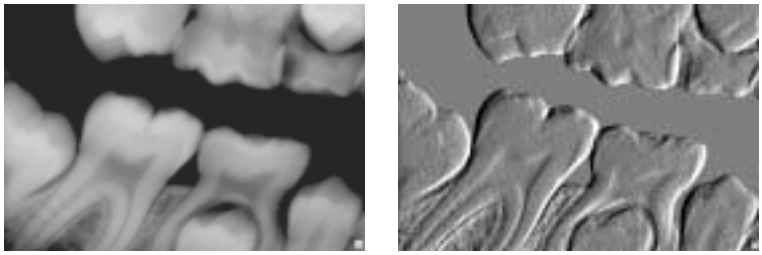
Enhance Menu

HOW DO I USE IT?

Select **Emboss** from the **Enhance** menu. The emboss filter traces the edges in an image and distinguishes between foreground and background layers. Emboss raises the foreground layer, giving the image its three-dimensional look. Emboss can be applied more than once to an image, but in most cases applying it once or twice is sufficient.

Emboss is only effective when applied to X-rays.

SAMPLE



Before Embossing After Embossing

Figure 16. Using the Emboss Feature

8.4.7 Highlight

WHAT DOES IT DO?

Emphasizes areas on the image that share the same pixel values. It can be a valuable tool for determining the outline of particular areas in the image and for detecting potential problem areas.

WHERE CAN I FIND IT?

Enhance Menu

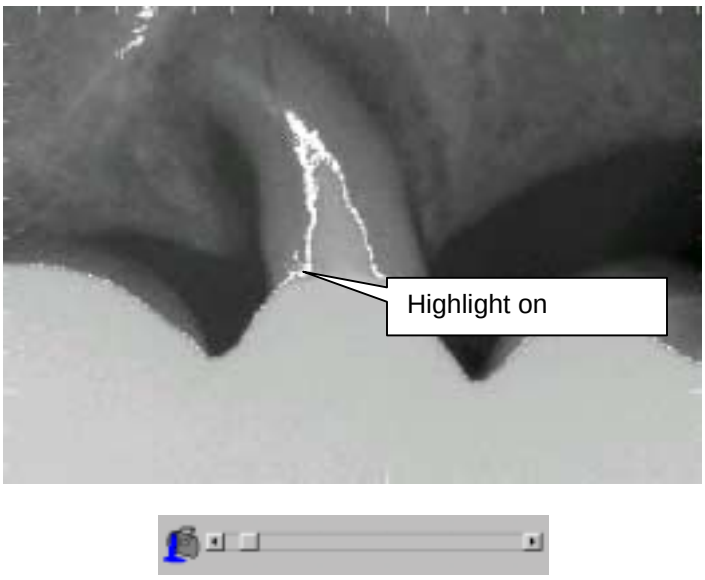
HOW DO I USE IT?

Select **Highlight** from the **Enhance** menu. The Highlight scroll bar appears and the cursor changes as you move it over the image to resemble the icon shown below.

Click on a pixel in the area of the image you want to highlight. A color palette appears from which one color can be selected.

After selecting the color, All pixels with that value will appear on the image in that color. These steps can be repeated any number of times, each color standing for a particular item or area of interest.

SAMPLE



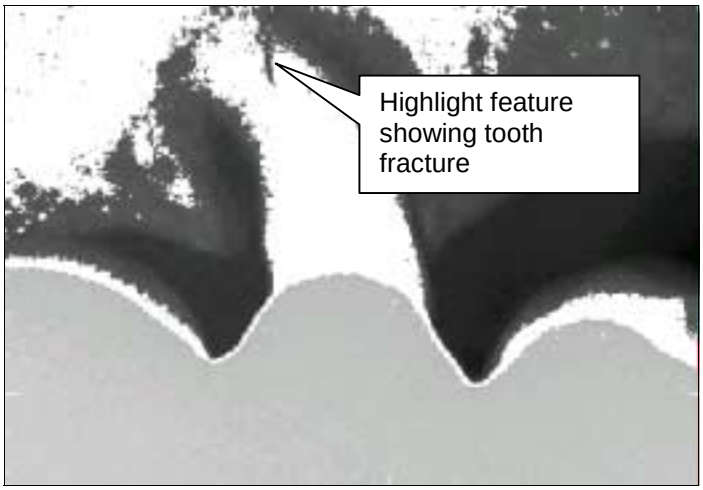


Figure 17. Using the Highlight Feature

8.5 Notes

Notes are a popular feature of CDR, allowing you to mark important areas of an image and to refer to them when needed. Notes can also be used to include a comment about the image in general. There are two categories of notes:

- *Flagged Notes* –these notes are numbered consecutively and are marked as flags on the image. CDR also saves the total number of flagged notes on the image and displays that number in the exam window. For notes that are repeated frequently, CDR can create shortcut descriptions. These shortcuts are defined, edited, and deleted in separate dialog boxes in the exam window (**Section 8.5.3**).
- *Global Notes* – a global note can be used to provide a single line summary of an image. Although it is not numbered, a global note will appear in the "Image Information" area when that image is selected (**Section 8.5.4**).

When flagged notes are used, they refer to text that you enter directly or select from several default descriptions supplied by CDR. Refer to the following paragraphs for information on adding notes to a CDR image.

8.5.1 Adding Notes

WHAT DOES IT DO?

Adds numbered flag notes to an image.

WHERE CAN I FIND IT?

Notes Button

Notes Menu

HOW DO I USE IT?

Flagged notes can be added whenever an image is open in the zoom window. Select **Insert** from the **Notes** menu, which changes the cursor to an arrowhead (as shown below.) Clicking on the image displays the Insert New Note dialog box.

Inside the Insert New Note dialog box, the wording for the note can be added in any of the following ways:

- Note buttons (Caries, Abscess, Root Canal, and Filling)
- Note shortcuts (described in **Section 8.5.3**)
- Text you enter yourself

Once the text of the note has been decided, clicking OK closes the dialog box, assigns (or increments) the number of the note, and saves the text.

SAMPLE

Figure 18. Insert Note Dialog Box

8.5.2 Editing/Deleting Notes

WHAT DOES IT DO?

Edits or deletes numbered flag notes on an image.

WHERE CAN I FIND IT?

Notes Menu

HOW DO I USE IT?

To edit or delete specific notes, select **Edit** or **Delete** from the **Notes** menu. Position the cursor over the note flag and click the left mouse button.

A dialog box appears (either **Edit** or **Delete**) with the wording of the note. The note can then be deleted or edited. *(The following samples are provided only for illustration and should not be used for diagnostic purposes.)*

SAMPLE

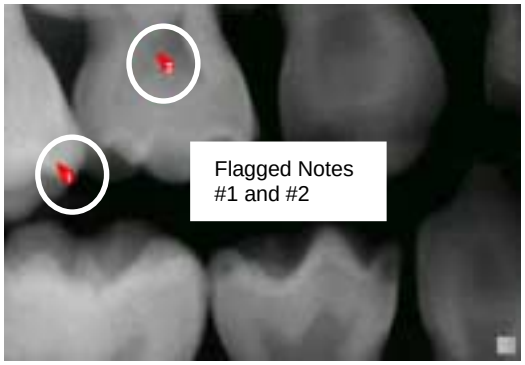
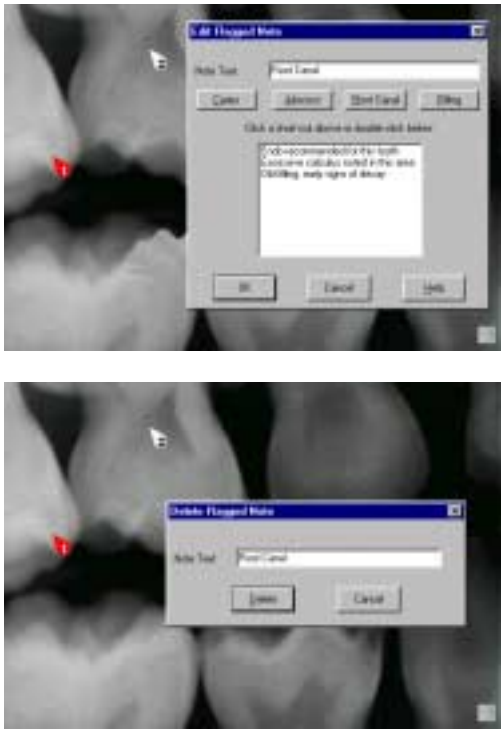


Image inside zoom window with two flagged notes



Flagged note #2 selected and ready to be edited

Flagged note #2 selected and ready to be deleted

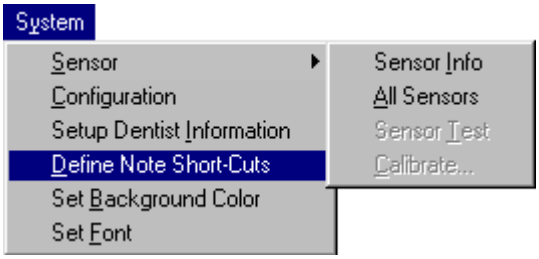
Figure 19. Editing and Deleting Notes

8.5.3 Note Shortcuts

WHAT DO THEY DO?

Instantly recall and apply relevant information when evaluating images. Shortcuts can be used in a variety of ways – to mark a condition that is encountered often in the practice or a recommendation that is used frequently.

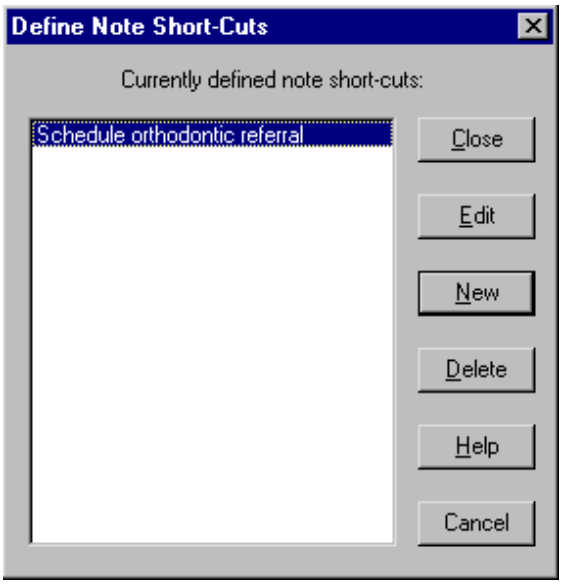
WHERE CAN I FIND THEM?



Define Note Short-Cuts Menu Item

HOW DO I USE THEM?

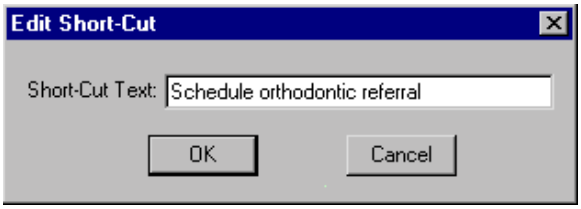
Creating, editing, and deleting shortcuts is accomplished in the exam window by clicking on the **System** menu and selecting **Define Note Short-Cuts**. Performing this action brings up the **Define Note Short-Cuts** dialog box immediately.



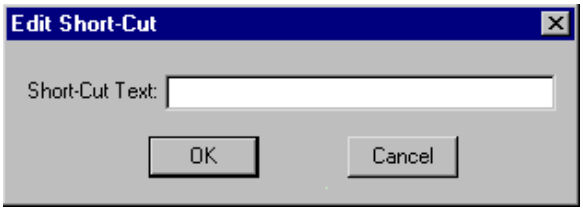
The **Define Note Short-Cuts** dialog box is the starting point for setting up the shortcuts and reviewing or changing them. When the dialog box appears, it lists all the currently defined shortcuts (if any). The Edit, New, and Delete buttons display other dialog boxes as shown in the following Sample area.

SAMPLE

C. Clicking Edit on the Define Short-Cuts dialog box displays the next dialog box. Note text is displayed, ready for editing.



D. Clicking New on the Define Short-Cuts dialog box displays the next dialog box. The text box is blank so new text can be added.



E. Clicking Delete on the Define Short-Cuts dialog box displays the next dialog box. Note text is displayed as part of the message in the dialog box.

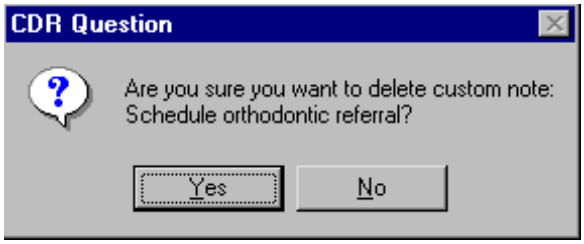


Figure 20. Note Shortcut Dialog Boxes

8.5.4 Global Notes

WHAT DO THEY DO?

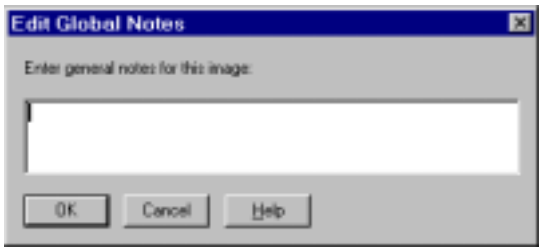
Provide an easy way of getting information about an image without having to open it in the zoom window.

WHERE CAN I FIND THEM?

Global Notes Menu Item

HOW DO I USE THEM?

To edit or delete specific notes, select **Global** from the **Notes** menu. When the dialog box appears, enter any note information you wish to add about the image.

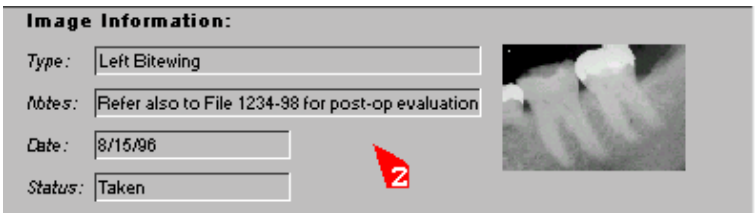


In the Sample area (Figure 21), several notes have been added to a CDR image. A global note is shown as it appears when the patient exam is opened in the exam window. The global note is also shown highlighted in the List All Notes dialog box.

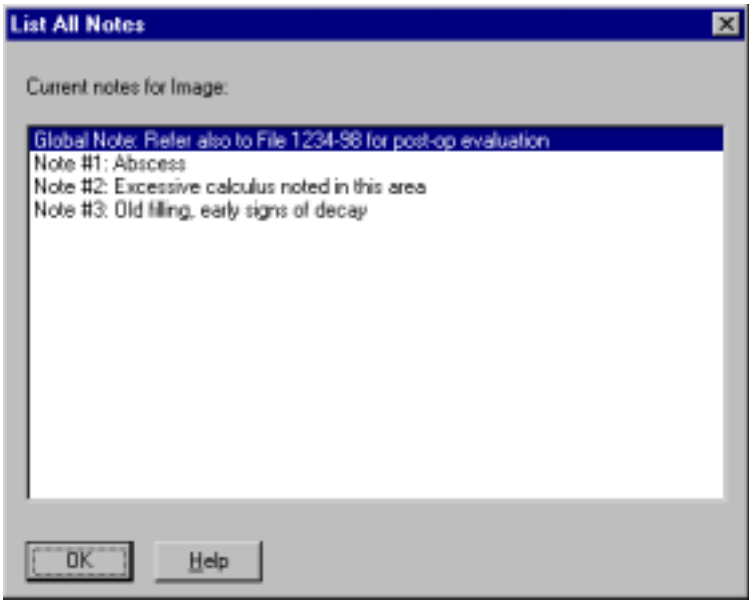
In addition to the global note, a CDR default note “Abscess” was used in Note #1; and two note shortcuts (Note #2 and Note #3) were also added.

