

Introduction

comPARAFingerprint , **comPARAPalmprint** , **comPARAPrint TECH+** and **comPARAPrint TECH+ DB** are a family of programs designed to allow comparison of finger, and/or palm prints on desktop or portable PC's. Designed as a high performance tool to aid the latent examiner,

In combination with a scanner or video capture device, prints can easily and rapidly be brought into the computer, have features extracted and be compared against any other stored print.

Each of the four programs uses Sirchie's sophisticated AFIS-grade feature extraction engine. This engine automatically detects and eliminates questionable areas of the print, including smudges, so that they will not be considered in the comparison. Technicians can easily intervene override such decisions. Points of minutia are located using sophisticated rules based on the cumulative knowledge of expert examiners. Technicians are given full freedom to add to or remove from the automatically generated set of minutiae.

Processing an image (that is, extracting its features) generates data detailing the coordinates and directions of the features, as well as three types of enhanced images: a binary representation, an embossed representation showing the print minus areas judged to be bad, and a skeletal image. The binary image results from the application of sophisticated process which first determines what areas of the print constitute ridges and what constitute background, and then removes the background while enhancing the ridges. The skeletonized, or thinned image, is the result of a process that removes extra pixels and produces a simpler image still made up entirely of pixels belonging to the skeleton of the object. Image enhancement algorithms offer the examiner different views of the print to aid in his decision to add or remove points of minutia.

All data extracted by the comparison engine or modified by the examiner can be stored as a data set, which means that your work is immediately available to you for later comparisons without having to repeat the processing.

Sirchie's AFIS-grade comparison engine is able to rapidly compare prints, compensating for the distortions inherent in latent and rolled prints, and uncertainties in relative rotation to provide a graded measure of the similarity of the two prints. The AFIS-grade comparison engine automatically makes a statistical comparison of the two prints, displaying a goodness rating for the comparison. In addition, a graphical overlay shows just what the comparison engine used as the basis of its decision, allowing intervention by the technician as desired. Comparisons can be made on the basis of the full latent, or on any user-defined portion of the latent.

Printouts of any of the computer generated images, including those showing points of minutia are available via any graphics-capable, Windows-compatible printer. Printouts of any screen, including side-by-side display of the reference and latent prints are also immediately available.

Prints can be stored as Windows bitmap, JPEG, Tiff or TARGA files for export to other graphics software.

Salient Features

Software automatically adjusts window size to your monitor's resolution.

Acquire images via any TWAIN-compliant device capable of 600 dpi resolution. Free-form input area allows you to acquire the full impression or latent or any part of it.

View prints side-by-side over a large range of magnifications.

Automatically extract features such as ending ridges, islands and bifurcations.

Manually add or delete features.

Choose areas of the print to be ignored by the feature extraction and feature comparison engines.

Adjust image Brightness, Contrast and Sharpness for best feature extraction
View or print Grayscale, Binary, Enhanced or Skeletonized images of ridge structure.

Load and then automatically compare latent and reference prints.

Automatically compare prints based on a region of the latent.

View or print matrix of lines and features used in making match.

Export images in JPEG, TIFF, or BMP formats.

Prepare courtroom presentations by printing latent print, reference print, or the screen to any Windows-compatible graphics printer.

Print any image that can be displayed on screen.

Save processed prints as datasets containing processed images and full data on automatically and manually extracted features (coordinates and direction vectors) for rapid reload and comparison.

Which program is right for you?

comPARAFingerprint is Sirchie's premier finger print comparison software. **comPARAFingerprint** features state-of-the-art feature extraction and comparison engines particularly tuned to fingerprints, automatic handling of latent rotation and an easy to learn interface. Load a print into the 'known' window and rapidly compare a latent against it. If your day-to-day workload is modest, and consists primarily of fingerprints, this is the choice for you.

comPARAPalmprint is Sirchie's premier palm print comparison software. **comPARAPalmprint** features state-of-the-art feature extraction and comparison engines particularly tuned to palm prints, automatic handling of latent rotation and an easy to learn interface. More often than the fingerprint examiner, the palm print examiner often faces the daunting task of determining the relative rotation of the lifted portion of a palm print to the full impression. **comPARAPalmprint** easily and rapidly accomplishes this task, even if the latent consists of widely separated areas of minutia on a single lift. Load a print into the 'known' window and rapidly compare a latent against it. If your day-to-day workload is modest and consists primarily of palm prints, this is the choice for you.

comPARAPrint TECH + combines Sirchie's premier fingerprint and palm print comparison software. Choosing the properly tuned feature extraction and comparison engines is as easy as clicking a mouse button. Stored prints 'remember' their type and automatically call the proper extraction and comparison engine on being loaded. Load a print into the 'known' window and rapidly compare a latent against it. If your day-to-day workload is modest and consists of a strong mix of palm prints and fingerprints, this is the choice for you.

comPARAPrint TECH+ DB combines Sirchie's TECH+ software with a database capable of holding 500 prints. With the database capability, comparisons between a latent and the prints in the database is made at the click of a button, without having to manually load each 'known' print, and with graded results posted. Results can be called to the screen one at a time for review by the examiner.

[Purchase Information](#)

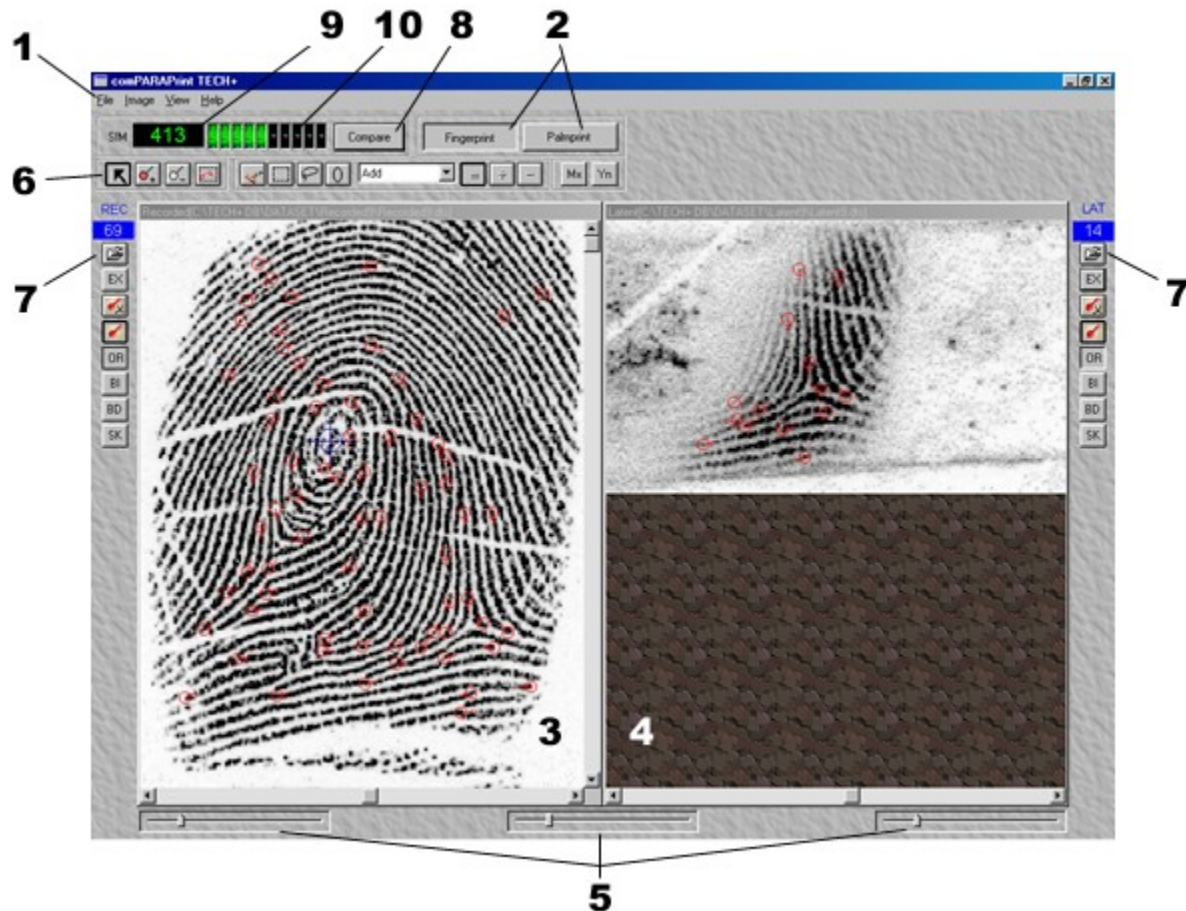
Main Screen

Main Screen

The Main Screen is the default screen for the program. This screen consists of several objects including the Main menu, the Build Control dialog, the Mode dialog, the Gallery, the working window, the Tool Bar, the tool function display, and the Current Component Gallery. With the exception of paint and edit operations in captured images, all Capture mode functions are selected from this dialog.

