USTER® *HVI SPECTRUM*

Instruction Manual

HIGH VOLUME FIBER TEST SYSTEM

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English

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All **USTER®** instruments are covered by a limited warranty, conditions of which may vary according to local laws.
We are required by current U.S. regulations to call this a "Limited Warranty" because there are ways a user might cause damage to this equipment that are completely beyond our control. Uster Technologies, Inc. assumes no responsibility for the customer's process, facilities, or personnel. The customer is liable for damage of this sort. Failure to supply specified electrical and air requirements will void the warranty. The warranty period is 12 months from the date the instrument is installed at the purchaser's site, or 18 months from the date the instrument is shipped from the Uster Technologies, Inc. factory.

Further, Uster Technologies, Inc. will replace externally undamaged glass electrodes, measuring cells, and electron tubes within 6 months of delivery if test results reveal manufacturing faults or insufficient life.

Upon written request of the purchaser within the warranty period, we will repair or replace (at our discretion) any instrument or part that fails in normal use as a result of improper design, faulty materials, or faulty workmanship. Replaced parts shall become the property of Uster Technologies, Inc.

In the event that the defective part/instrument must be returned to the factory for repair, transport both ways shall be at the cost and risk of the purchaser. Also the costs of dismantling and re-erection of the defective part are to be carried by the purchaser. If, for any reason beyond our control, such part cannot be repaired or replaced at our factory all additional costs resulting therefrom shall be borne by the purchaser.

The purchaser shall not be entitled to claim any further indemnity for deficiencies in the goods delivered, in particular for damages or for cancellation of the contract.

All contractual obligations of the vendor expire unless the purchaser advises Uster Technologies, Inc. of any claims arising under the guarantee in writing before expiry of the warranty period.

Excluded from the warranty are defects and losses resulting from improper storage, natural wear, improper maintenance, failure to observe the operating instructions, excessive loading, the user of unsuitable media, the influence of chemical or electrolytic action, unsatisfactory building or erection and commissioning work not undertaken by Uster Technologies, Inc., or other reasons beyond our control.

The vendor's liability shall cease if the purchaser or a third party undertakes changes or repairs to the goods without the written consent of Uster Technologies, Inc., or if such goods are resold by the purchaser to a third party without an agreement from the Uster Technologies, Inc.

For materials or goods supplied by third parties, the Uster accepts liability only to the extent of the guarantees provided by such third parties.

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Chapter 1 Overview

1 Purpose

This manual is intended for those operators who are responsible for the operation of the Uster Technologies' *HVI SPECTRUM* instrument. It contains the information necessary to setup the system, perform calibrations, test fibers, and generate/analyze data using user-defined reports as well as the accompanying software, QualiProfile and *BALE MANAGER*.

2 Introduction

The *HVI SPECTRUM* instrument measures the seven physical characteristics defined by the United States Department of Agriculture (USDA) in its cotton marketing system. It measures Fiber Length, Strength, Length Uniformity, Elongation, Micronaire, Color, and Trash.

All of these properties are important in fiber research, in the development of improved fiber blends, and in verifying that purchased fiber meets specifications.

The *HVI SPECTRUM* fiber test system offers precise and reliable automated operation with computer-controlled calibration and diagnostics.

All functions are controlled by dedicated microprocessors to simplify operation and to provide flexibility in testing parameters. The computer system has both a 3.5-inch floppy drive and a CD-ROM drive.

3 Visual Cues Used in this Manual

WHAT YOU SEE	WHAT IT MEANS
BOLD, SMALL CAP	**SMALL CAPITAL** letters in **bold** are used for on-screen button names (i.e. select the **TESTING** button to access the TESTING screen).
SMALL CAP	SMALL CAPITAL letters that are not bolded indicate the name of a screen or menu (i.e. *HVI SPECTRUM* MAIN MENU).
BOLD	Bold capital letters are used for the names of action items (i.e. **ENTER**, **Configure**, etc.).
italics	*Italicized*, non-capital letters indicate a placeholder for information that must be provided for the menu item to be selected (i.e. *filename* — the operator would enter the actual name of the file to be used).

CAUTION!

These statements always appear in a box and emphasize areas where bodily damage could occur if the instrument is operated improperly.

IMPORTANT: Important information, as well as **CAUTION** and **HAZARDOUS VOLTAGE WARNINGS**, appear in a text box with a yellow background.

Attention: These statements are in bold type. They provide information regarding safe and proper use of the instrument.

PCT TIP

This box gives important information on diagnosis and service of the HVI SPECTRUM.

Notes: *Appear in italic type. They give special emphasis, tips, or information about a subject.*

- Bulleted or numbered statements indicate that the operator must perform an action in order to complete the procedure or instructions.

- Information, such as a list of materials, features, components, etc. will appear in bulleted form.

For the most part, the screens shown in this manual should coincide with those on your *HVI SPECTRUM* instrument. In areas where the screens are different, the module is probably optional; therefore, it may not be shown on your instrument.

4 Major System Distinctions

The *HVI SPECTRUM* instrument is distinctly unique as a result of the following features:

- Maturity Measuring Module
- QualiProfile
- *BALE MANAGER*
- Moisture Measurement and Strength Correction
- Self Diagnostics
- Automatic Calibration for Length, Color/Trash, and Micronaire Modules
- Greatly Reduced Need for Frequent Calibration

5 HVI SPECTRUM Equipment

INSTRUMENT	COMPONENTS/SOFTWARE
HVI SPECTRUM	Length, Strength, Micronaire, Maturity, and Moisture Components; Reports, Bale Manager, and QualiProfile Software
HVI SPECTRUM I	Length, Strength, Micronaire, Maturity, Moisture, Color, and Trash Components; Reports, Bale Manager, and QualiProfile Software
HVI SPECTRUM II	Length, Strength, Micronaire, Maturity, Moisture, Color, and Trash Components; An Additional Sampling Station for Higher Volume Testing; Reports, Bale Manager, and QualiProfile Software

Table 1–1: Components and Software

The following features are provided with the *HVI SPECTRUM*:

Main Equipment:

- Base Unit containing the Length/Strength, Maturity, Micronaire, and Moisture instruments.

Computer Software:

- Report Manager
- Bale Management
- QualiProfile

Computer Hardware:

- Computer system with CD-ROM drive, 3.5-inch floppy drive, 4.1 GB or better hard drive, and Pentium processor
- IBM Flat Monitor
- Keyboard with Touch Pad Feature
- Balance
- Printer

The following options are available for the *HVI SPECTRUM*:

Optional Modules:

- Color/Trash Module
- Additional Color/Trash, Length/Strength, and Moisture Module
- *720 NEP TESTER* Module to measure Neps per gram and integrate results to *HVI SPECTRUM* instrument

Additional Options:

- UV Meter to measure Fiber Fluorescence and integrate results to *HVI SPECTRUM*
- Relative Humidity/Temperature Probe
- Bar Code Reader
- Connecting Support Frames (45° or 90°)
- Extending Shelves for *720 NEP TESTER* or Printer

6 System Drawing

The *HVI SPECTRUM* Instrument displayed below shows all available options.

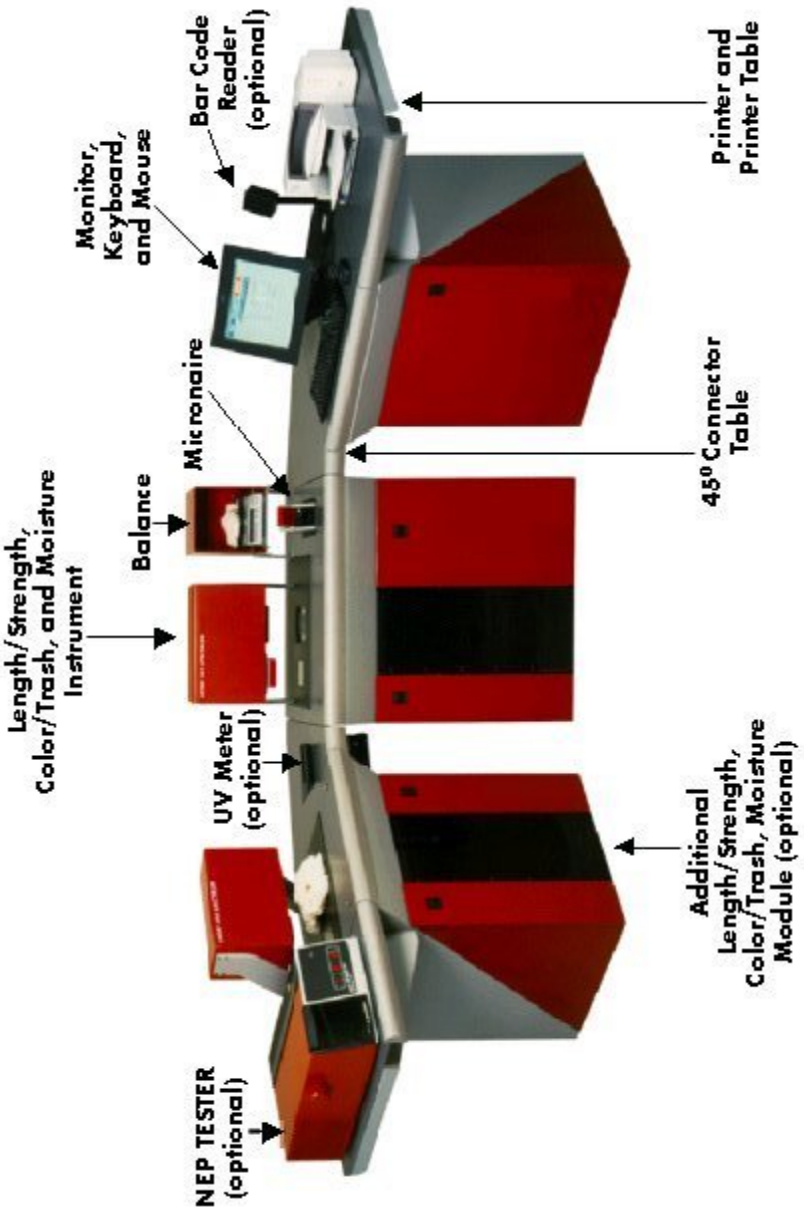

Figure 1-1: Instrument with ALL optional modules

7 *HVI SPECTRUM* System Modules

The *HVI SPECTRUM* system is housed in two floor-standing cabinets (three units if you have purchased the *HVI SPECTRUM II* with the additional Length/Strength and Color/Trash modules).

- One cabinet contains the Length/Strength, Micronaire, and Color/Trash modules.
- The other cabinet contains the computer and the control box.
- If you have purchased the additional Length/Strength and Color/Trash modules, they will be housed in the third cabinet.

Included with the system is an IBM flat screen monitor and a color ink jet printer. The monitor displays the menu selections, operating instructions, and test results. As tests are completed for each sample, the results can be transmitted to the printer and/or an external computer system.

7.1 Micronaire Module

Micronaire is measured by relating airflow resistance to the specific surface of fibers. An air stream is passed through a known mass of fiber confined in a chamber of fixed volume. The pressure differential across the chamber is then related to the specific surface of the fiber to determine the micronaire value for cotton.

Before a sample is placed in the micronaire chamber, it must be weighed. A precision electronic balance is provided to weigh the sample. The testing chamber for micronaire measurements is located directly below the electronic balance.

7.2 Length/Strength Module

The Length/Strength module optically determines fiber lengths and their associated uniformity. The elongation is calculated by averaging the length of distance the fibers will extend before breaking. The strength is determined by measuring the force that is required to break a sample of a known mass.

The Length/Strength module of the *HVI SPECTRUM* consists of a brushing mechanism, an optical system for measuring length and uniformity, and a clamping jaw system for measuring strength and elongation.

7.3 Color/Trash Module

The Color/Trash instrument for measuring cotton color (reflectiveness and yellowness) and trash is located in the Length/Strength cabinet that also houses the Micronaire Module. A pneumatic-powered automatic pressure plate that applies a consistent amount of pressure during testing is located directly above the tray.

When testing is initiated by pressing the two buttons that are mounted on the tabletop, the pressure plate descends to the test tray. The color and trash of the sample on top of the color glass are measured.

The *HVI SPECTRUM* system uses two Xenon Lamps to illuminate the sample during testing. The color components of cotton (reflectiveness and yellowness) are measured when the light reflected passes through the filters and is deflected by photo diodes. This reflectiveness is expressed as a percent reflectance (%Rd). The yellowness is expressed in Hunter's scale (+b) values. These values are converted into the equivalent USDA color grade codes that are based on the universal standards for grading American Upland and/or Pima cottons.

The Trash module is an automated video image processor that measures the amount of visible leaf or trash in a sample of cotton. The digitized image produces results for two measurements:

Trash area—the percent of the sample viewing area occupied by trash.

Trash count—an indication of the number of trash particles ≈0.01 inch in diameter or larger.

7.4 Moisture Probe

The moisture probe is mounted on the pressure plate that measures the Color/Trash. If there is no Color/Trash module, the glass plate will be replaced with a filler plate.

8 Software Features

The *HVI SPECTRUM* uses a windows-based operating system with icon-based software. This provides a simplified user interface. An optional bar code reader may be used for easy operation of the equipment.

The *HVI SPECTRUM* MAIN MENU contains seven function buttons, which allow access the major areas of testing, setup, and data management.

The major functions of the software are summarized in Chapter 3 of this manual. The remaining chapters explain each of these functions in full detail.

8.1 Error Messages

Error messages are usually preceded by an audible tone that signals an instrument or test malfunction. Audio tones also sound if test parameters have been exceeded. A message statement displays on the monitor to indicate the nature of the problem. Error messages are explained in the Appendix (Chapter 14 3) of this manual.

8.1.1 Keyboard Commands

Pressing the **ENTER** key on the keyboard registers an entry into the computer. An entry can be erased any time before pressing this key and corrected by using the **BACKSPACE** key.

If the keyboard does not respond to input or if the system halts in mid-operation, reset the system. If there is still no response, turn **OFF** the main power switch that is accessed by opening the door to the control cabinet.

8.2 Exit

Occasionally, you may wish to escape an operation without completing the sequence in a selected screen/dialog box. Generally, escaping can be accomplished by selecting the **CANCEL** button or the **QUIT** button.

8.3 Safety Labels

This label is located in front of the colorimeter unit. Caution should be taken to avoid crushing your hand as the top of the colorimeter chamber is activated.

Figure 1-2: Crush Hazard Label

This warning label is located in front of the Length/Strength chamber. It indicates that a shearing hazard could result if your hands are in the area beneath the chamber during activity.

Figure 1-3: Shear Hazard Label

This label is located in front of the Micronaire chamber indicating that caution should be taken when using the Micronaire. It automatically opens when the measurement has been taken. Injury could result if you don't keep clear of the Micronaire door.

Figure 1-4: Keep Clear of Door Label

This warning label is located on the frame of the *HVI SPECTRUM* instrument behind each of the front and rear cabinet doors as well as on the control box. It indicates that hazardous voltage is under these covers. Operators should **NEVER** open the covers.

Figure 1-5: HAZARDOUS VOLTAGE

The equipment label is located on the rear enclosure (behind the rear doors). It lists important information about the *HVI SPECTRUM*.

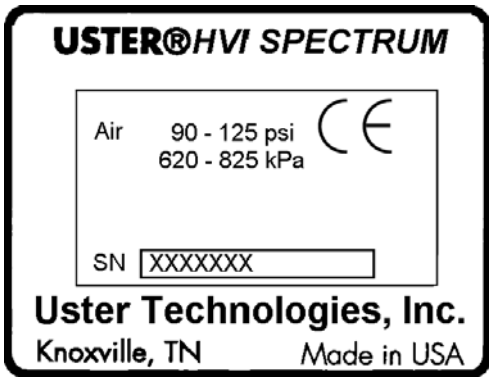

Figure 1-6: *HVI SPECTRUM* Equipment Label

The label with the flash symbol inside the triangle is located inside the power distribution box on top of the power connector blocks on the plastic shield. This indicates to the service person that hazardous voltage exists behind this cover.

Figure 1-7: HAZARDOUS VOLTAGE Warning Label

Chapter 2 Installation

1 General Requirements

HVI SPECTRUM and *HVI SPECTRUM I* units are each shipped in two (2) separate crates, and the *HVI SPECTRUM II* is shipped in three (3) separate crates.

These crates contain the module cabinets, the peripherals, and some internal parts of the system.

Upon the arrival of these crates:

- Inspect each crate for loss or damage.
- Immediately report any loss or damage to the carrier.

IMPORTANT: For warranty purposes, **ALL** crates must be opened by a qualified Uster Technologies' service technician. It is important that you **DO NOT OPEN** the crates or attempt to set up the system by yourself. **SUCH ACTION MAY VOID THE WARRANTY.**

- Once the system is received, an Uster Technologies' service technician will schedule a site visit in order to install the instrument with your assistance. **The instrument should ONLY be installed by a certified Uster Technologies' service technician.**

Note: *A plumber (pipe fitter) and electrician will be required the day of installation to assist with the final connections of the compressed air and electrical power.*

IMPORTANT: If the system is to be stored before being used, inside storage is *required* in a location that is protected from excess moisture, corrosive atmospheres, and chance of physical damage. Conditioned storage is recommended, but is not required. If the instrument has been exposed to a cold environment, condensation may form on cold surfaces when the instrument is moved into a warm area. In such situations, allow the instrument to warm and dry thoroughly before proceeding with installation.

Specific electrical requirements and connection procedures for the *HVI SPECTRUM* instrument are provided in this chapter. These instructions **MUST** be performed for each cabinet at the time of installation with the assistance of an Uster Technologies' service technician.

2 Electrical Requirements

The *HVI SPECTRUM* instrument operates on 208 or 230 volts ± 10% (single phase) (47 to 63 Hz) and requires a separate dedicated 20-amp circuit breaker at the facility's electrical load center. During normal operation, the *HVI SPECTRUM* draws approximately eight (8) amps; the startup current is sufficiently high to require the larger breaker. A power cord is provided that will connect to the *HVI SPECTRUM*. The opposite end must be fitted with connections compatible with the facility's electrical system. An uninterruptible power supply (UPS) is suggested.

Power Line: Single phase main with protection switch.

If these conditions cannot be met, a power regulator must be installed. It is recommended that you use SOLA #63-23-220-8 (60 Hz), #63-23-720-8 (50 Hz), or an equivalent.

2.1 Required Laboratory Conditions

It is recommended that the instrument be operated in a controlled environment, as follows:

Humidity 65% (+/-2%)
Temperature 20°C (+/-2°) / 68°F (+/-4°F)

Fiber samples should be properly conditioned in the laboratory environment to maintain consistent results.

2.2 Air Requirements

The system pressure should be regulated between 100psi and 150psi of clean, dry, unregulated compressed air. Use of dryer system, air filters and water trap is highly recommended.

Air Pressure	→	100 - 120 PSIG (585-825 kPA)
Amount of compressed air	→	approx. 8.5m^3/h
Air Tubes Diameter	→	10 mm (3/8″)

2.2.1 Air Quality Requirements

The air supplied to the instrument should comply with ISO8573.1 Quality Class 3 as follows:

- DIRT particle size: < 5 microns
- WATER Pressure Dew Point: <-4 F @ 100 PSIG (128 ppm by volume)
- OIL (including vapor): < 1.0 ppm

If the air line will be subjected to temperatures that could promote condensation, a water filter attached to the air line inside the lab is recommended to remove any condensation that may occur.

3 Uninterruptible Power Supplies (UPS)

If you expect to have frequent power shutdowns, Uster Technologies recommends that an Uninterruptible Power Supply (UPS) device be used to prevent loss of data or other related problems. The input for the UPS, which powers the computer and monitor, is located on the back of the main cabinet beside the power entry connector.

4 Floor Space Requirements

The *HVI SPECTRUM* and *HVI SPECTRUM I* are installed in an L-like configuration and the *HVI SPECTRUM II* is installed in a U-like configuration.

The following is a breakdown of the specific measurements for each instrument.

4.1 Standard *HVI SPECTRUM*

- The main control cabinet is 63 cm long and 80 cm deep.
- The Length/Strength cabinet is 85 cm long by 89 cm deep.
- The Length/Strength cabinet is connected to the main control system cabinet by a triangular-shaped support frame that is 69 cm at the widest part.
- The printer rests on a shelf that is 50 cm wide and 65 cm deep.
- The *HVI SPECTRUM* Length/Strength cabinet weighs approximately 410 gross kilos (285 net).

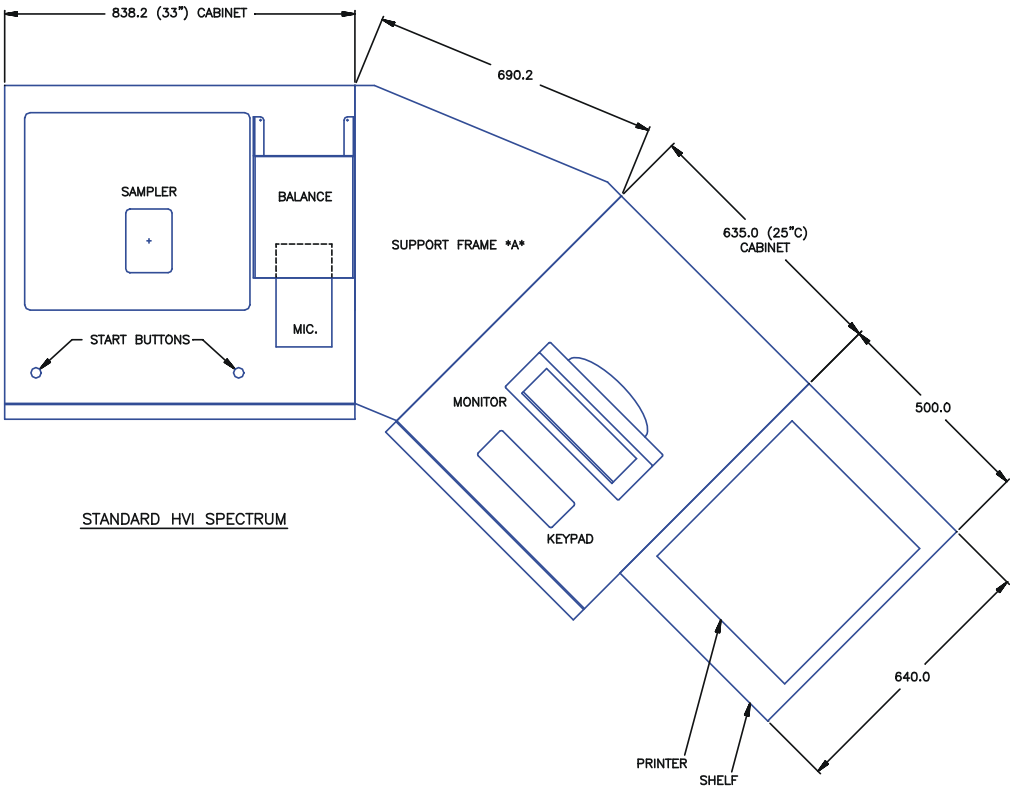

Figure 2-1: *HVI SPECTRUM* - Standard

4.2 *HVI SPECTRUM I*

- The main control cabinet is 64 cm long and 80 cm deep.
- The Length/Strength cabinet is 84 cm long by 80 cm deep.
- The Length/Strength cabinet is connected to the main control cabinet by a triangular-shaped support frame that is 70 cm at the widest part.
- The printer rests on a shelf located to the right of the main control cabinet that is 50 cm wide and 64 cm deep.
- The *HVI SPECTRUM I* weighs approximately 50 gross kilos (64 net).

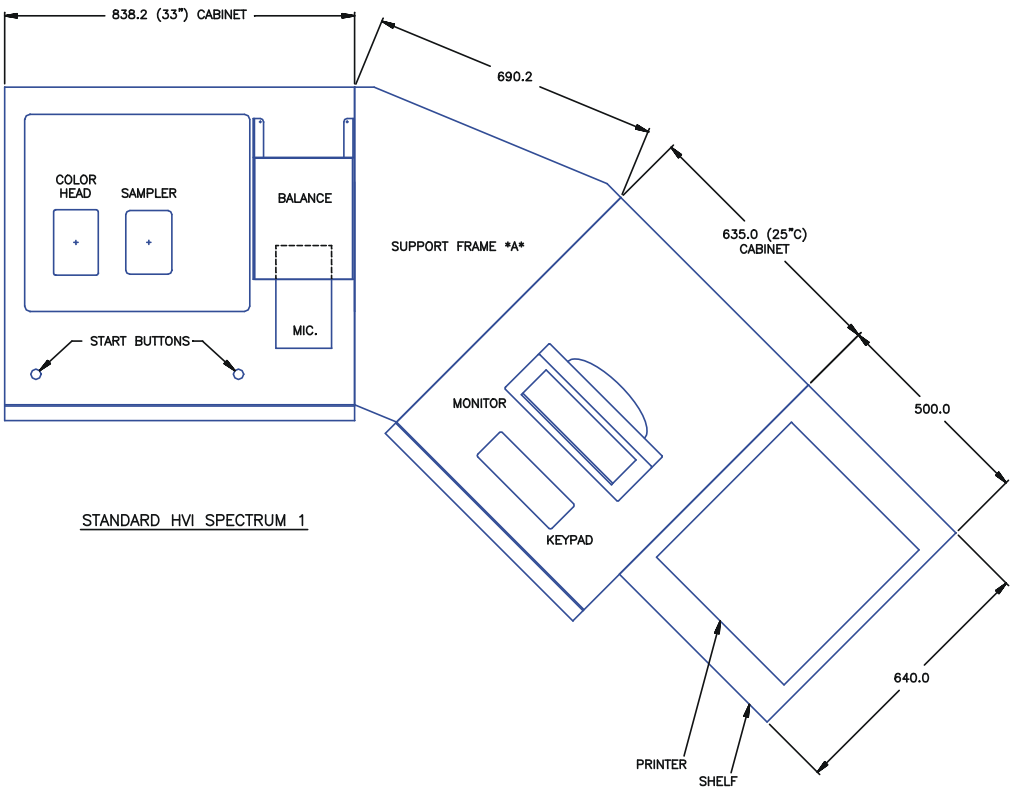

Figure 2-2: *HVI SPECTRUM I*

4.3 *HVI SPECTRUM II*

- The main control cabinet is 64 cm long and 80 cm deep.
- The Length/Strength cabinet is 89 cm long by 80 cm deep.
- The Length/Strength cabinet is connected to the main control cabinet by a triangular-shaped support frame that is 70 cm at the widest part.
- The printer rests on a shelf located to the right of the main control cabinet that is 50 cm wide and 64 cm deep.
- The *HVI SPECTRUM II* weighs approximately 50 gross kilos (64 net).

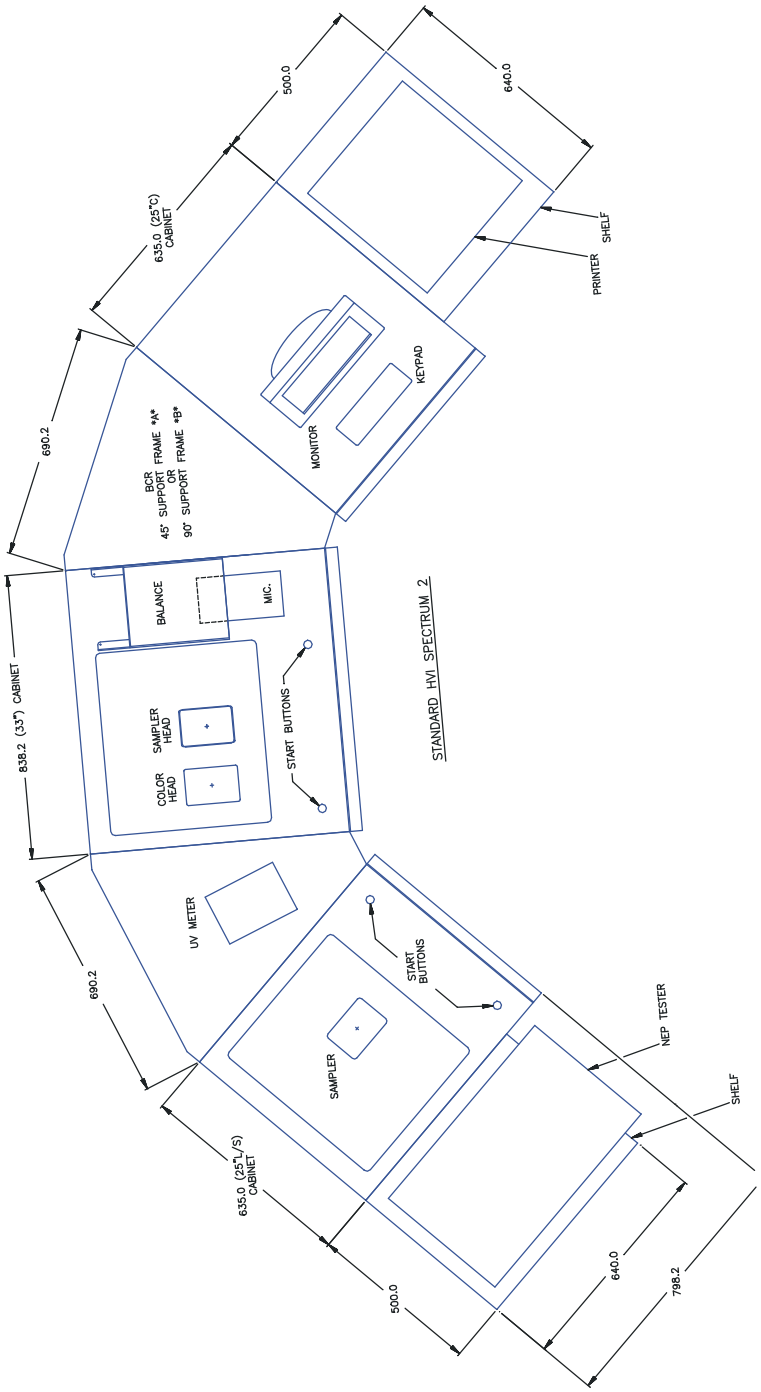

Figure 2-3: ***HVI SPECTRUM II***

5 Connections

The balance, monitor, keyboard, temperature/relative humidity probe, and bar code reader should be connected **BEFORE** the *HVI SPECTRUM* is turned **ON**. Follow the instructions below:

1. **Balance** - Connect the balance to the cable labeled "COM 2" located on the back of the computer system.

2. **Monitor** - Connect the monitor to the connector labeled VGA on the back of the computer in the control system.

3. **Keyboard -** The keyboard is attached to the connector labeled "KB" on the back of the computer. It is equipped with a touch pad feature for easy use.

Note: *Older versions of the HVI SPECTRUM units are equipped with a keyboard and mouse, which are installed in the same manner.*

4. **Temperature/Relative Humidity Probe (optional unit) -** The probe cable is attached to a connector on the control board in the Length/Strength cabinet.

5. **Bar Code Reader (optional unit) -** Connect the bar code reader to the cable labeled COM3 located on the 8-Port Rocket Board panel.

6. **Length/Strength** - The Length/Strength cabinet connects to the main Control Cabinet at COM4 located on the 8-Port Rocket board panel.

Chapter 3 Software Overview

1 Control System

IMPORTANT:

Please note that the screens shown in this manual depict the *HVI SPECTRUM I* instrument. If you are using an *HVI SPECTRUM II* instrument, the screens that you see on your monitor may differ slightly.

The *HVI SPECTRUM* is a sophisticated instrument that requires specific instruction and training to be used properly. Only operators that have received proper training should use the *HVI SPECTRUM*.

The main power switch is located on the Control System panel within the cabinet that holds the monitor and keyboard. It is labeled as **"Main"** for ease of identification.

- Press the main power switch to activate the unit.

Figure 3-1: Main Power Switch

The **VACUUM BLOWER** and the **POWER** button are located on the top of control cabinet *(see below)*. The **Power** button is **RED**, whereas the **Vacuum Blower** button is **YELLOW**.

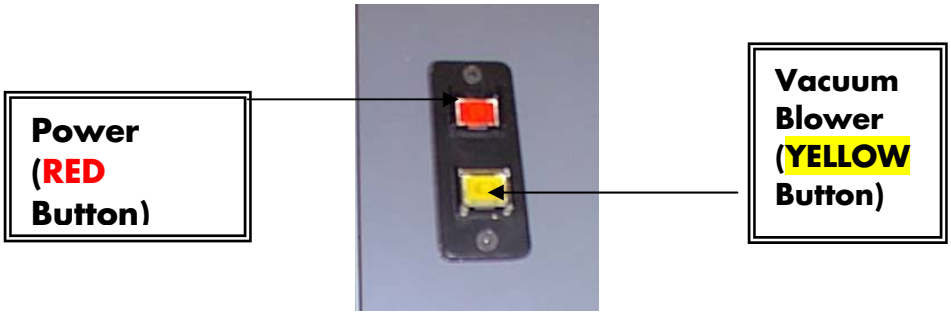

Figure 3-2: Power Button/Vacuum Blower Button

IMPORTANT: It is necessary to TURN ON the Vacuum Blower BEFORE initiating Length/Strength testing. If the Blower is OFF, testing will FAIL.

2 Software

The software for the *HVI SPECTRUM* system is installed on the hard disk drive (C:\HVI). When the system is turned on, the software performs a series of checks and the *HVI SPECTRUM* MAIN MENU is displayed.

2.1 *HVI SPECTRUM* Main Menu

The *HVI SPECTRUM* MAIN MENU, which contains the major features of the system, is automatically displayed:

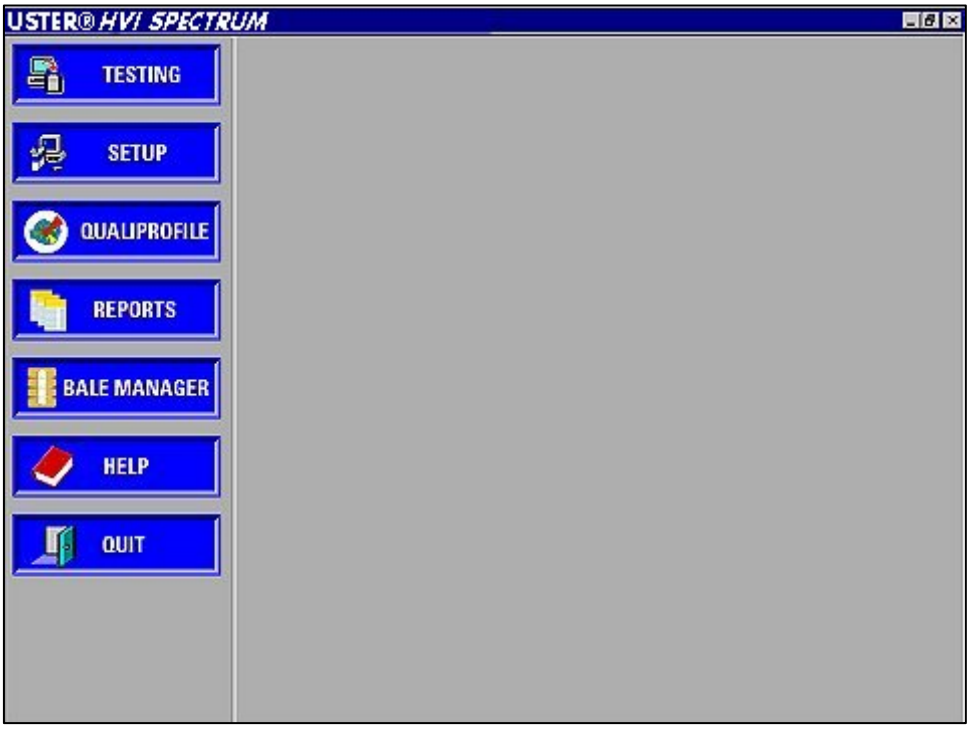

Figure 3-3: *HVI SPECTRUM* Main Menu

Note: *Clicking on a feature button will open or close your selection.*

For example: If you click on the REPORTS button, the REPORTS screen will appear. Once you have exited from the REPORTS screen, you will find that the REPORTS button is still activated and the other function buttons on the *HVI SPECTRUM* MAIN MENU cannot be used. It is necessary to click on the REPORTS button again in order to access the other functions of the main screen.

Note: *The example above applies to all function buttons with the exception of the* ***TESTING*** *button. When the testing screens are exited, all functions on the HVI SPECTRUM MAIN MENU are enabled.*

2.1.1 Testing

The **TESTING** button is used to perform the normal testing process of fibers. The testing sequence is described in detail in Chapter *7* .

Figure 3-4: Testing Button

2.1.2 Setup

The **SETUP** button accesses a series of functions, which are described below.

Figure 3-5: **Setup Button**

<u>These include the following:</u>

- **Color Chart** — is used to define/adjust the color chart(s) settings.
- **Lot Limits** — is used to define/adjust the lot limits settings.
- **Configure** — is used to define/adjust the system configurations.
- **Diagnostics** — is used to perform a series of diagnostic checks to ensure that the system is functioning properly.
- **System Check** — is used to determine whether or not the *HVI SPECTRUM* instrument requires calibration.
- **Calibrate** — is used to calibrate the various testing components.

2.1.3 QualiProfile

The **USTER®** QualiProfile enables the operator to see at first glance if a yarn is appropriate for a specific application and to compare it with **USTER®** Statistics. Additional information can be found in Chapter 11 .

Figure 3-6: USTER® QualiProfile Button

2.1.4 Reports

Test results from the *HVI SPECTRUM* system are collected, sorted, and stored using the *HVI SPECTRUM's* reporting system.

Figure 3-7: Reports Button

The **REPORTS** button is used to design, run, and print reports and graphs, edit records, export data, and define categories for inventory. Reports are discussed in Chapters 8 and 9.