Any global note information appears in the “Image Information” section of the CDR Exam window.

SAMPLE



Global Note in Exam Window



Global Note in Zoom Window

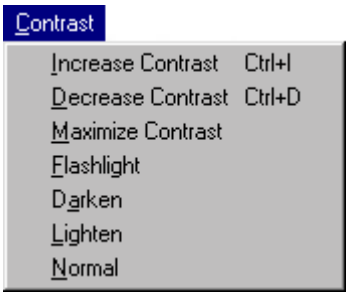
Figure 21. Location of Global Notes

8.6 Contrast

WHAT DOES IT DO?

Changes image contrast and brightness.

WHERE CAN I FIND IT?



Contrast menu

Contrast / Brightness sliders

HOW DO I USE IT?

Image brightness is adjusted by moving the slider either to the left (where the image approaches 100% black) or to the right (where the image approaches 100% white). When image brightness is maximized, all pixels are 100% white. When image brightness is minimized, all pixels are 100% black.

As image contrast is increased (scroll away from the symbol), there are fewer mid-range (gray) pixels and much clearer distinctions between black and white areas. As image contrast decreases (scroll towards the symbol), this distinction decreases. When image contrast is at a minimum, the image will appear entirely gray, as higher- and lower-range pixel values are mapped into the middle (half-black and half-white) range.

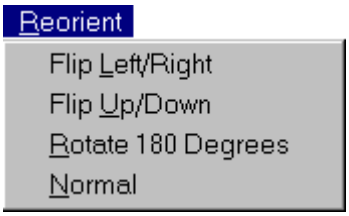
In addition to the sliders, contrast and brightness are also controlled using commands from the **Contrast** menu. When contrast and brightness are adjusted using the menu items, the changes are small and incremental. For quick adjustments, use the sliders. For maximum contrast, click the **Maximum Contrast** menu item.

8.7 Reorient

WHAT DOES IT DO?

Changes image orientation.

WHERE CAN I FIND IT?



Reorient Menu

HOW DO I USE IT?

Select any option from the **Reorient** menu to change the view of the image.

There are three **Reorient** settings: rotating the image 180 degrees, flipping the image up and down, and flipping the image left to right. A fourth setting, **Normal**, returns the image to its original orientation.

In some cases this feature is used when images are acquired in the wrong target frame. Normally, CDR auto-rotates the image to its correct orientation based on the view, and this is usually sufficient. In other cases additional reorientation may be needed.

In the CDR exam window, it is also possible to change the orientation of an image by using the **Swap** feature. When an exam contains both vertical and horizontal frames, swapping an image will re-orient it to 90 or 270 degrees. Use the commands in the menu bar under **Reorient** to rotate or flip the image or to return it to its original orientation.

SAMPLE

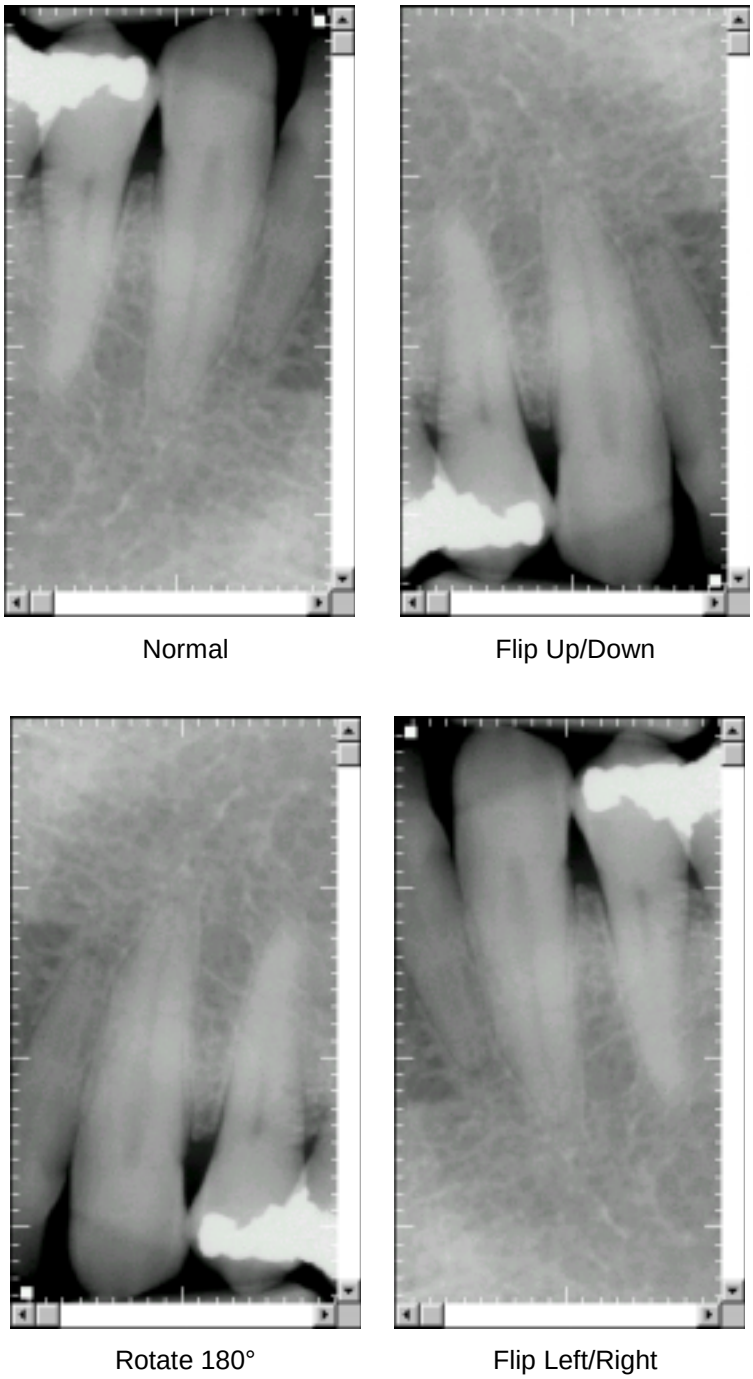


Figure 22. Using the Reorient Feature

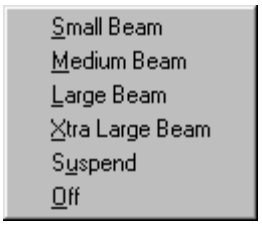
8.8 Flashlight

WHAT DOES IT DO?

Enhances or “illuminates” a specific area of an image.

WHERE CAN I FIND IT?

Flashlight Button



Flashlight Menu

HOW DO I USE IT?

Click the Flashlight button on the toolbar or select **Flashlight** from the **Contrast** menu. Selecting Flashlight from the menu brings up the beam selection menu and a selection of four beam sizes.

Clicking the Flashlight toolbar button turns on the feature with the large beam size as the default. Once the beam appears, right clicking on the image displays a popup menu so other beam sizes can be selected. In addition, like other CDR toolbar buttons, Flashlight has a toggle feature that enables and disables it with successive button clicks.

When Flashlight is on, the beam can be suspended in its current location by selecting Suspend from the menu bar or popup menu. When the beam is suspended, moving the mouse will not affect beam location.

Other features can be used with Flashlight as well: Positive, Sharpen, Spot Remover, Equalize, Maximize Contrast, Brightness, Lighten, Darken, and Normal.

By applying these options you remain focused on a specific area and evaluate it completely. Using the Suspend feature keeps the beam stationary so there is no need to reposition the beam after each effect is applied.

SAMPLE

Figure 23. Using the Flashlight Feature

8.9 Measure

CDR includes several tools to measure lines and pixels.

Measuring line distances (**Distance**) can be done manually using the mouse or by selecting a 1 mm by 1 mm grid overlay (**Grid**). The mouse can be used to help determine distances in other ways as well. To calculate the distance for more than one line at a time, use the **Multiple Lines** option. To measure the angle between two lines, using the **Angles** option is appropriate.

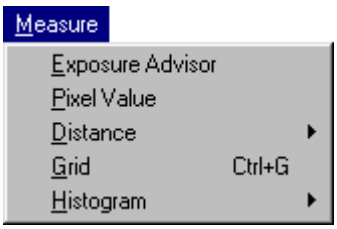
Pixels can be measured individually (**Pixel Values**) or along a straight line (**Histogram**) in any of the following ways: by user-defined line *(Line Histogram*), by column *(Vertical Histogram),* and by row *(Horizontal Histogram).*

8.9.1 Exposure Advisor™

WHAT DOES IT DO?

Assesses the image brightness of X-rays. *(New feature in CDR 2.1)*

WHERE CAN I FIND IT?



Measure Menu

HOW DO I USE IT?

After taking an X-ray, the Exposure Advisor may appear after the image is acquired. If Exposure Advisor does not appear, then:

- The exposure is good, or
- Exposure Advisor is off.

You can run the Exposure Advisor for any X-ray inside a zoom window. Click on the **Measure** menu and then on the **Exposure Advisor** menu item to start this feature.

To turn off the Exposure Advisor, perform any one of the following steps.

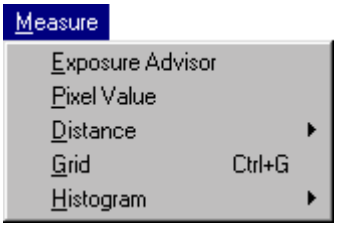
1. Click the "Don't show this after every acquisition" on the Exposure Advisor dialog box itself --**OR** --
2. Locate the [`Messages`] section of the `CDR.INI` and make `ShowExposureAdvisor=NO` -- **OR** --
3. Start CDR Options (**Start** > **Programs** > **CDR** > **CDR Options (CDR.INI)**. On the Intra-Oral Xray tab, find the checkbox for Show Exposure Advisor and click on it to remove the checkmark.

8.9.2 Pixel Value

WHAT DOES IT DO?

Displays pixel grayscale values on the status bar.

WHERE CAN I FIND IT?



Measure Menu

HOW DO I USE IT?

Select **Pixel Value** from the **Measure** menu and then click anywhere on the image. The pixel value at that point appears on the status bar.

Pixel values are measures of density, so if the density of the area being X-rayed is relatively high (bone for example), pixel values will be in the low-to-medium grayscale range. When X-rays travel through areas of low density (air for example) pixel values are much higher.

Knowing pixel values can help determine whether the exposure is dark enough for evaluation purposes. Darkest pixels should fall within the 92 to 99% range. If they fall below this threshold, retaking the image at a higher exposure can improve the image quality and make it easier to distinguish contrasting areas.

SAMPLE

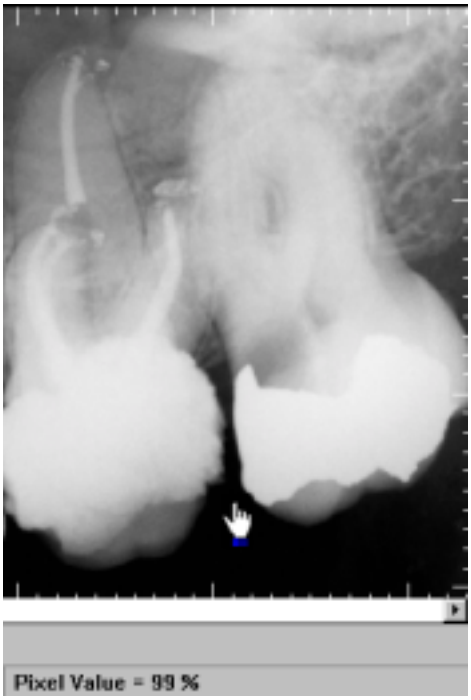


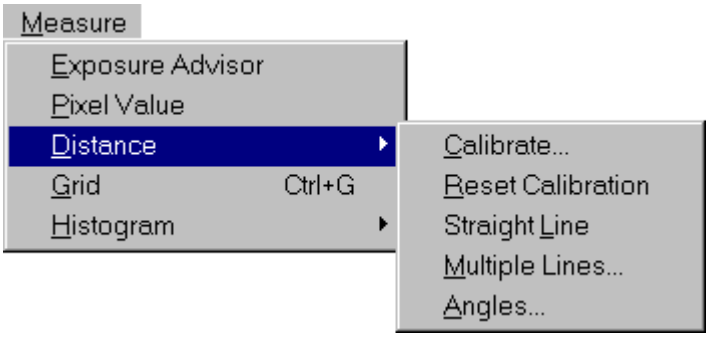
Figure 24. Using the Pixel Value Feature

8.9.3 Straight Line

WHAT DOES IT DO?

Measures the distance between two user-defined points and displays it on the status bar.

WHERE CAN I FIND IT?



Distance Menu Items

HOW DO I USE IT?

On the **Measure** menu, select **Distance** and then **Straight Line**. Click the left mouse button the to set a starting point and then hold the button down until you reach the length you want to measure. When you release the button, the length of the line from point-to-point is displayed in the status bar. When you begin measuring a new line, the previous line disappears.

Use this option as a quick way to determine single line distances and when you require more precise measurements than those supplied by the grid pattern. Distances measured with the Straight Line option are rounded to the nearest tenth of a millimeter; in comparison, the Grid is a 1-millimeter pattern.

SAMPLE

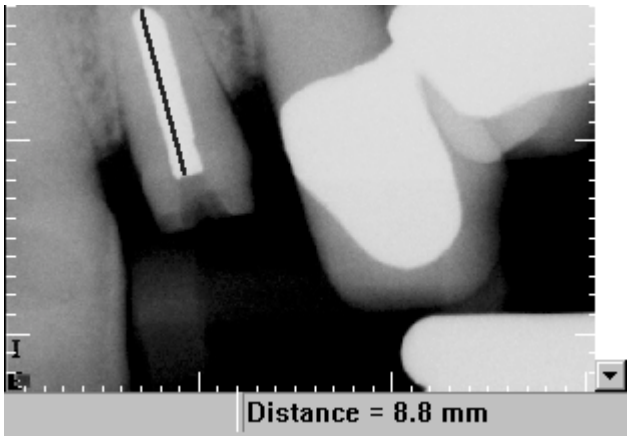


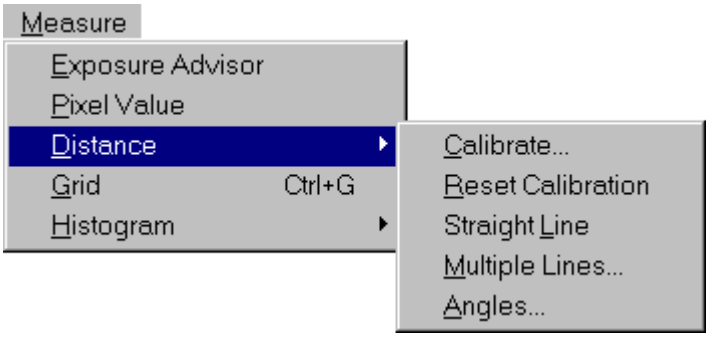
Figure 25. Using the Straight Line Feature

8.9.4 Calibrate

WHAT DOES IT DO?