The following describes its functionality:

- 1. Menu Bar:** The horizontal bar across the top of the screen which lists the categories or groups of functions available.
- 2. Mode Selection Buttons:** comPARAPrint® TECH+ offers two modes: Fingerprint and Palmprint. Select the desired mode by clicking on the appropriate button. Note that the Mode buttons appear only in comPARAPrint Tech+ software.
- 3. Recorded Window:** The window into which the known print is loaded and processed.
- 4. Latent Window:** The window into which the latent (unknown) print is loaded and processed.
- 5. Zoom Sliders:** Allow magnification of the Recorded image (leftmost slider) Latent image (rightmost slider) or synchronized magnification of both images (center slider).



6. Main Toolbar: An area at the top of the main screen that displays action buttons which activate the various functions available to you. Functions available include the Deselect, Add Features,

Remove Features, Add/Move/Delete Core, Process Area of Interest, Redefine Bad Areas, Create Rectangular Area, Create Freehand Area, Create Elliptical Area, Define Functionality, Start New Region, Add to Region, Subtract from Region, Display Match Matrix, and Display Descending Match.

7. Window Toolbars: An area at the side of each window that displays action buttons which activate the various functions available to you. Functions available include Feature Count, File Open, Extract Features, Remove Features, Hide Features, Show Original Image, Show Binary Image, Show Bad Areas, and Show Skeletonized Image.

8. Compare Button: Causes a comparison between the Latent and Recorded images to be performed.

9. SIM Display: Displays the “goodness” of the comparison. Generally, the higher the number, the better the match.

10. Graphical Display: Graphically displays the “goodness” of the comparison. A red final bar indicates an very high probability.

Mode Selector buttons (comPARAPrint Tech+ only)

The Mode Selector buttons are located at the top of the main window, and allow you to select between **Fingerprint** and **Palmprint** modes.



To Select the **Fingerprint** mode,

1. Click over the Fingerprint mode button.
2. Open a fingerprint data set.

If a palm print is already loaded, you are asked if you wish to remove the existing data. If you select yes, the existing data is removed. The Fingerprint mode button appears as though depressed.

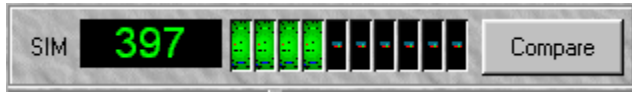
To Select the **Palmprint** mode,

1. Click over the Palmprint mode button.
2. Open a Palmprint data set.

If a fingerprint is already loaded, you are asked if you wish to remove the existing data. If you select yes, the existing data is removed. The Palmprint mode button appears as though depressed.

Compare Button and Comparison Results (SIM) display.

When both the REC and LAT windows have been loaded, and features for each have been extracted via the respective **EX** buttons, a comparison between the two prints can be made.



The comparison engine is launched via the **Compare** button. When a comparison is made between a print and a latent, the comparison engine reports a number that represents the goodness of the resulting match. This result is displayed in two ways: as a number, and as a bar graph. In general, the higher the number, the more likely the two prints are to match.

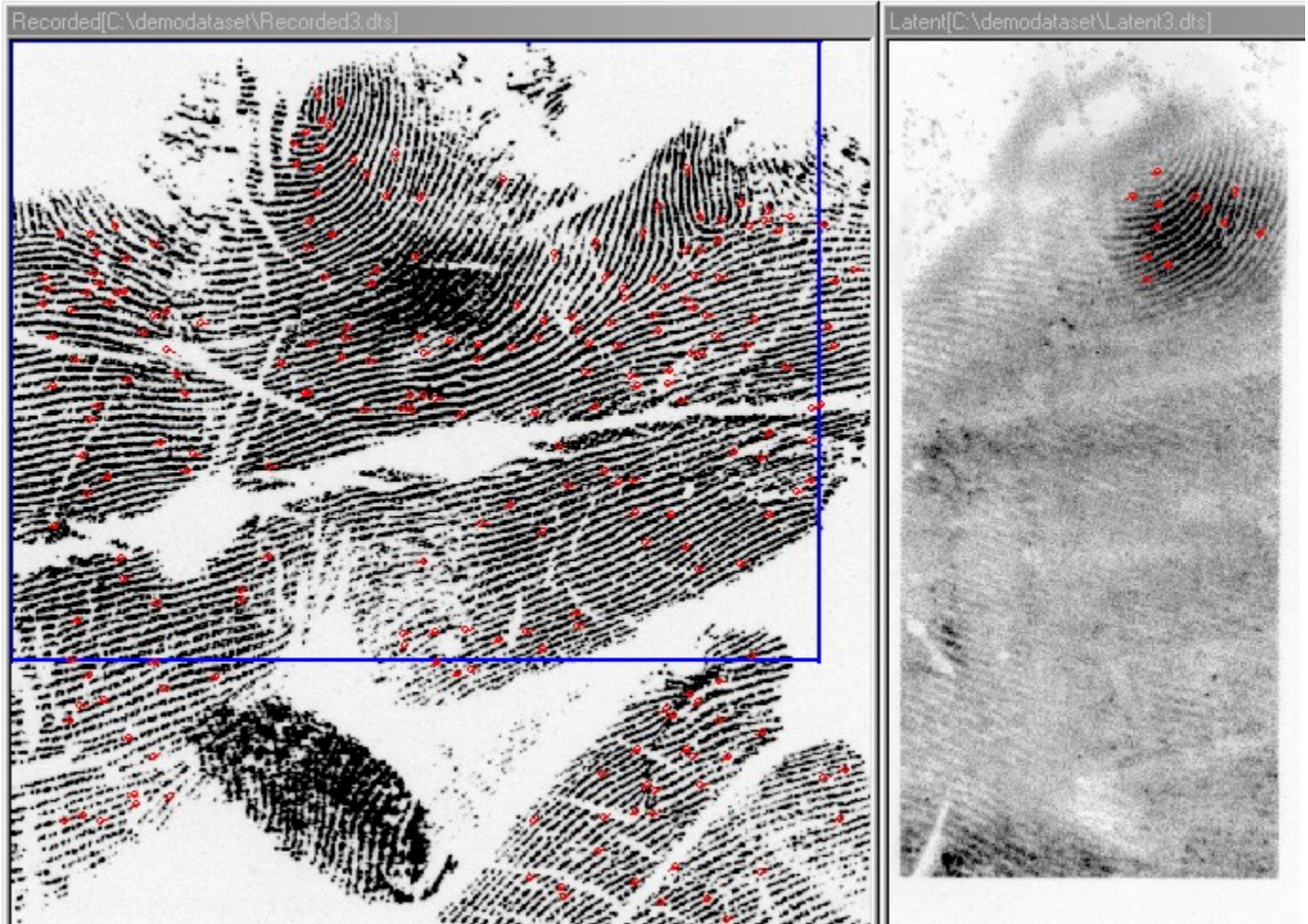
Comparing a latent to a recorded print.

Once features have been extracted to your satisfaction, the comparison engine is launched by simply clicking on the **Compare** button on the Main Window. The comparison engine will display a number in the **SIM** window that represents the goodness of the match; a higher number represents a greater likelihood of a match. In addition, a bar graph displays similar information. A red bar in the last position indicates an exceedingly high likelihood of a match.

