



# 3 Troubleshooting

## Correcting Errors

Occasionally errors (malfunctions), such as film jams, may occur in the imager during print operations. You can easily correct minor problems. If more serious malfunctions occur, you should contact a trained Authorized Service Provider of Kodak products (see [“Calling for Support” on page 3-17](#)).

## Error and Alarm Indications

The Imager can detect malfunctions and other conditions that require operator action. The Local Panel reports the presence of these errors or abnormal conditions in several ways:

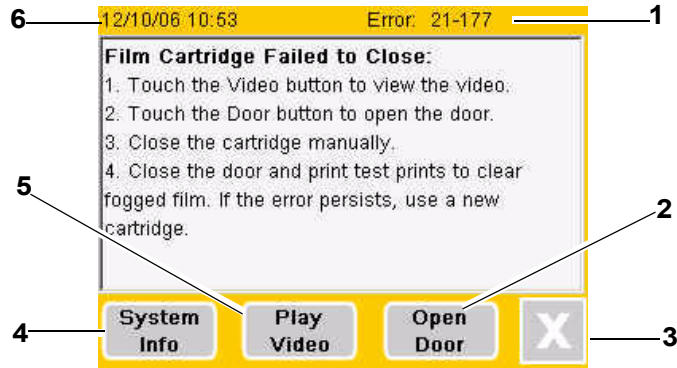
- **Error Message** screen
- **Current Errors** screen
- **Current Errors** notice on the **Home** screen
- **Home** screen status messages

## Home Screen Status Messages

For a description of the status information reported on the **Home** screen, see [“Home Screen Status Line” on page 2-14](#). Most of these status messages do not report errors or abnormal conditions, but they do give information about the current state of the Imager that may be useful for troubleshooting. Status information about the film supply and film tray is displayed within the **Film Tray** button on the **Home** screen. For a description, refer to [“Film Supply Button Status Information” on page 2-12](#).

## Error Message Screen

The **Error Message** screen is the main error reporting mechanism for the Imager. When the Imager detects an error, an alarm sounds and the Local Panel displays an **Error Message** screen that describes the error and gives a corrective action. Touch anywhere on the screen to silence the alarm.



Error Message Screen

### Error Message Screen Details

1	<b>Error Code.</b> Identifies the type of error. Refer to this code when calling for service.
2	<b>Open Door</b> button. Unlatches the front door. This button will appear when the front door must be opened to correct the reported error.
3	<b>X</b> button. Closes the <b>Error Message</b> screen and moves to the <b>Current Errors</b> screen, which lists any uncorrected errors in the Imager. (See “ <a href="#">Current Errors Screen</a> ” on page 3-4.) If you have not corrected the error when you press <b>X</b> , the error will be listed on the <b>Current Errors</b> screen.
4	<b>System Info</b> button. Opens the <b>System Information</b> menu screen. (See “ <a href="#">System Information Menu</a> ” on page 2-26.)
5	<b>Play Video</b> button. Plays a short video that explains how to correct the error. A video is not available for all errors.
6	<b>Date and Time.</b> When the error occurred.

**NOTE:** If you close an **Error Message** screen without correcting the current error, you can recall the **Error Message** from the **Current Errors** screen. (See [“Current Errors Screen”](#) on page 3-4.)

### Operator Action

When an error message is displayed:

1. Silence the alarm by touching anywhere on the **Error Message** screen.
2. Perform the corrective action recommended on the screen. If this does not clear the error, call for service. (See [“Calling for Support”](#) on page 3-17.)

Note the error code and error message before you call for service.

The error message may direct you to perform one of the following actions:

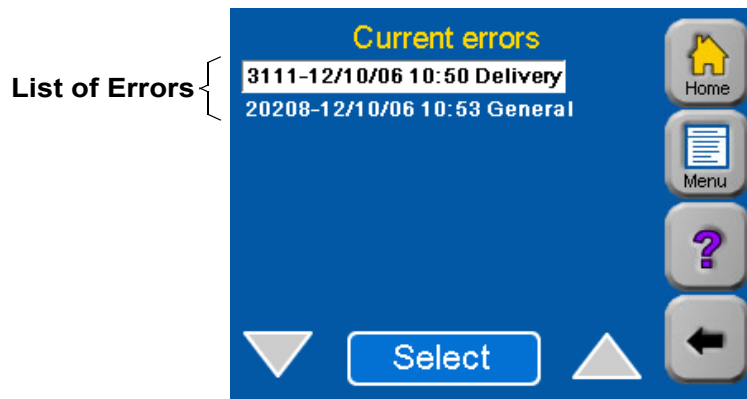
- Restart the Imager.
  1. Go to the **Home** screen.
  2. Press the **Power Off** button.
  3. Wait for the Local Panel to go blank.
  4. Turn off the power switch on the back of the Imager and then turn it back on.
- Open the front door manually. See [“Opening the Front Door Manually”](#) on page 2-49.
- Close the film cartridge. See [“Manually Closing the Film Cartridge”](#) on page 3-9.

### Current Errors Screen

The Current Errors screen shows a list of uncorrected errors in the Imager. To display this screen:

1. Press the **Menu** button.
2. On the **Main Menu** screen, press **Current Errors**.

The **Current Errors** screen appears:



Current Errors Screen

To see detailed information about any of the errors:

1. Highlight the error using the **Up** or **Down** arrow.
2. Touch **Select**.

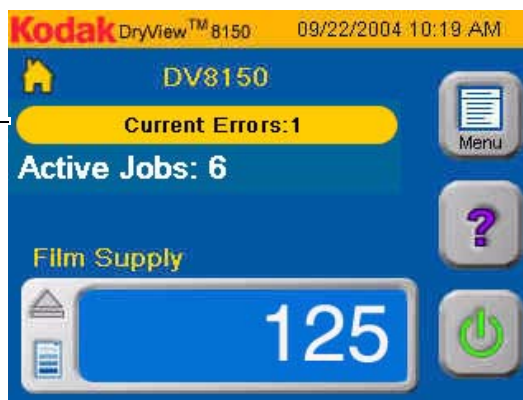
The **Error Message** screen displays the error message for the error you selected. (See [“Error Message Screen” on page 3-2.](#))

**Current Errors Notice on the Home Screen**

When there are one or more uncorrected errors in the Imager, the **Home** screen displays a **Current Errors** notice that shows the number of uncorrected errors in the Imager.

To see a list of the current errors, you can display the **Current Errors** screen. (See “[Current Errors Screen](#)” on page 3-4.)

Current Errors Notice



Home Screen

### Calibration Failure

Periodically the Imager must be calibrated to ensure that internal settings match the characteristics of the film in the Imager. Calibration is performed by running a calibration print. The Imager runs a calibration print when:

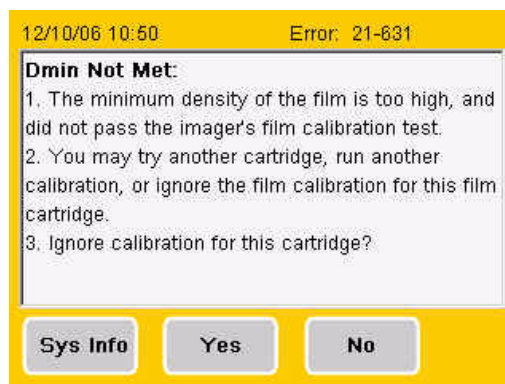
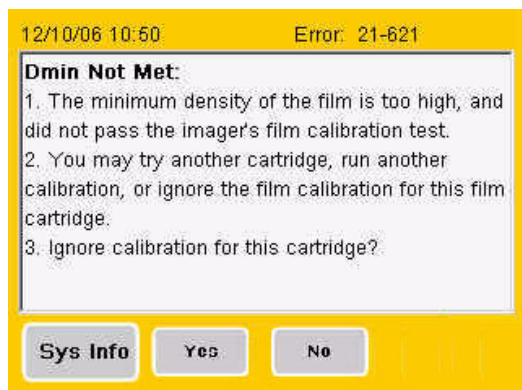
- A film cartridge containing film with new sensitometric characteristics (speed, contrast) is loaded.
- The Imager has not printed film for 7 days.
- The Dpatch (density patch) printed on the film is out of range.

The operator can also request a calibration print from the Local Panel.

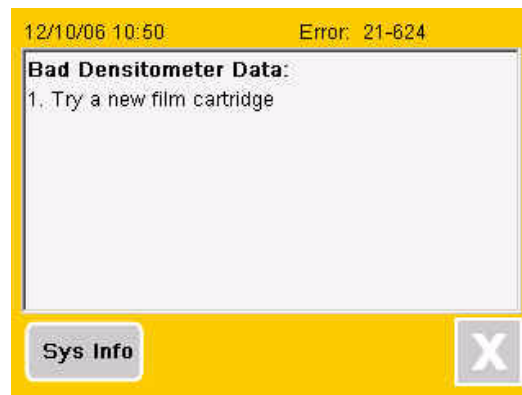
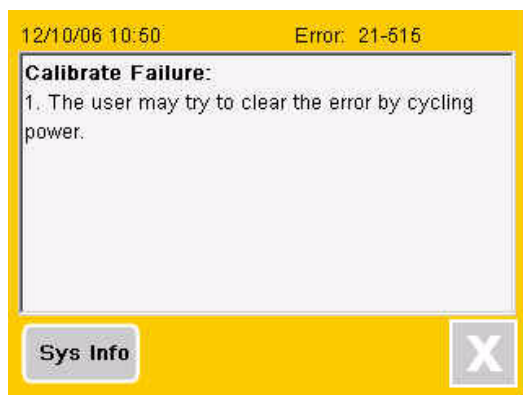
For more information on calibration, see [“Running a Calibration Print” on page 2-53](#).

Occasionally, the Imager may fail calibration. When this occurs, the Local Panel displays an error message screen. Depending on the cause of the calibration failure, the Imager may or may not be able to continue operating.

There are four conditions that cause calibration failure. The four error message screens, below and on the next page, describe these error conditions and show recommended operator actions.



These two errors indicate possible film aging. You can elect to continue operation with the current film by touching **Yes** on the error screen.



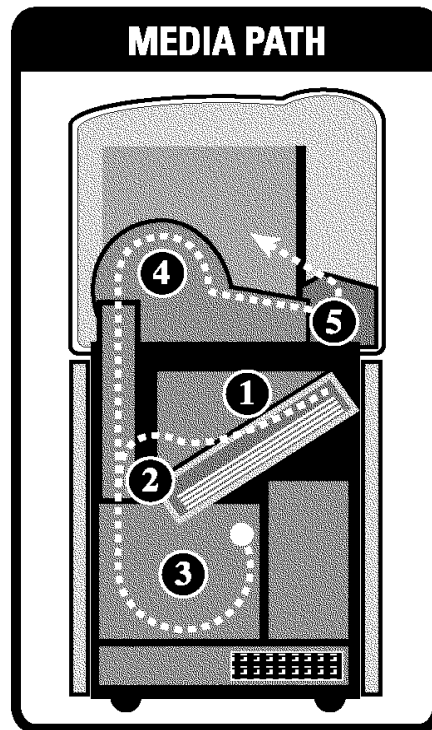
These two calibration errors indicate a major machine or film fault. The Imager cannot continue to operate with the current film.

If you cannot restore normal operation by following the recommended action on the error message screen, call for service. (See [“Calling for Support”](#) on page 3-17.)

