

*User's Manual*

# Scanner

*Epson Perfection*

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Revision B



The names of any providers and patients used in illustrations or examples in this document are fictitious.

Every effort has been made to ensure this manual is accurate, complete, and useful. Please let us know if you have any suggestions for improvement using one of the following means of contact:

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# Preface

## About this Document

This document is part of the set of user manuals provided with the AFHCAN Cart. These user manuals, covering various topics, are normally assembled into a binder delivered with each Cart. This modular design has the following advantages:

- the set of manuals provided with your cart includes documents for the specific peripheral devices installed
- each document is a stand-alone publication; as new devices or features are added to the Cart, new manuals can be added to the existing binder
- user information that is common to all items of equipment does not need to be repeated in each module, but can be covered in separate modules and referenced as needed

## Related Documents

This document assumes you have read the introductory hardware and software manuals included in this binder.

The original manuals provided with the equipment were included in a set of materials delivered with the AFHCAN Cart. Those manuals can be used to supplement the information provided in this document. Be aware, however, that items installed on an AFHCAN Cart may have been modified slightly, so the features as described in the original product manuals may not apply.

## For More Information

This document describes the equipment to a level of detail that will meet most user's needs in the context of clinical use of the AFHCAN Cart. For more information, contact AFHCAN Customer Support:

AFHCAN Customer Support  
Phone: 888 449-4435  
Fax: 907 729-2269  
email: [customersupport@afhcan.org](mailto:customersupport@afhcan.org)

Additional information about the scanner can be found on the manufacturer's website:

**[www.epson.com](http://www.epson.com)**



# Section 1 – Introduction

## 1.1 Introduction to the Scanner

This manual describes the features and operation of the scanner as installed on an AFHCAN Cart. Four scanner models are covered (see Figure 1):

- Epson Perfection Model 1640
- Epson Perfection Model 1650
- Epson Perfection Model 4490
- Epson Perfection Model 4990



**Figure 1**  
Four scanner models

Models 1640 and 1650 were part of the original deployment of AFHCAN Carts. These models work well in the AFHCAN installation, but are no longer being manufactured. Model 4490 is standard for new installations, or may be selected as a replacement for the previous models. Model 4990 is an option that can be ordered in place of the 4490, and allows for 8-inch by 10-inch transparencies such as x-rays to be scanned.<sup>1</sup>

In general, the AFHCAN software functions the same for all the scanners that have been deployed with the AFHCAN Cart. There is no significant difference in the basic operating sequences. However, with the newer scanners, the appearance of certain screens may vary slightly from the illustrations shown in this manual.

---

<sup>1</sup> Scanning of transparencies requires the use of manual mode, which is an advanced scanning feature. Information on manual mode will be provided separately. Consult the Epson documentation for details.

The scanners have a variety of buttons on their front panels. None of these buttons interact with the AFHCAN software, so they are not described here. Model 1650 does not have a power switch, but the other three models do. As installed on the AFHCAN Cart, the scanner power switch is not readily accessible. It is the standard practice on the AFHCAN installation to leave the scanner power button on at all times and to control power to the scanner via the Cart's main power switch. This power distribution strategy applies to most other devices on the Cart. For exceptions, refer to device-specific modules in this binder for details.

### 1.1.1 Functional Description

The scanner is used to scan paper documents, photographs, or other items into a case. The AFHCAN software activates a TWAIN driver, which is software that comes with the scanner.<sup>2</sup> The TWAIN driver controls the operation of the scanner.

The AFHCAN software and the TWAIN driver interact differently depending on which scan mode is selected. The AFHCAN software offers two scan modes:

- black and white (**Scan** button)
- color (**Scan Color** button)

In black and white mode (**Scan** mode), the AFHCAN software directs the TWAIN driver to scan in black and white. Each pixel is forced to be either white or black (in other words, shades of gray are lost). This is useful when scanning black and white forms or other documents where high contrast is a plus. The downside is that if there are items which are lightly shaded, those items may be dropped, and the overall image resolution may appear to be diminished. In **Scan** mode, a small window appears indicating that a scan is underway. **Scan** mode saves files in a PNG image format.

In the **Scan Color** mode, the TWAIN software performs the following steps:

- previews the image to determine the type of image, image area, and image characteristics
- automatically adjusts the image resolution, size, and other attributes
- scans the image and saves it in a JPG image file format
- sends the image file to the AFHCAN software for inclusion in a case

When running on a Cart, the software resets the TWAIN driver to factory defaults each time the AFHCAN software is started. This places the TWAIN driver in automatic mode.

**Note:** When the software is running on a PC workstation, the reset does not take place, which means the TWAIN driver will open in the same mode and with the same settings that were in effect when the software was last used.

In automatic mode, the preview is analyzed to determine the type of image, the image area, and any optimal settings. The TWAIN software distinguishes the types of images listed in Table 1.

---

<sup>2</sup> The term TWAIN refers to software that fits between the user application and a device (scanner, camera, etc.) TWAIN drivers make it easier to standardize the integration and control of various devices on a computer system. For more information on TWAIN, go to [www.twain.org](http://www.twain.org).



**Table 1**  
Image types, characteristics, and resolution

Image Type	Description <sup>1</sup>	Default Resolution
color photo	high resolution, color image	300 dpi
black & white photo	high resolution, black and white image	300 dpi
illustration	drawing with halftone components	150 dpi
text/line art	mostly text with simple line art	300 dpi
color document	color words and images (printed, not photo)	150 dpi
black & white document	black & white words and images (printed, not photo)	150 dpi

Note 1: The exact criteria by which automatic mode categorizes items is difficult to determine. The descriptions shown here are based on tests with the Model 1650 scanner. In some cases, the image preview assigned an image type other than what was expected. However, we found that automatic mode always produced reasonably good scans.

During the preview, it is possible to interrupt the automatic scan and activate the TWAIN driver's manual mode. Manual mode allows the user to manually control a number of image attributes such as resolution, color balance, and image area. ***The use of manual mode is not recommended for most AFHCAN installations.***

**Note:** The settings in manual mode are complex and are beyond the scope of this manual (refer to the Epson documentation for details). For those not familiar with advanced scanning features, manual mode can cause a lot of confusion, and can lead to technical difficulties or poor quality scans. Furthermore, some combinations of manual settings can generate huge files and may lead to system freeze-up.

Please be aware that the last scanner mode used becomes the default mode for the next session. If someone goes into manual mode and does not set it back to automatic mode, the next person to use the scanner will encounter the screen for manual mode. Software running on an AFHCAN Cart will reset the TWAIN driver to automatic mode each time the software is restarted.

On completion of the scan, the TWAIN driver saves the file and notifies the AFHCAN software that a scanned file has been saved. If for some reason the TWAIN driver cannot complete the scan, the AFHCAN software will display a ***Scan Failed*** message.

There are several situations that can cause a ***Scan Failed*** message to appear in the AFHCAN software. Some of the more obvious ones are the following:

- the scan was canceled in the TWAIN driver window
- scanner power switch is turned off or the scanner power cable is disconnected
- scanner data cable is disconnected

- the incorrect TWAIN driver has been selected

Each scanner model requires a specific TWAIN driver. If the TWAIN driver does not match the scanner model, the AFHCAN software will bring up the **Scan Failed** message when you attempt to scan.

The correct TWAIN driver is normally installed and tested when the scanner is installed. Normally it should not need to be changed. However, if the **Scan Failed** message appears, you will be invited to open a pop up window allowing you to select a different TWAIN driver.

**Note:** Selecting a new TWAIN driver typically would apply only when a different model scanner is being installed.

Table 2 lists the scanner models and associated TWAIN drivers. (Other TWAIN driver options may appear in the window that may not apply to scanners. Disregard any drivers not listed in Table 2.)