2.1.5 Bale Manager

The record-keeping functions of *BALE MANAGER* are used to manipulate inventory items, issue purchase orders, monitor shipments, and review past mixes.

Figure 3-8: Bale Manager Button

Bale Manager can also track cost-per-bale and cost-per-mix information to aid in the purchase of future inventory by providing the history of previous inventories. Instructions on using the *BALE MANAGER* are provided Chapter 10

2.1.6 Help

When the **HELP** button is selected, an ABOUT screen is displayed. Information providing the software version number, build number, and name of the download file are given.

Figure 3-9: Help Button

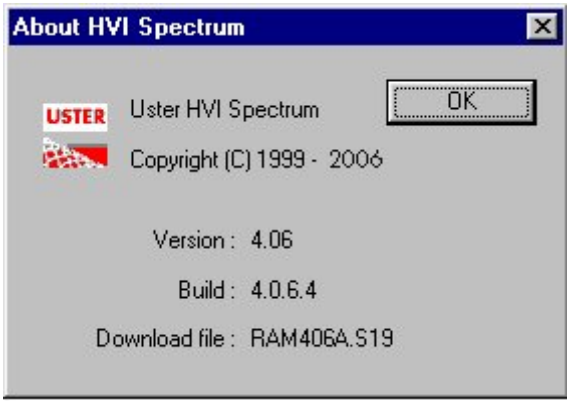

Figure 3-10: About Screen

2.1.7 Quit

This item is used to exit the application program and access other features or applications of the Windows operating system.

Figure 3-11: Quit Button

IMPORTANT:

It is recommended that the printer and monitors be turned OFF at the end of each testing day; however, the instrument should be left ON.

Note: *Various HVI SPECTRUM screens contain* ***"On/Off"*** *fields that are used to activate or deactivate a function of the system. If the field is checked (using the keypad or spacebar), the feature is in the* ***ON*** *position. If the field is blank, the feature is in the* ***OFF*** *position.*

3 Resetting the System

The main purpose of resetting the *HVI SPECTRUM* system is to clear the software of unnecessary information. Resetting erases old values from the system's memory buffer. If the system is reset in the middle of a testing sequence, the result will be a loss of test data.

The system can also be reset if it is not responding to keyboard strokes. Reset the instrument (reload the program) as follows while in any part of operation with the exception of the **TESTING** function.

- Open the front doors of the system cabinet and press the button labeled **RESET** on the computer system.

Figure 3-12: Computer System RESET Button

The system will reset and delete any measurement values that were interrupted when the reset procedure was initiated. The system will automatically reset itself after both start switches on top of the cabinet are activated simultaneously.

Chapter 4 Calibration

1 Overview

The measuring modules of the *HVI SPECTRUM* system **MUST** be calibrated before the initial use of the system and as calibration standards change.

Additionally, calibration checks should be performed periodically to ensure that the correct measurements are being collected. This chapter explains how this is accomplished.

Calibration cottons and the standard color tiles supplied by Uster Technologies, Inc. **MUST BE USED** to calibrate and to check calibrations. If you need to obtain calibration cotton samples, they can be ordered from:

Standards Preparation and Distribution Section
Cotton Division, AMS
U.S. Department of Agriculture
3275 Appling Road
Memphis, TN 38133

Since the moisture content of cottons affects its Length, Strength, and Micronaire values, calibration cotton must be stored in a proper laboratory environment. It is suggested that fiber samples be conditioned in the laboratory environment for consistent testing results. *See Required Laboratory Conditions in Chapter 2.*

Note: *The Routine Calibrations checks that are recommended in this Instruction Manual should be performed once a day.*

2 Cotton Calibration

To better understand the theory behind calibration procedures, it is important to know the instrument/software principles of calibration. Calibration is performed following engineering principles using hardware devices. Adjustments are then made within the instrument to the unadjusted, raw values through software manipulations. These adjustments cause the test values to agree with designated values of laboratory cotton samples. In this sense, the word "calibration" refers to the adjustment of *values* rather than to true calibration.

Adjusting the values is accomplished by a two-point regression analysis of individual test data points. The mathematics of the simple regression will show relationships defined by "slopes" and "offsets." If, by chance, the unadjusted values of the instrument tests agree exactly with the designated values of the two-calibration cottons, the software "slope" will be 1.0 and the "offset" will be zero. However, this perfect agreement will rarely ever exist.

In order for measured values to agree with designated values of calibration cottons, slopes and offsets are calculated from tests performed during calibration, and comparisons are made with the 1.0 slope/zero offset conditions. This results in corresponding adjustments to obtain agreement between measured values and designated values of calibration cottons.

If conditions such as calibration cotton samples, operator techniques and procedures, and fiber moisture content (temperature and relative humidity of laboratory air) do not change, the slopes and offsets that were obtained from the initial calibration do not need to be changed. The long-term stability in testing will exist.

The objective of calibration is to have slopes and offsets remain constant for long periods of time. This is achieved through management of laboratory conditions, following accepted procedures and techniques, and performing routine instrument maintenance and calibration checks.

If a **"Fail"** condition occurs during a calibration, changes are made to the parameters. However, **ONLY** those parameters that are critical for calibration to be brought to a **"Pass"** condition will change. In other words, no changes are made to those parameters that pass calibration originally.

For example: Assume that length and uniformity pass the original calibration, but there is a "Fail" condition for strength (perhaps as a result of a change in the relative humidity). During the next calibration procedure, the slope and offset for strength are all that would be changed. The slopes and offsets for length and uniformity would remain at their original values.

3 Module Calibration

The frequency of routine calibrations has been drastically reduced due to the innovative design of Uster Technologies' *HVI SPECTRUM*. It is suggested, however, that a routine calibration check on each module be completed once a day.

To Access the CALIBRATION screen:

- Select the **SETUP** button on the *HVI SPECTRUM* MAIN MENU.
- NEXT, Select the **CALIBRATE** button.

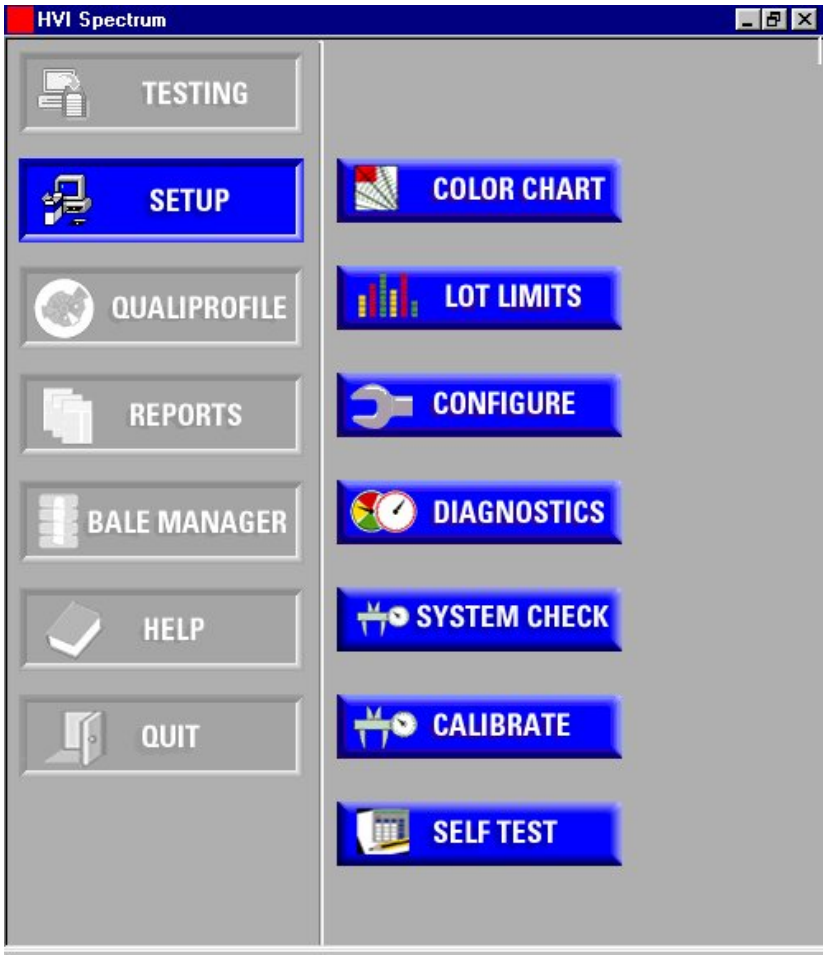

Figure 4-1: Main Menu

- The CALIBRATION screen shown below is displayed:

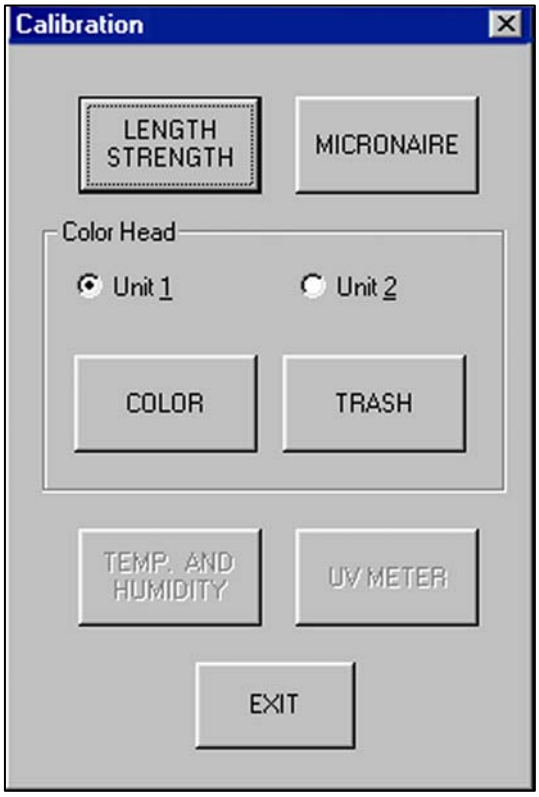

Figure 4-2: Calibration Screen

Note: *Although, testing for both units must be completed, HVI SPECTRUM II operators can choose which Colorhead to use first by selecting either Unit 1 or Unit 2. In figure 4-2, Unit 1 has been selected.*

The sections in this chapter explain how to check calibration and how to calibrate each component listed on the CALIBRATION screen shown above.

Note: *Depending on the configuration of the instrument, the menus displayed on your screen may differ from the figures shown in this manual.*

3.1 Length/Strength Calibration

Calibrations for Short and Long Cotton are performed in the same manner as for Cotton Calibration using the LENGTH/STRENGTH screen. (See section 2, Cotton Calibration, this Chapter)

- Select the **SETUP** button on the *HVI SPECTRUM* MAIN MENU.
- NEXT, Select the **CALIBRATE** button.
- Select the **LENGTH/STRENGTH** button. This will give you access to the LENGTH/STRENGTH CALIBRATION MENU.
- The LENGTH/STRENGTH CALIBRATION Menu is divided into three additional options:
  - **LENGTH/STRENGTH, UNIFORMITY**
  - **FACTORY CALIBRATION**
  - **QUIT**

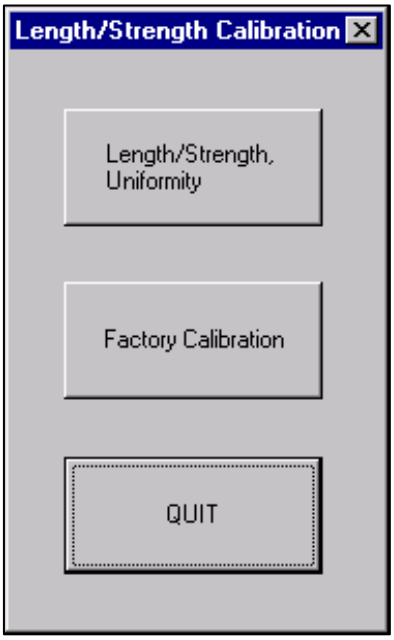

Figure 4-3: Length/Strength Calibration Menu

WARNING!

***HVI SPECTRUM* system operators <u>SHOULD NOT USE</u> FACTORY CALIBRATION. It is intended for use by Certified Uster Technologies' service technicians only and cannot be accessed without the proper password.**

3.1.1 Length/Strength and Uniformity Calibration

THE LENGTH/STRENGTH AND UNIFORMITY button is used to access the LENGTH/STRENGTH CALIBRATION screen, which is necessary to calibrate specific components.

1. Select the **LENGTH/STRENGTH, UNIFORMITY** button from the LENGTH/STRENGTH CALIBRATION MENU.

2. The LENGTH/STRENGTH CALIBRATION DIALOG BOX (shown below) will appear:

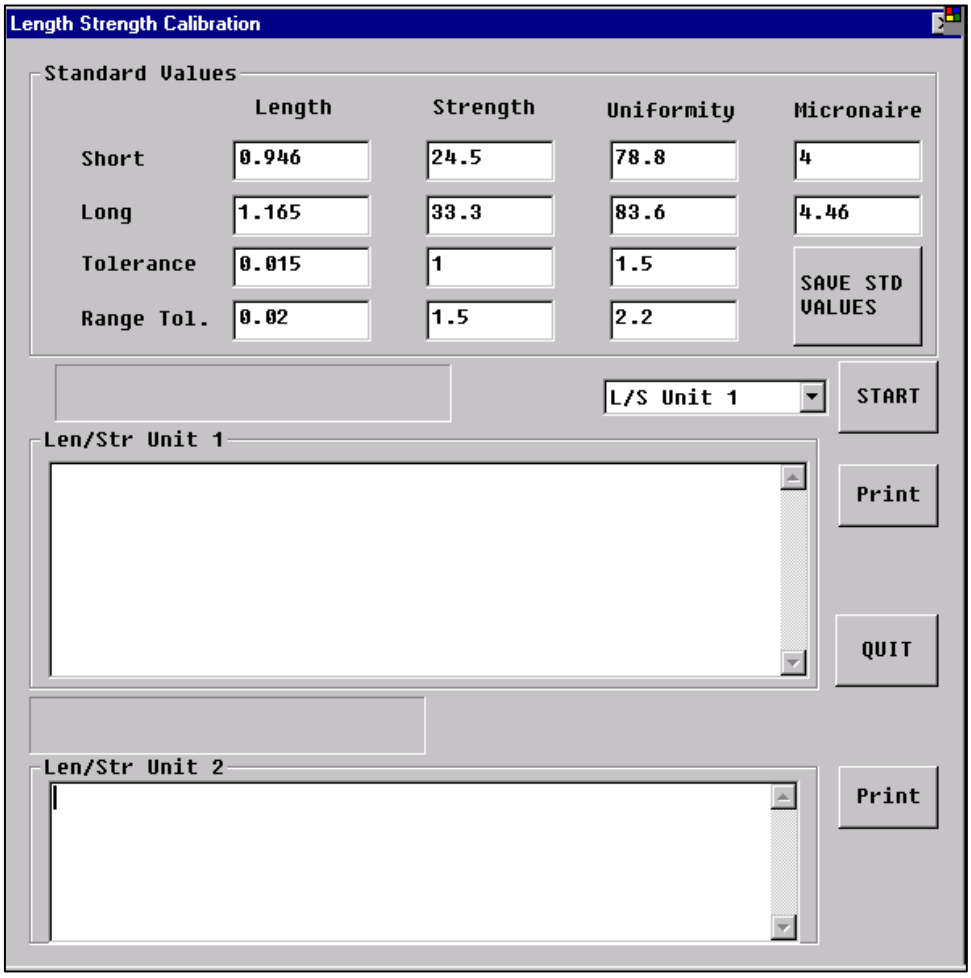

Figure 4-4: Length/Strength Calibration Dialog Box

Note: *HVI Spectrum II operators must select either Length/Strength Unit 1 or Unit 2 from the pull-down list, which is located to the left of the* **START** *button. This choice will designate which unit will complete testing first.*

3. Check the current Standard Values displayed at the top of the screen for Long and Short cottons.

4. If these values match those of the calibration cotton being used, **DO NOT** change the figures.

5. If the values are incorrect, enter the correct values and select the **SAVE STD VALUES** button to save the changes.

> **It is important that you select the SAVE STFD Values button to activate the new values.**

6. **BEFORE** initiating testing, press the **YELLOW** vacuum blower button to the **ON** position.

7. To begin the calibration process, select the **START** button on the screen. Instructions for placing the sample cotton on the Length/Strength plate are displayed on the screen (these will be the same as the testing procedure). For *HVI Spectrum II* operators, this information will appear in the message window that pertains to the Unit being used.

8. Simultaneously, press the two buttons located on the top of the Length/Strength cabinet. This will activate the testing process.

9. Calibration for Short Cotton is performed first and continues until a total of 12 tests have been completed.

10. Next, 12 tests for Long Cotton are performed.

> **It is important that you change the placement of the cotton after each test so a true reading of the sample is taken.**

11. After all 24 tests have been completed; the average values and the range of those values for the different parameters tested are displayed in the unit message window. If a parameter's average value or range falls within the prescribed tolerance level, the calibration for that parameter has **"Passed"** and the instrument is properly calibrated.

12. The operator can print the results to the default printer by selecting the **PRINT** button.

If there is a difference of one or more between the Standard Values and Average measured values that exceed the Tolerance values, a **"Fail"** condition will result. The **"Fail"** condition may be a result of one or more of the following situations:

1. The calibration cottons may have been mixed or contaminated with other cottons.
2. Calibration cotton moisture content may have changed since the previous calibration.
3. The factory-set value may not be realistic when consideration is given to the fact that cotton, even calibration cotton, is variable. If a **"Fail"** condition exits, 12 more tests for short and long cotton **MUST** be performed until **all** samples pass.

4. If there are **NO** changes when you are finished, select the **QUIT** button.

5. Select the **SAVE AND QUIT** button if changes have been made.

Note: *The* **QUIT** *button can also be used to interrupt the calibration procedure.*

6. Return to the LENGTH/STRENGTH CALIBRATION MENU by selecting the **QUIT** button on the LENGTH/STRENGTH CALIBRATION DIALOG BOX.

Note: *Factory Calibration screens are intended for certified Uster Technologies' Service Technicians and cannot be accessed without the proper password.*

3.2 Micronaire Calibration

Past research and experience with the Micronaire component that is used in *HVI SPECTRUM* have proven the stability of the instrument. Therefore, it is recommended that a *routine check* be performed rather than a *routine calibration*. A calibration should only be completed in cases of extreme swings in humidity or a malfunction in the unit.

Note: *Due to possible operator error, calibrating the Micronaire on a routine basis without prior checks (tests) could result in less than favorable results. Calibration requires a very precise mass (±0.03 grams). If a small amount of the sample is lost or if the sample is not prepared correctly a miss-calibration can occur.*

It is EXTREMELY IMPORTANT to KEEP a RECORD of the ORIGINAL SETTINGS for future use.

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.
2. Next, select the **CALIBRATE** button.
3. Select the **MICRONAIRE** button from the CALIBRATION screen.
4. This gives you access to the MICRONAIRE CALIBRATION MENU.

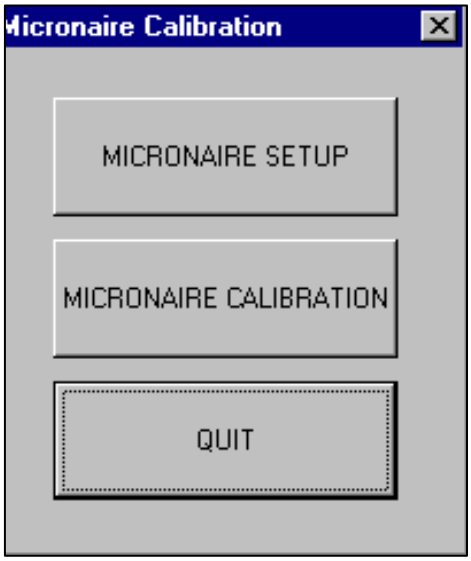

Figure 4-5: Micronaire Calibration Menu

IMPORTANT:

DO NOT use the MICRONAIRE SETUP button. ONLY a qualified Uster Technologies' service technician should access this screen.

5. Select the **MICRONAIRE CALIBRATION** button to access the MICRONAIRE CALIBRATION SCREEN shown below:

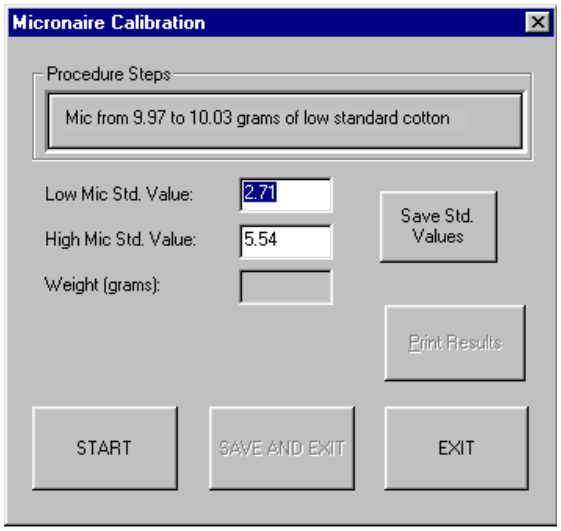

Figure 4-6: Micronaire Calibration Screen

6. Enter the low and high micronaire standard values in the appropriate fields.

7. Once this is done, select the **SAVE STD. VALUES** button.

IMPORTANT:

Calibration samples should be well-blended samples. It is recommended that only International Cotton Calibration Samples be used for calibrating the *HVI SPECTRUM's* Micronaire.

A difference of at least 2.5 should exist between the low and high value of the cotton used for Micronaire calibration.

8. To begin the calibration, select the **START** button, then follow the on-screen instructions by placing 10.0 grams of low-micronaire cotton on the balance. Take care to ensure that the weight is precise and the entire weighed sample is placed in the micronaire chamber.

9. Continue the process by following the on-screen messages to test the high-Micronaire sample.

10. Once all tasks have been completed as directed by the on-screen prompts, select the **SAVE AND EXIT** button. You can interrupt the calibration process by pressing the **EXIT** button.

3.2.1 Calibration Procedures for Micronaire

To begin the calibration:

1. Select the **START** button located at the bottom left of the MICRONAIRE CALIBRATION SCREEN.

2. Follow the on-screen instructions given in the **"Procedure Steps"** window by placing 10.0 grams of low-Micronaire cotton on the balance.

3. When the sample weight is within range, the weight is displayed in the **"Weight [grams]"** field on the *HVI SPECTRUM* TESTING screen.

Note: *It is extremely important that the weight of the cotton is precise and the* ***ENTIRE*** *weighed sample is placed in the Micronaire chamber.*

4. Insert the weighed sample into the Micronaire chamber and close the lid. The Micronaire test will begin automatically.

5. The chamber lid will open once the test is completed and the sample is ejected from the chamber.

6. The Micronaire value will be displayed in the **"Low MIC Std. Value"** field.

7. Continue the process of testing the High-Micronaire sample by following the on-screen messages.

8. The Micronaire value will be displayed in the **"High MIC Std. Value"** field.

9. Once all testing has been completed, select the **SAVE AND EXIT** button.

Note: *The calibration process can be interrupted at any time by pressing the* **EXIT** *button.*

Note: *If an error message appears repeatedly, it could indicate an air leak in the Micronaire chamber. If this occurs, perform a Micronaire calibration check to ensure that it is accurate. If necessary, contact an Uster Technologies' service technician for further support.*

3.3 Color Calibration

The Color component used in the *HVI SPECTRUM* instrument has been designed to operate for an extended period of time without requiring calibration. It is recommended that a *routine check* be performed rather than a *routine calibration*. A calibration should only be completed in cases of extreme swings in temperature or in a highly dusty environment.

When a color calibration check is performed, a series of five tiles of known color values are compared with the calibration constants stored in the system. If the values do not agree, the system alters the constants to bring **ALL** color measurements back to the known standards.

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU screen.
2. Next, select the **CALIBRATE** button.
3. When the CALIBRATION screen appears, select the **COLOR** button.

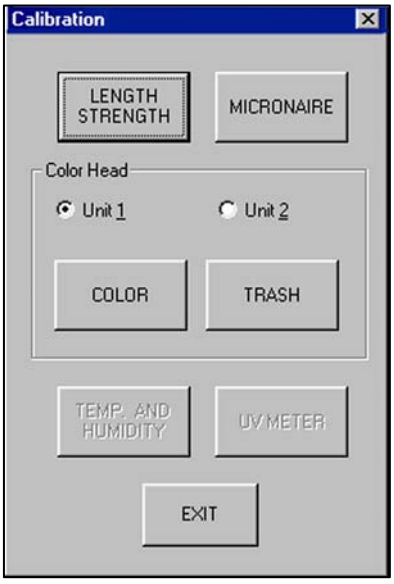

Figure 4-7: Calibration Screen

4. The COLOR REFERENCE VALUES screen is displayed:

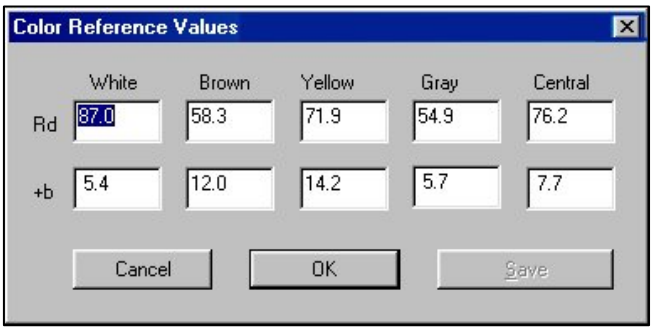

Figure 4-8: Color Reference Values Screen

5. In this screen, the Rd and +b values are displayed for each tile. Check these values with each tile supplied by Uster Technologies, Inc. to ensure that the displayed figures are the same as those printed on the calibration tile box.

6. If it is necessary to change any of the tile values, enter the values and save the changes by selecting the **SAVE** button.

7. Select the **OK** button once the values agree.

8. The COLOR CALIBRATION screen will be displayed at this time.

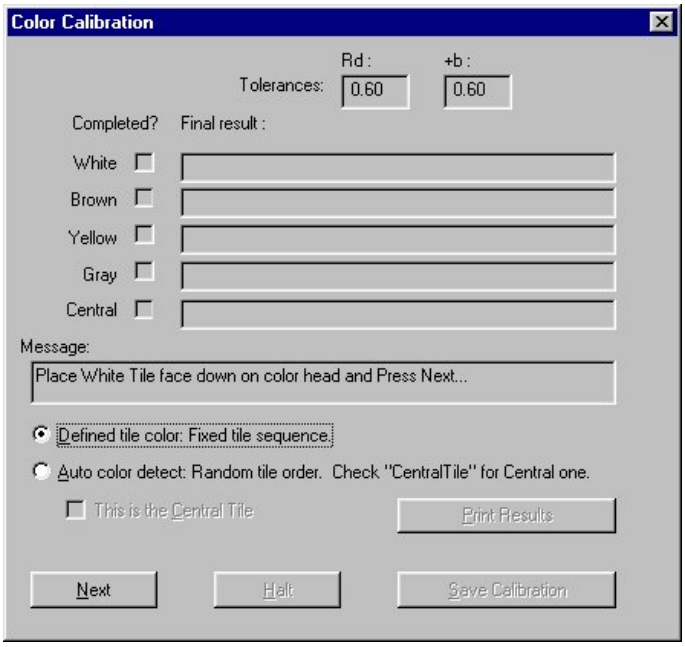

Figure 4-9: Color Calibration Screen – Defined Tile Color

IMPORTANT:

The FIRST time the system is calibrated, DEFINED TILE COLOR: FIXED TILE SEQUENCE MUST be selected! Refer to figure 4 – 9.

9. Begin calibration by selecting the **START** button.

10. The **"Message"** area, located beneath the list of tiles, offers instructions to the operator.

Note: *This message will differ depending on the selection (either Defined tile color or Auto color detect from the buttons located beneath the message area). In this example, the Defined tile color has been chosen.*

11. Follow the instructions on the screen by placing each tile on the color/trash plate as requested.

12. Press the **NEXT** button to continue.

Note: *A check mark will automatically appear in the box beside each color tile in the* ***"Completed?"*** *area of the screen indicating the image for that tile has been grabbed.*

13. Once the Color head has measured all five tiles, the final results will be displayed. If any of the readings for the tile are out of tolerance **(FAIL)**, it will be necessary to perform the calibration again.

14. When you are finished, select the **SAVE CALIBRATION** button to save any modified constants.

15. Select **PRINT RESULTS** to send the result to the connected printer.

16. The **HALT** button is used to stop processing while measurements are being taken. This option is most commonly used if:

    - The wrong tile was placed on the Color head.
    - The tile was not centered on the Color head plate.

Note: *After the defined sequence has been measured for the first time, the system can generally determine which tile is on the window with the exception of the central tile.*

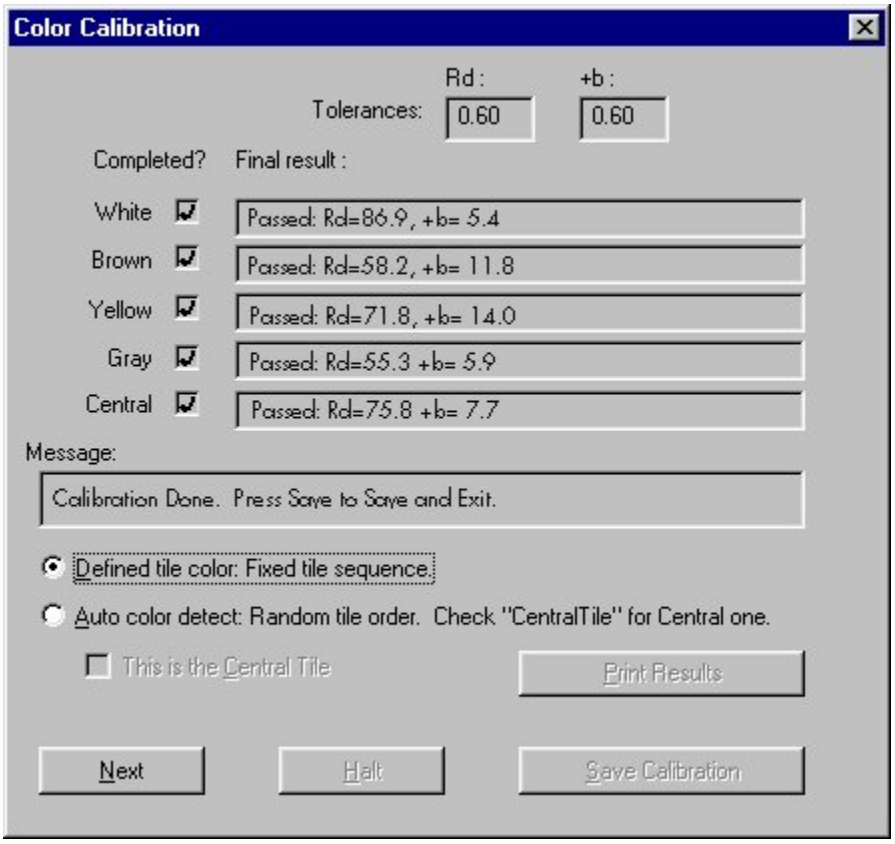

Figure 4-10: Color Calibration Screen – Results

17. When the **AUTO COLOR DETECT: RANDOM TILE ORDER CHECK "CENTRAL TILE" FOR CENTRAL ONE** button is selected, the tiles can be measured in any order.

18. Click in the box beside **"THIS IS THE CENTRAL TILE"** when the central tile is ready to be measured and has been placed on the window.

Note: *If this box is unchecked, the color head will automatically take measurements for a white tile. The results for the central tile will be incorrect and testing will have to be redone.*

3.4 Trash Calibration

The trash module used in the *HVI SPECTRUM* instrument has been designed to operate for an extended period of time without requiring calibration. It is recommended that a *routine check* be performed rather than a *routine calibration*. A calibration should only be done in cases of extreme swings in temperature or in a highly dusty environment.

In the event that it becomes necessary to calibrate the trash, follow these instructions:

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.

2. Select the **CALIBRATE** button.

3. Choose the **TRASH** button from the CALIBRATION screen.

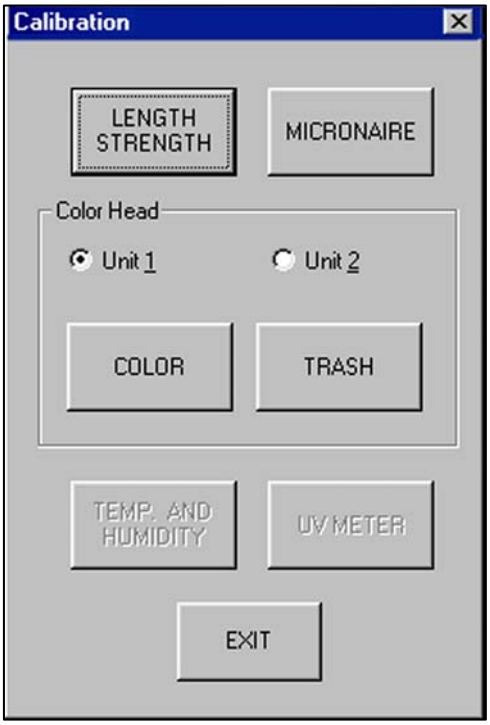

Figure 4-11: Calibration Screen

Note: *If you have the HVI SPECTRUM II, select which Length/Strength Unit will be used for testing by clicking in the circle beside either* ***"Unit 1"*** *or* ***"Unit 2"****.*

4. The CALIBRATE FLASH AND TRASH screen will appear:

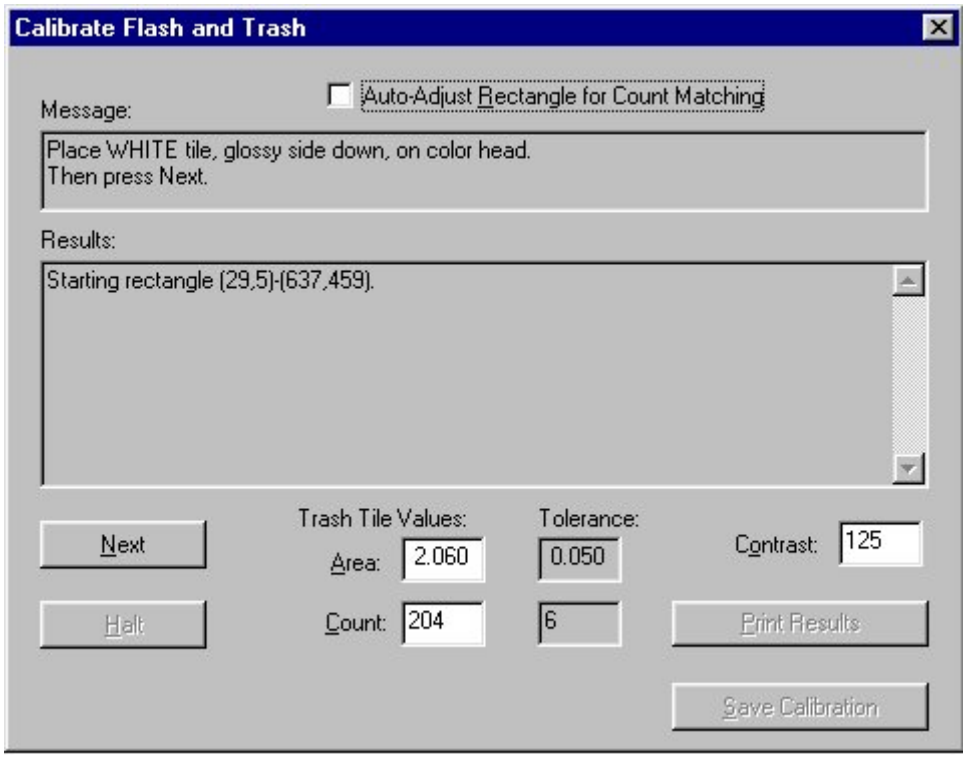

Figure 4-12: Calibrate Flash and Trash Screen

3.4.1 Procedures for Flash Calibration

IMPORTANT: The Flash is calibrated first.

1. Compare the trash tile **"Area"** and **"Count"** displayed on the screen with that listed on the back of the trash tile. If either is incorrect, change the value to reflect that listed on the back of the tile.

Note: *If the tiles require cleaning, make sure they are completely dry before proceeding with color calibration.*

IMPORTANT:

The Tile and sample glass must be void of any trash or other contaminants that could be seen by the camera. Both can be cleaned with a soft dry cloth or, if necessary, use a small amount of soapy water. See IMPORTANT instructions for cleaning trash tile on the next page.

2. Place the **WHITE** color tile on the sample window. Make sure the tile is centered on the window and none of the window is exposed.

3. Press the **NEXT** button.

4. The lamps will flash at the rate of one flash about every 5 seconds. An image will be grabbed and analyzed for brightness and even/odd illumination.

5. Once the flash passes the calibration criteria, the outcome will appear in the **Results** window of the CALIBRATE FLASH AND TRASH screen.

Note: *The white tile sets all necessary parameters for the calibration of the flash.*

6. Once the flash has been calibrated, the trash requires calibration.

Note: *Once calibration is complete, you can select* ***Print Results****.*

3.4.2 Procedures for Trash Calibration

1. Place the trash tile on the sample glass. (The trash tile has dark dots on a light background.)

IMPORTANT:

Trash tile should be inspected for foreign particles. If any dust, dirt, lint, or trash is on the tile, it should be cleaned with a clean dry cloth. DO NOT USE SOAPY WATER ON THIS TILE. This tile should ONLY be cleaned with a dry cloth or a lightly damp cloth. Any particles on this tile may result in a calibration error.

2. Press the **NEXT** button to continue with calibration.

3. The trash tile will be tested and a pass or fail outcome will be displayed in the **Message** window.

4. The measured area and particle count will be displayed in the **Results** window.

5. If the particle count is out of tolerance, the rectangle/trash may need to be adjusted. Check the **AUTO-ADJUST RECTANGLE FOR COUNT MATCHING** box at top of dialog box and retry calibration. Once the count is within tolerance, turn off the auto adjust rectangle.