## Film Transport Problems

The illustration below shows the path that film travels through the Imager after the operator requests a print. The numbers in the illustration identify key areas on the path through the five major areas in the Imager:

- Area 1 – Film pickup from the cartridge
- Area 2 – Film feed into the exposure area
- Area 3 – Film feed out of the exposure area
- Area 4 – Film feed into the processor
- Area 5 – Film feed out of the processor and into the film tray



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Film Drive Path



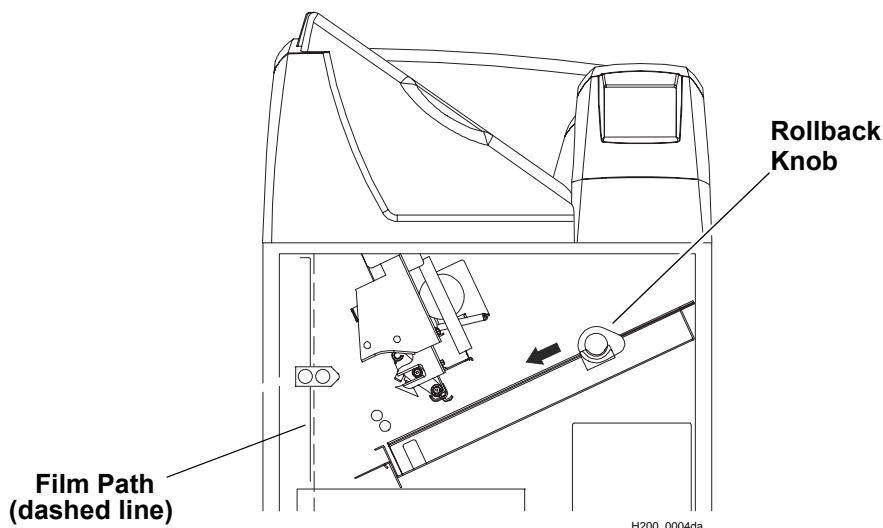
Films may occasionally jam at various points along the film path. When a film jam or film feed error occurs, an error message appears. The error message identifies the area where a jam has occurred and recommends a corrective action. The following information supplements the advice given in the error messages for film feed problems.

## Manually Closing the Film Cartridge

When clearing film jams you may have to close the film cartridge manually. Normally the Imager automatically closes the film cartridge when you press the **Open Front Door** button. When a film jam occurs, the Imager may be unable to close the cartridge. The front door then will not open.

When the film cartridge fails to close, an error message appears. Press the **Door Open** button on the **Error Message** screen to unlock the front door.

**NOTE:** If you open the front door when the film cartridge is open, the top sheets of film in the cartridge are exposed. Before opening the door, make the room as dark as possible to minimize exposure.



### Manually Closing the Film Cartridge

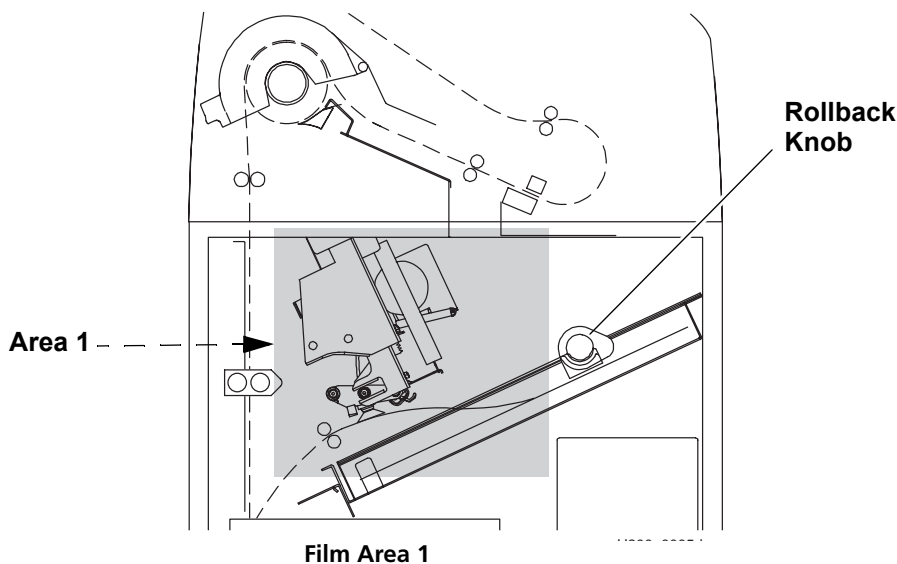
1. Darken the room.
2. Open the front door.

3. Clear any films that may be jammed in the film cartridge area.
4. Turn the rollback knob counterclockwise to close the cartridge.

### Film Pickup Problems in Area 1

Area 1 is the location where film is removed from the film cartridge and positioned to be sent by drive rollers toward the exposure area. If the Imager cannot properly pick up a sheet of film and position it for drive, error 21-116 (Pickup Fail) is declared. Error 21-177 (Cartridge Failed to Close) also relates to Area 1.

**NOTE:** When problems occur in Area 1, the film cartridge is left open. When you open the front door, the top sheets of film in the cartridge will be exposed. Before opening the door, make the room as dark as possible to minimize exposure.

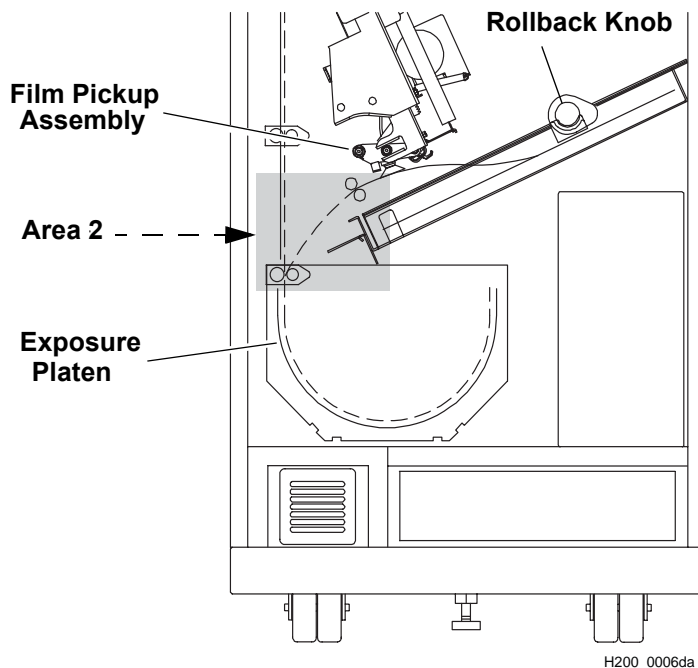


1. Press **Door Open** on the **Error Message** screen.
2. Remove any film outside the cartridge.
3. Turn the rollback knob counterclockwise to manually close the cartridge lid.
4. Close the front door.
5. If you cannot resolve the problem, call for service. (See [page 3-17](#).)

## Removing Film Jams from Area 2

Area 2 in the Imager includes the path between the film pickup assembly and the exposure platen.

**NOTE:** When jams occur in Area 2, the film cartridge is left open. When you open the front door, the top sheets of film in the cartridge will be exposed. Before opening the door, make the room as dark as possible to minimize exposure.

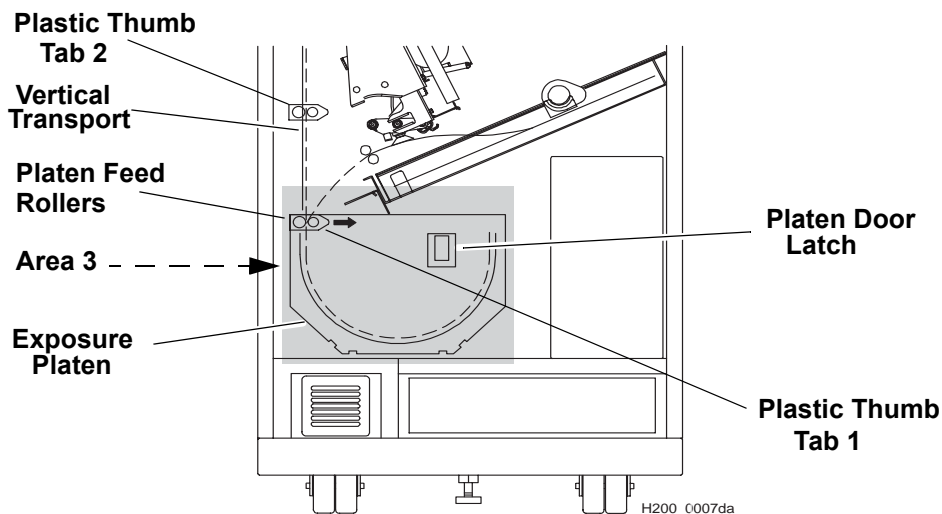


### Jam Area 2

1. Press **Door Open** on the **Error Message** screen.
2. Remove the jammed film.
3. Turn the rollback knob counterclockwise to manually close the cartridge lid.
4. Close the front door.

### Removing Film Jams from Area 3

Area 3 includes the exposure platen. Jams in this area occur as film is entering the platen before exposure, or as film is leaving the platen after exposure. In rare cases, film may stall in the transport area above the platen.



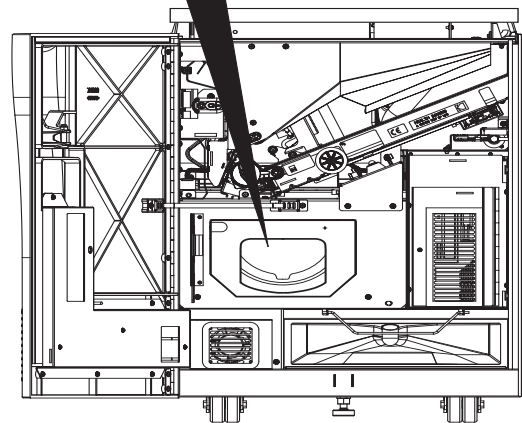
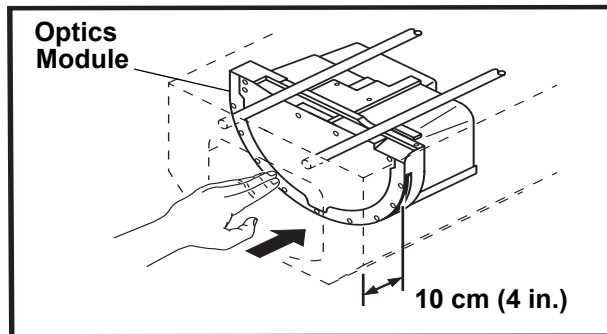
#### Jam Area 3

1. Open the front door.

**NOTE:** When film jams in this area, the cartridge may not close. If it does not close, the front door will not unlock normally. You may have to open the door manually (see [“Opening the Front Door Manually” on page 2-49](#)). When the front door opens, the top sheets of film in the cartridge will be exposed. Before opening the door, make the room as dark as possible to minimize exposure.

2. If the film cartridge is open, turn the rollback knob counterclockwise to manually close the cartridge lid.
3. Clear the jammed film, if it is accessible.
4. If the film is not accessible:
  - a. Open the platen door by sliding the door latch to the left and pulling out the platen door.

- b. Push the optics module toward the rear of the imager slowly and smoothly.

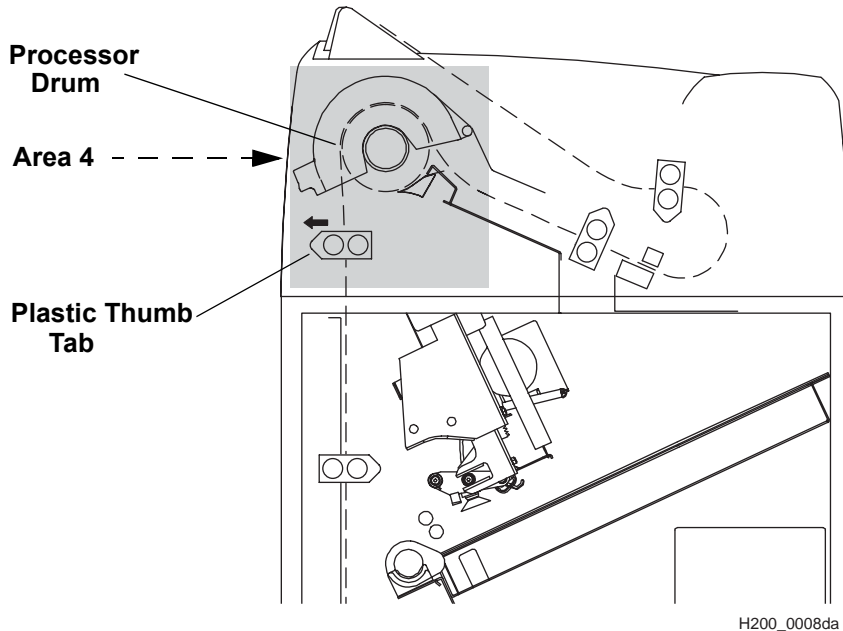


- c. Clear the film from inside the platen. If film is caught in the platen feed rollers, pull Plastic Thumb Tab 1 (inside the platen door) to the right. This opens the rollers and frees the film.
- d. After clearing the jam, close the platen door.
5. If film is stalled in the vertical transport area, pull Plastic Thumb Tab 2 in this area to the right to open the rollers and free the film.
6. Close the front door.