**Table 2**

Scanner models and their TWAIN drivers

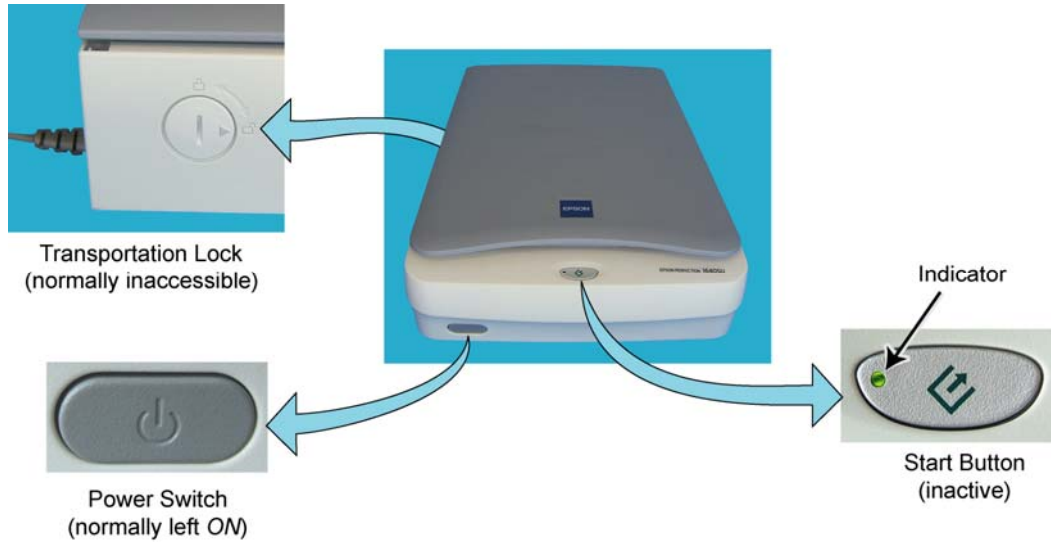
Scanner	TWAIN Driver <sup>1</sup>	Pop-Up Text
1640	5.71A (Rev F)	EPSON TWAIN 5 5.71 (32-22)
1650	5.71A (Rev F)	EPSON TWAIN 5 5.71 (32-22)
4490	2.76A	EPSON Perfection 4490 2.71 (32-22)
4990	2.68A	EPSON Perfection 4990 2.68 (32-32)

Note 1: These specific drivers were listed on the EPSON website, and were available for download, during the time when this document was in development. Other versions may be included with your software.

## 1.1.2 General Descriptions of Scanner Hardware

### 1.1.2.1 Model 1640 Hardware Features

Figures 2 through 4 show the main hardware features of the Model 1640.

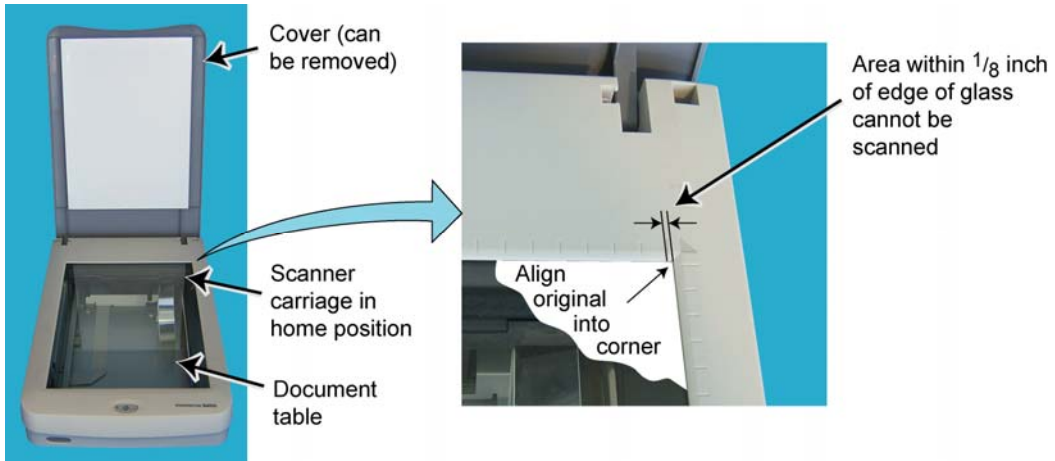


**Figure 2**  
General view of the 1640

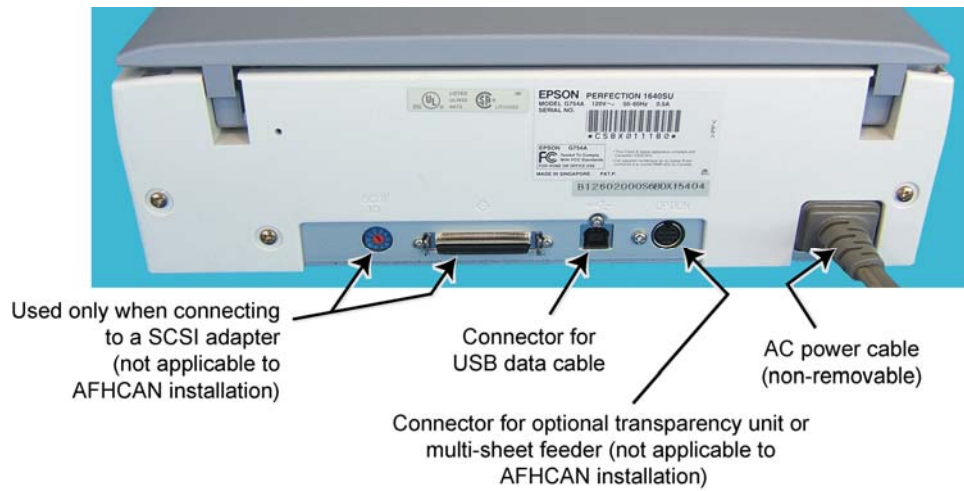
The indicator light on the scanner's start button is active in the AFHCAN installation. Table 3 lists the significance of the indicator light.

**Table 3**  
Model 1640 indicator light

Condition	Color	Status
flashing	green	Scanner is initializing (warming up) or busy scanning.
on steady	green	Scanner is on and ready to scan images.
flashing	red	Indicates error or malfunction. Refer to the section on troubleshooting.
off	n/a	The scanner is turned off or the Cart is powered down.



