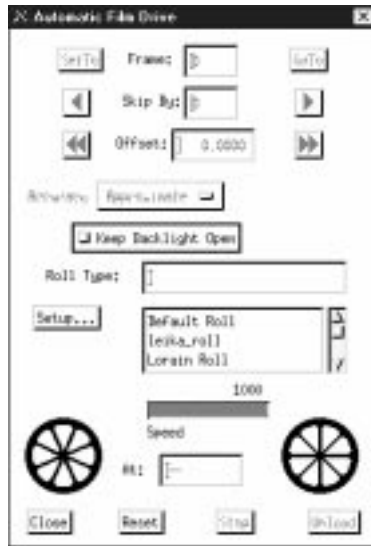


VX4000
Automated Film Drive
(AFD)
and
vxphotolist
USER'S MANUAL

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Manual Conventions



1. **Action Button Text:** This is text on a button that, when clicked with the mouse, will generally cause the software to perform a task, open a different window, or allow the user to choose a parameter (such as “negative” or “diapositive”). All such text will appear in bold, such as **Setup...** in the AFD Main Window.
2. “User interface descriptive text”: This is text that labels a part of the user interface, such as “Roll Type” in the AFD Main Window. Clicking on this text, which will be shown in quotes, will have no effect.
3. ‘Menu item text’: Single quotes around text signifies text that appears either on the menu bar itself or an option when an item on the menu bar is selected. The quotes signal to the user that this is the text that should be chosen to achieve the desired effect, such as opening a window. For example, select ‘Open .phl file’ to gain access to the Open Photo List File Window.
4. Input field: Fields identified by descriptive text, such as “Roll Type”, that can be clicked in and edited by the user.



The Automated Film Drive (AFD) was designed to increase productivity and decrease labor costs by providing automatic and unattended film scanning. AFD includes the following features:

- Film speed - up to 200 feet per minute.
- Accommodates spools up to 1,000 feet, 70 mm to 9.5 inches.
- Spring-loaded universal spindle tips automatically adjust to fit spools.
- Adjustable spindle arm posts make film spool interchange fast and easy.
- Fully programmable - scans film in sequences defined by the user.

vxphotolist was developed to assist the user by simplifying the unattended scanning process. Through vxphotolist the user defines which frames will be scanned and how.

AFD and vxphotolist are valuable tools for the VX4000 series of scanners.

User's Notes

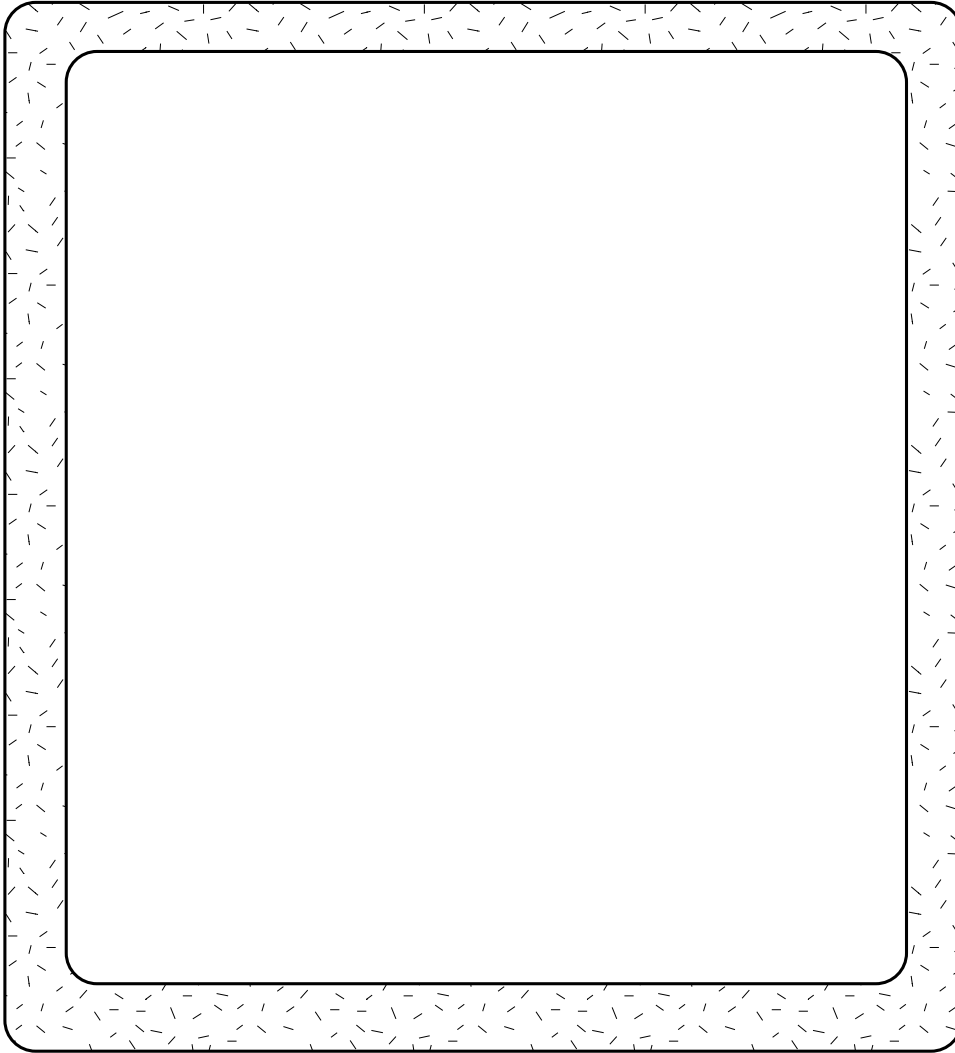


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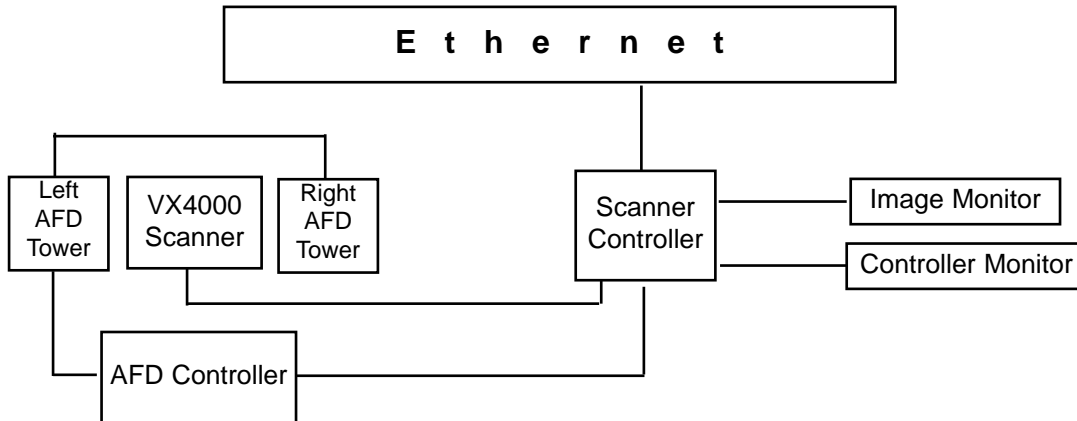
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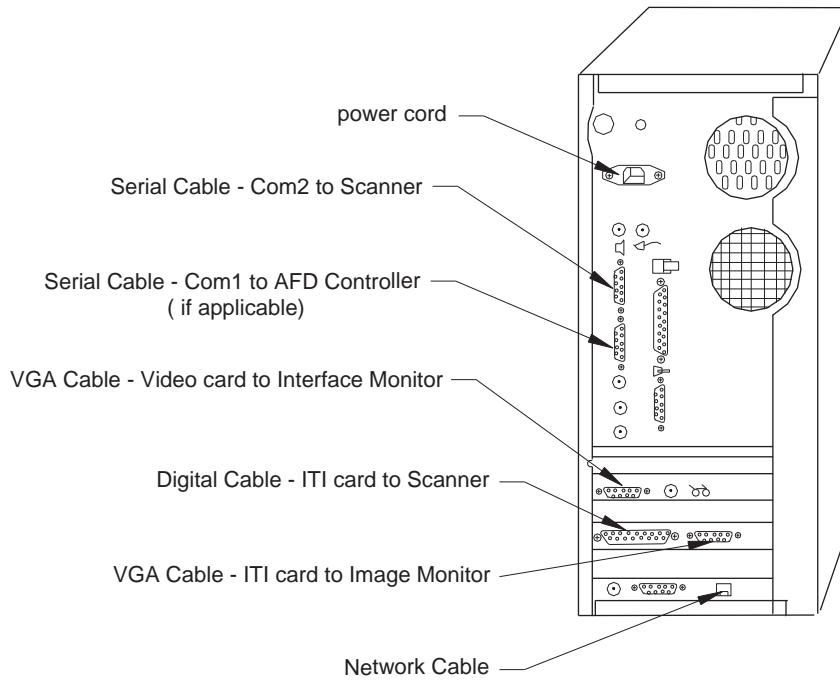
System Configuration

The VX4000 Scanning system with AFD (diagram shown below) is configured with a scanner pc controller, image monitor, controller monitor, scanner, AFD controller and two AFD towers.



- Ethernet** A standard Ethernet network that connects the Scanner Controller to remote network devices (ie; pc, workstation, server).
- Scanner Controller** The component that houses the controlling hardware and software for the VX4000 scanner and the windows NT based formatter.
- Image Monitor** The monitor which displays the live camera view.
- Controller Monitor** The monitor which displays the Window NT, vxscan, and vxphotolist User Interface.
- AFD Controller** The component that houses the controlling hardware for the AFD.
- AFD Towers** The devices that hold the film spools during the scanning process.

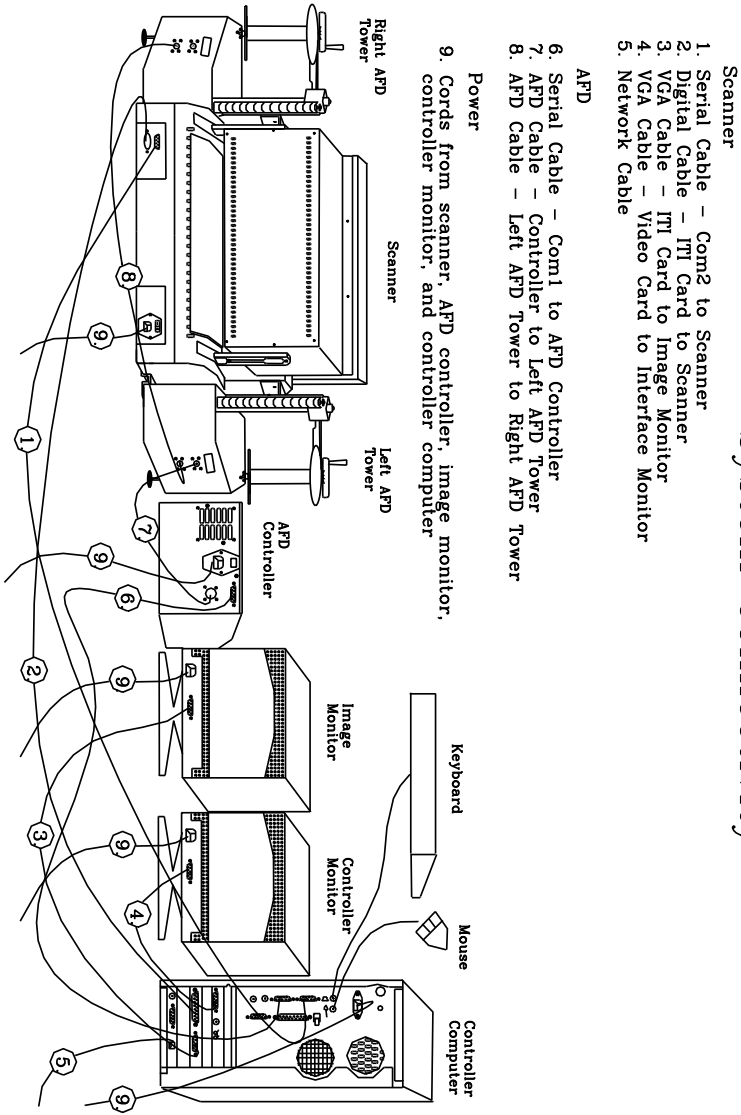
Controller Computer Connectivity



Controller Computer Connectivity
(Figure 1)

System Connectivity

System Connectivity

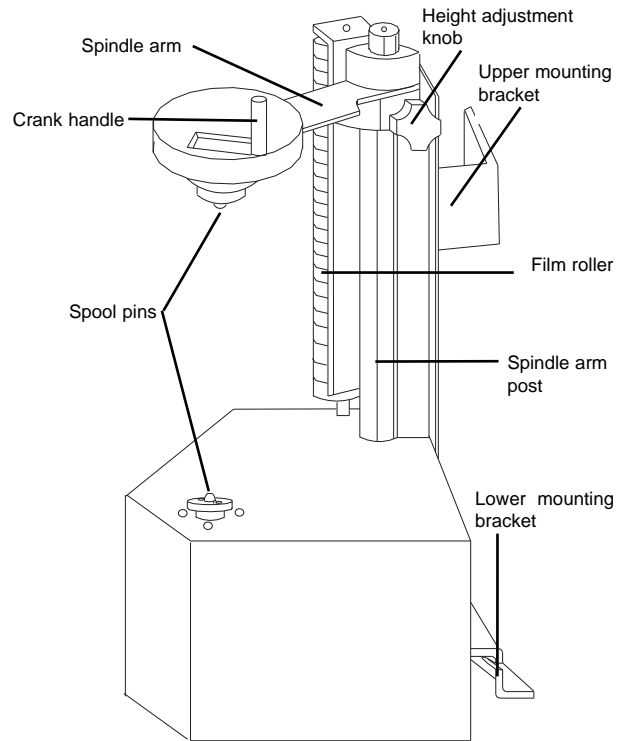


System connectivity
(Figure 2)

AFD Components

The AFD Towers:

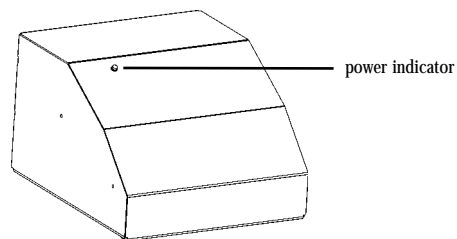
- The left and right towers may be used interchangeably for supply or take up.
- The spool pins ensure the roll is held securely in place during the scanning process.
- The spindle arms swing back and forth, as well as up and down.
- The towers are held securely to the VX 4000 scanner by the upper and lower mounting brackets.



Right AFD Tower
(Figure 3)

AFD Controller :

- The AFD controller not only supplies power, it also houses the controlling electronics used to run the AFD.



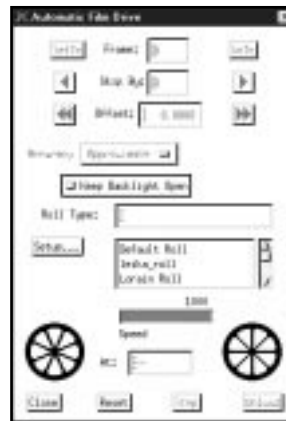
AFD controller
(Figure 4)

AFD & vxphotolist

Step By Step



vxphotolist Window (Figure 5)

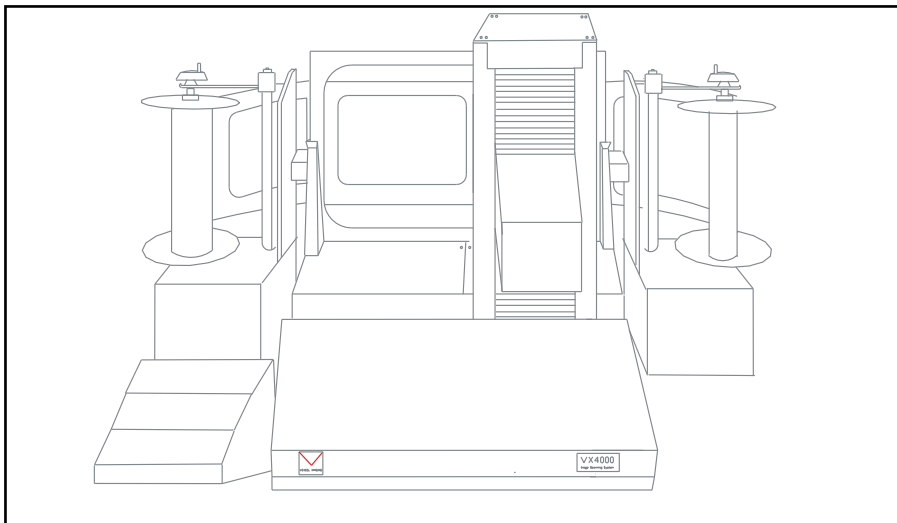


AFD Main Window (Figure 6)

- 1** Load Film.
- 2** Create Photo File.
- 3** AFD Setup.
- 4** Create Photolist File.
- 5** Execute vxphotolist.

