pakon®

F-135

Service Manual

Scanner Specifications

Minimum Host Computer Specifications

- Pentium III or Athlon CPU, 700 MHz or higher, with MMX support
- 4GB of free hard drive space, capable of a sustained transfer rate of 30MB/sec. If IDE, it must either be a **Primary** or **Secondary Master** drive or connected using a serial ATA connection.
- Windows 2000 and Windows XP
- 256 MB of RAM
- USB 2.0
- Screen resolution of 1024x768 or higher

Power

- External power supply
- 15V, 2.4 amps,
- 50-60 Hz Input voltage frequency
- Plug polarity is plus center, minus outside
- 5.5mm outer diameter, 2.5mm inner diameter

Contents of Box

- F-135 Film Scanner
- 6ft. USB 2.0 Cable
- Software and User Manual CD
- External power supply and power cord

Size

- 6.75" x 8.5" x 14.75" (H x W x D)
- 17.15cm x 21.6cm x 37.5cm (H x W x D)

Resolutions

The F-135 has two supported resolutions:
4Base   1000 x 1500
8Base   1500 x 2250

The F-135 Plus has three supported resolutions:
4Base   1000 x 1500
8Base   1500 x 2250
16Base   2000 x 3000

Light Source

The F-135 uses an LED light source which should outlast the life span of the scanner itself.

Film Types and Variations

- The F-135 is designed to scan 35 MM. color negative film. 35 MM. cut strips are supported in sizes from 3 frames to 40 frames. However, to ensure DX code reading, the strips must be a minimum of 4 frames.

DX Code Reading

- 35 MM. DX codes are read using the ISO 1007 specifications and are used by the host manager.

Installing the F-135

The F-135 is a peripheral device. It must be connected to a computer that meets the required specifications listed on page 1 of this manual.

1. Install the software for the F-135, if it is not already installed on the PC.
2. Clear a space near your computer system to place the F-135 scanner. The USB 2.0 cable must be able to reach the PC, so it cannot be more than 6 feet (2m) from the computer.
3. Connect the power cord to the power supply plug on the back of the scanner.
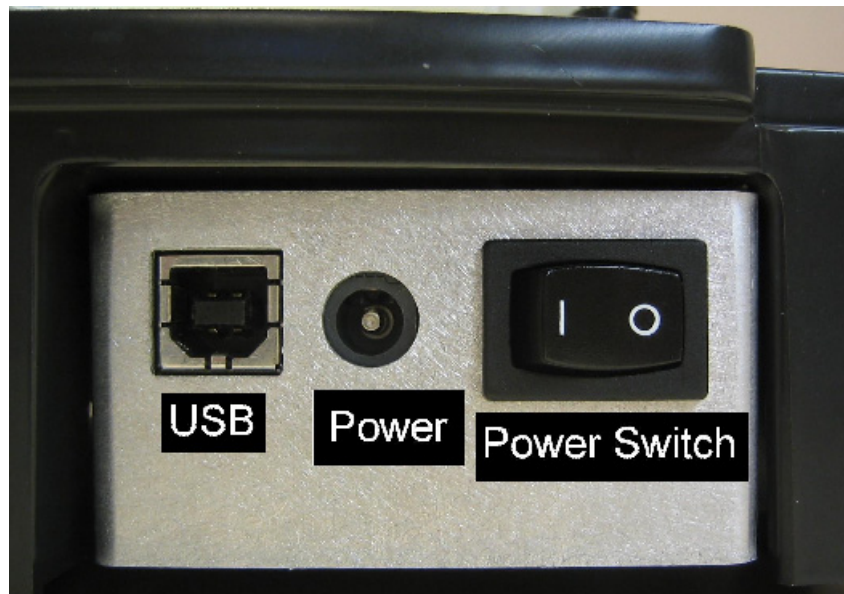
4. Connect the USB 2.0 cable to the back of the scanner.