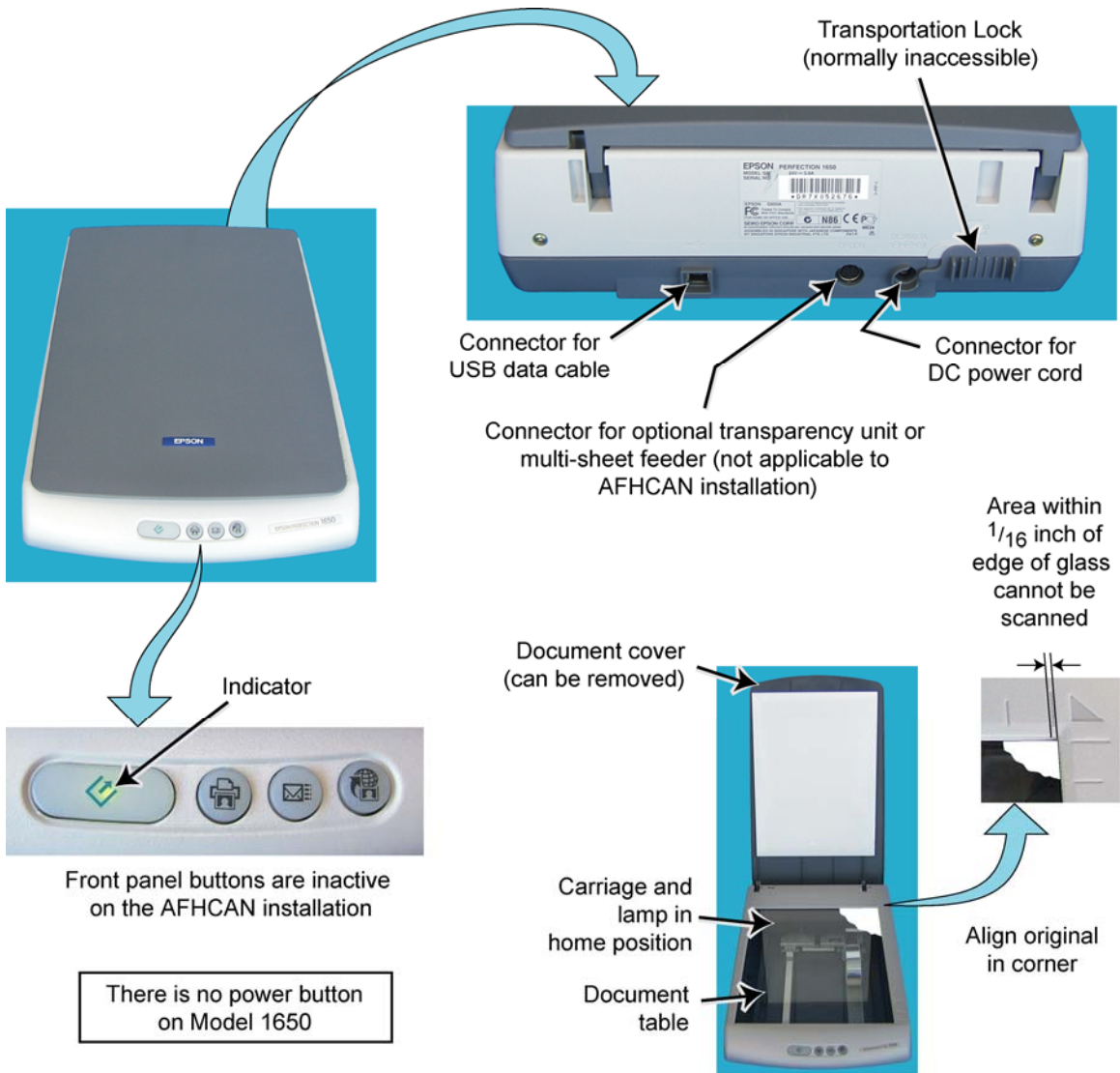
**Figure 3**  
Model 1640 document table and scanner cover



**Figure 4**  
Rear view of 1640

**1.1.2.2 Model 1650 Hardware Features**

Figure 5 shows the main hardware features of the Model 1650. The indicator light on the scanner's start button is active in the AFHCAN installation. Table 4 lists the significance of the indicator light.



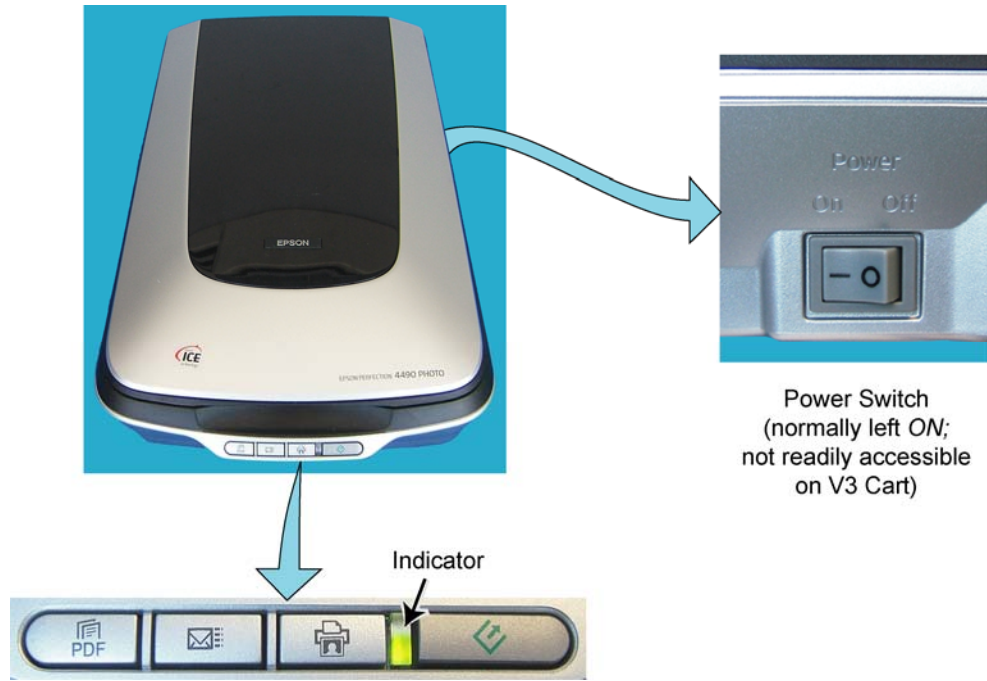
**Figure 5**  
General view of the 1650

**Table 4**  
Model 1650 indicator light

Condition	Color	Status
flashing	green	Scanner is initializing (warming up) or busy scanning.
on steady	green	Scanner is on and ready to scan images.
flashing	red	Indicates error or malfunction. Refer to the section on troubleshooting.
off	n/a	The scanner is turned off or the Cart is powered down.

**1.1.2.3 Model 4490 Hardware Features**

Figures 6 through 8 show the main hardware features of the Model 4490.



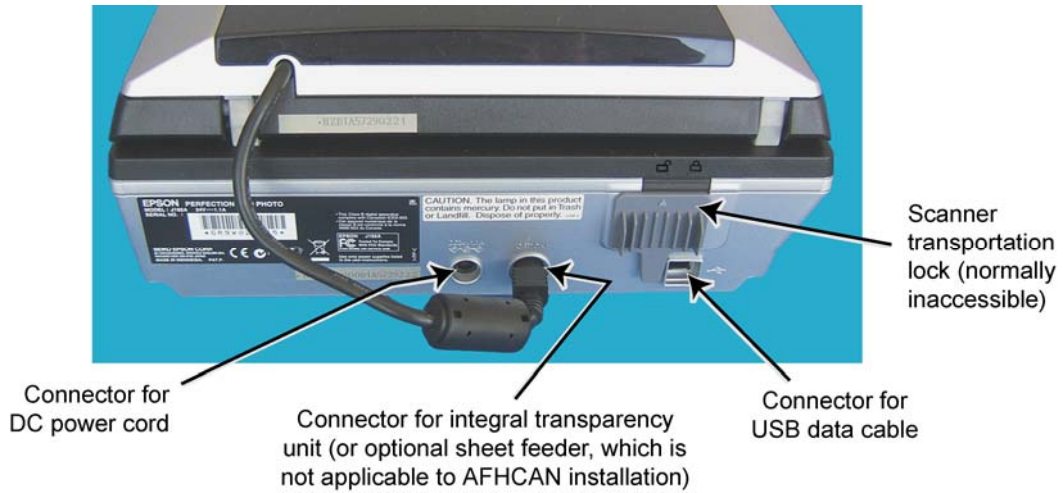
Power Switch  
(normally left ON;  
not readily accessible  
on V3 Cart)

