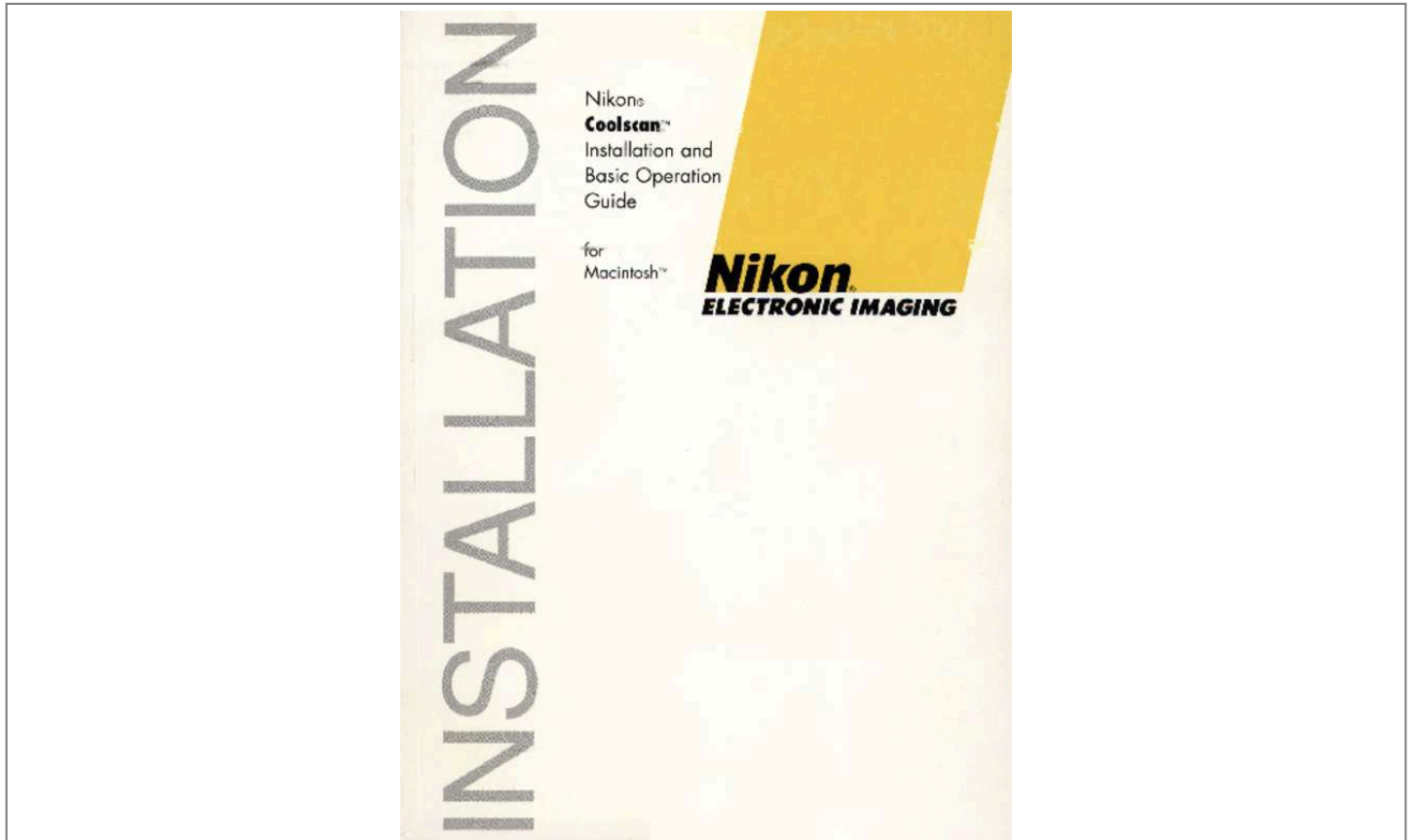




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User guide NIKON LS-10 INSTALLATION GUIDE FOR MACINTOSH
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Manual abstract:

Reorient or relocate the receiving antenna. 2. Increase the separation between the equipment and receiver. 3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. 4. Consult the dealer or an experienced radio/TV technician for help. Installation Safety Regulation of Coolscan Internal Model This scanner has been approved by the Underwriters Laboratories, Inc., in the U.S., the Canadian Standards Association, and as a class B device under Part 15 of the FCC (Federal Communications Commission) Rules. This unit should only be installed in equipment that has been approved according to the same standards. AC Line Cord Note that different power cords are needed for different line voltage. @@@@Therefore, before taking this product out of the country, consult with your Nikon service representative.

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.... 35 Handling the Filmn the installation of your scanner. There are two models of Coolscan.

The first is the IS-10 internal model, which is mounted into your computer just like a floppy disk drive. The other is the IS-10E external model, which is a peripheral device and cannot be mounted into your computer. As you follow the installation procedures in this guide, refer only to the sections which are appropriate to the Coolscan model you have purchased.