5. Connect the USB 2.0 cable to the back of the computer, in a USB 2.0 port. **Do not plug in to a USB 1.0 connector!**

6. While the computer is on and Windows is loaded, turn the scanner power switch into the 'on' position.
7. Windows will prompt you to click "Next" to continue the driver installation.

8. Then click on "Finish" to finish the driver installation.

9. The process will repeat twice before finishing.
10. After the driver is finished installing, verify that the scanner driver is properly installed, by viewing the scanner properties in the Device Manager under the heading, "Imaging Devices."

11. Clean the F-135 from any dust that may be inside the scanner. Please refer to these procedures in the "Operator Maintenance" chapter.

BIOS Configuration

The following BIOS options are used on systems configured by Pakon, and are recommended to be configured as outlined below.

Option	Setting
Plug and Play O/S	Disable
AGP Aperture Size	32MB
PCI Latency Timer	248
ACPI Suspend State	S1 State
USB Boot	Disable
PXE Boot to Lan	Disable
PCI to DRAM Prefetch	Disable

Scanner Theory

The F-135 film scanner is a stand alone USB 2.0 device, designed to convert 35 MM. film into digital images. It is highly flexible, and can easily be integrated into a larger digital photo processing system, or operated as an independent scanning device, attached to a host computer.
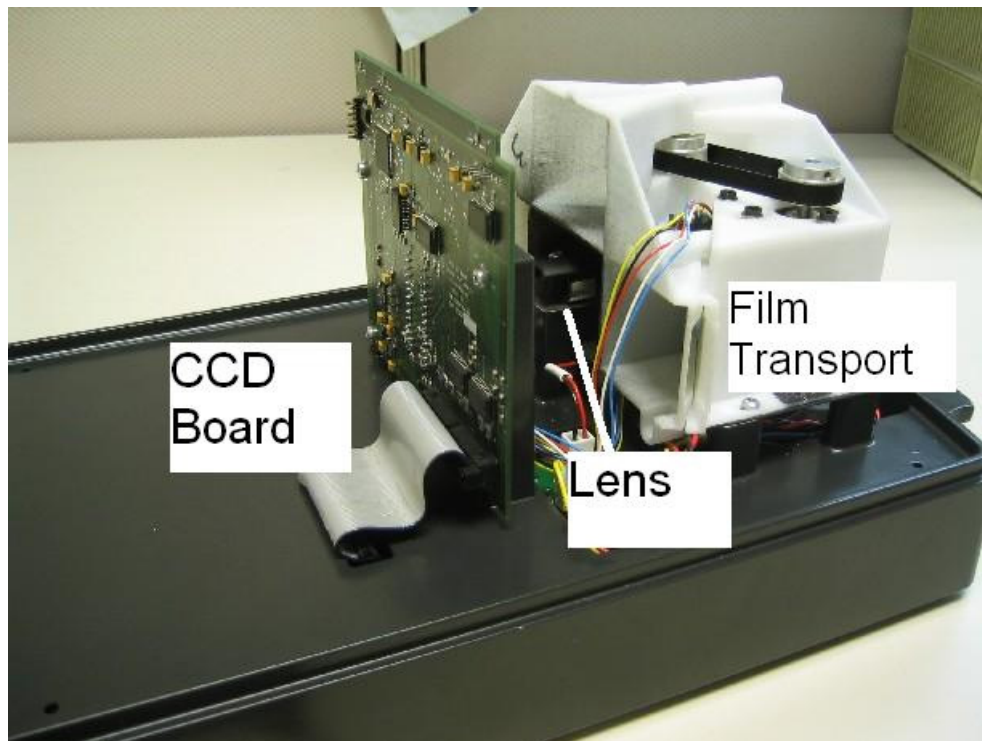

Transport Assembly

The F-135 transport assembly houses the film transport, light assembly, DX sensors, and Digital ICE hardware. There is only one roller in the transport assembly, so the film must be pushed by hand in far enough to reach this roller.