Resets distance information in an image.

WHERE CAN I FIND IT?



Distance Menu Items

HOW DO I USE IT?

The Calibrate feature corrects distortion problems created by poor sensor position, X-ray source misalignment, or other factor. To correct this problem, place an item of known length (such as an endodontic file) in the area being X-rayed. This item will provide a benchmark measurement once the image is acquired. Then, take an X-ray. *(For this discussion, we will use an endodontic file as the item of known length.)*

On the **Measure** menu, select **Distance** and then **Calibrate**. Click the left mouse button the to set a starting point parallel to the endodontic file and hold the button down until you reach the end of the file. When you release the button, the Distance Calibration dialog box appears. Enter the known length of the endodontic file in the text box.

Saving the image will save the new calibrated value, eliminating the need to recalibrate the image. When the image is re-opened, the saved value will be used as the baseline for all other measurements, including crowns, roots, and the distance for implants.

To clear the current settings for distance measurements select **Reset Calibration** from the **Measure** menu.

SAMPLE

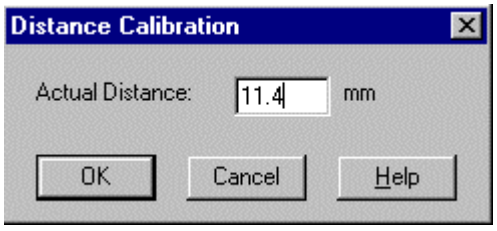


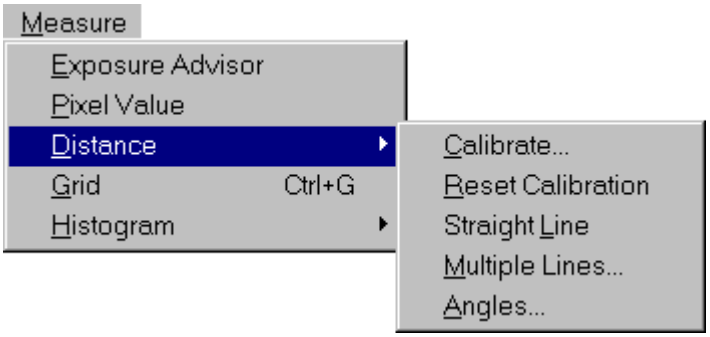
Figure 26. Distance Calibration Dialog Box

8.9.5 Multiple Lines and Angles

WHAT DO THEY DO?

Measure the distance between multiple lines and the angle between two straight lines. *(Although they are separate features, Multiple Lines and Angles are grouped together for this discussion.)*

WHERE CAN I FIND THEM?



Distance Menu Items

HOW DO I USE THEM?

On the **Measure** menu, select **Multiple Lines** or **Angles**. Click the left mouse button the to set a starting point on the image. Move the cursor in any direction to draw the next line, and left click again to end that line. Continue that line or stop measuring by clicking the right mouse button.

When **Measure** > **Multiple Lines** is selected, at least two measurements are provided in the Multiple Line Measure dialog box. One is the distance of the last line and the other is the total of all line distances. Angles can also be reported in the dialog box when the checkbox for that item is set.

When **Measure** > **Angles** is selected, the angle between the last two lines drawn, up to 180°, is displayed on the dialog box.

The Multiple Line option is used primarily to measure lines with curved features (for example, files and roots).

SAMPLE

Figure 27. Using Multiple Line Feature

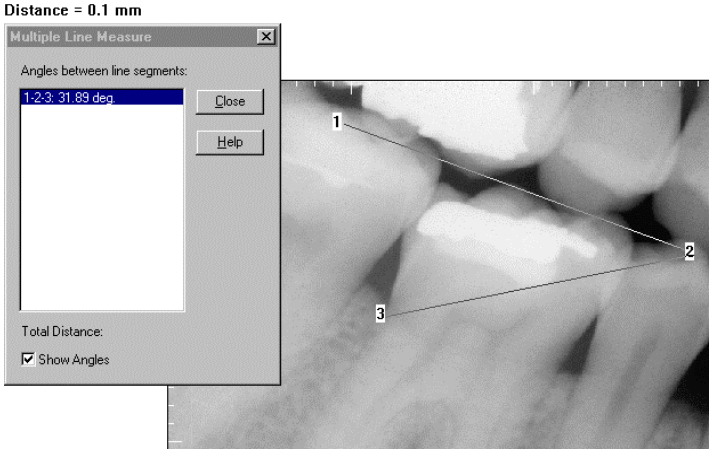


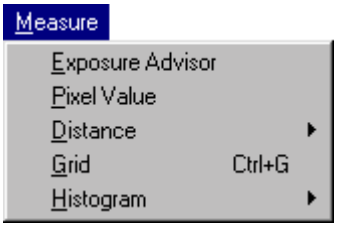
Figure 28. Using Multiple Line Feature (Angles Shown)

8.9.6 Grid

WHAT DOES IT DO?

Places a grid overlay over the image

WHERE CAN I FIND IT?



Histogram Menu Items

HOW DO I USE IT?

Select **Grid** from the **Measure** menu or click on the **Grid** toolbar button. The grid pattern, divided into 1 mm by 1 mm squares, appears over the image. To remove the pattern, click the Grid button again or select Grid from the Measure menu again. Grid is updated automatically when images are calibrated.

The grid can be used to get a quick, one-step view of distances on the image. When the dimensions of a small area are needed, using the grid overlay provides an accurate frame for that information.

SAMPLE

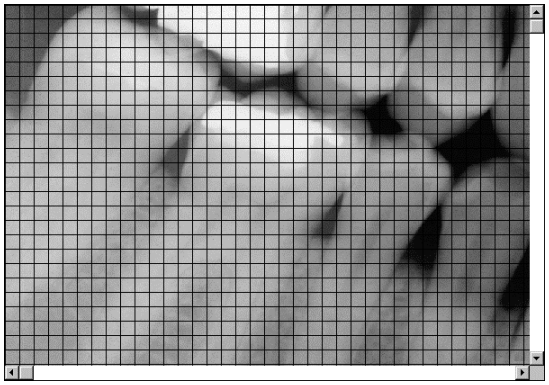


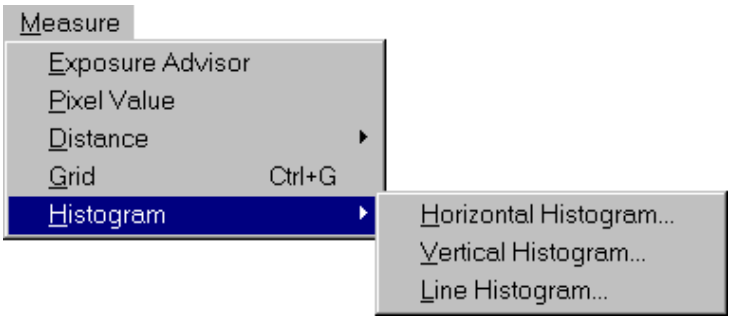
Figure 29. Grid Pattern

8.9.7 Histograms

WHAT DO THEY DO?

Display the grayscale value of every pixel along a vertical, horizontal, or user-defined line.

WHERE CAN I FIND THEM?



Histogram Menu Items

HOW DO I USE THEM?

Select **Histogram** from the **Measure** menu and select the histogram style. For vertical and horizontal styles, click on any pixel in the image and CDR creates a histogram measuring every pixel along that line. To display a line histogram, click once in the image to mark the starting point for the line, then hold the button down and drag the line to a certain length. When the button is released, the histogram is displayed.

Histograms are useful tools for finding areas of pixels having similar grayscale percentages. This can be an excellent indicator for determining the spread of areas affected by pathology and for finding other areas on the image with similar indications. This is the reason why CDR asks if the pixel information should be saved in a separate text file. When CDR saves this file, the grayscale value (0 to 255) for each pixel in the selected line is listed. Saving the information can be useful when making comparisons of the same tooth area over time.

SAMPLE

Figure 30. Vertical Histogram Sample

8.10 File

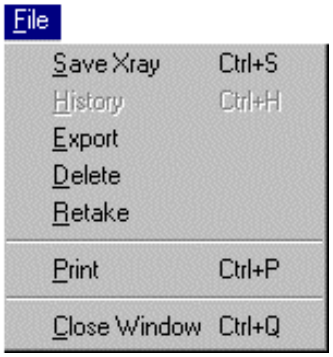
Under the **File** menu are the basic options that control the zoom window. In many cases, the selections found in this menu represent both the starting and the ending points for evaluating images. A brief summary of the menu items is supplied in the following paragraphs.

8.10.1 Save Xray

WHAT DOES IT DO?

Saves the current image and any changes that were made to it during the current CDR session.

WHERE CAN I FIND IT?



File Menu

Save Button

HOW DO I USE IT?

Select **Save Xray** from the **File** menu or click on the **Save** toolbar button.

8.10.2 Export

WHAT DOES IT DO?

Exports images to other applications.

WHERE CAN I FIND IT?

File Menu

HOW DO I USE IT?

Select **Export** from the **File**. When the dialog box appears, select the location where you want to save the file and select the file format. Enter a name for the file and click the Save button on the dialog box to export the image.

Selecting a graphics format depends generally on the how the image will be used. Refer to the following list for guidelines.

Windows Bitmap	.BMP	Standard, popular format.
LEAD PQ1	.CMP	Minimal loss in image quality, but lower compression rate (5:1) than JPEG.
JPEG	.JPG	*(New feature in CDR 2.1)* Higher compression rate (17:1) than PQ1, but higher loss of image quality.
Paintbrush	.PCX	Paintbrush bitmap format.
Targa	.TGA	High-end graphics output format.
TIFF/TIFF RLE	.TIF	Bitmap format for grayscale images and optional RLE lossless compression for smaller file sizes.
WordPerfect	.WPG	WordPerfect bitmap format.

8.10.3 Delete

WHAT DOES IT DO?

Deletes the currently selected image from the exam.

WHERE CAN I FIND IT?

File Menu

HOW DO I USE IT?

Select **Delete** from the **File** menu. A dialog box appears, asking to confirm the action. If your response is “Yes” the image is deleted from the exam, the zoom window closes, and you are returned to the exam window. “No” closes the dialog box only with no effect on the image. This option is identical to the **Delete** option in the exam window under the **Xray/Image** menu.

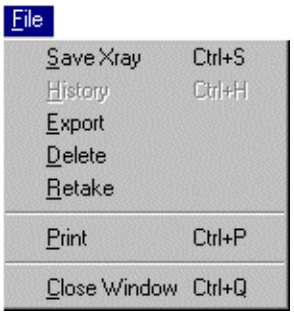
NOTE:Once the Delete action is performed, it cannot be undone. The Undo option, which is used for removing image enhancements, is not available for deletions.

8.10.4 Retake

WHAT DOES IT DO?

Takes a second X-ray to compare with the current one.

WHERE CAN I FIND IT?



File Menu

HOW DO I USE IT?

Select **Retake** from the **File** menu or click on the Retake toolbar button. After you take the second X-ray, CDR displays both images, side-by-side, for easy comparison. After reviewing the X-rays, accept one image, which will appear in its target frame in the exam window.

SAMPLE

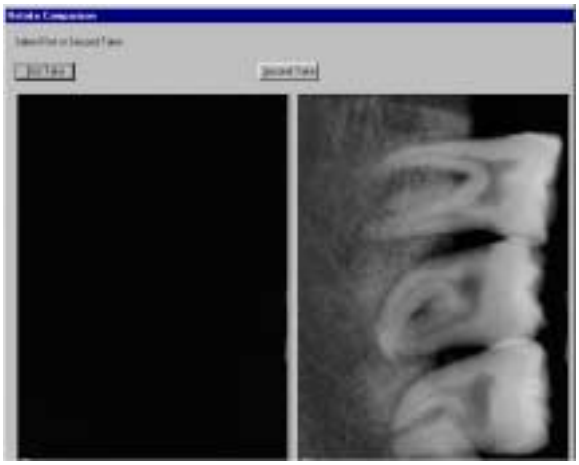


Figure 31. Retake Comparison Display

8.10.5 Print

WHAT DOES IT DO?

Prints the current image in the zoom window.

WHERE CAN I FIND IT?

File Menu

Print Button

HOW DO I USE IT?

Select **Print** from the **File** menu or click on the Print toolbar button. A Print dialog box appears, with options specific to the printer currently connected to your computer.

There are two additional options for CDR – Print Patient Info and Print Dentist Info.

- Add a checkmark next to the Print Patient Info to include patient name, ID, and exam date to the printed report.
- Add a checkmark next to the Print Dentist Info to include dentist name, address, and phone information to the printed report.

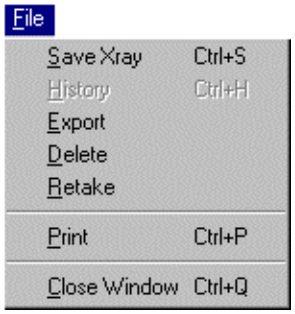
The printed image will reflect the enhancements and options applied in the zoom window (zoom level, contrast, colorize, etc.). These changes will appear on the image in the printed report even if the changes themselves were not saved yet.

8.10.6 Close Window

WHAT DOES IT DO?

Closes the zoom window.

WHERE CAN I FIND IT?



File Menu

Exit Button

HOW DO I USE IT?

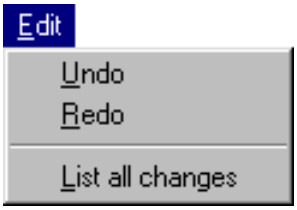
Select **Close Window** from the **File** menu or click on the Exit toolbar button. If the image was enhanced in any way, you are prompted to save those changes as well or discard them.

8.11 Undo/Redo/List All Changes

WHAT DOES IT DO?

Keeps track of all changes to an image (**List all changes**), and can be used to remove them (**Undo**) and re-apply them (**Redo**).

WHERE CAN I FIND IT?



Edit Menu

HOW DO I USE IT?

Select from the **Edit** menu in the zoom window. Changes are undone one at a time and every enhancement change that was applied to an image can be removed and re-applied. The date and the time the enhancement changes were made are also listed in the dialog box.

SAMPLE

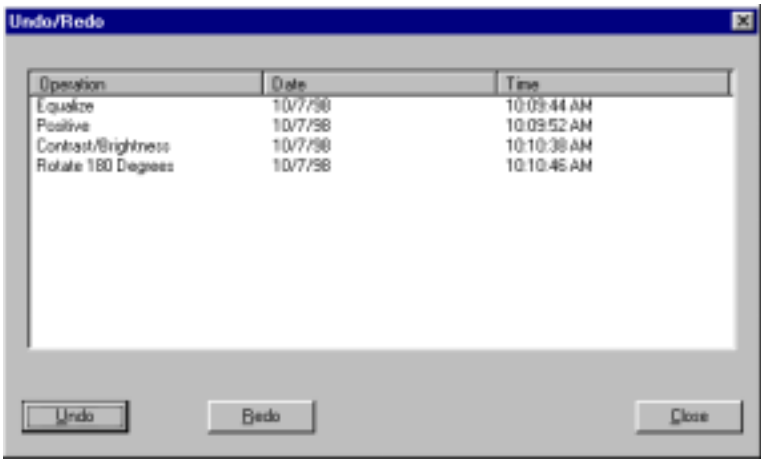


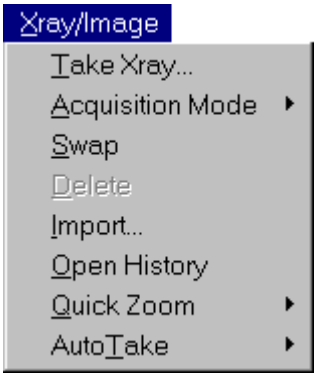
Figure 32. Undo/Redo Menu and Dialog Box

8.12 Import

WHAT DOES IT DO?