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In this guide, the Coolscan internal model will always be referred to as "LS-I 0." The Coolscan external model will always be referred to as "LS-IOE," in which the "E" designates "external." If you are unsure of which model you are installing, refer to the sticker on the base of the scanner, which will indicate it please complete the Product Warranty Registration Card and mail it today! Software Installation Installation of the Nikon scanning software accompanying Coolscan is covered in detail in the companion user manual Software Reference for Scanners. As is the practice with any software, it is strongly advised that you make a complete backup of the enclosed distribution software diskette and store the original master diskette in a safe place. Always work with the backup copies when installing the Nikon software. Nikon Coolscan Installation Guide for Macintosh Page 3 Introduction Chapter 1 Minimum Macintosh System Requirements As an absolute minimum, your Macintosh computer system must be configured with the following components: • Macintosh family of computers with SCSI interface • Macintosh System 6.0.

5 or later • 32-bit Quickdraw (when using models preceding Macintosh IIci) • 8 Megabytes of RAM (more recommended) • 80 Megabyte Hard Disk (300 MB or more recommended) • 8-bit display (24-bit true-color display strongly recommended) Suggested System Configurations Following these suggestions will yield the best scanning results: • Set your disk cache (found in the "Memory" Control Panel in System 7, and in the Control Panel in System 6) to the minimum setting, as scan times increase if the RAM cache is set above the minimum. Most imaging applications, including Nikon Control, have their own method for dealing with images larger than available RAM. • Virtual Memory, also in the "Memory" Control Panel in System 7, should be switched off. • File Sharing should be switched off. Any extended background operation, such as copying large files from your system to another over a network, may cause Coolscan to 'time out' during operation.

• Allocate at least 80% of your available memory to the application that is hosting the Nikon Scanner plug-in (see your Macintosh User's Guide if you are not familiar with this procedure). Nikon Control requires a minimum of 4 megabytes of RAM to operate. Adding memory to your system is one of the best investments you can make to increase overall performance. • Coolscan will only operate from the SCSI controller that is part of the main logic board, also referred to as the 'motherboard.' Do not connect Coolscan to any third-party SCSI controller in an attempt to increase your scanning speed.

Nikon's Marketing & Development Group is working with a number of third-party vendors to gain compatibility with such controllers. The limiting factor is the rate of data Page 4 Nikon Coolscan Installation Guide for Macintosh Chapter 1 Introduction delivered by Coolscan, not the rate that the SCSI controller card can accept data. The Nikon Scanner plug-in software will not find Coolscan unless it is connected to the main SCSI bus. • For the most pleasing display, set your "Monitors" Control Panel to the maximum number of colors available. "Thousands" or "Millions" of colors will provide an excellent display of your image. If your system only supports a maximum of 256 colors you will see a 'dithered' image, which looks grainy or speckled. The monitor setting has no effect on the actual quality of your image, which is always captured in 24-bit mode (16.7 million colors). • Color images can occupy large amounts of disk space. So, make sure your hard disk has sufficient free space to store the images you plan to scan.

You should have at least 60 megabytes of free space available if you plan on maximum resolution scans. Nikon Coolscan Installation Guide for Macintosh Page 5 Introduction Chapter 1 Page 6 Nikon Coolscan Installation Guide for Macintosh Chapter 2 Setting Up Coolscan Setting Up Coolscan This chapter will introduce you to the main components of the LS-I 0 and LSIOE models, proper placement of the LS-I OE, safely transporting your scanner, and precautions for safe operation. The Front Panel Let's take a look at Coolscan's front panel, as shown in Figure 2.1. The uncomplicated design of the front panel is indicative of how simple Coolscan is to use. The front panel of the LS-I 0 and LS-I OE is identical. The front panel consists of the film slot, focus wheel, and power/busy/error indicator light. Focus Wheel .CDDL.

SCAI'1. Nikon Power/Busy/Error Indicator LED Film Slot Insert Slide Here "- ~ ~ ?" ~ ~ 1 .1 Figure 2.1 Coolscan's front panel. Film Slot The film slot is the opening into which you insert your slides or film strips (using the supplied film strip holder) for scanning.

Slides and film strips are likewise ejected from the film slot. A high degree of care must be exercised with the film slot. Since this opening allows the film to enter the scanner, it thus provides access to its delicate instrumentation. Never insert any object into the film slot, other than mounted film or the provided film strip holder. Flammable materials, metals, water, etc.

, will cause fire, electrical shock and damage to the unit. Focus Wheel The focus wheel is used to fine-focus during scanning operation. This control is provided because of the wide variety of film and film mounts available, which affect the focusing function of the scanner. Nikon Coolscan Installation Guide for Macintosh Page 7 Setting Up Coolscan Chapter 2 The focus wheel must be in its center position during power up. The center position is indicated by the black line across the focus wheel being centered in the visible portion of the focus wheel. Power/Busy/Error Indicator Light The green power/busy/error indicator light has several functions. First, during power-up it blinks at one-second intervals until Coolscan's power-on self-test and autocalibration has completed. Second, after the self-test and autocalibration is complete, the light stays on constantly, indicating that Coolscan is ready to scan. Third, during scanning, the light will blink at two-second intervals, indicating that the scanning operation is in progress. Lastly, the light will blink rapidly if an error is detected, in which case the scanner will either recover on its own, or may have to be powered off and back on to effect a reset.

To summarize: Power-up: LED blinks at 1 second intervals Coolscan is ready: LED is on constantly Coolscan is scanning: LED blinks at 2 second intervals Error condition: LED blinks rapidly If you are installing an LS-IO model, please proceed to the section "The Rear Panel- LS-IO." The Rear Panel - LS-I OE The rear panel of the LS-I OE is shown in Figure 2.2. Note that there are five items of interest on the rear panel.