The film will then be transported through this assembly, past the light source which will project the image of the film through the lens to the CCD sensor. There are two DX sensors, that are staggered.

A skew in the film transport assembly will cause scanned images to be skewed. The result would turn "Skew" into *"Skew."* (The image would appear slanted, as the italicized "skew" demonstrates.) A skew adjustment procedure is performed during the scanner's original manufactur-

ing calibration process to properly align the CCD board. Shims are used to ensure the film transport is in the proper skew position.
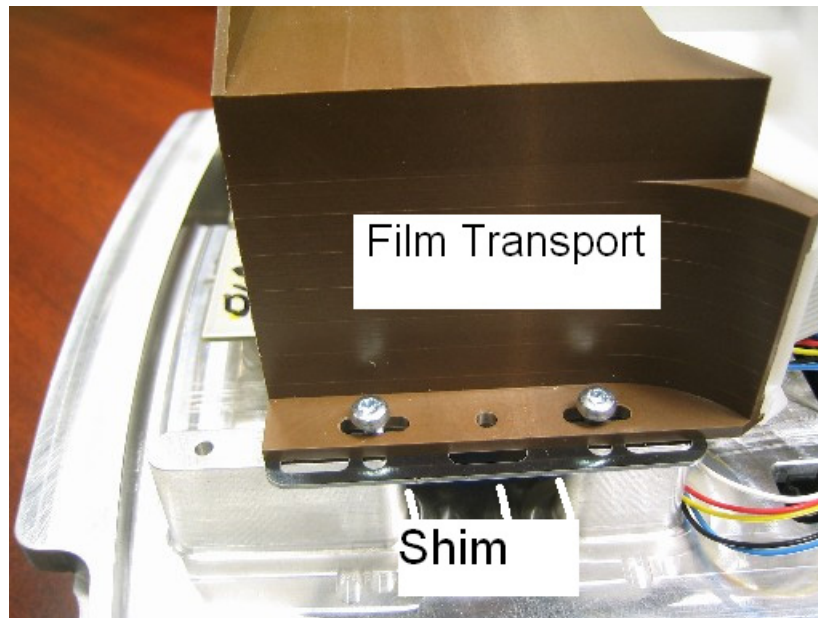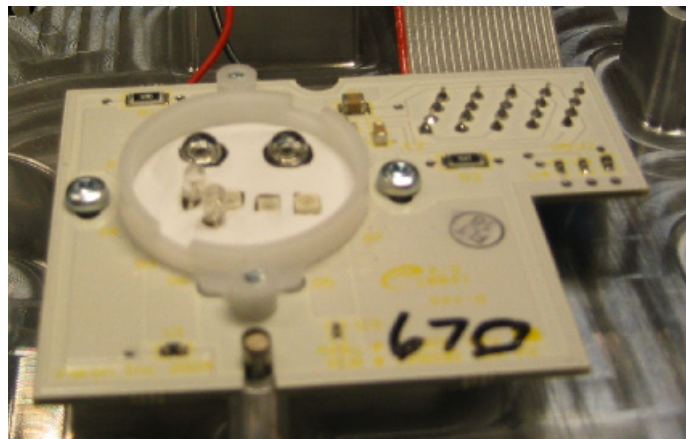