STEP 1

Load Film



VX4000 scanning system with Automated Film Drive
(Figure 7)

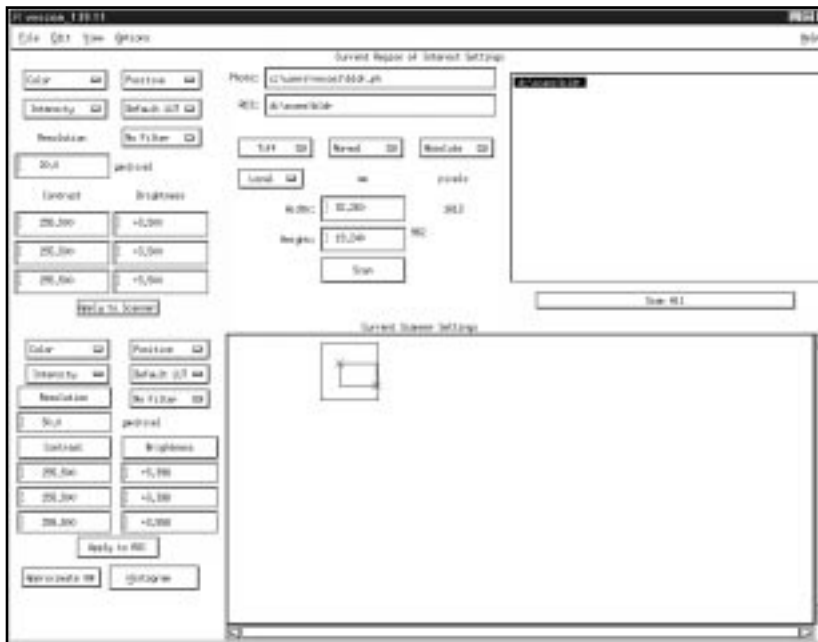
- 1** Place the supply roll on the desired tower, ensuring the film unloads from the back of the roll.
- 2** Place the take up roll on the remaining tower.
- 3** Open the backlight and thread the film through, emulsion side facing the reseau plate.
- 4** Secure the film to the take up roll.
- 5** Advance the film to the desired frame.

▲ AFD Step by Step ▼

STEP 2

Create Photo File

Photo (.ph) files, which are used by vxphotolist, must be created in vxscan.



vxscan Main Window (Figure 8)

- 1 Set up ROI(s).
- 2 Name ROI(s).
- 3 Adjust resolution and radiometric settings.
- 4 Digitize point for relative ROI(s).
- 5 Save .ph file.

STEP 3 Complete AFD Setup

1 Select Roll Type.

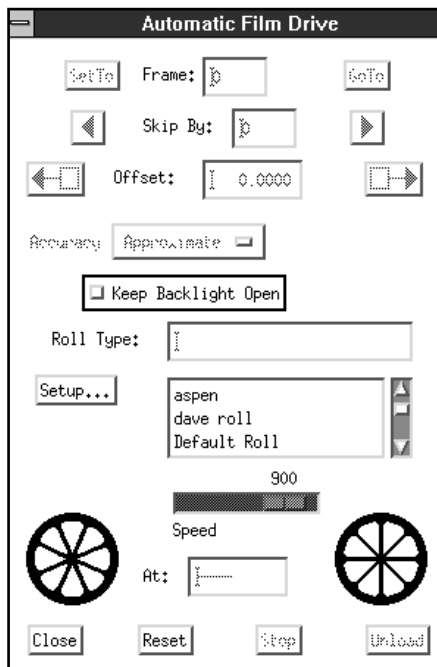
- or -

Create New Roll Type.

- Complete Roll Setup Window.
- Complete Frame Parameters Window.
- Complete Frame Mounting Window.

2 Complete Mounting Parameters Window.

3 Set Frame # in “Frame” input field and update current film position.

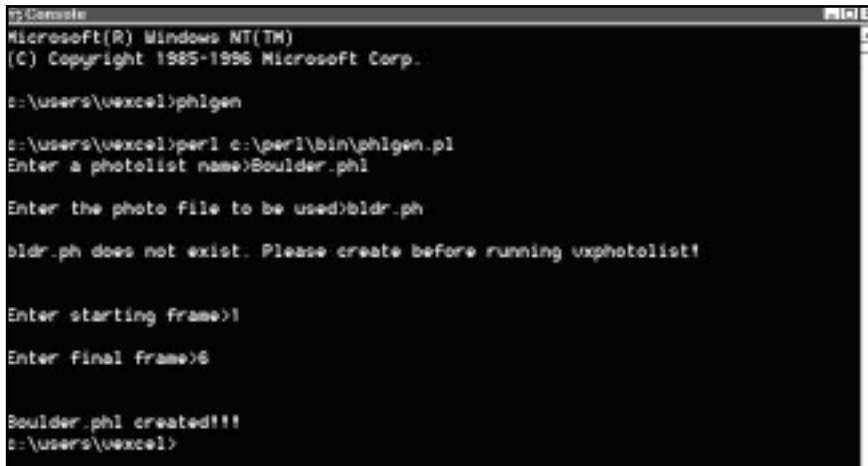


AFD Main Window
(Figure 9)

STEP 4

Create Photolist File

Photolist (.phl) files tell vxphotolist which frames to scan and how they will be scanned. .phl files are created using phlgen, the file generating script.



```
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.

c:\users\uxcel>phlgen

c:\users\uxcel>perl c:\perl\bin\phlgen.pl
Enter a photolist name>Boulder.phl

Enter the photo file to be used>bldr.ph

bldr.ph does not exist. Please create before running vxphotolist!

Enter starting frame>1

Enter final frame>6

Boulder.phl created!!!
c:\users\uxcel>
```

DOS/Console box during phlgen
(Figure 10)

- 1** Run the photolist file generating script (phlgen).
- 2** Name .phl file.
- 3** Designate frame numbers and .ph file(s).

STEP 5

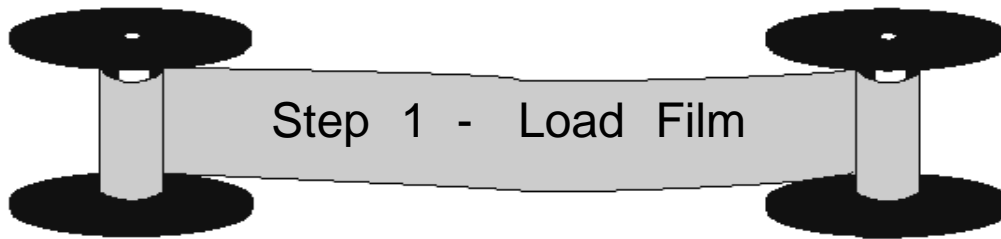
Execute vxphotolist

- 1** Open .phl file.
- 2** Select frame number, overwrite, and .ph file options.
- 3** Start scanning.



vxphotolist Window
(Figure 11)

▲ Step 1 - Load Film ▼



STEP 1
LOAD FILM

1.1 Mount Film Rolls

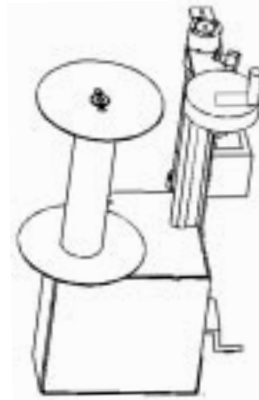
Turn the height adjustment knob to loosen the spindle arm. This will allow the spindle arm to move up and down.

Move the spindle arm to the top of the spindle arm post. Once the arm reaches the top it will swing freely, and 'open', allowing the spool to be placed on the tower. (Figure 12)

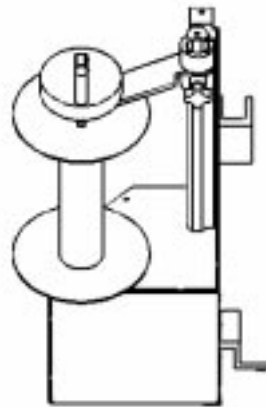
Lower the spool onto the bottom spindle tip ensuring that the film will unroll from the back, with the emulsion side facing the reseau plate. Turn the spool and listen for the pins to "click" into place.

Lower the spindle arm assembly onto the spool until it closes over, or drops down onto, the spool. (Figure 13) Using the crank handle, turn the roll until the top pins "click" into place.

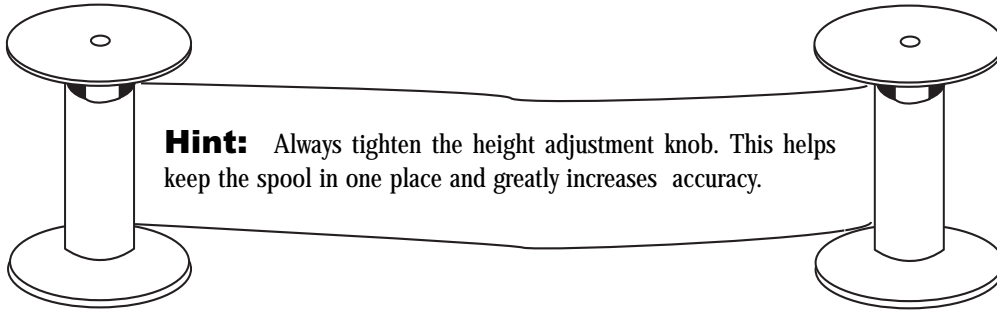
Repeat this process for the other spool.



Spindle arm 'open'
(Figure 12)



Spindle arm 'closed'
(Figure 13)

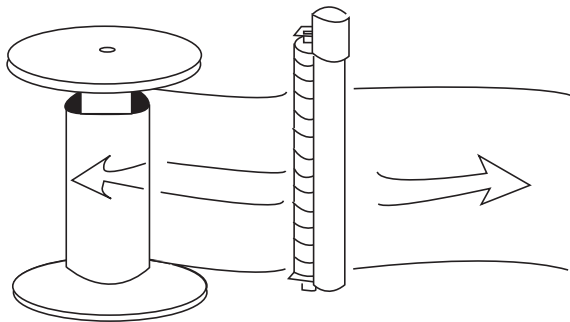


Hint: Always tighten the height adjustment knob. This helps keep the spool in one place and greatly increases accuracy.

1.2 Unload the Spools

Open the backlight, pushing it away from the scanner. The backlight mechanism is stiff and may require a firm push to open.

Unroll the film by running it behind the roller.

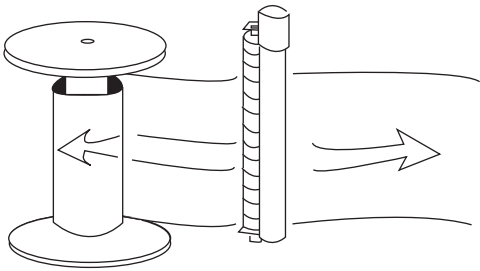


Film running behind roller
(Figure 14)

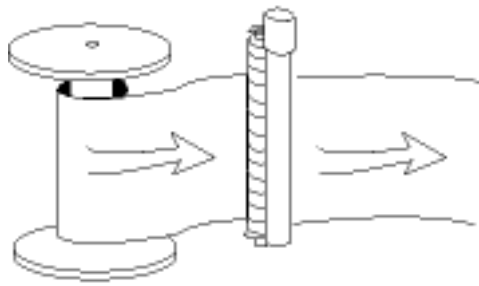
▲ Step 1 - Load Film ▼

Be sure the film loads and unloads from the back of the roll and not the front.

STEP 1
LOAD FILM



Film unloading from back - correct
(Figure 15)



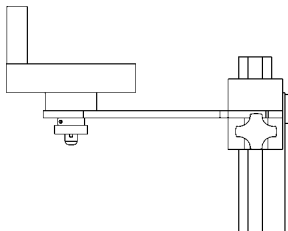
Film unloading from front - incorrect
(Figure 16)

Thread the film between the backlight and the reseau plate.

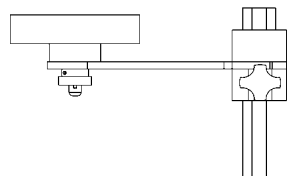
Wrap the film around the take-up reel using a friction wrap. A friction wrap simply requires the user to wrap the film around itself several times until the film is securely held in place.

1.3 Reel the Film

Use the crank handle to reel the film manually. To set the handle in an upright position, simply pull it up until it 'snaps' into place. To return it to the down position, first pull up on the handle then set it down.

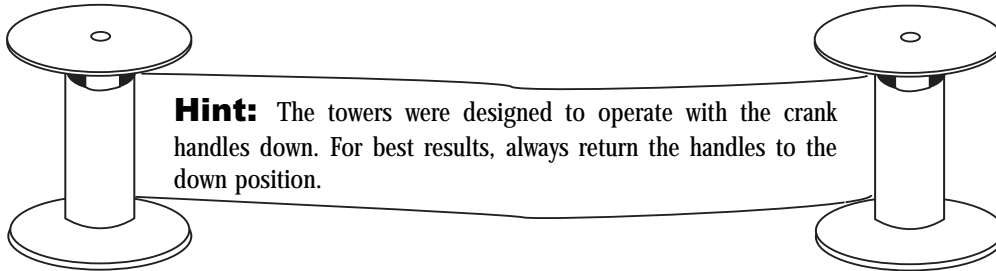


Handle in the 'up' position
(Figure 17)

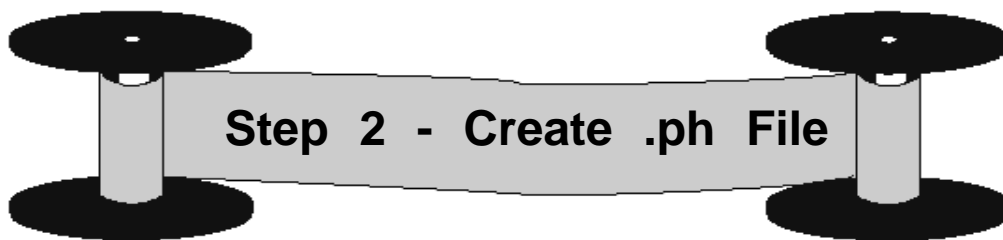


Handle in the 'down' position
(Figure 18)

NOTE: Tension will occur if the film is reeled more than ten frames making it difficult to continue reeling. Pausing momentarily will ease the tension and allow the film to be advanced



Hint: The towers were designed to operate with the crank handles down. For best results, always return the handles to the down position.



2.1 .ph File Overview

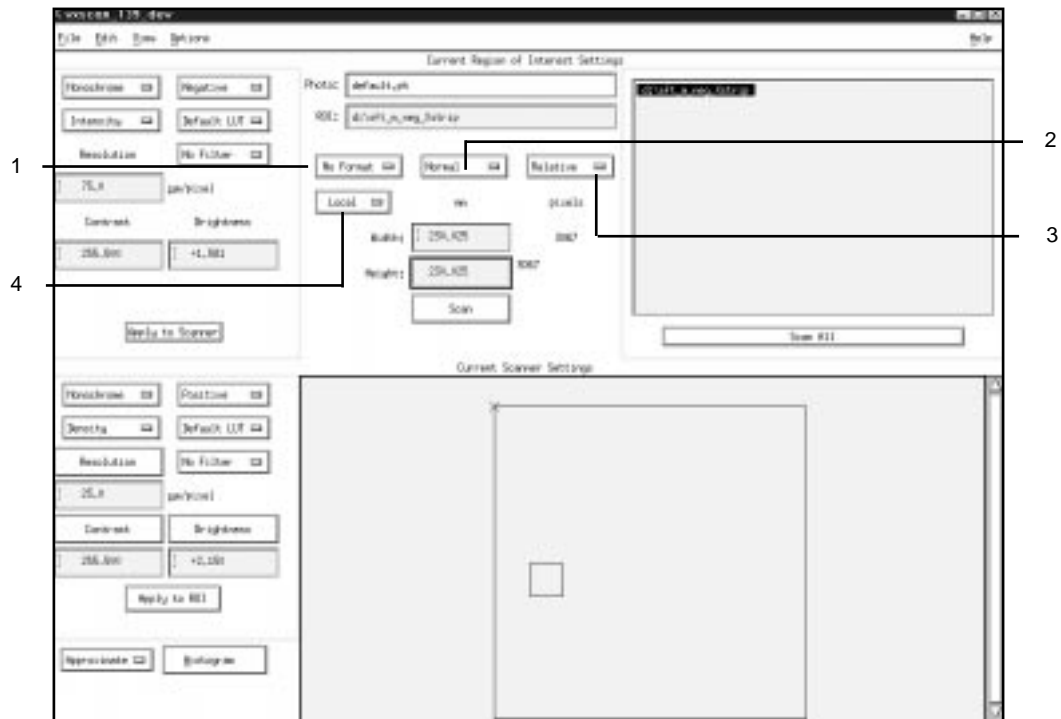
.ph files, which are created in vxscan, contain the following information:

- Placement of ROI(s)
- Radiometry of the ROI(s)
- Resolution
- Location of any point(s) digitized through the Acquire Points function.

Once saved, .ph files are combined with frame numbers to create the .phl files required by vxphotolist. This section will describe briefly the steps necessary to create a .ph file. More detailed instructions and definitions can be found in the VX4000 User's Manual. For best results it is recommended the VX4000 User's Manual be read thoroughly prior to this manual.

2.2 Establish an ROI

The first step in creating a .ph file is to establish the ROI(s). Move the camera to the top left corner of the image centered in the backplane. Place the pointer on the top left corner of the red ROI box and move it until it is positioned where desired. Click on the bottom right corner to stretch the ROI to the desired size. - or - If the size of the ROI is already known, simply enter the dimensions in the width and height fields (for instance 230 mm x 230 mm for full frame scan).



vxscan main menu
(Figure 19)

2.3 Verify Current ROI Settings

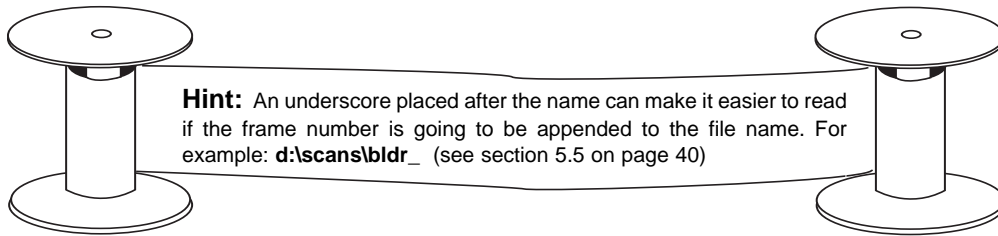
Prior to naming the ROI, the user should verify the following ROI settings:

1. Select desired format (ie, Tiff, BSF, No Format, etc.)
2. Designate the orientation of the scan with respect to the source image (Normal/Mirrored).
3. **Must always be set to relative.**
4. Designate formatter (Local/Remote).