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These are the AC power switch, AC power connector, the two SCSI connectors, the SCSI termination power switch, and the SCSI ID switch. Page 8 Nikon Coolscan Installation Guide for Macintosh Chapter 2 Setting Up Coolscan SCSI Termination Power Switch ----- AC Power Switch

2 Coolscan's rear panel - LS-IOE. The AC power switch and AC power connector should be familiar to you. The AC power switch is used to turn power to the scanner on and off. The AC power connector receives the female end of the AC power cord. The three SCSI-related items on the rear panel will be explained in detail in the next chapter, "The SCSI Interface."

"Please proceed to the section "Orientation and Placement of the LS-IOE." The Rear Panel - LS-IOE The rear panel of the LS-10 is shown in Figure 2.3. Note that there are three items of interest on the rear panel. These are the DC power connector, SCSI connector, and configuration DIP switch.

1 SCSI Pin 1 SCSI Connector Configuration DIP Switch IO-Pin Connector DC Power Connector

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Figure 2.3 Coolscan's rear panel- LS-IO. The configuration DIP switch is shown in Figure 2.3.

In almost all cases, the factory default settings of these switches will be proper for your installation. The default settings for the configuration DIP switch block are shown in Table 2.1. The significance of the SCSI connector, DC power connector, and the configuration- Nikon Coolscan Installation Guide for Macintosh Page 9 Setting Up Coolscan Chapter 2 tion DIP switch is discussed in greater detail in Chapter 3, "The SCSI Interface." For now, note that the scanner is set at the factory to SCSI 10 #5 and to termination OFF.

Disregard the IO-pin connector at the bottom-left side of Figure 2.3. This connector is not used when installing the LS-10 in a Macintosh. DIP Switch 1 (Down) 2 (Up) 3 (Down) 4 (Up) Default On Off On Off Usage SCSI 10 bit 0 = 1 SCSI 10 bit 1 = 0 SCSI 10 bit 2 = 1 SCSI Termination = Off Table 2.1 Factory default settings for configuration DIP switch block. Please proceed to the section "Transporting Coolscan." Orientation and Placement of the LS-IOE Proper Orientation The following guidelines and precautions should be adhered to when deciding on orientation of your LS-10E. Let's take a look at Coolscan, as shown in Figure 2.4. Although Coolscan can be oriented on either of its sides, it is strongly recommended that you orient Coolscan on its base, or feet, to ensure that it won't fall down.

In this orientation, the "Nikon Coolscan" label on the front panel will read properly. Figure 2.4 LS-IOE, properly oriented. Page 10 Nikon Coolscan Installation Guide for Macintosh Chapter 2 Setting Up Coolscan Proper Placement The following guidelines and precautions should be adhered to when deciding on placement of your LS-IOE: 1. Place Coolscan near the computer so that the maximum suggested SCSI cable length (6 feet) is not exceeded. 2.

Place the scanner so that it is easy to reach. 3. Coolscan should be placed on a flat, stable surface, free from vibration. 4.

Keep the scanner away from damaging liquids by locating it away from sinks, coffee pots, etc. 5. Protect Coolscan from dampness, high humidity, and excessive dust or smoke. Dust and smoke, in particular, can cause undesirable effects on the scanner's optical systems, requiring extensive cleaning and maintenance to correct. 6.

Avoid locations where a sudden change in temperature might cause condensation inside the scanner. 7. Protect the front of the scanner from direct sunlight or bright lights. 8. Avoid places with extremely hot or cold temperatures (below 10 degrees Celsius or above 35 degrees Celsius).

9. Avoid placing Coolscan near heat sources. 10. Avoid any physical shocks to the scanner. Do not store the unit where it will be subject to vibration. 11. Avoid placing Coolscan too close to other peripherals, and make sure there is sufficient air circulation on all sides of the scanner. Transporting Coolscan The following guidelines and precautions should be adhered to when transporting your Coolscan: 1. Always use the original packaging materials. 2.

If the original packaging materials are unavailable, use appropriate packaging Nikon Coolscan Installation Guide for Macintosh Page 11 Setting Up Coolscan Chapter 2 materials for precision instruments. If you are shipping your Coolscan back to Nikon, Nikon will not be responsible for damages incurred due to improper packaging. 3. The focus wheel must be turned all the way downward to the end of its travel before shipping. 4. Pay special attention to the air or courier service handle this precision instrument. to ensure that they can properly If you are installing an LS-IO, please proceed to the section "Installation Precautions." Connecting AC Power to the LS-10E The scanner's AC power cord is a standard three-wire grounding plug. This plug will fit only a grounded AC outlet. Intended to be a safety feature, the grounding connector should not be defeated.

Additionally, an electronic surge protector is highly recommended. Safety Precautions When Connecting AC Power to the LS-IOE to The following precautions should be complied with when connecting AC power the scanner: 1. Always use a proper power source of 115V AC or 230V AC, 50 to 60 Hz. 2. Do not hold the cord itself when plugging or unplugging the AC power.