6. If the area is out of tolerance, the contrast may need to be adjusted. The rule of thumb is to increase the contrast to increase the area.

Note: *If the contrast is 100 or above, there may be a problem with the camera. The fields for contrast and tolerance are located at the bottom of the* CALIBRATE FLASH AND TRASH *screen.*

7. When both the area and count are within tolerance, the calibration will pass. Be sure to click the **SAVE CALIBRATION** button to save the results when you are finished.

Note: *Once calibration is complete, you can select* ***Print Results****.*

Note: *Contact an Uster Technologies' service technician for assistance if repeated failures occur.*

3.5 Temperature and Humidity Calibration

The optional temperature and humidity probe is calibrated as follows:

1. First, select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.

2. NEXT, select the **CALIBRATE** button.

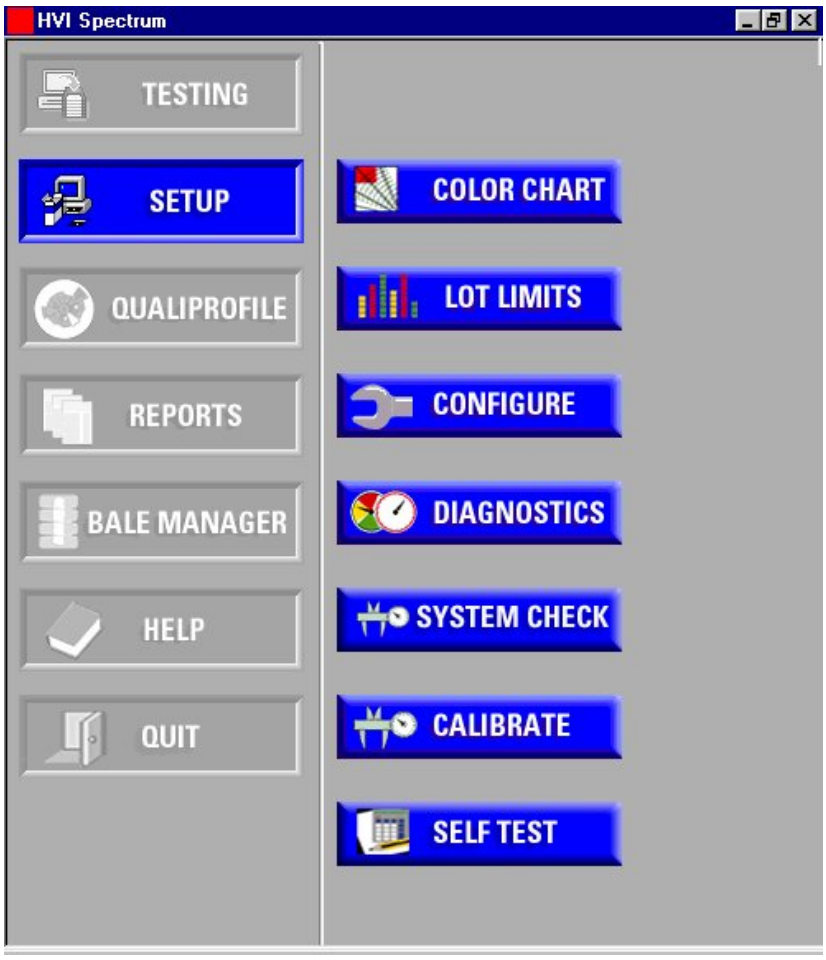

Figure 4-13: Main Menu - Setup

3. Select the **TEMP AND HUMIDITY** button from the CALIBRATION screen (refer to Figure 4-2) to access the TEMPERATURE AND HUMIDITY CALIBRATION screen.

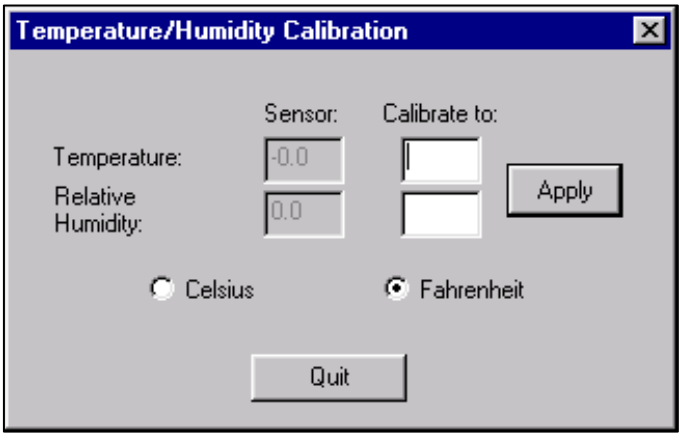

Figure 4-14: Temperature and Humidity Calibration

4. When this screen opens, readings are automatically taken and displayed on the screen for the operator to view.

5. If these readings are incorrect, enter the correct figures in the **Calibrate to:** fields for both the Temperature and Relative Humidity.

6. Next, select the appropriate temperature setting by clicking beside either **Celsius** or **Fahrenheit**.

7. Save the settings by selecting the **APPLY** button.

8. If the figures are correct, select the **QUIT** button to exit the TEMPERATURE/HUMIDITY CALIBRATION screen.

Note: *If you enter a value greater than the system can recognize, a % is shown in front of the invalid entry.*

3.6 UV Meter Calibration

The UV CHECK/CALIBRATION screen shows real-time updates of the values coming from the UV meter. This calibration supports the original "single tile" mode, or "multiple tiles" for a more accurate calibration over a wider range of UV values.

1. To access the UV CHECK/CALIBRATION screen, select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU screen.

2. Next, select the **CALIBRATE** button.

3. Choose the **UV METER** button on the CALIBRATION screen to access the UV/CALIBRATION screen.

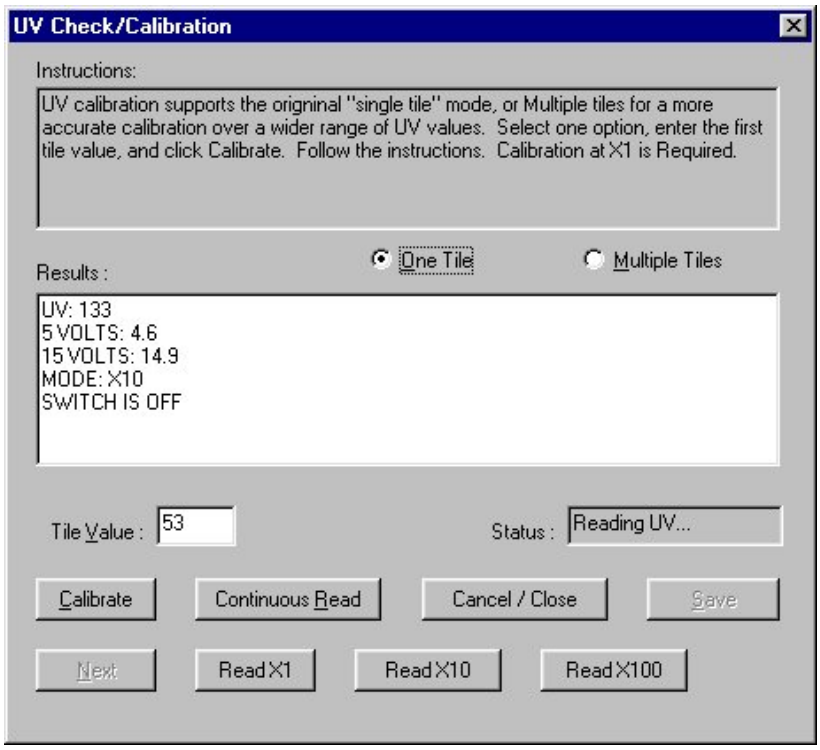

Figure 4-15: UV/CALIBRATION Screen

4. Select **One Tile** or **Multiple Tiles**.

5. Click **Calibrate**. The UV Meter values will be displayed at a continuous rate of occurrence.

6. Follow the on-screen instructions.

Note: *Calibration at **X1** is REQUIRED.*

To perform the check:

1. Place the **dark** side of the tile on the plate and take a reading. The UV reading should equal 0 (zero).

2. If the values are correct, no calibration is necessary. Select the **CANCEL/CLOSE** button.

3. If the values are incorrect, place the dark side of the tile on the UV meter and enter the correct tile value shown on the plate. Select the **CALIBRATE** button at the bottom left of the screen. The **dark** side should read 0 (zero).

4. Continue following the directions shown on the UV CHECK/CALIBRATION screen by flipping the plate and pressing the **NEXT** button.

5. Once all tile values have been read, perform a re-check. All values should be correct.

6. As stated previously, the **dark** side of the calibration tile should read 0 (zero).

7. Next, check the **fluorescent** side, which should read what is printed on the calibration tile.

IMPORTANT:

The operator should **ONLY** recalibrate if these values are out of limits.

8. Once all tile values are correct, select the **SAVE** button.

Chapter 5 System Check

1 Overview

The **SYSTEM CHECK** button replaces the **CAL CHECK** button found on previously used software versions. This feature is designed to assist in checking calibration.

Figure 5-1: System Check Button

2 System Check Selection Menu

The options on the SYSTEM CHECK TEST SELECTION MENU are designed so that the operator can check calibration for various modules. The screen/dialog boxes described in this chapter can be accessed through this menu.

2.1 Micronaire

2.1.1 Calibration Check

To check micronaire calibration:

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.
2. Press the **SYSTEM CHECK** button.

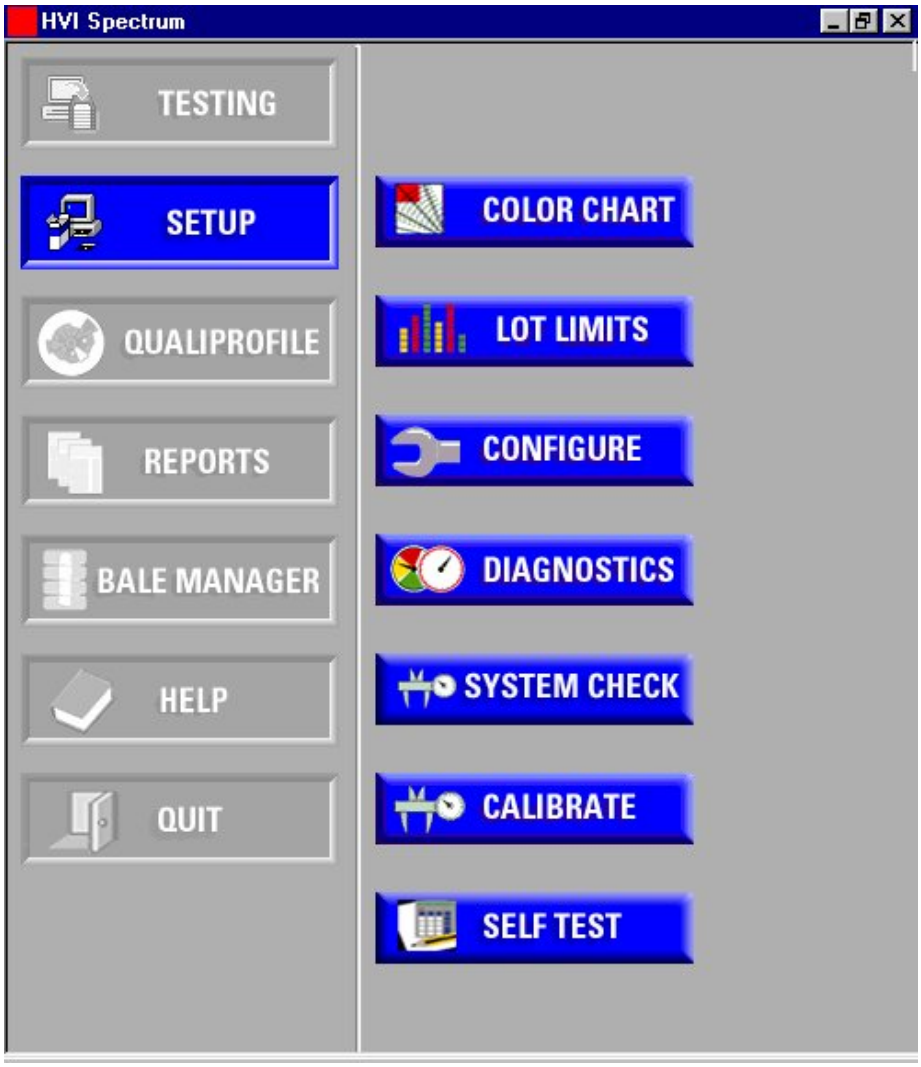

Figure 5-2: Main Menu - SETUP

3. This gives you access to the SYSTEM CHECK TEST SELECTION MENU.

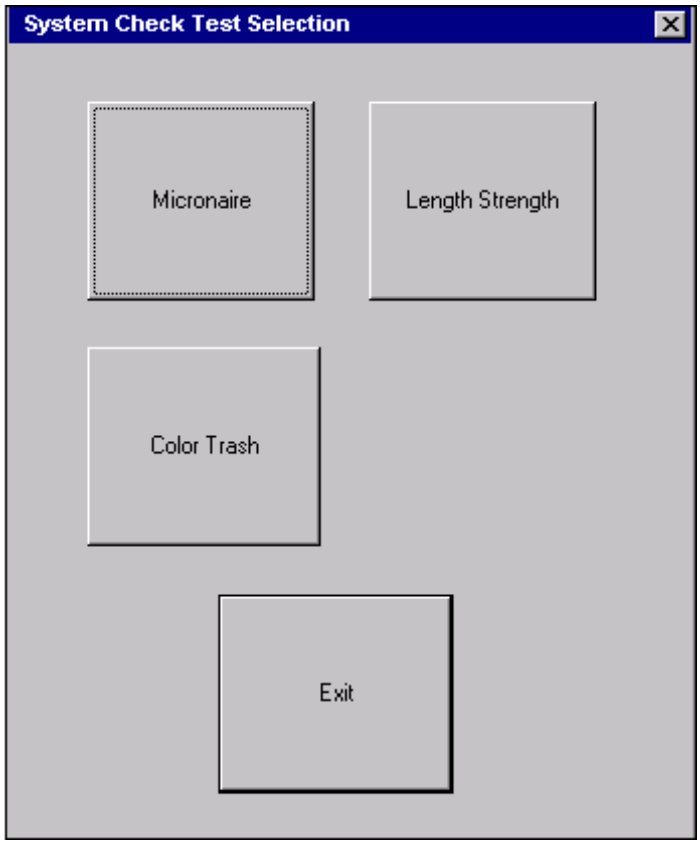

Figure 5-3: System Check Test Selection Menu

4. Click the **MICRONAIRE** button on the SYSTEM CHECK TEST SELECTION MENU.

5. This gives you access to the SYSTEM CHECK MICRONAIRE screen:

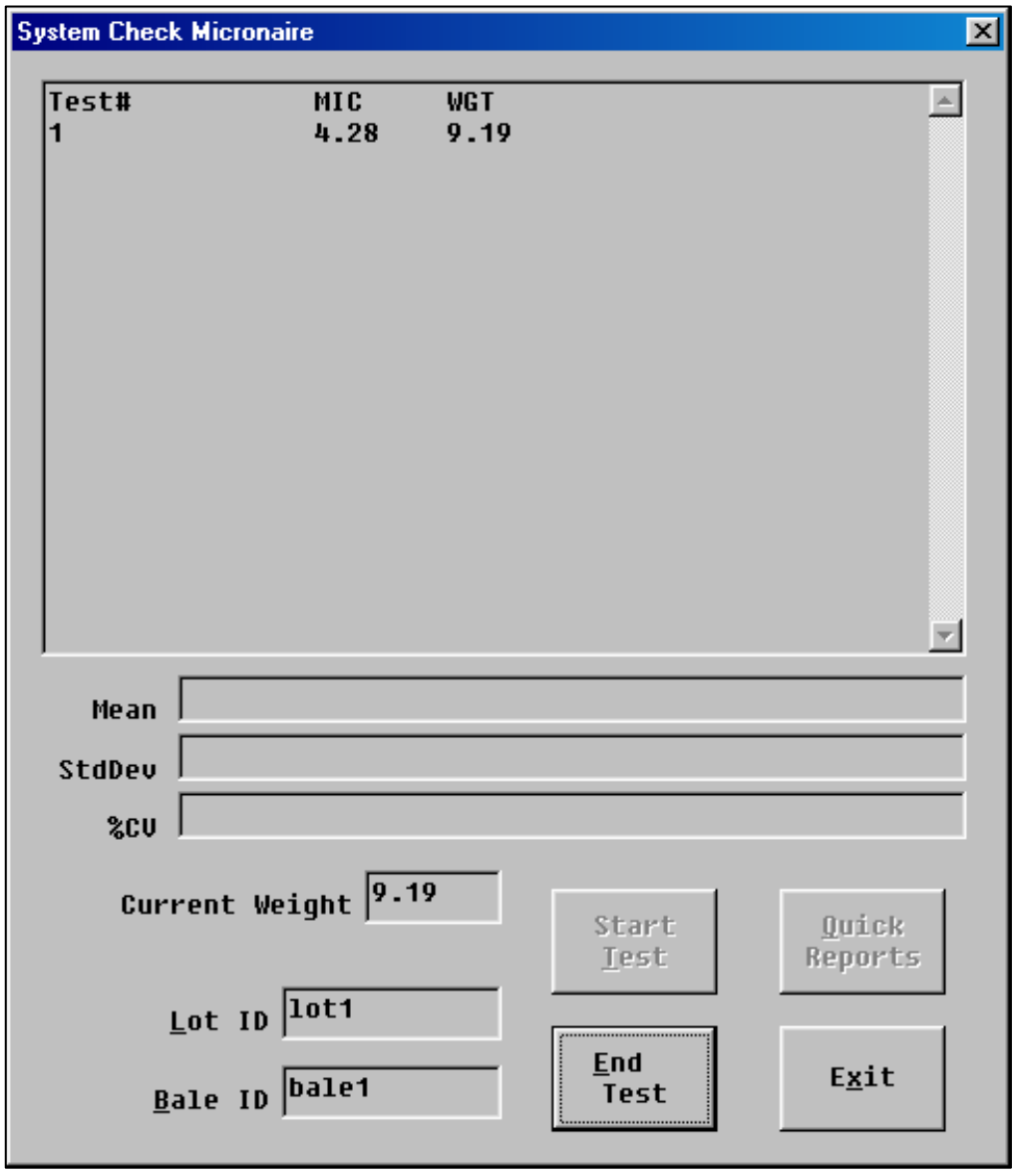

Figure 5-4: System Check Micronaire Screen

2.1.2 Calibration Test

To begin a calibration test:

1. Enter the **Lot ID** and **Bale ID** information in the corresponding fields.

2. Begin the testing procedure by weighing and measuring the sample. (R*efer to Chapter 4 of this manual for complete instructions.)*

3. Press the **START TEST** button on the SYSTEM CHECK MICRONAIRE screen.

4. The micronaire values will be displayed on the screen as the sample is tested.

   - The mean will be displayed on the screen after 2 or more tests are completed.

   - The StdDev and %CV will be displayed after 3 or more tests are completed.

5. Once testing is complete, press the **END TEST** button.

Note: *Reporting is not enabled until all testing has ended and the* **END TEST** *button has been selected.*

6. The **QUICK REPORTS** button enables you to print a report. Refer to Chapter 9, Quick Reports, for additional information regarding this function.

2.2 Length/Strength

2.2.1 Calibration Check

To check Length/Strength Calibration:

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU screen.
2. Press the **SYSTEM CHECK** button.
3. Click on the **LENGTH/STRENGTH** button located on the SYSTEM CHECK TEST SELECTION MENU.
4. The SYSTEM CHECK LENGTH/STRENGTH screen appears:

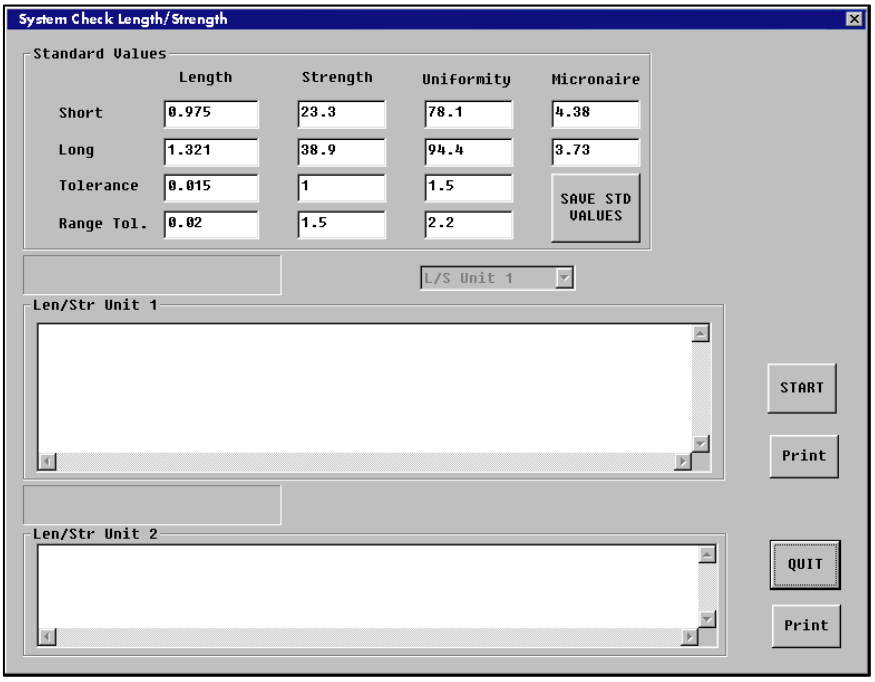

Figure 5-5: System Check Length/Strength Screen

2.2.2 Calibration Test

To begin the Length/Strength system check:

1. Check the Standard Values for **Short** and **Long** cotton (length, strength, uniformity, and micronaire). Save any changes by pressing the **SAVE STD VALUES** button.

Note: *HVI SPECTRUM II users must select either L/S Unit 1 or L/S Unit 2 from the pull-down list.*

2. Press the **START TEST** button.

3. When testing is finished, select the **END TEST** button.

2.3 Color/Trash

2.3.1 Calibration Check

To check Color/Trash calibration:

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.
2. Press the **SYSTEM CHECK** button.
3. Click on the **COLOR TRASH** button located on the SYSTEM CHECK TEST SELECTION MENU.
4. THE SYSTEM CHECK COLOR/TRASH screen will appear:

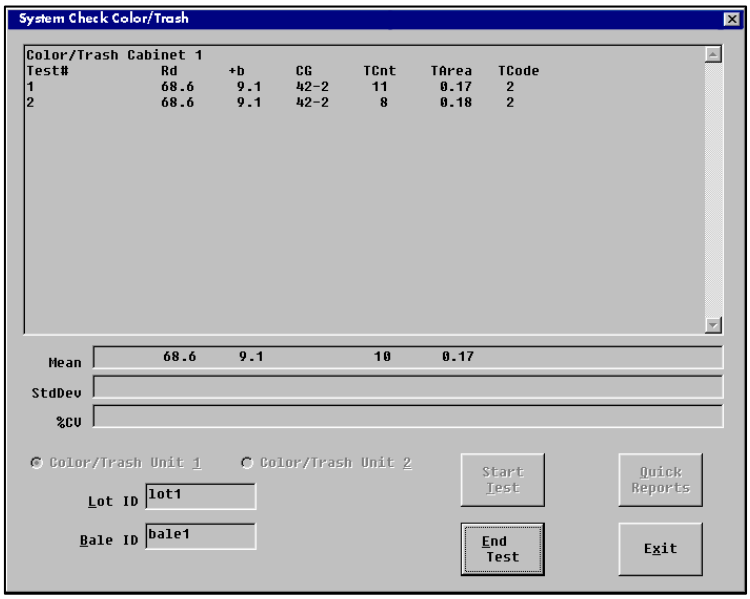

Figure 5-6: System Check Color/Trash Screen

2.3.2 Calibration Test

To begin testing:

1. Enter the **Lot ID** and **Bale ID** as shown in the figure above.
2. Select the **START TEST** button.
3. When you are finished, press the **END TEST** button.

Chapter 6 Configurations

1 Introduction

The *HVI SPECTRUM* is a versatile instrument, which can be configured to meet the testing needs of a variety of mills and gins. The CONFIGURATION screen is used to adjust various system settings as needed.

2 System Configuration Screen

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.

2. Next, select the **CONFIGURE** button.

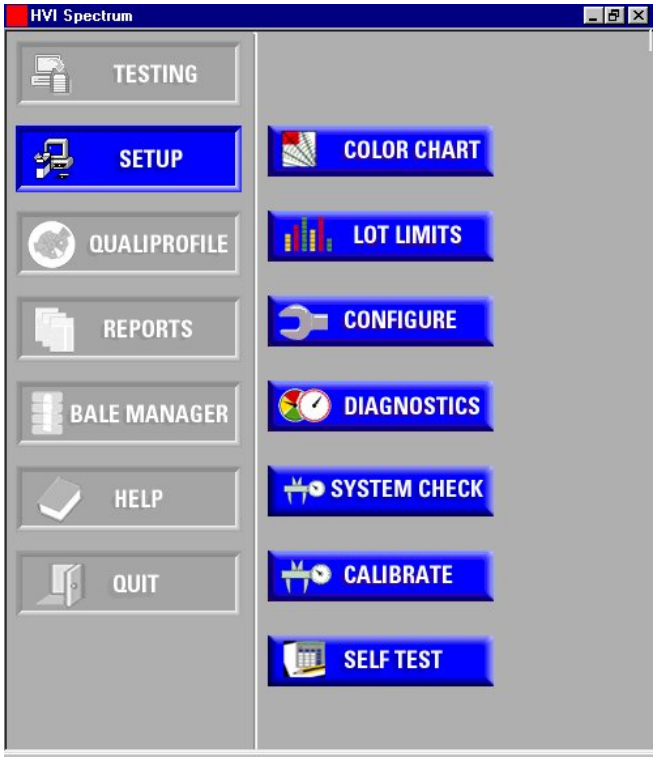

Figure 6-1: Main Menu - Setup

3. The SYSTEM CONFIGURATION screen will automatically appear. It contains six tabs that are used for various purposes.

2.1 Test Setup Tab

As the SYSTEM CONFIGURATION screen opens, the **TEST SETUP** tab is displayed. It has been chosen as the default tab because it is used more frequently than the remaining tabs.

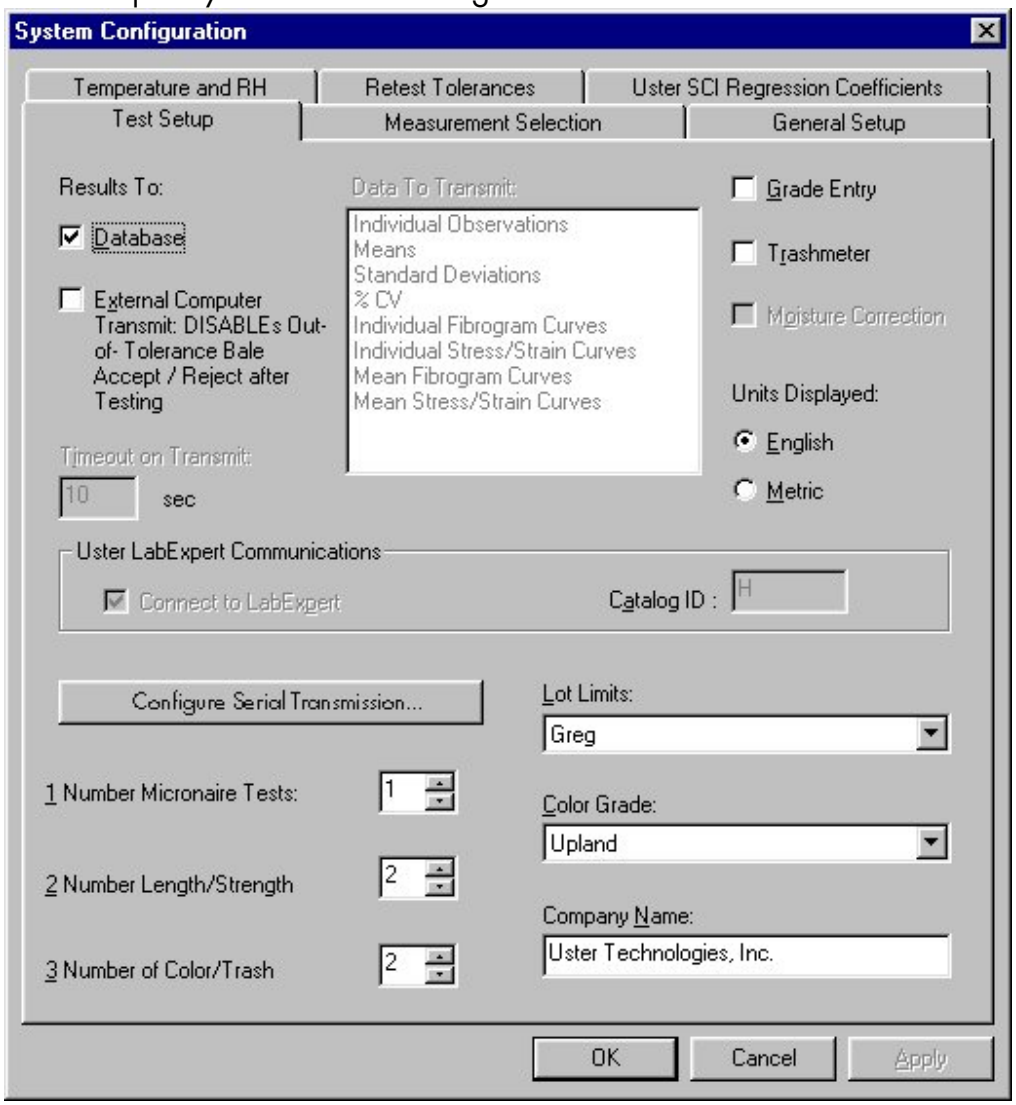

Figure 6-2: System Configuration – Test Setup Tab

The items that are enabled/disabled on this page reflect the general setup and measurement selection settings that have been applied to the system.

Note: *To enable/disable particular measurement types, use the* ***MEASUREMENT SELECTION*** *Tab* ***FIRST****.*

The TEST SETUP tab contains information that is crucial to test results.

The fields are explained as follows:

1. The **Database** and **External Computer Transmit** options are used to indicate where the data generated during the testing is to be sent. If you select to send the information to an external computer, you can choose specific information to be included using the **Data To Transmit** list.

   The Data To Transmit **Types** refer to the type of data the transmission to host will include, such as individual observations, means, standard deviations, and percent coefficient of variance (% CV).

   Various curves, such as the Universal Record Format (discussed in the Appendix chapter of this manual) may also be included in the transmission type.

2. The **Timeout on Transmit** field is used to set the amount of time (in seconds) that the computer will wait during the transmission of data and the acceptance response from the external computer. If an acceptance response is not received, a message will alert you to check the data connections, etc.

3. The **Configure Serial Transmission** option is specific for the External Computer connection.

4. The **Grade Entry** field is used to configure the system so that pre-defined grades for sample cottons can be manually entered in ASCII text format. This enables these grades to be compared with the grades generated by the *HVI SPECTRUM* during testing if necessary.

5. **Trashmeter** turns the trash meter off/on during testing. A Trashmeter Measurement is generally used whenever color/trash is measured. This function **SHOULD NOT BE TURNED OFF** unless the camera is not working properly.

6. The **Moisture Correction** field is used to turn **ON** the moisture correction calculations during the strength tests.

7. The fields used to indicate the number of tests to be performed for the micronaire, length/strength, and color/trash tests, are located at the bottom left of the dialog box beneath the **Configure Serial Transmission**.

8. The **Lot Limits** field contains a drop-down list, which is used to select a set of lot limits (default or user defined) to be applied to the test data. *(See Chapter 6 2.1.1 in this manual for additional information)*

9. The **Color Grade** drop-down list is used to select the color chart to determine where the test color parameters lie.

10. The **Units Displayed** field offers a choice between English or Metric units of measurement.

11. **Company Name** field is where you enter the name of your company. This name displays at the top of each report.

IMPORTANT:

When any of the tabs in System Configuration are used and selections are changed, you MUST remember to select the APPLY button at the bottom of each tab page. If this is not done before selecting another tab your changes WILL NOT be saved.

2.1.1 Lot Limits

The **Lot Limits** drop down box found on the **TEST SETUP** Tab *(Refer to Figure 6-2)* is used to establish a range of legitimate property values to be used during System Testing. The customer can define these ranges, as they will depend on the individual mill's requirements.

When a sample property is measured during system testing and it falls outside the valid Lot Limit, the system will produce a warning message. This will alert the operator that a sample is outside the defined ranges and is therefore not accepted by the database.

Note: *Lot limits are **not used** during module testing.*

The software is shipped with one set of Lot Limits named **Default** and a selection for **None**. The operator can establish multiple sets of lot limits for use with different cottons during system testing. As additional lot limits specifications are defined and named, they will be displayed in the lot limits drop down box.

Note: *The HVI SPECTRUM software allows up to twenty-two (22) sets of lot limits to be saved.*

To use a previously defined Lot Limit:

1. Select the lot limit name by using the arrow keys to highlight your selection from the **Lot Limits** drop down box.

2. Select the **APPLY** button.

3. If no lot limits are to be used, choose **NONE** from the **Lot Limits** drop down box.

2.1.2 Creating Lot Limits

Follow these steps to create new lot limits:

1. Select **SETUP** from the *HVI SPECTRUM* MAIN MENU.

2. Click on the **LOT LIMITS** button.

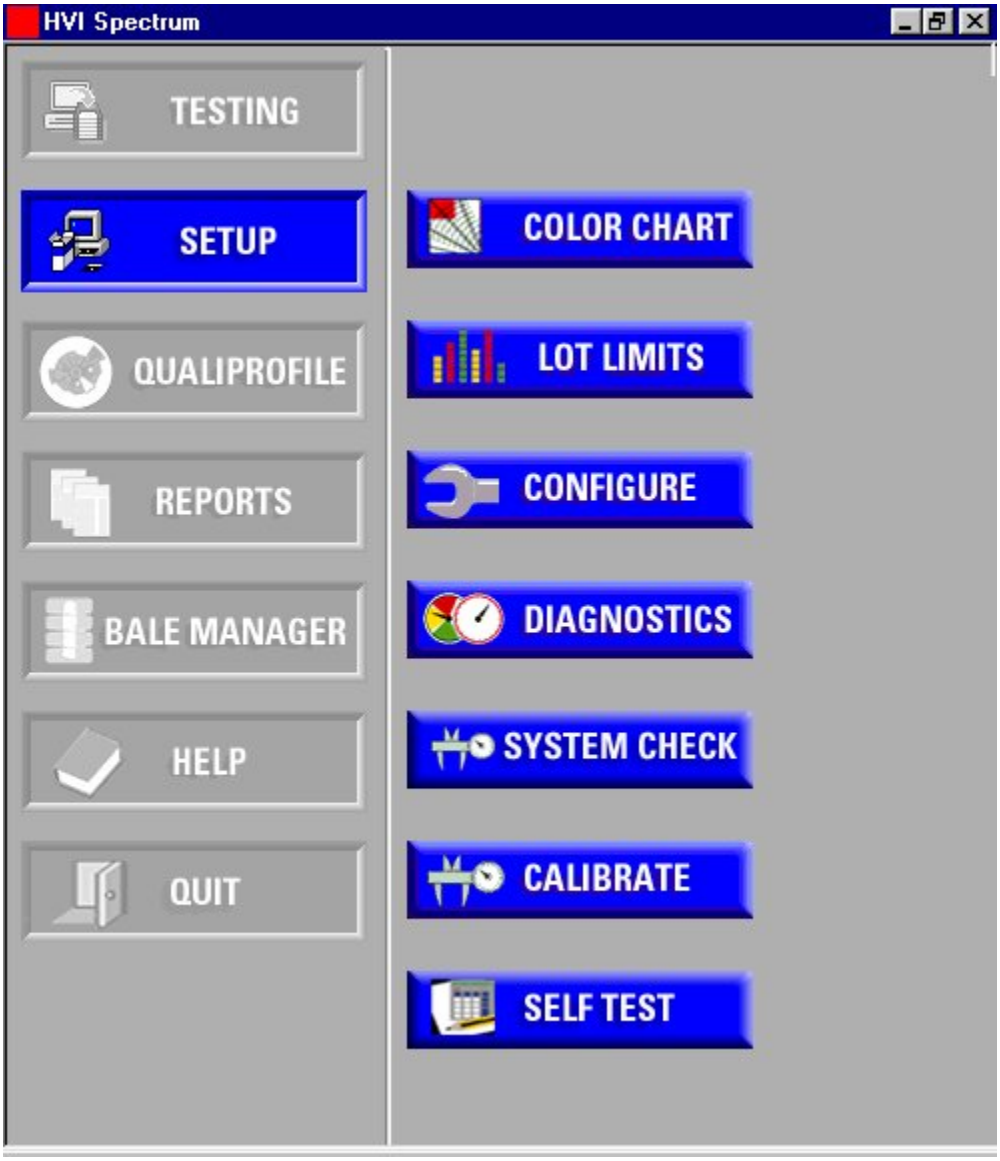

Figure 6-3: Main Menu - Setup

3. The following LOT LIMITS screen will appear:

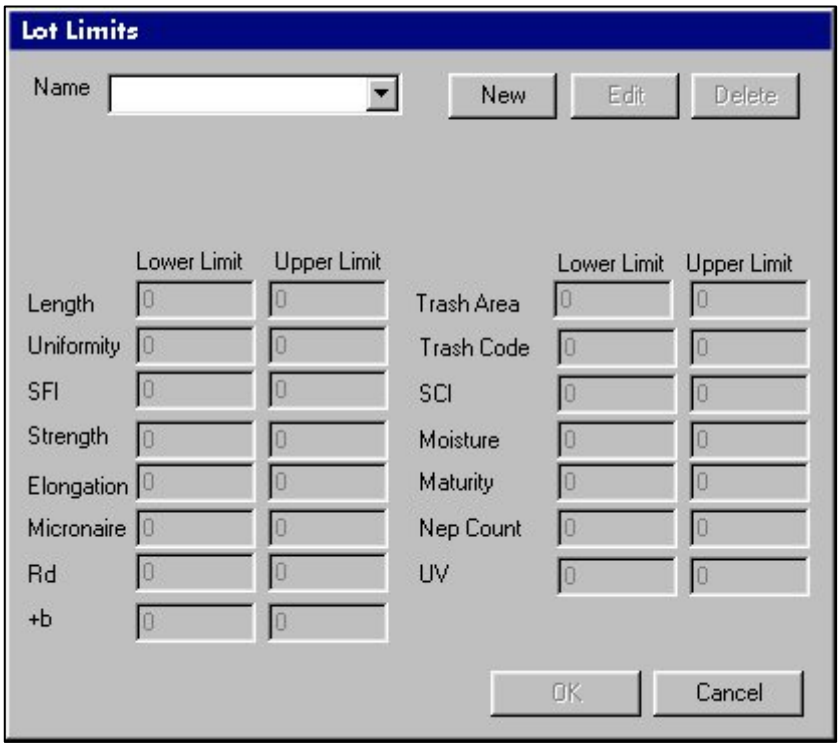

Figure 6-4: Lot Limits Screen

4. Select the **NEW** button, which is located to the right of the **Name** field.

5. Enter a name for the new lot limit and move the cursor to the first property you want to have a lot limit.

6. Insert the lower limit then press the **TAB** key on your keyboard and insert the upper limit.

7. Repeat this procedure for all the properties requiring lot limits.

8. Select **OK** when you are finished.

IMPORTANT: You cannot use an existing name when adding a new lot limit; THE NAME MUST BE UNIQUE. If you accidentally select an existing lot limit, an error message will appear.