**Figure 6**  
General view of the 4490

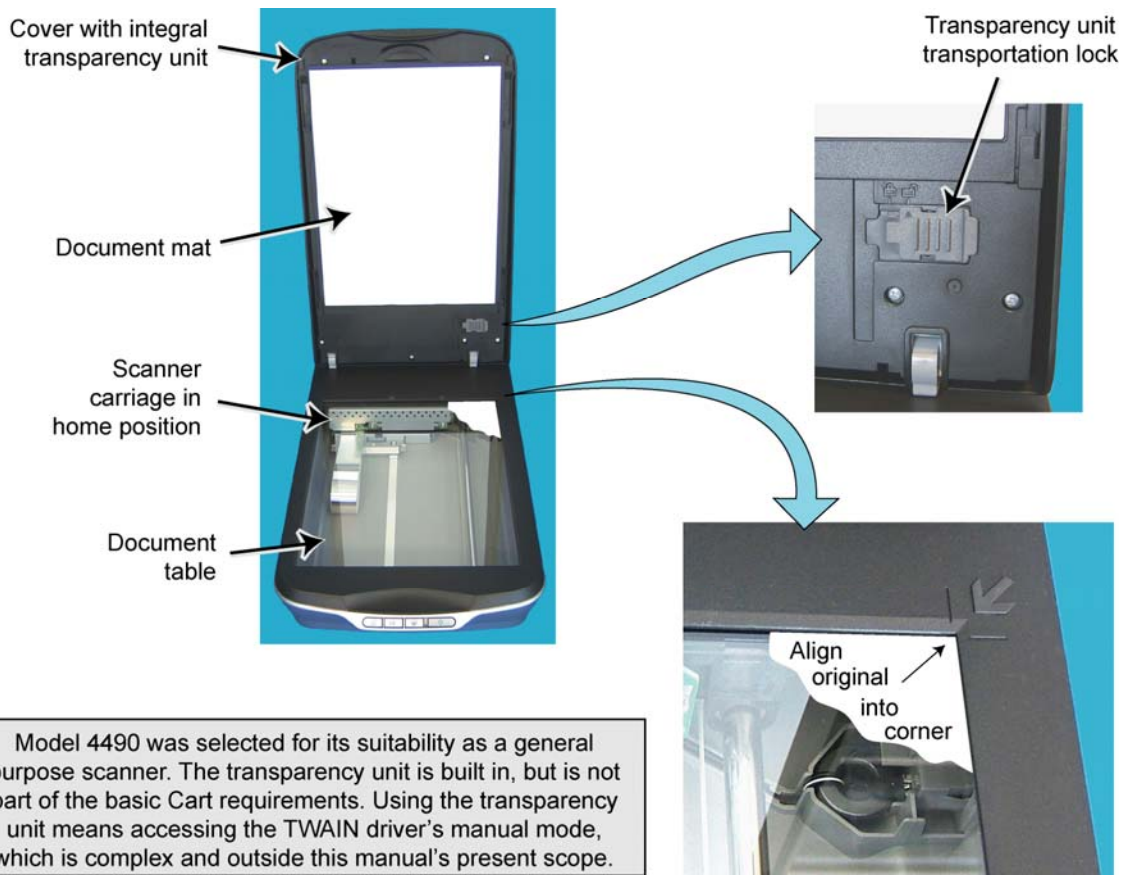
The indicator light is active in the AFHCAN installation. Table 5 lists the significance of the indicator light.

**Table 5**  
Model 4490 indicator light

Condition	Color	Status
flashing	green	Scanner is initializing (warming up) or busy scanning.
on steady	green	Scanner is on and ready to scan images.
flashing	red	Indicates error or malfunction. Refer to the section on troubleshooting.
off	n/a	The scanner is turned off or the Cart is powered down.



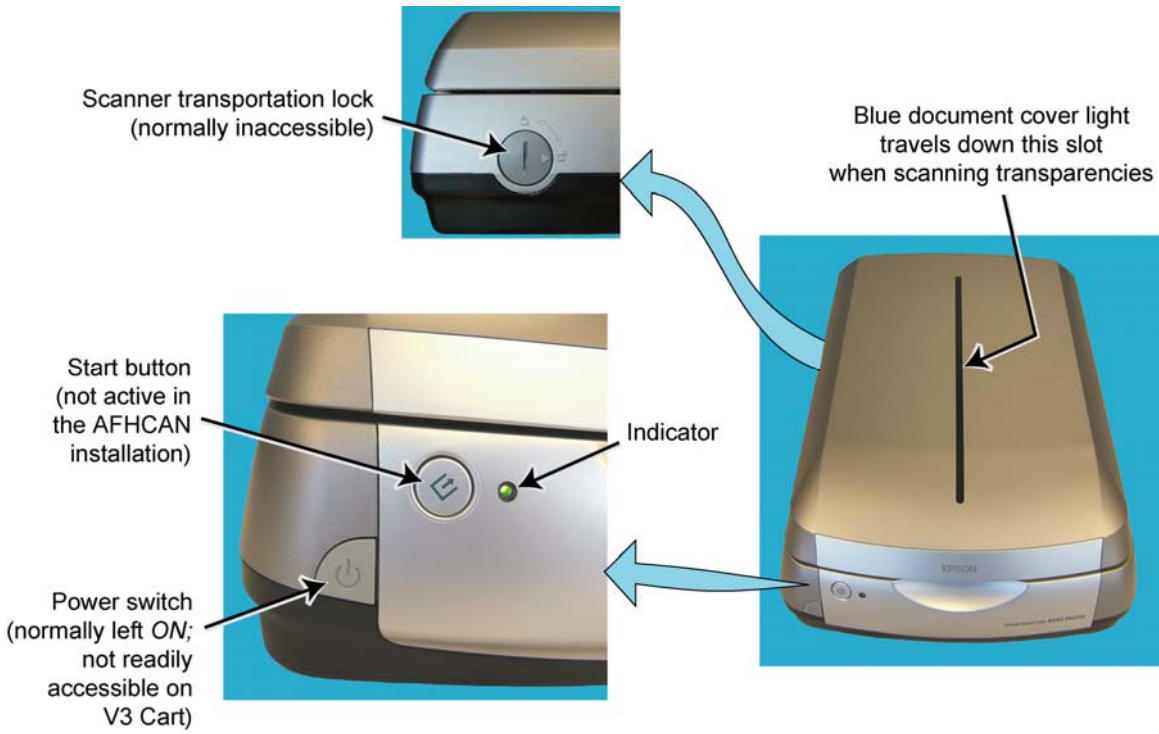
**Figure 7**  
Rear view of 4490



**Figure 8**  
Cover and mat of 4490

**1.1.2.4 Model 4990 Hardware Features**

Figures 9 through 11 show the main hardware features of the Model 4990.



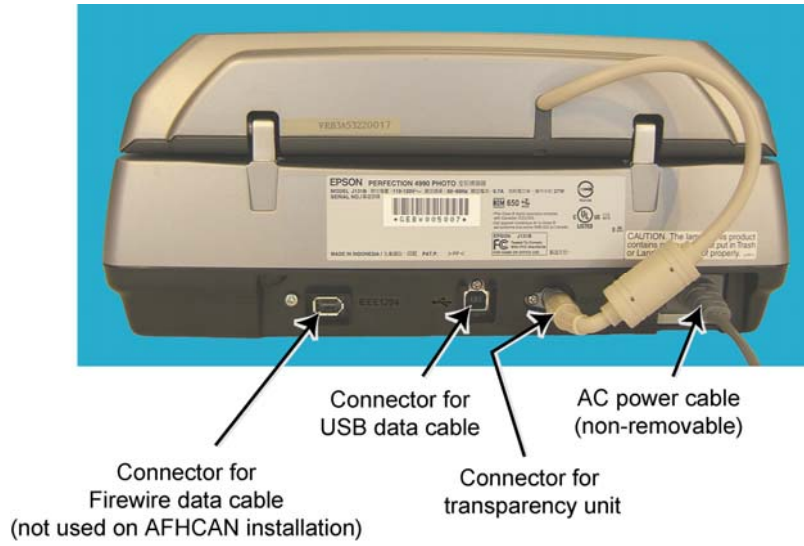
**Figure 9**  
General view of the 4990

The indicator light is active in the AFHCAN installation. Table 6 lists the significance of the indicator light.