Hold the plastic portion of the connector itself rather than pulling on the cord. 3. If you lose the supplied power cord, use an appropriate replacement that is subject to the voltage of the power source, using the following guidelines: • If a 230V AC power source is used, make sure that the plug is rated at 250V AC, 15A (NEMA 6P-16). • If a 115V AC power source is used, the plug must be rated at 120V AC, 10A. • The gauge of the cord must be at least 18 gauge (remember, the smaller the gauge, the thicker the wire).

For example, 18 gauge is thicker than 20 gauge). Page 12 Nikon Coolscan Installation Guide for Macintosh Chapter 2 Setting Up Coolscan • The cord must be approved by the safety regulations of the county where it is used. • A properly grounded three-conductor AC power source is required in order to reduce electrical noise and the possibility of electrical shock. AC Power Safety Precautions - LS-10E The following safety guidelines should be adhered to concerning AC power and Coolscan: 1. Once the AC power source is turned off, either through the Coolscan power switch or other AC power switch, wait at least 5 seconds before powering on again to ensure the proper power-up sequence. 2. Don't unplug the AC power cord from the AC source or from the Coolscan AC power connector while the Coolscan AC power switch is on.



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To be completely safe, don't unplug any other peripheral while Coolscan is powered on. 3. Do not move Coolscan while its power is on.

4. Never disassemble the scanner. It is very dangerous to touch the devices inside the unit due to high voltages, and there are no user serviceable parts inside. Such action may be a violation of your Nikon Limited Warranty, and would render the warranty null and void. Installation Precautions The following guidelines should be observed when installing Coolscan: 1. Make certain that power to all instruments directly connected to Cools can (via SCSI) is turned off before beginning the installation. This includes the AC power switch on Coolscan (LS-10E only). If you are installing an LS-10, there is no AC power switch since it relies on the Macintosh's power. Therefore, make sure that the Macintosh's power is off. 2.

Turn off the power to all peripherals connected to the computer (display, printer, etc.). 3. If your Macintosh has a key-lock facility, turn the key to the unlock position. 4.

Unplug the AC power cable to the Macintosh. Nikon Coolscan Installation Guide for Macintosh Page 13 Setting Up Coolscan Chapter 2 5. When mounting Cools can into the Macintosh (LS-10 only), be especially mindful to eliminate electrostatic discharge, as it can damage the scanner. Electrostatic discharge will damage the scanner if you touch its SCSI connector pins. Do not touch the pins.

General Safety Precautions Always power off Coolscan and/or remove the power cord from the AC source when anyone of the following occurs: 1. The AC power cord (LS-10E only) or 4-pin DC power plug (LS-10 only) becomes damaged. 2. Any liquids are spilled into the scanner. 3. The scanner is exposed to excessive moisture. 4. The housing of the scanner is opened or has become damaged (LS-10E only). 5. You suspect the scanner is not functioning properly.

6. Something unusual occurs, such as abnormal noise, odor, or smoke. In this case, bring your Coolscan to the dealer where it was purchased or to an authorized Nikon repair facility. Operational Precautions Never power on the scanner while the film strip holder is in the scanner slot. Doing so will interfere with the scanner's normal startup calibration procedure, resulting in incorrect color capture while scanning, and possible SCSI errors. 2. Do not attempt to insert slide mounts into Coolscan that are over 3mm thick. Remount the film into an appropriate holder. 3. Do not attempt to insert slide mounts into Coolscan that are not flat.

Remount the film into an appropriate holder. 4. Do not force a slide or the film strip holder into the Cools can film slot. A smooth gliding action should be used during both insertion and removal. 5.

Do not attempt to remove or reposition the slide or film strip holder in the Cools can film slot during the scanning process. Page 14 Nikon Coolscan Installation Guide for Macintosh Chapter 3 The SCSI Interface The SCSI Interface The computer interface used exclusively with Coolscan is called a Small Computer System Interface (SCSI - pronounced 'scuzzy'). This interface has been adopted as the standard in the Macintosh computing environment, and is utilized by many computer peripherals including disk drives, scanners, printers and CD-ROM drives. System Requirements for SCSI Installation In order to connect a SCSI device to the Macintosh, the following requirements must be met: 1. The computer system must have a SCSI controller (most Macintosh computers do).

2. The SCSI device must be set to an unused SCSI ID number. 3. A proper SCSI cable must connect the SCSI controller to the SCSI device. 4. The SCSI bus cabling must be correct if more than one peripheral shares the bus. 5. The SCSI bus must be properly terminated. 6. Appropriate SCSI driver software must be used.

These requirements will be addressed in the following sections. Setting the SCSI ID The SCSI bus is a sort of 'data highway,' with the SCSI devices connected to the SCSI bus representing 'stops' on this highway. Each device requires its own distinct SCSI ID number so that the Macintosh can easily locate it through the SCSI controller. Because the SCSI bus can accommodate up to seven devices, internal or external, a SCSI ID number can have a value between 0 and 6. There are no implicit regulations regarding the allocation of these numbers. Typically, however, the Macintosh's SCSI controller would be assigned SCSI ID number 7, while the SCSI devices would be numbered 0 through 6. The SCSI ID number is commonly set by a switch on the rear of the SCSI device. The default SCSIID number of Coolscan, set at the factory, is ID #5. Nikon Coolscan Installation Guide for Macintosh Page 15 The SCSI Interface Chapter 3 Determining Which SCSI ID Number to Use If Coolscan is the only external SCSI device that will sit on the SCSI bus, there is no need to change the SCSI ID number from the factory setting. This is assuming that your internal hard disk is set to SCSI ID #0.