Imports images from other applications.

WHERE CAN I FIND IT?



Xray/Image Menu

HOW DO I USE IT?

Create a new exam or open an existing one. In that exam. select an empty target frame where you want the imported image to appear. Select **Import** from the **Xray/Image** menu. When the dialog box appears, select the location and the file format of the image you want to import. Click the Open button on the dialog box to import the image.

> *NOTE:The orientation of the imported image (vertical or horizontal) must match the orientation of the target frame. If it doesn't, CDR will ask you to select another frame with the appropriate orientation.*

CDR can import files in the following formats:

- Windows Bitmap (.BMP)
- LEAD PQ1 (.CMP)
- JPEG (.JPG)
- Paintbrush (.PCX)
- Targa (.TGA)
- TIFF/TIFF RLE (.TIF)
- WordPerfect (.WPG)

9. Arranging Images

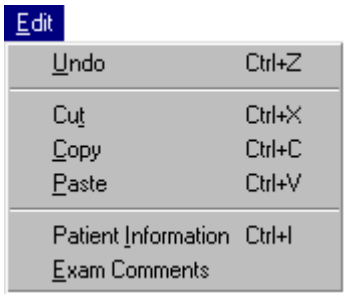
There are a number of options available in the exam window to move images: (a) within patient exams, (b) between patient exams, and (c) from the CDR program to other applications. Of the following options, **Copy**/**Paste** can move images in all three ways and **Swap** can move images in the same exam.

9.1 Copy/Paste

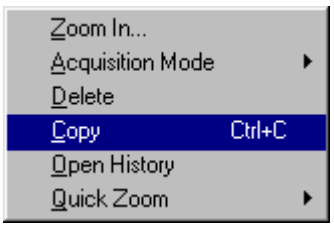
WHAT DOES IT DO?

Copies and pastes images within CDR or from CDR into another application.

WHERE CAN I FIND IT?



Exam Window Edit Menu



Right-Click Menu Item

HOW DO I USE IT?

To copy an image, highlight it first and select **Copy** from the **Edit** menu, or press the [Ctrl + C] keys, or right click on the highlighted image to display a short menu and click on **Copy**. When pasting a CDR image, the frame must be empty before the image can be copied there.

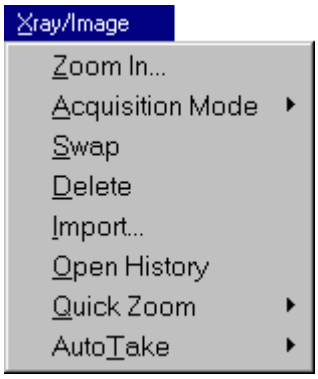
Images can be copied and pasted within a single CDR exam or from one CDR exam to another. Using the **Tile Exam** feature to display multiple CDR exams will expedite moving images between patient exams. To facilitate coping images between exams for the same patient, turn off the **Hide Exam Tabs** option from the **Window** menu, **Hide Elements** submenu. Images can also be copied and pasted in other applications like Microsoft Word for example.

9.2 Swap

WHAT DOES IT DO?

Switches the position of two images in the same patient exam.

WHERE CAN I FIND IT?



Xray/Image Menu

Toolbar Button

HOW DO I USE IT?

Highlight both images first by pressing down and holding the <SHIFT> key and selecting one image and then the next. Go to the **Xray/Image** menu and select **Swap**. The images will appear immediately in their new positions.

It is also possible to change the orientation of an image in the exam window by swapping two frames at different orientations. For example, swapping two images, one oriented vertically, the other horizontally, will re-orient both images 90 or 270 degrees.

10. Mailing Images

This feature allows CDR users to exchange X-ray and video images electronically over a networked system or the Internet.

To benefit from the new messaging feature in CDR, you will need the following resources:

Hardware

- ☑ Desktop or notebook system
- ☑ Modem or other hardware providing Internet access (required to send and receive images over the Internet).

Software

- ☑ CDR 2.0 or higher
- ☑ Windows 95, 98, or NT
- ☑ E-mail program (also called a *mail client*) like Microsoft's Outlook Express, Netscape's Messenger, or Qualcomm's Eudora.

On-Line Service (required for sending and receiving images over the Internet)

- ☑ Account with an on-line service or an Internet Service Provider (ISP) like America Online (AOL), Microsoft Network (MSN), or Prodigy.

The following steps describe how to send and receive CDR images. To illustrate these steps by example, Microsoft's Exchange is used as the mail client.

10.1 Sending Mail

STEP 1

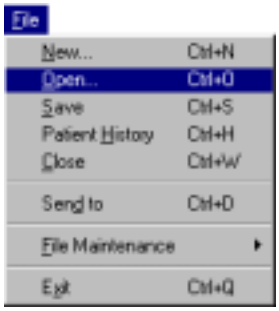
A. Sending CDR mail requires that information about the sender (at the very least the dentist name) be included with the mail.

B. If you receive the warning shown below when you try to mail the exam, it means that CDR did not find the dentist information it needed to identify the sender.

C. Go to the CDR exam window menu bar and click on **System**, then **Setup Dentist Information**. Click **New** from the Dentist Information dialog box and enter the required information.

STEP 2

Open a patient exam from either the menu bar at the CDR main window or by clicking on the Open button on the toolbar.



STEP 3

A. After selecting a patient exam, choose the image (or images) to be e-mailed by clicking on it once (if it isn't highlighted already). Once an image is highlighted with a red border, it means it has been selected.

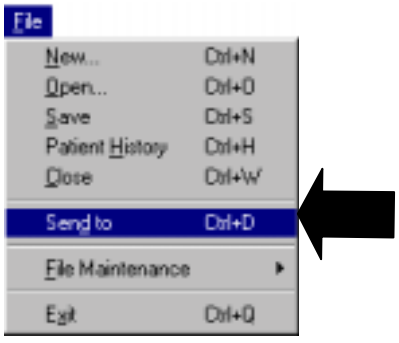
B. Multiple images are selected by:

- holding down the [Shift] key and left-clicking images, or
- positioning the cursor over an image, right-clicking to open a context menu, then clicking on the **Extend Selection** item. Refer to **Section** Error! Reference source not found. if you need more information on how to select images.

STEP 4

A. After selecting the images to be e-mailed, go to the menu bar and click on **File** > **Send to** or **File** > **Send to** > **Mail Recipient**, depending on your configuration.

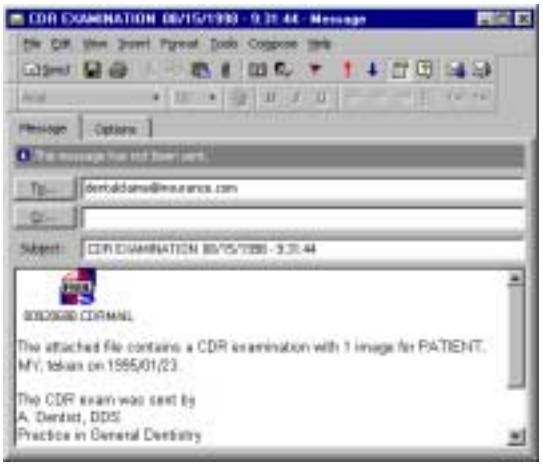
B. Depending on the mail program you are using, the Choose Profile dialog box may be displayed, confirming your profile settings and providing additional options. Click **OK**.



STEP 5

A. Your system will display a mail message window similar to the sample shown at right.

   NOTE:The display of the mail message dialog completes the CDR portion of sending e-mail. Any errors encountered after this step are outside the responsibility of CDR.



B. Patient name and the number of images included in the attachment (indicated by the `CDRMail` icon) are supplied automatically.

C. Subject and dentist information are also supplied automatically.

D. Additional comments can be added anywhere in the scrolling text area.

E. Add the recipient's e-mail address in the text area next to the button labeled **To. . .**

F. Click on **Send** to e-mail the CDR images.

10.2 Receiving Mail

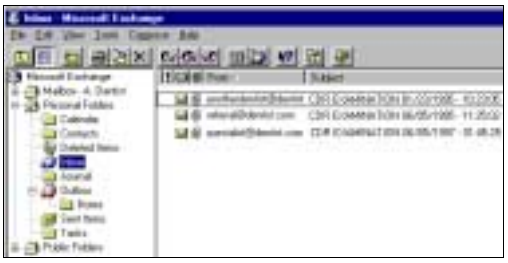
When images have been received electronically, they can be viewed immediately or saved for subsequent examination. These options are described in the following steps. As in the previous paragraph, Microsoft Exchange is used as the mail client.

STEP 1

A. Start your e-mail program.

B. Check your e-mail Inbox. (In the sample, the Inbox for Microsoft Exchange is shown.)

C. If a new mail message with CDR images is found, double click on that item in the list.

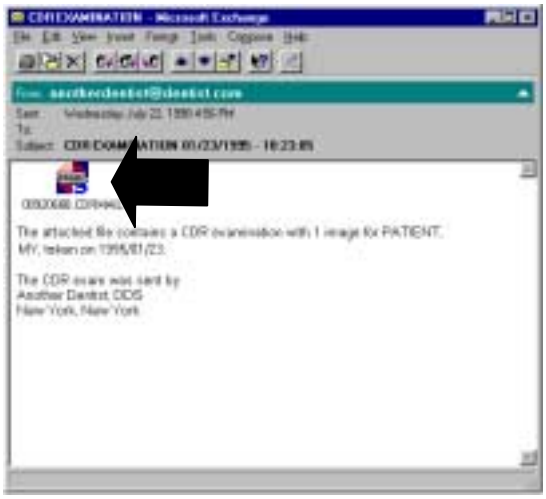


STEP 2

A. The message opens in its own window with the CDR mail attachment, patient exam, and dentist information provided.

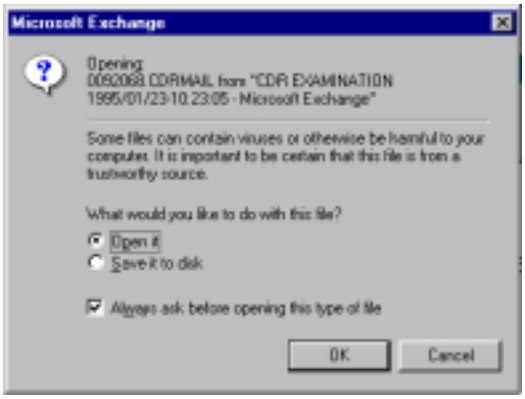
B. *Double-click* on the CDR Mail icon.

NOTE:In Microsoft's e-mail programs and some others, the CDR Mail icon appears just as you see it in the sample shown at the right. In other programs, like Netscape or Eudora Light, only the name of the attachment will appear.



STEP 3

A dialog box may appear (as shown in this sample for Microsoft Exchange). If not, continue with step 6.



STEP 4

A. Locate the checkbox near the bottom of the dialog box and shown at the right

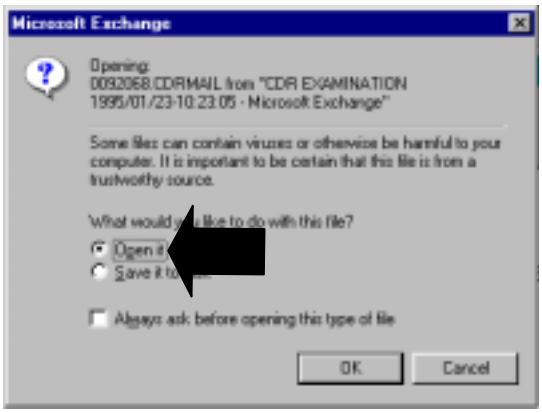
B. Make sure the checkbox is clear.

C. If necessary, click the check box to **remove** the check mark. By clearing this box, you'll skip over the previous step **the next time you open a CDR Mail message**. Instead, you'll see the CDR message described in step 6.

STEP 5

A. Click on the radio button to **Open** the CDR mail attachment.

B. Click **OK** to start the CDR program (if it is not active already).



STEP 6

A message box is displayed, confirming that the mailed exam has been copied to your CDR database. Click **OK** to close this message.

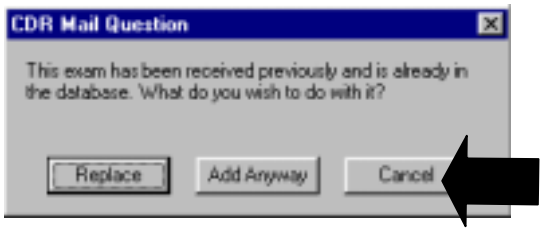
STEP 7

A. If CDR detects that you intend to add the **same exam** you added previously, it displays the dialog box shown at the right.

B. Click **Cancel** because you already have this exam.

   NOTE:*The other two options on this dialog box, Replace and Add Anyway, are intended for special situations.*

   For example, if you inadvertently deleted an image from a mailed exam, you could retrieve the original exam from your mail program's Inbox and Replace the modified exam with the original one. If you choose Add Anyway, an extra copy of the CDR exam will be placed in the database. Please note that this choice adds the same exam you added previously.



10.3 Some Notes on Configuring Mail

To work **directly** with CDR, the mail client must be MAPI-compliant. *(MAPI is the programming standard used by Windows to support e-mail.)* Some mail clients (Outlook, Internet Mail, and Exchange for example) are MAPI-compliant and require no changes in the `CDR.INI` file. Other MAPI-compliant programs (Outlook Express, Eudora Light, and Netscape) do require an additional change in the `CDR.INI` file, as described below.

Outlook Express (versions prior to OE 5)

1. Open the `CDR.INI` file.
2. Under the `[MAIL]` section, change the Mapi line to: `Mapi_DLL=OEMAPI32.DLL`.
3. Save changes and close the `CDR.INI` file.
4. Find `OEMAPI32.DLL` on your system and then copy and paste it into the CDR\OBJ folder.
5. *NOTE: For users upgrading to Outlook Express 5 from earlier versions of OE, the Mapi DLL is MAPI32.DLL. The CDR.INI file should reflect this DLL.*

Eudora Light

1. Open the `CDR.INI` file.
2. Under the `[MAIL]` section. change the Mapi line to: `Mapi_DLL=EUMAPI32.DLL`.
3. Save changes and close the `CDR.INI` file.
4. Find `EUMAPI32.DLL` on your system and then copy and paste it into the CDR\OBJ folder.

Netscape

5. Open the `CDR.INI` file.
6. Under the `[MAIL]` section, change the Mapi line to: `Mapi_DLL=NSMAPI32.DLL`.
7. Save changes and close the `CDR.INI` file.
8. Find the `NSMAPI32.DLL` file on your system and then copy and paste it into the CDR\OBJ folder.