Considerations in Palm print Mode

Comparison in Palm print Mode

In Palm print Mode, when a comparison is successfully made (at least a score of fifteen is generated), a rectangle is generated in the Recorded window to show you the general area where the match occurred. If you click on the Mx or Yn buttons, the area within the rectangle will be shown enlarged in the Recorded window with the appropriate lines display superimposed.



Box (blue) generated to illustrate the general area of the successful comparison.

Main Menu

The main menu groups are **File**, **Image**, **View**, and **Help**.

To select a main menu group:

1. Place the pointer over the desired menu group. [The corresponding option will become highlighted.]
2. Click the left mouse button. [A list of options drops down.]

Or

- 2a. While holding the Alt key down, depress the letter underlined on the desired main menu group. For example, if you wish to access the **File** group, hold down the Alt key and depress the 'F' key on the keyboard. [A list of options drops down.]

File group options

Selecting the **F**ile group on the main menu causes a number of related options to appear. The **F**ile group options include:

<u>O</u>pen Image	Opens an existing image
<u>O</u>pen Data Set	Opens an existing data set
<u>S</u>ave Original Image	Saves the original (unprocessed) image
<u>E</u>xport	Export any of the four processed images
<u>S</u>ave Data Set	Save a processed image as a data set
<u>P</u>rint	Print recorded or latent image or the screen
<u>P</u>rinter Setup ...	Set your printer parameters
<u>A</u>cquire	Acquire an image from either video or a page scanner
<u>S</u>elect Source ...	Select your TWAIN compliant source
<u>E</u>xit.	Exit the program

Open Image

Opens an existing image

Image files are files generated via the Acquire function and are saved via the Save Original Image function. Image files can be Tiff, Windows bitmap, or JPEG formats.

1. With the File menu dropped, place the mouse over the option **Open Image**

Or

1a. With the File menu dropped, type O

2. if the image is to be loaded into the Recorded window, select **Recorded** or type R

Or

2a. If the image is to be loaded into the Latent window, select **Latent** or type L

The File Open dialog will be generated

3. Locate and click or double-click on the filename of the desired file, or type the desired filename into the Filename field.

4. Click on Open. (Note: if you double-clicked on the filename, the file will load automatically.)

The image will be loaded into the appropriate window.

Open Data Set

Opens an existing data set

A comPARAPrint data set consists of the four processed images (original, binary, bad and skeletal) and the extracted features for a print. This type of file is generated via the Save Data Set function.

1. With the File menu dropped, place the mouse over the option Open Data Set
 - Or
 - 1a. With the File menu dropped, type t
 2. if the image is to be loaded into the Recorded window, select **Recorded** or type R
 - Or
 - 2a. If the image is to be loaded into the Latent window, select **Latent** or type L
- The File Open dialog will be generated, displaying all files with the extension “.dts”
3. Locate and click or double-click on the filename of the desired file, or type the desired filename into the Filename field.
 4. Click on Open. (Note: if you double-clicked on the filename, the file will load automatically.)
- The image will be loaded into the appropriate window.

Save Original Image

Saves the original (unprocessed) image

1. With the File menu dropped, place the mouse over the option **Save Original Image**

Or

1a. With the File menu dropped, type S

2. if the image is to be saved is in the Recorded window, select **Recorded** or type R

Or

2a. If the image is to be saved is in the Latent window, select **Latent** or type L

The File Save dialog will be generated

3. Choose the desired storage folder for the file

4. Choose the format you wish to save the file in (the default is Windows bitmap)

5. Type in the name for the file

6. Click Save

The file is saved to the indicated location. This type of image can be accessed through the Open Image function (see above).

Save Data Set

Save a processed image as a data set

1. With the File menu dropped, place the mouse over the option **Save Data Set**

Or

1a. With the File menu dropped, type D

2. if the image is to be saved is in the Recorded window, select **Recorded** or type R

Or

2a. If the image is to be saved is in the Latent window, select **Latent** or type L

The File Save dialog will be generated

3. Choose the desired storage folder for the file

4. Type in the name for the file

5. Click Save

The file is saved to the indicated location. This type of image can be accessed through the Open Data Set function (see above).

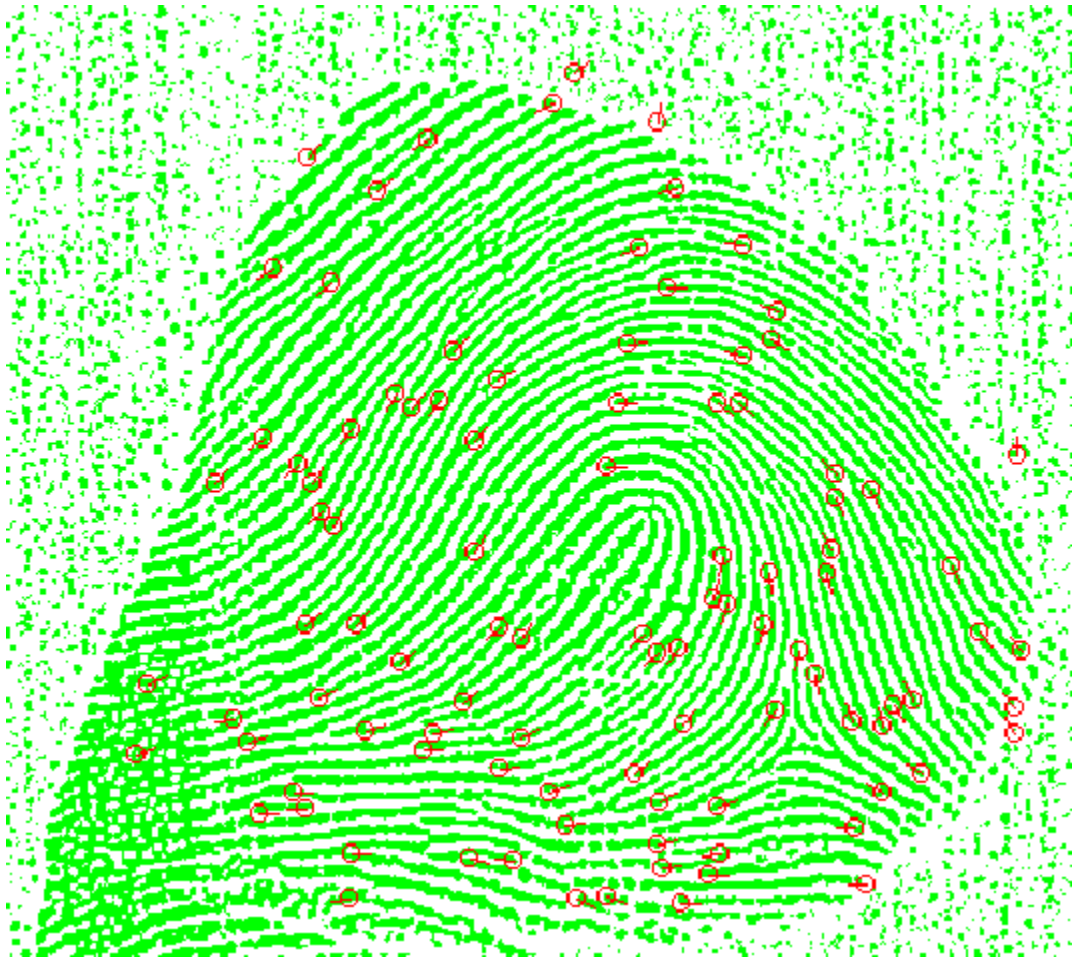
Export

Export any of the processed images

1. With the File menu dropped, place the mouse over the option **Export**
 - Or
 - 1a. With the File menu dropped, type **E**
 2. if the image is to be saved is in the Recorded window, select **Recorded** or type **R**
 - Or
 - 2a. If the image is to be saved is in the Latent window, select **Latent** or type **L**
- An image type menu will be generated.
3. To save the original image, select **Original** or type **O**
 - 3a. To save the binary image, select **Binary** or type **B**
 - 3b. To save the marked bad areas image, select **Bad** or type **a**
 - 3c. To save the skeletal image, select **Skeletal** or type **S**
 - 3d. To save the compared lines (Mx or Yn) image, select **Compared Lines...** or type **C**
- The File Save dialog will be generated
4. Choose the desired storage folder for the file
 5. Choose the format you wish to save the file in (the default is Windows bitmap)
 6. Type in the name for the file
 7. Click **Save**

The file is saved to the indicated location. This type of image can be accessed through the [Open Image](#) function .