If Coolscan must share the SCSI bus with one or more other SCSI devices, it is necessary to ensure that no two devices are using the same SCSI ID number. Create a list of all SCSI devices (See Table 3.1) on the SCSI bus of the Macintosh you will be installing Coolscan on, noting the device type and the SCSI ID number of each device. You can discover the SCSI ID of some disk drives by selecting the disk drive in the Macintosh Finder and selecting GET INFO from the FILE menu. To determine the SCSI ID number of other devices, look at the rear of each for some indication.

If there is no indication as to the SCSI ID number, then consult with the device's user's manual or contact the peripheral manufacturer to ascertain this information. Never change the SCSI ID number of a SCSI device while its power or the computer's power is on. SCSIID Device Type Internal Disk Drive 0 2 3 4 5 6 7 Coolscan Scanner (default) Macintosh Computer Table 3.1 Typical SCSI ID number chart. If another SCSI device shares the same SCSI ID #5 of Coolscan, change the SCSI ID number of Cools can to an unused number, as indicated in the following sections.

Note any changes in Table 3.1. If you are installing an LS-10, please proceed to the section "Setting the SCSI ID -LS-10." Page 16 Nikon Coolscan Installation Guide for Macintosh Chapter 3 The SCSI Interface Setting the SCSI ID -LS-10E If necessary, the SCSI ID number of the LS-10E can be set via a switch on the back of the scanner, as shown in Figure 3.1. Simply push the button above the SCSI ID number indicator to decrement the SCSI ID number. Conversely, push the lower button to increment the SCSI ID number. Top Button (push to decrement) SCSI ID Switch SCSI ID # Indicator Bottom Button (push to Increment) ~ •ffij CQ SCSI ID Figure 3.1 SCSI ID switch on the rear of Coolscan - LS-10E. Please proceed to the section "Terminating the SCSI Chain.

" Setting the SCSI ID -LS-10 If necessary, the SCSI ID number of the LS-10 can be set via the block of configuration DIP switches on the back of the scanner, as shown in Figure 3.



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5b. This cable is not supplied with Coolskan. SCSI cables should never be connected or disconnected while the computer's or SCSI device's power is on. Such action can damage the SCSI controller chip on your Macintosh, requiring a motherboard replacement. Please proceed to the section "The Macintosh's External SCSI Connector." SCSI Cables Used With the LS-10 The SCSI cable provided with the LS-IO enables you to connect the scanner to the Macintosh's SCSI chain as either the only device on the SCSI bus, or as an additional device. This is a chainable SCSI flat cable with two identical crimped connectors on each end and one connector crimped in the center, as seen in Figure 3.6a. If Coolskan is to be the only internal SCSI device: Connect one end of this cable to the existing SCSI bus in the Macintosh (connecting the SCSI cable to the Macintosh's SCSI bus will be explained in the next section), then connect the opposite end to the SCSI connector on the rear of Coolskan (refer to Figure 2.

3 to locate the SCSI connector). The center connector is not used. Make sure that DIP switch # 4 is in the termination ON position, as indicated in Figure 3.4. Nikon Coolskan Installation Guide for Macintosh Page 21 The SCSI Interface Chapter 3 If Coolskan is to be connected in the middle of the SCSI chain: Connect one end of this cable to the existing SCSI bus (connecting the SCSI cable to the Macintosh's SCSI bus will be explained in the next section), connect the center connector to the SCSI connector on the rear of Coolskan, and connect the last connector to your internal disk drive. (a) Chainable SCSI Flat Cable (not provided) SCSI 50-Pin Connectors Connector Protection Key (b) Non-chainable SCSI Flat Cable (not provided) SCSI 50-Pin Connectors Connector Protection Key Figure 3.6 SCSI Rat cables. (a) Chainable SCSI Rat cable provided with Coolskan.

(b) Non-chainable SCSI Rat cable. The cable seen in Figure 3.6b is a non-chainable SCSI flat cable. If you already have one of these, it can be used instead of the supplied cable if you are installing Coolskan as the last device in the SCSI chain. Make sure that DIP switch #4 is in the termination OFF position, as indicated in Figure 3.

4. SCSI cables should never be connected or disconnected while the computer's or SCSI device's power is on. Such action can damage the SCSI controller chip on your Macintosh, requiring a motherboard replacement. Please proceed to the section "The Macintosh's Internal SCSI Connector." Page 22 Nikon Coolskan Installation Guide for Macintosh Chapter 3 The SCSI Interface The Macintosh's External SCSI Connector The SCSI connector for external SCSI devices on the Macintosh, which is a 25pin DB25-type connector, is found on the Macintosh's rear panel.

This connector is indicated by the Macintosh's SCSI symbol, shown in Figure 3.7. Back of Macintosh Computer SCSI Symbol 25-pin OB25 SCSI Connector Figure 3.7 Simplified rear view of the Macintosh computer's SCSI connector. The 50-pin Centronics connector, the type used on Coolskan, is the most common connector used for external SCSI devices on the Macintosh. This is why a 25-pin DB25 to 50-pin Centronics cable has been provided with your Coolskan. The 25-pin end of the cable is connected to the SCSI connector on the Macintosh, and the 50-pin end to Coolskan. Examples of these connectors are shown in Figure 3.