Note: The above configuration is an example, all settings can vary except **relative**.

2.4 Name ROI

Click in the “ROI” input field. The Prompt_popup Window will appear automatically. Use the delete or backspace keys to delete any existing name that may already be in the window. Type an absolute path name for the Region of Interest. (eg: **d:\scans\bldr**) The path designated when naming the ROI indicates where images will be stored when the scanning process has been completed.



STEP 2
CREATE .PH FILE

2.5 Adjust Radiometry

Move the camera to the brightest area in the image. Enter the resolution that will be used on the scan in the “Resolution” input field in the lower left hand side of the vxscan main screen. Click on the **Histogram** button to bring up a histogram where the gray level is represented horizontally and the number of pixels is represented vertically. Use the slide bars on the right hand side to adjust the brightness. If desired, the gray level settings can be edited manually by clicking within the brightness or contrast fields. The histogram will be automatically updated.

Move the camera to the darkest region of the image so that the Contrast can be adjusted. Use the slide bar on the left hand side of the histogram to make any necessary adjustments.

Once satisfied with the settings, close the Histogram and select the **Apply to ROI** button so that the setting will be applied to the newly created ROI.

For additional assistance, refer to the VX4000 User’s Manual.

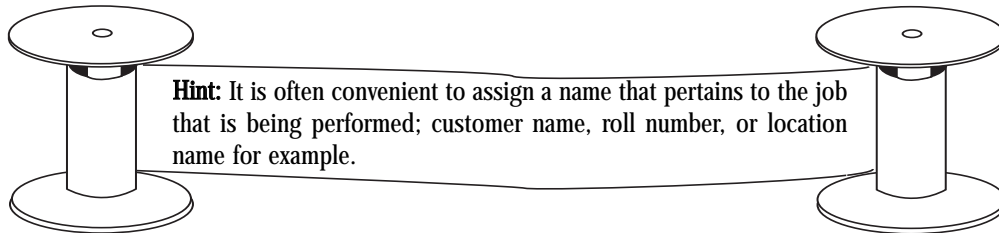
2.6 Digitize Point(s)

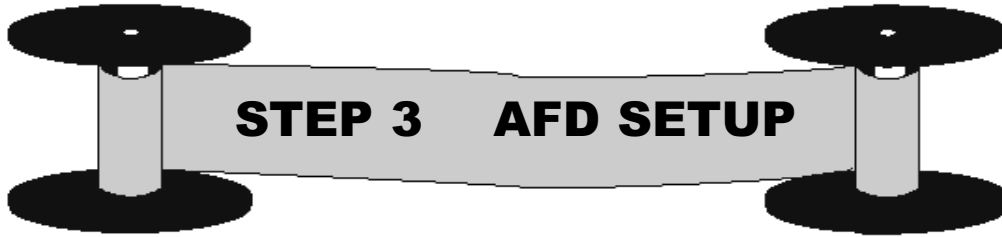
From the Edit menu, select 'Acquire Points'. This brings up the Acquire Point Window. Ensure **Template** has been selected. Move the camera to the upper left corner point of the ROI. Place the mouse pointer over the desired point and digitize it by clicking on the point using the left mouse button. An asterisk will appear next to the point name in the Acquire Points Window. When scanning in edge mode, the user must digitize at least one point, when scanning in Fiducial mode, at least four fiducials must be digitized. Once satisfied, click on **OK**.

Note: This process must be performed while in Accurate Mode.

2.7 Save .ph File

From the Menu Bar, select File, then 'Save as'. Type the desired name in the "Selection" input field and click on **OK** to complete the process. Photo files are denoted by a .ph extension.





3.1 AFD Main Window and Setup Flow

The AFD Main Window allows the user to give the application all of the physical information about the roll of film to be scanned. This information is broken down into Three categories: Roll Setup, Frame Setup, and Frame Finding.

Roll Setup information includes:

- Spindle diameters
- Film thickness
- Frame spacing
- Default offset
- Default speed
- Frame type
- Accuracy

Frame Setup information includes:

- Frame size
- Exposure type
- Camera database file
- Edge region locations (up to 16 per image)

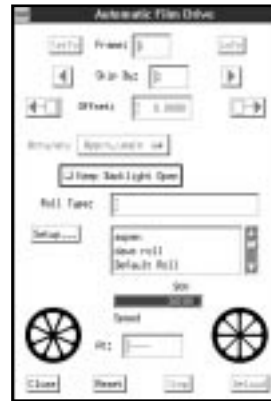
Frame Finding information includes:

- Scanner resolution
- Scanner brightness
- Scanner contrast
- Rotation
- Mirrored or normal

**STEP 3
AFD SETUP**

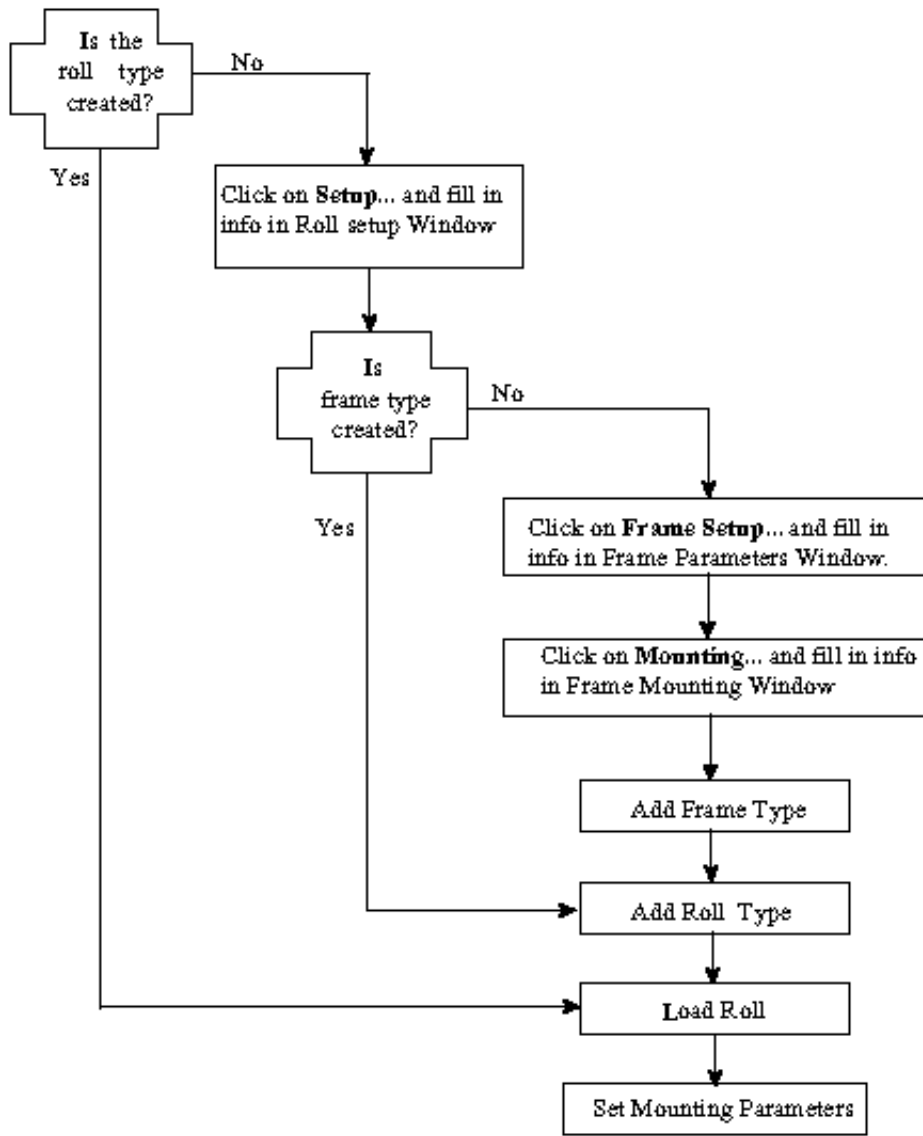
Although the AFD Main Window appears when vxphotolist is started, it is suggested that the AFD setup be performed while in vxscan. While completing the AFD setup it is sometimes necessary to adjust the radiometry. If vxscan is open these adjustments can be made immediately. Otherwise, the user would have to exit vxphotolist, open vxscan, and then return to vxphotolist.

To access the AFD Main Window from vxscan select 'Options' from the vxscan menu bar. If 'Automated Film Roll...' is grayed out, select 'Set Preferences'. In the Set Preferences Window, click on the "Use Film Drive" check box. Then, back under 'Options', choose "Automated Roll...".



AFD Main Window (Figure 20)

AFD Setup Flowchart



(Figure 21)

▲ Step 3 - AFD Setup ▼

3.2 Roll Setup Window

If the desired roll type already exists, enter the name in the “Roll Type:” input field on the AFD Main Window. An existing roll type can also be selected from the input field directly below the “Roll Type” input field by clicking on the desired name. Once a roll type is selected, the Mounting Parameters Window automatically appears (refer to section 3.6) and the user may proceed. If a new roll type must be created, the Roll Setup, Frame Parameters, and Frame Mounting Windows will need to be completed before proceeding on to the Mounting Parameters Window..

Click on the **Setup** button to bring up the Roll Setup Window (Figure 22).

The default values in the “Left Spindle Diam(mm):” and “Right Spindle Diam(mm):” are generally good for any photography spindle and need not be changed.

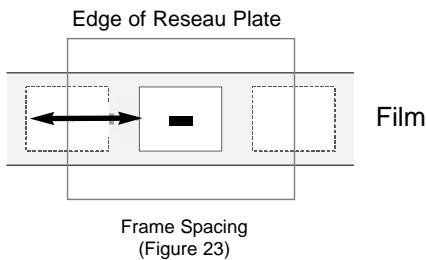
“Film Thickness” can be measured by the user after a Roll Type has been selected (see section 3.6)

Frame Spacing refers to the distance from the left edge of one image to the left edge of the next image. The user should measure this distance and fill in the “Frame Spacing (mm)” input field. These distances can be measured manually by placing a measuring stick or tape in front of the reseau glass, or digitally using vxscan.



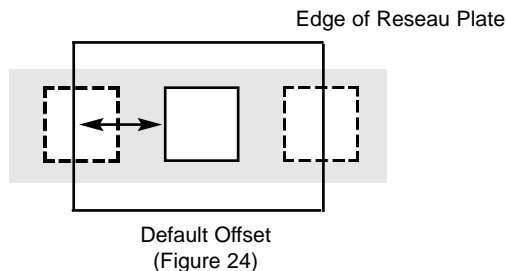
Roll Setup Window
(Figure 22)

STEP 3
AFD SETUP



To measure digitally, first set two images in the backplane. Then, in vxscan, place the camera so that the left edge of the left image is visible on the image monitor. Select 'Options' from the Menu Bar and click on 'Set Preferences'. In the Preferences Window, click on "Size in mm/inches". Draw an ROI in the vxscan Main Window that starts at the left edge of the left image and stretch it to the left edge of a neighboring image. Use the image monitor to ensure that the ROI is accurately placed on the edges of the images. The top middle section of the vxscan Main Window will contain information on the width and height of the ROI created. Use the "Width" value given for frame spacing.

"Default Offset" refers to the distance from the left edge of the backplane to the left edge of the target image. The default value, 150 mm, assumes the user has placed the target image in the center of the backplane.



The "Default Speed:" input field is used to designate the speed at which AFD will automatically move the film in millimeters per second. The speed can be adjusted here, or later from the AFD Main window.

"Accuracy" refers to the method that will be used to find the frames during the scanning process. Clicking on the button to the right of this option brings up three options: "Approximate", "Edge of Film", and "Fiducials". The degree of accuracy varies with each method.

- The **Approximate** mode is the fastest of the three but has the lowest level of accuracy.
- If **Edge of Film** mode is selected, AFD will use the contrast between the developed and undeveloped film as a means for finding the edges of the frame. As the film advances, the application will automatically check the film to make sure that the edges are where they are supposed to be. The values used to advance the film will

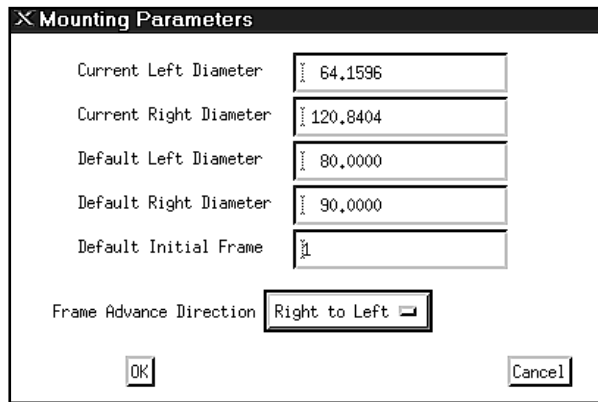
▲ Step 3 - AFD Setup ▼

be adjusted throughout the scanning process to take into consideration any discrepancies. This method is the most frequently used.

- **Fiducial** mode is the most accurate frame finding method. The higher accuracy requires additional time.

3.3 Default Mounting Parameters Window

Clicking on the **Default Mounting** button will bring up the Default Mounting Parameters Window as shown in Figure 25. Through this window the user is able to define default values for the left and right spindle diameters, as well as the “Frame Advance Direction”. Frame Advance Direction will be discussed in more detail in section 3.6, Mounting Parameters.



Default Mounting Parameter Window
(Figure 25)

STEP 3
AFD SETUP

The next step in the setup process is to complete the Frame Setup Window. Click on **Frame Setup...** to bring up the Frame Parameters Window.

3.4 Frame Parameters Window

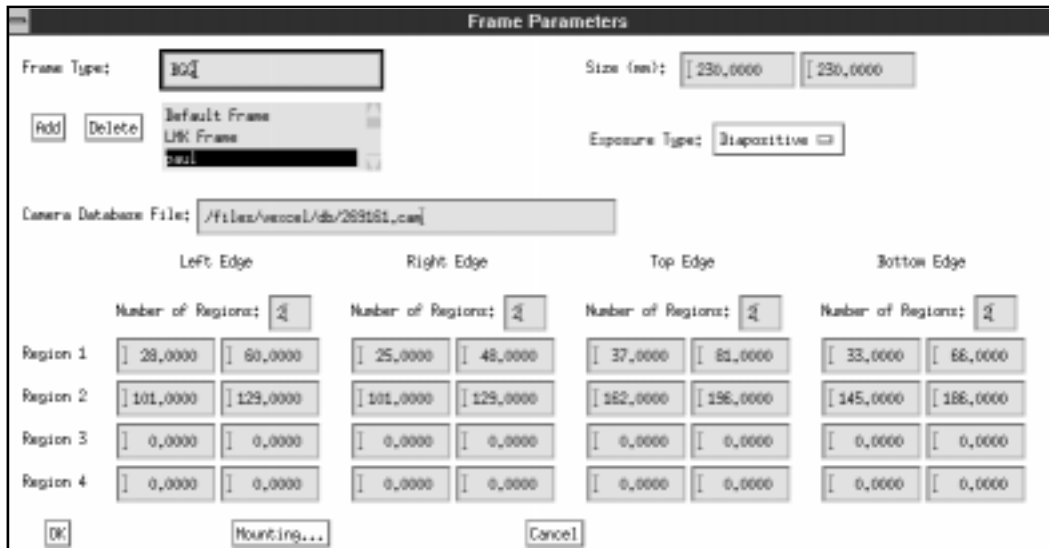
If an existing frame was selected in the Roll Setup Window the Frame Type input field will automatically display that frame type. The “Frame Type” text list, located below the input field, shows all existing frame types. If a frame type was not selected earlier, the “Frame Type” input field will be empty when the window appears. The **Add** button will be used to add the new frame type when all relevant input field have been verified and/or edited. The **Delete** button can be used on frame types that are no longer needed.

The “Size (mm)” input fields contain the x and y measurements of the image in millimeters.

Click on the button next to “Exposure Type” to define whether the film is Negative or Diapositive. If the film around the edges is clear, Negative is the appropriate choice. If the film around the images is opaque, then Diapositive is the appropriate choice.

The “Camera Database File” input field is only required when using fiducial mode.

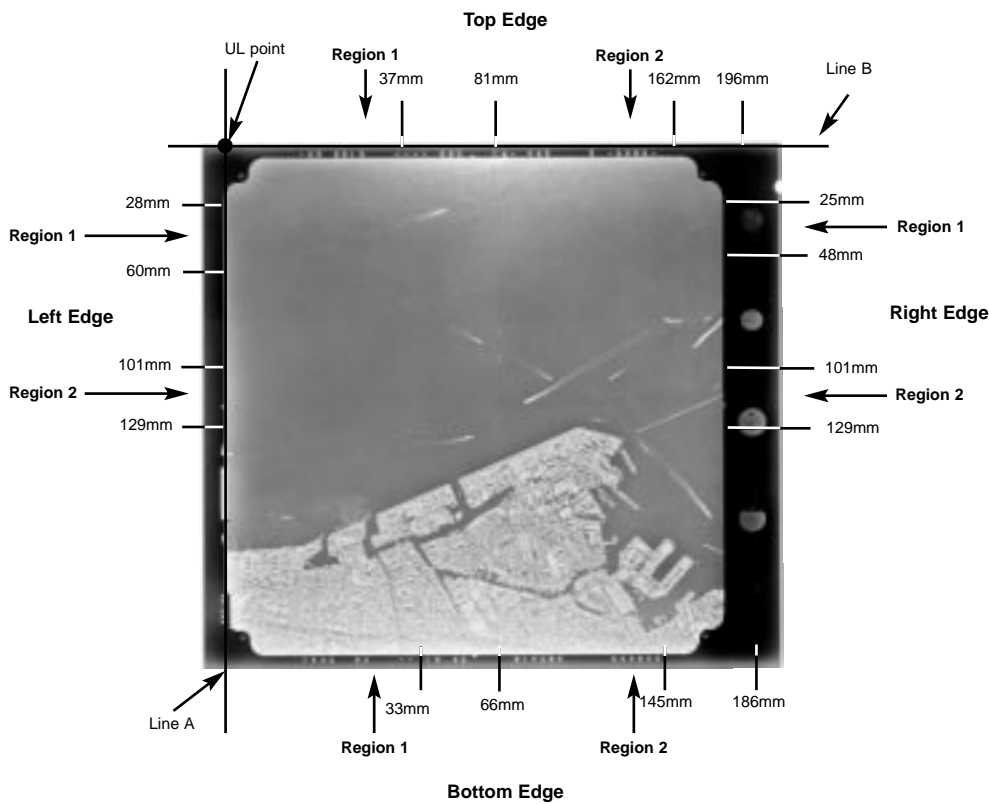
STEP 3
AFD SETUP



Frame Parameters Window
(Figure 26)

▲ Step 3 - AFD Setup ▼

The input fields in the bottom of the Frame Parameters Window contain values that tell the program where to look for the edges of the image. One to four regions per edge are allowed. While increasing the number of regions defined increases the time taken to find the edges, it does not necessarily increase accuracy. The regions are determined by taking the values of the endpoints of the regions as established from the intersection of lines A & B at the UL point (Upper Left-hand) in Figure 5. The edge of the image between the two endpoints of a region must be a straight line uninterrupted by anything such as writing on the film or faults in the film itself. Any deviation of the straight line between the image and the surrounding unimaged film will result in the application being unable to use that region to establish the position of that edge. Currently, defining only one region per edge is recommended. Once the region(s) have been defined, click on **Mounting...** to bring up the Frame Mounting Window.