CCD Chip and Assembly

The CCD chip is trilinear - it senses three colors: red, green, and blue. The CCD chip requires a tilt adjustment be done to ensure that the distance from one end of the CCD is the same as the opposite end. If these distances are not equal, then one edge of a scanned picture will be in focus, and the other edge of the picture will be out of focus. This procedure is performed during the scanner's original manufacturing calibration process. As the film is scanned, the data is converted into raw digital data through the 14 bit A/D chip on the CCD board. This data is transferred from the CCD board to the USB interface board and sent to the host PC. Shims are used to ensure proper alignment of the CCD Chip in relation to the film transport.
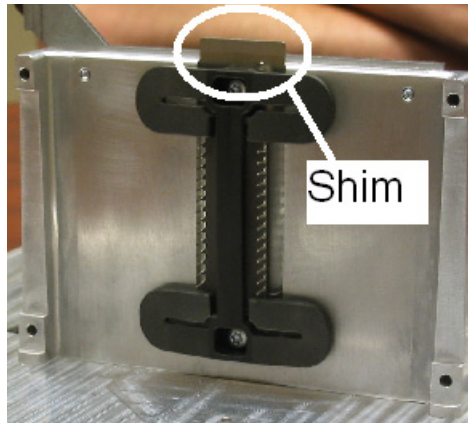
Light Source

The F-135 light source is made of LEDs, or Light Emitting Diodes. This light source's life expectancy is longer than that of the scanner's, meaning there is no light bulb to replace in the scanner.


Lens

The lens is mounted to a bracket between the transport assembly and CCD chip. During the manufacturing process, a focus fixture is used to position the lens in the proper alignment with the film track and CCD chip. Once the proper position is determined, the lens clamp is glued so the lens cannot move after the manufacturing calibration process. Once the lens position is set, the focal length of the scanner is fixed, and the scanner should not lose focus unless the optical path is manipulated manually by removing the CCD board, lens, or film transport assembly.
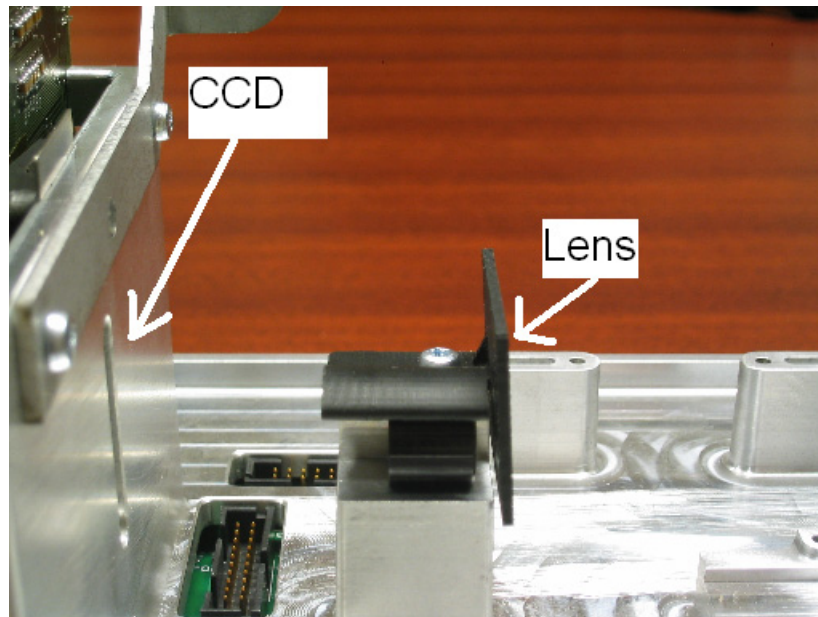
Scanner Motherboard