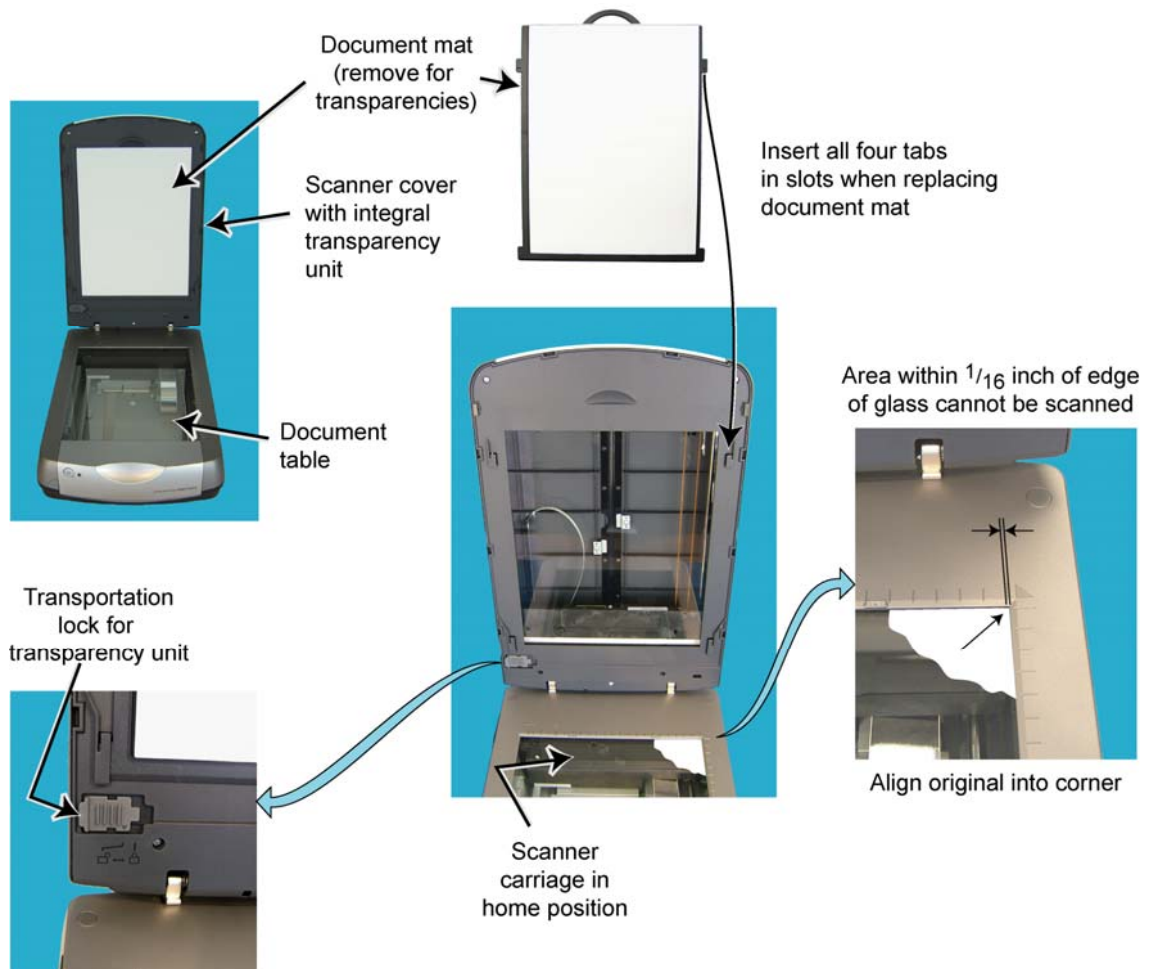
**Table 6**  
Model 4990 indicator lights

Condition	Color	Status
flashing	green	Scanner is initializing (warming up) or busy scanning.
on steady	green	Scanner is on and ready to scan images.
flashing	red	Indicates error or malfunction. Refer to the section on troubleshooting.
off	n/a	The scanner is turned off or the Cart is powered down.
<i>Blue document cover light</i>		
on steady	blue	Scanning transparent originals such as x-rays (manual mode only).
off	n/a	Scanning reflective originals such as photographs or paper documents.





**Figure 10**  
Rear view of 4990

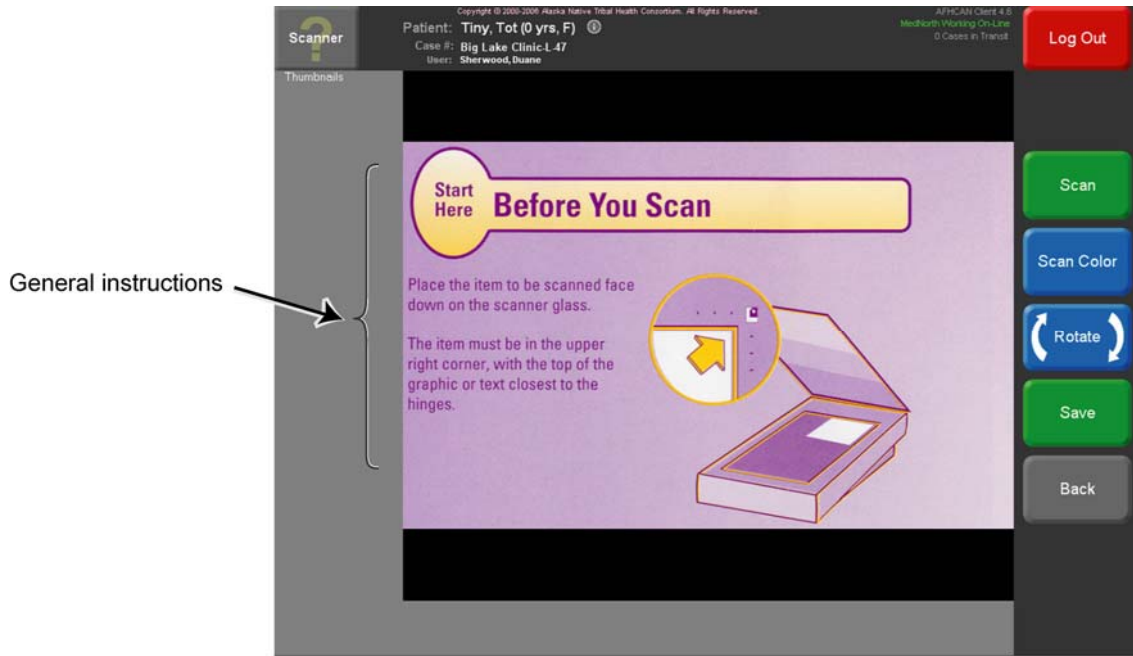


**Figure 11**  
Cover and mat of 4990

### 1.1.3 Scanner Features in the AFHCAN Software

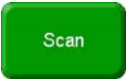
#### 1.1.3.1 Primary Features

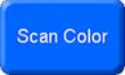
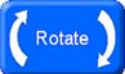

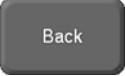
The AFHCAN software provides a means for activating the TWAIN driver and for handling the image that the TWAIN driver returns. To scan an image, press the **Scanner** button on the *Add To Case* screen. Figure 12 shows the initial *Scanner* screen. Table 7 shows the buttons on the *Scanner* screen and describes their functions.



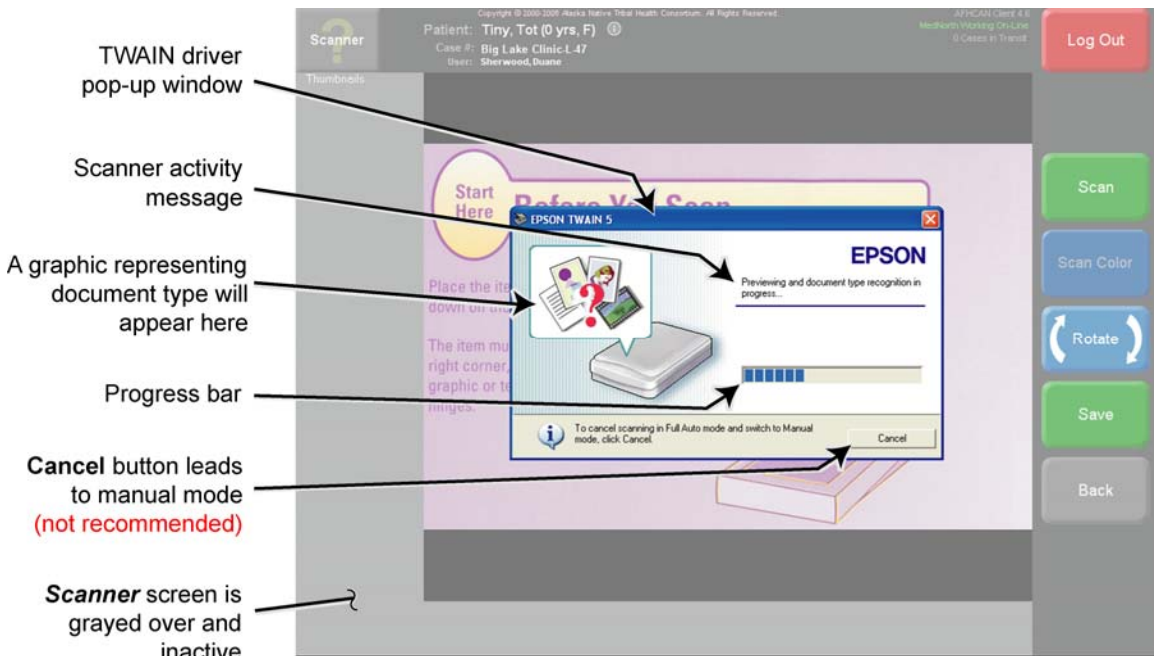
**Figure 12**  
Initial appearance of the *Scanner* screen