## Removing Film Jams from Area 4

Area 4 includes the film processor.

When a jam occurs in this area **all** films in the Imager must be removed.



Jam Area 4

1. Open the hood.



**CAUTION:**

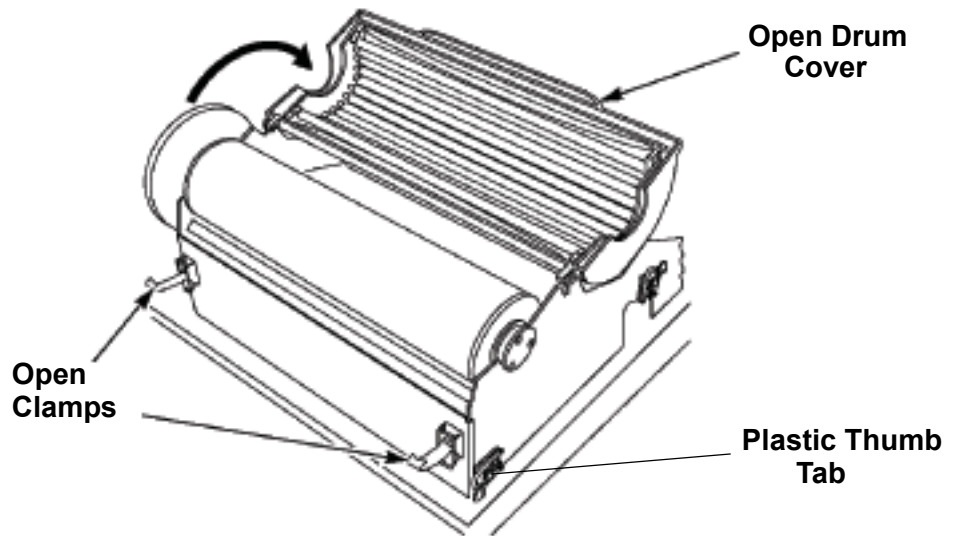
**Drum and rollers inside the processor are hot. Exercise caution when removing jammed film from the processor.**

2. Release the two clamps at the left of the processor and open the drum cover. (See the following figure).



**CAUTION:**

**To prevent damage to the surface of the processor drum, do not use any type of tool to remove jammed film.**



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#### Opening the Drum Cover

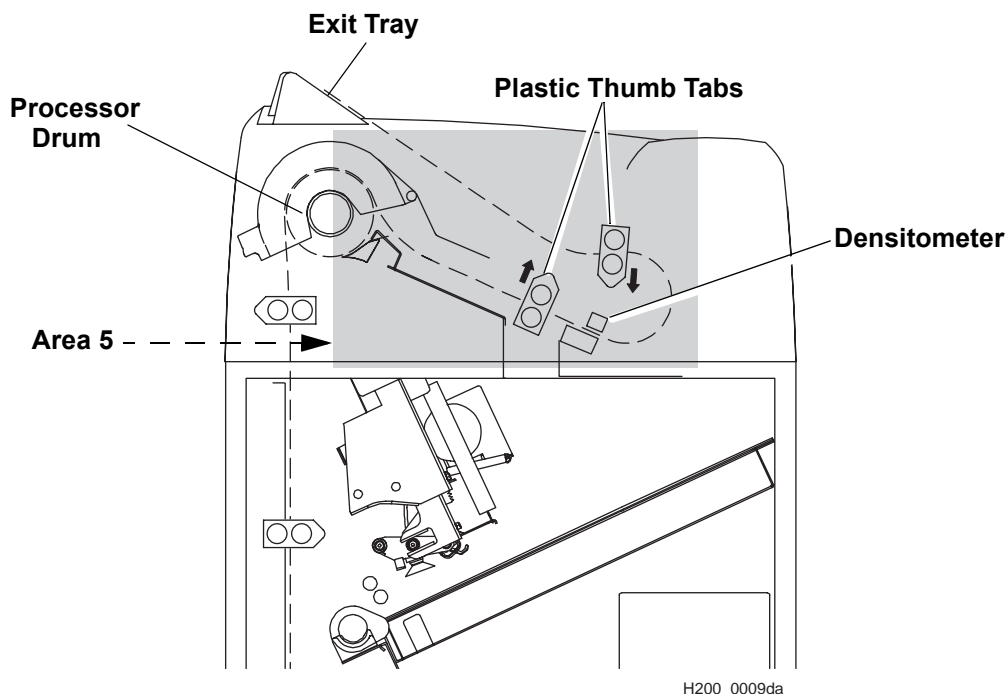
3. Clear the jammed film from the processor area (there may be more than one sheet). If film is jammed in the drive rollers, pull the Plastic Thumb Tab to the left to open the rollers and free the film.
4. Close the drum cover and secure it with the two clamps.
5. Remove any films in Area 5. (See [page 3-16](#).)
6. Open the front door.
7. Remove all films in the lower part of the Imager.
8. Close the front door.
9. Close the hood.

The processor will have to warm to operating temperature before the imager can resume printing.

### Removing Film jams from Area 5

Area 5 consists of the components between the processor drum and the film exit tray. Jams can occur in this area between the drum and the densitometer, or in the densitometer. See the figure below.

When a jam occurs in this area **all** films in the imager must be removed.



#### Jam Area 5

1. Open the hood.



#### **CAUTION:**

**Drum and rollers inside the processor are hot. Exercise caution when working in the drum area.**

2. Clear the jammed film from the processor area (there may be more than one sheet). If film is jammed in the drive rollers, pull the Plastic Thumb Tab to open the rollers and free the film.



3. Remove any films in the processor. (See [page 3-14](#).)
4. Close the hood.
5. Open the front door.
6. Remove all films in the lower part of the Imager.
7. Close the front door.

The processor will have to warm to operating temperature before the imager can resume printing.

## Calling for Support

If you cannot correct a malfunction and need help, call for support (see the following table). Before you call, have the following information ready:

- Model number: 8150
- K-number: Displayed on the Local Panel System Information Screen
- Error code and error message if they are displayed on the Local Panel

**Service Phone Numbers**

Country	Phone Number
Argentina	54-3327-458-195 54-3327-458-163
Australia	1 800 034 487 1 800 805 290
Austria	43.800291332
Azerbaijan	00 99412 410856
Belgium	32.27194116
Bolivia	54-3327-458-195 54-3327-458-163
Brazil	0800 15003
Canada	1-800-268-1567
Peoples Republic of China	800 820 5800
Cyprus	00 352 497777

**Service Phone Numbers**

<b>Country</b>	<b>Phone Number</b>
Czech Republic	420 236 100 307 420 62 335 426
Denmark	45 70206129
Finland	35.88001214
France	01 4001 4705
Germany	49.0180.3000.307
India	1600 118989
Iran	00 98 216 950821 00 98 216 402105 00 98 21 256 9741 00 98 21 256 9097
Ireland	44.01442 845775
Israel	00 972 3 9254040
Italy	39.02.66028000
Japan	0120-45-1881
Jordan	00 962 6 4545845 00 962 6 4543354
Netherlands	31.347.363900
Norway	47.66 81 80 80
Pakistan	00 92 21 2638881
Palistinian Territory	00 970 92387421
Paraguay	54-3327-458-195 54-3327-458-163
Portugal	351 21 414 7642
Qatar	00 974 4469 830 00 974 4360 820

**Service Phone Numbers**

<b>Country</b>	<b>Phone Number</b>
Romania	00 40 1210 3854
Saudi Arabia	00 966 2 682 8219 00 966 1 464 5064
Spain	902 19 03 99
Sweden	46.200.119.494
Switzerland	41.0800.804807
Syria	00 963 112128600
Tajikistan	00 90 216 578 2600
Turkey	90 216 572 54 33
Turkmenistan	00 90 216 578 2600
United Arab Emirates	00 971 6 746 6751 00 971 6 746 6285
United Kingdom	44 0442 84 6855
United States	800-328-2910

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# 4 Adding a Modality

After the Imager has been placed into service, you can later configure the Imager to print images from additional modalities. The Imager is capable of receiving images from twelve DICOM-compatible modalities concurrently. Adding a modality involves adjusting some of the image quality settings in the Imager to match the new modality. The following procedure explains how to add one new modality.

**NOTE: You must have the Service Passcode to perform this procedure.**

## Preparing to Add a Modality

- Before you begin, make sure that the new modality has been set up to print to the Imager. The Imager must be available as a print destination in the modality print command.
- You will need the following information about the modality:
  - The modality manufacturer
  - The modality type (CT, MR, etc.)
  - The modality model designation
  - The type and size of film to be used
  - Is the modality GSDF-compliant?
  - If GSDF-compliant, does the modality use PLUTs for all images it sends or only for some images?
- You should also decide on a screen name for the modality. This name will be used only on the Imager Local Panel to identify the modality

### Modality-Related Parameters

The Imager must be configured to print from each connected modality. In the Imager a set of modality-specific parameters must be created for each modality that will print to the Imager.

For many modalities, the required parameters can be taken from the "Modality Preferences Database" (MPDB). This internal database, within the Imager, contains tested parameter sets for many commonly used modalities.

Modality configuration is accomplished in three ways:

- **First Print** - When a modality prints to the Imager for the first time, the Imager automatically attempts to identify the type of modality from information included in the print job. If the Imager identifies the modality, it searches for a parameter set in the MPDB. If an appropriate parameter set is not found, the Imager assigns a universal set of parameters to the modality. If the parameter set does not produce acceptable prints, the installer can go on to the "Manufacturer/Model/Type" procedure.
- **Manufacturer/Model/Type** - If the automatic search in the MPDB is not successful, the installer can enter the Manufacturer, Model and Type of the modality on the Local Panel. The Imager uses this information to search the MPDB again for a set of parameters. A universal parameter set is applied if an appropriate parameter set is not found. If the parameter set is not acceptable, the Installer must use the Manual Entry method.
- **Manual Entry** - The installer can enter or adjust individual modality parameter values on several modality configuration screens.

For each of the above methods, the user must print a clinical image and check image quality to determine if the parameter set is acceptable.

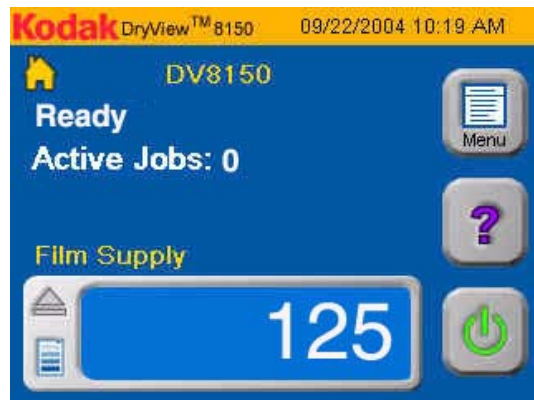
The user can use a combination of manual entry and one of the other two methods. For example, the user may accept the "First Print" parameter set but adjust one or two of the parameters manually to suit local preferences.

The parameter set selected using the above methods is placed in a "Connection Database" in the Imager and used to print all images from the modality. The Connection Database contains a separate parameter set for each modality associated with the Imager.

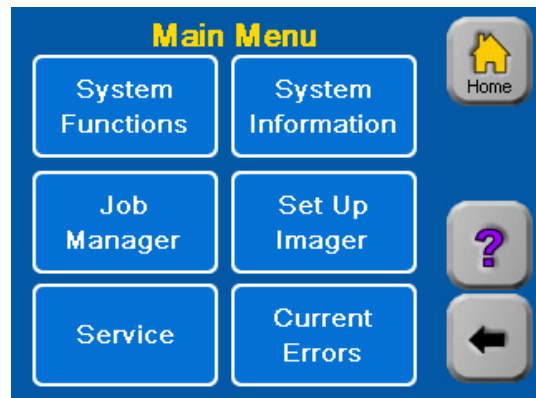
## Configuration Procedure

The modality setup procedure is performed on the Imager Local Panel.

1. Be sure that the proper film size and type required for the modality is loaded in the Imager.
2. Start from the Home screen.

