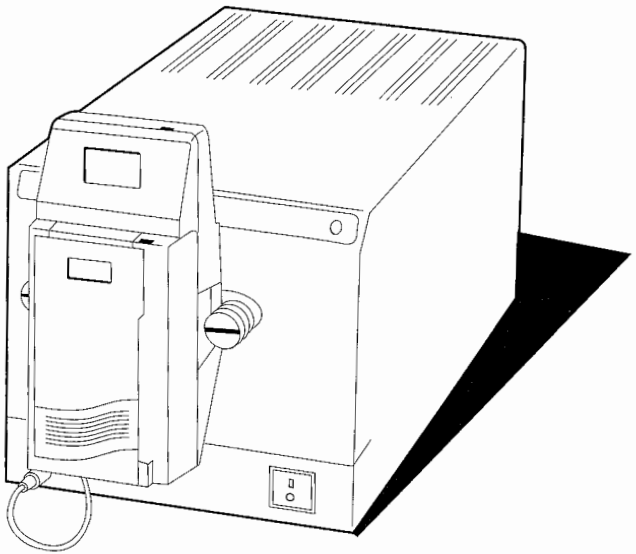
Polaroid

HR 6000

User's Guide



HR 6000 User's Guide

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Quick Start Guide

Set up the equipment

1. Turn off your computer and all equipment connected to it.
2. Connect the recorder to your computer using the cable supplied. Place the recorder at least 18-24 inches from your computer monitor.
3. If you are using the SCSI interface, be sure your SCSI connections are correctly made and properly terminated.
4. Plug the power cord into the recorder, then into a power outlet.
5. Turn on the recorder, then the computer.
6. Attach and load a camera back.

Install the software

Install the RasterPlus software according to the instructions packaged with the RasterPlus CD.

Important To ensure full-frame images, use the camera calibration procedure described in your software manual.

1. Introduction

This manual describes setup and use of the Polaroid HR 6000 film recorder. The HR 6000 includes both a parallel and a SCSI interface. The SCSI interface can be used with Microsoft Windows computers, Macintosh computers, and workstations. The recorder can operate over a voltage range from 100VAC to 240VAC.

Software accessory kits are available from Polaroid for PC and Macintosh computers:

- Palette for Windows Software Kit for CI and HR
- RasterPlus for Macintosh Kit for All Palette Recorders, or Palette for Macintosh Kit -- All Palette Recorders

For information on installing and using the software, see the manual with the software.

The Polaroid HR 6000 Film Recorder is a personal computer hardcopy device that prints photographs of graphics images on a variety of 35mm films, including conventional slide films (E-6 process) and negative film (C-41 process).

The resolution of the resulting images is dependent on the capabilities of the graphics application; these images typi-

cally have a higher resolution than the screen image. The HR 6000 is capable of up to 4096 x 2732 (4K). Color resolution is 256 levels for each primary color (red, green and blue) resulting in a color space of 16.7 million colors.

The recorder produces images by digitally controlling a light beam through an internal CRT and exposing film through red, green and blue filters. The recorder can be chosen as an output device from graphics software packages.

Technical assistance

Before calling customer support, please check this guide for answers to your questions. You can also obtain product support information on the World Wide Web at these Polaroid World Wide Web sites:

http://www.polaroid.com (U.S. and worldwide site)

http://www.polaroid.de

http://www.polaroid.co.uk

You can get answers to many common questions by visiting **www.polaroid.com**, clicking Customer Support, and then clicking Get Help.

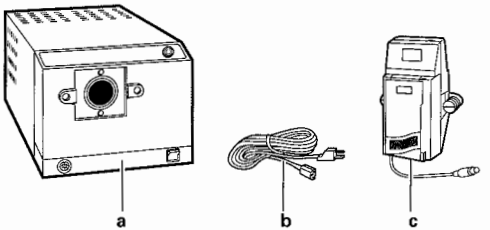
If necessary, call toll-free from within the U.S.A., Monday through Friday, 8 a.m. to 8 p.m. (Eastern time): **1-800-432-5355**. Or fax: **781-386-9688**

In Canada, call: **1-800-268-6970**.

Outside the U.S.A. and Canada, visit **www.polaroid.com.** Click Customer Support and then click Contact Polaroid World-Wide for contact information.