8. (a) 25-pin OB25 SCSI Connector (b) 50-pin Centronics SCSI Connector Figure 3.8 Typical SCSI connectors. (a) DB25 connector. (b) 50-pin Centronics connector. Please proceed to the section "The SCSI Chain."

"The Macintosh's Internal SCSI Connector The Macintosh's SCSI connector for internal SCSI devices, a 50-pin flat connector, resides inside the Macintosh on the motherboard (the main circuit board inside the Macintosh). This is shown in Figure 3.9. Please note that Coolskan will not operate properly unless it is connected to the main Macintosh SCSI port. Do not connect Coolskan to any SCSI accelerator card that may be installed.

Nikon Coolskan Installation Guide for Macintosh Page 23 The SCSI Interface Chapter 3 Connecting to the Internal SCSI Connector Again, the SCSI connector on the Macintosh's motherboard is a 50-pin flat connector, as shown in Figure 3.9. Note the position of pin 1 and the safety key. The safety key provides a level of protection against inserting the cable improperly. Typical SCSI Connector on Macintosh Motherboard Motherboard SCSI Connector SCSI Flat Cable Pin 1 Indicator Figure 3.

9 The 50-pin flat SCSI connector inside the Macintosh on the motherboard. If for some reason you choose not to use the internal SCSI cable provided with your Coolskan (you won't be using it for installing Coolskan in the Macintosh Quadra Series), note that there is a wide variety of 50-pin flat SCSI connectors and SCSI cables. They are all functionally the same, yet vary in some important ways: 1. Some cables might not have a safety key. In this case, take extra precautions to ensure that the mating cables' connectors are properly aligned prior to insertion. 2. Some connectors may not have Pin 1 clearly marked on the connector. 3. Some cables may have Pin 1 on the cable indicated in red. 4.

Some connectors will not have mechanical side levers to assist in plugging and unplugging the cable. Care must be exercised when inserting and removing these 50-pin connectors, shown in Figure 3.9, as they are rather fragile. Observe the following guidelines when handling these connectors: 1. Never force the connector in or out.

If you bend or break any of the pins, replacement of your motherboard will be required. 2. Make sure that the mating connectors are aligned properly before inserting. Take extra care in this very critical step. 3.

Push the cable connector gently into the mating connector. Once in place, push down firmly. Page 24 Nikon Coolskan Installation Guide for Macintosh Chapter 3 The SCSI Interface Never remove a cable from the connector by pulling on the cable. If you cannot remove the cable by hand, use a small screwdriver to pry each of the sides out, a little at a time. Use caution at all times. 4. Make sure that Pin 1 of the cable connector mates with Pin 1 of the computer connector. Never guess. 5. Never plug or unplug a SCSI connector while the computer is powered on.

This can result in damage to the SCSI controller. The SCSI Chain The SCSI chain, as you learned earlier, is the electronic data and control bus that connects two or more SCSI devices. The SCSI bus is the 'data highway' and the SCSI devices linked together forming the SCSI chain represent 'stops' on the highway.



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As mentioned at the start of this chapter, the SCSI chain can accommodate up to seven devices on the SCSI bus. On any SCSI bus, there must be at least one SCSI host and one SCSI target device. Coolscan is always a SCSI target device. This is the standard configuration for SCSI-based scanners. In fact, most devices connected to computers will be SCSI target devices. Typically, the Macintosh will always be the SCSI host. In any case, the SCSI ID number of each device must be unique.

If you are installing an LS-10, please proceed to the section "Setting Up the SCSI Chain - LS-10." Setting Up the SCSI Chain - LS-10 The LS-IOE can reside at any position in the SCSI chain. The two 50-pin connectors on the rear of Coolscan are both used for this purpose. There are essentially two possible SCSI chain configurations, the two SCSI devices configuration, and the multi-SCSI devices configuration. Unlike other Macintosh computers, the PowerBook does not supply SCSI termination power.

To use Coolscan with a PowerBook, the SCSI Termination Power Switch on the rear of the LS-IOE (see Figure 2.2) must be set to the ON position. This configuration will require termination at both ends of the SCSI chain. For further information, refer to the Macintosh User's Guide for Macintosh PowerBook Computers. Nikon Coolscan Installation Guide for Macintosh Page 25 The SCSI Interface Chapter 3 Connecting Two SCSI Devices In the simplest case, only two devices share the SCSI chain - the SCSI host and the SCSI target device.

This simple configuration is shown in Figure 3.10. Card Slots DB-25 DB-15 SCSI Video (a) Computer - SCSI Host (internally terminated) Port SCSI Cable (b) Scanner SCSI Target SCSI Terminator (Figure 3.10 Two SCSI devices on the SCSI bus. (a) The Macintosh is the SCSI host. (b) Coolscan is the SCSI target device. The rear view of your system may not be the same. Procedure (Use the SCSI cable supplied with Coolscan): 1.

Make sure that the Macintosh is powered off. 2. Connect the DB25-pin side of the cable to the Macintosh's SCSI connector (on the back of the Macintosh). 3. Connect the Centronics 50-pin side of the cable to the top SCSI connector on the back of Coolscan. This cable will connect Coolscan to the Macintosh's SCSI bus. 4. Connect a SCSI terminator to the bottom SCSI connector on the back of Coolscan, since this is the end of the SCSI chain. Termination on Macintosh HEx systems requires the proper black terminator, supplied by Apple. Do not use the gray terminator supplied with Coolscan.