**Table 7**  
Functions of *Scanner* screen buttons

Button	Function
	Pressing the <b>Scan</b> button activates the TWAIN driver and initiates a scan. The <b>Scan</b> button is used for scanning documents where a high-contrast, black-and-white image is desired. When the <b>Scan</b> button is used to initiate a scan, the software forces each pixel in the image to either 100% black or 100% white. This enhances the contrast for documents like forms, but removes shading information needed for photographic images. The resulting image file will be somewhat compressed, meaning it requires less memory and takes less time to send and receive. The <b>Scan</b> button can be pressed repeatedly to scan additional items. Each scan will be stored as a thumbnail on the <i>Scanner</i> page.

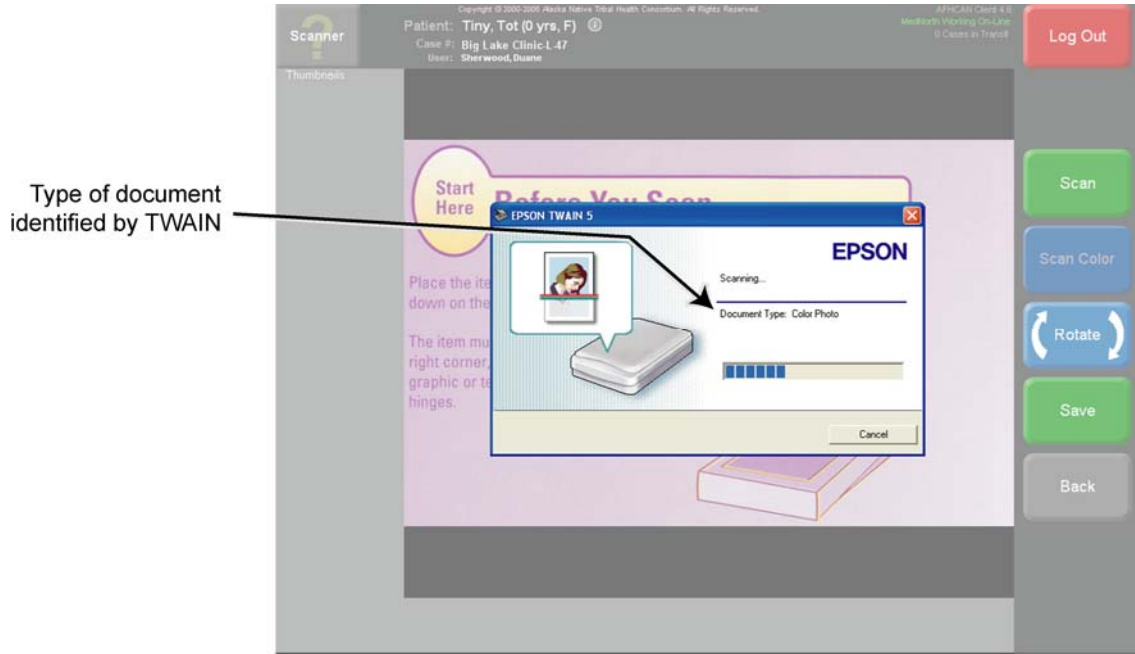
Button	Function
	<p>The <b>Scan Color</b> button is similar to the <b>Scan</b> button in that it activates the TWAIN driver and initiates a scan. <b>Scan Color</b> tells the AFHCAN software to receive and store the image exactly as provided by the scanner. In automatic mode, the scanner will determine the type of image and the appropriate image settings. Color and shading information will be retained making <b>Scan Color</b> more suitable for photographs. <b>Scan Color</b> may provide better results on some forms having higher levels of detail. The <b>Scan Color</b> button can be pressed repeatedly to scan additional images. Each scan will be stored as a thumbnail on the <b>Scanner</b> page.</p>
	<p>The <b>Rotate</b> button rotates the scanned image 90%. <b>Rotate</b> can be pressed any number of times to bring the image into the desired orientation. This is useful for getting text right-side-up when originals are in landscape mode. Image rotation must be done before the image is saved to the case.</p>
	<p>The <b>Save</b> button saves one or more scanned images (thumbnails) into the case and returns to the <b>Case</b> screen. It is always possible to add more scans by going to the <b>Add To Case</b> screen and pressing the <b>Scanner</b> button.</p>
	<p>The <b>Back</b> button exits from the <b>Scanner</b> screen and returns to the <b>Add To Case</b> screen. If any scans have been obtained, a warning message will appear. If the action is confirmed, the images will be erased.</p>

Once a scan has been initiated, the TWAIN driver displays a pop-up window over the **Scanner** page, as shown in Figure 13. Windows for Models 4490 and 4990 have a different appearance, but offer the same functionality.

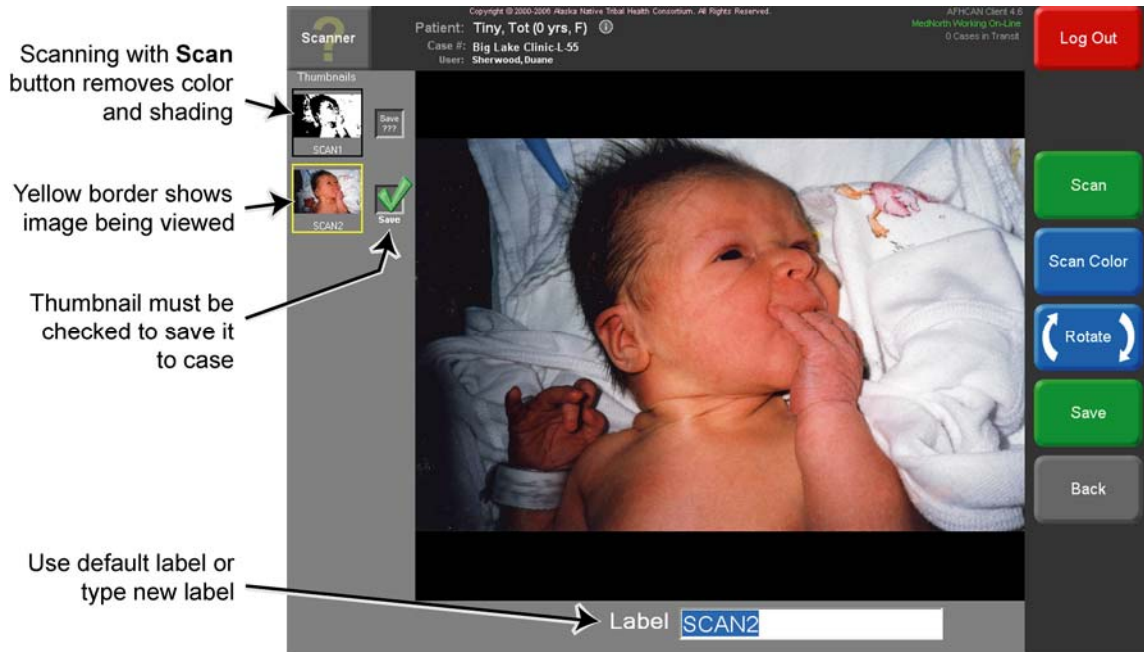


**Figure 13**  
TWAIN driver pop-up screen – preview

The preview function does a quick scan of the original to determine its type and area (image types are listed in Table 1). When actual scanning begins, the TWAIN pop-up has the appearance shown in Figure 14. Figure 15 shows the *Scanner* screen after scans have been obtained.