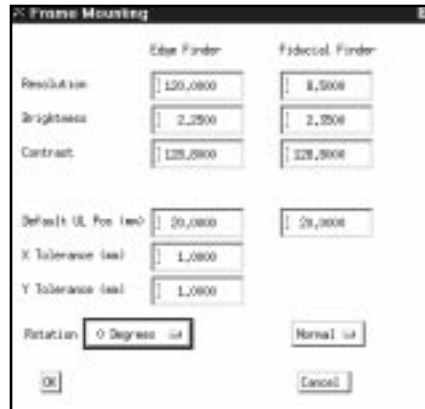


Defining regions in the Frame Parameters Window
(Figure 27)

STEP 3
AFD SETUP

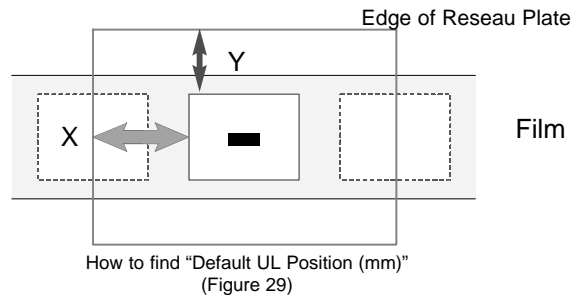
3.5 Frame Mounting Window

The six input fields at the top of the window are designed to help the user if the application is unable to find the edges or the fiducials when attempting to locate an image. If the application is having difficulties finding the edges, the values in the first column can be adjusted. For problems finding fiducials, the values in the second column can be adjusted.



Frame Mounting Window
(Figure 28)

The values in “Default UL Pos (mm)” input fields are used to identify the point which is located at the upper left hand side of the image. These values need to be measured for and filled in. The X value can be found by measuring the distance from inside the left end of reseau plate to the left edge of the target image. The Y value is found by measuring from the top of the reseau plate to the top edge of the target image (see Figure 30). These values can be found in the same way as the values for “Frame Spacing” were found; either manually using a measuring tape or stick, or digitally using vxscan. Be sure to use the “Height” value for Y when measuring from the top of the active area to the top edge of the target image. Also, when finding the UL point manually, be sure to measure from the lighted backplane, which starts approximately 1.3 cm from the edge of the reseau glass.



NOTE: For a 9x9 image the default values will need no adjustments

The value in the “X tolerance field” represents the degree of error relative to the established X axis that the program will use when trying to identify the left and right edges. The value in the “Y tolerance field” designates the degree of error allowed when searching for the top and bottom edges.

3.5.1 How it works...

The application finds the edges by first establishing the UL point as entered by the user in the Frame Mounting Window (Figure 29). Then, it will look to either side of the established axes by the amount entered in the “X Tolerance” and “Y Tolerance” text boxes in the Frame Mounting Window. Within that area, the program will establish the position of the edge of the film by looking for sharp contrast in a straight line between the imaged and non-imaged film. On the image monitor, a red line will be drawn where the edge has been located.

Once you have finished filling in the “Default UL Pos (mm)” input fields, (and others if necessary), click on **OK** to return to the Frame Parameters Window.

3.6 Completing AFD Setup

At this point the Frame Parameters Window should be complete. Click in the “Frame Type” input field and use the backspace or delete key to delete the current entry. Type in a name for the newly created Frame Type. Click on **Add** to save the settings under the given name in the “Frame Type:” input field. Then click on **OK** to exit the window. This will bring up the Roll Setup Window.

Near the bottom of the Roll Setup Window is the “Frame Type” input field. Just below it is a window that contains the names of previously saved frame types. Among them should be the frame type just created and saved in the Frame Type Window. Clicking on the name will bring it up in the “Frame Type” input field.

All of the settings for a new roll type are now complete! All that remains is to name and save the settings. At the bottom of the window, enter a new name for the roll type that was just created in the “Roll Type” input field. Click on **Add** to save the settings under the new

name in the roll type list below the "Roll Type" input field. Click on **OK** to exit the window and return to the AFD Main Window.

Once in the AFD Main Window, select the newly created roll type by clicking on it in the Roll Type text list. Filling in the "Roll Type" input field causes the Mounting Parameters Window to automatically appear.

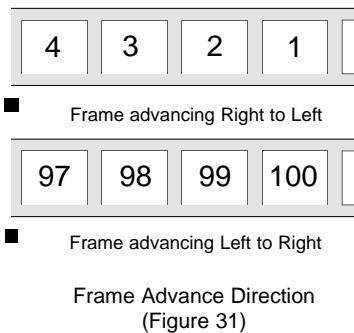
3.7 Mounting Parameters Window

The Mounting Parameters Window (shown in Figure 31) allows the user to determine the film thickness, as well as the frame advance direction. To use the default settings, click on **Use Default**. Unless edited, this number will always appear for the selected Roll Type.



Mounting Parameters Window
(Figure 30)

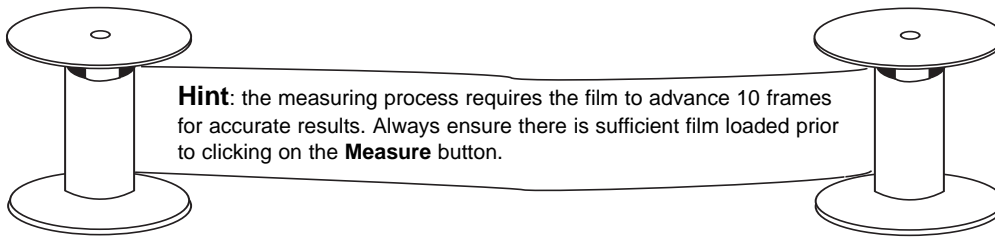
Frame Advance Direction refers to whether the frame numbers increase or decrease as the film advances. Assume the loaded film is always placed on the left tower. If the first frame number is number 1, and the frames increase as the film advances, select **Right to Left**. If however, the first frame is number 100, and the subsequent numbers decrease (99,98,97) then **Left to Right** would be the correct button to select.



Frame Advance Direction
(Figure 31)

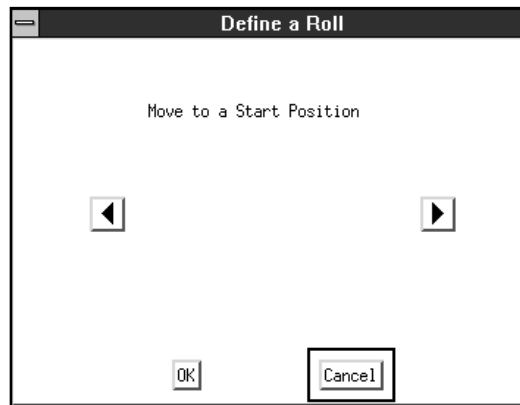
▲ Step 3 - AFD Setup ▼

If the measurements of the roll mounted are not known, click on **Measure** to have AFD begin the measuring process.



Click on **Measure** to bring up the first Define a Roll Window (Figure 32). It prompts the user to “Move to Start Position”. To do this align an edge or fiducial marks of any frame with the left edge of the reseau glass. This can be done by turning the crank handles on the spindle arms. Once it is aligned, click on **OK**.

STEP 3
AFD SETUP

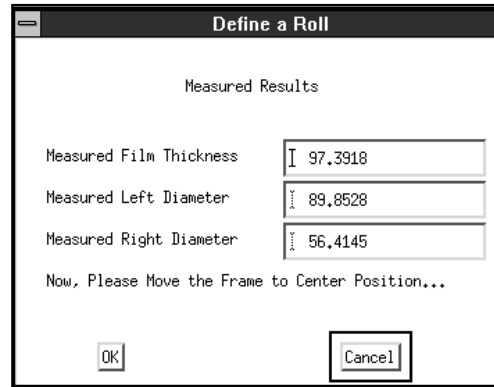


Define a Roll Window
(Figure 32)

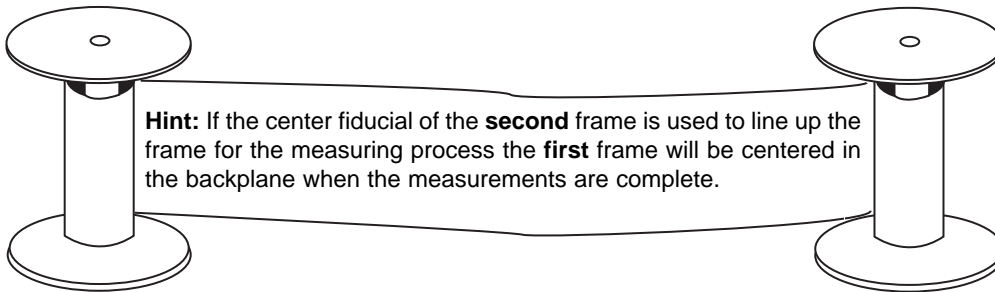
A similar window will then prompt the user to “Move to End Position”. To do this, follow the same procedure as for moving to the ‘start position’, aligning the *same edge, or fiducial marks* of the *image used when defining the start position*, with the *right* edge of the reseau glass.

After **OK** is clicked on the second Define a Roll Window, the application will advance the film ten frames in the direction the film was moved to arrive at the “end position”. Then the film will be returned to the original position.

Once this is done, The Measured Results Window (Figure 33) automatically appears and displays the measurements obtained for film thickness and the diameters of the left and right film spools with the film loaded. It will also prompt the user to move the first frame of the project to the center of the backplane.



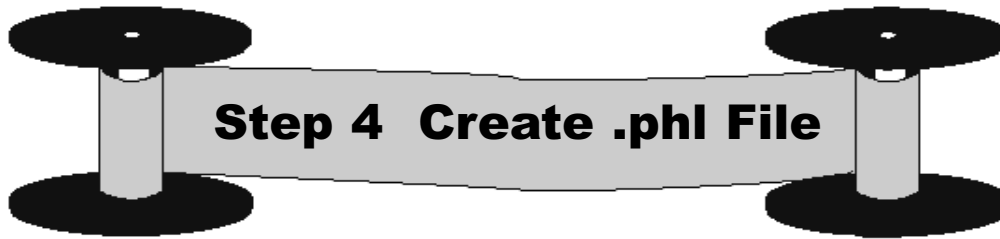
Measured Results Window
(Figure 33)



Clicking on **OK** will close the window and bring the user back to the AFD Main Window.

3.8 Verify Frame Number

Once the “Roll Type” has been selected, and the mounting parameters verified, the user needs to ensure that the starting frame number has been defined. In the “Frame” input field, located in the upper center of the AFD Main Window, type in the number of the frame which is currently centered in the backplane. Next, click on **Set To**, which is located directly to the left of the “Frame” input field. Verify the frame number has been set correctly, as well as verifying the correct number also appears in the “At” input field at the bottom of the window. AFD setup is now complete.



4.1 .phl File Overview

Photolist (.phl) files define which frames will be scanned and how they will be scanned. These files must be created before vxphotolist can be executed. Photolist files can be created either by running the photolist file generating script (phlgen), or by manually typing them using any text editor. Using phlgen is the recommended method and will be discussed in detail in this chapter. A description on creating .phl files using a text editor can be found in Appendix I.

Information Included in .phl files:

- What frames to scan
- How to scan each frame (.ph file)

4.2 .phl File Configuration

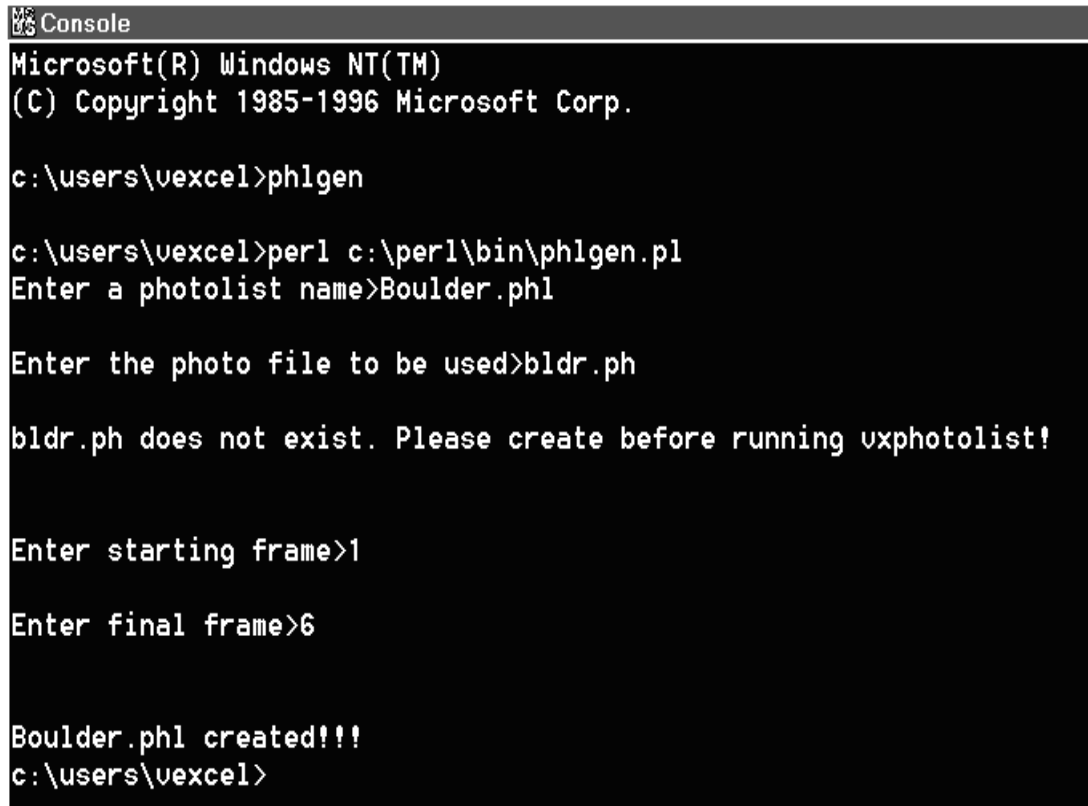
All .phl files have a standard format as follows:
PH <path and photo file> <frame number>

The entry PH is constant at the beginning of every new line and does not change. The <path and photo file> contains the path and name of the photo file which will be used to scan <frame number>, the frame number on the roll of film.

STEP 4
CREATE .PHL FILE

4.3 Using phlgen

To start the photolist file generating script, type “phlgen” in the DOS/Console box from the vexcel home directory c:\users\vexcel. The initial start up prompt, “Enter a photolist name” will appear. Once started, phlgen will prompt the user for all information necessary to create the .phl file.



```
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.

c:\users\vexcel>phlgen

c:\users\vexcel>perl c:\perl\bin\phlgen.pl
Enter a photolist name>Boulder.phl

Enter the photo file to be used>bldr.ph

bldr.ph does not exist. Please create before running vxphotolist!

Enter starting frame>1

Enter final frame>6

Boulder.phl created!!!
c:\users\vexcel>
```

Example of photolist file generation script
(Figure 34)

Note : It is necessary to use .phl and .ph extensions when using phlgen.

4.4 Creating a .phl File

Phlgen allows the user flexibility in selecting which frames will be scanned, as well as which .ph file will be used to scan each frame. The following sections demonstrate the options currently available when using phlgen.

4.4.1 Consecutive Scanning .phl Files

To create a .phl file which scans all consecutive frames from the starting frame to the final frame the .phl file would be created as follows:

Prompt	Action	Example
c:\users\vexcel>	Type phlgen in the DOS/Console box.	phlgen
“Enter a photo list name”	Type in the name desired for the .phl to be created.	Boulder.phl
“Enter the photo file to be used”	Type in the absolute path of the photo file to be used.	C:\users\vexcel\test\bldr.ph
“Enter the starting frame”	Type in the number of the frame which will be scanned first.	1
“Enter the final frame”	Type in the number of the frame which will be scanned last.	6
“Boulder.phl created!!!”		

The resulting photolist file, Boulder.phl, is as follows:

```
PH c:\users\vexcel\test\bldr.ph 1
PH c:\users\vexcel\test\bldr.ph 2
PH c:\users\vexcel\test\bldr.ph 3
PH c:\users\vexcel\test\bldr.ph 4
PH c:\users\vexcel\test\bldr.ph 5
PH c:\users\vexcel\test\bldr.ph 6
```

4.4.2 Alternately Scanning .phl Files

Perhaps on a particular strip of film the forward overlap is close to 70%. The user may wish to scan every other frame, rather than scan all frames. The .phl file could be created accordingly.