The Polaroid HR 6000 Film Recorder system

The recorder package



a HR 6000 Recorder
b Power cord
c 35mm camera back
d This manual, not shown

Palette for Windows software kit

- RasterPlus software
- ColorTune software
- Polaroid Palette Export for Windows 95 software and instruction booklet
- Host interface cable (Centronics parallel)

Macintosh software kits

- RasterPlus software
- Polaroid Palette Export for Macintosh software and instruction booklet
- Macintosh SCSI cable (25-pin to 50-pin)
- SCSI terminator

Radio and television interference

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

1. Setting up

The HR 6000 recorder includes two SCSI ports for connection to a Macintosh computer or a PC with a SCSI host adapter, as well as a parallel port. See the appropriate section for connection instructions.

WARNING: NOTHING INSIDE THE RECORDER CAN BE OWNER-SERVICED. TO AVOID POSSIBLE ELECTRICAL SHOCK, DO NOT OPEN THE RECORDER. DOING SO MAY ALSO VOID YOUR WARRANTY.

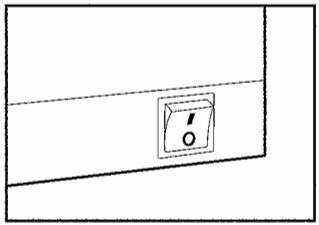
Unpacking and positioning the recorder

Remove the recorder very carefully. There is a cathode ray tube inside that may break if the unit is mishandled. Place the unit 18 - 24 inches from your monitor to avoid electromagnetic interference. (Save the carton and packing materials for possible future shipment.)

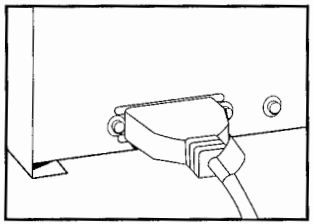
Connecting the recorder to a PC parallel port

WARNING: ALL CONNECTIONS MUST BE MADE WITH THE POWER OFF ON BOTH THE RECORDER AND THE COMPUTER. PAY STRICT ATTENTION TO THE SEQUENCE OF INSTRUCTIONS IN THIS SECTION. FAILURE TO COMPLY MAY RESULT IN DAMAGE TO YOUR COMPUTER AND/OR THE RECORDER. SUCH DAMAGE IS NOT COVERED BY THE WARRANTY.

1 Turn off your computer, if it is on, and make sure the recorder's On/Off switch is in the Off position.



2 Connect one end of the parallel cable into the recorder and fasten it with the two clips.



3 To connect the recorder to your computer, plug the other end of the cable into the parallel port. Fasten the connector with the two thumbscrews.

Connecting the recorder to a SCSI interface

WARNING: ALL CONNECTIONS MUST BE MADE WITH THE POWER OFF ON BOTH THE RECORDER AND THE COMPUTER. PAY STRICT ATTENTION TO THE SEQUENCE OF INSTRUCTIONS IN THIS SECTION. FAILURE TO COMPLY MAY RESULT IN DAMAGE TO YOUR COMPUTER AND/OR THE RECORDER. SUCH DAMAGE IS NOT COVERED BY THE WARRANTY.

The HR 6000 recorder includes a SCSI interface (Small Computer System Interface, pronounced "scuzzy"); a standardized cable system and communications protocol that allows you to connect up to seven SCSI peripheral devices to your computer.

The SCSI interface is standard for Macintosh computers. For the PC, you must have a SCSI host adapter installed in your computer. Support for SCSI host adapters is provided by the software application.

See the instructions provided with the SCSI adapter for proper installation.

SCSI guidelines

The SCSI system uses special cables and terminators to achieve communication between the computer and peripheral devices. To function properly, the combined length of the entire cable system must not exceed 19 1/2 feet (6 meters) and must include the appropriate number of terminators. Terminators are devices that maintain the clarity of the SCSI signal along the chain of devices. A SCSI chain must always be terminated at both ends. Incorrect termination can permanently damage the computer, digital film recorder, or any other device along the SCSI chain. Refer to the following guidelines and diagrams for more information.