Figure 6-5: Error Message - Lot Limit Name Already Exists

9. If a property does not require a lot limit, enter 0 (zero) as both the lower and upper limit. *(Refer to the figure below)*

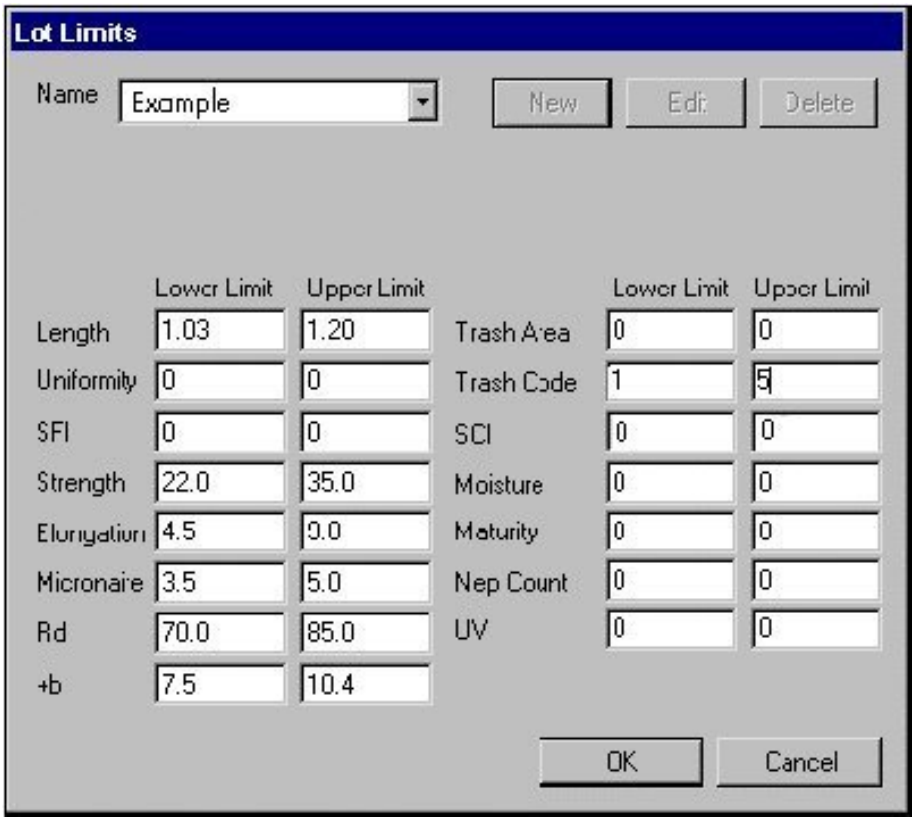

Figure 6-6: Lot Limits Screen – 0 Property

10. A NEW LOT LIMIT ADDED dialog box appears, select **OK**.

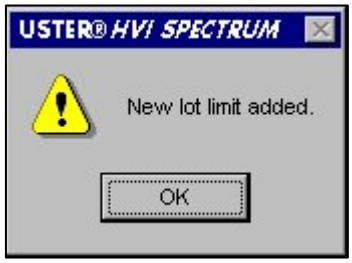

Figure 6-7: New Lot Limit Added

2.1.3 Edit Lot Limits

Follow these steps to edit lot limits:

1. Select the Lot Limit to be edited from the **"Name"** field drop down box on the LOT LIMITS screen.

2. Press the **EDIT** button.

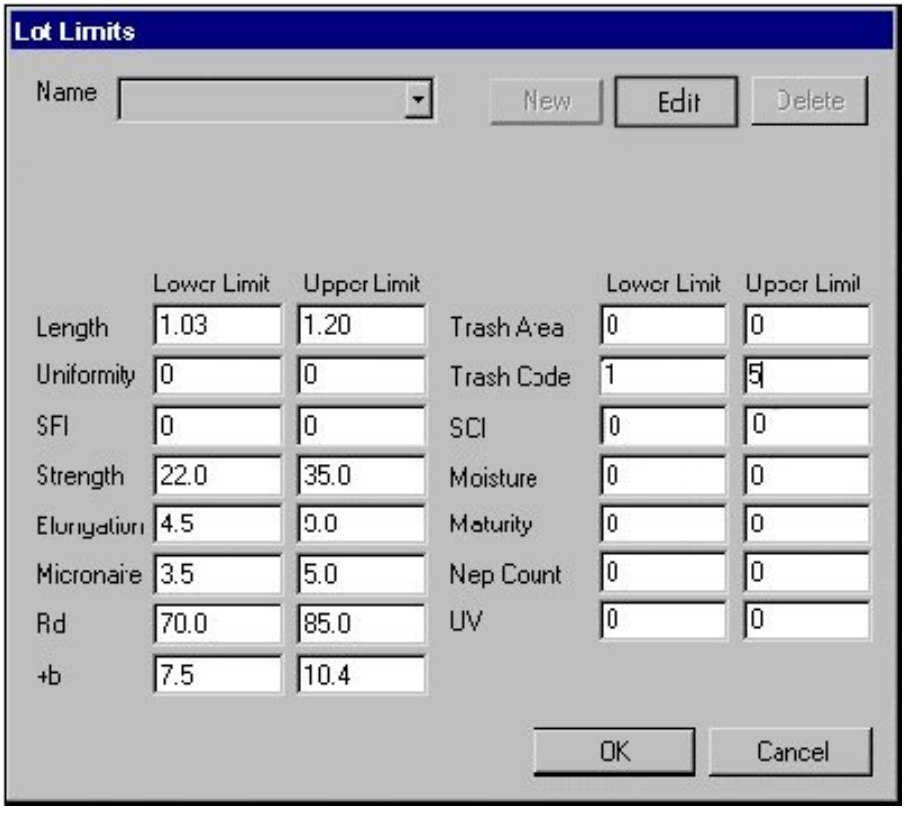

Figure 6-8: Lot Limits Screen – Edit

3. Edit or change the lot limit data.

4. Select the **OK** button located at the bottom of the screen when you are finished.

5. At the LOT LIMIT UPDATED prompt select **OK**.

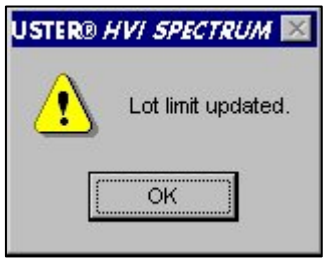

Figure 6-9: Lot limit updated

2.1.4 Delete Lot Limits

To delete a lot limit:

1. Select the lot limit to be deleted from the **Name** field drop down box on the LOT LIMITS screen.

2. Select the **DELETE** button.

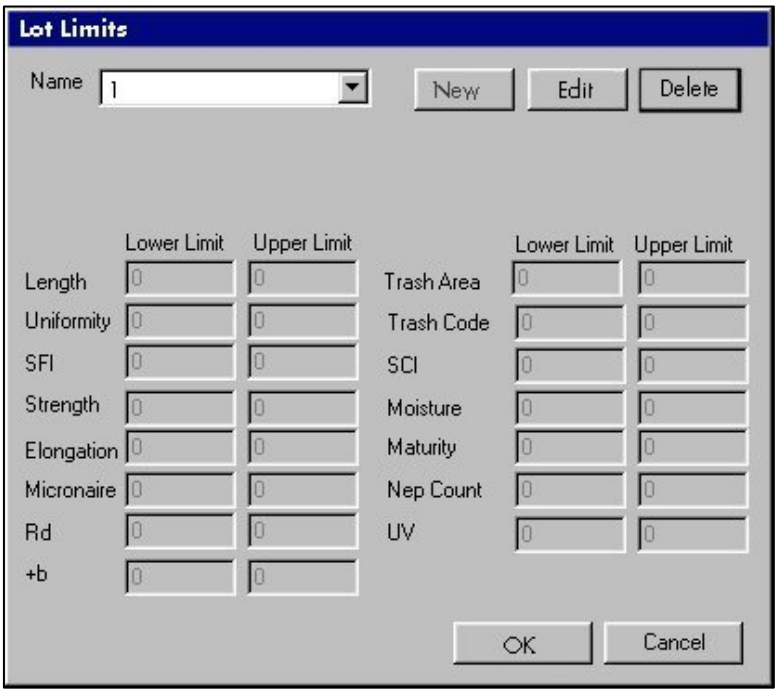

Figure 6-10: Lot Limits Screen - Delete

3. A warning dialog box, "DELETING LOT LIMIT 1. ARE YOU SURE?" is displayed.

Figure 6-11: "DELETING LOT LIMIT 1. ARE YOU SURE?"

4. Select **OK** if this is the correct lot limit to be deleted.

5. Select **CANCEL** if you wish to keep the selected lot limit.

2.2 Measurement Selection Tab

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.

2. Next, select the **CONFIGURE** button.

3. The SYSTEM CONFIGURATION screen will appear:

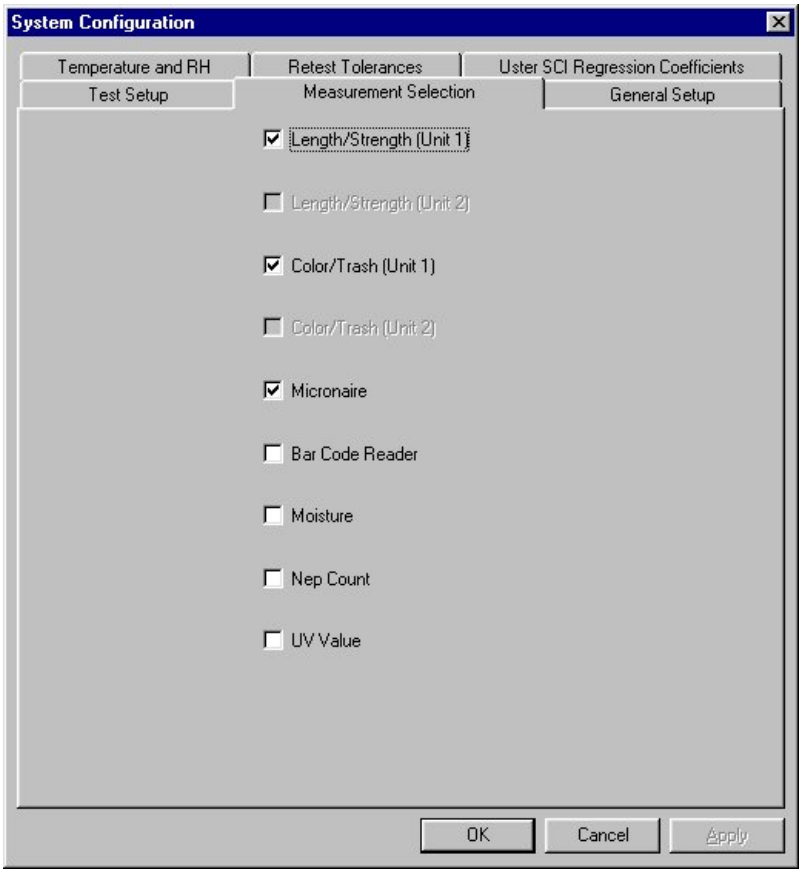

Figure 6-12: Measurement Selection Tab

4. The **MEASUREMENT SELECTION** tab is used to select the measurements that will be taken based on the type of *HVI SPECTRUM* system you have.

Note: *Items that are shaded out may not be available for use by the operator.*

5. Check or uncheck the box adjacent to the measurement type to change the settings.

6. Select the **APPLY** button when you have finished.
7. If you want to continue making changes to other configuration settings, choose another tab from the SYSTEM CONFIGURATION screen.
8. Press the **OK** button when you are finished.

2.3 General Setup Tab

1. Access the SYSTEM CONFIGURATION screen by selecting the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.

2. Next, select the **CONFIGURE** button.

3. The SYSTEM CONFIGURATION screen will appear:

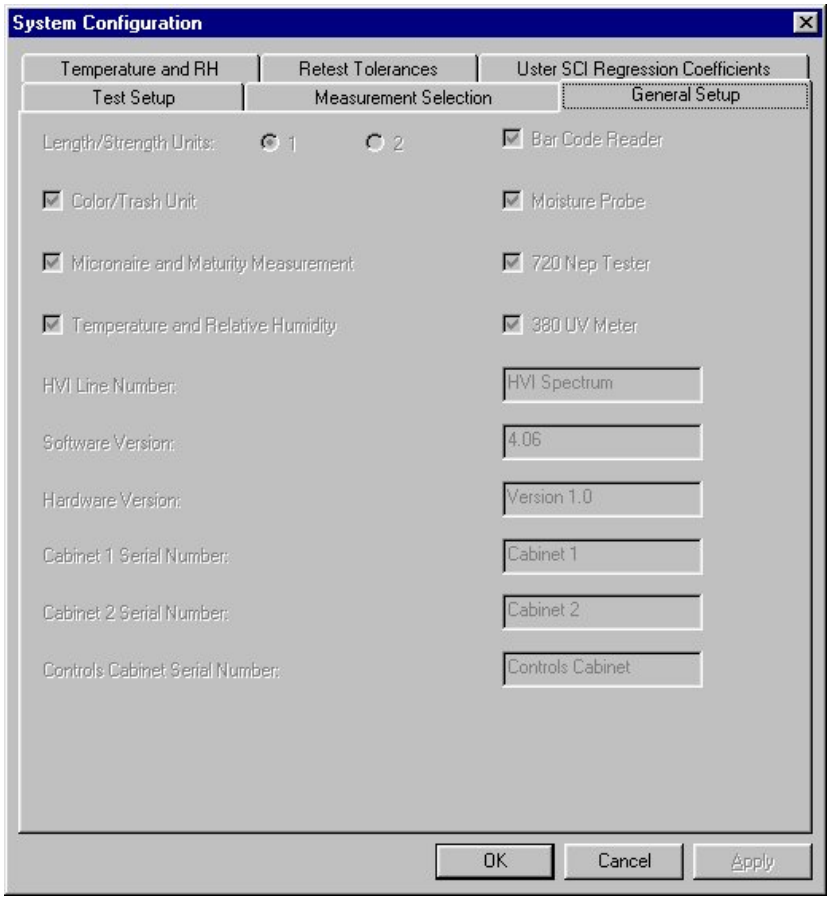

Figure 6-13: General Setup Tab

4. The information shown under the **GENERAL SETUP** tab is setup by an authorized Uster Technologies' service technician during initial installation.

Note: *Cabinet 1 and 2 are also referred to as Color head Unit 1 and 2 and are used on the HVI SPECTRUM II.*

2.4 Temperature and RH Tab

1. Access the SYSTEM CONFIGURATION screen by selecting the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.
2. Next, select the **CONFIGURE** button.
3. The SYSTEM CONFIGURATION screen will appear:

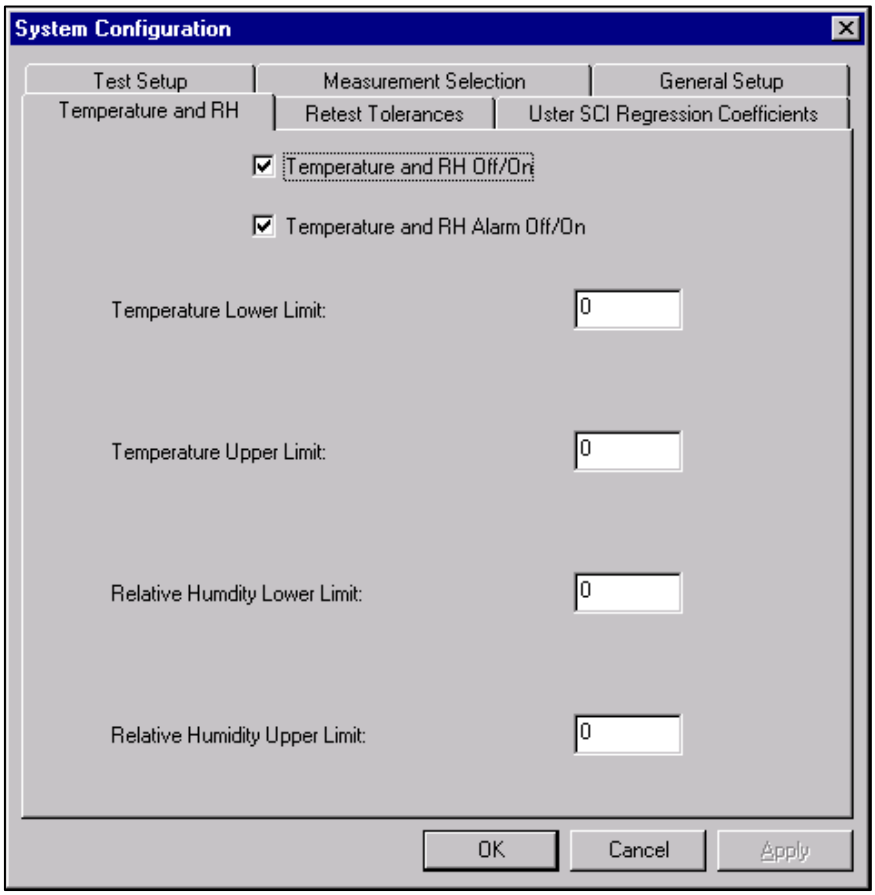

Figure 6-14: Screen Temperature and RH Tab

4. The **TEMPERATURE AND RH** tab is used to set the upper and lower limits for temperature and relative humidity. Selections to turn these features on/off are offered in addition to an alarm on/off selection.

Note: *The alarm for the Temperature and RH levels sounds when either of the high or low limits is reached.*

Follow the steps below to make changes to the system configuration under the TEMPERATURE AND RH tab:

1. Check or uncheck the box beside the **TEMPERATURE AND RH ALARM ON/OFF** to activate/deactivate the alarm. An unchecked (blank) box indicates the alarm is **OFF**.
2. Enter the upper and lower limits for Temperature and Relative Humidity in the appropriate fields.
3. When you are finished, select the **APPLY** button.
4. Select the **OK** button to save the changes and exit the screen.

2.5 Retest Tolerance Tab

1. Access the SYSTEM CONFIGURATION screen by selecting the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.
2. Next, select the **CONFIGURE** button.
3. The SYSTEM CONFIGURATION screen will appear:

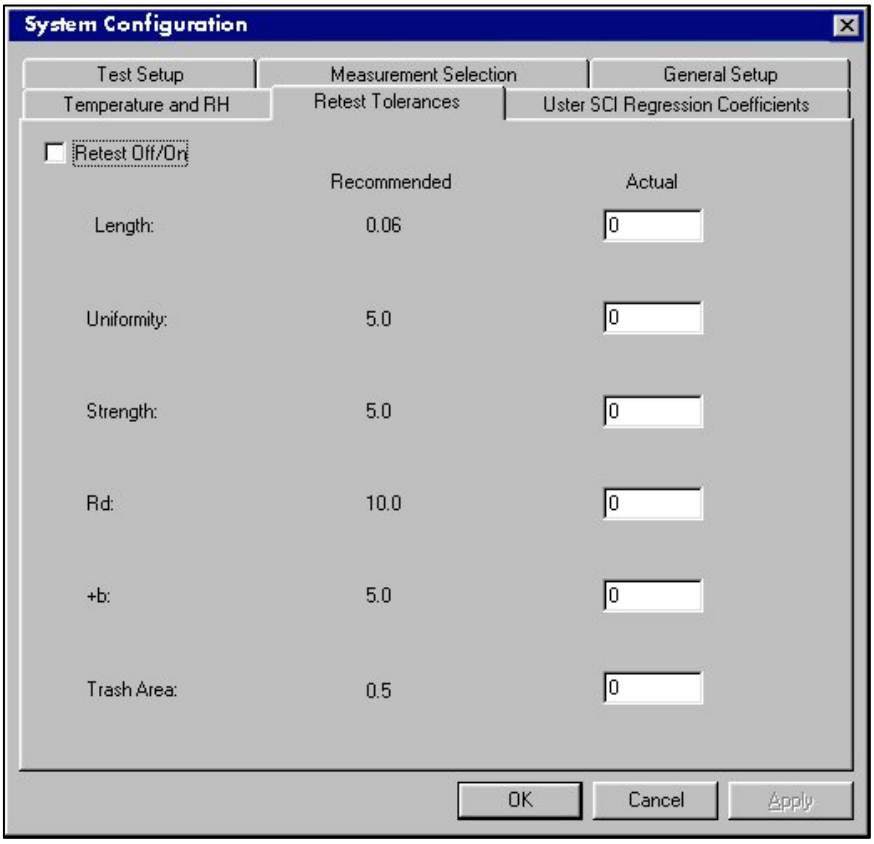

Figure 6-15: Reset Tolerances Tab

4. The **RETEST TOLERANCES** tab allows the range between the maximum and minimum values of a sample to be measured. If the difference between the test values is greater than the retest tolerance, the operator is notified by a warning message. The sample may be re-tested at this point. These tolerances are used to indicate a **two-sided bale**, which is a bale that may consist of two different lots of cotton (possibly from different growing areas).

Note: *This only applies if you run 2 or 4 tests per sample.*

5. To begin, click in the box located to the left of **Retest Off/On**.
6. Enter the actual retest tolerance amounts in each field and select the **APPLY** button to continue making changes to the System Configuration.
7. Select the **OK** button to save the changes and exit the screen.

2.6 USTER® SCI Regression Coefficients

The **USTER®** Spinning Consistency Index **(SCI)** is a calculated value based on multiple regression analyses that compare fiber properties to yarn properties. Each equation takes into account the *HVI SPECTRUM* properties and calculates one value to be used on each test sample.

The standard equation for SCI is based on many samples that contain a wide range of fiber properties such as yarn strength, appearance, elongation, neppiness, and spinning potential yarn numbers. For example:

Property	Range
Length	15/16 - 1 3/8 inches (23.8 - 34.9 mm)
Strength	18 - 36 grams/tex
Micronaire	2.8 - 5.8

Table 6–1: Standard Equation for SCI - Example

These ranges of fiber properties represent more than 90% of the cottons produced worldwide. This equation can be used on cottons produced in any growth area in the world. Several research institutes have done multiple regression analyses and have published results for their specific varieties of cotton. Currently, the following equation is used for SCI:

Uniformity Index (where UHML and ML in inches are used)
- 412.7 + 2.9 * Strength - 9.32 * Micronaire + 49.28 * Length + 4.80 * Uniformity + 0.65 * Rd

Table 6–2: SCI Equation

Inter-relationships exist among all cotton fiber properties. The SCI equation uses these similarities to analyze the effect groups of bale samples may have on yarn spinning consistency.

2.6.1 Changing the SCI Equation

The SCI equation may be modified for installations where no Rd color data is available. Follow the steps below to change the SCI Equation:

1. Estimate a typical average value for the Rd of your cotton.
2. Multiply that Rd value by 0.65 (i.e. 74.0 x 0.65 = 48.1).
3. Add the results to the -412.7 constant (i.e. -412.7 +48.1= -364.6).
4. Change the constant coefficient from -412.7 to -364.6.
5. Replace the Rd coefficient with zero.

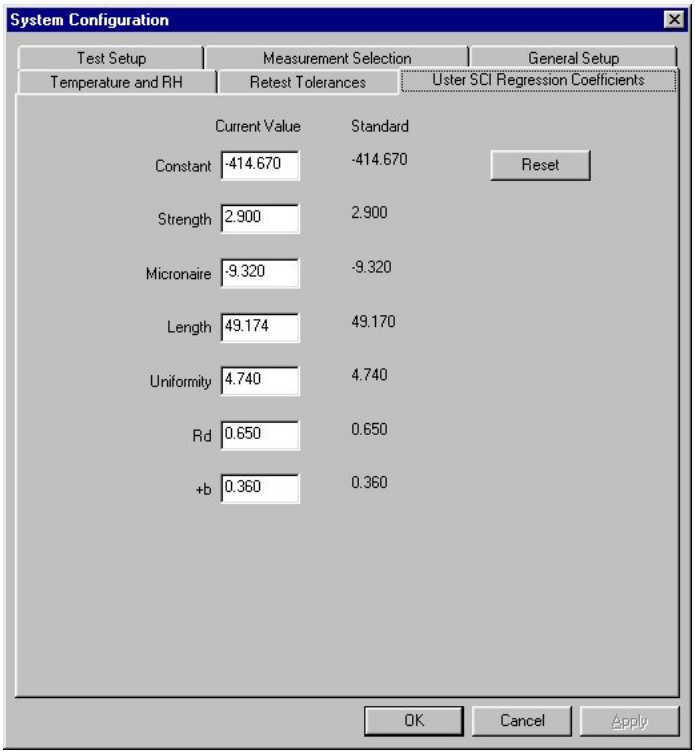

Figure 6-16: USTER® SCI Regression Coefficients Tab

6. Enter the **Actual** SCI Regression Coefficients amounts in each field.

7. Select the **APPLY** button to continue making changes to the system configuration.

8. Select the **OK** button to save the changes and exit the screen.

Chapter 7 Testing Procedures

1 Overview

The focus of this chapter is to instruct the operator on how to properly perform the fiber testing process using the *HVI SPECTRUM* instrument.

The *HVI SPECTRUM* is designed to allow a linear testing procedure that measures cotton's micronaire value, length/strength, color/trash content, maturity, and moisture content.

The *HVI SPECTRUM* can be purchased with a combination of components and software. Depending on this combination, you may have the *HVI SPECTRUM, HVI SPECTRUM I*, or *HVI SPECTRUM II*. Below is a breakdown of which instrument contains what components.

In addition to the listed components and software, optional items can be purchased for specific needs *(see Chapter 1 Overview for a list of the optional items).*

INSTRUMENT	COMPONENTS/SOFTWARE
HVI SPECTRUM	Length, Strength, Micronaire, Maturity, and Moisture Components; Reports, Bale Manager, and QualiProfile Software.
HVI SPECTRUM I	Length, Strength, Micronaire, Maturity, Moisture, Color, and Trash Components; Reports, Bale Manager, and QualiProfile Software.
HVI SPECTRUM II	Length, Strength, Micronaire, Maturity, Moisture, Color, and Trash Components; An Additional Sampling Station for Higher Volume Testing; Reports, Bale Manager, and QualiProfile Software.

Table 7–1: Instrument Components/Software

Note: *The information provided in this instruction manual was written using the HVI SPECTRUM I Instrument. However, it encompasses the procedures that are used to operate all configurations.*

2 Testing Sequence Quick Reference

The fiber testing sequence can be summarized as follows:

1. **Sample Identification**—The Lot ID and Bale ID for the sample are entered using the keyboard. If you have purchased the optional bar code reader, enter the Lot ID using the keyboard and enter Bale ID using the bar code reader.

2. **Micronaire**—The Micronaire value is used to calculate the corrected strength value. Therefore, it is necessary that the Micronaire test be completed following the steps below. It must also be **completed before performing the Length/Strength test**.
   a) Weigh the sample on the balance. Make sure that it weighs between 8.5 and 11.5 grams.
   b) Place the sample in the Micronaire chamber and close the door.
   c) The Micronaire test is performed and the sample is ejected.

3. **Length/Strength and Color/Trash (optional)**—These tests are performed simultaneously using two sample pieces from the bale.

IMPORTANT:
It is necessary to TURN ON the Vacuum Blower BEFORE initiating Length/Strength Testing. If the blower is off, testing will fail.

   a) Place one sample under the Length/Strength arm and the other sample under the Color/Trash arm.

b) Simultaneously, press down on each of the two buttons, which are located on the tabletop of the measuring components.

c) The sample hands will compress the samples to eliminate air pockets and the measurements will be taken. The sample hands will return to the original resting position when finished.

DO NOT REACH UNDER SAMPLE HANDS ONCE THE TESTING PROCESS HAS BEEN INITIATED!

4. Once all sample results have been calculated, they will be displayed in the appropriate fields on the *HVI SPECTRUM* TESTING screen. The results can then be sent to a printer and/or external computer (if configured to do so).

2.1 Step 1—Access the Main Testing Screen

- The *HVI SPECTRUM* MAIN MENU is automatically displayed as the software is initialized.

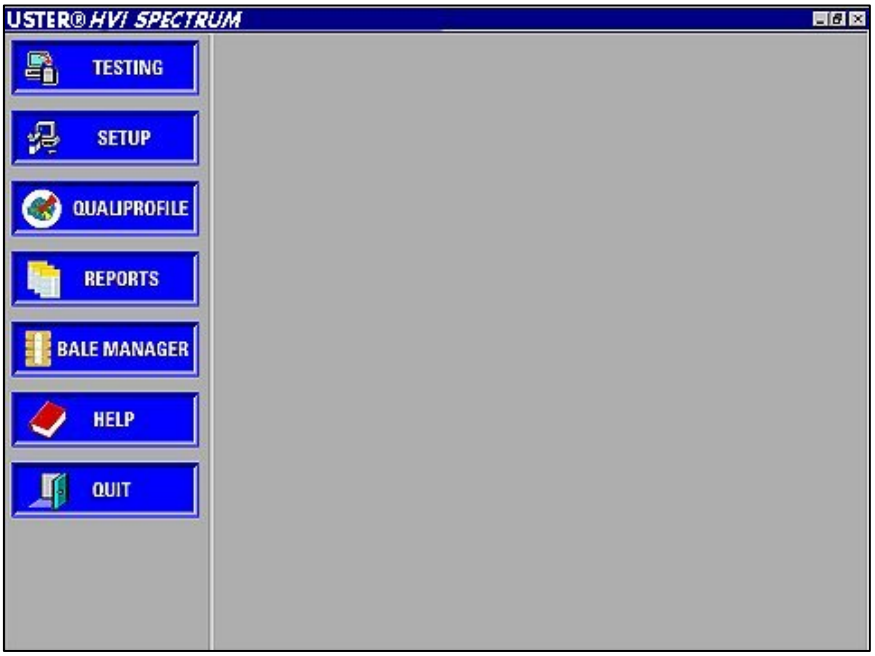

Figure 7-1: Main Menu

The **TESTING** button accesses all areas of the testing software.

Figure 7-2: Testing Button

- Begin testing by selecting the **TESTING** button on the *HVI SPECTRUM* MAIN MENU.

2.2 Step 2—Choose from Additional Selections

- Once Step 1 has been completed, the TESTING MODE SELECTION screen appears.

- This screen gives you a choice of **SYSTEM TESTING** and **MODULE TESTING** in addition to an **EXIT** button.

- Select the **SYSTEM TESTING** button.

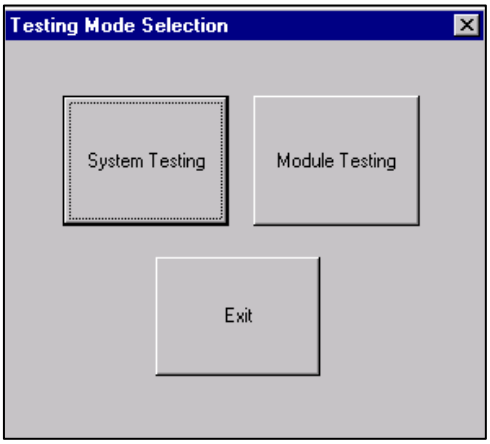

Figure 7-3: Testing Mode Selection Screen

2.3 Step 3—Operator Identification

Note: *When the HVI SPECTRUM software is initialized at the beginning of each shift or after a system shutdown, the identification number of the current testing operator must be entered.*

- The OPERATOR ID ENTRY DIALOG BOX opens.
- Enter your Operator Identification number.
- Select **OK** to continue. If you want to return to the *HVI SPECTRUM* MAIN MENU, select the **QUIT** button.

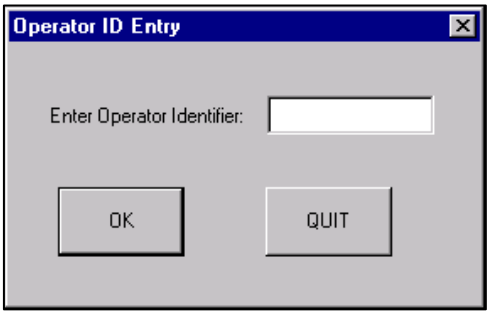

Figure 7-4: Operator ID Entry Dialog Box

2.4 Step 4—Identify the Sample

The *HVI SPECTRUM* MAIN TESTING screen is the primary screen used during the fiber testing process. It displays all measurements taken as they are being conducted.

- The *HVI SPECTRUM* MAIN TESTING screen will appear:

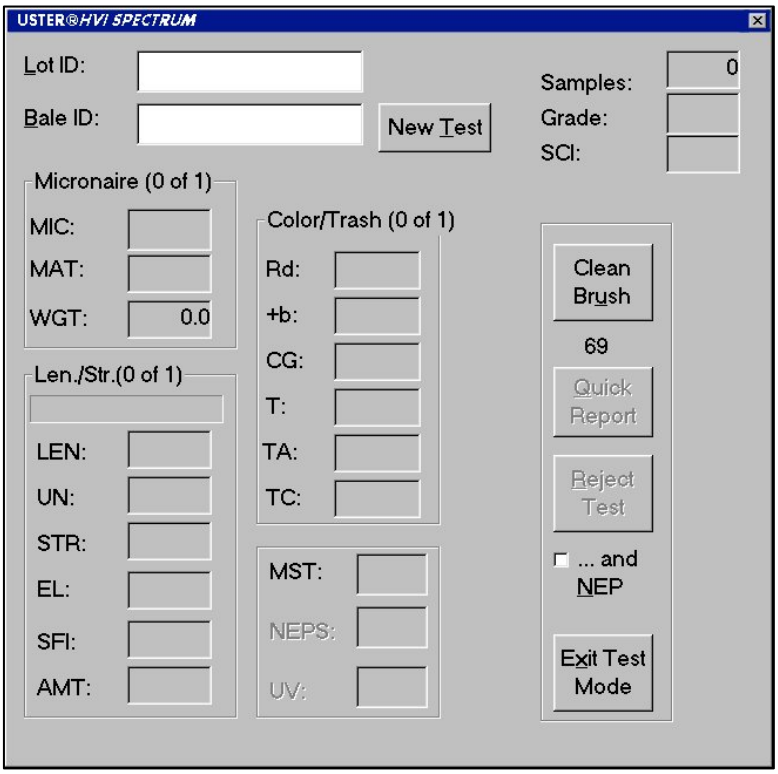

Figure 7-5: Testing Screen

Note: *Shaded items indicate either optional modules or items that have been set to the* ***OFF*** *position on the Test Setup screen. This screen is accessed by first selecting the* **SETUP** *button on the HVI SPECTRUM MAIN MENU and then the* ***CONFIGURE*** *button.*

- The **Lot ID** and **Bale ID** fields must be filled when testing a sample from a new lot or at the time of initial entry from the *HVI SPECTRUM* MAIN MENU to the *HVI SPECTRUM* TESTING screen.

Note: *Once Lot ID is entered; it is carried over when the next bale from the same lot is tested. When testing bales from a new lot,* ***you must re-enter*** *from the HVI SPECTRUM TESTING screen to change the Lot ID. The* ***Bale ID*** *field must also be modified each time a new sample is tested.*

Note: *If a bar code reader is used to enter the Bale ID, hold the bale tag with the code facing up. Slide the tag toward the reader until the beam is centered over the bar code on the tag. When the code has been read, the bar code reader will beep and the beam will shut* ***OFF****.*

2.5 Step 5—Perform the Micronaire Test

- Select the **NEW TEST** button.

The micronaire tests are performed next. Depending on the test setup parameters, they can include the micronaire test and the maturity index. The weight of the fiber is always taken.

The Micronaire measurement is used to calculate the values for Strength. Although the Micronaire measurement does not have to be completed before the Length/Strength and Color/Trash tests are run, it must be complete before the test results can be displayed on the *HVI SPECTRUM* Testing screen.