Examples of exported image of the Binary display of the fingerprint



Print

Print recorded or latent image or the screen

1. Select the type of image to be printed by selecting the **OR, BI, BD** or **SK** buttons on the appropriate window.
2. With the File menu dropped, place the mouse over the option **Print**
Or
- 2a. With the File menu dropped, type **P**
3. if the image is to be printed is in the Recorded window, select **Recorded** or type R
Or
- 3a. If the image is to be printed is in the Latent window, select **Latent** or type L
The image will be sent to your printer.

Printer Setup...
Set your printer parameters

1. With the File menu dropped, place the mouse over the option **Printer Setup...**

Or

1a. With the File menu dropped, type S two times

The Windows printer setup dialog will be displayed. Set the printer to the desired parameters.

Acquire

Acquire an image from either video or a page scanner

With the File menu dropped, place the mouse over the option **A**quire

Or

1a. With the File menu dropped, type **A**

if the image is to be acquired from a video capture device, select Video Capture or type **V**

Or

2a. If the image is to be acquired from a page-scanning device, select Page Scanner or type **P**

if the image is to be loaded into the Recorded window, select **Recorded** or type **R**

Or

3a. If the image is to be loaded into the Latent window, select **Latent** or type **L**

Your TWAIN source's software will be launched. Follow its procedures to obtain an image.

Select Source...
Select your TWAIN compliant source

1. With the File menu dropped, place the mouse over the option **Select Source...**

Or

1a. With the File menu dropped, type S three times

The Select Source dialog is generated.

2. Click on the source you wish to employ for this image acquisition.

The selected source will be highlighted

3. Click on the Select button.

The chosen source is ready to be accessed in the next **Acquire** operation.

Exit.

Exit the program

1. With the File menu dropped, place the mouse over the option **Exit**

Or

1a. With the File menu dropped, type **x**

The program will close.

Image group options

Selecting the **Image** group on the main menu causes four related options to appear.
The **Image** group options include:

Reverse

display the image as a negative

Restore to Original

restore the image you entered the program with

Flip Horizontal

flip the existing image left to right

Flip Vertical

flip the existing image top for bottom

Brightness

adjust brightness of the image

Contrast

adjust contrast of the image or a selected portion of the image

Sharpen

sharpen the image or a selected portion of the image

Reverse
display the image as a negative

The Reverse function applies to the whole image only.

1. With the Image Adjustment menu dropped, place the mouse over the option **Reverse**

Or

1a. With the Image menu dropped, type R

2. if the image to be reversed is in the Recorded window, select **Recorded** or type R

Or

2a. If the image to be reversed is in the Latent window, select **Latent** or type L

The image is reversed (negative for positive).

Original image



Reversed image



Restore to Original
Return to the originally scanned image

The **Restore to Original** function applies to the whole image only. It removes all processing which has been applied and all four processed images (OR, BI, BD, and SK) associated with it.

1. With the Image Adjustment menu dropped, place the mouse over the option **Restore to Original**

Or

1a. With the Image menu dropped, type E

2. if the image to be restored is in the Recorded window, select **Recorded** or type R

Or

2a. If the image to be restored is in the Latent window, select **Latent** or type L

The image is restored as though it had just been acquired without any extracted features or processed images.

Brightness

Adjust brightness of the image

The Brightness function applies to the whole image only.

1. With the Image menu dropped, place the mouse over the option **B**rightness

Or

1a. With the Image menu dropped, type **B**

2. if the image to be sharpened is in the Recorded window, select **R**ecorded or type **R**

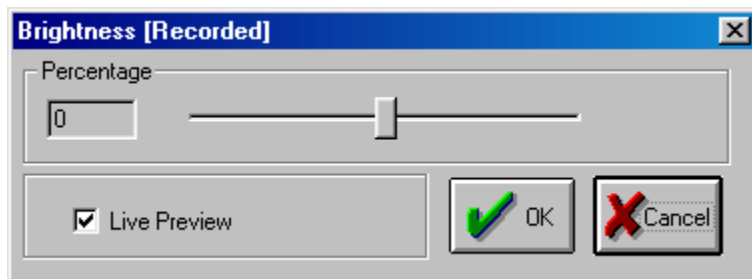
Or

2a. If the image to be sharpened is in the Latent window, select **L**atent or type **L**

The Brightness dialog will open.

3. Position the slider to achieve the desired degree of brightness. Note that the effect is previewed on the appropriate image.

4. Click **OK** to keep the altered image.



The Brightness Dialog.

Contrast

Adjust contrast of the image

The Contrast function applies to the whole image.

1. With the Image menu dropped, place the mouse over the option **C**ontrast

Or

1a. With the Image menu dropped, type **C**

2. if the image whose contrast is to be adjusted is in the Recorded window, select **R**ecorded or type **R**

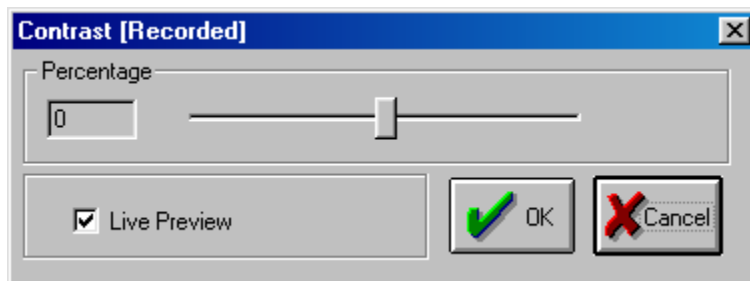
Or

2a. If the image whose contrast is to be adjusted is in the Latent window, select **L**atent or type **L**

The Contrast dialog will open.

3. Position the slider to achieve the desired degree of contrast. Note that the effect is previewed on the appropriate image.

4. Click **OK** to keep the altered image.



The Contrast dialog.

Sharpen

Sharpen the image

The Sharpen function applies to the whole image.

1. With the Image menu dropped, place the mouse over the option **S**harpen

Or

1a. With the Image menu dropped, type **S**

2. if the image to be sharpened is in the Recorded window, select **R**ecorded or type **R**

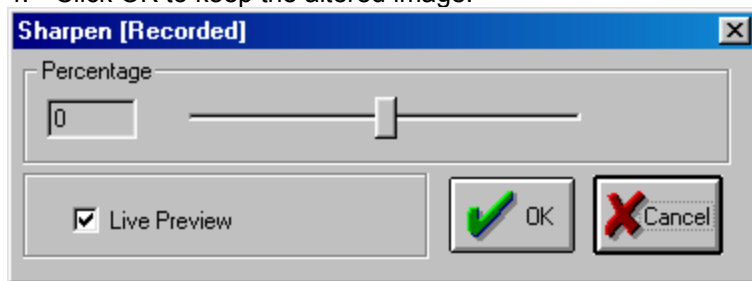
Or

2a. If the image to be sharpened is in the Latent window, select **L**atent or type **L**

The Sharpen dialog will open.

3. Position the slider to achieve the desired degree of sharpening. Note that the effect is previewed on the appropriate image.

4. Click OK to keep the altered image.



The Sharpen dialog.

View group options

Selecting the **View** group on the main menu causes a number of related options to appear. This menu group is available only in the TECH+ DB version of the software.