Termination

The SCSI chain must be terminated at both ends of the chain. The beginning of the chain is typically the computer. In a PC, make sure the SCSI host adapter is terminated; see instructions for the SCSI adapter. (However, if you have an internal SCSI hard drive and only one SCSI adapter, then the hard drive should be terminated and not the adapter.) Most Macintosh computers include a hard disk which is internally terminated. (If your computer does not include an internally-terminated hard disk, you must place an external terminator on the first device after the computer, between the device and the SCSI cable to the computer.)

Intermediate devices in the chain should not be terminated. If you have an internally-terminated device, place it at the end of the chain. (Check the manual for the device to determine if it is internally terminated or not.) If none of your devices are internally-terminated, place the external terminator provided on the last device. If the HR 6000 film recorder is the last device, connect the terminator to either of the two SCSI ports.

PowerBook note: According to Apple Computer, Inc., even though the PowerBook computer has an internal hard disk, you should treat it as an unterminated device. This means that you must have two terminators on the SCSI chain. Apple also advises that if you have only one device connected to a PowerBook computer, you must have two terminators on this one device. The documentation with your computer has more information.

Connection tips

- Always make SCSI connections firmly, connecting the clips or tightening the screws that secure cables and terminators. Most problems with SCSI devices are connection problems along the SCSI chain.
- Some devices, such as the HR 6000 film recorder, have two SCSI ports. The cable and terminator can be connected to either port without affecting the performance of your equipment. When you connect or disconnect a SCSI device, make sure all SCSI devices are switched off.
- Each device on a SCSI chain must have a unique SCSI ID number. These numbers are described in the following section.
- Wherever a 50-to-50 pin cable is required, be sure to use a cable which meets the SCSI-2 specification, such as an Apple cable.
- If you are using a PC, the recorder can be connected to two host computers at once; one via the Centronics connector and

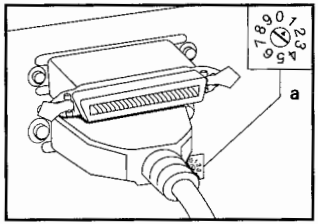
one via the SCSI connector. The recorder will image in the order the signal is received.

SCSI ID numbers

WARNING: TO PREVENT DAMAGE TO YOUR HARDWARE AND SOFTWARE, READ THIS SECTION BEFORE TURNING ON YOUR SYSTEM.

Each device on a SCSI chain must have a unique SCSI ID number from 0 to 6. The HR 6000 film recorder is set at the factory to SCSI ID number 1. If this number conflicts with any other device on your SCSI chain, you must change either the SCSI ID number of the recorder or the SCSI ID number of the other device. Refer to your SCSI card or SCSI adapter manual for more information.

Use the rotary switch **(a)** on the back of the recorder. **Before changing the recorder's SCSI ID number, be sure the device is turned off.**

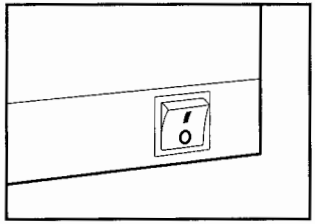


The switch has an arrow that points to the current SCSI ID number. Use a small, flat-blade screwdriver to change this number. Do not use the numbers 7, 8, and 9.

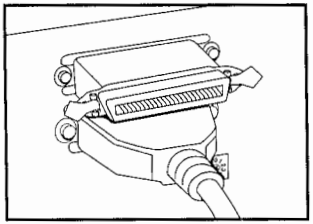
WARNING: IF TWO DEVICES ON A SCSI CHAIN HAVE THE SAME SCSI ID NUMBER, NEITHER WILL WORK CORRECTLY, AND DATA MAY BE DAMAGED WHEN YOU TURN ON THE DEVICES.

Connecting the cables

1 Turn off your computer and make sure the recorder power switch is off.



2 Be sure to place the HR 6000 film recorder at least 18-24 inches away from your computer monitor. Connect the 25-pin end of the data cable to the SCSI port on the back of your computer and the 50-pin end to one of the two SCSI ports on the rear panel of the recorder.



3 **Warning:** Use only the cable supplied with the HR 6000 software.