- Prior to placing the fiber on the balance, **make sure the panel reads "0.00"**. It may be necessary to tare the balance to get rid of any drift from zero that might occur. To do this, press the bar on the front of the balance.

Note: *The newer style balance has a* ***TARE*** *button instead of a bar.*

- Place the fiber on the balance. The sample must weigh between 8.5 and 11.5 grams for the micronaire test to be performed. Add or subtract fiber until the sample weight is within the acceptable limits.

- The sample weight is displayed on the balance display.

Note: *Allow the balance time to stabilize and make the correct reading before removing the fiber. The system will not accept the results until a stable reading is taken.*

- When the sample weight is within range, the weight is displayed in the **WGT** field on the *HVI SPECTRUM* TESTING screen.
- Insert the weighed sample into the micronaire chamber and close the lid. The micronaire test will begin automatically.
- The chamber lid will open once the test is completed and the sample is ejected from the chamber.
- The micronaire value will be displayed in the box for **MIC** in the **Micronaire** area.
- The maturity of the cotton will be displayed in the box for **MAT** after the length/strength measurement tests are complete.

Note: *Maturity Index is an optional setting.*

If the Micronaire value is outside the set limits:

- Select the **NEW TEST** button to accept the value and proceed with testing.
- To reject the value and perform another test sequence on the sample, press the **REJECT TEST** button and then press the **NEW TEST** button.
- Checking the **"...AND NEP"** box allows you to reject NEP data as well as other data.

Note: *If an error message appears repeatedly, it could indicate an air leakage in the micronaire chamber. In such a case, perform a micronaire calibration check to ensure that it is accurate. If necessary, contact an Uster Technologies' Service technician for further support.*

2.6 Step 6—Perform L/S and C/T (Optional Module) Tests

Once the micronaire tests are completed, follow the steps below to perform the length/strength and color/trash tests. **Remember to activate the Vacuum Blower or the test results will FAIL!**

- Place a piece of the sample on the length/strength plate. Make sure that the sample is large enough to cover the sample plate and thick enough that it isn't see through (approximately 30 grams).
- Place another sample on the color/trash window. Make sure that the sample is large enough to completely cover the entire window.
- Simultaneously, press down on each of the two buttons located on the tabletop in front of the measuring components.
- The sample hands will compress the cotton to eliminate air pockets and the measurements will be taken. The sample arms will return to the original resting position when testing finished.
- After the measurements are completed, the results are displayed under the **Length/Strength** area in the corresponding fields (elongation, uniformity, etc.). Each of the fields displays the test data to indicate that the test is finished.

The color/trash and micronaire tests can be performed in a different sequence than described here. However, keep in mind that **the Micronaire Value is required to calculate the Length/Strength and Fineness tests**.

- The trash test results are displayed in the **Color/Trash** area. These fields contain the color test results for % Rd (lightness) and +b (yellowness). The three-digit (xx.x) Rd number represents the average of the color observations for Rd, and the three-digit (xx.x) +b number is an average of the +b values.
    - **T: (Leaf** or **Trash Grade)** is a value that is based on trash area.
    - **TA: (Trash Area)** is the ratio of the total accumulated area of all the trash particles to the area of the viewing window of the instrument.

2.7 Exit from Testing

When you have finished testing the samples for the specified lot, exit the screen by following these steps:

- Select the **EXIT TEST MODE** button.

Attention: Be sure that you DO NOT exit System Testing until the test series for the last sample is completely finished. If you exit system testing by selecting *EXIT TEST MODE* too soon, you will lose the test results that have not been transmitted and will have to repeat all tests on that sample to regain the results.

2.8 Printing the Test Results

Test results can be viewed and printed at any time during testing by selecting the **QUICK REPORT** button on the *HVI SPECTRUM* TESTING screen. (See Chapter 9 Quick Reports for additional information)

3 Determining the Action when Cotton Fails to Meet Lot Limits

This section explains the options you have when a cotton sample fails to meet one or more of the Lot Limits selected.

1. When the MEASUREMENT OUT OF LOT LIMITS DIALOG BOX appears, you will have two (2) choices of action, **ACCEPT** or **RETEST**.

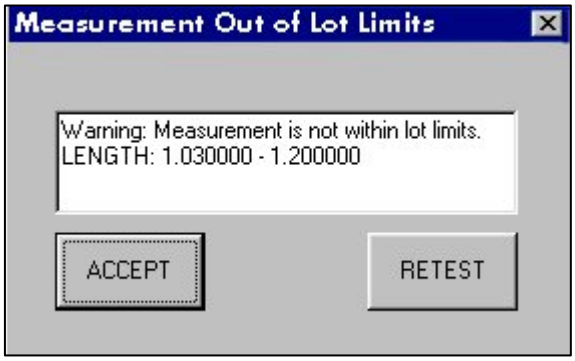

Figure 7-6: MEASUREMENT OUT OF LOT LIMITS DIALOG BOX

- **ACCEPT:** If you select the **ACCEPT** button, the data will be saved as accepted values. If a report of this information is printed, the data that was outside the lot limits will show in **BLUE** print.

- **RETEST:** If you select **RETEST** button, you will have to run another sample of the failed cotton sample. If the second test passes, the data will be saved as Accepted data. If the second test fails, the data will be saved as failed data.

Note: *You will have to select Accept or Retest for each parameter that is outside the lot limits.*

2. When all testing of a specific Lot Identifier is completed and you exit the SYSTEM TESTING screen, the BALES OUT OF TOLERANCE DIALOG BOX will appear:

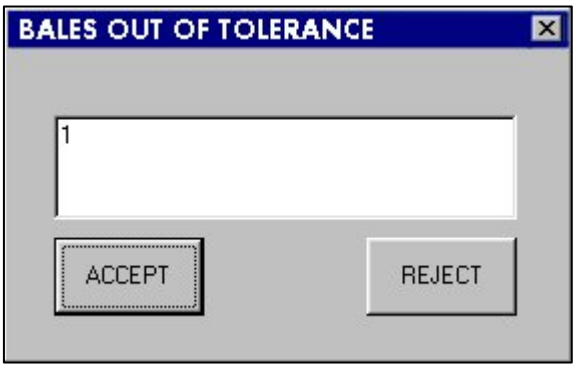

Figure 7-7: Bales Out of Tolerance Dialog Box

3. This dialog box shows you how many bales were out of tolerance. You will have the same two (2) options as to what to do with these test results.

   - **ACCEPT:** If you select the **ACCEPT** button, all the bales will be saved as accepted data. When you request a report of Accepted data, these bales will be included in the report. The out of tolerance data will be printed in **BLUE**.

   - **REJECT:** If you select **REJECT** button, the data will be sent to a file as rejected data. This information **will not be displayed** if you request a report of Accepted data.

Note: *If it is necessary to view the data for the rejected bales, you can design a report of rejected data in the Reports section of the software. (See Chapter 8, Reports, in this manual for additional information.)*

Chapter 8 Reports

1 Introduction

As the **USTER®** *HVI SPECTRUM* collects fiber test results, the information is summarized and stored in the database. It is from this database that Reports are generated.

The *HVI SPECTRUM* is designed so that these reports can be arranged and sorted to present specific information for review and interpretation. This chapter explains how to create categories for measurements of test data results, design and run reports and graphs, edit the database, and export selected data or test results to a specified location.

To access the REPORTS MENU screen, select the **REPORTS** button from the *HVI SPECTRUM* MAIN MENU.

Figure 8-1: Reports Button

- The REPORTS MENU screen will be displayed:

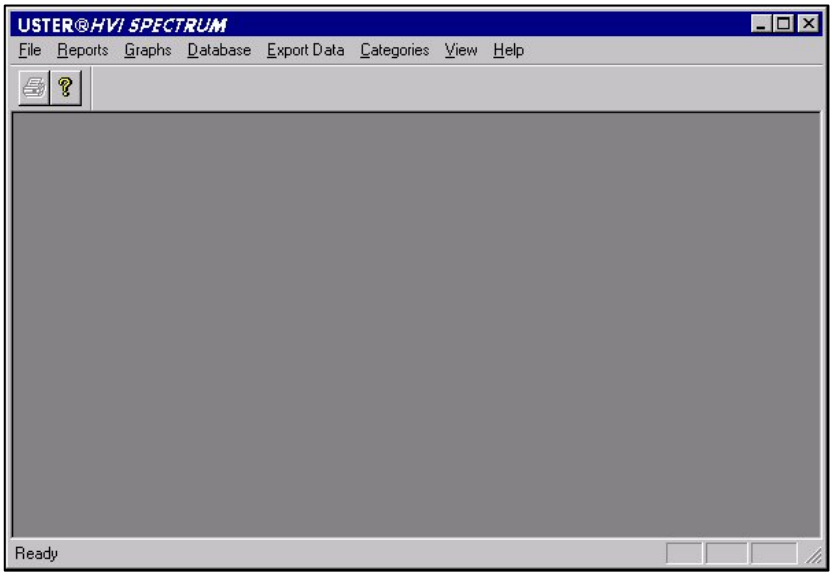

Figure 8-2: Reports Menu Screen

- The menu options on this screen are used to generate reports.

2 Categories

One method of analyzing data and warehousing cotton is by **Category**.

Note: *In depth instructions for categorizing fibers can be found in Chapter 14 .*

2.1 Creating Categories

1. Select the **REPORTS** button from the *HVI SPECTRUM* MAIN MENU.

Figure 8-3: MAIN MENU

2. When the REPORTS MENU screen is displayed, select **CATEGORIES** from the menu options.

Figure 8-4: Reports Screen Menu Options

3. The CATEGORIES screen is accessed at this time.

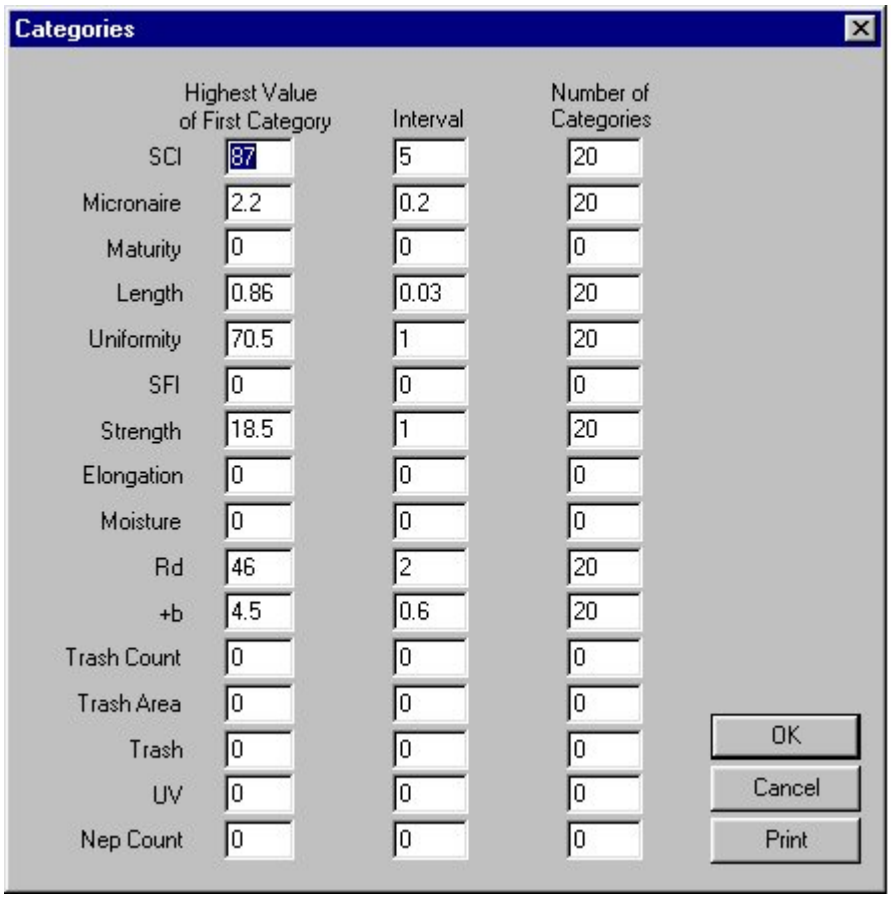

Figure 8-5: Categories Screen

2.2 Overview of the Category System

Each sample is placed into a category for each fiber property. The Category definitions require an estimate of the average value and range of each property for the samples that will be tested.

Note: *Use the same definitions for both the Reports and Bale Manager categories if you export the data to Bale Manager.*

It is important for yarn spinners to keep in mind that the number (quantity) of categories for each property should be kept to the minimum required to adequately cover inventory. This will also allow for small shifts the average inventory might make over a period of time.

Uster Technologies, Inc. pre-defines the categories at the time of initial installation using suggested settings. If this pre-set definition does not correctly represent your inventory, it is important that you make the necessary adjustments.

Once these categories are accurate, the definitions should not be changed unless the bales physically remaining in the warehouse are changed accordingly. A change in the Category Definition screen will cause the histograms review to be incorrect.

Note: *Give careful consideration to the categories as they are defined.*

2.3 Changing the Pre-Defined Categories

When the categories are defined, the highest value of the first category is the starting point at which the intervals between the categories are added. The operator must determine what that interval will be and how many categories are necessary to cover the range of measured fiber properties. Cotton is categorized based on where the property's measured value falls within the established categories.

The CATEGORIES screen (refer to Figure 8-5) is divided into three major columns that are used to determine the category range of each measurement taken by the *HVI SPECTRUM* system. These are Highest Value of First Category, Interval, and Number of Categories.

- **Highest Value of First Category**—This is the value at which the fiber property's first category should end. All samples that have a measured value at or below this value will be included in this category.

- **Interval**—This is the range or width between categories. The Data Manager uses intervals to determine where each category begins and ends. Sample test results are assigned to categories according to where they fit in the categories.

Intervals between categories differ according to the fiber property. If the intervals are small, an excessive number of categories might be created. Having large intervals between the categories for yarn spinners may not allow good control of the variation within a mix or between mixes.

- **Number of Categories**—Each fiber property can have up to 10 categories. In order for yarn spinners to keep warehousing as simple as possible, the number of categories should be limited to the smallest number reasonable for the range of cotton in inventory.

    - Enter the numbers in the appropriate columns according to your specific needs. When finished, select the **OK** button to save the information.

Reports and graphs can now be designed in order to meet particular requirements and tests.

3 Designing/Deleting/Modifying Reports

3.1 Type and Format of Test Data

When deciding how your reports will be designed (i.e. what information will be presented on each), consider the character spaces the data may require.

Example:

Reports generated by category require fewer character spaces; therefore, more properties can be selected. Reports, generated by category and value, require more character spaces; therefore, they could be divided into separate parts and two reports can be generated.

The following is a list of the abbreviations used in the header for the fiber properties:

Abbreviation	Grade
SCI	Spinning Consistency Index
Mic	Micronaire
Mat	Maturity Index
Len	Length
Unf	Length Uniformity
SFI	Short Fiber Index
Str	Strength
Elg	Elongation
Mst	Moisture
Rd	Rd
+b	+b
Color	Color Grade

Table 8–1: Fiber Property Abbreviations - Table 1

Abbreviation	Grade
Tr Cnt	Trash Count
Tr Area	Trash Area
Tr Grade	Trash Grade
L Grade	Leaf Grade
Nep	Nep Count
UV	UV Value
Temp	Temperature
RH	Relative Humidity

Table 8–2: Fiber Property Abbreviations - Table 2

3.2 Designing a New Report

The *HVI SPECTRUM* is designed to be flexible with the type and format of the test data that is presented. The **REPORTS** selection located on the *HVI SPECTRUM* MAIN MENU accesses REPORT screens that are used to design, delete, and modify reports.

1. First, select the **REPORTS** button from the *HVI SPECTRUM* MAIN MENU.

2. The REPORTS MENU screen will appear. Select **REPORTS** from the menu options.

3. Select the **DESIGN** item from the pull-down menu. This brings you to the REPORT DESIGN screen shown below:

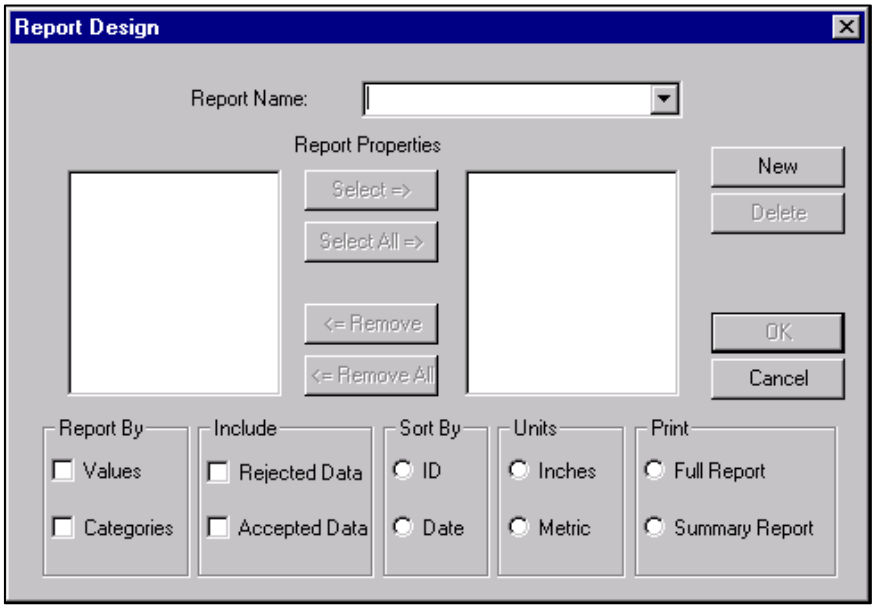

Figure 8-6: Report Design Screen

4. Once you have considered the design, select the **NEW** button on the REPORT DESIGN screen to begin creating the report.

5. Position the cursor in the **Report Name** field. Replace the words **New Report** with the name of the report you are creating. This name will appear in the report selection list on the RUN A REPORT screen and will become the actual title of the report.

6. The information that appears on the report is determined by the report properties chosen. A list containing all the available fiber properties is displayed in a window.

   - To select the report properties, simply highlight the property in the left-hand side column in the window and choose the **SELECT** button. The item will be displayed in the right side column.

   - Repeat this process until all properties that are to be included in the report are listed in the right side column. If you want all of the listed properties to appear in your report, you can select them all at the same time by choosing the **SELECT ALL** button. Likewise, you can de-select items in the right-hand list by choosing the **REMOVE** or **REMOVE ALL** buttons.

7. Once you have selected the properties, you can further define the report as described below.

Reports can be displayed or printed in three different ways:

Value — The test values from the *HVI SPECTRUM* are reported for samples in each identifier for the properties selected.

Categories — The test values are assigned to a category according to the category definitions. The assigned category is printed on the report.

Values and **Categories** — Both the test values and the assigned category number are displayed/printed.

These options are found on the lower part of the REPORT DESIGN screen (Refer to Figure 8-6 or to the figure below which shows the lower section of the screen).

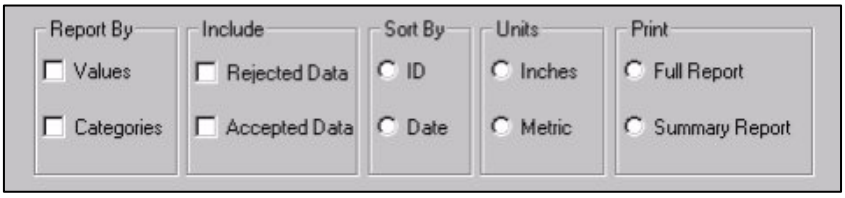

Figure 8-7: Report Design Screen – Lower Section

When the report is generated, it can include:

Accepted Data — Only tests that are acceptable according to the lot limit specification at test time will be included in the report.

Rejected Data — Only tests that are rejected according to the lot limit specification at test time will be included in the report.

Accepted and **Rejected Data** — All tests are included in the report, whether or not they were accepted or rejected according to the lot limit specification.

Accepted and rejected tests are determined by the lot limits as they were at the time of testing. Out-of-limit values are also shown in **BLUE** and rejected properties are shown in **BOLD** on an on-screen report. Rejected properties are shown in **BLUE** on a printed report.

- A report can be sorted in ascending value by the ID numbers of the samples or chronologically by the date of data generation.
- Data can be displayed in either **Inches** or **Metric** Units.
- You can choose to print a **Full Report** or a **Summary Report**.

3.3 Modifying/Deleting a Report

Once a report has been created, it can be modified or deleted as needed.

- Select the name of the report from the drop down list on the REPORT DESIGN screen. *(Refer to Figure 8-6)*

- To modify a report, select and remove the report properties by using the same steps that are outlined in the Design Report section. The settings at the bottom of the screen can also be modified to reflect changing needs. Once the report has been modified, save the changes by selecting the **OK** button.

- To delete a report, select the name from the drop down list and press the **DELETE** button. Select **OK** when the confirmation box appears to delete the report.

3.4 Generating a Report

1. Select **REPORTS** from the *HVI SPECTRUM* MAIN MENU.

2. The REPORTS MENU launches.

3. To run a report, select the **REPORTS** item from the menu options.

4. Select the **RUN** item from the drop-down menu.

5. The RUN A REPORT screen appears.

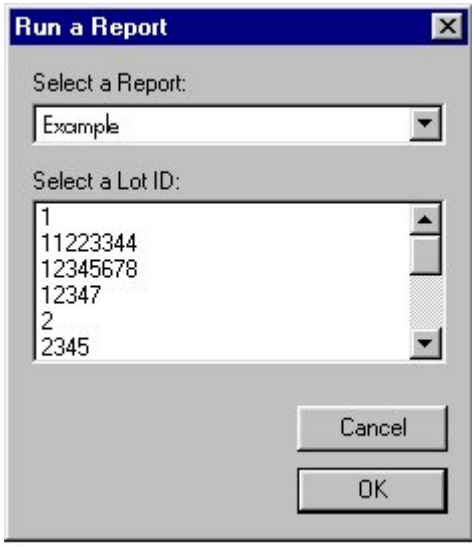

Figure 8-8: Run a report Screen

6. Reports are generated based on the report name and the Lot ID.

7. Enter the name of the report that you want to run (it must be entered exactly as it appears on the list) or select it from the pull-down list in the **Select a Report** field.

8. Next, scroll down in the window to select from the desired lot number(s) in the **Select a Lot ID** field.

9. Once you have selected the information to be generated, press the **OK** button.

10. The report will be displayed on the screen.

11. If desired, the report may be printed by selecting the **PRINT** option on the toolbar or by choosing **PRINT** from the **FILE** menu.

3.5 Graphs

As stated previously, the *HVI SPECTRUM* is designed to be flexible with the type and format of the test data that are presented. Therefore, in addition to providing a means of creating reports, the *HVI SPECTRUM* also provides a means to create graphs.

The **REPORTS** option, located on the *HVI SPECTRUM* MAIN MENU, accesses the REPORTS MENU screen. Menu options give access to graph screens that are used to design, delete, and modify graphs.

3.6 Creating a New Graph

1. To access the GRAPH DESIGN screen, first select the **GRAPHS** menu item from the REPORTS MENU screen and then select the **DESIGN** item.

Figure 8-9: Reports Screen Menu options

2. The *HVI SPECTRUM* offers two graphs for charting fiber-testing data. They are the **Histogram** and the **Color Chart**.

   - A **Histogram** is a bar chart that is broken down by categories for a chosen property on the x-axis and the bale count on the y-axis.

   - A **Color Chart** shows the Rd versus the +b in a scatter plot that corresponds with the operator-configured color chart.

3. Begin to create a new graph by selecting the **NEW** button on the GRAPH DESIGN screen.

4. Type the name of the new graph in the **Graph Name** field. Press **TAB** or **ENTER** to move the cursor to the next field or position it in the next field using the touch pad.

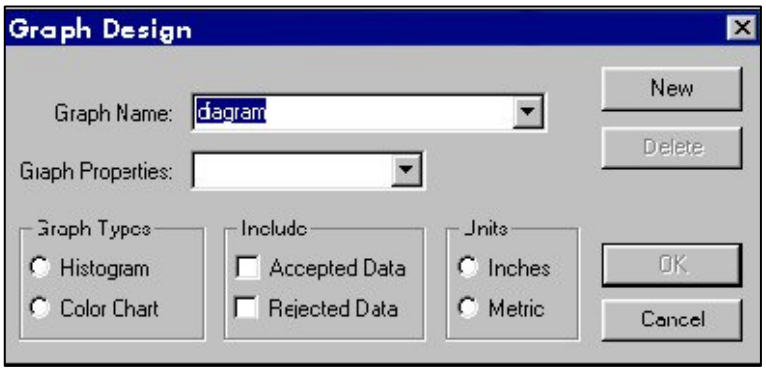

Figure 8-10: Graph Design Screen

Note: *The graph name will also be the title of the graph.*

5. If you are creating a Histogram, select the appropriate property from the pull-down list in the **Graph Properties** field. (This field is shaded out when creating a color chart because it doesn't apply.)

6. Select the type of graph you are creating by clicking in the circle for either **Histogram** or **Color Chart** in the **Graph Types** area.

7. If you are creating a histogram or a color chart, select to include **Accepted Data**, **Rejected Data**, or both by placing a check mark in the appropriate box/boxes.

8. Choose to display the data in either **Inches** or **Metric** in the **Units** area following the same manner as above.

9. Once you have selected the appropriate type of graph and include all information, select the **OK** button to save the new graph.

3.7 Deleting a Graph

Once a graph has been created, it can be deleted as needed.

1. Select the name of the graph from the drop down list on the GRAPH DESIGN screen.

2. Select the **DELETE** button.

3. Press **OK** when the confirmation box appears.

4. The graph will no longer be listed in the pull-down menu.

3.8 Generating a Graph

1. First, select the **REPORTS** button from the *HVI SPECTRUM* MAIN MENU.

2. The REPORTS MENU screen will appear. Select **GRAPHS** from the menu options.

3. To generate a graph, select the **RUN** item. The RUN A GRAPH screen will appear:

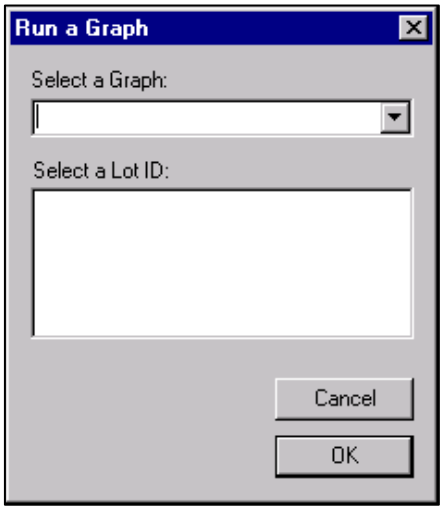

Figure 8-11: Run a Graph

4. Enter the name of the graph that you want to run by typing the name (it must be entered exactly as it appears on the list) or by selecting it from the pull-down list in the **Select a Graph** field.

5. Enter the Lot Number under **Select a Lot ID**.

6. Once you have selected the information to be generated, select the **OK** button.

7. The graph will display on the screen.

8. Print the graph, if desired, by selecting the **PRINT** option on the REPORTS screen toolbar or by choosing **FILE, PRINT**.

3.9 Exporting Data

Data generated by the *HVI SPECTRUM* unit can be exported in several formats to a variety of destinations.

- To access the EXPORT DATA screen, select the **EXPORT DATA** menu option from the REPORTS MENU screen options.

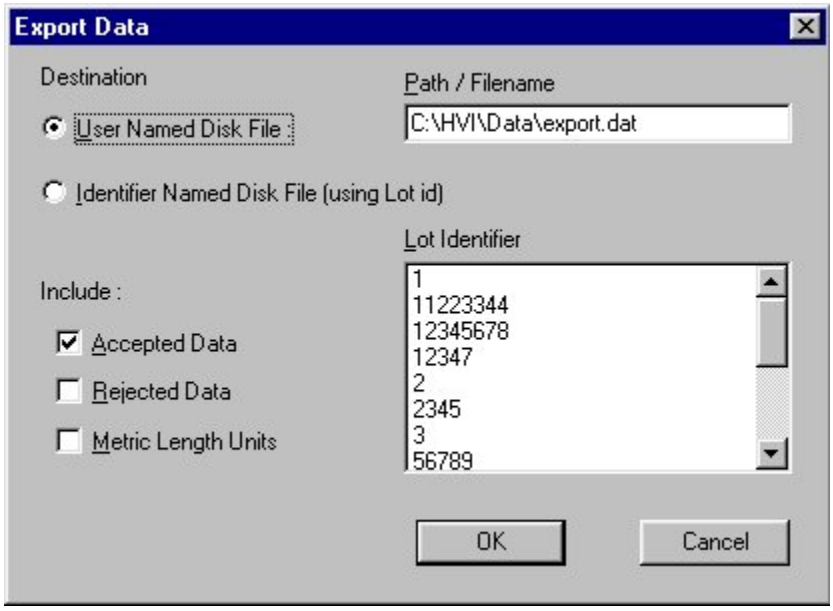

Figure 8-12: Export Data Screen

3.9.1 Export Data Type

The type of test data to be exported can consist of the following:

1. **Accepted Data** — Only tests that are acceptable according to the lot limit specification at test time will be exported.

2. **Rejected Data** — Only tests that are rejected according to the lot limit specification at test time will be exported.

3. **Metric Length Units** — Exports data in metric length units regardless of whether or not metric was specified in Configuration.

3.9.2 Export Options

Export Options include:

- **User Named Disk File** — Enter the path (if required) and file name in the field located to the right of this option (i.e. data to be stored in a file named EXPORT.DAT and written to a floppy disk in the A:\ drive would be entered as **A:\EXPORT.DAT**).

- **Identifier Named Disk File** — Data for each selected identifier will be exported to a separate file. The filename(s) will be the same as the identifier name(s). Enter the path in the field located to the right of this option.

1. Select the desired destination by checking the button beside either **User Named Disk File** or **Identifier Names Disk File**.

2. Choose which type of data you want to export by checking **Accepted Data**, **Rejected Data**, or both.

3. **Metric Length Units** – allows you to export data in metric units even if this was not specified in configuration.

4. Select the **Lot ID** for the file that is to be exported from the **Lot Identifier** area.

5. Press the **OK** button to finish.

3.10 Using the *HVI SPECTRUM* Database

As information is collected during testing, it is stored in the database. This information can be deleted by lot number or by record number by using the screens accessed by the **DATABASE** option found on the REPORTS MENU options.

> **IMPORTANT!**
>
> **ONCE YOU DELETE INFORMATION - IT CANNOT BE RETRIEVED.**

3.10.1 Delete All Data for a Specific Lot

This selection provides a mode for deleting all data for a particular lot at one time.

1. Select the **REPORTS** option from the *HVI SPECTRUM* MAIN MENU.
2. Select **DATABASE** from the REPORTS MENU *(or from the Database selection on the toolbar).*
3. Select the **DELETE LOT** item from the **DATABASE** menu. The DELETE LOT MENU will appear:

Figure 8-13: Delete Lot Menu

4. Select the **Lot ID** from the pull-down list or enter it in the **Select Lot Identifier** field.

5. Next, select the **OK** button to delete the records from the database.

6. A confirmation dialog box will appear:

Figure 8-14: Deleting Dialog Box

7. Select the **OK** button.

3.11 Delete Multiple Records for a Lot

This selection provides a mode for deleting records for multiple bales at one time.

1. Select **REPORTS** from the MAIN MENU.

2. Select **DATABASE** from the menu options on the REPORTS MENU.

3. Select the **DELETE RECORD** item from the menu. The DELETE RECORDS screen will be displayed:

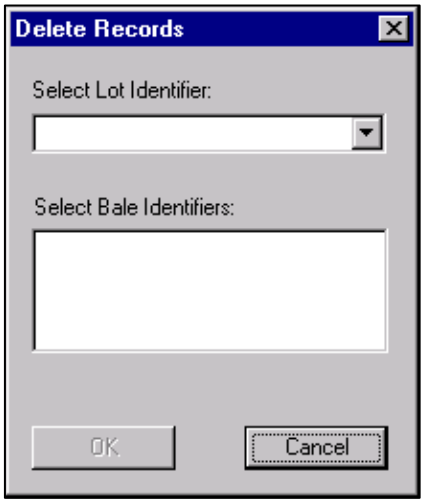

Figure 8-15: Delete Records Screen

4. Enter the identifier for the lot containing the bale records to be deleted in the **Select Lot Identifier** field.

5. Select the specific Bale ID(s) from the pull-down list under **Select Bale Identifier**.

6. Select the **OK** button to remove the records from the database.

Chapter 9 Quick Reports

1 Introduction

Test results can be viewed and/or printed at any time **during testing** by selecting the **QUICK REPORT** button on an *HVI SPECTRUM* TESTING screen or MODULE TESTING screen.

The data associated with each completed test in addition to the average and standard deviation (if enough data is present) is displayed.

1. While you are in a testing mode, click on the **QUICK REPORT** button to access the SELECT QUICK REPORT screen.

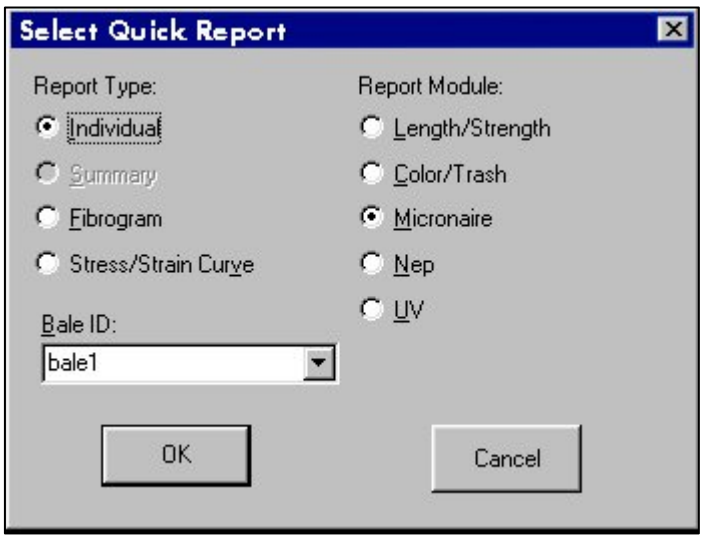

Figure 9-1: Select Quick Report Screen - Individual

2. Click on the radio button to the left of the type of report you want to print (or view) from the **Report Type** area on the screen.

3. Make a selection in the **Report Module** area by clicking on the radio button to the left of the report module type. In the screen above, micronaire has been selected.

4. Enter the Bale ID or highlight it from the pull down list in the **Bale ID** field.

5. Press **OK** when you are finished.

Note: *When accessed from Micronaire Module Testing,* ***INDIVIDUAL REPORT TYPE*** *is automatically selected when the* SELECT QUICK REPORT *screen is accessed. The* ***SUMMARY*** *report type is disabled. (Refer to figure 9-1.) When basic components are used, Summary shows as the default. (Refer to figure 9-3.)*

6. The figure below depicts the SELECT QUICK REPORT screen, but shows the **Summary** checked instead of **Individual** in the **"Report Type"** area.

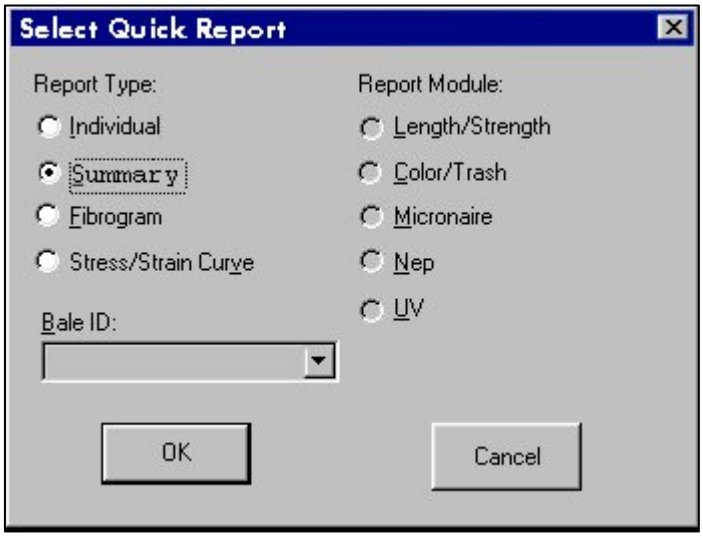

Figure 9-2: Select Quick Report Screen - Summary

7. A report is generated when the **OK** button is pressed.

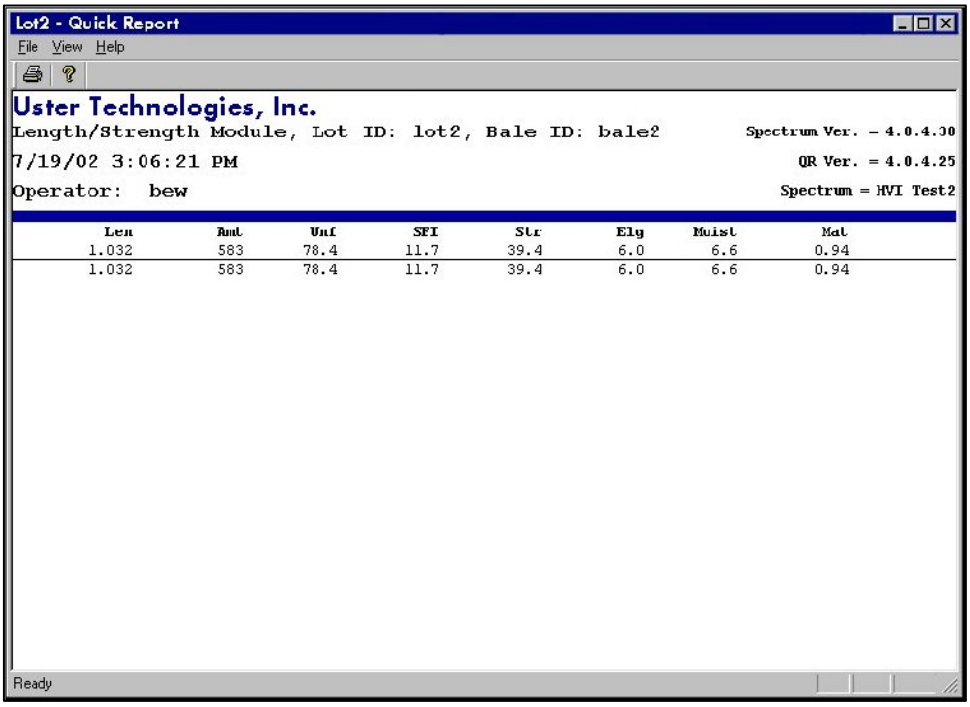

Figure 9-3: Quick Report Example

8. To print the report showing the results of all tests performed under the current Lot Identification number (since the last report was generated); select the **PRINTER** icon.