In this case, both the SCSI host side of the bus and the SCSI target device side of the bus must be terminated, as shown in Figure 3.10. Page 26 Nikon Coolscan Installation Guide for Macintosh Chapter 3 The SCSI Interface Connecting Multiple SCSI Devices In many cases, more than one SCSI target device will be connected to the SCSI bus. In this example, Coolscan is placed at the end of the SCSI chain. This daisy chaining configuration, as shown in Figure 3.

11, minimizes the number of cables and connectors required. Card Slots Computer SCSI Host (internally terminated) SCSI Cable - Scanner - SCSI Target - SCSI Terminator = SCSI Cable - SCSI Terminator - Other SCSI - Target Device - (no termination) Figure 3.11 Daisy chaining SCSI devices. Coolscan is at the end of the chain. Remove the SCSI terminator from the last device in the SCSI chain.

3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919. 920. 921. 922. 923. 924. 925. 926. 927. 928. 929. 930. 931. 932. 933. 934. 935. 936. 937. 938. 939. 940. 941. 942. 943. 944. 945. 946. 947. 948. 949. 950. 951. 952. 953. 954. 955. 956. 957. 958. 959. 960. 961. 962. 963. 964. 965. 966. 967. 968. 969. 970. 971. 972. 973. 974. 975. 976. 977. 978. 979. 980. 981. 982. 983. 984. 985. 986. 987. 988. 989. 990. 991. 992. 993. 994. 995. 996. 997. 998. 999. 1000.

It is a standardized interface • The SCSI-1 ASPI 3.1 interface was standardized in 1986. This has made possible the use of any single SCSI-1 standard device with any computer system that supports the SCSI-1 interface standard, such as the Macintosh. Advantages: • Because of the vast array of competing third-party developers, SCSI hardware is relatively inexpensive and plentiful. • SCSI-based software is well defined and widely supported. Limitations: • Although the SCSI-1 interface itself is standardized, the computer-to-SCSI interface is not. Consequently, each SCSI controller may have its own computer interface. • Different SCSI devices cannot necessarily be controlled with the same host code.

Therefore, there are times when it is best to use provided SCSI controllers for different SCSI devices instead of chaining the SCSI devices. Page 30 Nikon Coolscan Installation Guide for Macintosh Chapter 3 The SCSI Interface 2. It is a multi-device interface.

As noted throughout this chapter, the SCSI interface can support up to seven independent SCSI devices, one of which is your Macintosh. Advantages: • Ability to daisy chain multiple devices off of one interface to the computer. • Allows easy system expandability. Limitations: • Not all SCSI devices can work together on the same SCSI bus. • Some SCSI devices will not operate correctly if daisy chained in a particular order.

This may require that you experiment with the order of the devices in the daisy chain. • Some SCSI devices are internally-terminated at the factory. This may require that you or a qualified technician remove this termination if the device is to be placed in the middle of a SCSI chain. • When daisy chaining many SCSI devices together, the total length of all the SCSI cables used in the chain should not exceed 18 feet. A chain of more than 18 feet may result in lost data and 'lost' devices. • System performance can suffer as devices are added to the SCSI bus. This is related to the length of the SCSI chain. Data has a longer path to travel as more devices and cables are added to the SCSI chain, resulting in electrical instability and signal reflections. This leads to miscommunicated bytes, which must be re-sent until they are received correctly, a lengthy procedure. 3.

It is a fast parallel interface. Advantages: • The complex SCSI 'handshaking' is managed in hardware, allowing high speed variable size block transfers. In other words, the SCSI interface allows fast transfer of blocks of data. Limitations: • The parallel bus limits the length of the SCSI chain, and therefore the distance between SCSI devices. 4. SCSI devices can easily be connected, disconnected, and moved. Advantages: • Allows portability of devices between different computers. • Allows easy relocation of devices. • Allows easy system expandability. Disadvantages: • Connecting and disconnecting SCSI devices that reside on the same SCSI bus as the computer's bootable disk can cause loss of data and/or damage to the SCSI devices if performed while the computer or any SCSI device is powered on.

Coolscan can accommodate either of these two film types. (a) Film in a typical slide mount. (b) Positive film is sometimes referred to as 'reversal' film.



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It is much easier to find the emulsion side of the film when the film is not mounted. First remove the film from the slide mount. Then, position the film such that you can read the text along the edge of the film surface. In Figure 4.5b, an enlargement of this portion of the film shows the frame numbers clearly visible and in the proper orientation for reading.

Note that the arrows point to the right. This is the base side of the film. The opposite side is the emulsion side. Slide Orientation Since the slide mount is typically square, it could be inserted into Coolscan in any orientation. However, the orientation of the slide frame when inserted will affect the image area scanned.