**Figure 14**  
TWAIN driver pop-up screen – scanning

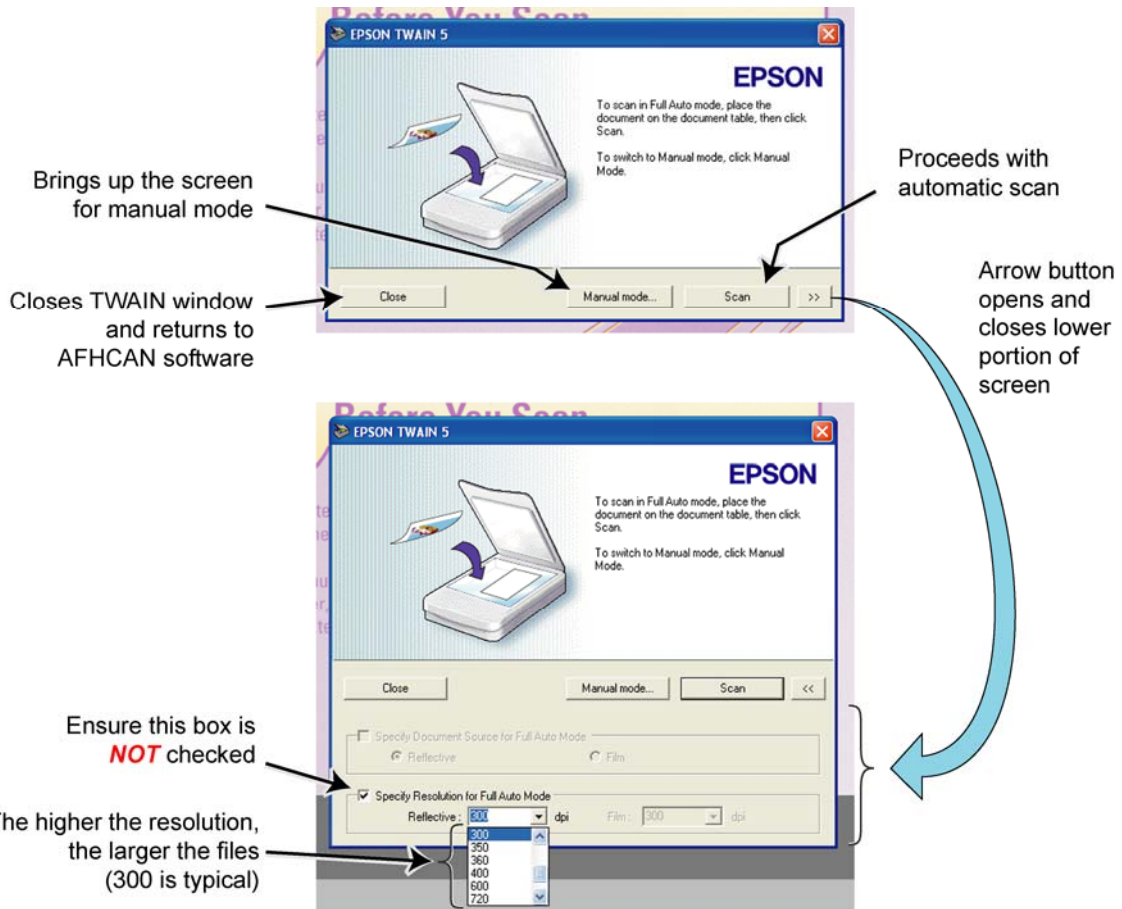


**Figure 15**  
Completed scan

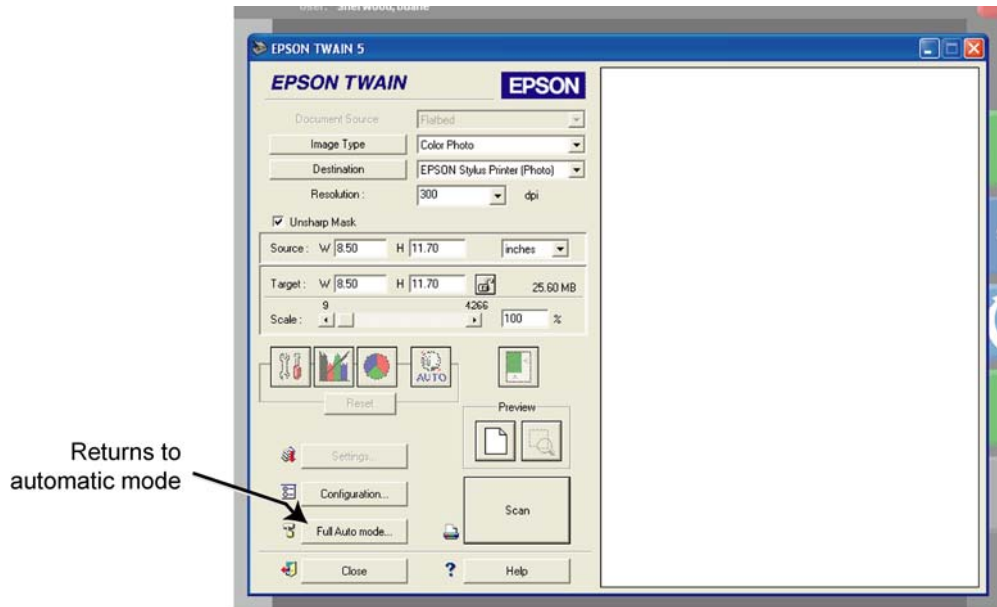
When the scan is completed, a thumbnail of the scan will be added in the left column, and the scanned image will be displayed in the middle area of the screen (Figure 14). All images must be given a name. The AFHCAN software will automatically enter the word SCAN with a sequence number. You can type in a different name manually. At this point, the selected scans can be saved to the case by pressing the **Save** button. To discard all the currently displayed scans, press **Back**.

### 1.1.3.2 Recovering from Manual Mode

As mentioned previously, manual mode is complex and is not recommended for routine scanning. Details on manual mode are beyond the scope of this manual. However, if another user scans with manual mode, you may encounter the TWAIN screens for manual mode when you do a new scan. This is because the software remembers what mode was used last and opens the next scanning session in the same mode. Clicking **Cancel** during preview brings up the screen show in Figure 16. Clicking **Manual Mode** in Figure 16 brings up the screen in Figure 17.