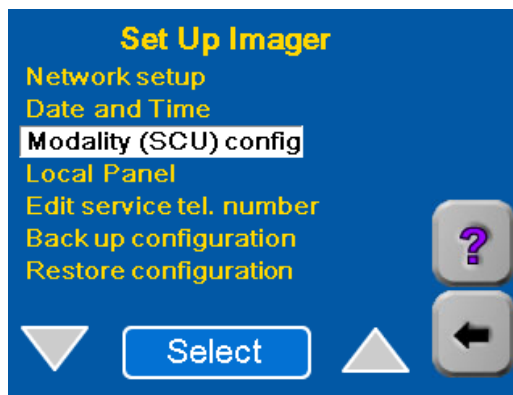


3. Press Menu.



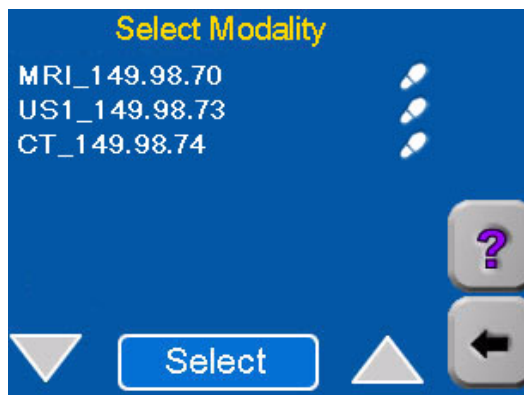
4. Touch **Setup Imager**.

## Adding a Modality



5. Select **Modality (SCU) config**.
6. Enter the Service User ID (99) and the Service Passcode on the keypads that appear.

Previously Configured Modalities



NOTE: If the new modality has previously printed to the Imager but has not been configured, it will appear on the above list but without a footprint symbol.

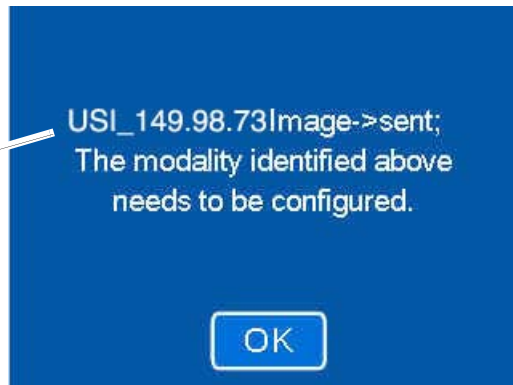
7. Send an Image from the new modality to the Imager.
  - If this is the first time the new modality has printed to the Imager, continue with step 8.
  - If the modality has previously printed to the Imager, go to step 10 on [page 4-6](#).



8. Wait for the following message screen to appear - about 1 minute.  
(When a modality prints to the Imager for the first time, this message will appear.)

NOTE: If this message does not appear, the modality may not be properly set up to print to the Imager. Check the modality setup and re-send the image.

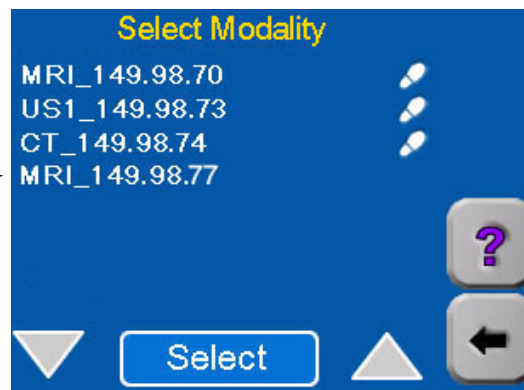
IP Address of the modality that has printed to the Imager



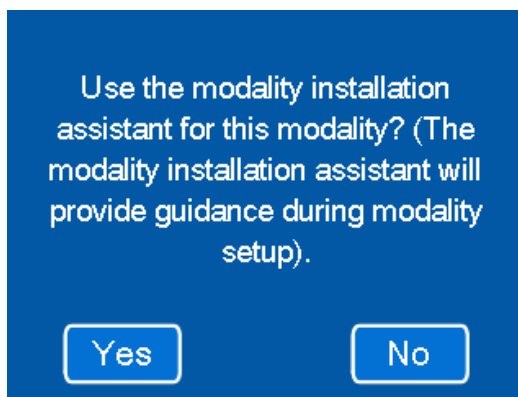
9. Touch **OK**.

The modality that sent the image should now appear at the bottom of the list of modalities.

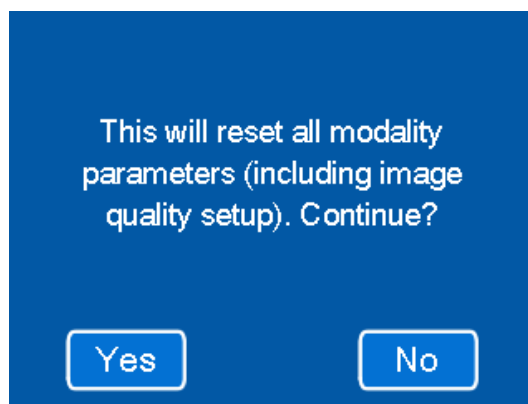
New Modality - that just printed



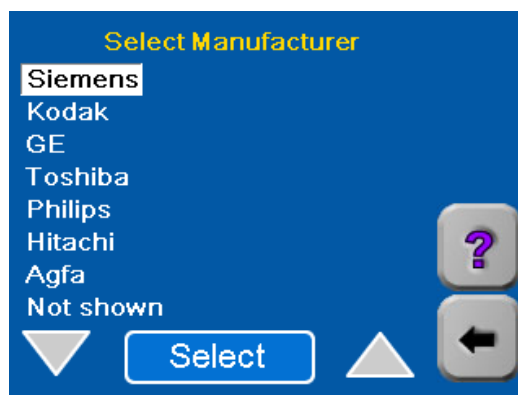
10. Wait for the Imager to print the image sent from the modality.
  - The imager will attempt to find an appropriate set of parameters for the modality in its internal database of modality parameters.
  - If no parameter set is found for the modality, the Imager uses a universal set of parameters to print the test image.
11. Examine the quality of the print. Determine if it is acceptable.
12. On the Select Modality screen ([page 4-4](#)), select the modality that printed the image.



13. Is the quality of the print acceptable?
  - If acceptable, touch **No** (do not use the modality installation assistant). Go to [“Changing the Modality ID” on page 4-10](#).
  - If not acceptable, touch **Yes** (use the modality installation assistant).  
You will now see a series of screens that will allow you to enter the Manufacturer, Type and Model of the modality. The Imager will use this information for a second search of its parameter database.

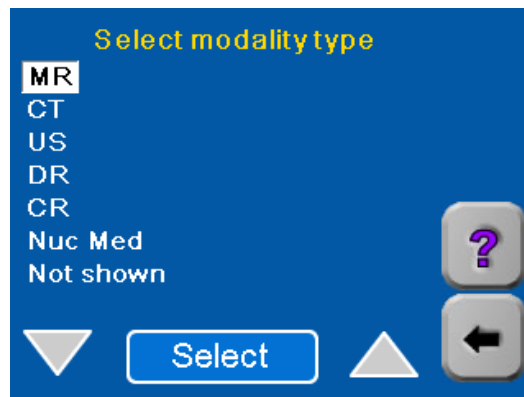


14. Touch **Yes**.

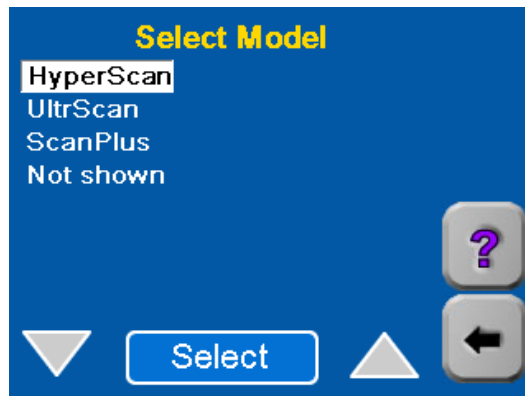


15. Select the name of the modality manufacturer.

## Adding a Modality

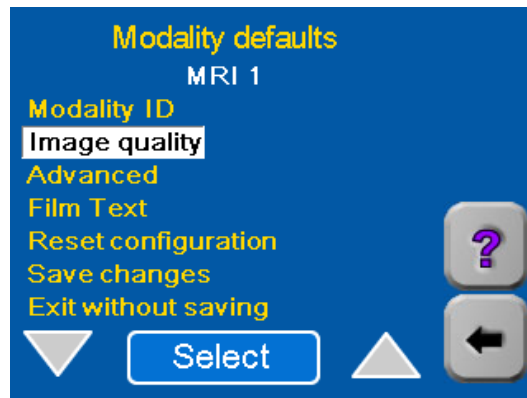


16. Select the modality type.

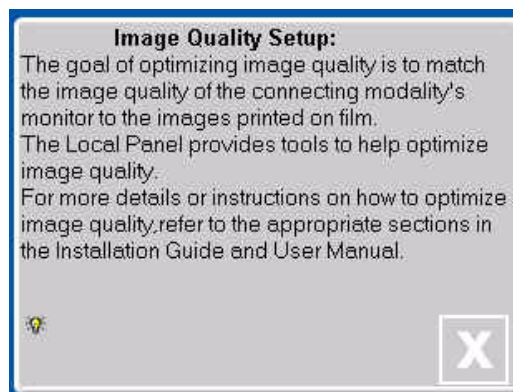


17. Select Model.

- The Imager searches the parameter database:
  - If an appropriate set of parameters is found, these parameters will be applied to all images printed from this modality.
  - If no parameter set is found for the modality, a universal set of image quality parameters is assigned to the modality. You will probably have to modify some of these parameters to achieve satisfactory image quality.
- The Modality defaults screen appears.

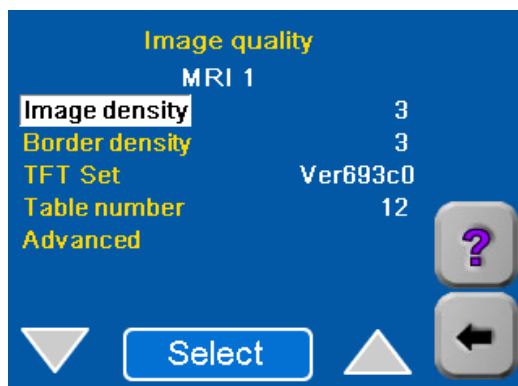


18. Send another clinical image from the modality to the Imager.
19. Wait for the Imager to print.
20. Examine the quality of the print.
21. Is the quality of the test print acceptable?
  - **Yes** - Go to “Changing the Modality ID” on page 4-10.
  - **No** - You can change image quality by adjusting individual image quality parameters:
    - a. Select **Image quality** on the Modality defaults screen.



- b. If the above information screen appears, Touch [X].  
The Image Quality screen appears.

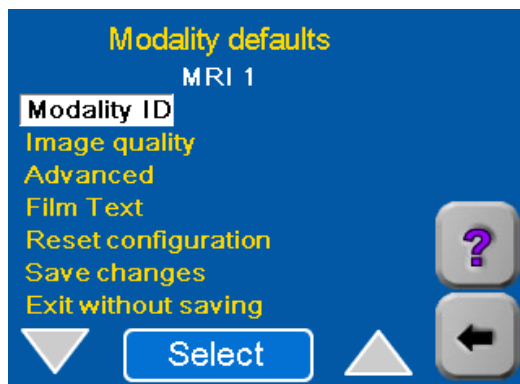
## Adding a Modality



- c. Go to Section 5 of this manual to adjust the parameters shown on the Image Quality screen.
- d. After completing the procedure in Section 5, continue with [“Changing the Modality ID”](#).

## Changing the Modality ID

The Modality ID sent down from the modality is a combination of modality type and IP Address. If you wish, you can change this "name" to a more user-friendly name for use on the Local Panel Screens as follows:

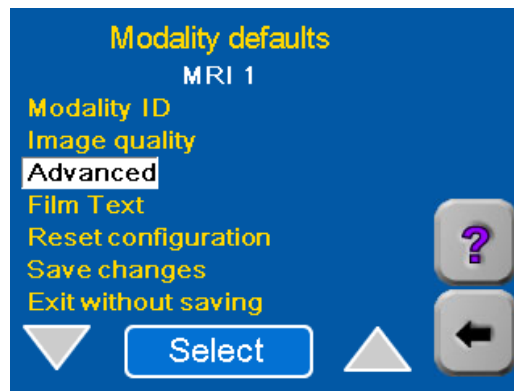


1. With **Modality ID** highlighted, touch **Select**. A keypad appears on the Local Panel.
2. Use the keypad to enter a new name for the modality.
3. Touch **OK** to return to the Modality defaults screen.