The **View** group options include:

Database View

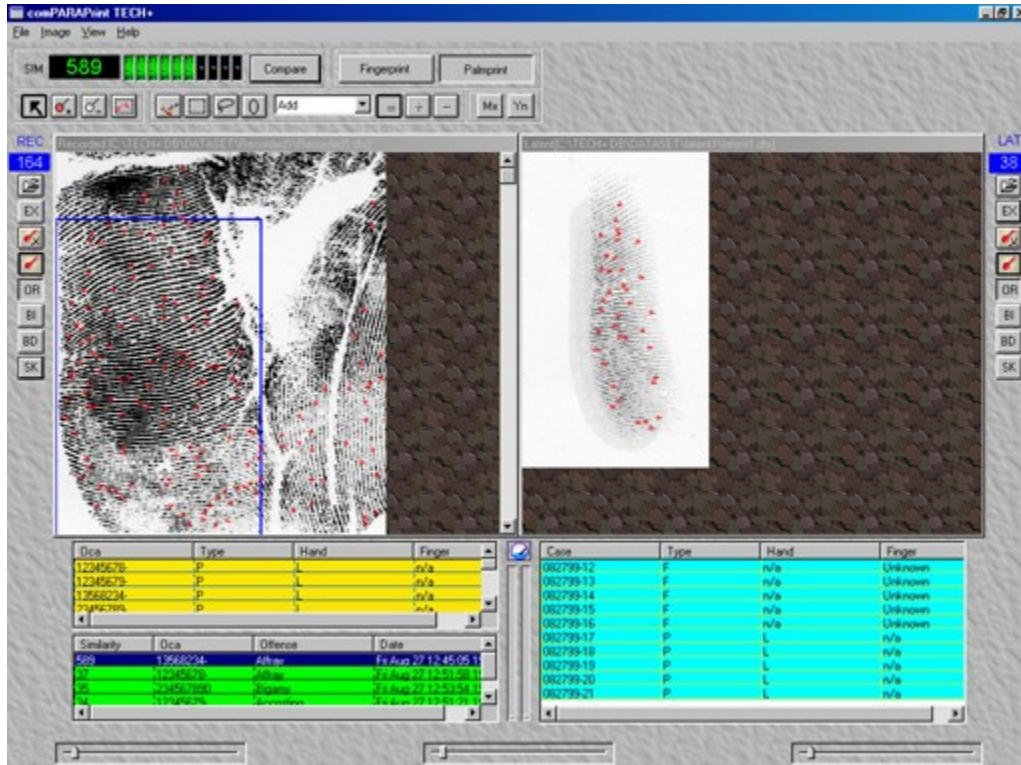
Causes the Database window to be displayed

Search Database

Causes the current Latent to be searched against the print database

Database View

Selecting the **Database View** option on the View option group causes the Database Window to be displayed. In this view, prints loaded into the Recorded window can be added to the Recorded database, prints loaded into the Latent window can be loaded into the Latent Database, and Searches against the database can be performed.



The Database View. The Latent Database entries appear in aqua (right of the screen), the Recorded Database in Gold (left of the screen), and the Match Candidates appear in green (left of the screen)

Searching a Latent against the Recorded Database

Any latent in your Latent Database can be searched against the Recorded Database. To Search:

1. Load the desired print from the Latent Database.
2. Select View/Search Database/ on the Main Menu. The Similarity Filter dialog will appear.
3. Enter the number for the lowest similarity you wish to accept and click on OK. The search will execute against prints of the same type (finger or palm) in the Recorded database. Any print found to have a similarity greater than or equal to the value you entered for the lowest similarity will be added to the Match Candidates Database, and be displayed in the Match Candidate window.
4. Load any print from the Match Candidates database for further study.

Help group options

Selecting the **H**elp group on the main menu causes two related options to appear.
The **H**elp group options include:









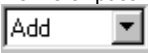





A bout	Displays information about the release of the software
H elp Topics...	Launches the program's help file

Main Toolbar

The Main Toolbar allows access to functions which can be used on either the Recorded print or the Latent print.



Left to right, these functions include:

	<u>F/P modes</u>	Makes all tools inactive; releases an Area of Interest
Deselect all tools		
	F/P modes	Allows you to add features to a print manually
Manually ADD features		
	F/P modes	Allows you to remove features from a print manually
Manually REMOVE features		
	F/P modes	Select an area of the Latent to compare against the Recorded
Process area of interest on latent		
	F/P modes	Add or Remove selected area to or from Bad areas
Redefine Bad Areas		
	F/P modes	Define a rectangular region on the window
Define rectangle		
	F/P modes	Define an arbitrary region on the window
Define Freehand		
	F/P modes	Define an elliptical region on the window
Define elliptical		
	F/P modes	Define the functionality of the Redefine Bad Areas tool
Add/Remove		
	F/P modes	Create a new region, discarding any existing region
Start New Region (=)		
	F/P modes	Add the next area to an existing region
Add to Existing Region (+)		
	F/P modes	Subtract the next area from an existing region
Subtract from existing region (-)		
	F/P modes	Show the matrix of features used in determining the match
<u>Display Match Matrix (Mx)</u>		
	F/P modes	Show features used in match in horizontal order
<u>Display Descending Match (Yn)</u>		

Adding/Removing Features, and Repositioning the Center manually.

While current technology is very good at extracting features and ignoring noise, no extraction engine approaches a skilled technician except in speed. All versions of **comPARAPrint** allow for the addition of and the removal of features.

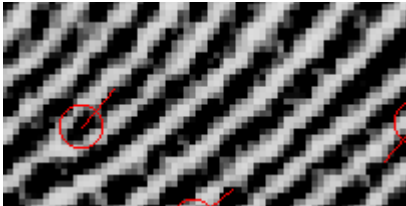
WARNING: Make manual adjustments to the feature set only after you are satisfied with the automatic extraction and the marking of good and bad areas. Features added or removed manually will be lost if the automatic extraction engine is run.



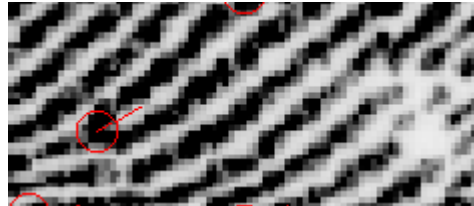
Adding Features

1. Select the **Add Feature** tool on the **Main Toolbar**
2. Magnify the image as desired.
3. Position the pointer over the feature of interest
4. Click over the feature and drag the mouse in the direction of the feature. In the case of an ending ridge, drag to show the direction of the ridge (that is, start from the end, drag back up the ridge); in the case of a bifurcation, split the Y. Another way to think of how to mark a bifurcation is to image its negative, so that instead of, say, black ridges splitting to form a bifurcation you have a white ending ridge surrounded by black: then just mark this ending ridge as usual).

Ending Ridge (or white bifurcation?)



Bifurcation (or white Ending Ridge?)



5. Release the mouse button. The feature will be added.



Removing Features

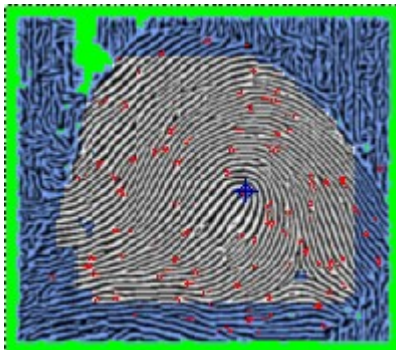
1. Select the **Remove Feature** tool on the **Main Toolbar**
2. Magnify the image as desired.
3. Position the pointer over the feature to be removed
4. Click the mouse button. The feature will be removed. Note: To remove multiple features, drag the mouse to 'paint' over the features to be removed. All features along the path drawn will be removed.