Page 38 Nikon Coolscan Installation Guide for Macintosh Chapter 4 Basic Operation Coolscan front panel film slot -----t----=o----tf-HN--+ l~~~~~ (a) Film inserted into the Cool,= o=ow , Id, fim (will scan entire film) -----~ ==67 Correct Coolscan front panel .!!lr9n - ~". film slot - - - - -II-----,O=----*I--+!!lf--+ l:Q~~~~~ (b) Film inserted into the Coolscan wide side first (will cause clipping) - - - - - Figure 4.6 Inserting a slide into the Coolscan scanner. (a) Inserting the narrow side first, resulting in a scan of the entire film. (b) Inserting the wide side first, resulting in a scan that clips the film. As shown in Figure 4.2, the film aperture is rectangular. For the entire film area to be scanned, it is necessary to insert the slide with the narrow side of the film, the 24mm side, first into the scanner. This is shown in Figure 4.

6a. The entire film surface cannot be scanned if the wide side of the film, the 36mm side, is inserted into Coolscan first. This incorrect insertion is illustrated in Figure 4.6b. If the film is incorrectly inserted, as shown in Figure 4.6b, the resulting scan will not cover the entire film area. This outcome, known as clipping, is shown in Figure 4.7. Nikon Coolscan Installation Guide for Macintosh Page 39 Basic Operation Chapter 4 Clipped Region of Film - - - - - i f - - + , - - - - - Scanned Region of Film - - - - - i f - - + .. - - - - - 22.

5mm Mounted 35mm film -----111~II~i ~24mm~ Figure 4.7 The effect of inserting the wide side of the film first into Coolscan. There is common terminology used to describe a rectangular film format. If the image on the film is oriented so that the top of the image corresponds to the wide side of the film, the orientation is called landscape. Landscape orientation is illustrated in Figure 4.

8a. Conversely, if the image on the film is oriented so that the top of the image corresponds to the narrow side of the film, the orientation is known as portrait. Portrait orientation is illustrated in Figure 4.8b. This terminology is identical to that used in preparing an 8.5 x 11 inch page for text processing or printing.

Although film is inserted in portrait orientation only, either landscape or portrait can be produced by software control, resulting in correctly oriented previews and final scans. (a) Image on Film is in a ~ Landscape Orientation -----t~ ~ Portnti'iliioob'ioo (b) Image on Film is_ina __ -+ _I JIA 1 'T Coolscan Intallation Guide for Macintosh Figure 4.8 The landscape and portrait orientation of the film. Page 40 Nikon Chapter 4 Basic Operation Inserting Slides Now that you understand how to prepare your film, determine whether it is a portrait or landscape image, and identify its emulsion side, you are ready to insert the slide for scanning.

The slide is inserted into Coolscan in much the same way as a floppy diskette is inserted into a disk drive. First, determine the proper orientation for insertion by using the guidelines below. Then, insert the slide into the slot in the front of the scanner, gently pushing the slide in as far as it will go, without forcing it. The slide will be difficult to grasp once properly inserted. Inserting Portrait Orientation Slides If the film is in a portrait orientation, determine the emulsion side of the film and ensure that this side of the film faces towards the top of the scanner. Insert the slide into the scanner with the top of the image entering into the scanner first. This is shown in Figure 4.9. (a) Image on film is in a portrait orientation - - - - - rnTI III I Lru --/m7 ~:I)mR~s~t~n:oi:::eo::ntation ----- ~ ~ ~J : monitor is oriented correctly Coolscan front panel film slot -----II-----:]:--ftf--"Hfl-(b) Film inserted narrow side ~~~~~"i'il first when the image on the Figure 4.9 Inserting film into Coolscan that is in a porrrait orientation.

If the bottom of the image inserted first, the resulting scan will be upside-down. This can be corrected in the scanning software before the final scan by performing a vertical flip. This operation is fast and causes absolutely no loss of image quality. Inserting Landscape Orientation Slides If the film is in a landscape orientation, determine the emulsion side of the film and ensure that this side of the film faces the top of the scanner. Insert the slide, making Nikon Coolscan Installation Guide for Macintosh Page 41 Basic Operation Chapter 4 sure that the top of the image enters the film slot facing the left side of the scanner.

This is shown in Figure 4.10. (a) Image on film is in a landscape orientation - - - - - Coolscan front panel film slot -----l-o---ItAIII(b) Film inserted narrow side ~F5~\$l first when the image on the film is in a landscape orientation - - - (c) Resulting image on monitor is oriented correctly - - - - - - - - - - - 1 Figure 4.10 Inserting film into Coolscan mat is in a landscape orientation. If the top of the image is inserted facing the right side of the scanner, the resulting scan will be upside-down.

Again, this can be corrected in the scanning software before the final scan by performing a vertical flip. Eiecling Slides There are three ways in which you can eject film from Coolscan: o o You can eject the slide through a software command. You can use the Eject Coolscan Film application. o The film is also ejected when power is first applied to the scanner. There is no method for removing the film if electrical power is not available. All of these methods are explained in the Software Reference for Scanners. Do not use any tool other than your fingers to remove a slide. If a slide cannot be removed easily you should contact Nikon's Service Department at 516-547-4351 for advice. Using tweezers or similar tools can damage the scanner, void your warranty and cause possible electric shock. Page 42 Nikon Coolscan Intallation Guide for Macintosh Chapter 4 Basic Operation The Film Strip Holder Negative processed film is typically cut into strips of five or six frames per strip.

To eliminate the need for you to cut and mount strip film for scanning, we have supplied you with a film strip holder. The Coolscan film strip holder can accommodate film strips up to six frames long, then be inserted into Cools can for scanning.



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