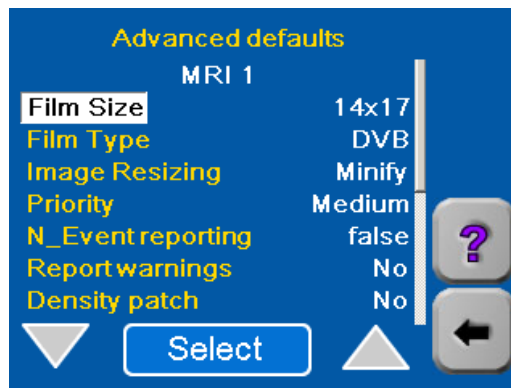
## Setting the Advanced Parameters

NOTE: The Imager automatically sets the Advanced default parameters for a modality when you begin the modality setup process. In most cases these settings are satisfactory. Do not change these parameters unless you are certain that your application of the modality requires different settings.

1. Return to the Modality defaults screen.



2. Select **Advanced**. A list of "Advanced" parameters with their currently selected default values appears.

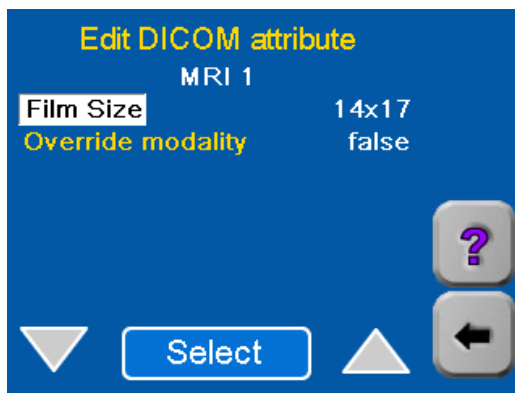


## Adding a Modality

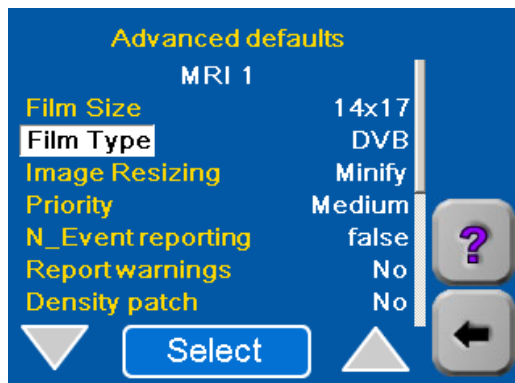
### Selecting Film Size

The film sizes accepted by the Imager are 14 by 17 in., 11 by 14 in., and 14 by 14 in. If the default size shown on the screen is not the desired size, change it.

1. On the Advanced defaults screen, highlight **Film Size**.



2. Use the **Select** button to choose the film size appropriate for this modality. Each time you touch **Select**, the film size will change.
  3. For most installations **Override modality** should be left at **false**.
- NOTE: If you select **True** for **Override modality**, the **Film Size** set in step 2 will take precedence over any film size requested by the modality.
4. Touch the **Back** arrow to return to the Advanced defaults screen.



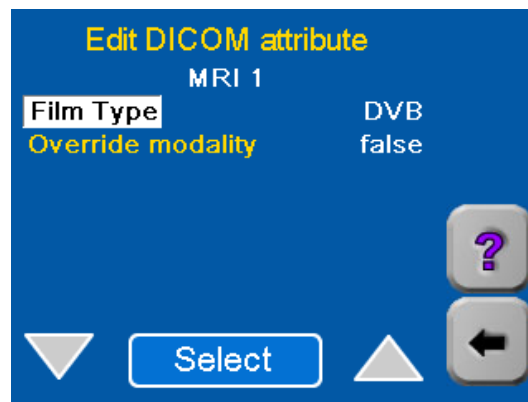


## Selecting Film Type

The Film Type choices are DVB (*DryView Blue*) and DVC (*DryView Clear*). There is more than one type of *Kodak DryView* DVB film. The DVB choice applies to all DVB and DVB+ film types.

If the default shown is not correct for this modality, change the value as follows

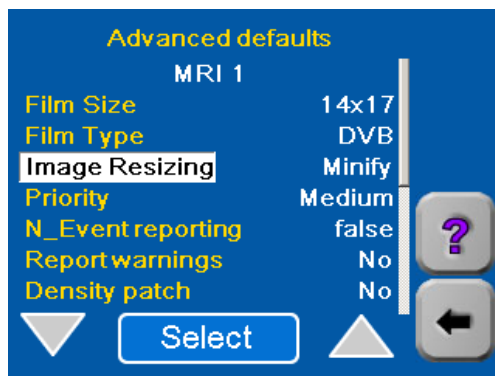
1. On the Advanced defaults screen, highlight **Film Type**.
2. Touch **Select**. The Edit DICOM attribute screen appears.



3. Use the **Select** button to choose the type of film appropriate for this modality.
4. For most installations **Override modality** should be left at **false**.

NOTE: If you select **True** for **Override modality**, the **Film Type** set in step 3 will take precedence over any film type requested by the modality.

5. Touch the **Back** arrow to return to the Advanced defaults screen.



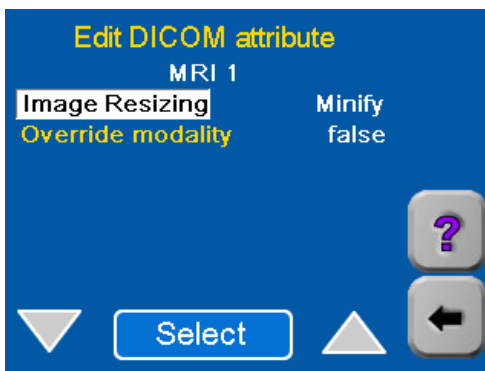
### Selecting the Type of Image Resizing

If the image sent down from the modality is too large for the size of film installed in the Imager, the Imager can resize the image to fit on the film by either of two methods:

- **Minify** - To reduce the image to fit on the selected film size.
- **Crop** - To remove the edges of the image to allow it to fit on the selected page size.

For more information on these two methods, refer to [“Image Resizing” on page 2-45](#).

1. On the Advanced defaults screen, highlight **Image Resizing**.

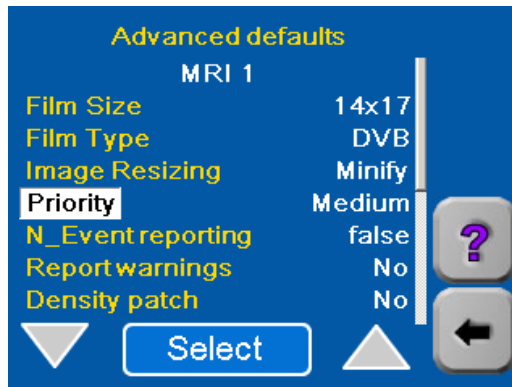


2. Touch **Select** to display the Edit DICOM attribute screen.
3. Use the **Select** button to choose the desired resizing option (**Minify** or **Crop**).

4. For most installations **Override modality** should be left at **false**.

NOTE: If you select **True** for **Override modality**, the Image Resizing mode set in step 3 will take precedence over any type of sizing requested by the modality.

5. Touch the **Back** arrow to return to the Advanced defaults screen.



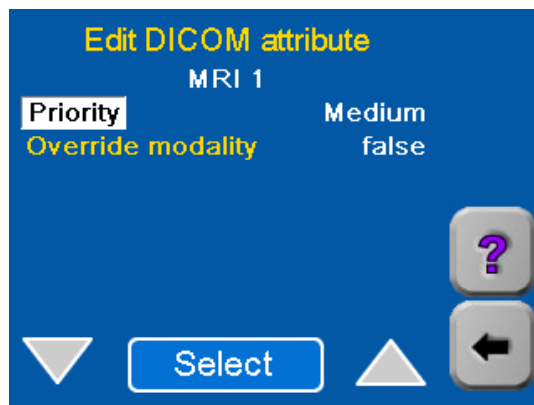
### Selecting Print Priority

The **Priority** for prints determines the order in which the Imager will process prints if a number of modalities are requesting prints at the same time. You can select one of three priority levels.

- High - Prints from this modality will take precedence over prints from modalities with lower priority.
- Low - Prints from modalities with higher priorities will take precedence.
- Medium - Prints from this modality have "medium" priority.

1. On the Advanced defaults screen, highlight **Priority**.
2. Touch **Select** to display the Edit DICOM attribute screen.

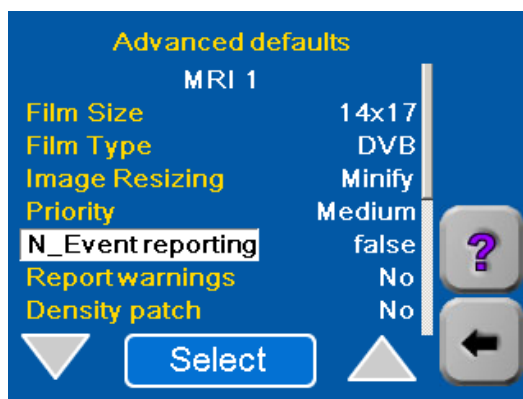
## Adding a Modality



3. Use the **Select** button to choose the desired priority for printing.
4. For most installations **Override modality** should be left at **false**.

NOTE: If you select **True** for **Override modality**, the priority set in step 3 will take precedence over any priority requested by the modality.

5. Touch the **Back** arrow to return to the Advanced defaults screen.



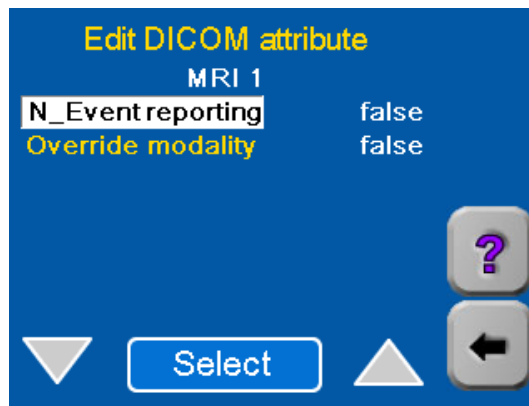
## Selecting N\_Event Reporting

"N\_Events" are status changes at the Imager, such as changes from "ready" to "busy." The Imager can be configured to report these status changes to the modality as they changes occur.

### CAUTION:

**This feature can cause a serious malfunction in the modality if it is not designed or configured to accept N\_Event messages. Leave the N\_Event reporting attribute set to false unless you are certain the modality can accept N\_Event messages.**

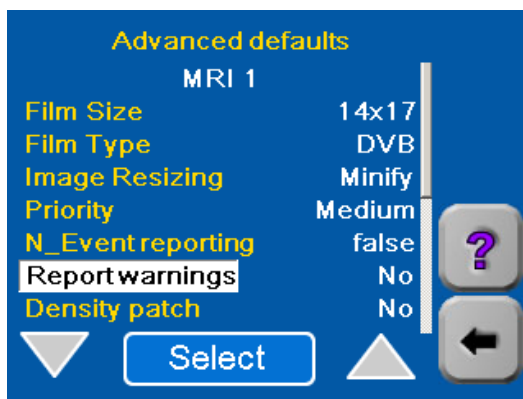
1. On the Advanced defaults screen, highlight **N\_Event reporting**.
2. Touch **Select** to display the Edit DICOM attribute screen.



3. Use the **Select** button to choose **true** or **false**. Selecting **true** enables the Imager to send N\_Event messages to the modality.
4. For most installations **Override modality** should be left at **false**.

NOTE: If you select **true** for **Override modality**, the "N\_Event Reporting" value set in step 3 will take precedence over any request from the modality.

5. Touch the **Back** arrow to return to the Advanced defaults screen.



### Selecting Report Warnings

"Warnings" are messages from the Imager indicating a non-fatal problem in the Imager. Like "N\_Events," these can be sent to the modality if desired, but they should not be if they can cause problems at the modality.