Following the directions above, Boulder.phl would be created as follows:

Prompt	Action	Example
c:\users\vexcel>	Type phlgen in the DOS/Console box.	Phlgen
"Enter a photolist name"	Type in the name desired for the. phl to be created.	Boulder.phl
"Enter the photo file to be used"	Type in the absolute path of the photo file to be used.	C:\users\vexcel\test\bldr.ph
"Enter the starting frame"	Type in the number of the frame which will be scanned first.	1
"Enter the final frame"	Type in the number of the frame which will be scanned last.	7
"Do you wish to alternate frames? (y/n)"	Type in the letter which corresponds to the desired outcome	y
"Boulder .phl created!!!"		

```
PH c:\users\vexcel\test\bldr.ph 1
PH c:\users\vexcel\test\bldr.ph 3
PH c:\users\vexcel\test\bldr.ph 5
PH c:\users\vexcel\test\bldr.ph 7
```

Note: Any time the start and end frames are either both odd or both even, phlgen will give the user the option to alternate frames.

▲ Step 4 - Create .phl File ▼

4.4.3 .phl Files Containing Multiple .ph Files

Consider multiple flight lines flown over Boulder County. The user may want to use different photo files for every flight line. The desired .phl file can be created by appending additional information to an existing .phl file.. The append function can be performed multiple times to a single .phl file. In the following example, the user will append additional frames onto the existing Boulder.phl. The newly added frames will use a different .ph file than those used in the existing Boulder.phl.

Prompt	Action	Example
c:\users\vexcel>	Type phlgen in the DOS/Console box.	Phlgen
"Enter a photolist name"	Type in the name desired for the .phl to be appended.	Boulder.phl
"Boulder.phl already exists! Overwrite, append or exit (o/a/e)"	Type in the letter which corresponds to the desired outcome.	a
"Enter the photo file to be used"	Type in the absolute path of the photo file which will be used.	C:\users\vexcel\test\long.ph
"Enter the starting frame"	Type in the number of the frame which will be scanned first	6
"Enter the final frame"	Type in the number of the frame which will be scanned last	10
"Do you wish to alternate frames? (y/n)"	Type in the letter which corresponds to the desired outcome.	n
"Do you wish to append another section to Boulder.phl (y/n)?"	Type in the letter which corresponds to the desired outcome.	n
"Boulder.phl created!!!"		

The output from the following example would be the following Boulder.phl:

```
PH c:\users\vexcel\test\bldr.ph 1
PH c:\users\vexcel\test\bldr.ph 2
PH c:\users\vexcel\test\bldr.ph 3
PH c:\users\vexcel\test\bldr.ph 4
PH c:\users\vexcel\test\bldr.ph 5
PH c:\users\vexcel\test\long.ph 6
PH c:\users\vexcel\test\long.ph 7
PH c:\users\vexcel\test\long.ph 8
PH c:\users\vexcel\test\long.ph 9
PH c:\users\vexcel\test\long.ph 10
```

**STEP 4
CREATE .PHL FILE**

4.4.4 Creating .phl Files with Descending Frame Numbers

If the beginning frame number is larger than the ending number, the .phl file created should have decrementing frames.

Prompt	Action	Example
c:\users\vexcel>	Type phlgen in the DOS/ Console box.	Phlgen
"Enter a photolist name"	Type in the name desired for the .phl file to be created.	Boulder.phl
"Enter the photo file to be used"	Type in the absolute path of the photo file which will be used.	C:\users\vexcel\test\bldr.ph
"Enter starting frame"	Type in the number of the frame which will be scanned first	5
"Enter final frame"	Type in the number of the frame which will be scanned last	1
"Do you wish to alternate frames? (y/n)"	Type in the letter which corresponds to the desired outcome.	n
"Boulder.phl created!!!"		

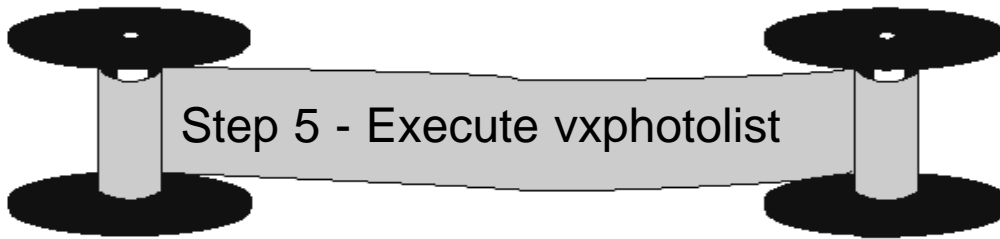
The resulting Boulder.phl would appear as follows:

```
PH c:\users\vexcel\test\bldr.ph 5
PH c:\users\vexcel\test\bldr.ph 4
PH c:\users\vexcel\test\bldr.ph 3
PH c:\users\vexcel\test\bldr.ph 2
PH c:\users\vexcel\test\bldr.ph 1
```

4.5 Additional features of phlgen

- To view the contents of a current .phl file type: **Type <<name>>.phl**
- To overwrite the contents of an existing .phl file select "o" when prompted.
- To exit without overwriting or appending an existing file, select "e" when prompted.
- If the user selects a .ph file that does not currently exist, the following reminder message will be displayed: "name.ph does not exist. Please create before running vxphotolist."

▲ Step 5 - Execute vxphotolist ▼



5.1 vxphotolist Overview

vxphotolist allows the user to define which frames will be scanned and how they will be scanned. To access the vxphotolist Window, click on the vxphotolist icon or type “vxphotolist” in the Dos/Console Window. If AFD setup was completed while in vxscan, the user must exit out of vxscan before executing vxphotolist. Information included in vxphotolist Window:

- .phl file
- Program Status
- Append frame number option
- Image file overwriting options
- Frame selections

5.2 vxphotolist Window

Once the vxphotolist Window appears, the first step is to identify which photolist file will be used. Click on 'File' from the menu bar and then select 'Open .phl'. The Open Photo List File Window (Figure 36) will appear.

Note: The desired roll type must be loaded before a .phl file can be opened.

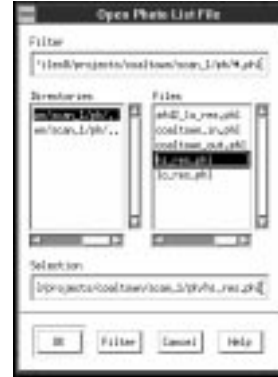


vxphotolist Window
(Figure 35)

STEP 5
EXECUTE VXPHOTOLIST

5.3 Photo List File Name

Once the Open Photo List File Window appears, the “Directories” and “Files” text windows can be used to locate the desired photolist file. The user may also identify the desired file by typing the absolute path in the “Selection” input field. Once the file name is displayed in the “Selection” input field, click on **OK**. The file path will be displayed in the “Photo List File Name” display field in the vxphotolist Window. This field cannot be edited.



Open Photo List File Window
(Figure 36)

5.4 Program Status

The “Program Status” display field keeps the user apprised of what function the scanner is currently performing, and on which frame it is being performed. The display will update throughout the scanning process.

5.5 Append Frame Number to File Name.

When using the same .ph file to scan many frames, it becomes necessary to differentiate the names given to the scans so that each scan does not simply overwrite the previous one. One way to eliminate this problem is to select the “Append Frame Number to File Name” check box. When this feature is selected the frame number will be appended to the file name of the resulting scan.

▲ Step 5 - Execute vxphotolist ▼

If this feature is not selected, the resulting file: **d:\scans\bldr_\bldr.tif** would be overwritten each time a new frame was scanned. Appending the frame number, however, would ensure that each scan would be given a unique name. When this option is selected the resulting files would be created as follows:

```
d:\scans\bldr_1\bldr_1.tif  
d:\scans\bldr_2\bldr_2.tif  
d:\scans\bldr_3\bldr_3.tif  
d:\scans\bldr_4\bldr_4.tif  
:  
d:\scans\bldr_n\bldr_n.tif
```

where the ROI name is **d:\scans\bldr_**, **Tif** is the desired format, and **n** is the number of frames to be scanned.

5.6 On Overwriting an Existing Data File

In order to prevent ROI data files defined in .ph files from being accidentally written over, the “On Overwriting An Existing Data File:” text box gives the user several options to choose from should an image file already exist with the same name and path that is in the “Photo List” text list.

Create a new file with a unique file name - This option should be selected if the user wishes vxphotolist to randomly generate a name for the file if one currently exists.

Skip this frame and no data file created - When this option is selected vxphotolist will skip a frame if the resulting file name already exists.

Pause the scanning and wait for instructions - If this option is selected vxphotolist will pause if there is an identically named file and wait for instructions from the user before continuing.

Overwrite it anyway - Selecting this option will cause vxphotolist to overwrite identical files.

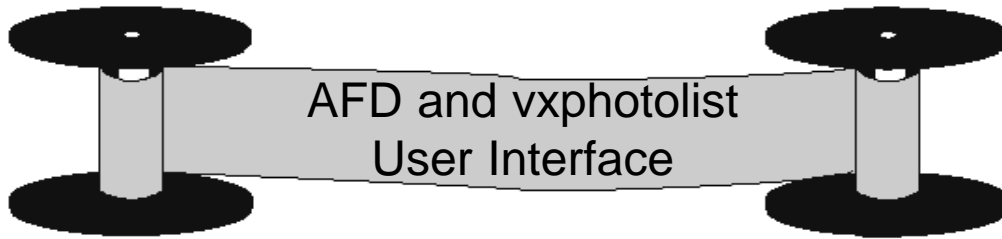
5.7 Selecting Specific .ph Files and Frames for Scanning

In Section 4.4, Creating .phl files, various ways of setting up .phl files were discussed. Once a .phl file is selected from the Open Photo List File Window, all frames associated with it are shown in the "Photo List" text window. The vxphotolist Window gives the user the opportunity to select specific .ph files and frame numbers from those contained in the selected .phl file.

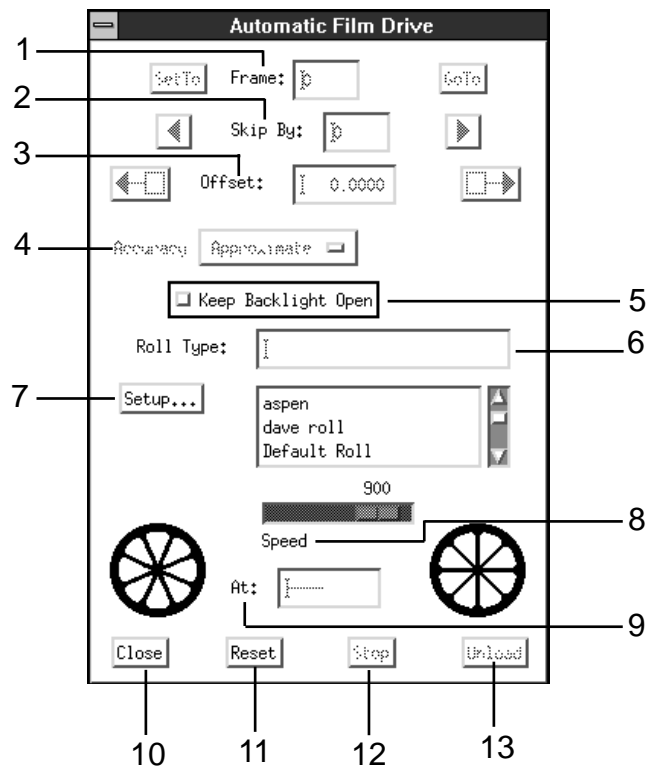
- Holding down the Shift key while clicking on .ph files will allow the user to select a string of consecutive .ph files.
- Holding down the Alt key while clicking on .ph files allows the user to pick multiple .ph files that are not sequential.
- Simply clicking on a .ph file will result in only the target .ph file being selected.
- Clicking on **Do Selected** will result in the highlighted .ph files being scanned.
- Highlighting one .ph file then clicking on **Start From** will result in the selected .ph file, and all following .ph files being scanned.
- The entire .phl file can be selected for scanning by clicking on **Do All**.

5.8 Starting the Scan

Once the user has selected one of the three bottom buttons the scanning process will begin.



AFD Main Window



(Figure 37)

The top three input fields of the AFD window, Frame, Skip by, and Offset, allow the user to adjust the position of the film on the scanner.

1 Frame

The **Set To** button to the left of the “Frame” input field will tell the program to give the frame currently on the scanner the value in the box. Clicking on **Go To** will advance or rewind the film until the specified frame number is positioned on the backplane.

2 Skip By

The value in the “Skip By” input field specifies the amount of frames you want to move when using the adjacent left or right arrows.

3 Offset

“Offset” defines the distance from the left edge of the backplane to the left edge of the frame.

On either side of the “Offset” input field are arrow buttons which will slowly move the film across the backplane. This feature is used to move the frame to the position specified in the input field, as well as make minute adjustments to the frame position.

4 Accuracy

Accuracy determines how the application finds the frames and the degree of accuracy with which it positions the frame on the scanner. The **Approximate** mode is the fastest of the three modes, but lacks the precision of the other two. **Edge of Film** positions the frame by utilizing the contrast between the developed and undeveloped film to find the edges of the frame. In this mode, as the film advances, the application will automatically check the film to make sure that the edges are where they are supposed to be. If any discrepancies are found, the values used to advance the film will be adjusted to compensate for the difference. **Fiducial** is the most accurate mode, but also is the most time consuming.

5 Keep Backlight Open

Selecting this will keep the backlight open. This way the film can be moved freely without waiting for the backlight to open and close.

6 Roll Type

This box specifies the name of the roll type currently being used. Different rolls can be selected by clicking on the name that corresponds to the loaded film in the roll list located directly below. Selecting a roll type will bring up the Mounting Window.

7 Setup...

Clicking on **Setup...** will bring up the Roll Setup window.

8 Speed

Adjusting the **Speed** slide bar with the mouse will set the speed, in feet per minute, that the AFD will move the film through the backplane.

9 At

The number in the **At** input field displays the value assigned to the current frame in the backplane.

Action Buttons

10 Close

In vxphotolist this option is not used since the AFD window must always be open.

11 Reset

Reset clears all text windows and reinitializes the AFD.

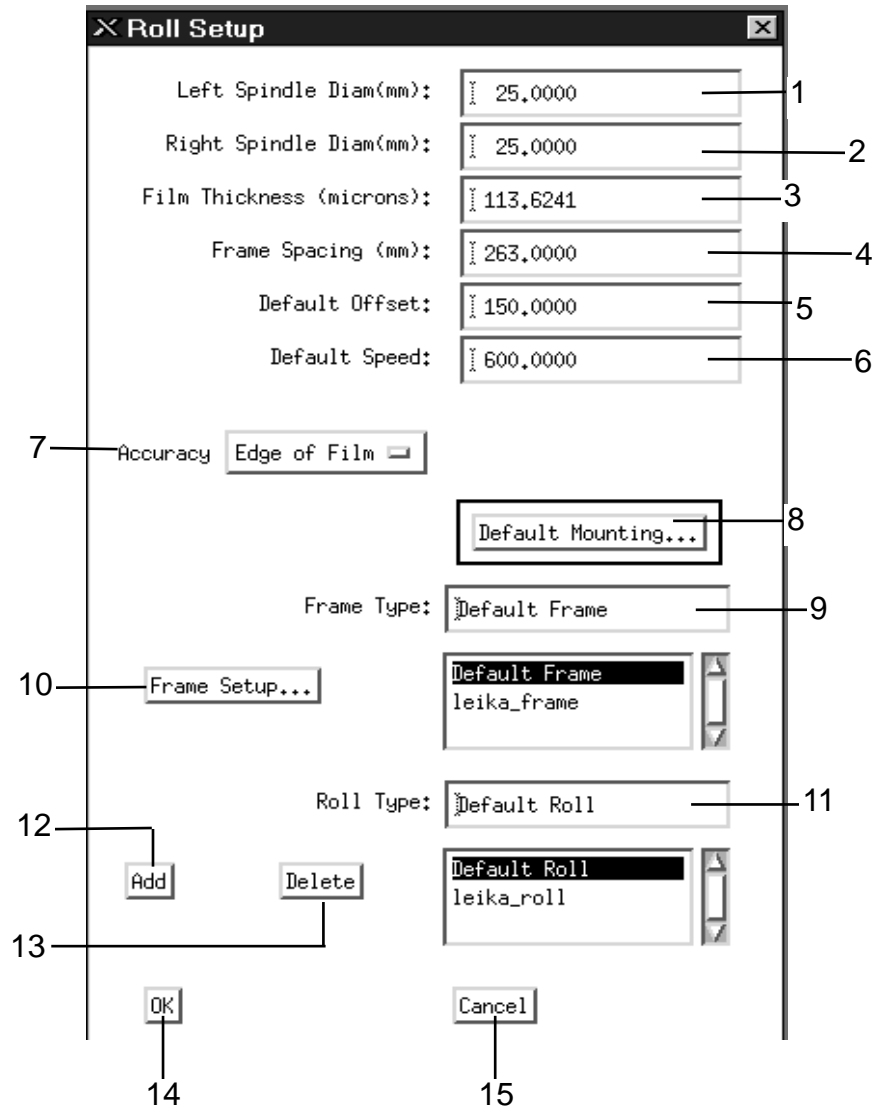
12 Stop

Stop will instantly stop the film.

13 Unload

Unload opens the backplane and allows for rewinding and removal of the spools.

Roll Setup Window



(Figure 38)

1 Left Spindle Diam (mm)

This field displays the measurement of the unloaded left (take-up) spindle. It is not necessary to change this value as the default values will work for any film roll.

2 Right Spindle Diam (mm)

Same as #1 - it is not necessary to edit this field.

3 Film Thickness (microns)

This value denotes the thickness of the loaded film. The default value need not be edited.