The scanner motherboard houses most of the scanner's electronic circuitry. It houses the motor control, DX, USB communication, and power regulation. This board controls all motors, sensors, and communication with the host PC.
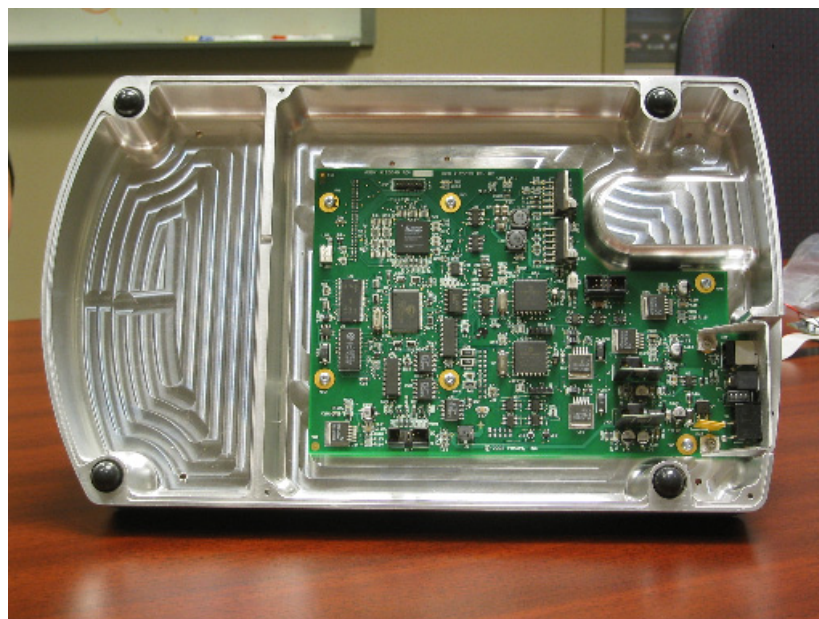
Motor Speed

The calibration wizard sets the film speed in the final phase of the calibration procedure. Each resolution, film type, and 3 channel and 4 channel setting must have its own film speed. These settings, as all calibration settings are stored in the EEPROM of the scanner, on the scanner main board.

DX Sensors

The film track has DX sensors built into the assembly. These sensors are positioned so they have the ability to read DX code on both sides of the film. The DX codes will report film type and film specifier values. They also determine index numbers for each frame. To see requirements for DX code reading, please refer to the "Scanner Specifications" chapter.

There are two DX sensors that are staggered in the film track. The DX sensor on the film exit side of the scanner also acts as a film sensor, which will warn the operator that there is still film inside the scanner if a new scan is initiated.
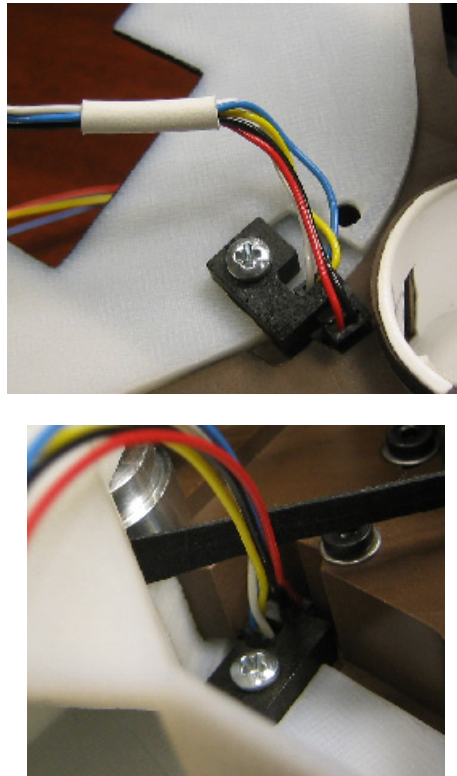
USB Connection

The F-135 scanner communicates to a host PC via a USB 2.0 interface. The scanner has a USB interface board built into the scanner motherboard. This board communicates with the scanner, and then relays that information to the host PC.

The motherboard has an EEPROM chip built into it to store calibration information. The Calibration Wizard program writes all calibration data to this EEPROM chip. When the scanner interface software is launched, this calibration data in the EEPROM is written to the Windows registry. This means that a F-135 scanner will be properly calibrated and functional when attached to any PC that meets the Computer Requirements outlined in the first chapter.

Operational Information

Powering On

Power on the host PC, and allow it to finish loading Windows before turning the F-135 scanner on. This will ensure that the scanner can properly communicate with the host computer.