1. On the Advanced Defaults screen, highlight **Report Warnings**.
2. Use the **Select** button to choose **Yes** or **No**.

### Selecting Use of a Density Patch on the Film

A "Density Patch" (also called "dPatch") is a small area of specified density on the edge of the film that can be used by the Imager software to monitor and control changes in density from print to print. The Density Patch is used only on 14 x17 in. film. If the modality requires a different size film, leave this parameter set to **No**.

1. On the Advanced Defaults screen, highlight **Density patch**.
2. Use the **Select** button to choose **Yes** or **No**.

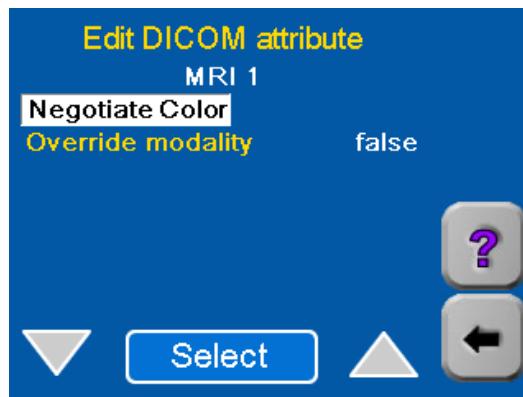
If you select **Yes**, the Imager will print a Density Patch on the edge of every print. If you select **No**, it will not.

When Density Patch is selected, the Automatic Image Quality Control (AIQC) system in the Imager is enabled. This system monitors image quality automatically and makes adjustments to minimize sheet-to-sheet density variation.

## Selecting Color Negotiation

The Imager prints only grayscale images. If a modality has color capability and a request to print a color image is sent to the Imager, the Imager software can print a grayscale version of the color image.

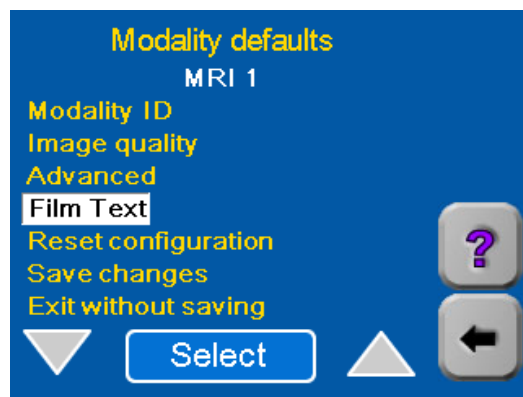
1. Touch the **Down** arrow to proceed to the second Advanced defaults screen.



2. Use the **Select** button to choose **No**.

**NOTE:** If you select **No**, the Imager will not accept color prints from the modality. If you select **Yes**, it will print a gray scale version of the color print.

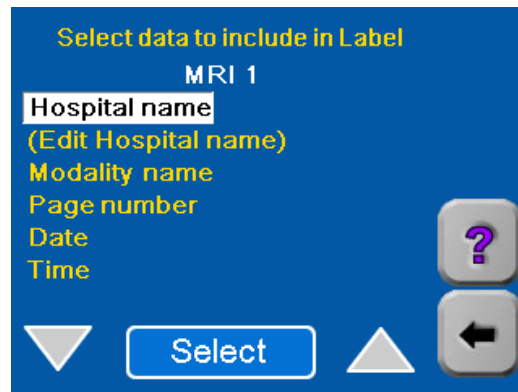
3. Touch the **Back** arrow to return to the Modality defaults screen.



### Setting up the Text (Annotation) Box

This parameter allows you to select items to be printed in a "text box" on the bottom of each sheet of film.

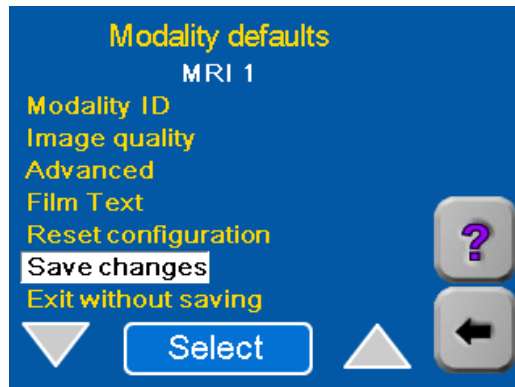
1. Select **Film Text** to display the items you can select.



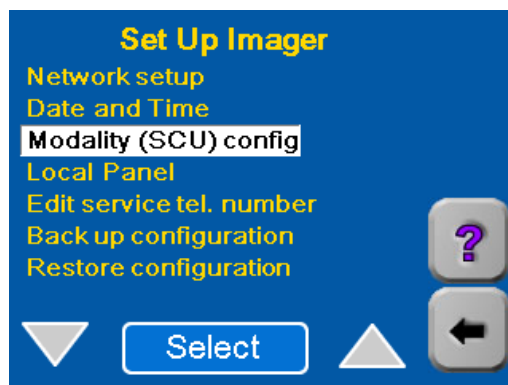
2. Select **Hospital name** if you wish to include the name of your hospital in the annotation box. A check will display adjacent to the field.
  - a. Select **(Edit Hospital name)** and touch **OK**.
  - b. Use the keypad to enter the name.
  - c. Touch **OK**.
3. Select any or all of the other items on the screen. A check will display adjacent to each item you select.
4. Touch the **Back** arrow to return to the Modality Defaults screen.



## Saving the Modality (SCU) Parameters



1. Select **Save Changes** to save the parameter changes you have made.
2. Touch **OK**.
3. Touch the **Back** arrow twice to return to the Setup Imager screen.

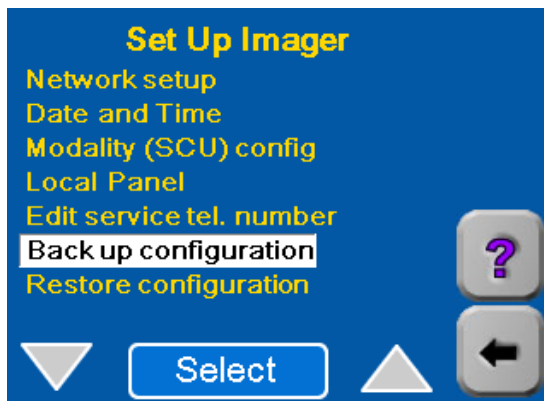


### Backing up the Configuration

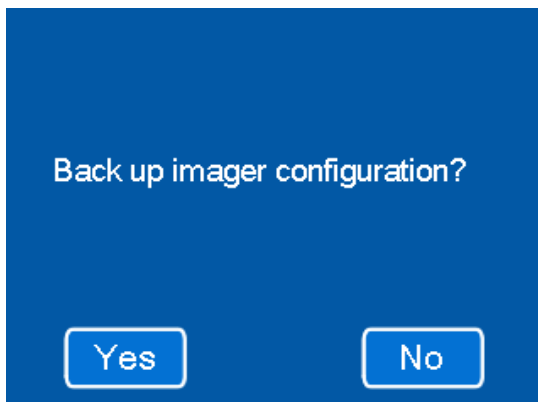
The configuration parameters must be backed up (recorded) on a floppy diskette so they can be restored if the Imager software is updated.

You will need a blank 3.5-inch floppy diskette, 1.44 mb, IBM format.

1. Start from the Setup Imager screen.



2. Select **Backup Configuration**.

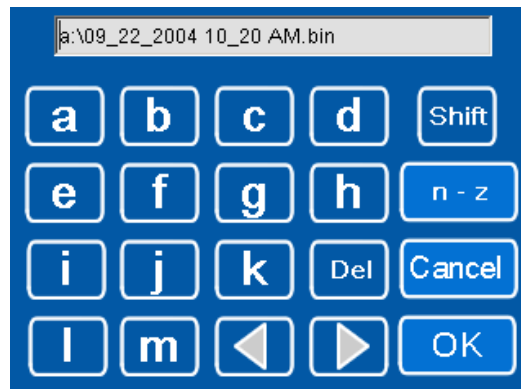


3. Touch **Yes**.

On the keypad shown next, enter a path and name for the backup file, or accept the default. If using the floppy drive, be sure to put a disk in the drive before closing the keypad.

OK

4. Touch **OK**.



5. Choose an easy-to-remember file name for the backup file. For example, **a:\09\_15\_04.bin** or **a:\backup1.bin**. The prefix **a:\** and suffix **.bin** are required.
6. Write down the filename.
7. Enter the filename on the keypad and touch **OK** on the keypad.

## Adding a Modality



You have selected the "a:" drive for backup or restore. Open the front door now to access the floppy?

Yes

No

8. Touch **Yes**.



Opening



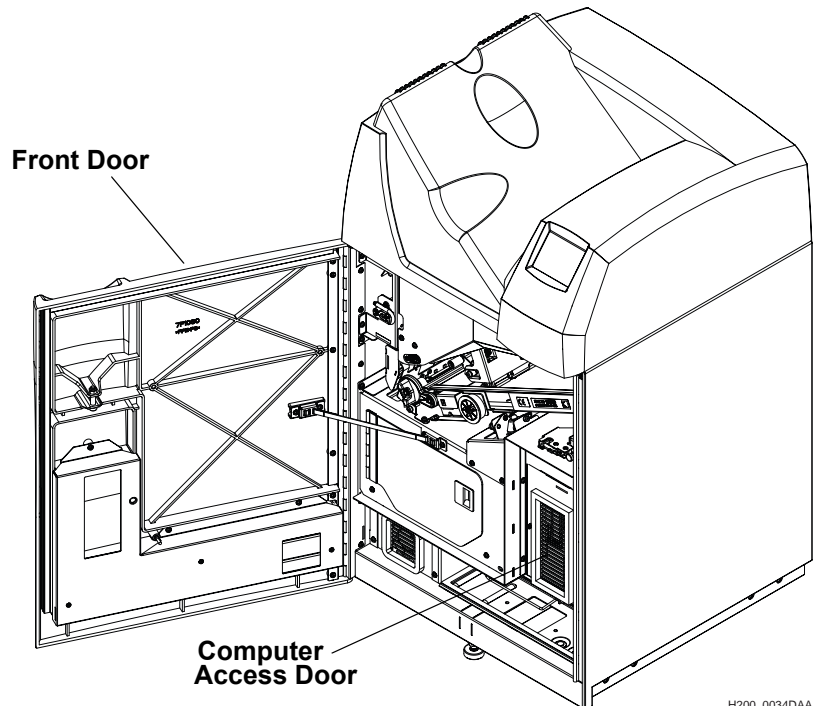
When the front door is open, insert a floppy disk in the drive, then press OK.

OK

lblMsg

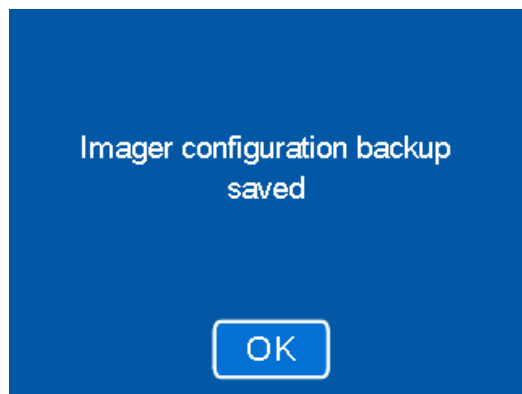
9. Wait for the front door to open.

The Imager first closes the film cartridge and then unlatches the door. This takes about 30 seconds.



H200\_0034DAA

10. Open the computer access door.
11. Insert a blank diskette into the floppy disk drive.  
The Imager records a backup file of the configuration parameters on the diskette.



12. Touch **OK**.
13. Remove the floppy disk from the computer.
14. On the disk label, write the filename exactly as you entered in step 7. Include the date of the backup.
15. Store the floppy disk in a safe place. It may be required if the Imager is serviced.
16. Close the computer access door and the Imager front door.
17. Log out of the Service Passcode:
  - a. Touch the **Back** arrow to return to the **Main Menu**.
  - b. Touch **System Functions**.
  - c. Touch **Log off** and then Touch **OK**.