4 Frame Spacing (mm)

The distance between two frames from the left edge of the first frame to the left edge of the second. (see Figure 23 on page 23)

5 Default Offset

This is the number that appears in the “Offset” function of the AFD Main Window. This offset number is the distance from the left edge of the backplane to the left edge of the frame and is entered in millimeters. (see Figure 24 on page 24)

6 Default Speed

This is the speed in feet per minute that the AFD travels as you move through the frames, particularly when you skip over many frames at one time. You may want to keep this value low if you're not sure what frame you're looking for so that you can more easily stop the AFD when you see the frame you want. You can also change the speed using the speed slider in the AFD window.

7 Accuracy

Accuracy determines how the application finds the frames and the degree of accuracy with which it positions the frame on the scanner. The **Approximate** mode is the fastest of the three modes, but lacks the precision of the other two. **Edge of Film** positions the frame by utilizing the contrast between the developed and undeveloped film to find the edges of the frame. In this mode, as the film advances, the program will automatically check the film to make sure that the edges are where they are supposed to be. If any discrepancies are found, the values used to advance the film will be adjusted to compensate for the difference. **Fiducial** is the most accurate mode, but is the most time consuming.

8 Default Mounting:

This button brings up the Mounting Parameters Window.

9 Frame Type:

The input field here displays the currently selected frame type. It can be changed by selecting a name from the "Frame Type" text window located directly below this field.

10 Frame Setup

Clicking on this button will bring up the Frame Setup Window.

11 Roll Type

This input field displays the currently selected roll type. The roll type can be changed by selecting a name from the "Roll Type" text list located directly below, or typing in a new name directly into the input field and clicking on **Add**.

12 Add

This button is used when creating a new roll type. A new roll type is created by manually entering a name in the "Roll Type" input field and clicking on **Add**. This will result in all the settings in the Roll Setup window being saved under that name.

13 Delete

This button deletes the current roll type , and all of its settings.

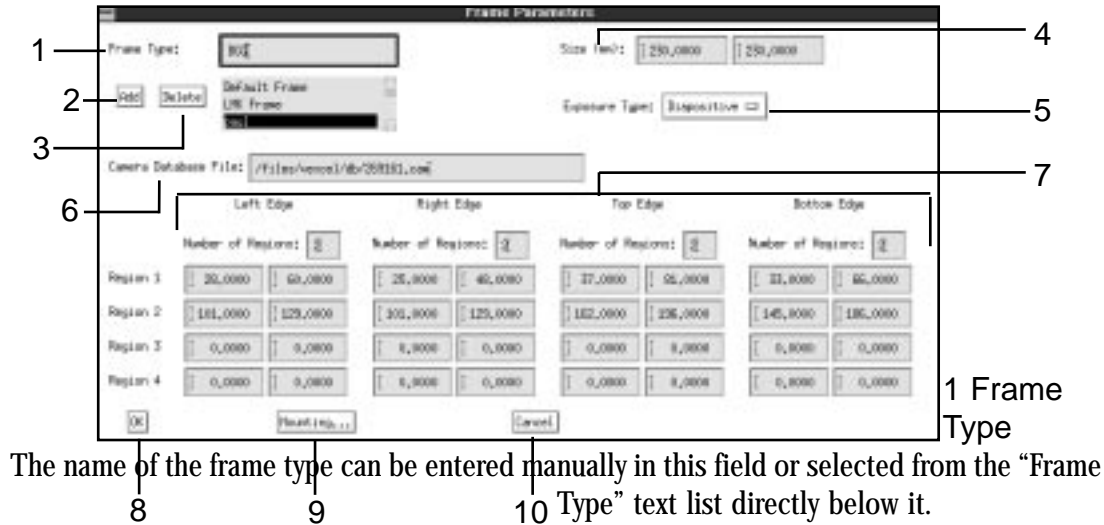
14 Done

The **Done** button returns the user to the Main AFD Window after saving any changes made in the Roll Setup and connected windows.

15 Cancel

Cancel returns you to the Main AFD Window without saving any changes that were made in the Roll Setup window.

Frame Parameters Window



The name of the frame type can be entered manually in this field or selected from the “Frame Type” text list directly below it.

(Figure 39) 2 Add

This button is used when creating a new frame type. A new frame type is created by typing a name in the “Frame Type” input field and clicking on **Add**. This will save all the settings in the Frame Parameters Window under that name.

3 Delete

This button deletes the frame type in the “Frame Type” input field and all of its settings.

4 Size (mm):

The X and Y measurements of the frame in millimeters.

5 Exposure Type

Clicking on this box expands the box giving you two choices. If the undeveloped film on a roll is clear or light, then **Negative** is the appropriate setting. If the undeveloped film is

solid, or dark, **Diapositive** should be chosen. This setting tells vxphotolist what type of edge to look for when scanning for edge positions in Edge of Film mode.

6 Camera Database File:

The name of this file is entered manually by the user when fiducial accuracy is desired.

7 The Edge Section

This section tells the program where to look to find the edge of the frame in the Edge of Film mode. One to four regions per edge can be defined; one is recommended. The regions are determined by taking the values of the endpoints of the regions as established from the intersection of lines A & B at the U.L. point (Upper Left-hand.) The edge of film between the two endpoints of a region must be a straight line uninterrupted by anything such as writing on the film or faults in the film itself. Any deviation of the straight line between the developed and the undeveloped film will result in the application being unable to establish the position of that edge.

8 OK

Selecting the **OK** button returns you to the Roll Setup Window and saves all current settings.

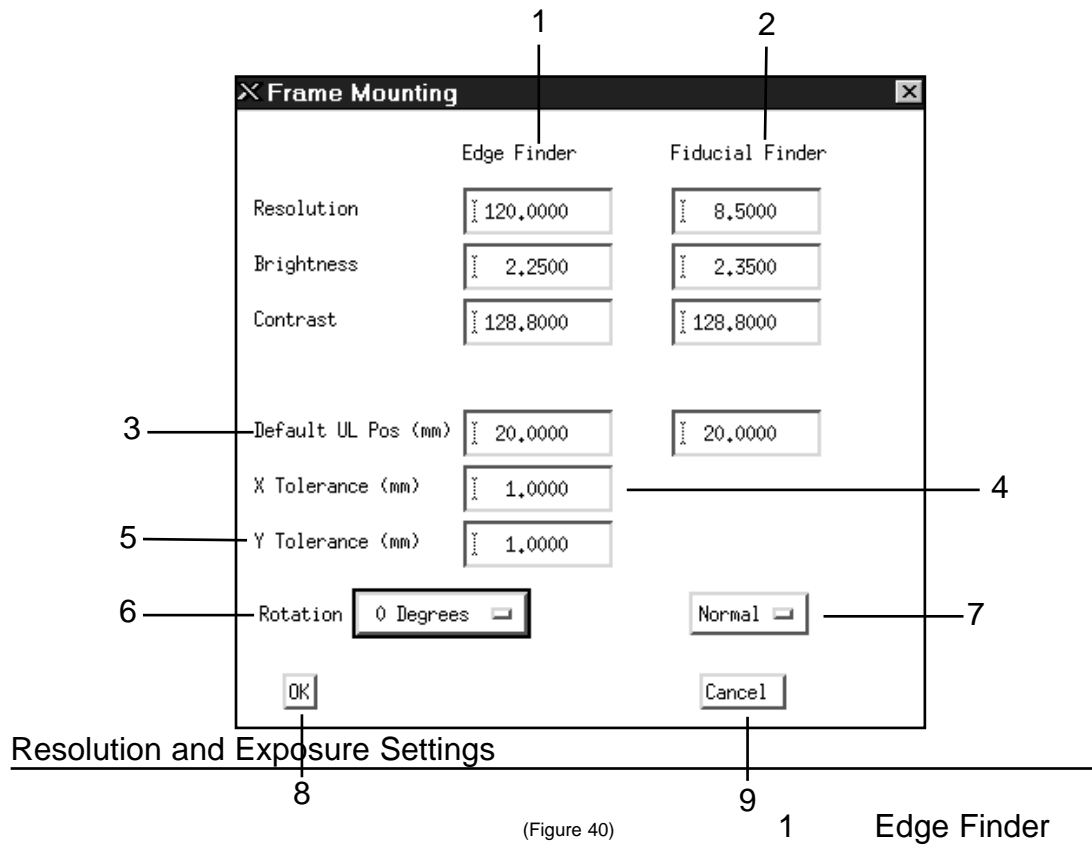
9 Mounting...

This button brings up the Frame Mounting Window.

10 Cancel

The **Cancel** button returns you to the Roll Setup Window without saving any changes made in the Frame Setup Window.

Frame Mounting Window



Resolution and Exposure Settings

The three settings for resolution, brightness, and contrast are what the scanner will use when looking for edges in Edge of Film mode. The recommended settings for these operations are shown in the Frame Mounting Window on the previous page.

2 Fiducial Finder

As in #1, the three settings are used by the program when looking for the fiducials. The recommended settings for these operations are shown on the previous page.

3 Default UL Pos (um)

The default values for the UL point's X and Y can be entered in these two input fields. The X value can be found by measuring the distance from the inside of the reseau plate to the left edge of the target image. The Y value is found by measuring from the top of the reseau plate to the top edge of the target image. (see figure 30 on page 28)

4 X Tolerance

This value tells the program how far to either side of the established X axis to look when finding the edges.

5 Y Tolerance

Same as #4 for the Y axis.

6 Rotation

Clicking on **Rotation** causes it to expand, giving you four choices: 0°, 90°, 180° and 270°. These values specify how the film will be mounted relative to the Camera Database File.

7 Normal

This button toggles to **Mirror**. This effects how the film will be mounted, relative to the Camera Database File. In normal mode **Rotation** choices are 0°, 90°, 180°, and 270°, and in **Mirror** mode they would read 270°, 180°, 90°, and 0°.

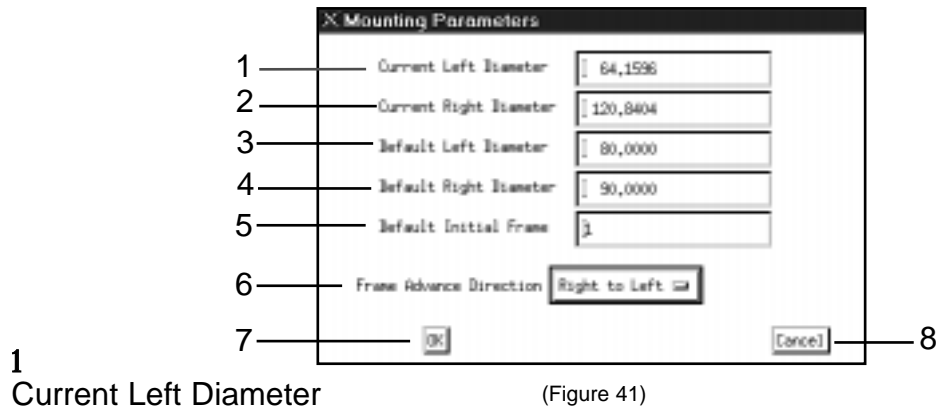
8 OK

Clicking on **OK** saves all current settings and returns the user to the Frame Parameters Window.

9 Cancel

The **Cancel** button returns you to the Frame Parameters Window without saving any changes made in the Frame Mounting Window.

Default Mounting Window



1 Current Left Diameter

The value displayed is the most recently used measurement of the left spool.

2 Current Right Diameter

The value displayed is the most recently used measurement of the right spool.

3 Default Left Diameter

The value displayed is the default measurement for the left spool. This value can only be changed through the Default Mounting Window.

4 Default Right Diameter

The value displayed is the default measurement for the right spool. This value can only be changed through the Default Mounting Window.

5 Default Initial Frame

This field tells the application what frame number is centered on the backplane when the applications begins to scan a roll.

6 Frame Advance Direction

Please refer to page 56 for a complete description.

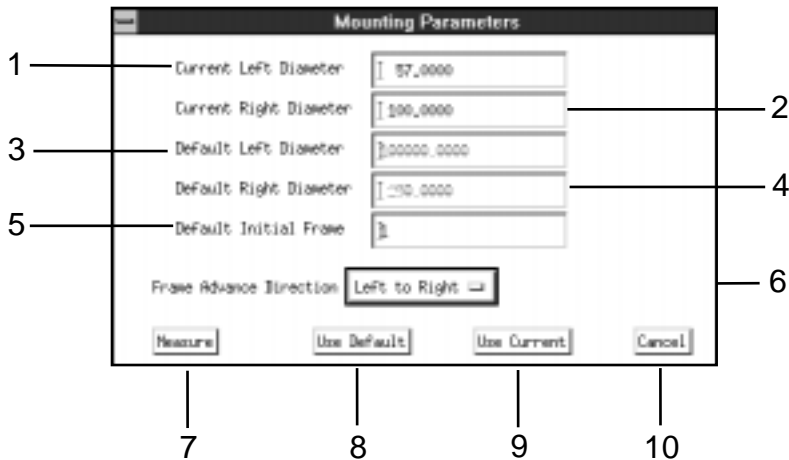
7 OK

Select **OK** to save any changes and return to the Roll Setup Window.

8 Cancel

Select **Cancel** to cancel any changes made and/or return to the Roll Setup Window.

Mounting Parameters Window



(Figure 42)

1 Current Left Diameter

The value here is the most recently used measurement of the left spool.

2 Current Right Diameter

The value here is the most recently used measurement of the right spool.

3 Default Left Diameter

This value is generally grayed out and can be changed in the Default Mounting Window

4 Default Right Diameter

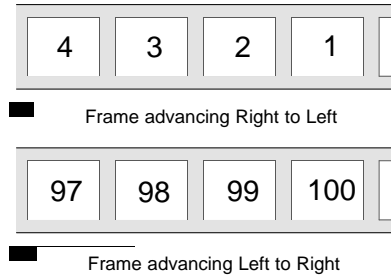
This value is generally grayed out and can be changed in the Default Mounting Window.

5 Default Initial Frame

This tells the application what frame number is centered on the backplane when the application begins to scan a roll.

6 Frame Advance Direction

This defines whether your frame numbers increase from left to right or right to left. Assuming that you always place the loaded spool on the left tower, if your film starts with the number 1 and increases to 2, 3, etc. as you advance through the film you would choose Frame Advance Direction, Right to Left. If your loaded film starts with the number 100 and decreases to 99, 98, 97 etc. as you advance through the film, you would choose the Frame Advance Direction, Left to Right because your numbers increase from left to right.



(Figure 43)

7 Measure

This button brings up the Define a Roll Windows which will allow the user to interactively measure the roll.

8 Use Default

Uses the grayed out values in numbers 3 and 4.

9 Use Current

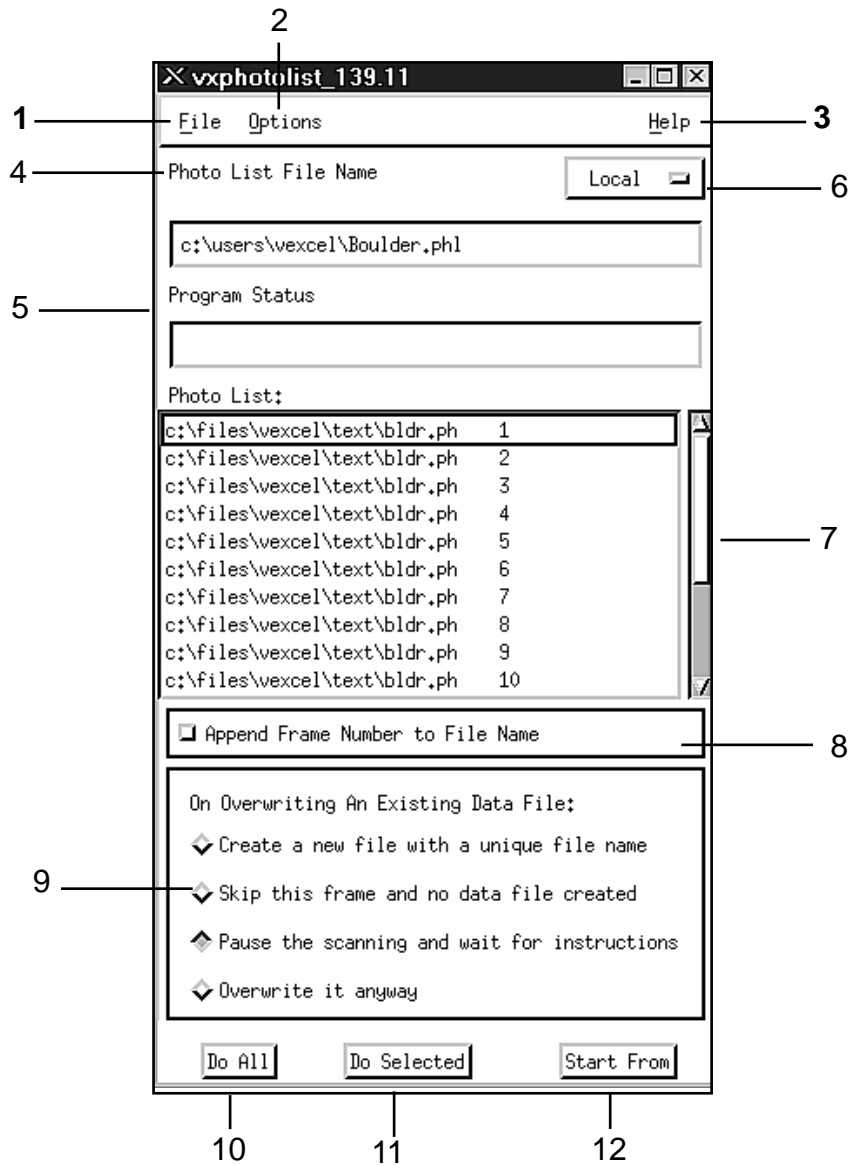
Uses the values in numbers 1 and 2.