To ADD a bad area (an area for the extract engine to ignore):

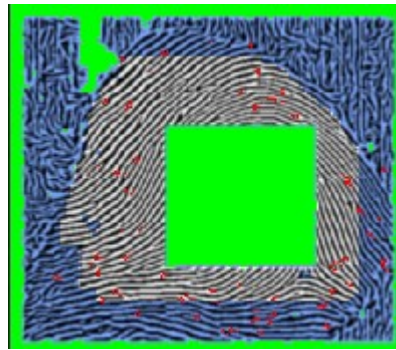
1. Select the original image by clicking on the **OR** button on the **Window Toolbar**.
2. Choose the **Add** option in the combo box on the **Main Toolbar**
3. Choose the equal sign (=) button to the right of the combo box.
4. Choose a region-generating tool, such as the **Rectangle** tool, the **Freehand** tool or the **Ellipse** tool, by clicking on it.
5. Draw a region around the area you wish to mark as bad.
- 5a. To add or subtract from the area you have drawn (i.e. to create complex areas) use the plus (+) and minus (-) buttons to add or subtract respectively from the region created with the equal (=) button active.
6. When you have created the desired region, click on the Redefine Bad Areas tool on the **Main Toolbar**. The extract engine will perform an extraction disregarding areas marked as bad.

Areas marked for the extraction engine to ignore (marked as 'Bad') in its search for features are shown in green when the BD image is selected on the Window Toolbar. Areas automatically set by the extraction engine can be modified using functions on the Main Toolbar, as described above. Areas can be simple or complex.

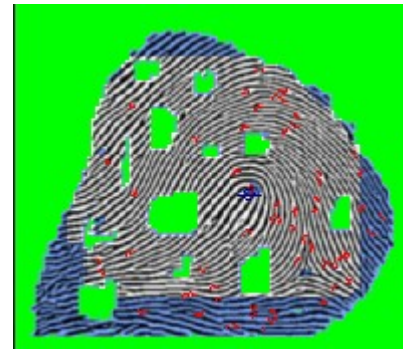
Bad areas as marked by the automatic extraction engine



Simple rectangular area Added to the bad area



Complex set of bad areas added using the + and - functions



To REMOVE a bad area or a portion of an area marked as bad:

1. Select the original image by clicking on the **OR** button on the **Window Toolbar**.
2. Choose the **Remove** option in the combo box on the **Main Toolbar**
3. Choose the equal sign (=) button to the right of the combo box.
4. Choose a region-generating tool, such as the **Rectangle** tool, the **Freehand** tool or the **Ellipse** tool, by clicking on it.
5. Draw a region around the area you wish to remove from the area marked as bad.
- 5a. To add or subtract from the area you have drawn (i.e. to create complex areas) use the plus (+) and minus (-) buttons to add or subtract respectively from the region created with the equal (=) button active.
6. When you have created the desired region, click on the **Process Defined Region** tool on the **Main Toolbar**. The extract engine will perform an extraction adding the marked region back into the area from which to extract features.

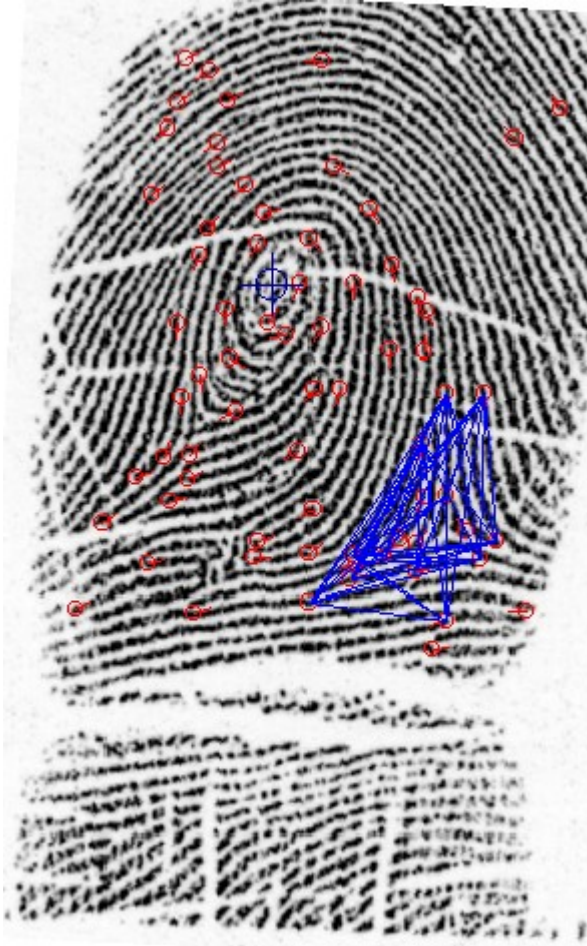
Comparing a portion of a latent print to a recorded print

1. Click on the **Process Area of Interest** button on the **Main Toolbar**.
2. Drag the mouse to create a rectangular area of interest on the latent print.
3. Release the mouse button. A comparison will be made between the area of interest defined and the reference print.
4. Repeat as desired.
5. To undo the area of interest and return to your starting point, click on the **No Tools Selected** tool on the **Main Toolbar**.

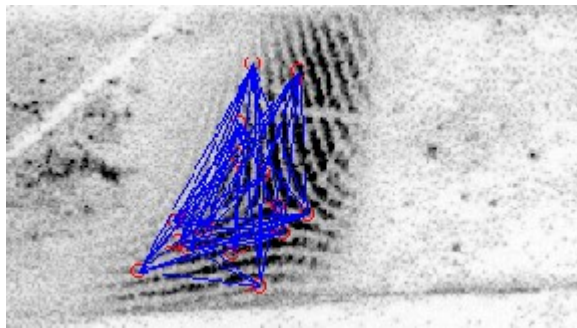
Display Match Matrix (Mx)

If, during the Compare operation, a likeness score of fifteen (15) or greater is obtained, the Mx button on the Main Toolbar is enabled. Clicking on it causes the matrix of lines between features used by the comparison engine to be displayed as shown below. This display allows you to see what the engine is basing its comparison score on, so that you can judge the comparison for yourself. These images can be saved via the Export command.

Recorded



Latent

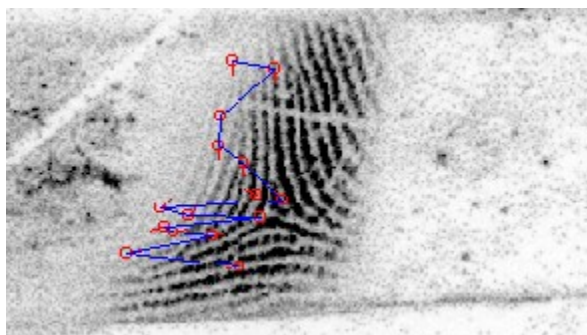
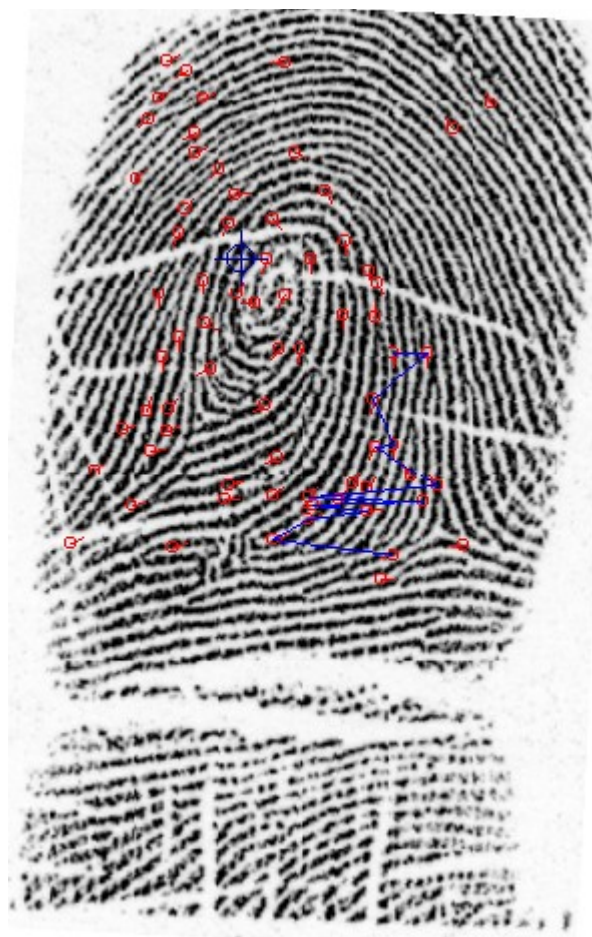


Display Descending Match (Yn)

If, during the Compare operation, a likeness score of fifteen (15) or greater is obtained, the Yn button on the Main Toolbar is enabled. Clicking on it causes the features used by the comparison engine to be displayed in order of their Y-coordinate, as shown below. This display allows you to see what the engine is basing its comparison score on, so that you can judge the comparison for yourself. These images can be saved via the Export command.