18. Press the **Back** arrow.  
The Home screen should appear. **Configuration of the new modality is now complete.**

Blank Page

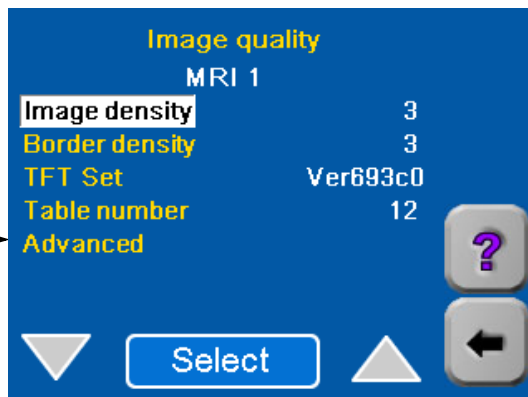


# 5 Optimizing Image Quality

## Image Quality Parameters

If the quality of an image printed by the Imager is not acceptable, you will have to enter new values for the parameters shown on the "Image quality" screen. This section provides basic information that will help you select and enter values for these parameters that are appropriate to the type of modality that sent the image.

The Advanced Parameters are "Polarity" and "Smoothing Type."



The "Image quality" parameters include:

- **Image Density** - A setting that determines the maximum density (Dmax) that will be used in printing.
- **Border density** - The density of the border of the film.
- **TFT Set** - A group of 15 Transfer Function Tables (TFTs) used in *Kodak* Imagers. Each TFT in the set is a grayscale curve that relates each digital input (pixel) value to a target value of perceived brightness and a corresponding target value of printed optical density.
- **Table number** - A number (1- 15) which specifies a particular TFT (contrast curve) in the TFT Set selected for printing.

- **Advanced** - Includes two parameters:
  - **Polarity** - In general, indicates whether an image is black on a white background or the reverse. In this case, specifies whether the Imager will print images with the same polarity as the images sent from the modality (Positive), or the reverse (Negative).
  - **Smoothing Type** - A value (1 - 15) that specifies a level of smoothness/sharpness in transition between density differences.

### Selecting the Image Quality Parameter Values

Use Table 1 (on [page 5-4](#)) and Table 2 (on [page 5-8](#)) to select the image quality parameters. The parameter selections are based on modality type. They also depend on whether the modality is GSDF-compliant. (GSDF stands for Grayscale Standard Display Function.)

To select the parameters:

- If the modality is not GSDF-compliant, go to “[Non-GSDF Modalities](#)” below.
- If the modality is GSDF-compliant and does not use PLUTs or uses PLUTs for only some images, go to “[GSDF-Compliant Modalities](#)” on [page 5-9](#). (PLUT stands for Presentation Look-Up Table.)
- If the modality is GSDF-compliant and uses PLUTs for all images, it is not necessary to change the image quality values in the Imager. Continue with “[Setting the Advanced Parameters](#)” on [page 4-11](#).

### Non-GSDF Modalities

Use this procedure to select parameters for modalities that are not GSDF-Compliant.

Write down the parameter values you select.

1. Refer to Table 1 and find the **Modality Type** for which the Imager is being configured.
2. Choose the **TFT Set** recommended in the table for this type of modality. If more than one TFT Set is listed, read the Notes in the table for guidance in selecting the appropriate set.
3. Choose the **Table No.** (contrast setting) recommended for the chosen TFT Set. If a number is in boldface type, choose this number first. (You may have to try more than one Table Number.)

4. Choose the **Image Density** associated with the **Table No.** you chose. If there is a range of density values:
  - Choose the density value indicated in bold if there is one.
  - If there is no bold value, choose the middle value. For example, if the range is 2.7 to 3.1, choose 2.9.
  - If there are only 2 density values, choose either one.
5. Choose the **Smoothing Type** from Table 1.
6. For **Border Density** on the film, choose a low density for a clear border and a high density for a black border. Typically this density is matched to the Image Density. (This parameter is not included in Table 1.)
7. For **Polarity** of the film, choose either Positive or Negative. Positive is used for most applications. Negative is used by Nuclear Medicine modalities. (This parameter is not included in Table 1.)
8. Continue with [“Entering the Image Quality Parameters”](#) on page 5-10.

**Table 1. Selection of Parameters by Modality Type**

<b>Modality Type</b>	<b>TFT Set</b>	<b>Table No. (Contrast Setting)*</b>	<b>Image Density (Dmax)*</b>	<b>Smoothing Type</b>	<b>Note</b>
<i>Kodak</i> and other <b>CR</b> (Computed Radiography) and <b>DR</b> (Digital Radiography) Systems. Also Workstations and imaging devices that output data to a linear-in- density contrast curve.	WRKSTN2A.w87	1 2 3 4	3.1 3.0 2.9 2.8	5	Select Table number (contrast) and Dmax in the pairs shown. Do not use with <i>Fuji</i> CR. (See <i>Fuji</i> CR below.)
<i>Fuji</i> <b>CR</b>	FCR302C4.w87	10 11 12 13 14 15	2.6 2.7 2.8 2.9 3.0 3.1	5	Table number (contrast) and Dmax must be chosen in the pairs shown. The contrast curves are approximately linear in density for most of the pixel value range, but become relatively flat at high (bright) pixel values. Designed for use with <i>Fuji</i> CR only.
<b>CT</b> (Computed Tomography) or <b>MRI</b> (Magnetic Resonance)	VER693C0.w87	5, 7, 8	3.0, 3.1	15	Table 7 provides good grayscale range in all CT and MRI studies. Table 5 has less mid-tone contrast. Table 8 has more mid-tone contrast.

**Table 1. Selection of Parameters by Modality Type**

<b>Modality Type</b>	<b>TFT Set</b>	<b>Table No. (Contrast Setting)*</b>	<b>Image Density (Dmax)*</b>	<b>Smoothing Type</b>	<b>Note</b>
<b>DSA</b> (Digital Subtraction Radiography), including C-Arm and Digital Fluoro	VER713C0.w87 (Alternative 1)	6, 7, 9	2.9 - 3.1	15	VER713C0 provides brighter image background than VER693C0. Lower Table numbers have less mid-tone contrast. Higher have more.
	VER693C0.w87 (Alternative 2)	6, 7, 9	2.9 - 3.1	15	VER693C0 provides darker image background than VER713C0. Lower Table numbers have less mid-tone contrast. Higher have more.
<i>Phillips Medical Systems</i> (PMS) - <i>EasyVision</i> and other PMS modalities.	PMSV3K.w87	9	3.0, 3.1	15	Check with the PMS service engineer. On some PMS modalities, image quality calibration must be run from the PMS control console.

**Table 1. Selection of Parameters by Modality Type**

<b>Modality Type</b>	<b>TFT Set</b>	<b>Table No. (Contrast Setting)*</b>	<b>Image Density (Dmax)*</b>	<b>Smoothing Type</b>	<b>Note</b>
<b>Nuclear Medicine</b>	VER713C0.w87 (Alternative 1)	5 - 7 - 10	2.2, 2.3	12	Table 7 is popular. Table 5 has less mid-tone contrast and shows more isotope takeup. Table 10 has more mid-tone contrast and reduces takeup visibility on film.
	PMSV3K.w87 (Alternative 2)	<b>10 - 14</b>	2.2, 2.3	12	Start with Table 10. Higher tables have increased brightness and reduce isotope takeup visibility on film. Lower tables show more takeup.
<b>Siemens Host Control or Workstation</b>	WRKSTN2A.w87	4	2.8	15	Typically the density is set to 2.8 by the Siemens host control software. Table 4 must be chosen for linear grayscale translation.

**Table 1. Selection of Parameters by Modality Type**

<b>Modality Type</b>	<b>TFT Set</b>	<b>Table No. (Contrast Setting)*</b>	<b>Image Density (Dmax)*</b>	<b>Smoothing Type</b>	<b>Note</b>
<b>Ultrasound</b>	VER693C0.w87 (Alternative 1)	5 - <b>8</b> - 12	2.4 - 2.8	15	Table number choices vary with manufacturer and radiologist. Lower table numbers have less mid-tone contrast. Higher numbers have more.
	PMSV3K.w87 (Alternative 2)	7 - <b>10</b> - 13	2.4 - 2.8	15	Table number choices vary with manufacturer and radiologist. Higher table numbers have increased brightness.
Notes: * The number in bold should be the first choice when you are selecting parameter values.					

**Table 2. GSDF0 Dmax Setting versus Table Number (Contrast Setting)**

Density (Dmax)	Table Number (Contrast)
1.7	1
1.8	2
1.9	3
2.0	4
2.1	5
2.2	6
2.3	7
2.4	8
2.5	9
2.6	10
2.7	11
2.8	12
2.9	13
3.0	14
3.1	15

Density and Table Number must be chosen in the pairs shown.

**NOTE:** Some DICOM GSDF-modalities may direct the use of DICOM Presentation Look Up Tables (PLUTs) for some or all images. If the PLUT capability in the 8150 Imager is enabled, a PLUT sent from the modality overrides the GSDF0 TFT set (used for GSDF modalities) and associated parameter settings. The DICOM PLUT capability in the Imager is normally enabled but can be disabled by your Service Provider.



## GSDF-Compliant Modalities

Use this procedure to select image quality parameters for GSDF-Compliant modalities that do not use PLUTs or use PLUTs for only some images.

Write down the parameter values you select.

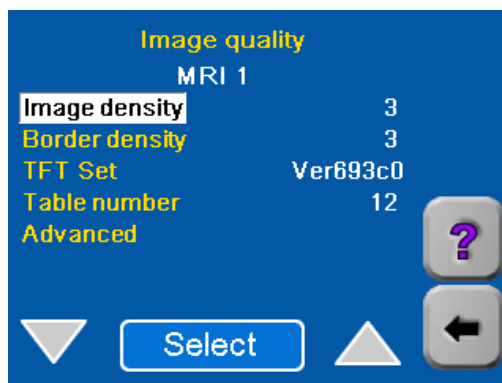
- a. Choose **TFT Set** GSDF0.w87 (used for all GSDF modalities).
- b. Refer to Table 1 (on [page 5-4](#)) and find the **Modality Type** for which the Imager is being configured.
- c. Choose **Image Density**. Choose the recommended density value in the **Image Density** column. If there is more than one density value:
  - Choose the bold value if there is one.
  - If there is a range of values (but no bold value), choose the middle value.
  - If there are only 2 values, choose either value.
- d. Refer to Table 2 (on [page 5-8](#)). Choose the **Table Number** that corresponds to the **Image Density** value you selected.
- e. Choose the **Smoothing Type** for the modality type from Table 1.
- f. For **Border Density** on the film, choose a low density for a clear border and a high density for a black border. Typically this density is matched to the Image Density. (This parameter is not included in Table 1.)
- g. For **Polarity** of the film, choose either Positive or Negative. Positive is used for most applications. Negative is used by Nuclear Medicine modalities. (This parameter is not included in Table 1.)
- h. Continue with [“Entering the Image Quality Parameters” on page 5-10](#).

# Entering the Image Quality Parameters

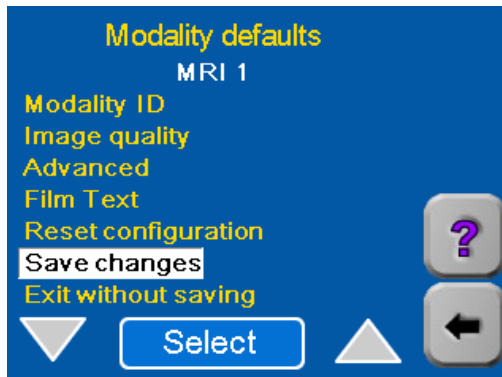
1. After choosing the parameter values for the modality, enter them from the **Image quality** screen.
  - Each choice on this screen calls up an entry screen for one of the parameters.
  - On some parameter entry screens an **Override Modality** option appears. The choices are **True** or **False**. For most installations you should select **False**.

If you select **False**, the parameter value you enter will be used only if the modality does not send this parameter with a print job.

NOTE: Select **Advanced** to enter **Smoothing Type** and **Polarity**.



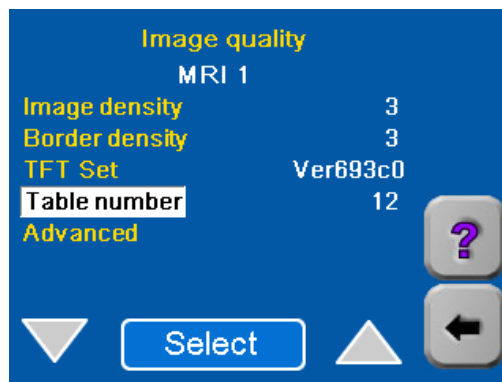
2. Touch the **Back** arrow (2 or 3 times) to return to the **Modality defaults** screen.