10 Cancel

The **Cancel** button returns you to the Frame Setup Window without saving any changes that were made in the Frame Mounting

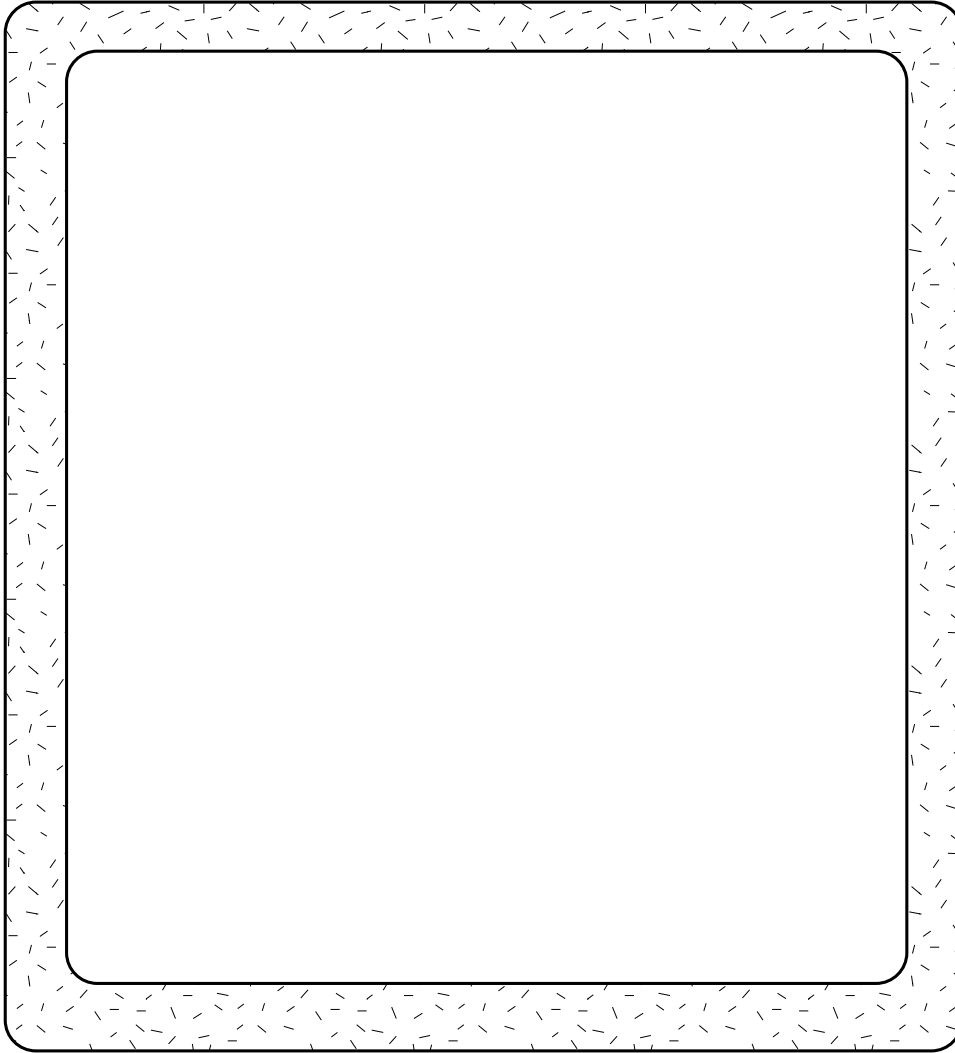
vxphotolist Window

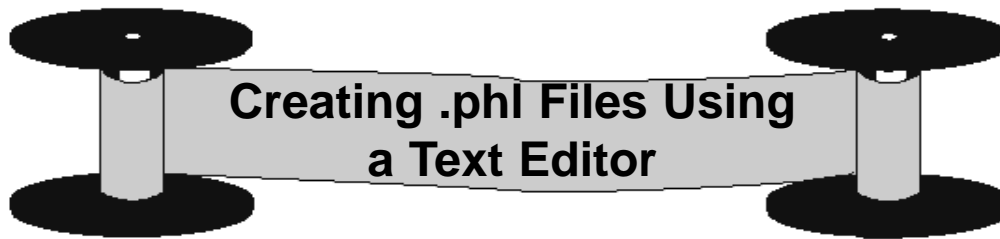
▲ User Interface ▼



(Figure 44)

User's Notes





Menu Bar

1. File

Open .phl

Open.phl' will open an existing .phl file for processing in the vxphotolist Window.

Save .vxscanrc

This option saves the current settings in the vxphotolist Window (i.e. file saving options) in the default setting so that the current settings automatically come up when the application is accessed.

2. Options

AFD Setup

This option brings up the Automated Film Drive Window. Generally, this window should be left open while operating vxphotolist.

Open Backplane

This option allows the user to open the backlight assembly without having to do it manually.

Close Backplane

This option allows the user to close the backlight assembly without having to do it manually.

Backlight on

This option allows the user to keep the backlight on during procedures which would normally be performed with the light off.

Backlight off

This option allows the user to keep the backlight off during procedures which would

normally be performed with the light off. It is also used to turn the light off if it was turned on using the previous option

3. Help

About vxphotolist

Selecting this will bring up copyright and version number information on vxphotolist.

vxphotolist Window Contents

4 Photo List File Name

This display field shows the name of the .phl file to be processed by vxphotolist. To select a file, choose the 'Open.phl' option under 'File' on the Menu Bar.

5 Program Status

This display field shows the status of the frame currently being scanned. The message will read either "Processing Frame x" while scanning, or "Finished Frame x" once the scan has been completed.

6 Host Selection Button

This button allows the user to designate either a local or remote host as the data input source. Note: The filter option in the Open .phl Window is only available if local is selected. If any other option is selected the user must know and enter the absolute path.

7. Photo List Display Window

This window contains the list of all the frame numbers and .ph files in the current .phl file (i.e. the .phl file whose name appears in the "Photo List File" input field). Using the mouse and pointer, the .ph files appearing in this field can be selected.

File Naming Options

8 Append Frame Number to File Name

Activating the button in this field will result in the frame number being appended to the name of the file in which the scanned image will be saved.

example: The scan of an ROI titled c:\images\scans\Bldr_" which is located on frame #5, will be saved as "c:\images\scans\Bldr_5".

9 On Overwriting an Existing Data File

In this section you tell Vxphotolist what to do if it is confronted with a file name identical to the one under which it is trying to save a scan. Next to each option is a button. The depressed, or darkened button, signifies the option that is currently activated. The selections in this area will operate on the files independent of the "Append Frame Number to File Name" option.

Create a new file...

This option will tell vxphotolist to randomly generate a name for the scan file.

Skip this frame...

Once vxphotolist has detected an identically named previously saved file it will simply move on to the next .ph file scan on the list.

Pause the scanning...

This option will cause vxphotolist to stop the entire process at this scan and to wait for you to give it further instructions before continuing.

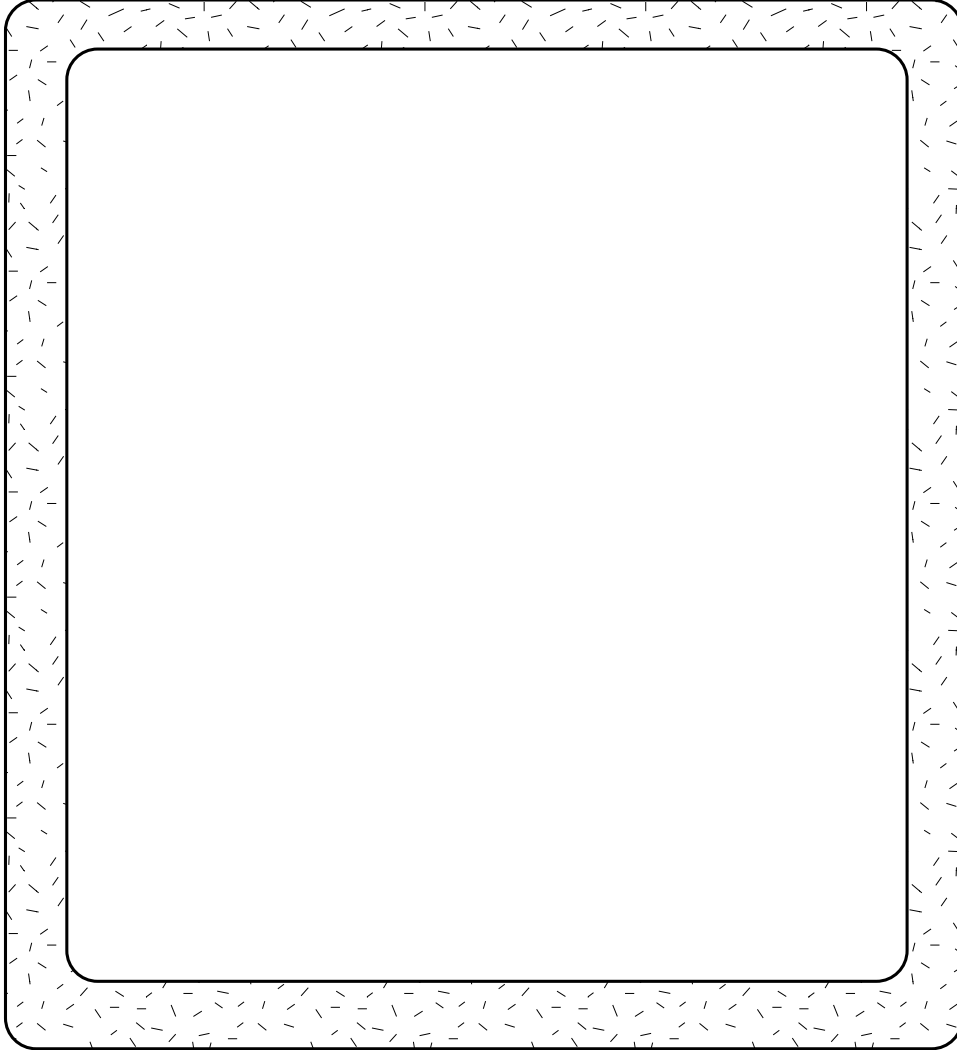
Overwrite...

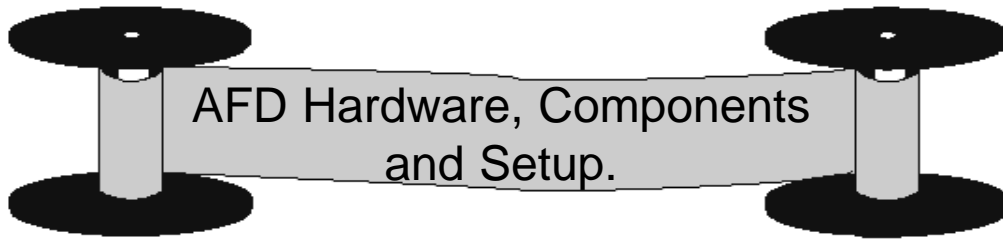
This option will allow vxphotolist to overwrite identical files with the new information from the scan.

Action Buttons

Activating one of these buttons is the last step before vxphotolist starts automatically scanning and saving the .ph files contained within the .phl file. All of the .ph files are displayed within the "Photo List:" display field in the middle of the vxphotolist window.

User's Notes

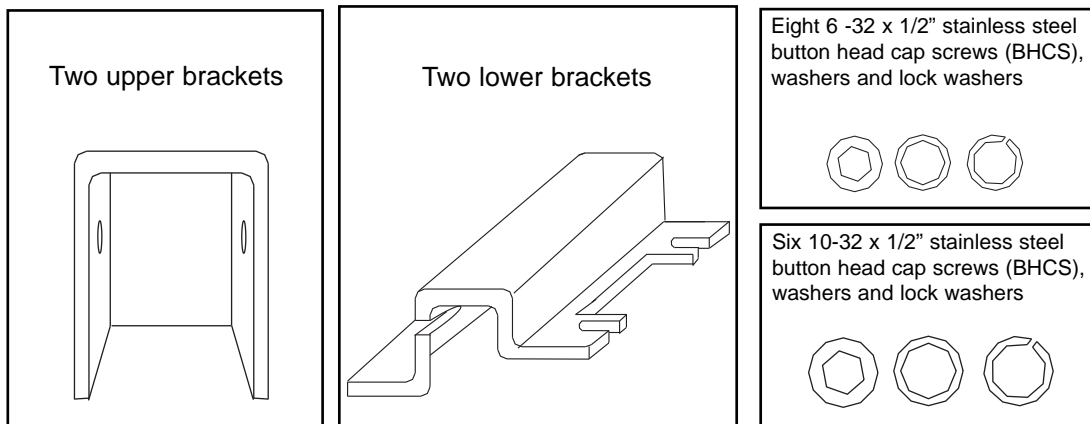




When the VX4000 arrives and is installed at a customer site, the AFD components have been attached and the unit is ready for operation. At some point, however, it may have become necessary to either move the scanner to a different location, or to disconnect the AFD towers when performing maintenance. The following discussion will provide instructions on how to attach the upper and lower brackets to the AFD towers, as well as how to properly attach the AFD towers to the VX4000 scanner.

AFD Hardware

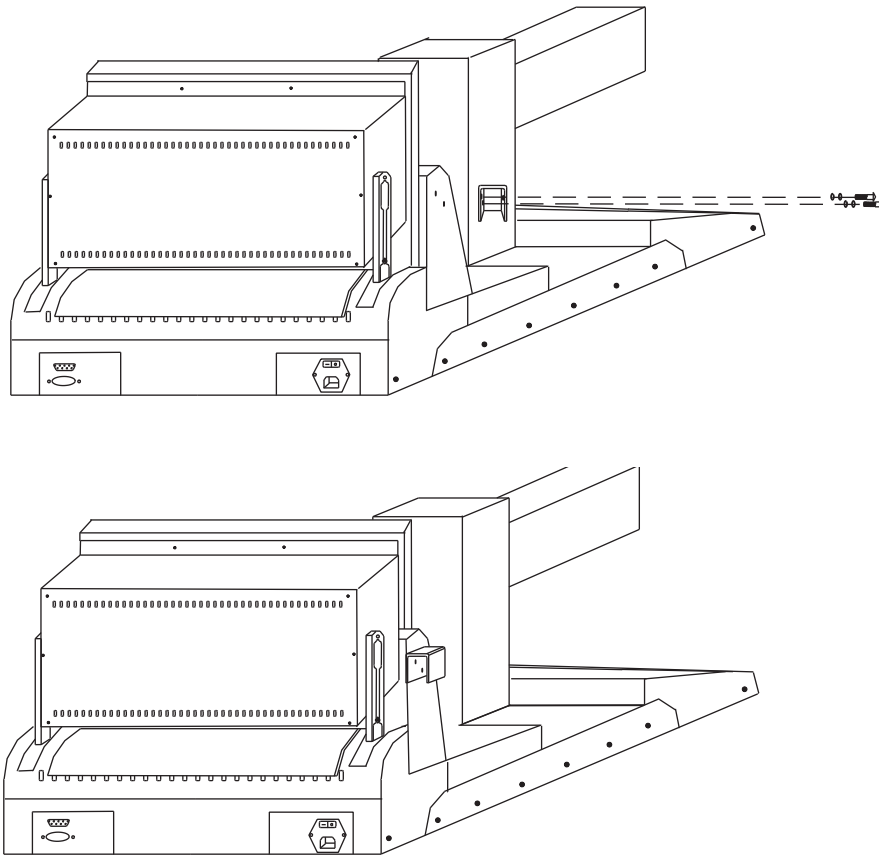
AFD hardware consists of: (Not to scale)



Hardware for AFD components
Figure A-1

Step 1 - Attach upper bracket to scanner

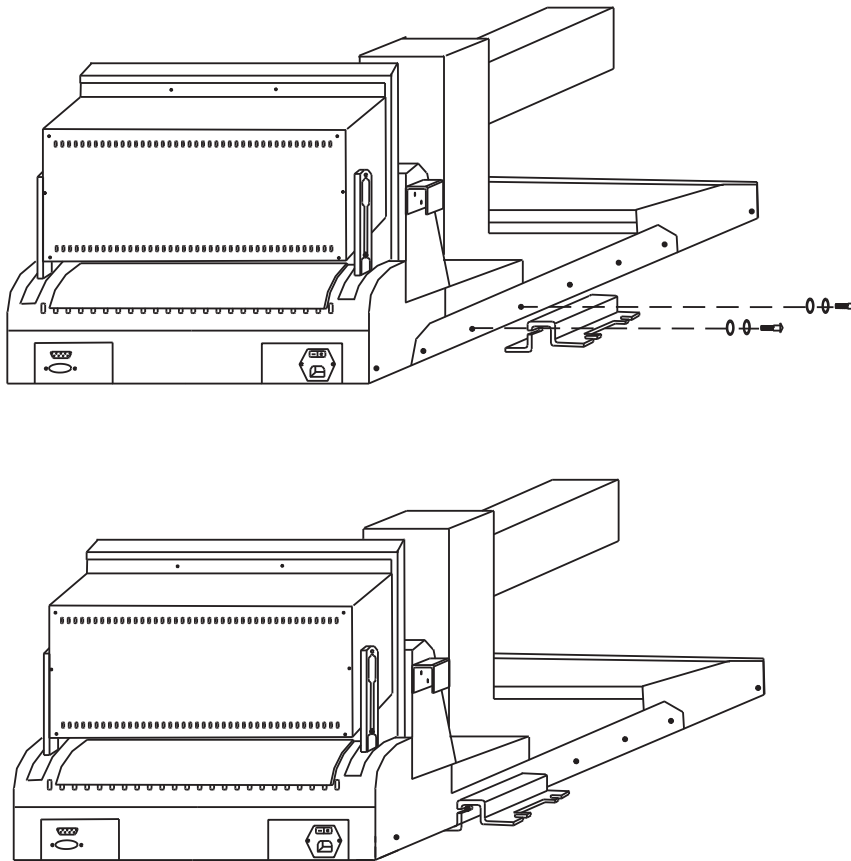
The first step in attaching the AFD towers to the scanner is to attach the upper bracket to the scanner. The upper bracket is attached to the scanner by two of the larger cap screws with a set of washers on each side as shown in figure A-2 below.