Chapter 10 Bale Manager

1 Overview

Bale Manager is used to guide decisions on fiber procurement, facilitate warehousing, control short and long term variation within and between mixes, predict spinning performance, and prepare reports for review. Data files containing test results generated by the *HVI SPECTRUM* are imported and assigned to categories. Mixes from these categories are selected and data regarding these mixes is stored.

The record-keeping functions of Bale Manager are used to manipulate inventory items, issue purchase orders, monitor shipments, and review past mixes. Bale Manager can also track cost-per-bale and cost-per-mix information to aid in the purchase of future inventory by providing the history of previous inventories.

The Bale Manager software is similar to the QualiProfile software n that it accompanies the *HVI SPECTRUM's* software to provide a complete testing, analyzing, and managing system.

2 Accessing Bale Manager

1. Select **BALE MANAGER** from the *HVI SPECTRUM* MAIN MENU.

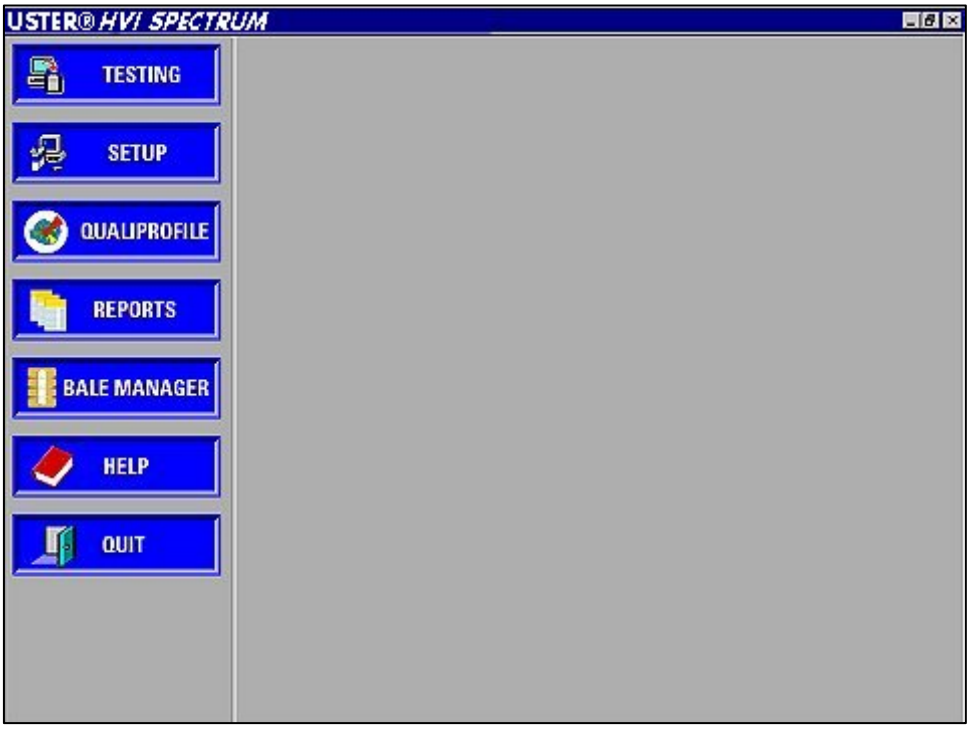

Figure 10-1: Main Menu

2. The BALE MANAGER MAIN MENU (shown below) will appear:

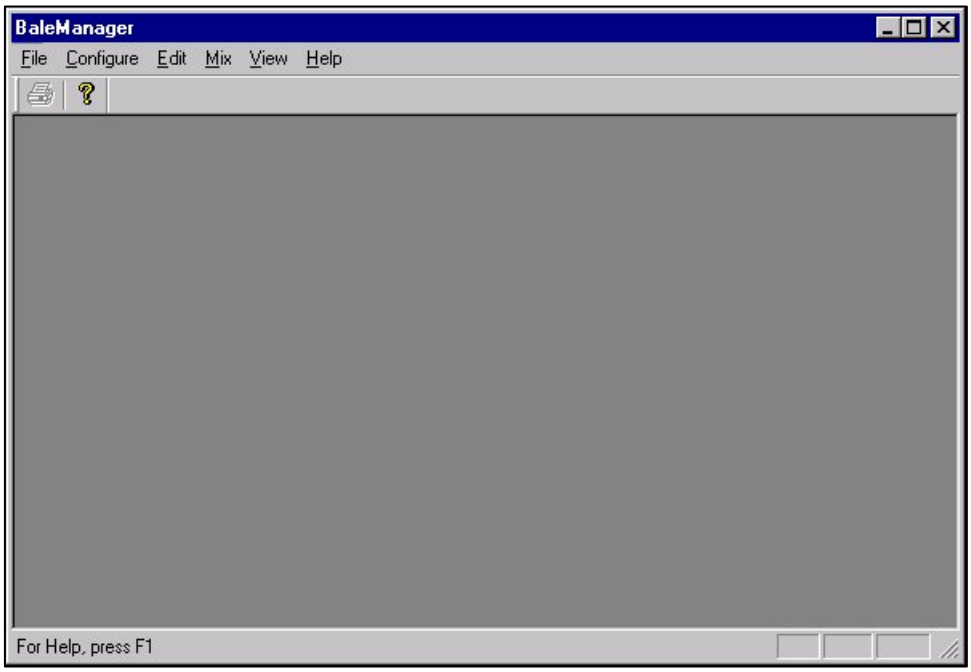

Figure 10-2: Bale Manager Main Menu

3. Six main menu options, **FILE**, **CONFIGURE**, **EDIT**, **MIX**, **VIEW**, and **HELP**, access the various functions of the Bale Manager software.

3 Main Functions

The primary function of each of these menu items is described in the table shown below:

Button Name	Functions
FILE	Used to import data from the default path or a:\ drive, as well as exit the Bale Manager software.
CONFIGURE	Used to configure the system as well as define categories, growth areas, mix criteria, and SCI calculation settings.
EDIT	Used to edit bale data in the database, delete data for identifiers, growth areas, and mix histories, as well as change a growth area for a particular Lot ID.
MIX	Used to make a new mix, work with an active mix, or preview or accept a mix.
VIEW	Used to view inventory, mix history, mix history details, histograms, and mix history trends.
HELP	Displays an About Bale Manager screen.

Table 10–1: Menu Functions

3.1 File

The **FILE** menu is used to import data into the database and to exit the Bale Manager software.

3.1.1 Data Import

The DATA IMPORT screen is used to import data from an outside source. To access this screen follow the steps below:

1. Select **FILE** from the BALE MANAGER MAIN MENU.
2. Next, select the **IMPORT** item. The DATA IMPORT screen is displayed at this time:

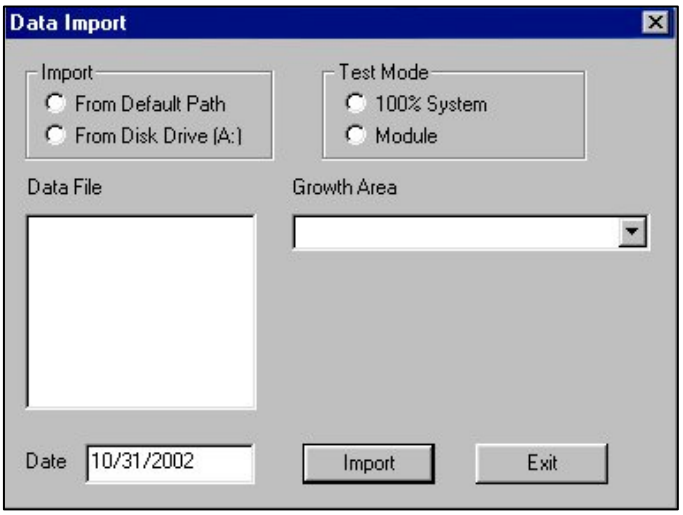

Figure 10-3: Data Import Screen

To import an item:

1. Select the correct location from where the data will be imported by checking beside either **From Default Path** or **From Disk Drive [A:]** in the **Import** area.
2. Next, indicate the Test Mode that will be used.
   - **100% System** should be selected when all bales in the inventory are individually tested. The bale data is imported as it occurs, but nothing is computed.
   - **Module** testing should be selected when only a fraction (typically 10%) of the bales in the inventory are actually tested.

When using the **MODULE** Test Mode, a screen will appear showing the mean, standard deviation, and the percent coefficient of variance (%CV) of various properties (length, strength, Rd, +b, elongation, uniformity, etc.). If these values are correct, you can choose to accept the data and these averaged values will be applied to the lot.

Once this is done, select the starting Bale ID number and the number of bales that are to be included in the lot.

The system will automatically number the bales and store them in the database with the average values that were accepted.

3. Select the **Growth Area** where the lot originated from the pull-down list.

Note: *Growth areas are added and deleted using the Define Category screen.*

4. Select those files that are to be imported as "*filename.*dat". Multiple files may be imported by selecting multiple entries. The specific Lot ID number will usually be the *filename*.

The Data File item is used to import data from previous versions of *DATA MANAGER* and *HVI SPECTRUM*.

5. Select the data source from the drop down list in the **Data File** area or leave the default entry, which will be the current version of the *HVI SPECTRUM*.

6. Verify the date of when the data was generated (this also defaults to the current date). If needed, enter another date.

7. When all information has been accurately entered, select the **IMPORT** button to begin importing the data.

8. The data will be imported from the specified location.

9. In the event that the data has already been imported into the database, the following dialog box will appear:

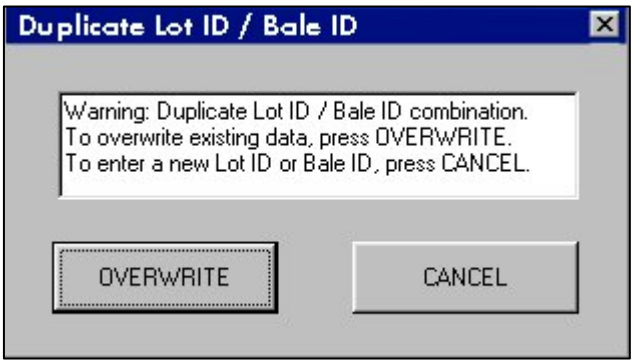

Figure 10-4: Bale Manager – Duplicate Data Detected

10. To abort the import attempt, select **CANCEL.**

11. Select **OVERWRITE** to overwrite a single record.

12. Once the data has been imported, the STATUS DIALOG will appear:

Figure 10-5: Status Dialog

13. Press the **OK** button.

3.1.2 Exit

To exit Bale Manager:

- Select the **EXIT** item from the **FILE** menu on the BALE MANAGER MAIN MENU or click on the ☒ located in the top right corner of the screen.

3.2 Configure

The **CONFIGURE** item found in the menu options on the BALE MANAGER MAIN MENU is used to access the following screens:

- System Status
- Categories
- Growth Areas
- Mix Criteria
- SCI Calculation

Each of these screens is explained in this chapter.

3.2.1 System Status

The SYSTEM STATUS screen is used to configure the system settings.

- Access the SYSTEM STATUS screen by selecting the **CONFIGURE** menu item from the BALE MANAGER MAIN MENU. Select **SYSTEM**.

- The **Database** field is used to define the location and name of the data file used by the Bale Manager.

- For Bale Manager applications installed on an *HVI SPECTRUM* machines, this will be fixed to the data file for the *HVI SPECTRUM*. On stand-alone installations this can be any path.

- The **Import Data Path** field is used to indicate the path where test data will be imported and stored. Data can be imported from the default path set here or it can be imported from the disk drive (A:). This selection is made using the DATA IMPORT screen *(discussed in Section 3.1.1)*.

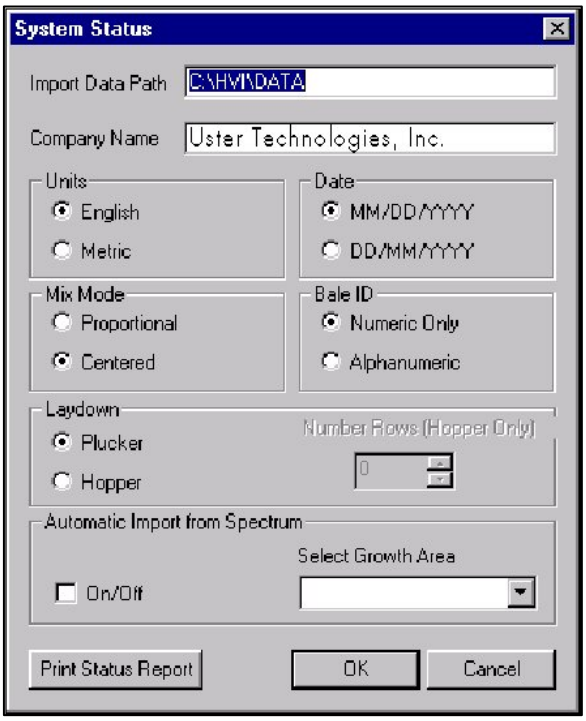

Figure 10-6: System Status Screen

- The **Company Name** field is used to indicate the name of the company that has purchased the *HVI SPECTRUM*.

Note: *This name will appear on various screens and reports throughout the system.*

- Select either English or Metric in the **Units** field, which is used to indicate the units of measure.

Note: *All length measurements are stored in the database in inches and are converted as needed when the data is presented.*

- In the **Date** field, choose the format in which you want the date presented.

- Next, choose from either proportional or centered mixes in the **Mix Mode** field. This determines how bales are selected from the warehouse.

    - "Proportional" mixes are pulled proportionally to the distribution of all bales in each category in the warehouse. This means that all bales in the warehouse are being considered for the selection process. This is necessary to ensure that all bales will be used at some point in time, avoiding left over bales.

    - "Centered" mixes are used in applications where special yarn qualities are needed. These mixes make a bale selection with a specified mix average that may be different from the warehouse average.

For example: In a specific application for strong yarn, stronger cotton is needed in the mix/laydown. Stronger cotton can then be selected with a "centered" mix to meet the specified strength average for that mix. The program will pull an evenly distributed mix to achieve that average, however excluding the lower strength categories in the warehouse.

IMPORANT!

It is recommended to use "proportional" mix selection for the majority of operations, ensuring all bales in each category will be used equally.

- The **Bale ID** selection is used to indicate the format of the ID values that are automatically generated by the system. Choose either **numeric only** or **alphanumeric** in this field.

- Next, indicate your selection in the **Laydown** field. This selection is used to indicate the type of bale opening equipment used in the plant.

    - **Plucker** is an automated system, whereas **Hopper** is manual. If **Hopper** is selected, then the number of hoppers in a row must be entered in the adjacent field.

Note: *The Automatic Import from HVI SPECTRUM can be turned off/on as needed. If no data is being imported via the import utility, this feature should be disabled. If data is being imported, click inside the* ***On/Off*** *field to turn on the auto import feature.*

- Select the growth area from the pull-down list in the adjacent field.

Note: *If desired, you can select the* ***PRINT STATUS REPORT*** *button to print a status report showing the current system settings. The report will print to the default printer.*

- Enter the appropriate settings for the *HVI SPECTRUM* according to your needs and select the **OK** button to save the settings.

4 Defining Categories

4.1 How the Category System Works

In the category system, each bale is placed into a category for each fiber property. The category definition for each fiber property consists of the number of categories, the ending point of the first category, and the interval between the categories. The category definitions require an estimate of the average value and range of each property for the bales in your inventory. Instructions to determine category definitions are explained in the following sections.

4.2 Number of Categories

It is important to keep in mind that the number of categories for each property should be kept to the minimum required to adequately cover your inventory and to allow for the small shifts the average inventory might make over a period of time.

Note: *A maximum of 20 categories for each fiber property can be entered in the* ***Number of Categories*** *field.*

4.3 Why Category Definitions Should Remain the Same

A change in category definition will cause the inventory to be incorrect if the physical storage of the bales in the warehouse is not changed at the same time. Therefore, careful consideration should be given to the categories as they are defined because the consequences of making changes in category definition are so great.

4.4 Defining Categories—Initial Definition

When initially defining the categories for inventory analysis, first estimate the average value and range of each measured property for the bales in inventory.

- Use the values below to initiate histograms for each fiber property according to the procedures outlined in this section. Most actual inventories cover a much smaller range.

Note: *When beginning, all categories should be set to "20".*

Initial Values Chart	Highest Value of 1st	Interval Between	First Category Number	Number of Categories
Length (inch)	0.86	0.03	1	20
Length (mm)	21.8	0.8	1	20
Uniformity (index)	70.5	1.00	1	20
Strength	18.5	1.00	1	20
Micronaire	2.2	0.20	1	20
Rd	46.0	2.00	1	20
+b	4.5	0.60	1	20
SCI	87	5.00	1	20
Short Fiber Index	2.0	2.0	1	20
Elongation	1.0	1.0	1	20
Trash Count	5	5	1	20

Table 10–2: Example Values for Fiber Property Histograms

Note: *These are **NOT** the recommended category definition values. Use these values only in the very beginning in order to study the distributions of each measured fiber property.*

- Once you have determined what the values are that should be entered for the Category Definitions to reflect your inventory, you are ready to define the Categories. This section assumes that you have analyzed your inventory and know the numbers to be assigned for the Category Definition of each property.

4.4.1 Define Categories to Reflect Inventory

1. Select **BALE MANAGER** from the *HVI SPECTRUM* MAIN MENU.

2. The BALE MANAGER MAIN MENU will be displayed.

3. Select the **CONFIGURE** menu item from the BALE MANAGER MAIN MENU.

4. Choose the **CATEGORIES** item to access the DEFINE CATEGORIES screen shown below:

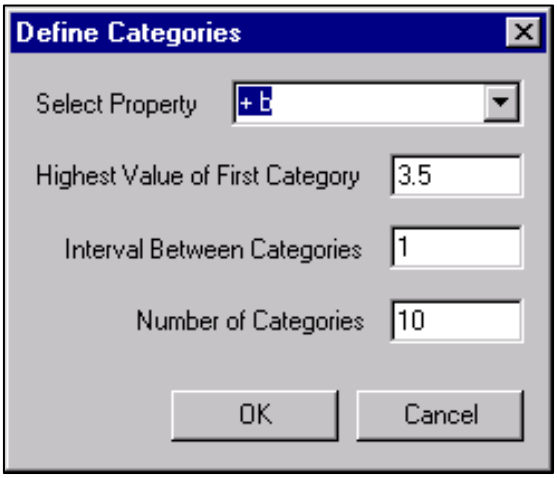

Figure 10-7: Define Categories Screen

The **Select Property** field is used to indicate the property that is of the category being defined (i.e. Length/Strength, elongation, etc.…).

The cursor is positioned in the **Highest Value of First Category** field for the highest value for the first category. This is the value at which the fiber property's first category should end. All bales that have a measured value at or below the value entered here will be included in this category.

The **Interval Between Categories** represents the range between categories. Bale Manager uses the interval to determine where the next category should begin. The sample test results are assigned to categories according to where the test results fit. The interval between categories differs according to the fiber property. If the intervals are small, an excessive number of categories might be created. On the other hand, large intervals between the categories may not give good control of the variation within a mix or between mixes.

Categories will be assigned numbers in sequential order beginning with this number. The **Number of First Category** field is used to indicate what number to use to begin numbering the categories. If you do not enter a number, the categories will be numbered starting at one **(1)**.

A maximum of 20 categories for each fiber property can be entered in the **Number of Categories** field. To keep warehousing as simple as possible, limit the number of categories to the smallest number reasonable for the range of your inventory.

- Enter the information requested in each field and select the **OK** button to save the data. Repeat the entry for each applicable property.

Categories should ONLY be changed if the laydown of the remaining bales in the warehouse can be changed accordingly.

4.4.2 Define Growth Areas

This selection allows the operator to add and/or delete specified growth areas.

1. Select the **CONFIGURE** menu item from the BALE MANAGER MAIN MENU.

2. Select **GROWTH AREAS** to access the DEFINE GROWTH AREAS screen shown below:

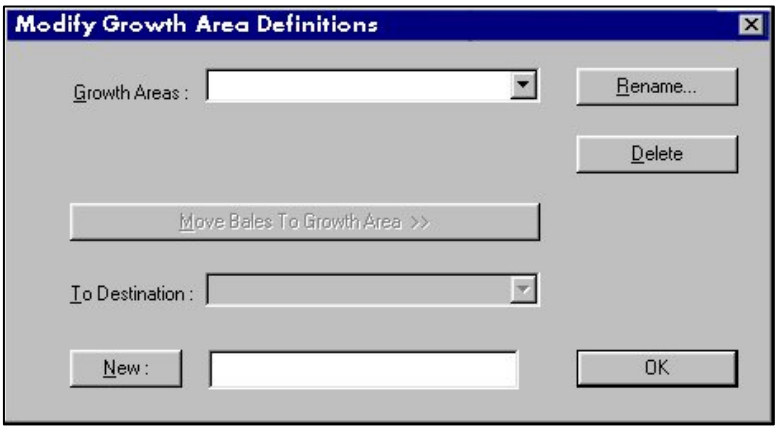

Figure 10-8: Define Growth Areas Screen

3. To add a new growth area, select the **NEW** button and enter the name assigned to the new growth area in the adjacent field. Select the **OK** button to save the entry.

Note: *Up to 30 growth areas can be entered in the system. There is a limit of 20 characters per name.*

4. To rename a growth area, press the **RENAME** button on the right. An EDIT screen appears:

Figure 10-9: Define Growth Areas - Edit Screen

5. Enter the new name in the area provided on the EDIT screen and click **OK**.

6. To delete previously defined growth areas, select the area from the pull-down list in the **Growth Areas** field.

7. Press the **DELETE** button then the **OK** button.

To move the bales to a different growth area:

- Click on the **MOVE BALES TO GROWTH AREA** button.
- Select a destination from the pull down list in the **To Destination** field.
- Press **OK** when you are finished.

4.4.3 Define Proportional/Centered Mix Criteria

Note: *The title and function of this screen toggles between "Defining Proportional Mix Criteria" or "Defining Centered Mix Criteria." (Refer to page 8 in part 3.2.1 for differences in these types of mixes) Selecting the appropriate mix mode on the System Status screen controls the setting.*

1. Select the **CONFIGURE** menu from the BALE MANAGER MAIN MENU.

2. Next, select the **MIX CRITERIA** item. The DEFINE/PROPORTIONAL MIX CRITERIA screen will appear:

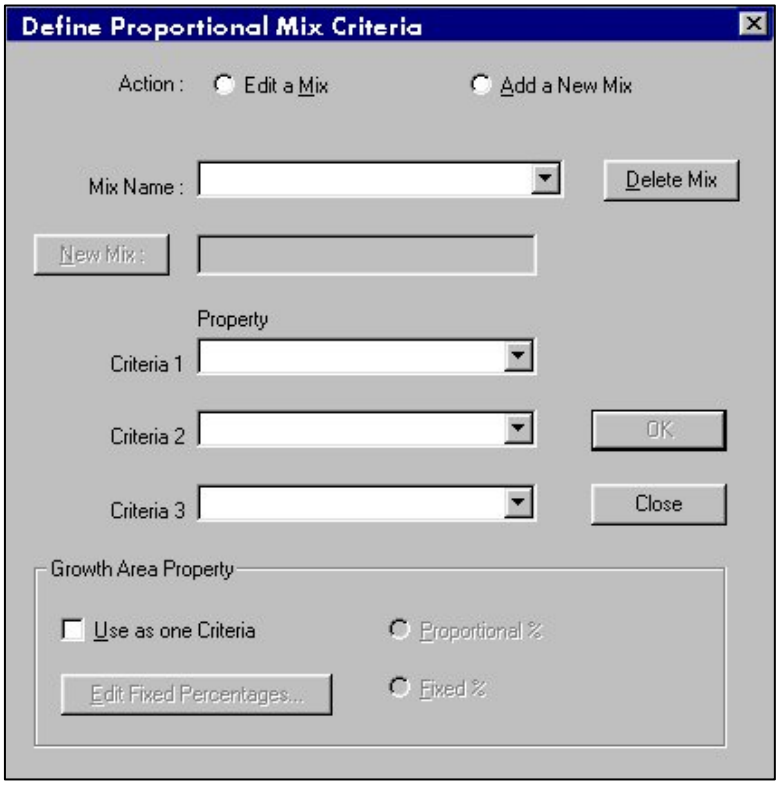

Figure 10-10: Define/Proportional Mix Criteria Screen

To Edit a Mix:

1. Click in the radio button to the left of **EDIT A MIX** in the **Action** area of the screen.

2. Select the name of the mix from the pull-down list in the **Mix Name** field.

3. Select each of the criteria from the property pull-down menus.

> **IMPORTANT:**
>
> If you are using **Fixed Percentages** and **EDIT A MIX** is selected, the percentages MUST be re-entered.
>
> The **OK** button will not work after the percentages are entered. You **MUST** select **CLOSE**.

4. Save the information by selecting the **OK** button after you have made modifications to the information.

To Create a New Mix:

1. Click in the circle to the left of **ADD A NEW MIX** in the **Action** area of the screen.

2. Enter the name in the **New Mix** field and then select the **NEW MIX** button.

3. Select each of the criteria from the property pull-down menus.

4. Press the **OK** button when you have entered the information.

To Delete a Mix:

1. Select the **DELETE MIX** button after entering the name in the **Mix Name** field.

2. Press the **OK** button when you have entered the information.

4.4.4 Define SCI Calculations

1. Select **CONFIGURE** from the BALE MANAGER MAIN MENU.

2. Next, select the **SCI CALCULATION** item. The DEFINE SCI EQUATION screen will appear:

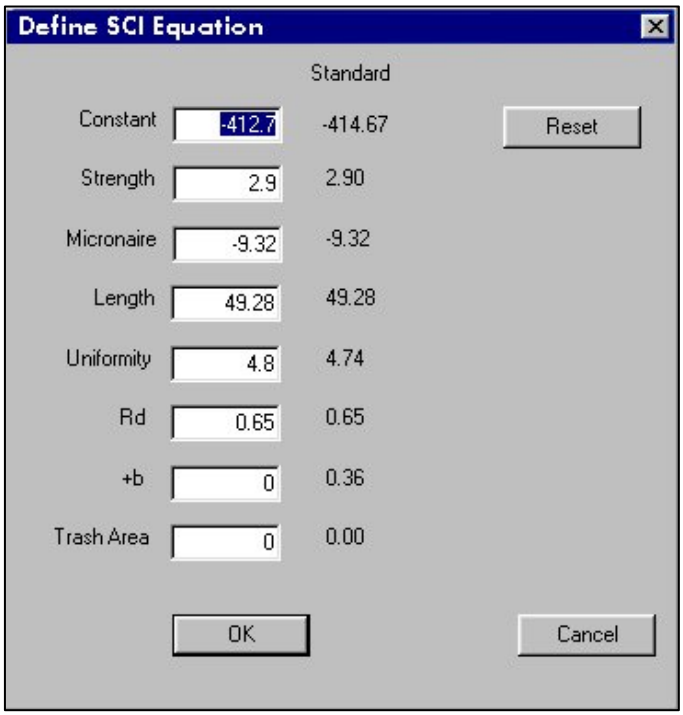

Figure 10-11: Define SCI Equation Screen

- SCI is a calculated value that is based on a regression analysis equation that compares fiber properties to yarn properties.

- The equation takes into account the most important *HVI SPECTRUM* properties and calculates one value for each bale tested.

- The standard equation for SCI used in Bale Manager is based on hundreds of samples including yarn strength, appearance, elongation, neppiness, and spinning potential yarn numbers, which contain a very wide range of fiber properties.

For example:

Property	Range
Length	5/16 - 1 3/8 inches (23.8 - 34.9 mm)
Strength	18 - 36 grams/tex
Micronaire	2.8 - 5.8

4.4.5 Changing the SCI Equation

The following equation should be used for installations when the *HVI SPECTRUM* instrument has taken **no color or trash measurements**.

Constant	**-322.98**
Strength	**2.89**
Micronaire	**-9.03**
Length	**43.53**
Uniformity	**4.29**

Table 10–3: SCI Equation for No Color or Trash Measurements

If it is necessary to change the equation, the following steps are required:

1. Estimate a typical value for that parameter.
2. Add the result to the coefficient and the typical value to the constant term.
3. Replace the coefficient with zero.

It is not recommended to change the other SCI factors unless extensive fiber-to-yarn experiments have been carried out over an extended period of time using advanced statistical analysis methods.

4.5 Edit

The **EDIT** menu is used to access the following screens:

- **Bale Data** - add new data and edit existing data.
- **Delete for Lot ID** - delete bales for selected identifier.
- **Delete For Growth Area** - delete bales for selected growth area.
- **Delete Mix History** - delete mix history up to the specified date.
- **Change Growth Area** - change growth area of a specified lot.

4.5.1 Bale Data

This screen is used to display the data that is generated for each bale tested by the *HVI SPECTRUM*. Existing data can be edited and new data can be added.

1. Select the **EDIT** menu item from the BALE MANAGER MAIN MENU.

2. When the **BALE DATA** item is selected, the BALE DATA screen will appear:

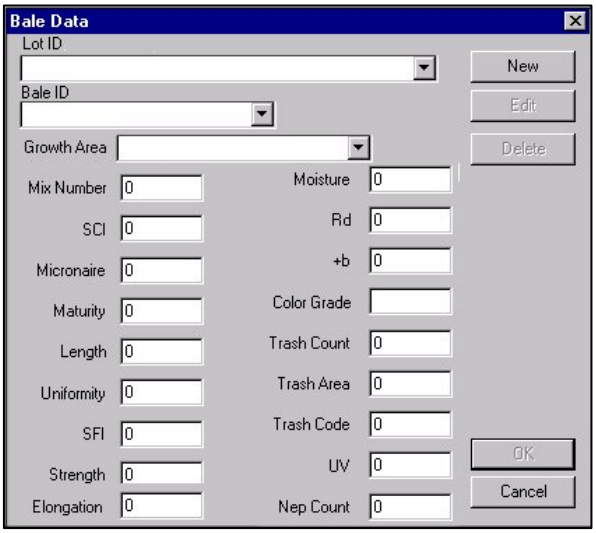

Figure 10-12: Bale Data Screen

To Edit Existing Data:

1. Press the **EDIT** button.

2. Enter the Lot ID and Bale ID or select them from the pull down lists.

3. Position the cursor in the appropriate field for **Mix Number**, **SCI**, **Micronaire**, etc and make the necessary correction(s).

4. Press the **OK** button to save the change(s) when you are finished.

To Add New Data:

1. Press the **NEW** button.

2. Enter the Lot ID and Bale ID or select them from the pull down lists.

3. Enter the necessary data in the **Mix Number**, **SCI**, **Micronaire**, and etc. fields.

4. Press the **OK** button to save the information when you are finished.

4.5.2 Delete for Lot ID

The Delete for Lot ID option is used to delete **ALL** bale information for a selected lot.

1. Select the **EDIT** menu from the BALE MANAGER MAIN MENU.

2. To access the DELETE FOR LOT ID screen, select the **DELETE FOR IDENTIFIER** item.

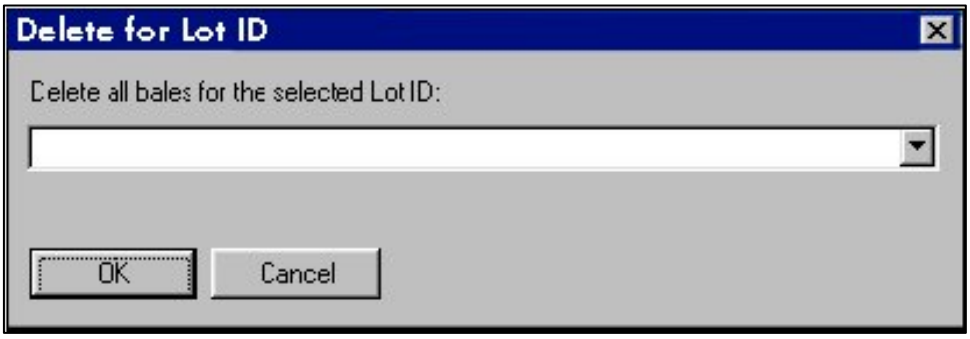

Figure 10-13: Delete for Lot ID Screen

3. Select the Lot Identifier from the pull-down list and select the **OK** button to delete the bale information.

4.5.3 Delete for Growth Areas

1. Select the **EDIT** menu from the BALE MANAGER MAIN MENU.

2. When the **DELETE GROWTH AREAS** item is selected, the DELETE FOR GROWTH AREA screen will appear:

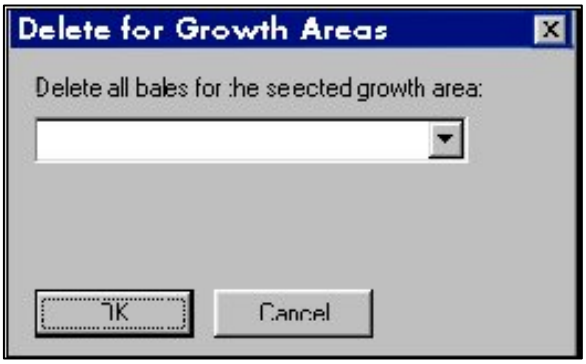

Figure 10-14: Delete for Growth Area Screen

3. To delete all bales in a growth area, highlight all bales from the pull-down list and press the **OK** button.

WARNING! Deleting a growth area deletes ALL BALES associated with that growth area.

4.5.4 Delete Mix History

This screen is used to delete the mix history prior to the date entered on the screen.

1. Select the **EDIT** menu from the BALE MANAGER MAIN MENU.

2. Next, select the **DELETE MIX HISTORY** item. The DELETE MIX HISTORY screen will appear:

Figure 10-15: Delete Mix History

3. Enter the date when the mix history should begin.

4. Next, select the **OK** button to delete the data prior to that date.

4.5.5 Change Growth Area

This screen is used to change the growth area of a specified lot.

1. Select the **EDIT** menu from the BALE MANAGER MAIN MENU.
2. Next, select the **CHANGE GROWTH AREA** item. The CHANGE GROWTH AREA screen will appear:

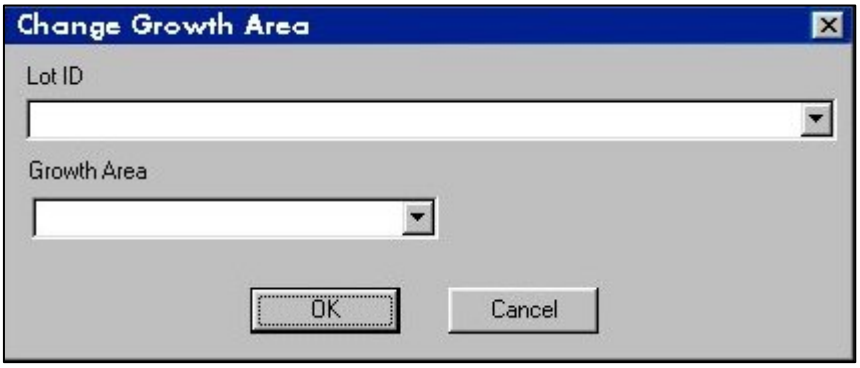

Figure 10-16: Change Growth Area Screen

3. Enter the Lot Identifier in the **Lot ID** field.
4. Select the Growth Area from the pull-down list.
5. Select the **OK** button to change the information.

Note: *This screen is used to delete growth area information when a Lot ID was improperly imported into an incorrect growth area.*

4.6 Mix

A **mix** is defined as a group of bales or a **laydown** that is combined in a mill to create a yarn.

The **MIX** menu is used to access the following screens:

- **Make a Mix** - is used to select a specified number of bales out of the inventory to make a mix.
- **Active Mixes** - is used to view, edit, or delete a previously created, but unaccepted mix.
- **Preview/Accept Mix** – this screen is used to preview and/or accept active mixes.

Each of these screens is discussed below.

4.6.1 Make a Mix

This screen is used to choose the bales form the "working" inventory that will be used to create the mix.

- Select the M**IX** menu from the BALE MANAGER MAIN MENU. Select the **MAKE** item to access the MAKE A MIX screen.

Note: *The Mix Mode is determined by the System Configuration screen and can be either "Proportional" or "Centered."*

1. Enter the number assigned to the mix in the **Mix Number** field.

2. Enter the number of the bales that will comprise the mix in the **Number of Bales** field.

3. Select the name of the mix from the **Mix Name** pull-down list.

4. Press **OK** when finished.

Figure 10-17: Make a Mix Screen

4.6.2 Active Mixes

This screen is used to view, edit, or delete **a <u>previously created, but unaccepted mix</u>**. Deleting an active mix is another option, which is offered.