**Figure 16**  
TWAIN screen leading to manual mode

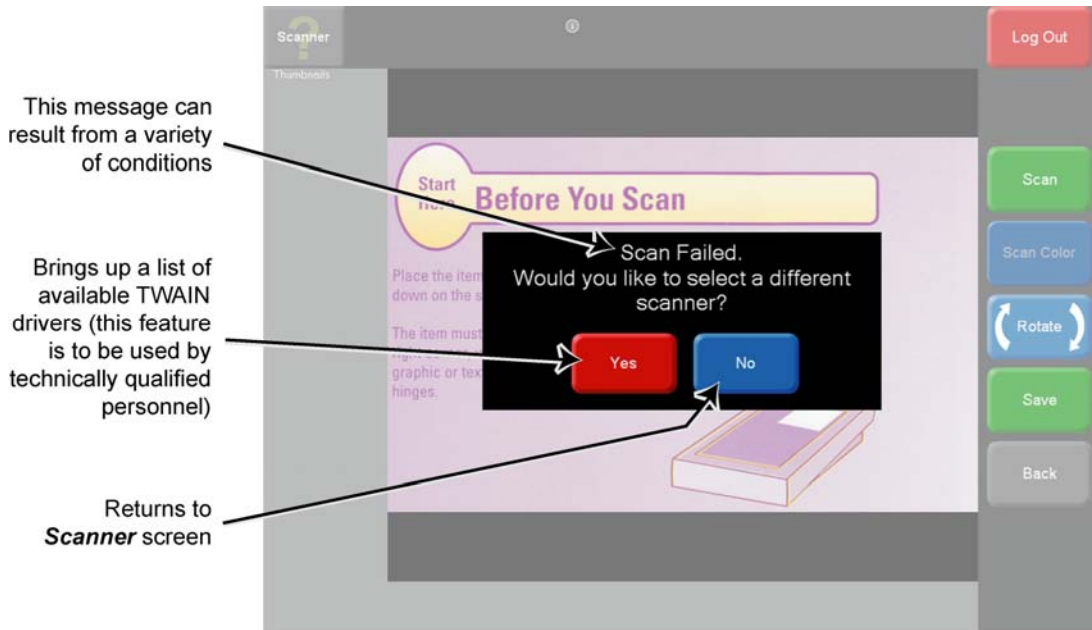


**Figure 17**  
TWAIN manual mode screen

Pressing the **Full Auto mode** button returns to the screen in Figure 16. Pressing **Scan** in Figure 16 returns to the screen in Figure 13.

### 1.1.3.3 Scan Failure

If for any reason the TWAIN driver cannot complete the scan, it will notify the AFHCAN software. The AFHCAN software will display the message shown in Figure 18.



**Figure 18**  
Scan failed message

The TWAIN drivers for various scanners were listed in Table 2. Possible causes of *Scan Failed* error message include but are not limited to the following:

- not placing an original on the document table
- manually cancelling a scan (while not the preferred method, it is possible to cancel a scan during the preview: on the screen shown in Figure 12, push **Cancel**, then on the screen shown in Figure 15, push **Close**)
- scanner power turned off (difficult to do on the V3 Cart)
- a scanner cable has been disconnected (cables are well protected on the V3 Cart)
- an actual malfunction of the scanner (the indicator light will flash red)
- the TWAIN driver does not match the scanner model (the TWAIN driver is selected and tested by qualified personnel when the scanner is installed)

Users may be able to clear this message as follows:

1. click the **Yes** button to view the list of drivers
2. click **OK** to accept the highlighted driver (the correct driver should be established when the system is installed and should not need to be changed)
3. click the **Scan** or **Scan Color** button

If the problem persists, contact AFHCAN Customer Support at 888-449-4435.

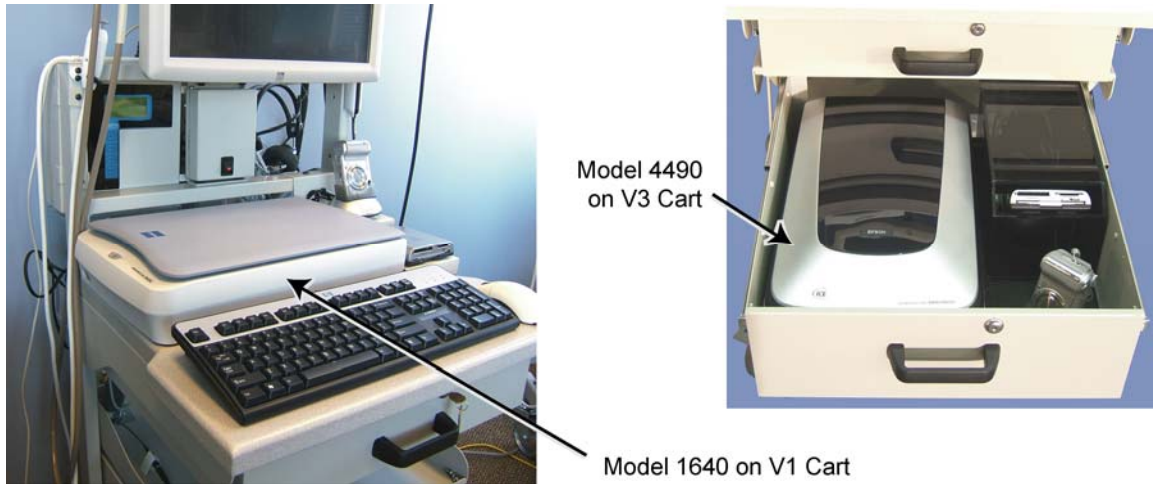
## 1.2 Particulars of the AFHCAN Installation

On the V3 Cart the scanner is in the second drawer (Figure 19). This limits access to the power switch, the cables, and the scanner transport locks. The scanner power switch is normally left on with power to the scanner being controlled via the Cart's main power switch.

The use of equipment options such as a sheet feeder or separate transparency unit are not supported in the AFHCAN installation.

The front panel buttons on the scanners do not interact with the AFHCAN software.

The position of the scanner in the drawer does not permit the scanner cover to be opened to the full 90 degree position. As installed in the second drawer on the V3 Cart, the Model 4490 cover opens to the first detent (about 45 degrees). Scanner covers should not be removed.

**Figure 19**

Scanner as mounted on V1 Cart and V3 Cart

### 1.3 Warnings and Cautions

Please observe the following points:

- Follow all warnings and cautions in the manufacturer's literature provided with the device, as applicable.
- Avoid placing heavy objects on the document table.
- Do not expose the scanner to fluids, except as described in Section 3.
- Avoid scratching glass on document table, and do not use abrasive cleansers or materials to clean it.
- Before opening the scanner cover on the V3 Cart:
  - ensure the upper drawer is fully closed
  - ensure the lower drawer is fully extended
- Open the cover carefully to ensure it does not contact the drawer above it.



## Section 2 – Operation


### 2.1 Scanning


1. From the *Add To Case* screen, press the **Scanner** button.
2. On the V3 Cart, make sure the upper drawer is fully closed and the lower drawer is fully extended.
3. Lift the scanner cover and place the original face down on the document table:
  - the top of the image should be towards the back of the scanner (or the image can be rotated later)
  - the original should be aligned into the right rear corner of the document table
4. On the *Scanner* screen, select the type of scan:
  - for a high-contrast, black and white image, push **Scan**
  - to retain color, shading, and details, push **Scan Color**
5. Observe the TWAIN driver window as it goes through the following steps:
  - a. scanner warming up
  - b. preview
  - c. scan
6. When the scan is complete, the image will appear in the *Scanner* screen. If desired, push the **Rotate** button to rotate the image 90 degrees.
7. Scan additional images, if desired.
8. Click on the checkbox next to each thumbnail image to select or deselect it, and press **Save** to save the selected images into the case.

### 2.2 Restoring Automatic Mode

The following procedure specifically applies to the TWAIN 5 driver supplied with the Model 1640 and 1650 scanners.

In the event that a scan brings up the manual mode screen (see Figure 16), return to automatic mode as follows:

1. Press the **Full Auto mode** button. This returns to the screen in Figure 15.
2. On the screen shown in Figure 15, ensure that the manual setting for resolution is deactivated as follows:
  - a. Press the right arrow button  to expand the lower area of the screen, if necessary.
  - b. If the box by *Specify Resolution for Full Auto Mode* is checked, click on it to remove the checkmark.

- c. Press the left arrow button  to collapse the screen.
3. On the screen in Figure 15 (upper window), press **Scan** to initiate a scan and set automatic mode as the default for the next scan session.

## **Section 3 – Routine Maintenance**

Maintenance is limited to light cleaning.

Clean the exterior of the scanner using a soft, clean cloth dampened with a mild detergent solution.

Clean any paper dust or debris off the glass document table by wiping it gently with a soft, clean dry cloth.

Clean any smudges from the glass document table with a soft, clean cloth lightly dampened with glass cleaner.



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