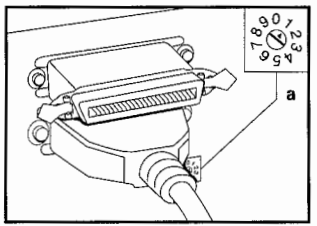
4 If the recorder is the last device in the chain, connect the proper terminator provided to the other SCSI port to terminate the signal.

5 The second port can also be used to connect another SCSI device to the chain, using another SCSI cable. Terminate the signal at the last device in the chain. If the recorder is part of a SCSI chain and not directly connected to your computer, be certain to use only SCSI-specified cables for all connections in the chain. For details, see "SCSI guidelines" (page 7), "Termination" (page 8) and "Connection tips" (page 8).

6 **Note:** If you are connecting the recorder to a Macintosh that requires special termination, connect the special terminator provided by Apple to the last device on the SCSI chain.

7 The diagrams on the following pages will serve as a reference to correct SCSI connections for various system configurations.

8 Change the SCSI address of the recorder, if necessary, by changing the SCSI selector switch **(a)**.



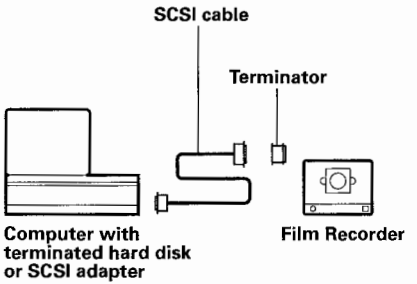
See page 7 for detailed information on SCSI ID numbers.

Diagrams of various SCSI configurations

There is a variety of system configurations depending on what peripherals you own.

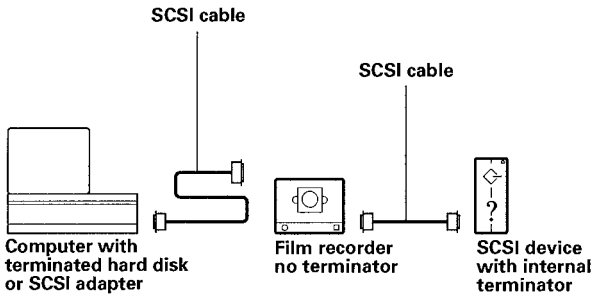
The following pages contain diagrams for connecting the many different combinations. Find the appropriate configuration for your hardware, and follow the connection diagram and instructions.

Recorder as the only external SCSI device



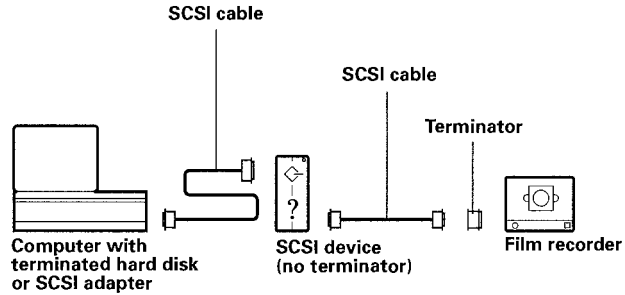
The internal SCSI hard disk or the SCSI host adapter is internally terminated. Therefore, you only need to add one terminator between the cable and the HR 6000 film recorder.

Multiple external SCSI devices, one internally terminated



Place the device with the internal terminator at the end of the chain and do not add any additional terminators. If any other external device has an internal terminator, the terminator will have to be removed according to the manufacturer's directions.

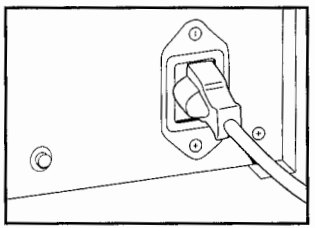
Multiple external SCSI devices, none internally terminated



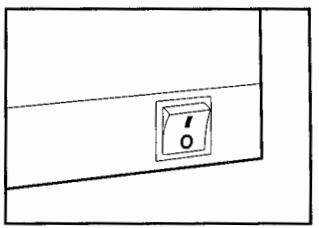
Place a terminator between the SCSI cable and the last external SCSI device on the chain. If one external device has an internal terminator, see the example above.

Turning on the system

1 With the recorder off, plug the power cord provided into the recorder, and then into an appropriate grounded outlet. The recorder can operate over a voltage range from 100 to 240 VAC.