Operation and Film Insertion

When scanning film, do not load film until the film status LED is green.

Inserting the film properly will ensure that the DX codes are read and that the framing will be done correctly. Insert the film with the emulsion to the inside of the scanner, DX Code up, and starting with the lowest number first, as shown below:

Do not attempt to remove film from the scanner while the scanner motor is moving! This will cause damage to both the film and the scanner.

Calibration

There are two types of calibration for the F-135.

Color calibration is set during the manufacturing process, as well as any service that involves the CCD or any optical filter. This is to be performed by trained and authorized service personnel only.

Scanner corrections are performed automatically. They consist of a series of steps performed when the scanner is first turned on, as shown below:

- Start-up corrections
- Initial LED warm-up
- Gain and exposure Control Corrections
- Run Time Corrections

LED Indicator Lights

Power LED	Function
Solid Green	+5V is functioning
Off	+5V is not functioning

Status LED	Function
Solid Green	Scanner Ready
Blinking Green	Scanner is Scanning
Blinking Yellow	Scanner is unable to scan at the moment
Blinking Red	Scanner Error
Off	Scanner not Functioning

Film LED	Function
Solid Green	Film is being scanned
Blinking Green	Insert film to be scanned
Blinking Yellow	Remove film from scanner
Off	No film in the scanner

Digital ICE

Digital ICE is designed to assist in removing scratches, dust, and debris artifacts from scanned film. It should be used as a complement to a photo lab's normal cleaning procedures. Customers are still advised to clean the floors and work surfaces regularly to keep the lab environment as dust-free as possible.

It is also recommended to clean all film with a lint-free cloth before attempting to make prints 8"x10" or higher.

If a lab is having persistent dust problems, it is recommended to perform the following regularly:

- Clean all customer film with a lint-free cloth before scanning it.
- When the scanner is turned off, cover it with a plastic, or lint-free cover.
- Use a lint-free cloth daily to clean the cover of the scanner and the surface of the table it is positioned on.