Attaching the upper bracket
(Figure A-2)

Step 2 - Attach lower bracket to VX4000 scanner

Use two 6-32 x 1/2" BHCSs to secure the lower bracket to the VX4000 scanner. Do not tighten the screws all of the way in case it becomes necessary to reposition it slightly once the AFD tower has been attached.



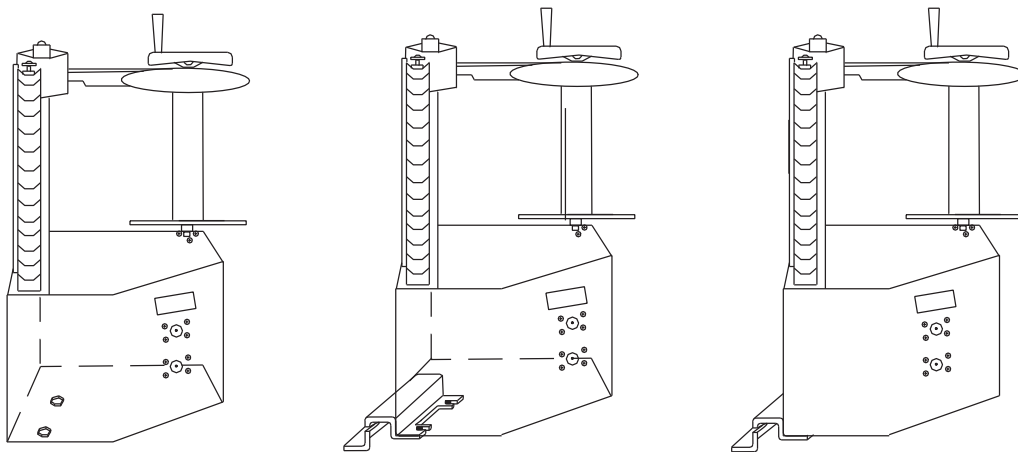
Attaching the lower bracket
(Figure A-3)

Step 3 - Adjust AFD tower

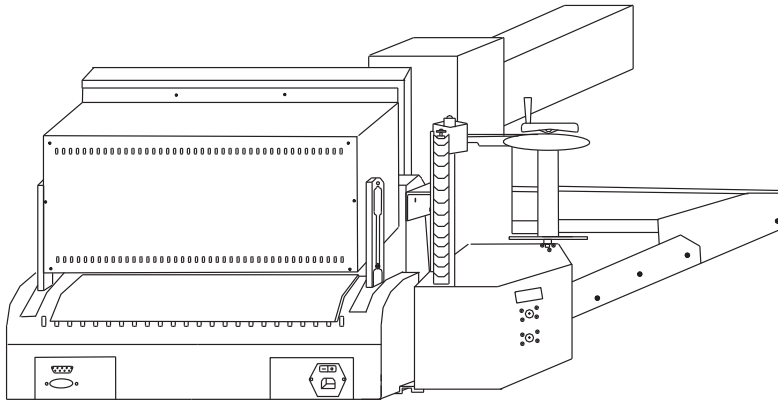
Position the AFD tower onto the lower bracket. The tower should be placed in a position where the film will not rub on the reseau plate or backplane assembly. The positioning of the tower can be adjusted by moving the lower bracket slightly. Once the correct position has been found, remove the AFD tower from the lower bracket and tighten the screws holding the lower bracket to the scanner all of the way (as done in Step 2). Once the lower bracket is firmly attached to the scanner, place the AFD tower back onto the lower bracket.

Step 4 - Attach lower bracket to the AFD Tower

On the bottom of each AFD Tower are two bolts. In order to fit the tower onto the bracket, the bolts must be unscrewed slightly. Once loosened, the tower should be slid onto the lower bracket until the screw is flush up against the lower bracket. Once the tower is in place, tighten the nuts so the tower is firmly held into place.



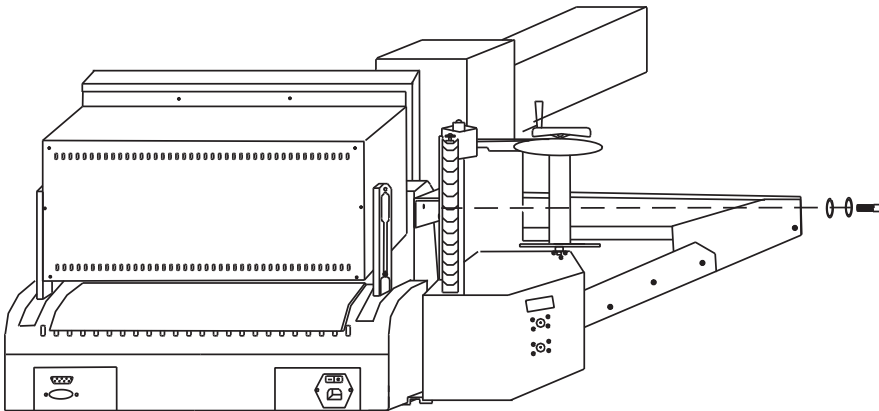
Attaching lower bracket to AFD Tower (scanner not shown)
(Figure A-4)



AFD Tower properly attached to scanner
(Figure A-5)

Step 5 - Attach AFD Tower to upper bracket

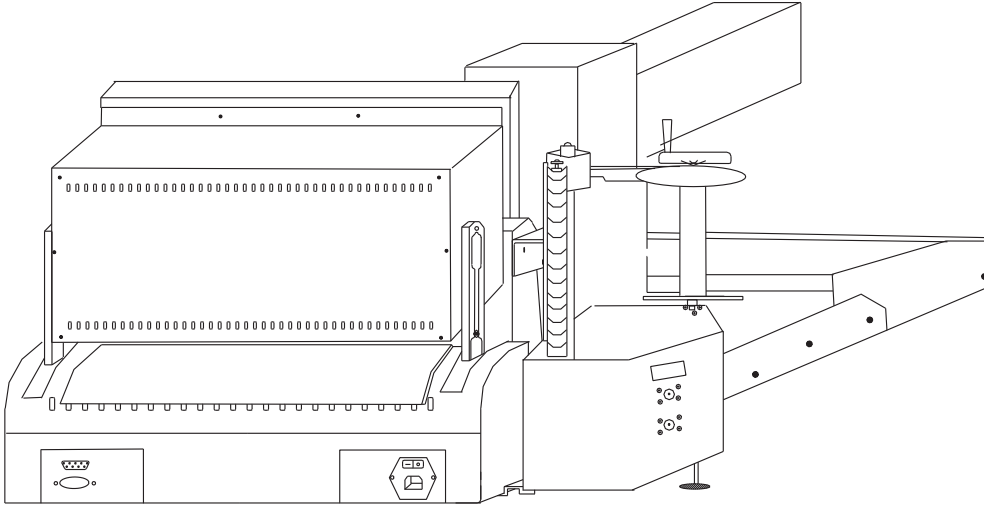
Secure the tower to the upper bracket with one 10-32 x 1/2" BHCS and a set of washers.



Attaching upper bracket
(Figure A-6)

Step 6 - Lower AFD foot to provide stability

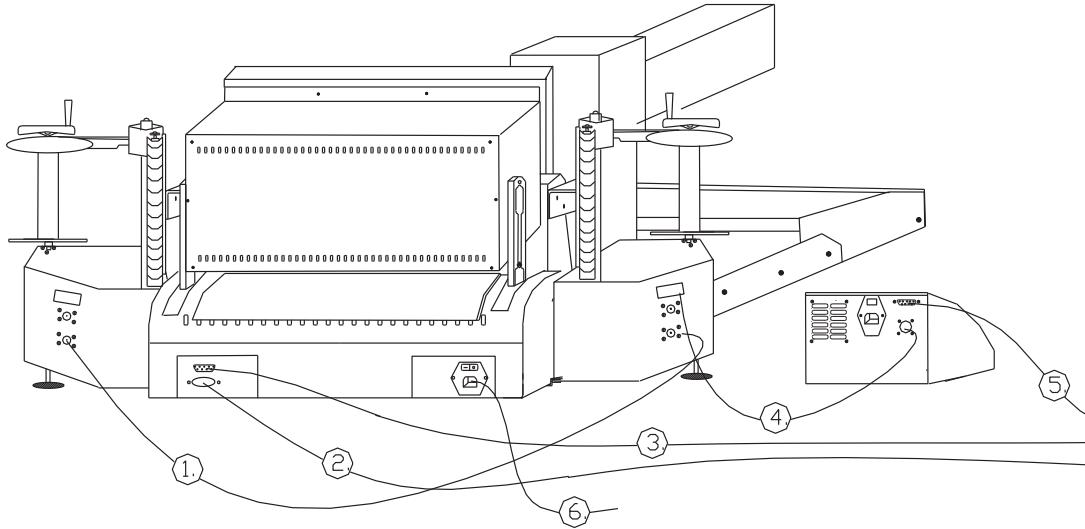
Lower the “foot” from the base of the tower. Ensure it is adjusted in a way that supports the tower. Once the foot touches the table top lightly lock it into place with locknuts.



Lowering the AFD foot
(Figure A-7)

Step 7 - Connectivity

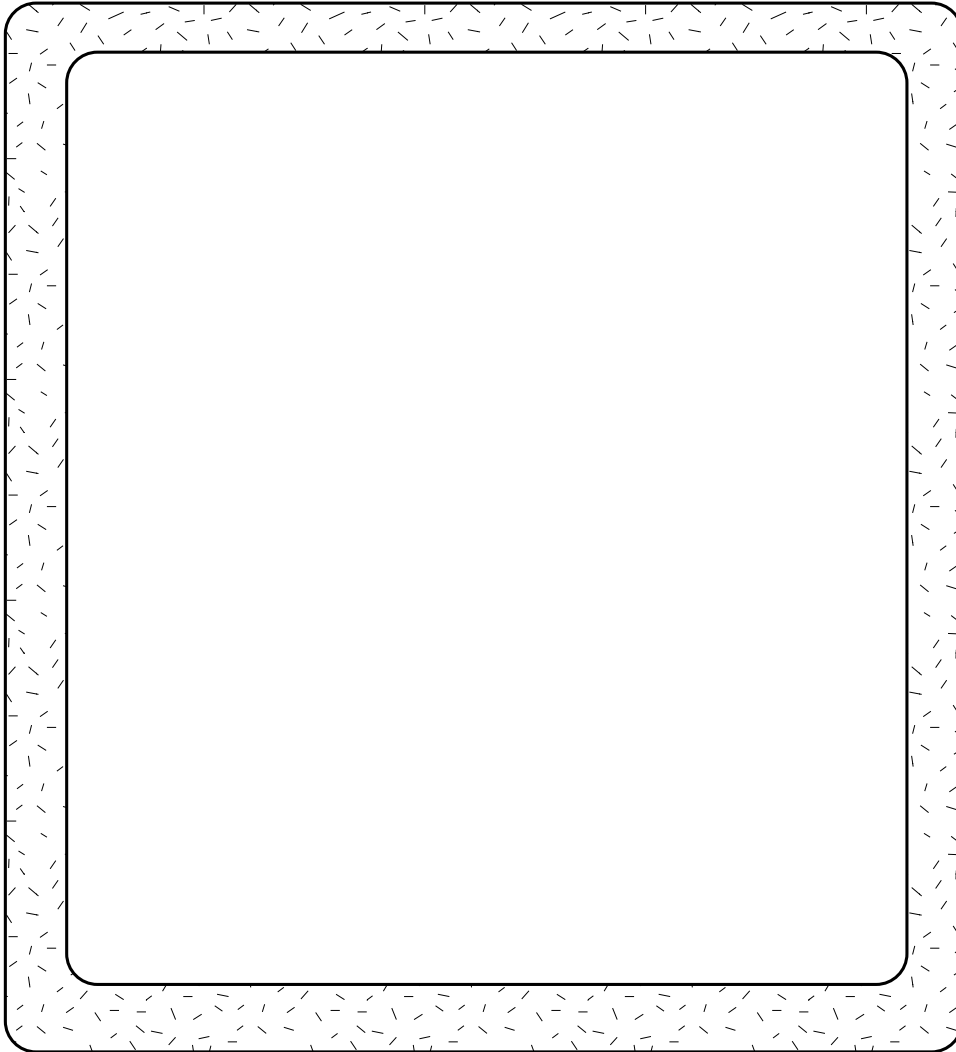
Once the towers have been properly attached to the scanner, the cables should be attached as shown in figure A-7 below.

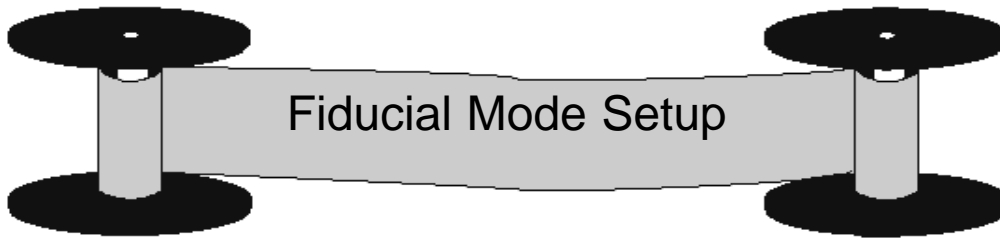


AFD Connectivity
(Figure A-8)

1. AFD cable - Left AFD Tower to Right AFD Tower.
2. Digital cable - ITI card to scanner.
3. Serial cable - Com2 to scanner.
4. AFD cable - AFD Controller to Left AFD Tower.
5. Serial cable - Com1 to AFD Controller.
6. Power cable

User's Notes





Camera Calibration Files

A camera calibration file has to be created by the user according to a specified file format. The file format for camera files is displayed below. For vxphotolist, the camera files can be placed anywhere on the system. vxphotolist can handle cameras with either four or eight fiducials.

File format for actual camera information file (ASCII format)

File format - 4 fiducials:

Line #1: Camera name.

Line #2: Number of fiducials defined in this file. (at least 4, no more than 8)

Line #3: Fiducial #1., IDAS (Integrated Aerotriangulation System) scanning position number, calibrated X coordinate, calibrated Y coordinate, fiducial mask file name.

Line #4: Fiducial # 2

Line #5: Fiducial #3

Line #6: Fiducial #4

Line #7 (if using 4 fiducials):calibrated X coordinate, calibrated Y coordinate, fiducial mask file name - **or** -

Line #8 (if using 4 fiducials): calibrated camera focal length in microns. - **or**-

File format using 8 fiducials:

Line #1: Camera name.

Line #2: Number of fiducials defined in this file. (at least 4, no more than 8)

Line #3: Fiducial #1., IDAS scanning position number, calibrated X coordinate, calibrated Y coordinate, fiducial mask file name.

Line #4: Fiducial # 2

Line #5: Fiducial #3

Line #6: Fiducial #4

Line #7: fiducial #5

Line #8: Fiducial #6

Line #9: Fiducial #7

Line #10: Fiducial #8

Line #11: Calibrated X coordinate, calibrated Y coordinate, fiducial mask file name.

Line #12 (if using 8 fiducials): calibrated camera focal length in microns

The following is a camera file called RMKTOP,

```

RMKTOP
8
1      3      112996.0 112999.0      rmk_top15a.msk
2      7      -112991.0 -112990.0      rmk_top15a.mak
3      5      113003.0 -112992.0      rmk_top15a.msk
4      1      -112997.0 112999.0      rmk_top15a.msk
5      4      113004.0 2.0          rmk_top15b.msk
6      8      -112997.04.0         rmk_top15b.msk
7      6      5.0          -112995.0      rmk_top15b.msk
8      2      3.0          112997.0      rmk_top15b.msk
0.0    0.0
153923
    
```


IDAS scanning position number

A fixed scanning position numbering system was developed for IDAS. The IDAS scanning position number will allow the user to find the scanned image position that corresponds to the calibrated camera fiducials. The following is the IDAS scanning position numbering sequence.

1	2	3
8		4
7	6	5

The IDAS scanning position number will not be changed even if the camera has only four fiducials. If the camera has four corner fiducials, then the position numbers 1, 3, 5, 7 will be used to match the fiducial numbers. If the camera has four side fiducials, then the position numbers 2, 4, 6, 8 will be used to match the fiducial numbers.

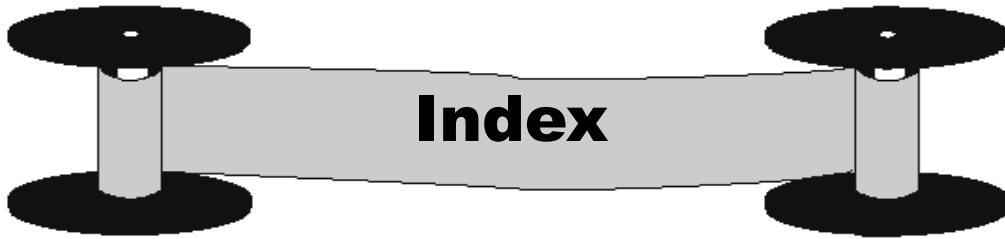
Special requirements when using the Automatic Film Drive System with vxphotolist

When using the Automatic Film Drive System with vxphotolist, the first quadrant of the camera file must be located toward the scanning position number 3. The camera rotation angle can be used for rotating the camera to the actual scanning position when needed. Also, the coordinates of the calibrated camera must be a right-hand coordinate system.

Fiducial mask file

In order to automatically match the camera fiducials, one fiducial mask has to be created for each type of fiducial on the camera. Usually two fiducial masks will be needed for a camera with eight fiducials, i.e., one fiducial mask will be used for the corner fiducials, and the other one will be used for the side fiducials.

For your convenience, a library of fiducial masks for the most common aerial cameras has been supplied for you. Please contact your Vexcel Imaging representative to find the exact location of these files.



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