2 Turn on the recorder power switch.



A green LED on the front of the recorder indicates power is on. The unit goes through a brief self-test and a warm-up period of up to 20 minutes, then is ready for imaging. (If the system displays an error message that the unit is not warmed up when you attempt your first exposure after powering up, wait a few moments and try again.)

If the system detects an internal problem when powering up, the LED will blink in irregular bursts (an SOS pattern); contact Technical Assistance (see page 4) for help. During an exposure cycle, the LED will blink at a regular rate to indicate that data is being transferred to the recorder.

3 Turn on your computer.

Caution: As with any highly sensitive optical equipment, vibrations or bumping the recorder during the exposure cycle may result in picture defects. Locate the unit where it will not be disturbed during use.

Testing your installation

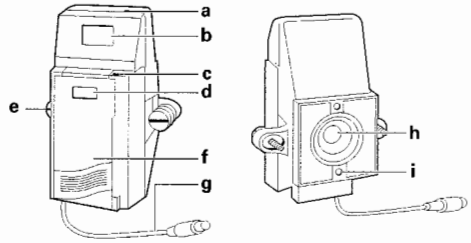
To test that your hardware is correctly installed, you can make a test image without software by using the reset button. See "Testing your hardware installation" on page 20 for details.

Installing and loading the camera/adapter

35mm camera/adapter features

The 35mm camera/adapter features a panel that displays helpful messages during film loading, exposing and rewinding. It detects the speed and length of your film, and counts frames as you make exposures. This information can be displayed for your reference.

The camera/adapter also features automatic film loading, advancing and rewinding for maximum convenience. It requires no batteries; it is powered by the recorder through a cable connection.

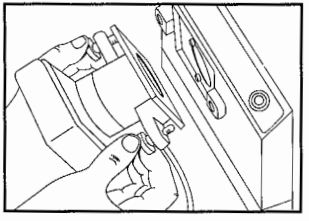


a Control button
b Message panel
c Film door button
d Film ID window
e Attaching screws
f Film door
g Control cable
h Positioning holes
i Lens

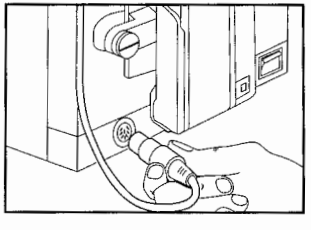
Mounting the camera/adapter

1 Remove the lens cap with the plastic shield. Orient the camera so the cable is at the bottom. Line up the two positioning holes with the two small pins on the recorder and push the back into

place. Turn the knobs simultaneously until they are firmly finger-tight. Never use a wrench of pliers to tighten the knobs.



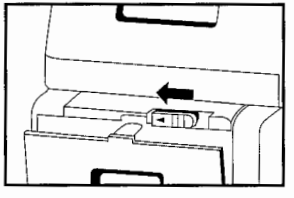
2 Plug the control cable into the connection on the front of the recorder. This connection powers the camera/adapter and allows the film recorder to control the camera. (If you remove the 35mm camera back to install another camera back, unplug the control cable.)



3 When your recorder is plugged in and turned on, the message panel displays `OUT OF FILM` if there is no film loaded. (If there is film in the camera/adapter, the message panel displays the film speed and frame number.)

Loading 35mm film

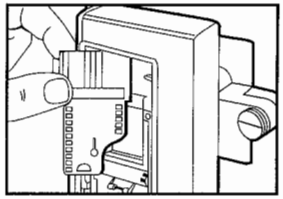
1 Slide the film door button to the left and open the door. The message panel displays `OPEN`.



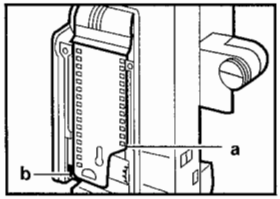
Note: When the door is open, pressing the control button has no effect and the camera will not take a picture.

2 Insert the film cassette at an angle into the chamber at the top as shown. The pin in the chamber fits into the hole on the bottom of the cartridge. Push it all the way in, and all the way to the right, so that the film lays flat in the track. When loading Polaroid instant slide film, remember that the emulsion (dull

side) faces away from the lens. This is different from conventional film, which must have the emulsion side facing the lens.