Operator Maintenance

Cleaning the Film Track

It is recommended to clean the film track every two weeks, along with the illumination cleaning. Keeping the film track clean will ensure that DX code reading remains reliable. It will also maintain the proper motor speed for each resolution. We recommend ensuring the film is clean before putting it into the scanner.
1. Position the tip of the compressed air hose in the film track entrance, and blow, moving the hose up and down while blowing inside.
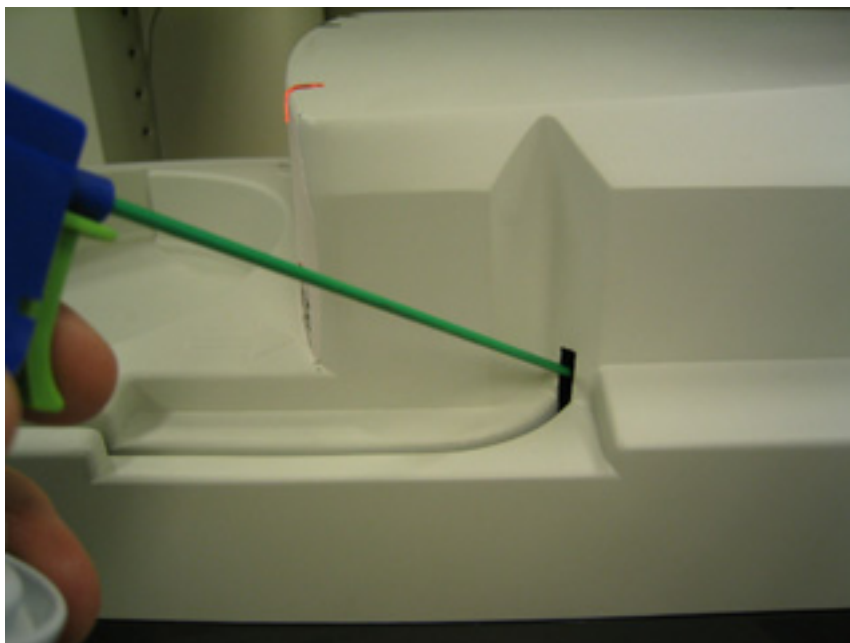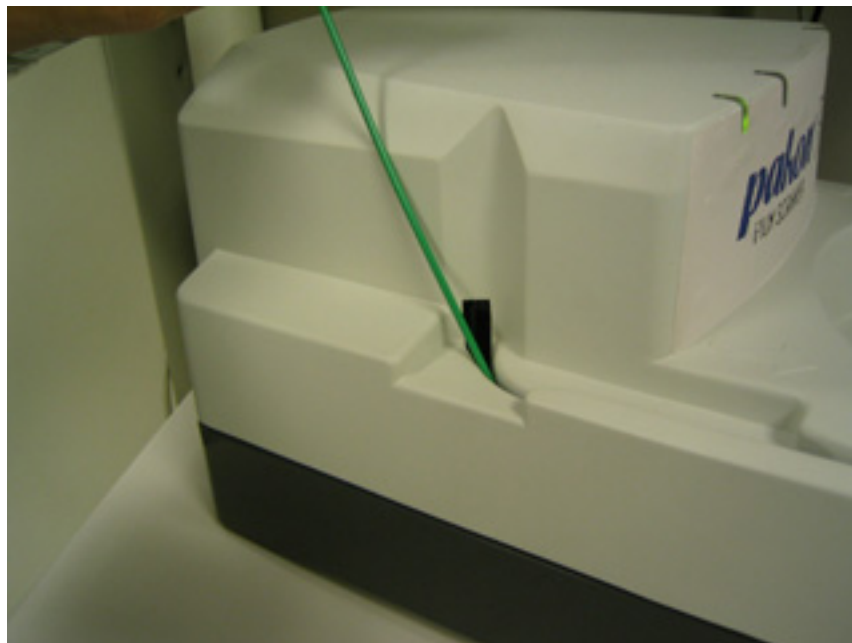

2. Follow the cleaning instructions for cleaning the scanner cover below.
3. After cleaning the film track, run the 'Film Track Test' in the client interface program.

Cleaning the Scanner Cover

1. Aim the hose of a can of compressed air into the film path--blowing the air away from the film entrance.
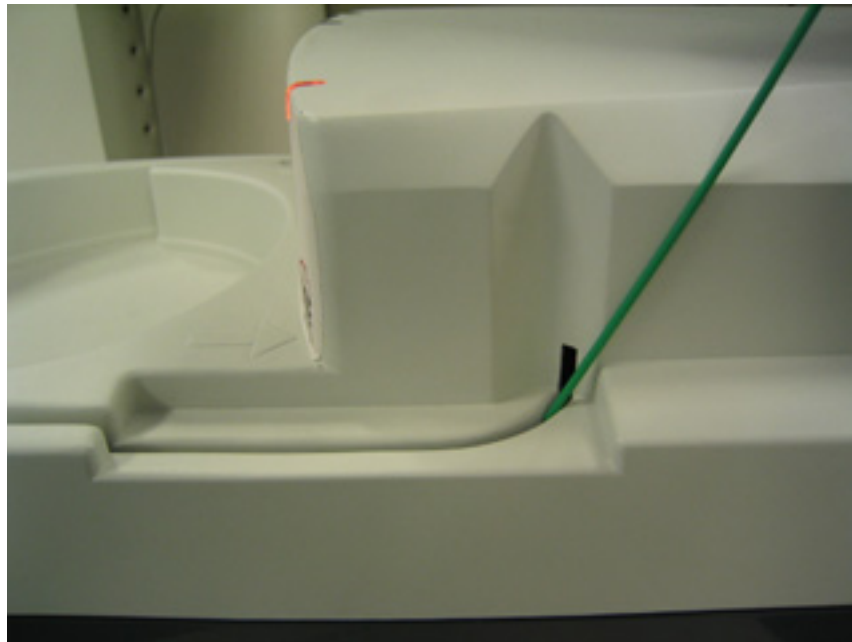
2. On the film exit side, blow the air away from the film exit.