10.4 Generating Attachments Only

If the mail client does not support MAPI, CDR will not create an e-mail message, but you can open your mail client and attach a file (`*.CDRMAIL`) that includes the CDR exam and the selected images. Using CDR messaging in this way requires a change to the `CDR.INI` file (**Section 13**) since this is not the default setting. Under the `[MAIL]` section change the attachment line to read `Attachment_Only=YES`. This option is also suitable if you intend to send the file attachments at some later time, using a mail client or MAPI program.

10.5 Note for Receiving CDR Exams from AOL Users

All CDR exams received from AOL users require extra consideration. This applies to AOL subscribers and mail recipients who do not subscribe to AOL but who receive CDR exams from AOL users (any @aol.com address).

- (AOL Subscribers) When the AOL Download Manager prompts you, change the file extension of the mail attachment from `*.CDR` to `*.CDRMAIL`.
- (Non-AOL Subscribers) When your mail client prompts for the location to save the attachment, change the file extension from `*.CDR` to `*.CDRMAIL`.

11. Printing

CDR provides several different printing options.

- Print the current image in the zoom window. The effects of CDR's enhancement tools (for example, Contrast, Colorize, etc.) will appear when printed, even if those effects have not been saved with the image yet.
- Print the last saved version of the image.
- Print an entire exam.

After images are printed they can be used in a number of ways.

- Stored with other information in a patient’s physical file
- Shared with other consulting dental care professionals
- Provided to dental insurers when needed
- Shared with the patient

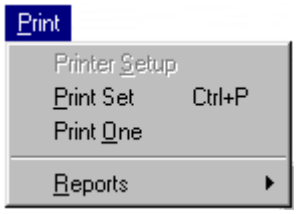
11.1 Single Image

WHAT DOES IT DO?

Prints one image.

WHERE CAN I FIND IT?

Print Image in Zoom Window



Print Image in Exam Window

HOW DO I USE IT?

To print the last saved version of an image, highlight the image in the exam window, and then select the **Print One** option from the **Print** menu. When printing with this option, the image is always shown at 100%. When the print dialog box opens, you can include patient, dentist, and exam date information by adding a checkmark to the appropriate box.

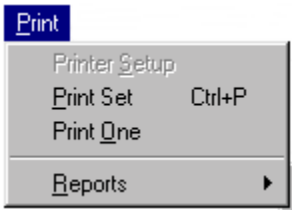
To print the current image in the zoom window, select the **Print** option from the **File** menu. When printed, the image reflects any of the enhancement effects you have applied, *even if you have not saved them yet with the image*. In addition, any numbered flag or global notes will be printed with the image. You can also choose to include patient and dentist information by adding a checkmark to the appropriate box on the print dialog box.

11.2 Multiple Images (Exams)

WHAT DOES IT DO?

Prints all the images in a patient exam.

WHERE CAN I FIND IT?



Print Menu

Print Set Button

HOW DO I USE IT?

To print all the images in an exam, select the **Print Set** option from the **Print** menu, or click on the **Print Set** button, or press the [Ctrl + P] keys. When the print dialog box opens, you can include patient, dentist, and exam date information by adding a checkmark to the appropriate box.

Exams are printed in landscape orientation, show only target frames with images (empty target frames are disregarded), and include exam comments (if any were added).

Occasionally, you may need to print images from several different exams. In this situation, copy and paste the images into a single exam and then select the **Print Set** option. This will print each image and the date it was acquired. Click the Print Dates checkbox on the Print Dialog Box to include/suppress exam dates in the printed copy.

NOTE:Not including exam dates will enable images to print about 20% larger.

11.3 Printers

CDR is compatible with several types of printers and can support the printing of both color and monochrome images. Color images include colorized X-rays, intra-oral camera images, and imported color bitmap images. Black and white (monochrome) images include X-rays and imported gray-scale bitmap images.

The printers listed below are several popular printers that have been tested with CDR and have been proven to be compatible with it. In general, though, almost any 8½ x 11 or 8½ x 14 printer with a Windows printer driver can be used.

Table 10. Printers Compatible with CDR

MANUFACTURER	MODEL	TYPE
Epson	800 and 900 Series	Color inkjet printer
Fargo	FotoFun!	Dye-sublimation color printer
	PrimeraPro	Digital color printer
Hewlett Packard	LaserJet Series	Monochrome laser printer
Sony	UP-D860, UP-D890	Thermal grayscale printer

11.4 Reports

There are three types of reports that can be printed using CDR:

- "Classic" Endodontic Style Reports
- "Classic" Periodontic Style Reports
- Word Style Template Reports

All report styles are available from the **Print** menu in the exam window. Reports can be generated *after* a patient exam is opened. Once the exam is open, you choose between a default report style, which includes standard wording appropriate to the type of exam, or a new report style, where the text is entered directly by you. In both default and new report styles, you can revise the text as needed.

Another advantage to these reports is that when new styles are created, they can be listed as menu items for quick and easy access, just like the default styles (**Endodontic** and **Periodontic**). Up to 10 new styles of endodontic and periodontic reports can be added.

11.4.1 Endodontic Report

WHAT DOES IT DO?

Creates a standard report for endodontists.

WHERE CAN I FIND IT?

Template Styles

HOW DO I USE IT?

Creating a New Report

1. Open an exam in CDR and select TWO images.
2. At the **Print** menu, click **Add Report >Classic CDR Endo Style**.

3. Fill in the appropriate text areas. When you're finished, click on the **Save** button.
4. To create a report based on the template, click **Print** > **Reports** and then browse for the template. Both the patient name and exam date information are already supplied by the current exam.

SAMPLE

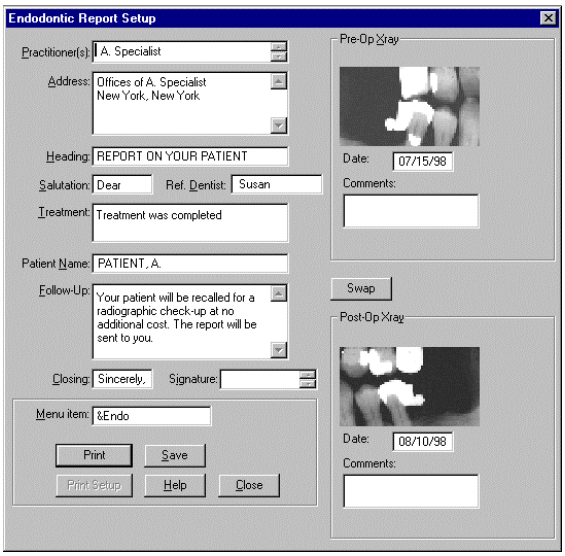


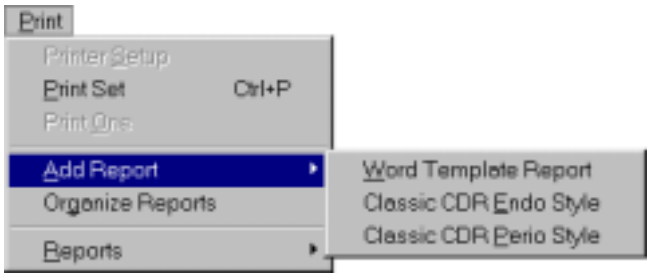
Figure 33. Endodontic Report

11.4.2 Periodontic Report

WHAT DOES IT DO?

Creates a standard report for periodontists.

WHERE CAN I FIND IT?



Template Styles

HOW DO I USE IT?

Creating a New Report

- Open an exam in CDR. Perio reports include all the images in the exam, so it is not necessary to make any specific selections.
- At the **Print** menu, click **Add Report >Classic CDR Perio Style**.
- Fill in the appropriate text areas. When you're finished, click on the **Save** button.
- To create a report based on the template, click **Print > Reports** and then browse for the template. Both the patient name and exam date information are already supplied by the current exam.

SAMPLE

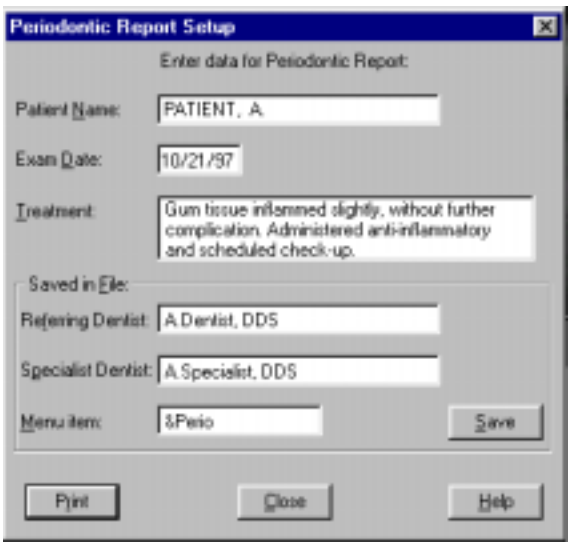


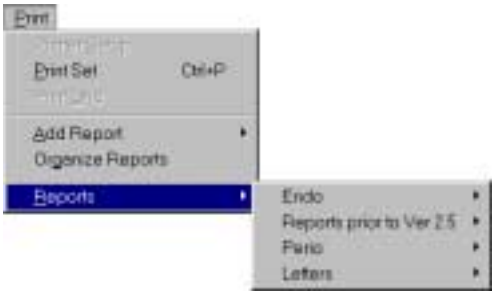
Figure 34. Periodontic Report

11.4.3 Word Template Report

WHAT DOES IT DO?

Creates a Microsoft Word report or new template. *(New feature in CDR 2.1 and updated in CDR 2.5)*

WHERE CAN I FIND IT?



Report Folders

Template Styles

HOW DO I USE IT?

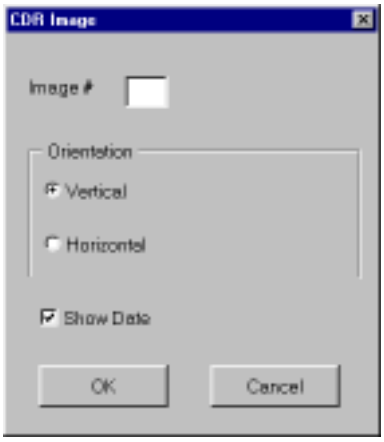
Creating a New Report

- Open an exam in CDR. Choose the images you want to include in the report by selecting one image at a time. The order in which the images are selected determines where the images appear in the report.
- Click on the **Print** menu, **Reports**, and then on the particular report style you want to use. Word creates a report based on the template style, and the patient's name, X-ray images, and dates are all automatically copied into the report.
- At Word's **File** menu, click **Print** to print the report

- Since your report was based on a template, Word will prompt you to save changes to the **report**. **(The template remains unchanged.)**
- Word will open the Save dialog box so you can choose to save the report just as you would any document that you create in Word.

Creating a New Template

- Start CDR. At the Print menu, click **Add Report** > **New Word Template Report**.
- Word opens a blank template (`BLANK.DOT`).
- Start entering the text portion of your template. Use the special toolbar (shown at left) provided with `BLANK.DOT` to add First Name, Last Name, and Exam Date to the appropriate places in text. Use the Insert Image button on the special toolbar to select the image order and orientation.



- When you click on the Insert Image button, the dialog box (shown at left) is displayed. The *Image #* box refers to the order (starting with number 1) in which images are selected in CDR. Select the *Orientation* of the image box by clicking either the vertical or horizontal checkbox. Select whether you want the *Exam Date* to appear below the image.
- When you're finished, click on **File** > **Save As** and then enter a name for the template.
- To create a report based on the new template, click **Print > Reports** and then browse for the template.

12. Displaying Images and Exams

Options under the **Window** menu are available to change the way CDR images and exams are displayed and arranged, making it easier to work with them and use them. Two of these options, tiling and stacking, are covered in detail below. A third option ("exploding") maximizes a tiled or stacked exam to fill the area inside the exam window.

12.1 Multiple Images

Multiple images can be tiled (placed side-by-side to each other) or stacked (placed on top of each other). The images can be of any type and any mix — X-rays, video, or panoramic. As images are tiled or stacked, each image is displayed inside a zoom window, ready for any editing or enhancement that might be needed. The choice to use either the tile or stack features is related to how the images are being used at the time. *Tiling* provides a global view: all the tiled images are shown and ready for evaluation. *Stacking* is a singular view: one image at a time, available for viewing and enhancement.

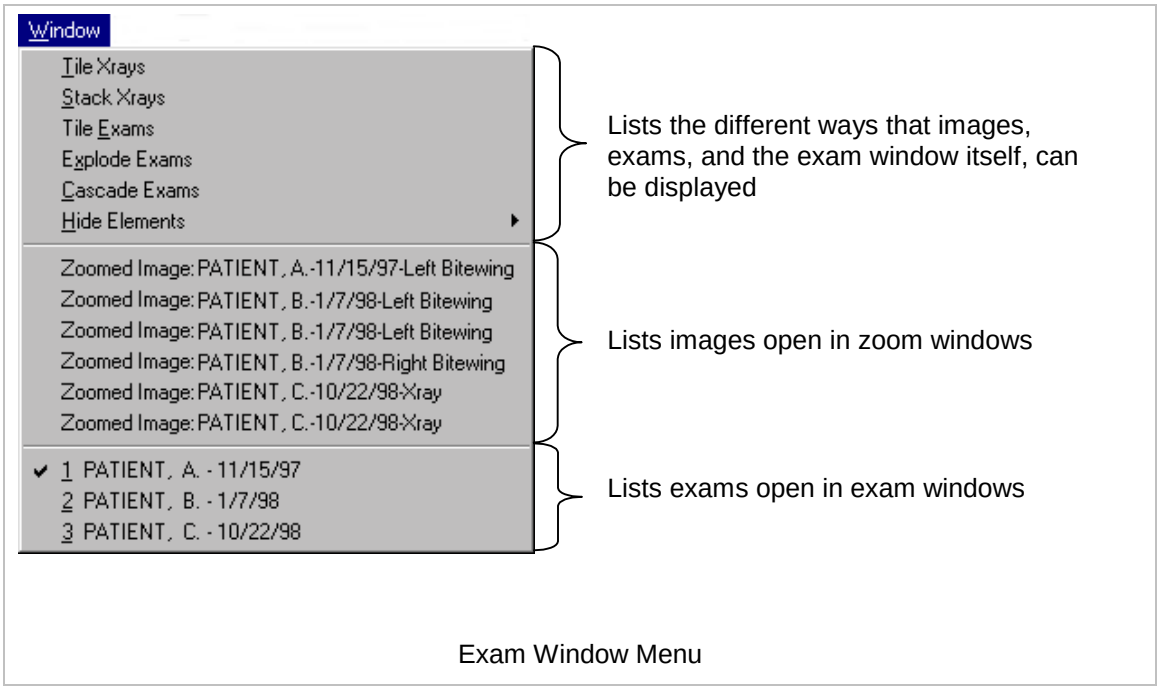


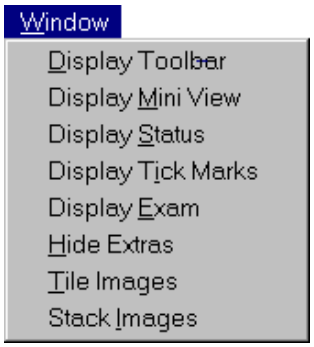
Figure 35. Menu List of Images and Exams

12.1.1 Tiling

WHAT DOES IT DO?

Compares two or more images side-by-side.