1. Select the **MIX** menu option from the BALE MANAGER MAIN MENU.

2. Select the **ACTIVE MIX** item. The ACTIVE MIXES screen will appear:

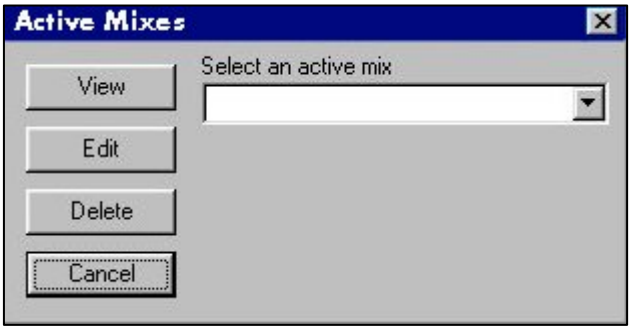

Figure 10-18: Active Mixes Screen

3. To delete an active mix, make a selection from the pull-down menu and press the **DELETE** button.

4. To **VIEW** or **EDIT**, select the mix and press the appropriate button.

4.6.3 Preview/Accept Mix

1. Select the **MIX** menu from the BALE MANAGER MAIN MENU.

2. Once the **PREVIEW/ACCEPT** item has been selected, the PREVIEW/ACCEPT MIX screen will appear:

Figure 10-19: Preview/Accept Mix Screen

3. Select an active mix from the pull-down menu. Press the **OK** button to review the mix criteria.

4.7 View

The **VIEW** menu is used to access the following screens:

- **Inventory** – This menu option accesses the VIEW INVENTORY BALE DATA screen.
- **History** – This menu option contains sub items to access screens to MIX HISTORY, MIX HISTORY DETAIL, HISTOGRAMS, AND MIX HISTORY TRENDS.

4.7.1 View Inventory Bale Data

This screen is used to generate inventory reports based on the selected criteria.

1. Select the **VIEW** item from the BALE MANAGER MAIN MENU.

2. Select the **INVENTORY** item to access the VIEW INVENTORY BALE DATA screen.

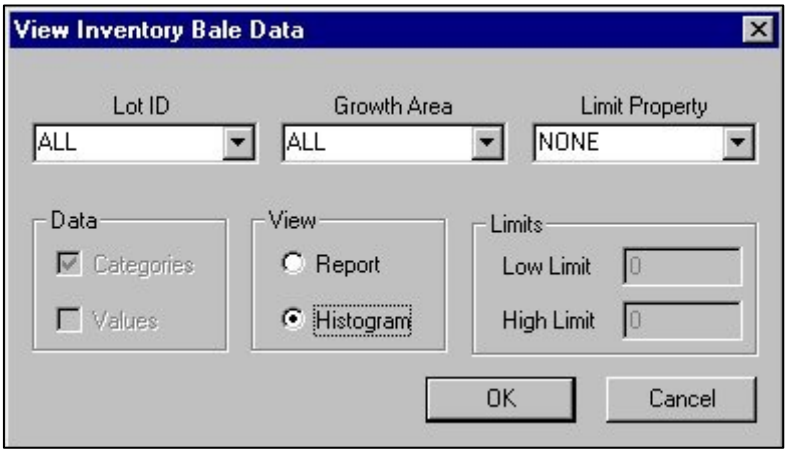

Figure 10-20: View Inventory Bale Data

3. The **Lot Identifier**, **Growth Area**, and **Limit Property** fields are used to indicate the specific inventory that you want to review.

4. Select the specific inventory areas from each pull-down list.

5. Enter the type of data that you want to view. This can be by category, value, or both.

6. The View selections are used to indicate how you would like the information to be presented. This can be either in a report format or as a histogram.

7. Next, indicate the limits, if any, on the data presented.

8. When all selections have been made, select the **OK** button to view the results.

4.7.2 View Mix History

The mix history is used to document what mixes have been made in the past. This information is useful when trending analyses for the mill manager.

1. Select the **VIEW** menu from the BALE MANAGER MAIN MENU.

2. Next, select the **HISTORY** item and the VIEW MIX HISTORY screen will appear:

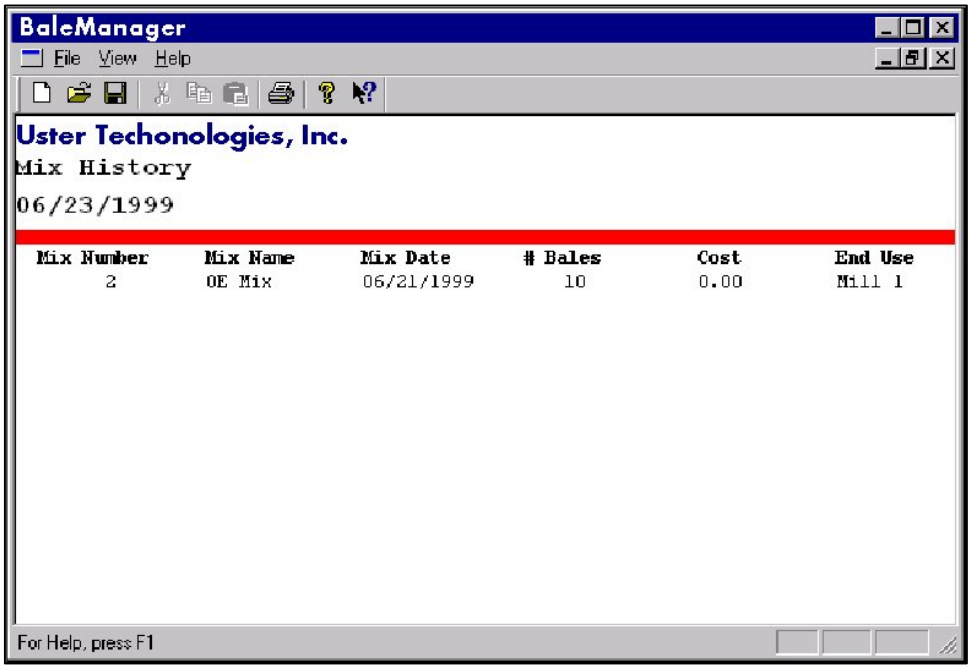

Figure 10-21: View Mix History Screen

4.7.3 View Mix History Details

1. Select the **VIEW** menu option from the BALE MANAGER MAIN MENU.

2. Next, select the **HISTORY** item.

3. Select the **MIX HISTORY DETAIL** sub item.

4. The VIEW MIX HISTORY DETAIL screen will appear:

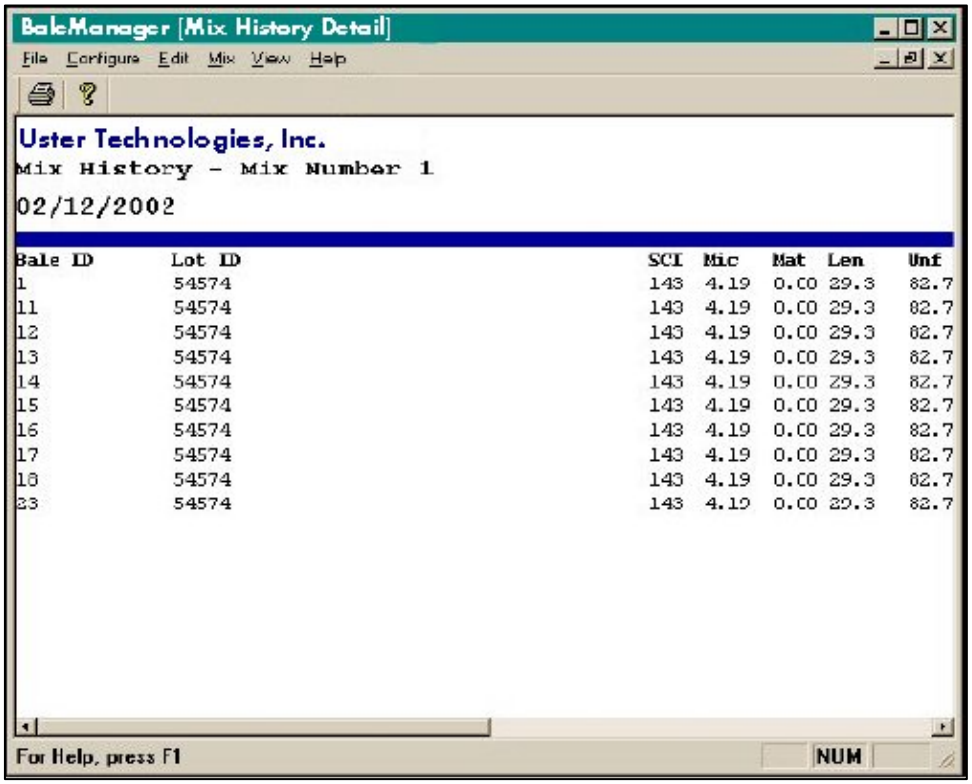

Figure 10-22: View Mix History Detail Screen

5. The Mix History Detail screen shows the individual bales that comprised a mix.

4.7.4 View Mix History Histograms

1. Select the **VIEW** menu option from the BALE MANAGER MAIN MENU.

2. Next, select the **HISTORY** item and the **HISTOGRAM** sub item. The MIX HISTORY HISTOGRAM screen will appear:

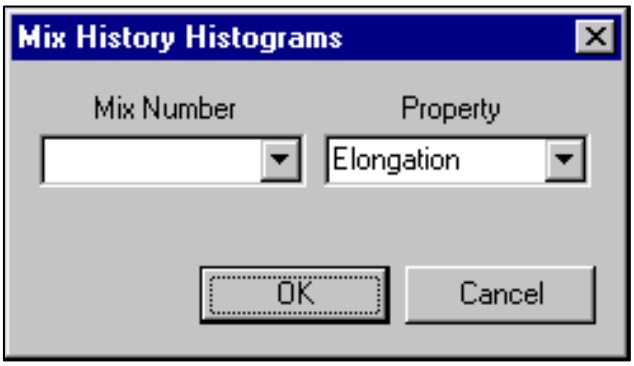

Figure 10-23: Mix History Histogram Screen

3. Enter the **Mix Number** or select it from the pull-down list on the left.

4. Select the Property from the **Property** pull-down list.

5. Once the selections have been made press the **OK** button.

6. The Histogram will be displayed.

4.7.5 View Mix History Trends

Mix History Trends provides a means of viewing a single property across multiple mixes through a date range.

1. To begin, select the **Mix Name** and the desired **Property** you want to view from the drop-down lists.

2. Next, select either the **Mean** or the **%CV** as the value to display.

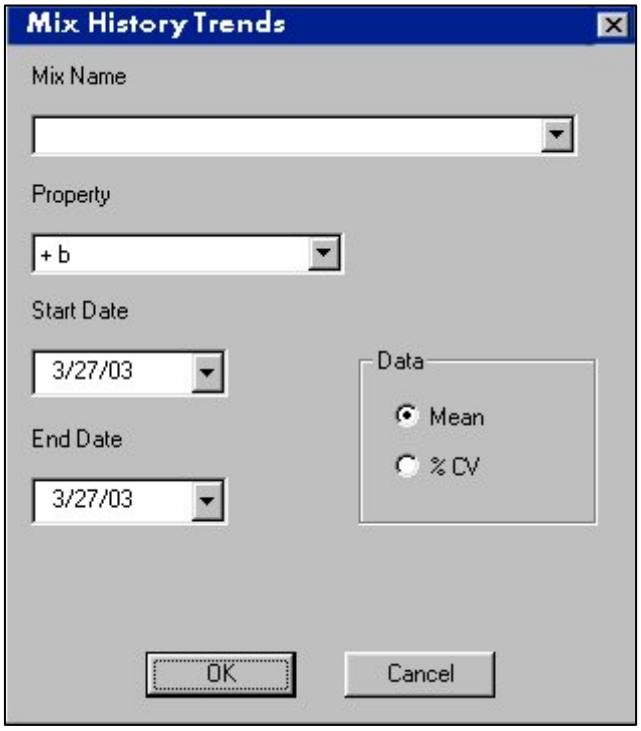

Figure 10-24: View Mix History Trends

3. The date range is selected by clicking on the down arrow beside the **Start Date** field to pop up the calendar.

4. Use the left and right arrows to select the desired month and year and click on the day on the calendar to complete the selection.

5. Click the **OK** button to display the results.

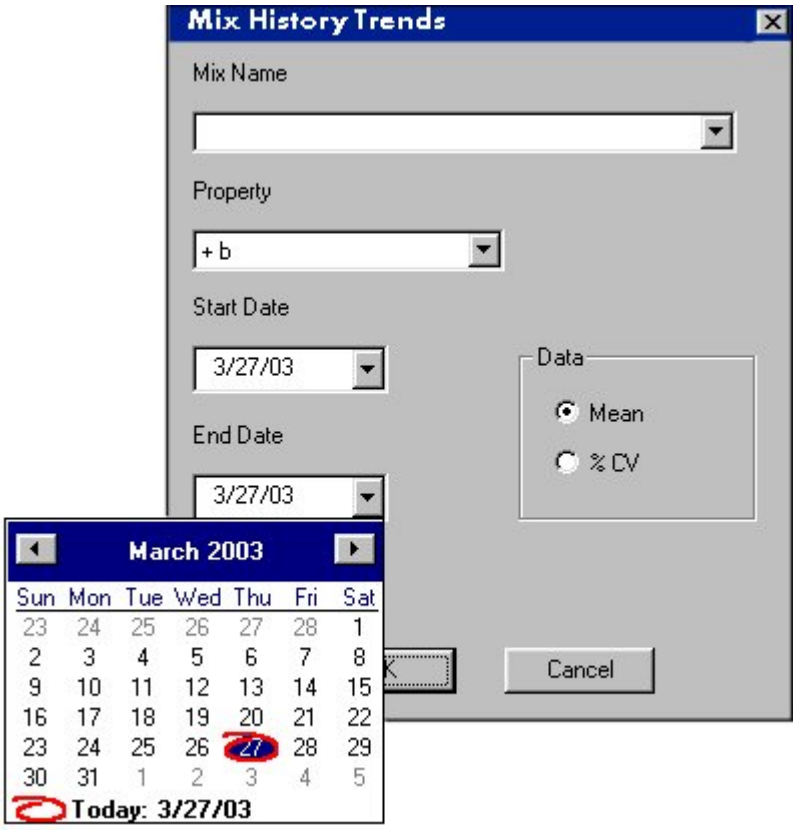

Figure 10-25: View Mix History Trends – Date Range / Calendar

Chapter 11 USTER® QualiProfile

1 Introduction

The **USTER®** QualiProfile enables the operator to see if the cotton fiber is within the predefined measurement tolerances and a comparison with the **USTER®** Statistics can be completed. This feature is beneficial for internal quality control.

Important attributes of the QualiProfile software are listed below:

1. The test values of the cotton will be shown in a sun diagram.

2. The importance of a value is proportional to the width of the representing segment.

3. The diagram can be scaled with the percentile values of the Statistics, depending on the definition/selection of each individual profile (→Profile Setup).

4. A parameter and its representing segment can be subdivided in sub values. The diagram is built in a hierarchic form (tree-type form) →Quality→HVI→Color→Rd.

5. Every test value is compared with the profile and is represented in a color indicating if the test value is **within** or **outside** the selected minimum and maximum upper values of the profile.

- For example, the color **GREEN** indicates that the value is within the set value limits and **RED** indicates that the value is outside those limits.

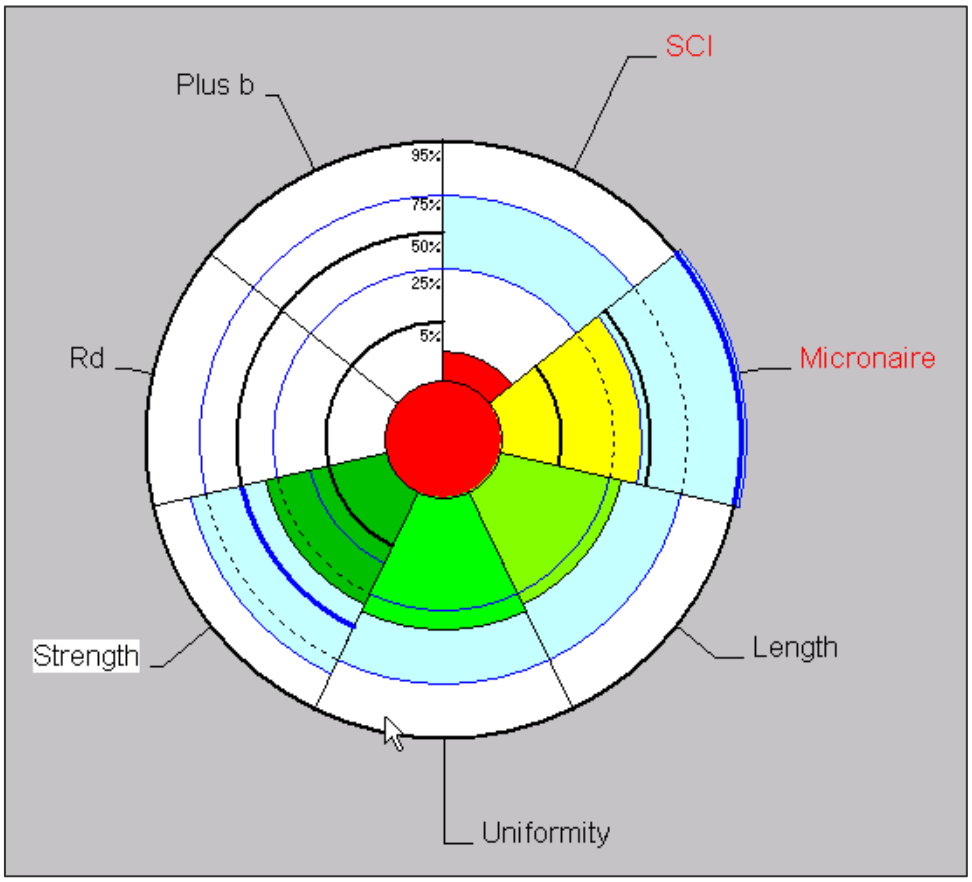

Figure 11-1: Graph Example 1

6. Print the graph by choosing **PRINT** from the **FILE** menu option.

7. The screen containing the graph will also show the screen shown in figure 11-2.

8. This graphic displays the values of the profile when the operator clicks on one of the graphical pie's slices.

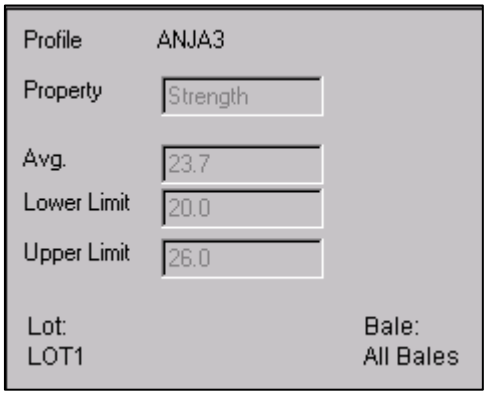

Figure 11-2: Graph Example 2

2 QualiProfile

Upon launching the software, THE *HVI SPECTRUM* MAIN MENU automatically appears:

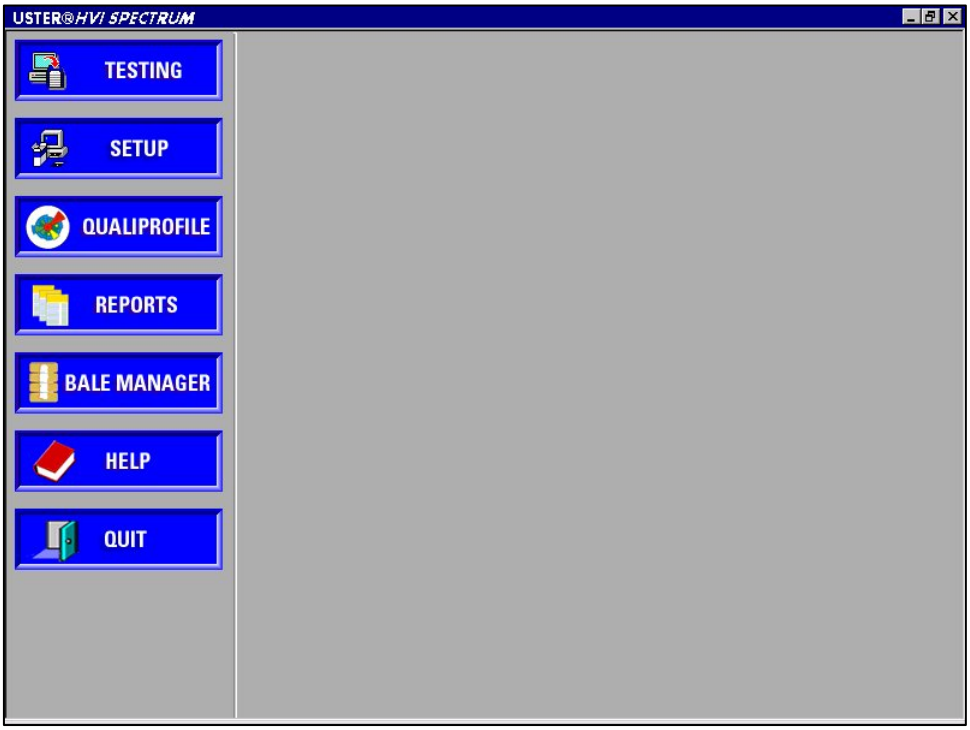

Figure 11-3: Main Menu

1. Select the **QUALIPROFILE** button.

2. This will access the QUALIPROFILE MAIN MENU.

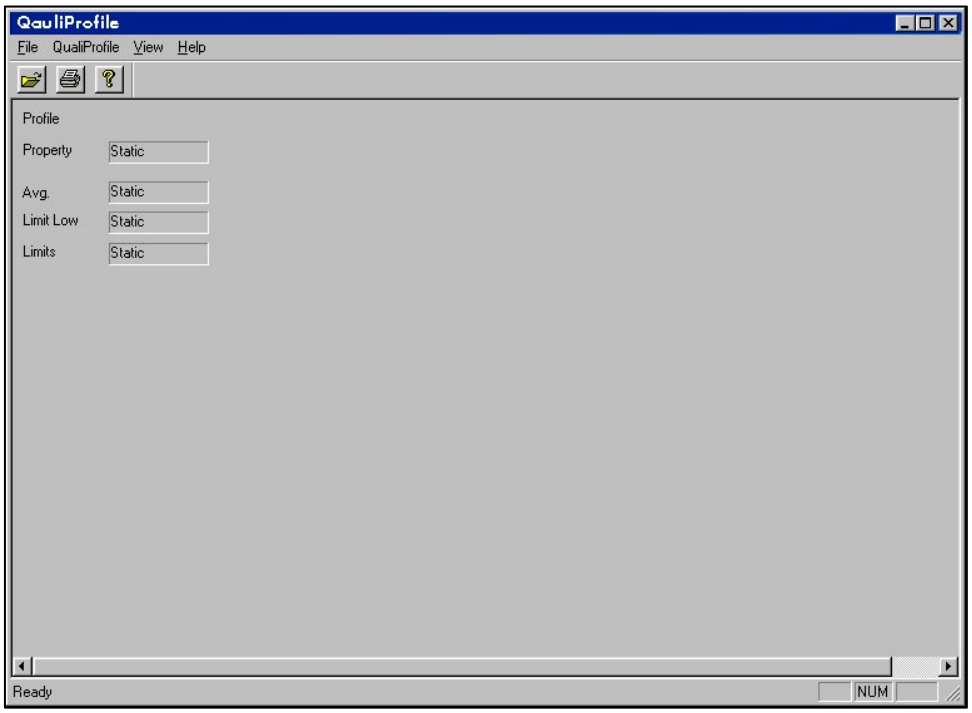

Figure 11-4: QualiProfile Main Menu

3. A Profile is displayed along with its components **"Property"**, **"Avg"**, **"Limit Low"**, and **"Limits"**.

2.1 Selecting a Profile

To select a profile, follow the steps below:

1. First, choose the **RUN** item under the **QUALIPROFILE** menu options on the QUALIPROFILE MAIN MENU.

2. The SELECT A PROFILE screen shown on the right is displayed.

3. Choose a profile from the drop-down list located under **Select Profile**.

4. A Lot Identifier must be selected to which the profile will be applied. Make a selection from the drop-down list under **Select Lot Identifier**.

5. The QualiProfile can be applied to all bales within a lot or to selected bales within a lot. Specific bales can be selected under the **Select Bale Identifier** drop-down list. (The Bale Identifier will automatically appear after you select the Lot Identifier.)

6. Press the **OK** button when you are finished.

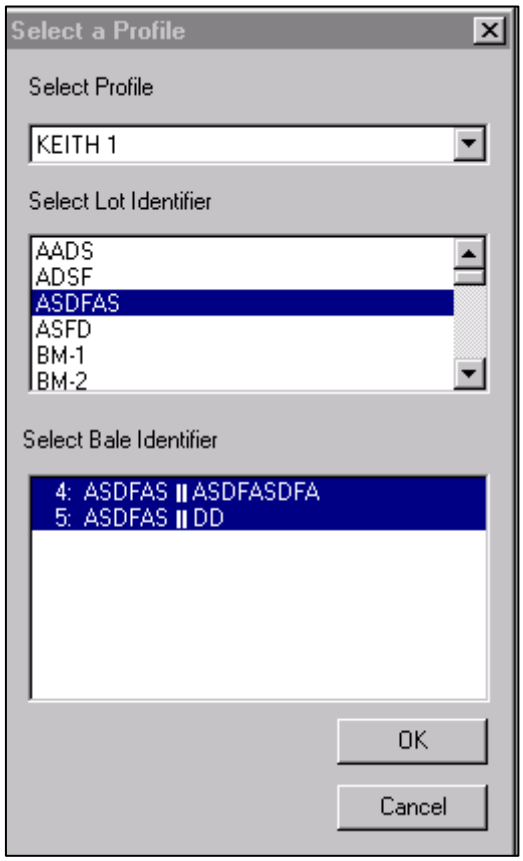

Figure 11-5: Select a Profile Screen

2.2 Designing a QualiProfile

To design a QualiProfile:

1. Select **DESIGN** from the **QUALIPROFILE** menu item on the QUALIPROFILE MAIN MENU.

2. The following screen will appear:

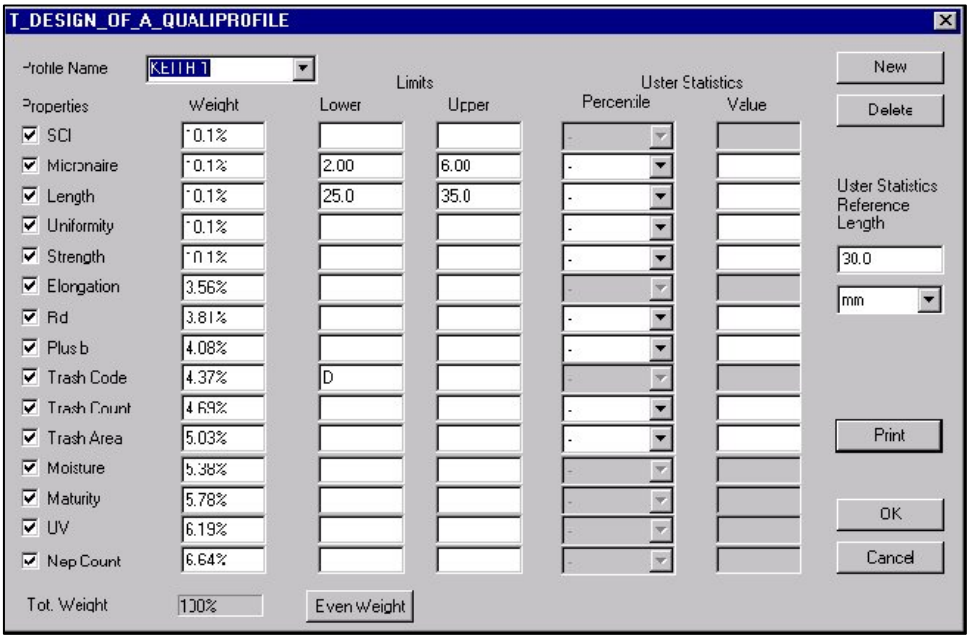

Figure 11-6: T Design of a QualiProfile

3. Click on the **NEW** button located at the top right of the screen.

4. Name the QualiProfile by entering the data in the **Profile Name** field or by making a selection from the drop-down list.

5. Select the values you want to include by clicking in the boxes in the **Properties** area.

Note: *If a value is excluded, all of the sub values in the hierarchy are also excluded.*

6. Specify the weight depending on your application by entering the data in the **Weight** field on the bottom left of the screen. Select even distribution by selecting the **EVEN WEIGHT** button. The width of the segment is specified by the weight of the value.

7. Enter the lower and upper value Limits for each property in the corresponding fields. Make sure the limits represent actual measurement ranges.

8. Select the percentile value of the **USTER®** Statistics that you want to compare.

9. Enter the reference length in the field labeled **USTER® Statistics Reference Length**. Choose the unit of measurement from the drop-down box located beneath.

ATTENTION: Select the correct reference lengths for the USTER® STATISTICS in order to make correct comparisons. For example, it does not make sense to compare a 1" staple length to a 1 3/16" (or 31.0 mm) cotton length.

10. Click on the **PRINT** button to print your QualiProfile selection for future reference.

11. Click **OK** to save QualiProfile.

12. Click **NEW** if you want to design another QualiProfile.

13. Select a name from the **Profile Name** drop-down box and hit the **DELETE** button if you want to delete a profile.

Chapter 12 Diagnostics

1 Introduction

The *HVI SPECTRUM* Diagnostics provides a means of testing its individual instrument circuits and components. The screen is intended for use by service technicians during routine checks, troubleshooting, and maintenance. However, at some point you may be asked by a service technician to perform some of these troubleshooting routines. This chapter briefly describes the steps that should be taken in such a situation.

Note: *The screens shown in this manual may differ from those displayed on the unit you are working with depending on the modules of HVI SPECTRUM that were purchased.*

2 Diagnostics

1. Select the **SETUP** button from the *HVI SPECTRUM* MAIN MENU.

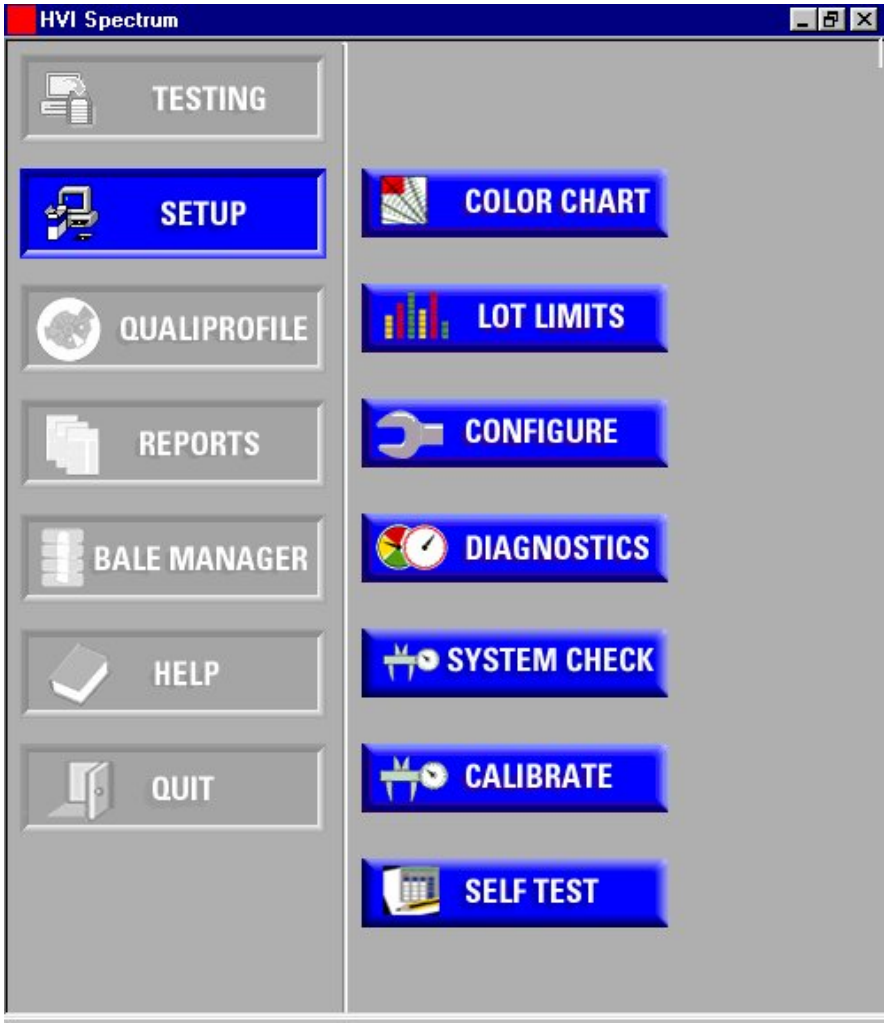

Figure 12-1: Main Menu - Setup

2. Select the **DIAGNOSTICS** button.

The DIAGNOSTICS screen is intended for use by qualified Uster Technologies' service technicians during routine checks, troubleshooting, and maintenance.

3. The DIAGNOSTICS screen automatically appears:

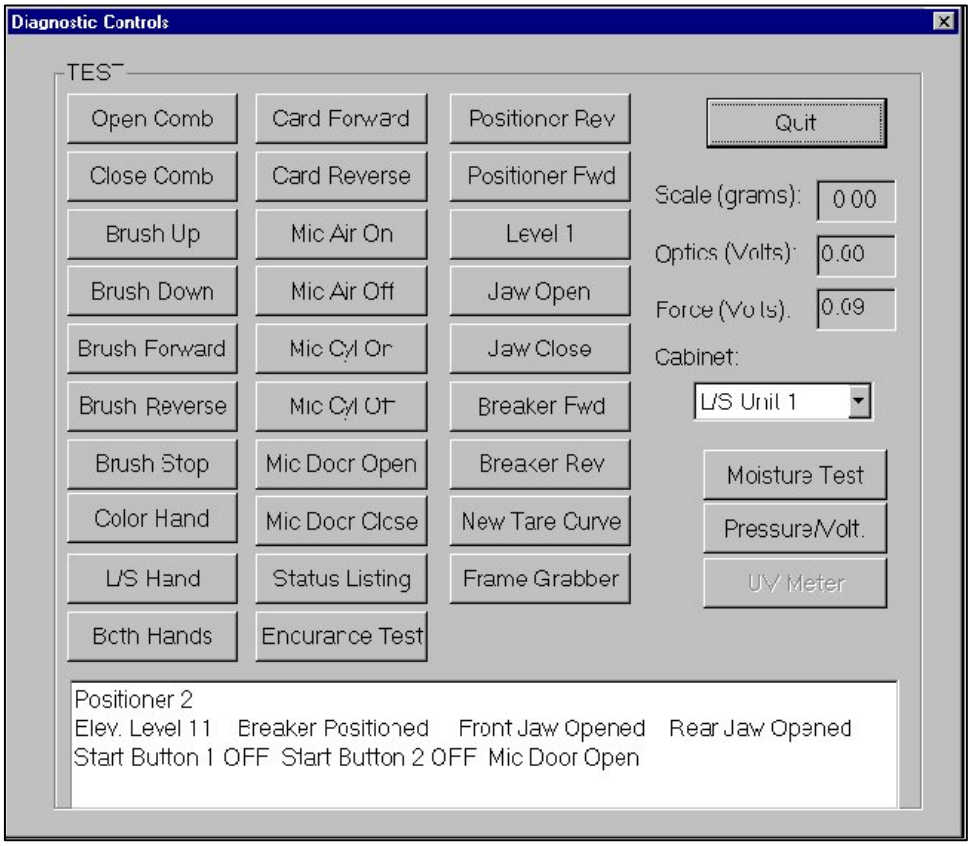

Figure 12-2: Diagnostics Screen

Note: *The unit (cabinet) selection determines which camera image will be displayed on an HVI SPECTRUM II.*

The DIAGNOSTICS CONTROL screen contains the following items that are used to troubleshoot problems. As previously stated, this Diagnostics screen is intended for use by service technicians during routine checks, troubleshooting, and maintenance.

Button	Action
Open Comb	Opens Comb
Close Comb	Closes Comb
Brush Up	Moves Brush in upward direction
Brush Down	Moves Brush in Downward motion
Brush Forward	Moves Brush in Forward motion
Brush Reverse	Moves Brush in Reverse direction
Brush Stop	Stops motion of Brush
Color Hand	Lowers and raises the Color Hand
L/S Hand	Lowers and raises Length/Strength Hand
Both Hands	Raises and lowers both the Color Hand and the Length/Strength Hands
Card Forward	Moves the Card in a Forward direction
Card Reverse	Moves the Card in a Reverse direction
Mic Air On	Activates the air to the Micronaire Chamber
Mic Air Off	Deactivates the air to the Micronaire Chamber
Mic Cyc On	Activates the Micronaire Cylinder to front position
Mic Cyc Off	Reverses the Micronaire Cylinder
Mic Door Open	Opens the Door to the Micronaire Chamber when closed
Mic Door Close	Closes the Door to the Micronaire Chamber when opened
Status Listing	Prints a list of the current configuration of the instrument

Button	Action
Endurance Test	Initiates a continuous Testing Cycle
Positioner Rev	Runs transport from back to front
Positioner Fwd	Runs transport from front to back
Level 1	Level 1, Level 2, Level 3
Jaw Open	Unclamp jaw
Jaw Close	Clamp jaw
Breaker Fwd	Moves out of home position
Breaker Rev	Moves back to home position
New Tare Curve	Clamp diagnostics tool (Service Personnel only)
Frame Grabber	Initiates Frame Grabber program
Moisture Test	Checks the moisture probe
Pressure Volt	Checks the voltage and the pressure reading
UV Meter	Displays voltage and UV values; used to select the type of mode desired
Scale (grams)	Scale readout
Optics (volts)	Optics readout
Force (volts)	Check for zero force transducer readout

Table 12–1: Description of Diagnostic Function Keys

3 Error Log

The Error Log file located in the *HVI SPECTRUM* directory contains many important system errors, which may be needed for troubleshooting purposes. A list of error messages and their possible causes are located in the Appendix of this manual.