Troubleshooting

Basics

The scanner will not work properly unless the scanner is turned on after Windows 2000 or XP has finished the loading process. Ensure this is done before attempting more advanced troubleshooting.

Error Logs

There are four primary error logs generated by the scanner software. These error logs are a very important tool to determine the cause of any reported error codes. When contacting technical support, it is advisable to provide these logs to ensure a more informed response. Dealers and distributors can request a list of the error codes with information on troubleshooting them.

These logs can be located in C:\Program Files\Pakon\F-135\TLX COM Server\Logs.

These logs include:

PakonErrorLogMain
Logs any errors associated with scanner communications with the host PC.
PakonErrorLogScan
Logs any errors associated with the scan process.
PakonErrorLogSave
Logs any errors associated with the save process.
PakonErrorLogPI
Logs any errors associated with the color correction process.

Scanning stops after one frame

The scanner calibrations may need to be re-done every two hours because the lamp temperature may vary throughout the day.

DX code reading is not working

The film track should be cleaned every two weeks to ensure proper DX code reading. This procedure can be found in the "Service" chapter in this manual. When finished, run the 'Track Test" calibration in the client interface program.

This requires a four frame strip of film with DX codes on it. Be sure to insert the film emulsion up, starting with the lowest number first, with the DX codes to the back of the scanner.

If DX code reading does not improve after cleaning and running the client film track test, the film track test should be run using the Calibration Wizard program.

Vertical Banding through Images

If images appear to have strange vertical banding through them, position the scanner so that no light is shining directly into the film entrance or exit slots.

This banding is caused by light shining directly into the scanner, through the sprocket holes of the film, and onto the CCD chip.

The images would appear as follows:

Contacting Technical Support

When contacting support by phone, please follow these guidelines to ensure timely assistance:

- Have the computer and scanner on.
- Have PSI loaded, if possible.
- Have any reported error codes written down for quick reference.
- Know the version of PSI being used.
- Know the serial number of your scanner.

If you prefer to email support, please include the following information in your email request:

- Any applicable error log files.
- Version number of PSI.
- Serial number of your F-135 scanner.
- A sample image, if helpful.
- Your company name and location.
- Details on the problem and what has been attempted so far to resolve the problem.

Pakon Contact Information

Phone:

Within the United States - 877.217.2566
Outside the United States - 952.936.4390

Email:

support@pakon.com

On the Web:

http://www.pakon.com
ftp://ftp.pakon.com

Regulatory Information

CE

Warning:

     This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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 instruction manual, 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.

Site Conditions:

Not for use in a computer room as defined in the Standard for the Protection of Electronic Computer/Data Processing Equipment, ANSI/NFPA 75.

Ne peut être utilisé dans une salle d'ordinateurs telle que définie dans la norme ANSI/ NFPA 75 Standard for Protection of Electronic Computer/Data Processing Equipment.

Temperature	15-29 degrees Celsius
Humidity	30-75% (non-condensing)
Vibration	Not to Exceed 0.05G RMS 5-200Hz
Ventilation	A 4" clearance above and behind the scanners ventilation duct is necessary
Lighting	<1000 LUX ambient light
Noise	< 70db(A)

Shipping and Storage Conditions
Temperature: -25 to 60 degrees Celsius

Part Numbers

Part Number	Description
125040	Motherboard
125038	CCD Board
125035	CCD Spring
123528	CCD Chip
125166	Lens
125034	Lens Clamp
125159	TE Cooler
125055	Film Transport
125154	DX Sensor
125115	Plastic Cover
125158	CCD Cable