3 Pull the end of the film out carefully, until the end is aligned with the white mark at the bottom, near the take-up spool **(b)**.



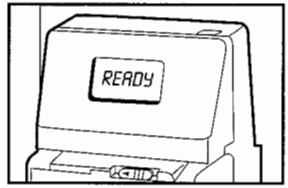
Note: A label **(a)** on the lower right corner of the film track reminds you how to load the film.

4 When the end of the film is properly aligned with the white mark, close the film door until it clicks shut.

The camera automatically advances the film for your first exposure. The message panel displays the following in sequence:

`LOADING`
`ADVANCE`
`ISO` (your film speed)

When the film is fully advanced for the first exposure, this message appears: `READY, 01 OF 36` (the last number indicates the number of exposures in your film cartridge).

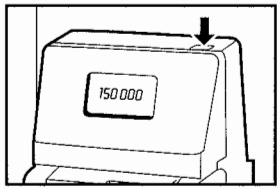


If the cartridge is not DX-coded, the message panel displays `ISO N/A` (not available).

Note: The film loading cycle is longer than the rewind cycle. This is because the film advances to the end of the roll during the loading cycle. It winds back into the cartridge frame by

Removing a partially exposed roll

To rewind a partially exposed roll, press the control button twice and then hold it down until you hear the film start to rewind.



Note: The message panel displays status messages, then `REWIND IN... 3... 2... 1` as it counts down for 3 seconds. Hold the control button down through the countdown to rewind. If you change your mind, cancel the command by releasing the button before the countdown finishes.

Processing instant 35mm film

To process instant 35mm film, refer to the instructions with the film and with the 35mm instant film processor. Be sure to keep your instant 35mm film and the processor away from heat-generating devices such as your monitor. For best results, keep the film as close as possible to the recommended processing temperature (70-75°F/21-24°C).

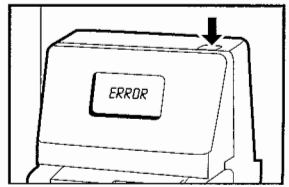
Tips for film loading

If the film does not engage on the take-up spool, the message panel displays `OUT OF FILM` as if no film were loaded. If this happens, open the film door. Then reposition the end of the film and close the door. (See step 3 on page 18 for film positioning details.)

Camera/adapter error message troubleshooting

If `OPEN ERROR` appears on the message panel, the film door was opened while film was loaded in the camera/adapter. If this happens, rewind the film and load a new roll. (See "Removing a partially exposed roll" on page 18.) You can also use your software application to expose a few extra frames to advance the film past the area that might have been struck by light when the door was opened.

If `ERROR` appears on the message panel, press the control button to clear the message and continue.



If the message reappears, remove the roll. (See "Removing a partially exposed roll" on page 18.) Then reload the film and try again. If the error message persists, try a different roll of film.

Power failure during exposure

If power fails during an exposure, restart your system normally after power is restored. Use your software application to expose a frame and advance the film beyond the frame that was being exposed when power failed. Then re-expose your image.

For best results

Use Polaroid film for best results. Polaroid 35mm film is available in both instant and conventional formats.

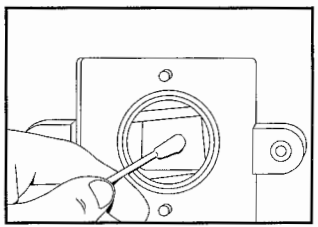
1. Care and maintenance

Maintenance

Keep the unit covered when not in use. The CRT inside the recorder will attract smoke and dust particles like any other CRT; protect the recorder from smoke and dust as much as possible.

Cleaning the CRT face

Remove the camera back from the recorder. Then move the filter wheel with a cotton swab, taking care not to touch the filters, until the open window is in front of the CRT. Wipe the CRT with a dry cotton swab.

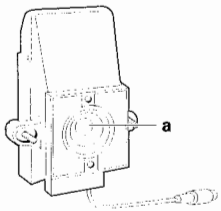


Cleaning the cabinet

Clean with a mild detergent solution. Keep the sponge or cloth barely moist.