WHERE CAN I FIND IT?



Window Menu

Toolbar Button

HOW DO I USE IT?

When you open two or more images, it is possible to tile them so you can see all of the images at once on your display.

> *NOTE:If you intend to tile images, open each image from the exam window: do not use the thumbnail exam on the zoom window. Using the mini-exam window "recycles" images in the same zoom window. Tiling requires at least two images, each in its own zoom window.*

How can you tell how many images are open at one time? One way is to check your Windows taskbar, found usually at the bottom of your Windows desktop. Each time an image is opened in CDR, a button is placed on the taskbar. Another alternative is to check the **Window** menu of the exam window. A list of currently open images will appear on the menu.

When images are tiled, they are resized to fit inside the exam window. As the number of tiled images increases, the size of each image – how large it appears in the zoom window – decreases. This is important to remember since opening too many images at the same time will make them difficult to see even with the tile feature active. Selecting **Hide All Extras** from the **Window** menu of each zoom window will provide some extra space for the image.

SAMPLE

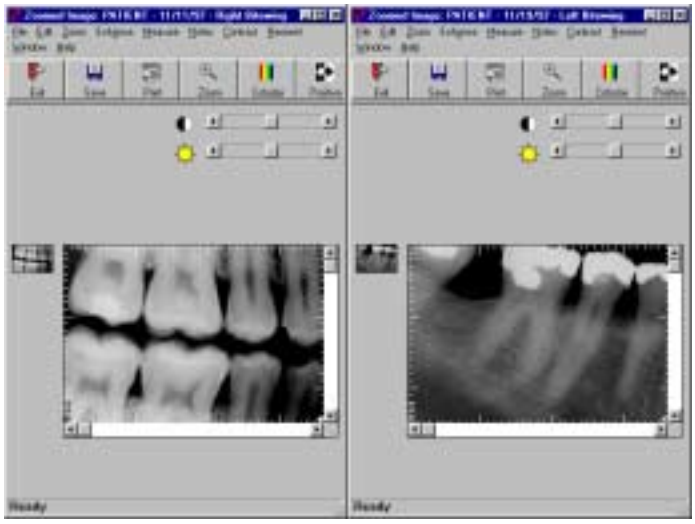


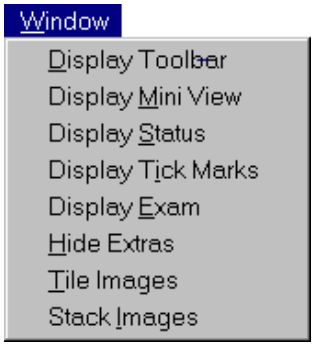
Figure 36. Tiled Zoom Windows

12.1.2 Stacking

WHAT DOES IT DO?

Places two or more images on top of each other in one zoom window.

WHERE CAN I FIND IT?



Window Menu

HOW DO I USE IT?

When you open two or more images, it is possible to stack them, making it easy to page through the images at full size. When you stack images, working with them is similar to having them in a book with one image on top of another.

To move from one stacked X-ray to the next, use the [Page Up] and [Page Down] keys.

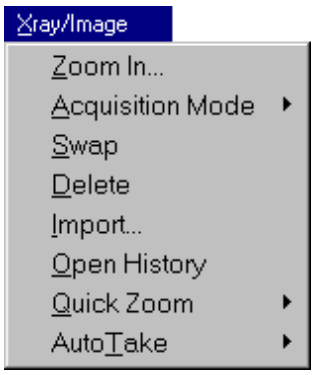
Stacking X-rays works best when it is necessary to work with several images, full size, at the same time. All buttons and menu features are available for stacked X-rays.

12.1.3 Image History

WHAT DOES IT DO?

Searches through the exams of the current patient and locate images that share the same view.

WHERE CAN I FIND IT?



Xray/Image Menu

HOW DO I USE IT?

To open the history of an image, you should click on the image and select the **Open History** item from the **Xray/Image** menu. As CDR finds images with the same view as the selected image, it displays them in an X-ray history window.

To see the entire exam where an X-ray history images was found, click on that image, then go back to the **Xray/Image** menu and select the **Go to Exam** item. The entire patient exam will be displayed in the exam window.

12.2 Multiple Exams

Like images, exams can also be displayed in different ways.

- Tiling is an effective way of viewing images from different exams. It can be especially useful when you wish to keep several exams open for comparison or to copy and paste images from one exam to another.
- Cascading offer similar advantages, but only the images in the first exam can be seen since the other exams overlap behind it.
- Using the Explode option displays the selected exam at full size.

Figure 37. Tiled Exams in Exam Window

Figure 38. Cascaded Exams in Exam Window

Figure 39. Exploded Exam in Exam Window

12.3 Hiding Exam Window Areas

The **Hide Elements** option toggles the display of specific items to increase or decrease the area available to display an exam. This is a good way to focus just on the exam images themselves by hiding other elements of the exam window, namely, exam information, toolbar buttons, status bar, and exam tabs. Hiding elements "cleans up" the exam window so it is easier to work with the exams. No exam information is changed, and any element that can be hidden can be redisplayed again just by clicking on the appropriate menu item. As elements are hidden, exam images are displayed at slightly larger sizes.

Figure 40. Hide Elements Menu Item

Selecting **Hide Exam Information** hides the following information in the current exam: (a) patient information, (b) image and exam view information, (c) exam tabs, and (d) thumbnail image. If several exams are open, each one will hide these areas as well. By hiding exam information, the images in the current exam and the dates below them are re-scaled upwards to a larger size.

Selecting **Hide Toolbar** hides the toolbar buttons. If several exams are open, any one of them can be used to hide the toolbar, just as any current exam can be used to redisplay it. When this option is selected, the current exam is maximized ("exploded") to fill the exam window. If several exams are open, these are initially hidden behind the current exam, but when they are re-tiled, all of them will be displayed slightly larger now that the toolbar is hidden.

Selecting **Hide Status Bar** hides the status bar information located at the bottom of the exam window. When this option is selected, the current exam is maximized ("exploded") to fill the exam window. If several exams are open, these are initially hidden behind the current exam, but when they are re-tiled, all of them will be displayed slightly larger now that the status bar is hidden.

Selecting **Hide Exam Tabs** hides the tabs located just above the status bar. When this option is selected, the current exam is maximized ("exploded") to fill the exam window. If several exams are open, these are initially hidden behind the current exam, but when they are re-tiled, all of them will be displayed slightly larger now that the exam tabs are hidden.

Selecting **Hide All Extras** hides the exam information, the toolbar, the status bar, and exam tabs. This is the quickest way to "clean up" the exam window, and display just the images in the current exam. If several exams are open, these are initially hidden behind the current exam, but when they are re-tiled, only the current exam will have the extra elements hidden. Selecting **Hide All Extras** again will restore the toolbar, status bar, and exam tabs.

13. Advanced Topics

The following items are called *advanced* based more on their function than on any difficulty in using them. Primarily, they are tools to help manage the exams in the CDR patient database and are less likely to be used during typical CDR exams.

13.1 File Maintenance

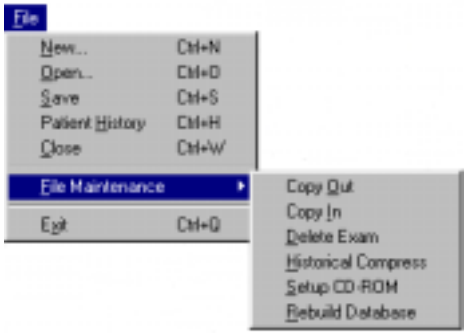
In the **File Maintenance** menu there are several features that focus on manipulating patient exams (by copying, deleting, or reading them from CD) and cleaning up the patient database (by compressing images or rebuilding the database).

13.1.1 Copy In/Out

WHAT DOES IT DO?

Copy In copies exams from a connected drive to the drive where the patient database is located. *Copy out* copies exams from the drive where the patient database is located to another connected drive.

WHERE CAN I FIND IT?



File Maintenance Submenu

HOW DO I USE IT?

When receiving an exam on floppy disk, for example, use the **Copy In** option to copy it into your patient database. When you need to send an exam to another CDR user, use **Copy Out** to perform this task.

Copying exams requires that you become familiar with the dialog boxes that control the copy function. The “Drives” scroll boxes are used to locate the source of the exams to be copied in or out. Click on the appropriate drive letter and then select the exams to be copied. Click the copy button to perform the action or on **Close** to cancel.

Before each exam is copied, CDR will display a message box, asking you to confirm the copy operation. Once confirmed, the exam is copied from the source drive unless there is insufficient space on the destination drive. If this happens, CDR indicates how much space is needed for the copy operation to be completed.

SAMPLES

Copy In Exams Dialog Box

Copy Out Exams Dialog Box

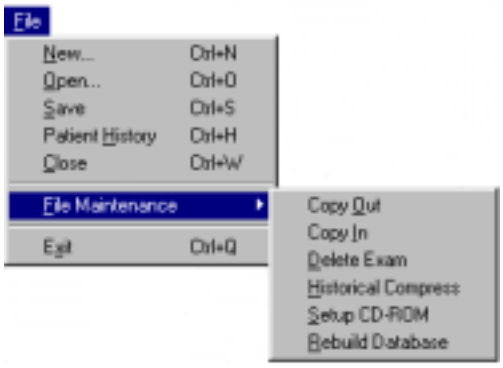
Figure 41. Copy In and Copy Out Dialog Boxes

13.1.2 Delete

WHAT DOES IT DO?

Deletes one or more exams from a selected drive.

WHERE CAN I FIND IT?



File Maintenance Submenu

HOW DO I USE IT?

Deleting exams is important for keeping the patient database free of duplicate or empty exams and for eliminating information that is no longer needed. Proper back-ups and periodic maintenance is one of the best ways to ensure good system operation and sufficient space for new CDR exams.

The search feature in the Delete Examination dialog box uses several key fields to locate exams. Once the search is activated, CDR will locate all the exams that fulfill the search criteria and will highlight them in the Delete Examinations dialog box.

The Delete option should be used mindful of the fact that deleted exams cannot be retrieved. As a precaution, CDR will prompt you before deleting the exam and will require confirmation before deleting the exam.

CDR Tip

As you take X-rays and save them in patient exams, they occupy space on your hard drive or other storage location. Each CDR image is between 200 and 600 KB in size (40 to 125 KB compressed), so over a period of time, exams can consume a significant of amount of space.

When the amount of storage memory available is less than 50 MB, CDR will issue a warning message, **but it is far better to "clean up" your exam archive periodically by removing old and obsolete exams**. Deleting old exams is one good strategy for ensuring your system always has enough space for new exams.

To delete an exam:

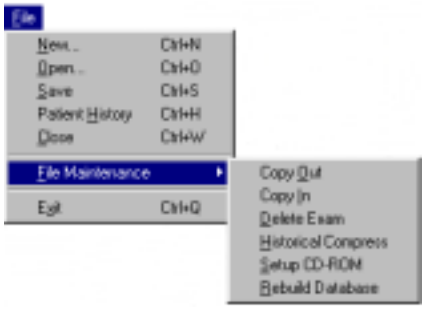
1. Make sure you want to delete the exam.
2. Open the exam you wish to delete.
3. Click **File** > **File Maintenance** > **Delete Exam**. The Delete Examinations dialog box is displayed with the current exam highlighted in the exam list.
4. Click the Delete button, and when prompted, click OK to delete the exam.

13.1.3 Historical Compression

WHAT DOES IT DO?

Compresses images to help reduce the amount of storage space used by CDR exams.

WHERE CAN I FIND IT?



File Maintenance Submenu

HOW DO I USE IT?

The first step before compressing files is to back up data and close or save any current exams. Compressing images can take time depending on the number of exams undergoing compression, so selecting exams in small groups is usually preferable to compressing a large number of exams at the same time.

Selecting which exams to compress is made at the Historical Compression dialog box. For the best compression format in CDR, we recommend LEAD Compression (Perfect Quality 1, or just PQ1), which is one of the formats available in the dialog box.

If you can't remember if you've already compressed the images in an exam, perform either one of the following steps:

- Open an image in CDR. Click on the **Help** menu and then on **Image Information**. Several types of information appear in the dialog box including whether the image has been compressed and what type of compression was used. Check other images in the exam for this information as well.

- Re-compress the exam. Using the same compression format on a compressed exam does not degrade the quality of its images.

CDR Tip

To compress exams:

1. Make sure all exam data has been backed up.
2. Close or save any current exams.
3. Start CDR if it is not already running.
4. Click File > File Maintenance > Historical Compress.
5. In the dialog box, click **Search**.
6. Enter a date in the first date field and the last date field
7. Press OK. (All the exams between those dates are highlighted. As a general rule, do not compress more than 100 exams at a time.)
8. Select the compression type (LEAD Compression PQ1) by clicking on the Format scroll bar and scrolling up to find the PQ1 format.
9. Click **Compress**.
10. After exams are compressed, they are indicated by asterisk (as shown below).

SAMPLE

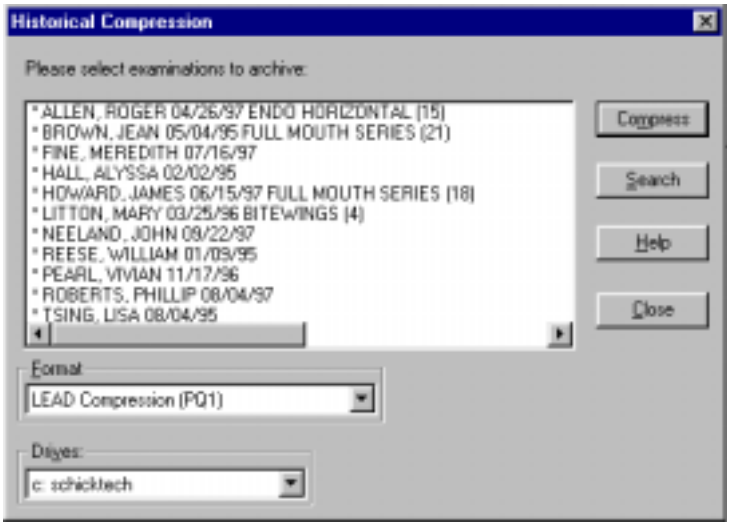


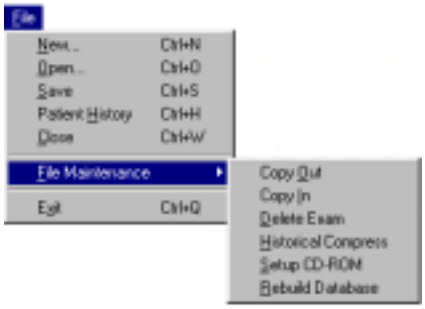
Figure 42. Historical Compression Dialog Box

13.1.4 Setup CD-ROM

WHAT DOES IT DO?

Copies images from a Schick Technologies CD to the patient database.

WHERE CAN I FIND IT?



File Maintenance Submenu

HOW DO I USE IT?

When you run a Schick Technologies backup CD of your exams, CDR scans the CD, comparing the exams with your patient database. When CDR encounters duplicate exams, it deletes the exam on the hard drive. If the exams are not exactly the same, you must choose **SKIP** to keep the exam on the hard disk or **ADD** to install the exam from the CD-ROM. In this way, no data is ever lost: an exam is either on the hard drive or it is on the CD-ROM. Once the CD-ROM has been scanned, CDR will automatically know where to find the exams, in either location.