Recorded

Latent



Marking areas of the print as bad









Marking areas of a print as bad instructs the feature extraction engine to ignore those areas. To mark an area as bad, you must first load or acquire an image, adjust rotation, brightness, contrast and sharpness as desired, and run the extraction engine. Running the extraction engine creates four distinct images (original, binary, bad and skeletal), along with a dataset of coordinates and direction vectors for features. Once the Bad image has been created, you can add or subtract "bad" areas.

Marking an area as "Bad"

Unmarking an area previously marked as "Bad"

Window Toolbars

Each window has an associated toolbar. From top to bottom, the tools are:

Function	Symb ol	Window	Description
Window Name	REC or LAT		Tells which window the toolbar works on
Feature Count field	-	REC/LAT	Displays the number of features the extract engine located
File Open		REC/LAT	Calls the File Open dialog
Extract Features		REC/LAT	Activates the feature extraction engine
Remove Features		REC/LAT	Permanently removes all extracted features
Show Hide Features toggle		REC/LAT	Shows (down) or Hides (up) extracted features
Show Original Image		REC/LAT	Shows features over the original image
Show Binary Image		REC/LAT	Shows features over the Binary image
Show Bad Image		REC/LAT	Shows features over the image with Bad areas marked in green
Show Skeletal Image		REC/LAT	Shows features over the Skeletal image

The example below is from the Latent (LAT) window



Extracting Features

comPARAPrint's feature extraction engine is called either by clicking on the **EX** button present on both window tool bars, or by adding to or subtracting from areas declared as bad on the print. The extraction process is dependent on the condition of the original print, so that efforts should be made to optimize brightness, contrast and sharpness before the extraction engine is called. Note carefully that each time the extraction engine is called it discards any manual alterations you may have made. Make manual additions and deletions to the automatically generated feature set only after you are generally satisfied with the features found.

Add a Print to the Latent Database

To add a print in the Latent Database:

1. If the print has not been previously saved as a data set, create and save the dataset.
2. Open the saved dataset in the Latent Window.
3. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Place the cursor over any record in the Latent Database window, or over the bar at the top of the window if there are no entries and right-click. A pop-up menu will appear.

Case	Type	Hand	Finger
082799-12	F	n/a	Unknown
082799-13	F	n/a	Unknown
082799-14	F	n/a	Unknown
082799-15	F	n/a	Unknown
082799-16	F	n/a	Unknown
082799-17	P	L	n/a
082799-18	P	L	n/a
082799-19	P	L	n/a
082799-20	P	L	n/a
082799-21	P	L	n/a

The Latent Database Window

4. Click on Add Latent. A data entry form will be displayed.

DBFORM

Case: 082799-21B5 Date: Fri Aug 27 13:08:20 1999

Officer: Bill Sewell

Hand: Left Right

Finger: Unknown

Offense: Pandering

OK Cancel

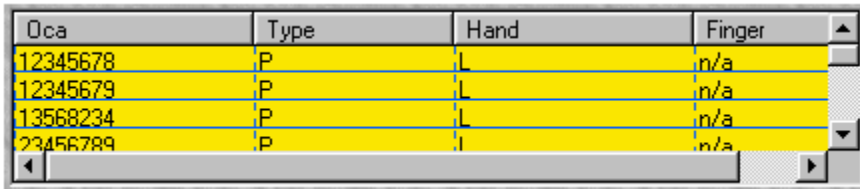
The data entry form

5. Supply the requested data. (Note: the Case Number field must be filled in.).

Add a Print to the Recorded Database

To add a print in the Recorded Database:

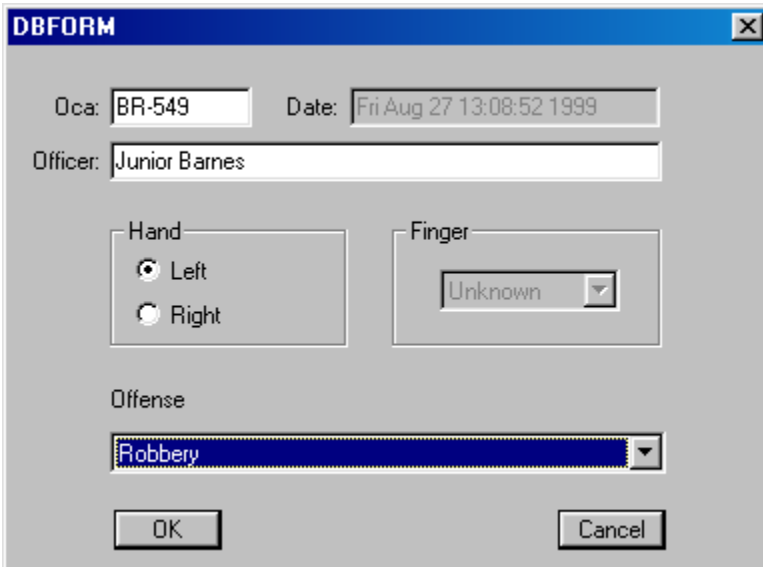
1. If the print has not been previously saved as a dataset, create and save the dataset.
2. Open the saved dataset in the Recorded Window.
3. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Place the cursor over any record in the Recorded Database window, or over the bar at the top of the window if there are no entries and right-click. A pop-up menu will appear.



Oca	Type	Hand	Finger
12345678	P	L	n/a
12345679	P	L	n/a
13568234	P	L	n/a
23456789	P	L	n/a

The Recorded Database window

4. Click on Add Recorded. A data entry form will be displayed.



DBFORM

Oca: BR-549 Date: Fri Aug 27 13:08:52 1999

Officer: Junior Barnes

Hand: Left Right

Finger: Unknown

Offense: Robbery

OK Cancel

The Data Entry form.

5. Supply the requested data. (Note: the OCR Number field must be filled in.).

Delete a Print from the Latent Database

To delete a print in the Latent Database:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Latent Database window until the desired record is seen.



The Latent Database Window

3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Delete... A warning message will be displayed.
5. Confirm your intention to delete the print. Note that if a search result involves the print being deleted, the search result will be cleared from the Match Candidates database.

Delete a Print from the Recorded Database

To delete a print in the Recorded Database:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Recorded Database window until the desired record is seen.
3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Delete... A warning message will be displayed.
5. Confirm your intention to delete the print. Note that if a search result involves the print being deleted, the search result will be cleared from the Match Candidates database.

View Latent Database Print's Properties

To view the properties associated with a print in the Latent Database:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Latent Database window until the desired record is seen.



The Latent Database window

3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Properties... The record's properties will be displayed. Note that these are read-only.

The Properties window displays the following information:

Version:	10
Case:	090199-32
Officer:	Bill Sewell
Offense:	Burglary Tools
Date:	Wed Sep 01 09:10:53 1999
Type:	F
Hand:	n/a
Finger:	R Index

Data Set Record:
C:\TECH+ DB\DATASET\090199-32a\090199-32a.DTS

OK

The Properties window.

Properties explained:

The following properties are displayed in the Properties Window.