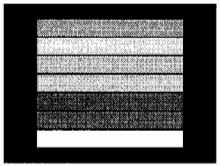
Cleaning the camera lens

To clean the camera lens **(a)**, remove as much dirt as possible with an aspirator, pressurized air, or a camel hair brush, available at camera stores. If necessary, wipe the lens with a cotton-tipped swab moistened with lens cleaner. Do not soak the swab so that the lens is flooded with cleaner. Examine the surface of the lens for scratches and replace it if any are found (contact the nearest Polaroid Service Center).



Testing your hardware installation

To test that your recorder is imaging properly, you can make a test image that does not require software. The image is a series of color bars on a black background, with a line of white text above.

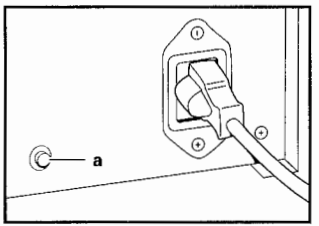


If you prefer not to expose the image and process the film to view it, you can confirm your installation without taking a picture.

1 Remove the camera/adapter and observe the CRT through the lens opening in the recorder.

2 With the power on, press and hold the white reset button **(a)** until the power LED on the front of the recorder begins to

blink (about 20 seconds), indicating that the exposure cycle is beginning.



3 Release the button and the recorder starts to perform the test exposure. If you are looking at the CRT through the camera back opening, you see an intermittent vertical line move across the CRT for each of three filter wheel positions. Do not obstruct the filter wheel as it moves. When the exposure cycle is finished, the power LED stops blinking.

4 If the test is not successful, there is a problem with your hardware or hardware installation. Check your cable connections. If the cables are connected properly, contact Polaroid customer support for technical assistance (see page 4).

If the test was successful but you cannot image from a software package, your problem is software related. Please check the software manual for troubleshooting information. If you cannot solve the problem, contact Polaroid customer support.

Troubleshooting hardware and film problems

This section describes symptoms and solutions for problems with your hardware setup and use of the camera backs and film. Refer to your software manual for troubleshooting software problems.

General

Random black spots: Caused by dirt specks on the CRT face. Clean as described on page 19.

Distorted pictures: Caused by electromagnetic interference with the recorder. Recorder should not be located next to power transformers, disk drives, video monitors, television sets, etc. Make sure it is at least 18-24 inches from any of these devices.

Image not centered in pictures: Adjust the image area using Camera adjust (see the calibration routine in your software manual).

Software does not respond when choosing a 35mm film type: Be sure the camera is loaded with film, and the door is latched shut.

Dark, or pale colored horizontal lines across image: Make sure the recorder is properly grounded (including extensions and

multiple outlet strips), use only the cables supplied with the recorder, and protect the unit from bumps and vibrations during exposure.

Image too light or dark; incorrect color balance: Make sure the correct film type has been specified in the software; see the software instructions for details.

Color negatives

Color balance/exposure: When using color negative film, color balance and exposure can vary over a wide range due to the variability of processing and printing at the processing lab. If exact color matching is important, shoot the test image at the beginning of each roll and have a custom lab calibrate their equipment to that image for color balance and exposure before printing the roll. The image is equivalent to an 18% neutral density gray card.

Macintosh users: The test image GRAYCARD is in the RasterPlus Samples folder (RasterPlus for Macintosh Kit) or the Polaroid Film Tables folder in the System folder (Palette for Macintosh Kit). **Windows users:** The test image GRAYCARD.TIF is in the RasterPlus\Samples folder.

Limited One Year Equipment Warranty

Polaroid Corporation warrants your HR 6000 Film Recorder system equipment (except the enclosed software package) against defects in manufacture for a period of one year from the date of purchase. To verify the warranty period, you should keep the sales slip or other proof of the purchase date.

Should this product, or any component or accessory included with it, become defective at any time during the warranty period, except for defective software, Polaroid Corporation will, at its discretion, either replace or repair this item, without charge, provided the product is returned to a designated servicing location (prepaid and insured).

This Limited Warranty does not apply to software defects or to product damage resulting from accident, incorrect installation, unauthorized modification, misuse or abuse.

U.S.A. and Canada

Before you return your equipment for repair, please contact Polaroid Technical Assistance (see page 4). We can help you determine what is at fault, and advise you on how and where to get service in the quickest and most convenient way.