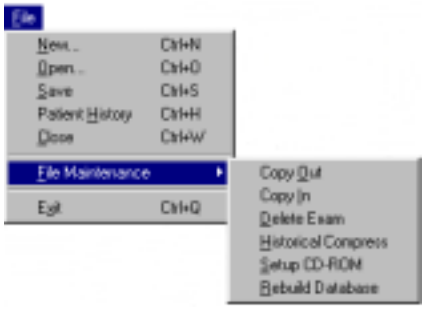
Every CD supplied by Schick Technologies is labeled with the client's name plus a CD sequence number. This number is unique and is used by CDR to distinguish between other CD-ROMs. If the CD is different from the one CDR expects, CDR will display a message box prompting you to insert the appropriate CD.

13.1.5 Rebuild Database

WHAT DOES IT DO?

Rebuilds the patient database.

WHERE CAN I FIND IT?



File Maintenance Submenu

HOW DO I USE IT?

Rebuilding the patient database actually refers to rebuilding the patient.db file. The patient.db file, located in the `CDR\XRAYS` folder, is a shortcut containing all the information CDR needs to display the patient list. To provide this list, the patient.db file contains data stored in the individual `.p0` and `.vs0` files in the exam directories.

The `.p0` and `.vs0` files contain enough exam information for the `patient.db` to be a fast and current summary of CDR exams. This also the reason why rebuilding the patient.db is possible at all — it is only a copy of the actual data in the `.p0` and `.vs0` files.

In cases when an exam has been copied or added incorrectly to the patient database, using the **Rebuild Database** feature should be used to repair the patient database.

13.2 System Maintenance

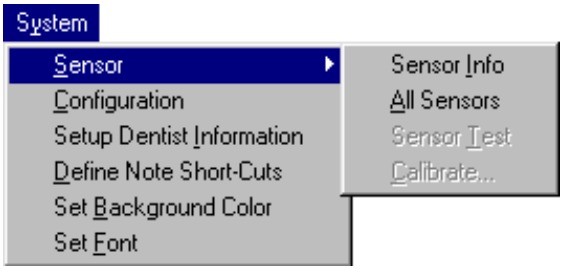
The **System** menu allows you to check sensor information, to configure system information (for example, printer, printer port, and file format), to set up dentist information, to define note short-cuts (described in **Section 8.5.3**), to set the background color of windows in CDR, and to set the fonts.

13.2.1 Sensor Information

WHAT DOES IT DO?

Provides information on the currently connected sensor.

WHERE CAN I FIND IT?



Sensor Submenu

HOW DO I USE IT?

Sensor Info includes the sensor serial number, the size of the sensor, and the date of the sensor's calibration file. If no sensor is connected, "Unknown" is displayed for each of these items. If for CDR cannot find the calibration file for the current sensor, the calibration file date will be listed as "Unknown."

Checking the sensor information is important during troubleshooting. If images cannot be acquired, verify that the calibration file for the currently connected sensor is installed on your system. If the correct calibration file is installed (the date of the calibration file is listed on the Sensor Information dialog box), but you continue to experience problems with taking X-rays, additional troubleshooting is indicated.

One of the first places to look for the cause of the problem is the computer-to-sensor connection. If the cables between sensor, Remote Module, and computer are secure, but CDR does not detect the sensor, the problem may be along the path between the sensor and the computer. Additional troubleshooting would be needed to localize the cause of the error, but this simple check may eliminate some obvious factors.

For a detailed analysis of current or potential problem areas in your CDR 2000 USB system, run the CDR Diagnostic Utility. More information on this utility can be found in **Section 13.5** .

When more than one sensor is used on a CDR system, information about which sensors can be used is provided in **All Sensors**. The **All Sensors** option displays which sensors have calibration files and the dates of those files. This information can be useful when swapping and upgrading CDR sensors.

SAMPLE

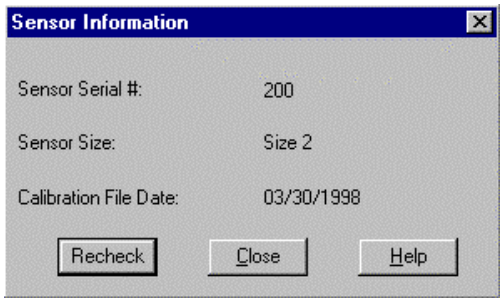


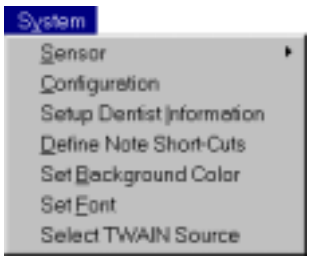
Figure 43. Sensor Dialog Box

13.2.2 System Configuration

WHAT DOES IT DO?

Changes the current printer, printing format settings, and file compression.

WHERE CAN I FIND IT?



System Menu

HOW DO I USE IT?

In general, these options are concerned with printing options, but you can also choose the default format for saving and exporting images here. Refer to the following descriptions and the accompanying sample for more information on configuration options.

- Printer – Displays the currently selected printer
- File Format – Displays the default file format used for acquiring images
- Sony LPT Port – Displays the available port settings for the Sony 890 printer when the Windows printer driver is not used
- Print Options – Displays the information that is included when images and reports are printed.
- Sony Printer Series – Displays the size setting options available with the Sony 890 printer

Changing an option takes effect immediately, without the need to exit and restart CDR. In addition, you can set the changes for the current CDR session only, or for each time you use CDR. Refer to Table 11.

SAMPLE

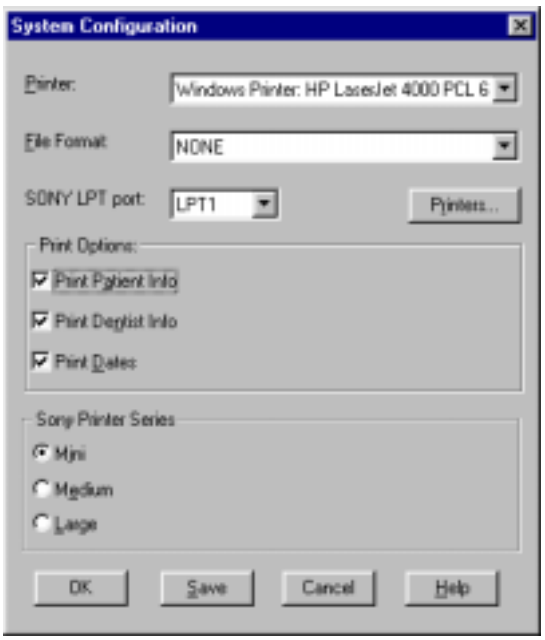
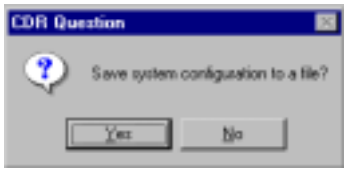
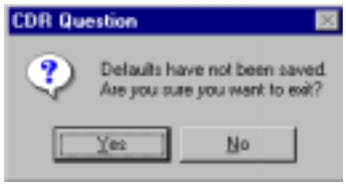


Figure 44. System Configuration Dialog Box

Table 11. CDR Questions at the System Configuration Dialog Box

CDR Question	Details
	• Clicking YES changes the settings for the current CDR session only. In the next CDR session, the settings will reset to their previously saved indications. • Clicking NO returns to the System Configuration dialog box.
	• Clicking YES saves the changes to the settings and will be used in the current and subsequent CDR sessions until changed again. • Clicking NO returns to the System Configuration dialog box.
	• Clicking YES does not save any changes made in the System Configuration dialog box, but it closes the dialog box and returns to the CDR Exam window. • Clicking NO returns to the System Configuration dialog box.

13.2.3 Setup Dentist Information

WHAT DOES IT DO?

Adds dentist information to reports and mailed exams.

WHERE CAN I FIND IT?

System Menu

HOW DO I USE IT?

Dentist information can be included with CDR reports and as part of the text supplied with CDR Mail messages. It can also be hidden during report printing or deleted before images are mailed. In dental practices where several associates are resident, this option is an easy time-saver, eliminating the need to re-enter dentist information.

Up to five different sets of dentist information may be stored in CDR, although only one set may be selected at any time.

Inside the Dentist Information dialog box, you have the option to edit, add, copy and delete information. Information to be deleted should be double-checked since there are no prompts prior to deletion.

SAMPLE

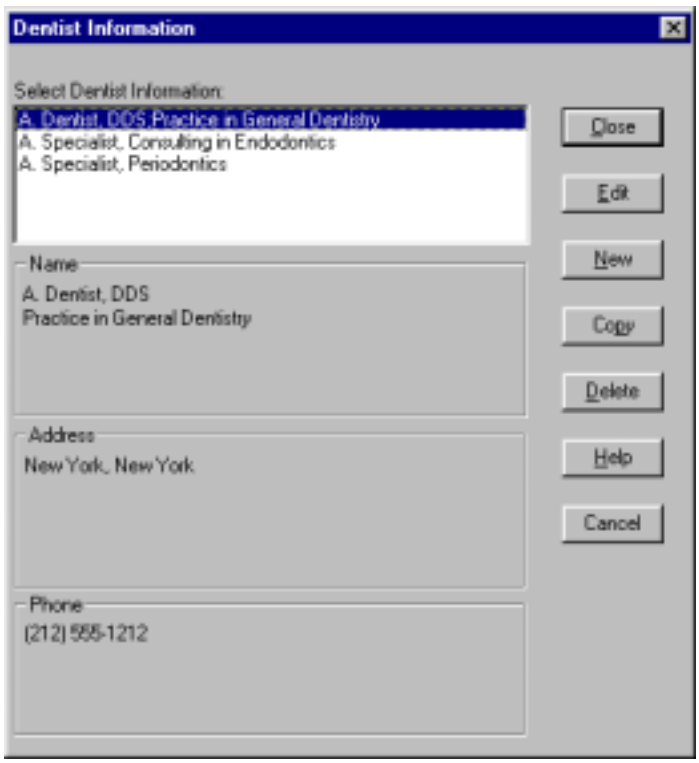


Figure 45. Dentist Information Dialog Box

13.2.4 Define Note Short-Cuts

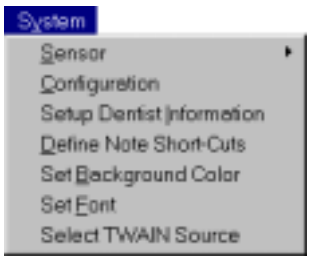
(Refer to **Section 8.5.3** for description.)

13.2.5 Set Background Color and Set Font

WHAT DOES IT DO?

Sets the background color of CDR and the font style used in CDR text.

WHERE CAN I FIND IT?



System Menu

HOW DO I USE IT?

Set Background Color is used to select the background color of the CDR Exam and Zoom windows. When this option is selected, a color palette will appear with a choice of colors. Clicking OK selects the new color background. The new settings will not take effect until the next time CDR is opened.

Set Font is used to set the font and font size of text in CDR. When this option is selected, a choice of font styles will appear. Clicking OK selects the new display and printer font style. The new settings will not take effect until the next time CDR is opened.

The font used in CDR can also be changed in the `CDR.INI` file (**Section 13**). To edit the INI file, select the Edit `CDR.INI` item from the CDR menu (click the Windows Start menu, then Programs, then CDR). Under the [Windows] section, there is a `FONT=` entry followed by the font currently used by CDR. Delete that font name and enter the new one from the fonts available. Generally, a sans serif font (Arial, Helvetica, Univers) will be easier to read when displayed and printed.

13.2.6 Set TWAIN Source

WHAT DOES IT DO?

Selects the TWAIN device (scanner, digital camera, or other digital source) to be used for acquiring images in CDR.

WHERE CAN I FIND IT?

System Menu

HOW DO I USE IT?

To acquire images in CDR with a TWAIN device, be sure:

- The TWAIN device is on and connected correctly to your computer.
- Any software provided with the TWAIN device (for example, scanning software) has been installed on your computer.
- You are acquiring either 24-bit color or 8-bit grayscale images on at a time.

After selecting the TWAIN source, click on the **Xray/Image** menu, then **Acquisition Mode > Scanner**. When you click on an empty target frame, CDR begins to acquire one image.

Accepting an image from a TWAIN device adds a watermark “S” to one corner of the image as a reminder of how the image was acquired.

SAMPLE

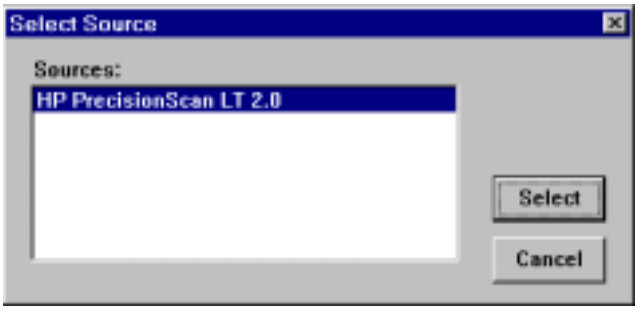


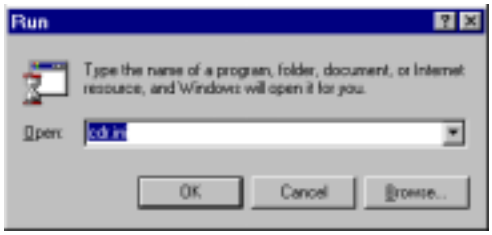
Figure 46. Select TWAIN Source

13.3 CDR.INI File

WHAT DOES IT DO?

Contains (in text format) the settings for the acquisition, display, printing, and storage of X-ray and video images in CDR.

WHERE CAN I FIND IT?



Opening CDR.INI from the Run Dialog Box

HOW DO I USE IT?

CDR.INI is always located in the Windows directory. For Windows 95/98 this is usually `C:\Windows`; in Windows NT, this is usually `C:\WINNT`. If Windows is installed elsewhere, the `CDR.INI` will be located in that location.

The best sequence for editing the `CDR.INI` file is to perform the following steps:

- Close CDR
- Open and edit the `CDR.INI` file using Notepad. When editing items, make sure there are no spaces on either side of the equal sign. There should also be no extra spaces before or after an item.
- Save the `CDR.INI` file and close Notepad
- Restart CDR

The order of sections listed in CDR.INI has no effect on CDR. Similarly, the order of items within each section is also irrelevant. Items that belong in the same section, however, must be grouped together in that section.