Item	Definition
Version	Version of the database. Updated versions may be added from time to time.
Case	Case number associated with the print
Officer	Officer Name associated with Case
Offense	Offense associated with recorded print
Date	Date of last edit.
Type	'F' (finger print) or 'P' (palm print)
Hand	'L' or 'R' if palm print, 'n/a' if finger print
Finger	'n/a' if palm print

View Recorded Database Print's Properties

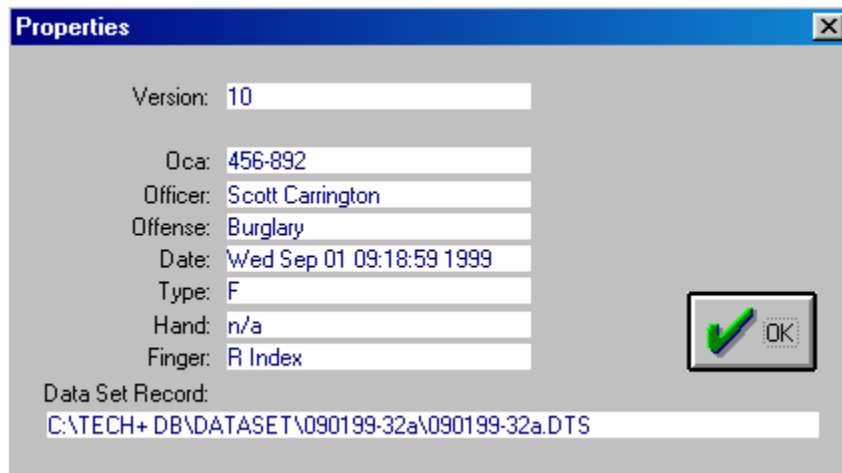
To view the properties associated with a print in the Recorded Database:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Recorded Database window until the desired record is seen.



The Recorded Database window

3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Properties... The record's properties will be displayed. Note that these are read-only.



The Properties window.

Properties explained:

The following properties are displayed in the Properties Window.

Item	Definition
Version	Version of the database. Updated versions may be added from time to time.
OCA	OCA number assigned to the print
Officer	Officer Name associated with Case
Offense	Offense associated with recorded print
Date	Date of last edit.
Type	'F' (finger print) or 'P' (palm print)
Hand	'L' or 'R' if palm print, 'n/a' if finger print
Finger	'n/a' if palm print

Edit a Latent Database Entry

To edit a print in the Latent Database:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Latent Database window until the desired record is seen.



The Latent Database Window

3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Edit... The database entry dialog will be displayed.
5. Edit the desired field(s).
6. Click on OK to accept the changes or Cancel to exit without changing the record. Selecting OK will automatically update the time stamp on the record.

To edit the features associated with a latent print:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Latent Database window until the desired record is seen.
3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Open... The print will be loaded into the Latent window.
5. Process the print as desired.
6. Save the print as a dataset, overwriting the old file.

Edit a Recorded Database Entry

To edit a print in the Recorded Database:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Recorded Database window until the desired record is seen.
3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Edit... The database entry dialog will be displayed.
5. Edit the desired field(s).
6. Click on OK to accept the changes or Cancel to exit without changing the record. Selecting OK will automatically update the time stamp on the record.

To edit the features associated with a recorded print:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Recorded Database window until the desired record is seen.
3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Open... The print will be loaded into the Recorded window.
5. Process the print as desired.
6. Save the print as a dataset, overwriting the old file.

Load a Print from the Latent Database

To Load a print from the Latent Database:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Latent Database window until the desired record is seen.



The Latent Database Window

3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Open... The print will be loaded into the Latent window.

Load a Print from the Recorded Database

To edit the features associated with a latent print:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Recorded Database window until the desired record is seen.



The Recorded Database Window

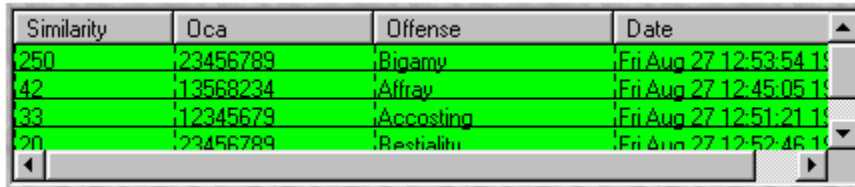
3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Open... The print will be loaded into the Recorded window.

Load a Print from the Match Candidate Database

When a latent is searched against the Recorded database, candidate matches are placed in the Match Candidate database and displayed in the Match Candidate window. If the search results in no candidates, no entries will be available in the Match Candidate database.

To load a print from the Match Candidate database:

1. Select View/Database View/ on the Main Menu. The database windows will appear.
2. Scroll the Match Candidate Database window until the desired record is seen.



Similarity	Oca	Offense	Date
250	23456789	Bigamy	Fri Aug 27 12:53:54 19
42	13568234	Alfray	Fri Aug 27 12:45:05 19
33	12345679	Accosting	Fri Aug 27 12:51:21 19
20	23456789	Bestiality	Fri Aug 27 12:52:46 19

The Match Candidate database window

3. Place the cursor over the desired record and right-click. A pop-up menu will appear.
4. Click on Open... The print will be loaded into the Recorded window.

Zoom Controls

Three zoom controls are located at the bottom of the main window. The controls with the pointed sliders at the left and the right can be used to independently zoom the REC and LAT respectively. The center control (with the square slider) zooms the two windows simultaneously.



The Zoom Controls.

Topics

Acquire an image from either video or a page scanner
ADD a bad area (an area for the extract engine to ignore):
Add a Print to the Latent Database
Add a Print to the Recorded Database
Adding/Removing Features manually.
Brightness
Compare Button and Comparison Results (SIM) display.
Comparing a latent to a recorded print.
Comparing a portion of a latent print to a recorded print
Comparing Palmprints
Contrast
Database View
Delete a Print from the Latent Database
Delete a Print from the Recorded Database
Edit Latent Database Entry
Edit Recorded Database Entry
Exit the program
Export a processed image
Extracting features
File group options
Flip Horizontal
Flip Vertical
Help group options
Image group options
Introduction
Main Menu
Main Screen
Main Toolbar
Marking areas of the print to ignore (marking as bad)
Mode Selector buttons (comPARAPrint Tech+ only)
Open Data Set
Open Image
Open (Load) a Match Candidate
Open (Load) Print from Latent Database
Open (Load) Print from Recorded Database
Printer Setup...
Print
Purchase Information
REMOVE a bad area or a portion of an area marked as bad:
Restore to Original
Reverse
Save Data Set
Save Original Image
Search Database
Select Source...
Sharpen
View group options
View Latent Database Print's Properties
View Recorded Database Print's Properties
Window Toolbars
Zoom Controls

Purchase Information

Sirchie offers the **comPARAPrint** family software in four configurations: **comPARAFingerprint**, **comPARAPalmprint**, **comPARAPrint TECH+** and **comPARAPrint TECH+ DB**.

comPARAFingerprint (CPARA5000L) is fingerprint only software, optimized for comparing latent and rolled finger impressions.

comPARAPalmprint (CPARA6000L) is palm print only software, optimized for comparing latent and rolled palm impressions.

comPARAPrint TECH+ (CPARA7000L) consists of both fingerprint and palm print software in a single package.

comPARAPrint TECH+ DB (CPARA7000LDB) consists of both fingerprint and palm print software in a single package, with a database capable of holding 500 latent and 500 recorded prints, and a fast search capability.

Contact Information:

Inquiries concerning this software should be addressed to

Sirchie Finger Print Laboratories, Inc., 100 Hunter Place, Youngsville, NC 27596.

Voice: 800 356-7311

Fax: 800 899-8181

eMail: sirchie@mindspring.com

Web Site: <http://www.Sirchie.com/>

Flip Horizontal

display the image flipped left for right

The Flip Horizontal function applies to the whole image only.

1. With the Image Adjustment menu dropped, place the mouse over the option **Flip Horizontal**
- Or
- 1a. With the Image menu dropped, type H
 2. if the image to be flipped is in the Recorded window, select **Recorded** or type R
- Or
- 2a. If the image to be flipped is in the Latent window, select **Latent** or type L
- The image is flipped horizontally (left for right).

Original image



Image flipped horizontally



Flip Vertical

display the image flipped top for bottom

The Flip Vertical function applies to the whole image only.

1. With the Image Adjustment menu dropped, place the mouse over the option **Flip Vertical**
- Or
- 1a. With the Image menu dropped, type V
 2. if the image to be flipped is in the Recorded window, select **Recorded** or type R
- Or
- 2a. If the image to be flipped is in the Latent window, select **Latent** or type L
- The image is flipped vertically (left for right).

Original image



Image flipped vertically