3. Select **Save changes** to save the changes you have made, and touch **OK**.
4. Send another image from the modality and check print quality.

NOTE: For DICOM GSDF-compliant modalities, the printed images should approximately match images on DICOM GSDF-compliant displays.

5. Is the quality of the print acceptable?
  - Yes: Continue with [“Setting the Advanced Parameters” on page 4-11.](#)
  - No: Select **Image Quality**.
6. If an "Image Quality Help" screen appears, touch **X**.



7. Refer again to Table 1 (Table 2 for GSDF-compliant modalities) and choose the Table No. (for the same modality type) that is just below or

## Optimizing Image Quality



above the one you previously entered.

8. Enter and save the new Table number (steps 1 - 3).
9. Send another image from the modality and check print quality again.

NOTE: You may have to try other Table numbers (and Densities) to achieve high quality prints.

10. When print quality is acceptable, return to [“Changing the Modality ID” on page 4-10.](#)
11. If you are unable to achieve satisfactory quality, call service for help. Refer to [“Calling for Support” on page 3-17.](#)



# 6 Specifications

## Dimensions

Height:	117 cm (46 in.) - Top cover closed 158 cm (62.3 in.) - Top cover open
Width:	63.5 cm (25 in.)
Depth:	66 cm (26 in.) - Front door closed 124.5 cm (49 in.) - Front door open
Weight:	204 kg (450 lb)

## Electrical

Voltage:	100 V $\pm$ 10%, 50/60 Hz $\pm$ 3 Hz 120 V $\pm$ 10%, 50/60 Hz $\pm$ 3 Hz 230 V $\pm$ 10%, 50/60 Hz $\pm$ 3 Hz
Current Draw:	100 V: 12 Amps max. 120 V: 10 Amps max. 230 V: 5.3 Amps max.
Power Consumption:	1200 W (maximum)

## Specifications



### Laser Specifications

Wavelength:	805 - 815 nm
Power:	50 mW
Type	Diode
Diode Radiation Class:	3B
Imager Radiation Class	Class 1 product

### Operating Environment

Temperature:	15° to 35° C (59° to 95° F)
Humidity:	15% to 85% RH, non condensing
Magnetic Field:	< 50 Gauss
Altitude	3048 - 12,192 m (100 - 40,000 feet)

### Storage Environment

Temperature:	-35° C to 60° C (-31° F to 140° F)
Humidity:	10% to 90% RH, non condensing
Altitude	Up to 3048 m (10,000 feet)

### Environmental Effects

Heat Dissipation:	3000 BTU/hour (average)
Acoustical Noise:	Less than 55 dB at one meter (70 dB momentary)  Less than 80 dB, non-repetitive tasks such as door open/close

## Film Sizes

The 8150 Laser Imager processes the following film sizes:

- 28 x 35 cm *DryView* Film (11 x 14 in. landscape)
- 35 x 35 cm *DryView* Film (14 x 14 in.)
- 35 x 43 cm *DryView* Film (14 x 17 in.)

## Film Types

The 8150 Laser Imager processes the following film types:

- *Kodak DryView* DVB Laser Imaging Film
- *Kodak DryView* DVC Laser Imaging Film
- *Kodak DryView* DVB+ Laser Imaging Film
- *Kodak DryView* DVB+ Premium Laser Imaging Film

NOTE: Not all of these film types are available in every country.

## Film Throughput

Prints 70 films per hour.

## Agency Compliance

See the *Kodak DryView* 8150 Laser Imager Safety Manual, document number 7F3779.

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# 7 Film Technical Information

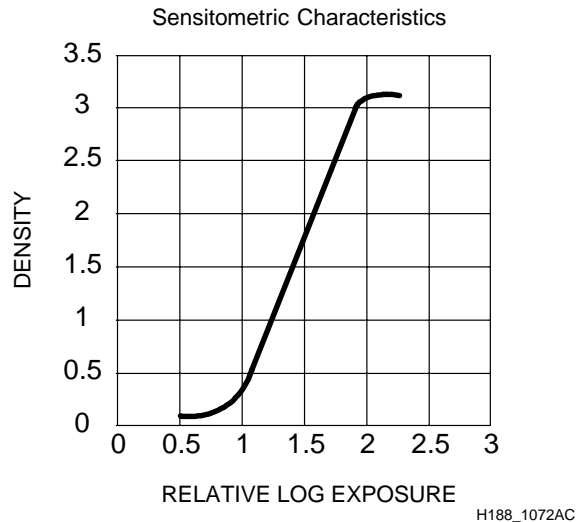
## General Description

This section describes the characteristics of *Kodak DryView* Laser Imaging Film, not the operation of the *Kodak DryView* 8150 Laser Imager. *DryView* Laser Imaging Film is a high-resolution, infrared-sensitive, photothermographic film designed specifically for the family of *Kodak DryView* Laser Imagers. *DryView* Laser Imaging Film is packaged in daylight load packages, available in blue or clear, 7-mil polyester base. The 8150 Laser Imager accepts three film sizes:

- (28 x 35 cm) 11 x 14 in.
- (35 x 35 cm) 14 x 14 in.
- (35 x 43 cm) 14 x 17 in.

## Spectral Sensitivity

*DryView* Laser Imaging Film is infrared sensitive and has been sensitized to the infrared laser diode of *DryView* Laser Imagers. When handled according to instructions on the daylight-load film package, safelights are not needed. If you remove undeveloped film from the daylight load package, you will need a darkroom setting and a green safelight.



### Relative Log Exposure (Example)

## Image Quality

*DryView* Laser Imaging Film delivers diagnostic-quality, continuous-tone images along with sharp alphanumeric and optimum contrast. This high-quality, silver-based film provides radiologists with the same diagnostic information they are accustomed to viewing - including the spatial resolution, contrast and grey levels. Because it is a totally dry imaging process, there is no image quality variability due to "wet" chemistry.

## Automatic Image Quality Control

*DryView* Laser Imaging Film is system-matched for the Kodak patented Automatic Image Quality Control (AIQC) technology. This fully automated system, which is a standard feature of *DryView* Laser Imagers, is designed to ensure that image quality parameters meet preset user preferences, film-to-film, lot-to-lot.

## Environmental Impact

Tests show that *DryView* Laser Imaging Film is not considered hazardous to the environment. As a result, you can develop, recycle, and dispose of film with less impact on the environment than if you were using wet-developed silver halide films.

<b>DryView Laser Imaging Film - US Environmental Regulations Comparison</b>					
	<b>Wet Silver Halide</b>				<b>DryView</b>
	Developer	Fixer	Wash	Film	Film
<b>Product Regulations</b>					
OSHA MSDS	Required	Required	Not required	Not required	Provided
DOT	Hazardous	Hazardous	No limits	No limits	No limits
Use permits	Local	Local	None	None	None
<b>Disposal* Regulations</b>					
EPA	Hazardous	Hazardous	No	No	No
DOT	Hazardous	Hazardous	No	No	No
Note: There is no SUPERFUND liability with <i>DryView</i> Laser Imaging Film.					
* State and local laws vary. Consult appropriate regulations or authorities prior to disposal.					

## Recycling Film

According to the Environmental Protection Agency (EPA) standards, *DryView* Laser Imaging Film is not considered hazardous and requires no special disposal procedures. However, the film does contain silver and polyester that may be recovered by using one of several recycling processes. Call your local Kodak sales representative or go to the Kodak web site [www.kodak.com/go/KES](http://www.kodak.com/go/KES). Refer to Publication J700 and see "End of Life Management" section.

## Storing and Handling Undeveloped Film

To achieve consistent results up to the expiration date indicated on the film package, *DryView* Laser Imaging Film must be stored in a cool, dry place (41° F/5° C to 77° F/25° C) and protected from radiation and chemistry fumes.

The film can withstand short-term temperature spikes (up to 95° F/35° C) for several hours during transit without any significant effect on film quality or performance. Transit temperatures above 95° F/35° C will gradually diminish shelf life. If the AIQC encounters film that has been damaged by improper handling, the AIQC will automatically alert system operators.

### Handling Developed Film

Handling *DryView* Laser Imaging Film requires reasonable care.

Prolonged exposure to intense light or excessive heat (130° F/54.4° C) for more than 3 hours may cause some gradual darkening of images. Leaving films in vehicles in hot climates for extended periods of time is not recommended.

Spills, humidity and other forms of water typically have no significant effect on image quality or film integrity. If necessary, film can be cleaned with a clean, damp cloth.

For best results, store film in sleeves when not being reviewed. *DryView* Laser Imaging Film can be left on a light box for more than 24 hours. In extreme cases in which light boxes are exceptionally hot (120° F/49° C), Kodak recommends removing them prior to 8 hours of continuous exposure.

Take care when using spotlight viewing for more than 30 seconds because temperatures near the light source may exceed 180° F/82.2° C. Use in slide projectors is not recommended due to the high temperatures generally found in these devices.

With *DryView* technology, a small amount of final development occurs when the film exits the Laser Imager and is initially exposed to ambient or view-box lighting. This is virtually undetectable and has no effect on image quality (i.e., typically 0.02 change in density). This small density increase is uniform and permanent upon full exposure of the film under normal handling conditions (i.e., room light or view box).

### Archiving Developed Film

*DryView* Laser Imaging Film has been tested and can be archived for more than 100 years when stored at American National Standards Institute (ANSI) recommended storage conditions (77° F/25° C). Developed films may be stored at higher temperatures; however, that may reduce the number of years the film can be stored. For example, storing films at a constant elevated temperature of 90° F/32.2° C may reduce archive capability to 30 years.

### Dissipating Odor

*DryView* technology eliminates virtually all unpleasant odors. While some low-level odors are produced during the development process, they pose no known adverse health risks. Processing odor levels are further reduced by a non-hazardous, recyclable filter in the Laser Imager. This filter traps most low-level odors and prevents them from dissipating into the work

environment. To help maintain optimum performance, the filter requires periodic replacement. *DryView* Laser Imagers require no special venting.

## **Dissipating Heat**


*DryView* Laser Imagers use controlled heat to develop *DryView* Laser Imaging Film. The heat has virtually no effect on the air temperature of the work area. The amount of heat dissipated into an area during a day is typically less than the heat generated by four 100-watt light bulbs.

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# Glossary

<b>AIQC</b>	Automatic Image Quality Control.
<b>CR</b>	Computed Radiography, the process of creating digital radiographic images.
<b>CT</b>	Computed Tomography, the process of creating digital tomographic images.
<b>DICOM</b>	Digital Imaging and Communications in Medicine. A TCP/IP-based protocol for transmitting and receiving medical imaging and related data over a network.
<b>Dmax</b>	Maximum density. The density of an area on the film which has received maximum exposure.
<b>Dmin</b>	Minimum density. The density of an unexposed area on the film.
<b>Dpatch</b>	Density patch. A small patch of specified density on the trailing edge of each film that AIQC uses to monitor density change on film.
<b>DR</b>	Digital radiography, the process of creating digital radiographic images.
<b>DVB</b>	<i>DryView</i> Blue Laser Imaging Film.
<b>DVC</b>	<i>DryView</i> Clear Laser Imaging Film.
<b>GSDF</b>	Grayscale Standard Display Function
<b>Key operator</b>	The person(s) designated by the department manager to receive applications training and allowed access to password-protected areas to make system changes.
<b>Modality</b>	Medical equipment that actually generates medical images (for example, an MRI).
<b>MR</b>	Magnetic Resonance.
<b>N/A</b>	Not available or not applicable.
<b>K number</b>	The K number (Kodak number) is located on the Local Panel System Information Screen.
<b>Platen</b>	The metal surface on which the film rests as it is exposed.
<b>Shutdown</b>	The process of exiting current tasks and applications and turning the power off.
<b>SMPTE test pattern</b>	A Society of Motion Picture and Television Engineering monitor test pattern that is used for analyzing image-quality problems.



**Test type**

The type of test film that will be printed. Two film test types are available: a density test film (SMPTE pattern) and a calibration film.

**TFT**

Transfer Function Tables.

**Unprintable queue**

The queue of jobs that cannot be printed because of errors in the print jobs.







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