SAMPLE

```
[CDR]
Device=USBCDR.SYS
DynamicRangeMsg=NO
Eq_Min_Count=9999
Eq_Thresh=9950
Integrate_time=7
Check_Mult_Plist=YES
Print_DentInfo=YES
Print_PatInfo=YES
Print_Dates=YES
RAMPUP=8
XDrive=C
XPath=C:\CDR\XRAYS
Reports_Root=C:\CDR\REPORTS
QZoom_Def_Mag=1
Phoenix_Integrate_time=7
Reset_Duration=410
Network=NO
Language=English
PRINTER=Windows
COMPRESS=None
FOOTPEDAL=TWO-PEDAL
EXP_TIME=15
AUTOTIME=HIGH
AUTOCOUNT=40
SPOT_REMOVER=NO
EQUALIZE=NO
CALIBRATE=YES
AUTO_ACCEPT=YES
LPT_Port=LPT1
Port=300
SONY_SERIES=MINI
SERIES_FLIP=NO
FOOTPEDAL_COM=0
Storage=Flat
Check_Show_All_Exams=NO
New_Exam_Copy=NO
RAMPUP_IMG=6
Check_Local_Drives=YES

[MAIL]
Mapi_DLL=MAPI32.DLL
Attachment_Only=NO
```

```
[MODULES32]
&Xray=XRAY32.DLL
&Video=cdrvideo.dll
&Panoramic=CDRPANO.DLL
&Scanner=CDRTwain.DLL

[Windows]
AcquireModeButton=NO
MaximizeEvalWindow=YES
DisplayEvalMiniView=YES
DisplayEvalStatus=YES
DisplayEvalToolbar=YES
DisplayEvalTicks=NO
DisplayMainToolbar=YES
DisplayMainStatusBar=YES
DisplayExamInfo=NO
MainWindowSize=46 80 623 469
MaximizeMainWindow=NO
BigButtons=YES
DisplayZoomExam=YES
DisplayExamTabs=YES
AddExamTabAfterFile=NO
CustomColor1=0 255 255
CustomColor2=16 0 239
CustomColor3=32 255 223
CustomColor4=48 0 207
CustomColor5=64 255 191
CustomColor6=80 0 175
CustomColor7=96 255 159
CustomColor8=112 0 143
CustomColor9=128 255 127
CustomColor10=144 0 111
CustomColor11=160 255 95
CustomColor12=176 079
CustomColor13=192 255 63
CustomColor14=208 0 47
CustomColor15=224 255 31
CustomColor16=240 015

[USB]
rev=27
program_time=20
post_reset_time=9
```

```
[MESSAGES]
AutoDatabaseCheck=NO
ShowTwainMessage=Yes
ShowTwainRotateMessage=YES
ShowExposureAdvisor=YES

[PANO]
Last_Direction=LTOR
Device=CDRPAN.VXD
lx=2700
ly=1603
blanks=3
thresh=99
extra_bad_rows=NO
Direction=LTOR
Spot_Remover=NO
Initial_Timeout=15
Stop_Timeout=7

[Auto_Acquire]
Init_At_Startup=NO
Flash_Interval=1
```



```
[VIDEO]
Driver=vidvfw.dll

[CAMERA]
AutoWhite=YES
CamPort=320
LightSource=YES
Mode=0
UseCamera=NO

[REPORTS]
PERIO1=C:\CDR\REPORTS\PERIO\PERIO1.rpt
PERIO1ITEM=PERIO &2
ENDO1=C:\CDR\REPORTS\ENDO\endo1.rpt
ENDO1ITEM=&Endo2
```

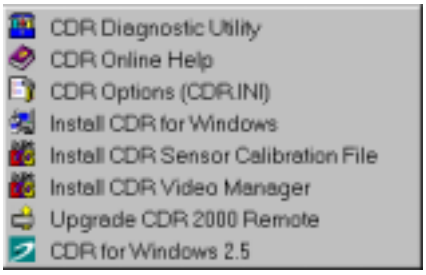
Figure 47. Sample CDR.INI File

13.4 CDR Options

WHAT DOES IT DO?

Contains (in one dialog box) the settings for the acquisition, display, printing, and storage of X-ray and video images in CDR. *(New feature in CDR 2.5)*

WHERE CAN I FIND IT?



CDR Program Group

HOW DO I USE IT?

By selecting CDR Options, a dialog box with several tabs is displayed. Each tab covers a different aspect of CDR, and related settings are enclosed in groups that contain checkboxes or lists.

Active settings are checkmarked. To disable the setting, click on the checkbox to clear the checkmark. Clicking on an empty checkbox enables the setting.

To accept changes made in the dialog box without closing the dialog box itself, click **Apply**. To accept changes and close the dialog box, click **OK**. To close the dialog box without accepting changes, click **Cancel**. CDR settings shown with gray backgrounds cannot be changed using the CDR Options.

SAMPLE

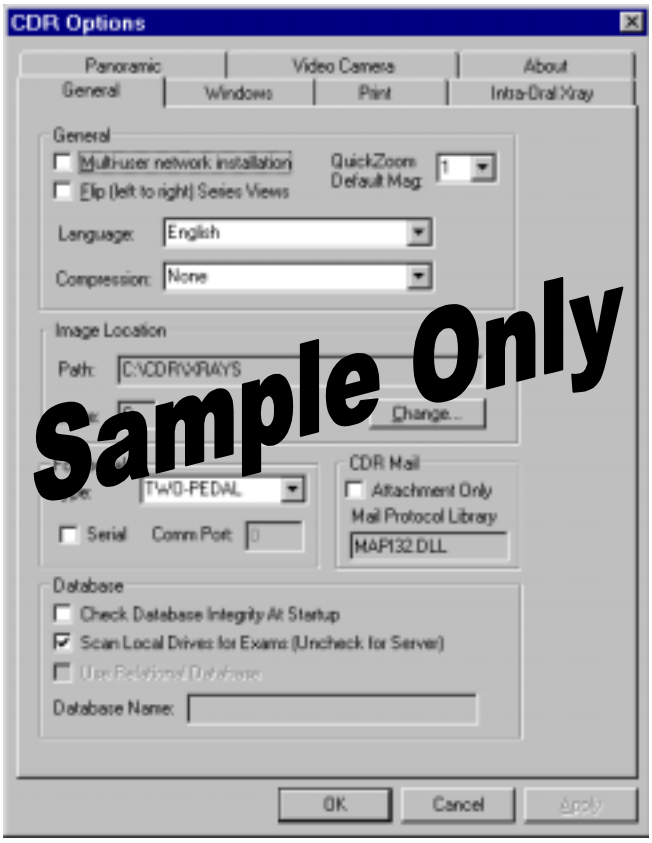


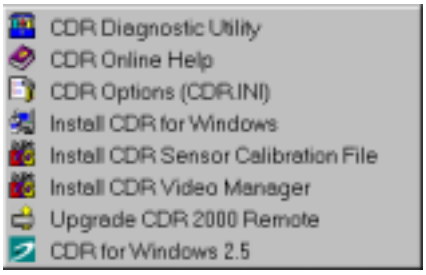
Figure 48. CDR Options Dialog Box

13.5 CDR Diagnostic Utility

WHAT DOES IT DO?

Compares the system's resources and configuration with CDR's own performance requirements. *(New feature in CDR 2.5 – for USB systems only)*

WHERE CAN I FIND IT?



CDR Program Group

HOW DO I USE IT?

Before starting the Diagnostic Utility, make sure you connect all the CDR hardware you would normally use to take X-rays at the workstation, including:

- Sensor
- Remote Module
- USB cable from computer to Remote Module
- Footpedal

To start the Diagnostic Utility, click the Windows **Start** button > **Programs** > **CDR** > **CDR Diagnostic Utility**. This utility is capable of detecting multiple installations of CDR, but will test one instance at a time. At the setup screen, click the Check CDR USB System button.

The utility probes the resources of the computer running CDR (or NCDR) and verifies whether CDR is configured correctly, and if critical files and settings are up-to-date.

As the utility collects information, it reports the results on a series of screens.

- A green arrow next to an item indicates that the item is correctly configured and up-to-date.
- A red checkmark (Error) indicates a problem that will prevent CDR from operating normally. Additional information and recovery buttons are provided.
- A yellow checkmark indicates a potential problem. As with errors, additional information and recovery buttons are provided.

As an option, a cumulative report of the current utility session, and of previous sessions, can be printed.

SAMPLE

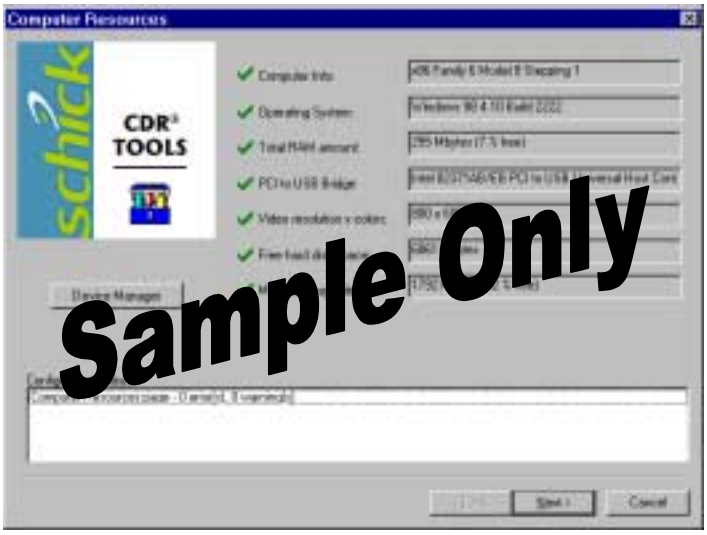


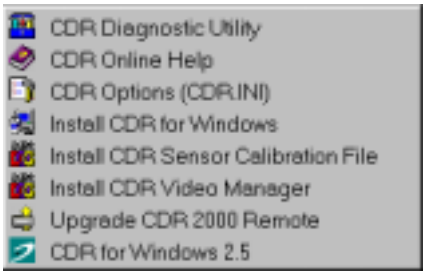
Figure 49. One of the CDR Diagnostic Utility Screens

13.6 Upgrading CDR USB Remote Modules

WHAT DOES IT DO?

Upgrades the firmware in USB Remote Modules.

WHERE CAN I FIND IT?



CDR Program Group

HOW DO I USE IT?

Before starting the upgrade utility, make sure you connect the following CDR hardware:

- Sensor
- Remote Module
- USB cable from computer to Remote Module

To start the upgrade utility, click the Windows **Start** button > **Programs** > **CDR** > **Upgrade CDR 2000 Remote**.

NOTE:If prompted, disconnect the USB cable from the Remote Module for a moment, and then reconnect them. If they are not connected, connect them.

At the setup screen, click the GO button. Follow the short directions provided as the new firmware version is copied to the remote. The upgrade itself will take approximately 1 – 2 minutes to complete.

When the upgrade is successful, the message, “The CDR 2000 USB Remote Interface is programmed successfully” will be displayed.

SAMPLE

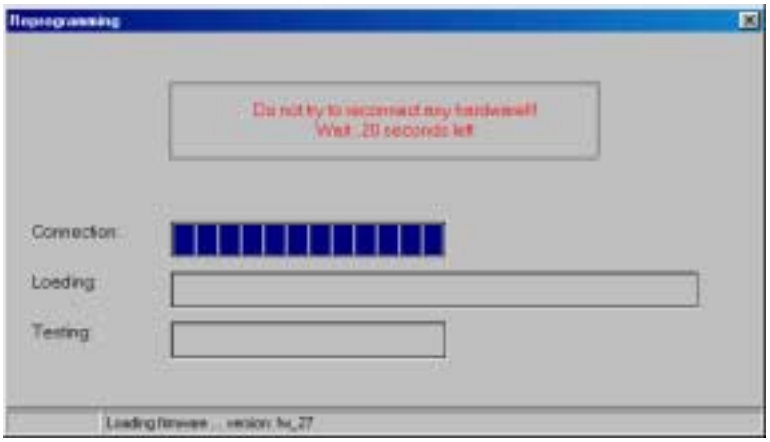


Figure 50. Upgrading Remote Module Screen

14. Shortcuts and Toolbar Buttons

14.1 Shortcuts

Table 12. Exam Window Shortcut Keys

Menu Name	Command Name	Shortcut Key		
FILE	New Exam	Ctrl	+	N
	Open Exam	Ctrl	+	O
	Save Exam	Ctrl	+	S
	Patient History	Ctrl	+	H
	Close Exam	Ctrl	+	W
	Send CDR Mail	Ctrl	+	D
	Exit CDR	Ctrl	+	Q
EDIT	Copy X-ray	Ctrl	+	C
	Paste X-ray	Ctrl	+	V
	Edit Patient Information	Ctrl	+	I

Menu Name	Command Name	Shortcut Key		
SERIES	Edit Series	Ctrl	+	E
PRINT	Print Full Set	Ctrl	+	P

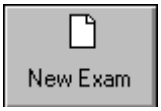
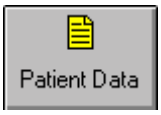
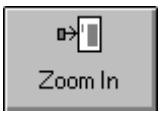
Table 13. Zoom Window Shortcut Keys

Menu Name	Command Name	Shortcut Key		
FILE	Save X-ray	Ctrl	+	S
	Print	Ctrl	+	P
	Close Window	Ctrl	+	Q
ZOOM	Zoom In 2x	Ctrl	+	Z
	Zoom Out 2x	Ctrl	+	O
	Zoom Full	Ctrl	+	F
	Zoom Window	Ctrl	+	W
ENHANCE	Colorize Image	Ctrl	+	C

Menu Name	Command Name	Shortcut Key		
MEASURE	Grid	Ctrl	+	G
CONTRAST	Increase Contrast	Ctrl	+	I
	Decrease Contrast	Ctrl	+	D
	Lighten Image	Ctrl	+	L
	Darken Image	Ctrl	+	A
	Normal	Ctrl	+	N
	Flashlight	Ctrl	+	B

14.2 Toolbar Buttons

Table 14. Exam Window Toolbar Button and Menu Item Equivalence

Clicking this button . . .	Is the Same as Selecting the following Menu Item . . .
	File | New
	File | Open
	File | Close
	File | Send To
	Edit | Patient Information
	Print | Print Set
	Xray/Image | Zoom In
	Xray/Image | Quick Zoom
	Xray/Image | Swap

Clicking this button . . .	Is the Same as Selecting the following Menu Item . . .
	Window | Tile X-rays
	Window | Hide Elements | Hide All Extras
	Help | Contents

Table 15. Zoom Window Toolbar Button and Menu Item Equivalence

Clicking this button . . .	Is the Same as Selecting the following Menu Item . . .
	File | Close Window
	File | Save Xray
	Edit | Retake
	File | Print
	Zoom | Zoom Mode
	Enhance | Colorize
	Enhance | Positive
	Enhance | Equalize

Clicking this button . . .	Is the Same as Selecting the following Menu Item . . .
	Contrast | Flashlight | Large Beam or Off
	Measure | Distance
	Notes | Insert
	Help | Contents

Table 16. Exam Window Small Button Toolbar and Menu Item Equivalence

Clicking this Button . . .	Is the Same as Selecting the following Menu Item . . .
	File | New
	File | Open
	File | Save
	File | Send To
	Edit | Patient Information
	Series | Select
	Print | Print Set
	Xray/Image | Zoom In
	Xray/Image | Quick Zoom
	Xray/Image | Swap
	Window | Hide Elements | Hide All Extras
	Window | Tile Xrays
	Help | Contents

Table 17. Zoom Window Small Button Toolbar and Menu Item Equivalence

Clicking this Button . . .	Is the Same as Selecting the following Menu Item . . .
	File | Save Xray
	File | Retake
	File | Print
	Zoom | Zoom Mode
	Zoom | Zoom Window
	Zoom | Zoom Full
	Zoom | Pan Mode
	Enhance | Colorize
	Enhance | Positive
	Enhance | Equalize
	Contrast | Flashlight | Large Beam or Off
	Measure | Distance
	Measure | Grid
	Notes | Insert
	Help | Contents

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