Chapter 13 Maintenance

1 Introduction

The *HVI SPECTRUM* system has been designed to reduce maintenance to a minimum. To keep the instruments in top condition, a few tasks must be performed routinely.

2 Cleaning the System

Maintenance can be divided into three categories:

- As required
- After each shift
- Daily

2.1 As Required

- Excess cotton should be removed from the carding plate as needed.

2.2 After Each Shift

- After each shift, the excess fiber that has gathered in the instrument during the measurement procedures should be removed using a vacuum cleaner.
- After cleaning, close all doors and covers to their original positions.

2.3 Daily

- The lint/waste box on the instrument should be cleaned daily. The vacuum on the box is relieved using the vacuum **ON/OFF** switch on the top.
- Use the handles to open the lint/waste box doors. Remove all fibers from the lint box by hand. Close the door when finished.
- Clean the filter inside the waste box with a brush (or vacuum cleaner). Make sure all loose material is removed.
- Upon completion, close the door. The door **MUST** be closed for proper operation.
- Clean the color window with a soft, damp cloth (do not use abrasives or corrosive agents).
- Inspect the computer's cooling fan filters and clean if necessary.
- Inspect the system's vacuum motor filter and clean it with a brush or vacuum as needed.
- Inspect the rear door fans and filter. Clean if necessary.

3 Calibration Tile Care

The calibration tiles are the reference for all color and trash measurements on the colorimeter. When calibration tiles are not maintained in good, clean condition, they can affect system calibration. Proper calibration is essential to produce accurate testing results. Often, when a significant drift of Rd or +b is noted while testing, calibration tile condition is responsible.

Uster recommends that users follow the guidelines below.

- The tile set assigned with the unit should STAY with the unit. The tile set will normally maintain its calibration value throughout the life of the instrument. It is recommended that each set be checked against a master tile set every two to three years. This is to allow re-adjustment in the unlikely event that the Rd or +b values change or shift. *These small shifts are usually minimal when compared to a shift in color grade.*

- Never try to use a tile set other than the one assigned to the unit. Due to technology changes there are important differences in colorimeters that require different levels when the calibration tiles are assigned.

- Always store tiles in the container they are shipped in. These boxes are manufactured solely for tile storage and are designed to keep the tiles in a clean and dust free environment.

- If a tile is broken or becomes cracked the **entire** box should be returned to USTER for repair or replacement. During repair/replacement, the entire tile set will be evaluated and values re-assigned if necessary.

- Only calibrate with the tiles (supplied with the unit) as prescribed by the calibration section of the instruction manual.

- Always check the tile set for fingerprints or soil spots **before** calibrating a colorimeter. Fingerprints, though not very noticeable can cause a calibration level shift of up to 0.4 RD or +B. Even though the colorimeter may calibrate under these conditions, the cotton testing results will not be accurate. Fingerprints can usually be seen on tile sets by holding the tile up and looking at the reflections given off the tile set. Fingerprints, if left on a tile set for a period of time, will turn yellow and thereby shift the color calibration.

- Handle the tiles only on the edges by stretching the fingers across the back-side of the tile and grasping the edges. Never handle the tiles in a manner that will place fingerprints on the color surface.

- Uster recommends the tile set be cleaned on a periodic basis, depending upon use and conditions. Usually every 2 to 3 months is sufficient.

3.1 Cleaning Calibration Tiles

Use care when handling, using or cleaning the tile set. To clean the tile set,

1. Use a small amount of dish liquid in about ½ gallon water.
2. Using the soap mixture, use a soft cloth to thoroughly clean all fingerprints from the surface of both sides of each tile.
3. Do not touch the color surface once the cleaning has been done.

4. Thoroughly rinse the tile with warm water taking care to remove all soap and residue.
5. Thoroughly dry both sides of the tile with a soft cotton cloth.
6. These tiles are very porous and should be allowed to dry for a period of at least 24 hours before next use.
7. After the 24 hour drying period, it is recommended that they be buffed again with a clean cotton cloth.

4 Service

ONLY a qualified Uster Technologies' service technician should perform service on the *HVI SPECTRUM* system. Factory service is available at the home office and field service is available worldwide. If service is necessary, contact Uster Technologies, Inc. for current service rates.

We will gladly provide technical assistance by telephone, fax, or e-mail. Please refer to the title page of this manual for the appropriate phone number(s).

Chapter 14 Appendix

1 *HVI SPECTRUM* Specifications

Length/Strength, Micronaire Module – Physical Dimensions:

	Standard	Metric
Length	33″	838.2 cm
Height*	55″	1395.0 cm
Depth	31.5″	798.2 cm
Weight	Lbs. 335	

Control Module – Physical Dimensions:

	Standard	Metric
Length	25″	635 cm
Height*	38.5″	970 cm
Depth	31.5″	798.2 cm
Weight	Lbs. 170	

* Height is measured from floor to the top of sample hands and balance.

Power

215 - 230 Volts, 50/60 Hz, 1080 Watts
6 amps

Air

External air source required: 100 – 120 psi
620 - 825 kPa

Vacuum

Self-contained

CRT

14-inch color screen, anti-glare face

Resolution:	800 dots x 600 lines
Character Field:	2000 (80 x 25 lines)
Dimensions:	359 x 356 x 395 mm (H x W x D)
Net Weight:	28.2 lbs

Force Transducer

"S" Beam full bridge type

Linearity	.03% full scale
Range	Total load 100 lbs; maximum overload 300 lbs.

Balance

Electronic

Weighing range	310 g
Readability	0.01 g
Reproducibility	0.003 g (standard deviation)

Pressure Transducer

Low differential pressure

Accuracy	+1% full scale
Range	±0-5 inches water column

Lamps

Xenon
Expected Life: > 10 years

2 Disk Information

2.1 Diskettes

- Store diskettes in a safe place away from dust, moisture, and magnetic fields.
- **DO NOT** place diskettes near magnets, transformers, or electric motors.
- Avoid extreme temperature ranges.
- Normally, diskettes that are supplied are not “write-protected.” To write-protect, slide the built-in tab over to reveal the write-protect hole.
- To insert the diskette into the disk drive, slide it into the slot (metal toward the drive) until you hear it click into place.
- To remove the diskette, press the **PUSH** button by the door of the drive.

2.2 Disk Operating System

The *HVI SPECTRUM* is shipped with Windows 98. Refer to the Windows 98 User's Guide for information on the following procedures:

- Formatting (preparing the diskette to hold information)
- Copying Files
- Directories

2.3 Monitor Information

- No user-serviceable parts are included inside the monitor's cabinet. Please **DO NOT** attempt to remove the back of the cabinet. You will be exposed to a shock hazard!

CAUTION!

Prior to connecting or disconnecting any display peripheral, be sure that the AC power to the instrument is turned "OFF". Failure to do so may cause serious personal injury, as well as permanent damage to your computing equipment.

- In order to prevent overheating, ensure that the ventilation openings in the monitor are not covered. The monitor should not be placed near a source of heat.

- **DO NOT** place objects on top of the monitor cabinet that could fall into vents or that could cover the vents and prevent proper cooling of the monitor's electronics.

- **DO NOT** place the monitor where sunlight or bright room light will fall directly on the screen.

- When necessary, clean the cabinet with a damp cloth. Use only mild detergents. **DO NOT** use alcohol or ammonia based products.

2.4 Printer Information

The *HVI SPECTRUM* must be operated using the Hewlett Packard DeskJet Printer. For instructions on using this printer, please refer to "*The HP DeskJet Printer User's Guide*" that is provided with your *HVI SPECTRUM*.

It is important to note that the *HVI SPECTRUM* has been configured to work in cooperation with this specific printer. It is strongly suggested that should this printer fail, it be replaced with the same model. If this is not possible, consult a certified Uster Technologies' service technician who will have to reconfigure your unit before it will operate correctly with any other printer.

2.5 Balance Configuration

The *HVI SPECTRUM's* Micronaire Module is provided with a Mettler Balance. Please refer to the manufacturer's User's Guide that is also provided with your instrument if you have specific questions on the balance.

The following is the procedure Uster Technologies uses to configure the Mettler PB602-S balance. This configuration cannot be changed without altering the balance hardware. A certified Uster Technologies' Service technician **MUST** complete any changes made to the configuration. For this reason, the following list is provided for information purposes only.

1. Press hold **Cal/Menu** button until "**Menu"** appears.
2. Release button. **"Reset"** should now be displayed.
3. Press and release **Cal/Menu** button.
4. Press the **F** button until **"F-nonE"** appears.
5. Press and release **Cal/Menu** button.
6. Press the **F** button until **"Std"** appears.
7. Press and release **Cal/Menu** button.
8. Press the **F** button until **"Unit 1 g"** appears.
9. Press and release **Cal/Menu** button.
10. Press the **F** button until **"Unit 2 g"** appears.
11. Press and release **Cal/Menu** button.
12. Press the **F** button until **"A.2Ero"** appears.
13. Press and release **Cal/Menu** button.

14. Press the **F** button until **"HoSt"** appears
15. Press and release **Cal/Menu** button.
16. Press the **F** button until **"S Cont"** appears.
17. Press and release **Cal/Menu** button.
18. Press the **F** button until **"S. PM"** appears.
19. Press and release **Cal/Menu** button.
20. Press the **F** button until **"bd 4800"** appears.
21. Press and release **Cal/Menu** button.
22. Press the **F** button until **"8b-no"** appears.
23. Press and release **Cal/Menu** button.
24. Press the **F** button until **"HS oFF"** appears.
25. Press and hold the **Cal/Menu** button until "**Stored"** appears.

Programming is complete.

2.6 Recommended Lot Limits for Cotton

Uster Technologies, Inc. recommends that the following values be used for cotton lot limits:

MICRONAIRE LOWER LIMIT	**3.2**	
MICRONAIRE UPPER LIMIT	**5.9**	
	Inches	**Millimeters**
LENGTH LOWER LIMIT	**0.93**	**22.9**
LENGTH UPPER LIMIT	**1.35**	**34.3**
	Index	
UNIFORMITY LOWER LIMIT	**77**	
UNIFORMITY UPPER LIMIT	**90**	
		HVI SPECTRUM
STRENGTH LOWER LIMIT		**24**
STRENGTH UPPER LIMIT		**45**

Table 14–1: Recommended Lot Limit Values

- Upper and lower limits for other properties should be set to 0 (zero).

- Operators may set their own values for lot limits by selecting **SETUP** from the *HVI SPECTRUM* MAIN MENU, and then **LOT LIMITS** from the screen.

- If test results are to be transmitted to an external computer, the above limits should also be set in the REPORTS screens. *(See Chapter 8 Reports.)*

2.7 Transmission Architecture

This document describes the transmission format of the *HVI SPECTRUM*. The instrument will transmit records of data from the serial port and can be configured to transmit particular records. The configuration must occur prior to the sample testing. All records will be transmitted after all observations of a sample are finished. Transmission records are characterized by the following:

- All records start with a standard header (discussed in Universal Record Format), followed by record specific data fields.

- The record length is variable.

- The data is transmitted as ASCII characters. In other words, the number 12.5 will be transmitted as four characters, namely "1" (0x31), "2" (0x32), "." (0x2e), and "5" (0x35).

- Records will be delimited by CR (0x0d).

- Fields will be delimited by "@" (0x40).

- A checksum is included with all records as the last field.

  The checksum for a string is produced by taking the "exclusive-or" of all characters in the string up to and including the field delimiter before the last field where the checksum is to be placed in the record. The checksum will not include the CR delimiting the records. The checksum value is formatted as a decimal value.

  As an example, consider the following HVI Micronaire mean record:

  ```
  HVI@MIC@02@100@12:00@01-DEC-93@TEST RUN@1@3.5@n@91@<CR>
  ```

  Note that <CR> in the above example is a single character, namely CR (0xd), at the end of this record. The 91 in the last field is the checksum derived by taking the xor of the 48 characters before the "91".

Interaction between instrument and external computer (transmission cycle):

- Host computer settings are: 4800, E, 7, 1.
- The *HVI SPECTRUM* instrument will send a start dataset record (see record types below) before the first data record of a sample.
- The *HVI SPECTRUM* instrument will send a stop dataset record after testing for a particular sample is complete and all data records for that sample have been sent and acknowledged.
- The *HVI SPECTRUM* instrument will expect to receive an ACK (Ox06) upon good transmission of record.
- The *HVI SPECTRUM* instrument will expect to receive a NAK (Ox15) upon bad transmission of record.
- The *HVI SPECTRUM* instrument will attempt three transmissions while receiving a NAK. If there is transmission failure, proceed to step g.
- The *HVI SPECTRUM* instrument will wait some time after transmission for a signal from the external computer. The amount of this time will be set in the status menu. After this time has expired, this transmission cycle will fail; proceed to step g.

- Upon failure of the transmission response sequence, the *HVI SPECTRUM* instrument will query the operator to either retransmit or abort. Abort will cause control of the instrument to return to the menu prior to sample testing.

2.8 Universal Record Format

All records transmitted from an *HVI SPECTRUM* instrument will contain a header that describes the information contained within the record. This record header follows:

<instrument type>@<module>@<record type>@<instrument id>@<time>@<date>@<record specific fields>@<check sum>@<CR>

1. **Instrument Type:**

   HVI SPECTRUM: Record is from an *HVI SPECTRUM* Instrument.

2. **Module:**

   Will be blank in the cases of start-dataset and stop-dataset.

IDENTIFIER	DESCRIPTION
L&S	*HVI SPECTRUM* Length and Strength
MIC	*HVI SPECTRUM* Micronaire
C&T	*HVI SPECTRUM* Color and Trash
SCI	*HVI SPECTRUM* SCI
MST	*HVI SPECTRUM* Moisture
MAT	*HVI SPECTRUM* Maturity
UV	*HVI SPECTRUM* UV
NEP	*HVI SPECTRUM* NEP

Table 14-2: Module Identifier and Description

3. **Record Type:**

IDENTIFIER	DESCRIPTION
01	Individual observations
02	Means
03	Standard Deviation
04	% CV
05	Start Dataset
06	Stop Dataset
07	Ready for Transmit; sent by the *HVI SPECTRUM* upon entry into System Testing
08	Discard Last Sample
09	Signoff
40	*HVI SPECTRUM* Length Single Rep Curve
41	*HVI SPECTRUM* Strength Single Rep Curve
42	*HVI SPECTRUM* Length Mean Curve
43	HVI Strength Mean Curve

Table 14-3: Record Type

4. **Instrument ID** (0 – 12 characters)

5. **Time** (xx:xx), 24-hour format

6. **Date** (dd-mmm-yy), where dd is day, mmm is month [JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC], and yy is the last two digits of the year.

PCT TIP

The customer is responsible for supplying the database program to accept the data in the Host computer.

2.9 *HVI SPECTRUM* Record Formats

The *HVI SPECTRUM* records will be divided into Length/Strength, Micronaire, Color/Trash, Spinning Consistency Index (SCI), Maturity, *HVI SPECTRUM* Moisture, and *HVI SPECTRUM* NEP Count data sets. The following describes specific fields.

Note that for the indicated fixed-length fields (xx or xx.xxx for example), the following applies:

- Integer fields are left-padded with spaces.
- Floating-point fields are left-padded with spaces (beyond the "0." units representation for values less than one), and right-padded with 0s. For example 0.32 in a format of "xx.xxx" would transmit "0.320".

The standard deviation and CV records are only transmitted for observation counts of 3 and above. A Mean record is sent if there are 2 or more observations.

For Mean record sets, some data types send a flag for two-sided Retest and /or a flag for Rejected. **'R'** is for Retest, **'n'** is for Not retested; **'L'** is for a Lot limit that was accepted, **'n'** for Not a Lot limit.

2.9.1 Length/Strength

01 Individual Observation

Field Description	**Size/Type**
Identifier	40 alphanumerics
Sample Id	12 alphanumerics
Rep #	XX
Total Reps	xx
Length	x.xxx (inches for English units) or xx.xx (mm for Metric units)
Uniformity	xx.x
Strength	xx.x
Elongation	xx.x
Short Fiber Index	xx.x

02 Mean of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample Id	12 alphanumerics
Length	x.xxx or xx.xx (as specified for Individual observations)
Length Retest	R or n
Length Lot Limit	L or n
Uniformity	xx.x
Uniformity Retest	R or n
Uniformity Lot Limit	L or n
Strength	xx.x
Strength Retest	R or n
Strength Lot Limit	L or n
Elongation	xx.x
Short Fiber Index	xx.x
Grade	6 alphanumerics
Temperature	xxx.x
Relative Humidity	xxx.x

03 Standard Deviation of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Length	x.xxx or xx.xx (as specified for Individual observations)
Uniformity	xx.x
Strength	xx.x
Elongation	xx.x
Short Fiber Index	xx.x

04 %CV of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Length	xxx.x
Uniformity	xxx.x
Strength	xxx.x
Elongation	xxx.x
Short Fiber Index	xxx.x

40 Length Individual Curve Data[1]

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rep #	xx
Total Reps	xx
Curve Data Point #1	xxxx
…	
Curve Data Point #80	xxxx

41 Strength Individual Curve Data[2]

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rep #	xx
Total Reps	xx
Curve Data Point #1	xxxx
…	
Curve Data Point #80	xxxx

[1]x-axis: starts at 0.15 inches (typically), increments 0.025; y-axis: normalized to the extrapolated y-intercept and multiplied by 1000.

[2]x-axis: starts at 0, increments 1/800 inch; y-axis: (pounds x 100)[1].

42 Length Average Curve Data

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Curve Data Point #1	xxxx
…	
Curve Data Point #80	xxxx

43 Strength Average Curve Data

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Curve Data Point #1	xxxx
…	
Curve Data Point #80	xxxx

2.9.2 Micronaire

01 Individual Observation

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rep #	xx
Total Reps	xx
Micronaire Observation	x.xx

02 Mean of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Micronaire	x.xx
Micronaire Lot Limit	L or n

03 Standard Deviation of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Micronaire	x.xx

04 %CV of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Micronaire	xxx.x

2.9.3 Color & Trash

01 Individual Observation

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rep #	xx
Total Reps	xx
Rd	xx.x
+b	xx.x
Color Grade	xxxx
Trash Particle Count	xxx
Trash Area	xx.xx
Trash Code	xx

02 Mean of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Color Retest	R or n
Rd	xx.x
Rd Lot Limit	L or n
+b	xx.x
+b Lot Limit	L or n
Color Grade	xxxx
Color Grade Lot limit	L or n
Trash Retest (Area only)	R or n
Trash Particle Count	xxx
Trash Area	xx.xx
Trash Area Lot Limit	L if rejected or n
Trash Code	xx
Trash Code Lot Limit	L or n

03 Standard Deviation of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rd	xx.x
+b	xx.x
Trash Particle Count	xxx
Trash Area	xx.xx

04 %CV of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rd	xxx.x
+b	xxx.x
Trash Particle Count	xxx.x
Trash Area	xxx.x

2.9.4 SCI

02 Mean of Observation

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
SCI	xxxx
SCI Lot Limit	L or n
CSP	xxxx
CSP Lot Limit	L or n

2.9.5 Maturity

01 Individual Observation

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rep #	xx
Total Reps	xx
Maturity	x.xx
reserved	No characters
reserved	No characters

02 Mean of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Maturity	x.xx
Maturity Lot Limit	L or n
reserved	No characters
reserved	No characters
reserved	No characters

03 Standard Deviation of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Maturity	x.xx
reserved	No characters
reserved	No characters

04 %CV of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Maturity	xxx.x
reserved	No characters
reserved	No characters

2.9.6 Moisture

01 Individual Observation

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rep #	xx
Total Reps	xx
Moisture Observation	xx.x

02 Mean of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Moisture	xx.x
Moisture Lot Limit	L or n

03 Standard Deviation of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Moisture	xx.x

04 %CV of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Moisture	xxx.x

2.9.7 NEP Count

Note: *The NEP data is only transmitted at the end of the current set of Bales for a Lot ID. NEP data is sent separately for each bale in the lot. The Start and Stop dataset records are transmitted for each set of NEP data, per bale.*

01 Individual Observation

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rep #	xx
Total Reps	xx
NEP Count Observation	xxxx

02 Mean of Observation

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
NEP Count	xxxx
NEP Count Lot Limit	L if rejected

03 Standard Deviation of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
NEP Count	xxxx

04 %CV of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
NEP Count	xxx.x

2.9.8 UV

01 Individual Observation

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
Rep #	xx
Total Reps	xx
UV Observation	xxxxx

02 Mean of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
UV	xxxxx
UV Lot Limit	L if rejected

03 Standard Deviation of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
UV	xxxxx

04 %CV of Observations

Field Description	Size/Type
Identifier	40 alphanumerics
Sample ID	12 alphanumerics
UV	xxx.x

3 Error Messages

When the microprocessor is unable to accept or process information, various error messages are displayed on the screen. These messages appear in a highlighted block and are normally accompanied by a long audio tone. If any of these messages occur repeatedly, call an Uster Technologies' service technician.

The following is a list of error messages with an explanation as to why the error may have occurred.

"At least one color grade must be entered"	The color test cannot proceed until it has a color grade to compare to the cotton sample.
"No color grades defined for this lot limit"	Either no color grades have been entered, or none of the color grades you have entered are acceptable for this lot limit.
"No color chart has been selected"	In Edit mode of the color chart wizard, you must select a color chart menu from the drop-down combo before you can edit.
"Color chart name has not been changed"	A new color chart is being generated but the title must be changed from the default "New Color Chart" name.
"The color chart name already exists"	You are attempting to create a duplicate color chart by giving it the same name as one that currently exists.
"VP.CFG File was not FOUND"	The file vp.cfg was not found in the c:\hvi directory. This file must be present for the Framegrabber to be initialized.

"Download ABORTED. FG2K.BIT File was not FOUND"	The file fg2k.bit was not found in the c:\hvi directory. This file must be present for the Framegrabber to be initialized.
"Frame Grabber Download Failed"	The process of downloading the configuration file to the Framegrabber failed.
"Framegrabber RAM test failed"	The RAM test was not successful after the Framegrabber has been initialized.
"CPLD Version Not Available. Frame Grabber is busy"	The Framegrabber did not respond to the request for the CPLD version number.
"ERROR: NOT ENOUGH MEMORY FOR SFI CALCULATION"	There is insufficient memory in the PC environment. The short fiber index calculation routines cannot allocate the memory necessary to run.
"No lot limit has been selected"	In Edit mode for lot limits, you must select a lot limit name from the drop-down combo before you can edit.
"Lot limit name has not been changed"	A new lot limit definition is being generated, but the title has not been changed from the default "New Lot Limit" name.
"The lot limit name already exists"	You are attempting to create a duplicate set of lot limits.
"Breaker Error at location X"	The breaker was in the wrong location during the start of step X of the length/strength cycle.

"Receive data register full in Control Board"	The receive data register filled up without being processed in the control board.
"Receive buffer overflow in Control Board"	The receive buffer overflowed in the control board.
"Noise error in Control Board"	A value that was not valid data was received in the control board.
"Framing error in Control Board"	The byte was not properly framed when received by the control board.
"ERROR: LOW AMOUNT ->"	During Testing, the sample of cotton taken was too small to give good strength results. The Length/Strength cycle must be repeated.
"ERROR: HIGH AMOUNT ->"	During Testing, the sample of cotton taken was too large to give good strength results. The Length/Strength cycle must be repeated.
"Read Video Configuration File failed"	The Video configuration file (vp.cfg) could not be read.
"Xilinx Download failed"	The Framegrabber card could not be programmed.
"The number of color/trash tests must be 1 or 2 times the number of length/strength tests"	On the SETUP, CONFIGURATION page, under the MEASUREMENTS TAB, the number of color/trash tests must be either the same as the number of length/strength tests, or exactly twice the number.
"Error: Positioner not at back of middle sensor before starting Length/Strength cycle"	Reset and initialize Length/Strength unit to continue.

"Error: Positioner not at front of cabinet before taking sample"	Reset and initialize Length/Strength unit to continue.
"Error: Positioner not at middle sensor before carding sample"	Reset and initialize Length/Strength unit to continue.
"Error: Positioner not in correct position for carding sample"	Reset and initialize Length/Strength unit to continue.
"Error: Positioner not in correct position for brushing sample"	Reset and initialize Length/Strength unit to continue.
"Error: Positioner not able to find back sensor after brushing"	Reset and initialize Length/Strength unit to continue.
"Error: Positioner not at back sensor before reading length data"	Reset and initialize Length/Strength unit to continue.
"Error: Positioner did not find back sensor after taking strength data"	Reset and initialize Length/Strength unit to continue.
"Error: Positioner not at correct position for doffing sample"	Reset and initialize Length/Strength unit to continue.
"Error: Positioner not at middle sensor after completing Length/Strength cycle"	Reset and initialize Length/Strength unit to continue.

"Error: Elevator not at top position when starting Length/Strength cycle"	Reset and initialize Length/Strength cabinet to continue.
"Error: Elevator not at top position when taking sample"	Reset and initialize Length/Strength cabinet to continue.
"Error: Breaker not positioned to take data"	Reset and initialize Length/Strength cabinet to continue.
"Error: Elevator not in correct position"	Reset and initialize Length/Strength Cabinet to continue.
"Error: Positioner not in correct position"	Reset and initialize Length/Strength Cabinet to continue.
"Error:Breaker not in correct position"	Reset and initialize Length/Strength Cabinet to continue.

Table 14–4: Error Messages

Chapter 15 Glossary

+b — The part of Hunter's Scale that indicates yellowness. Cotton ranges from 4 to 18. +b appears as a report header.

 # Break Points — The number of readings taken on the stress-strain curve.

Max Amount — The selected maximum amount suitable for testing.

Min Amount — The selected minimum amount suitable for testing.

Alphanumeric — Numbers and alphabetical characters on a keyboard in upper or lower case.

Amount — Relates to the size of the prepared beard of fibers and is proportional to the number of fibers in the prepared beard.

Area — The abbreviation for Trash Area that appears as a report header.

Arrow keys — These keys are used to move the cursor or highlight bar to the desired position. They are located on the keyboard and are labeled with an arrow for the direction in which the arrow points: Up arrow ↑, down arrow ↓, left arrow ←, and right arrow →.

Baud Rate — This is the rate, in bits per second, at which information is transmitted over a serial path. For successful serial communication, the baud rate of the computer and peripheral must be the same. For Bale Manager the Baud Rate is set on the COMMUNICATIONS screen that is displayed when **COMMUNICATIONS SETTINGS** is selected from the EXPORT MENU.

Beard — The sample fibers that are gathered in the comb. In length testing, the part of the specimen that protrudes from the comb that has been combed and brushed.

Break Amount — The amount values required for measurement of fiber strength.

C.G. — The abbreviation for Color Grade that appears as a report header.

Calibration — Calibration is used to check or correct the graduations of measurement on the *HVI SPECTRUM* instrument.

Calibration Constants — The slopes and offsets obtained by the two-point regression in the calibration procedure.

Calibration Tolerances — In calibration procedures, the selected allowable deviations in measurement of the properties assigned to the calibration samples of fiber.

Category — A method for analyzing test data. The fiber properties are broken into defined groups for classifying the cotton. Each sample is assigned a category for each fiber property as it is imported into the system.

Category Definition — The method of assigning the number of categories, the beginning and ending values, and the interval between the categories for each of the fiber properties and calculated properties.

Category Intervals — The range between the categories.

Centered Mixes — Centered mixes are used in applications where special yarn qualities are needed. Centered mixes make a bale selection with a specified mix average that may be different from the warehouse average. For example, in a specific application for strong yarn, stronger cotton is needed in the mix/laydown. Stronger cotton can then be selected with a centered mix to meet the specified strength average for that mix. The program will pull an evenly distributed mix to achieve that average, however excluding the lower strength categories in the warehouse. See also *Proportional Mixes*.

Cnt — The abbreviation for Trash Count that appears as a report header.

Colorimeter — The instrument used to measure the reflectance and the degree of yellowness in cotton.

Comb (Fibrocomb) — The specimen holder that is used to gather the sample fibers (beard) from the mass of fibers.

Constant — The value in the SCI or CSP equation that is to be multiplied by a test value.

Count Strength Product (CSP) — In determination of yarn strength, the product of the English yarn number (Ne) and skein break value (SBr).

Cursor — A special symbol seen on the monitor screen; a flashing underline or box, that indicates the position where the next character will be entered.

Data Files — A file created within an application. In this case, the data files generally refer to the files containing the *HVI SPECTRUM* test results.

Database — A large collection of data that is organized so that it can be searched, retrieved, updated, and expanded for different purposes.

Default Settings — The predetermined action or value set in the software program that will take effect unless a value is entered. These temporary answers can be overridden by entering another value.

Destination — This determines where a report will be seen. For example, a report can be sent to either the screen or to the printer.

Elongation — The distance to the maximum of the stress-strain curve, less the distance attributed to crimp, multiplied by 100, and divided by the break gage (1/8 inch).

Enter — This keyboard key is sometimes labeled **RETURN**. When the key is pressed, the software interprets this as a signal to proceed to the next action.

Exit — Button used to leave the current operation or screen.

Fibrogram — The Fibrograph curve representing the second accumulation of the length distribution of length distribution of the fibers sensed by the *FIBROGRAPH* instrument in scanning the fibers.

Field — A defined area or location on the screen for entering particular information.

Field Label — The name or label associated with a field. It appears on the screen to identify the field.

File — A collection of information that has been assigned a name and is stored on disk.

Filename — The name that is assigned to a file.

Fin — Abbreviation for Fineness that appears as a report header.

Fineness — Fiber weight per unit length or linear density.

Floppy disk — A device used for storing data. A floppy disk can be inserted in and removed from a floppy disk drive (typically 3.5-inches in diameter). Often used to backup data or to move data from one computer system to another.

Force — The pounds needed to break the yarn.

Front Position — When the needles are closest in proximity to the optics, the front position is the distance between the center of the needles and the center of the optics.

Grade — The Grade appears as a report header.

Hard disk — A device used for storing data on a permanent or semi-permanent basis. It is a large rigid platter that is permanently mounted in its drive. It is capable of storing a large amount of data.

Hardware Configuration — The setup of your computer, keyboard, monitor, and printer.

Highest value for first category — The value at which the fiber property's first category should end. All bales that have a measured value at or below this value are included in the first category.

Histogram — A graphical representation of a frequency distribution. One axis plots the values of a particular characteristic while columns

perpendicular to that axis contain the proportional count of the frequency with which the characteristic occurs.

ID — A name or number designating a bale or sample for testing. A series of ID numbers is usually associated with the same identifier.

Instrument Constants — Values assigned to formulae within the software and related to various internal functions of the instrument.

Identifier — A name or number that defines, or is associated with, a particular group of samples.

Interval between categories — The value of the difference between the categories within a fiber property. The value assigned as the interval varies from one fiber property to another.

Leaf — The trash content in the cotton fiber.

Len — The abbreviation for Length that appears as a report header.

Len1 — Either the mean length measured value.

Len2 — Either the upper half mean length measured value.

Length — Based on the Mean Length and Upper Half Mean Length.

Length Standard — The metal comb provided with the instrument that is used to measure the distance from the comb transport's home position to the center of the optics.

Listings — The reports that are generated by the software. There is usually a choice to display the listing on the screen or to generate a hard copy from the printer.

Lot Limits — The upper and lower limits assigned to each fiber property.

Lot Limit Rejections — When the values for the fiber property are not within the valid lot limits, a bale is rejected.

Lots — Groups of cotton bales are called "Lots".

Mat — Maturity appears as a report header.

Mean Length — The average length of the fibers in the sample.

Mic — The abbreviation for Micronaire that appears as a report header.

Micronaire — A value associated with cotton fineness (fiber perimeter) and maturity (cell wall thickness) by use of the airflow method.

Mix Mode — determines how bales are selected from the warehouse. See also *Proportional Mixes* and *Centered Mixes*.

Modulus — The spring constant of a sample of fibers. The slope of a straight line that is tangent to the stress-strain curve at a point halfway to the force maximum of the curve.

Neppiness — The amount of Neps that are in the cotton.

Number of Categories — A maximum of 10 categories are allowed for each fiber property. The number selected should reflect your inventory, but not exceed the requirements because you do not want an excessive number of categories in the warehouse.

Numeric — Only numbers can be used. In certain fields, a valid entry must consist of numbers (no alphabetic characters are allowed).

Observations — The number of individual tests made on a sample. During system testing, the values displayed, printed, and/or sent to a host computer are averages of the number of observations made on the sample.

On Line — The computer directly controls the equipment or devices that respond to the user's commands. A printer must be on line before printing can occur.

Optics — The LED light source, lens, photo detector, and electronics system within the instrument.

Parameters — Characteristic elements chosen by the user such as the constant values entered and used by the software to determine the measured values of the sample.

Port — This is the connection on the computer where you plug the cable that carries data to another device. The Port is set on the COMMUNICATIONS screen that is displayed when **COMMUNICATIONS SETTINGS** is selected from the EXPORT MENU.

Printer Configuration — Determines the code sent to the printer for different printer selections.

Printer Graphics Type — The type of printer that is being used (IBM Graphics, Epson, Okidata, HP, etc.).

Printout — The paper copy of a report that is printed on the printer.

Properties — The characteristics or measured values of a sample.

Proportional Mixes — Proportional mixes are pulled proportionally to the distribution of all bales in each category in the warehouse. This means that all bales in the warehouse are being considered for the selection process. This is necessary to ensure all bales will be used at some point in time, avoiding bales to be left over. See also *Centered Mixes*.

Protocol — A set of rules that defines how computers communicate with each other when they transmit and receive data.

Range — The variance between certain set limits.

Rd — The unit of measurement for reflectance. Higher Rd values indicate higher grades of cotton. Rd appears as a report header.

Reflectance — The amount of light reflected from an object. It is measured on a black and white scale of 0 to 100 in units of Rd. Cotton ranges from 40 to 85 Rd.

Regression coefficients — The coefficient related to each measured fiber property in the mathematics of regression analysis.

Reject Bales — Bales outside of Lot Limits.

Report — Information based on selected parameters that is sent to the screen or printed.

Report Type — A report can be based on actual test values or on the category that was assigned to the test value. Reports can have both value and categories.

Reverse Chronological Order — Arranged in the opposite order from occurrence. The most recent event is listed first.

Sample — The cotton fiber mass to be tested. For Micronaire measurements, it must be a certain weight; for length, strength, uniformity, and elongation measurements, it must be in the form of a beard.

SCI — Spinning Consistency Index is a calculated value based on a regression equation that takes into account all *HVI SPECTRUM* properties and calculates one value to be used on each sample tested. SCI also appears as a report header.

SFI — Short Fiber Index appears as a report header.

Software — The instructions that make the computer hardware perform tasks. Programs, operating systems, and applications are all software.

Source File — Data file on floppy.

Span Length — The distance a selected percentage of fibers extend from a clamp in which they have been caught at random along their length.

Specific Surface — The relationship between total fiber surface area to the total fiber volume as measured by the resistance to air flow of a known mass of fibers confined in a fixed volume.

Specification — A set of criteria that has been established to ensure that samples are acceptable.

Spinning Potential — Based on test results, the anticipated quality of yarn after it is spun.

Standard Values — Values assigned to the calibration samples of fiber.

Status — The menu where the parameters that affect the program components are defined. The items on these menus are normally defined when the system is first set up and remain unchanged indefinitely.

Str — The abbreviation for Strength that appears as a report header.

Strength — The relationship of the breaking force to the mass of fibers broken, corrected for Micronaire and modified by the calibration constants. The units match the standard values entered for calibration cottons, typically grams per tex (g/tex).

Strength @ % Elong — The percent elongation at which a secondary strength measurement is made for mm fibers.

Stress-Strain Curve — A graphical representation that shows the relationship of the sample's change in dimension to the force applied and the magnitude of the force.

Subdirectory — A logical division of the disk drive used so that files can be grouped together for easier access.

T — The abbreviation for Trash tat appears as a report header.

Test — A measurement, either a single observation or the average of several observations, taken by the instrument on a sample.

Test Series — A group of tests performed on a sample (i.e. Color, Trash, Micronaire, Length, Strength, Uniformity, and Elongation tests performed on samples).

Trash — The non-fiber portion of cotton. It consists of stems, hulls, whole or parts of seeds, motes, grass, sand, dust, oil from machinery, etc. Using the video camera, all areas darker than a threshold level are counted as trash. The discrimination between trash and background is

made on the basis of absolute reflectivity rather than trash contrast, so variations in cotton background do not affect the readings.

Trash Area — The ratio of the accumulated areas of all the trash particles to the area of the viewing window of the instrument.

Trash Code — The range where the tested sample falls according to the levels determined during calibration.

Trash Count — The number of individual particles of trash in the sample that are 0.01 inch in diameter or larger.

Unf — Abbreviation for Uniformity that appears as a report header.

Uniformity — The ratio, expressed in percent, of two length measurements.

Upper Half Mean Length — The average length, by number, of the longer half (50%), by weight, of the fibers in a sample.

USDA Color Grade — A three-digit code associated with the Universal Standards of American Upland Cotton.

Version — The revision level of the software.

Window — In the *HVI SPECTRUM* software, the windows are the sections of the screen bordered by single or double lines that present information to the operator or provide a place for the operator to enter information into the system.

Work @ % Elong — The percent elongation at which a secondary work measurement is made for mm fibers.

Chapter 16 Index

P

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R

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T

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