NATIONAL OPTRONICS

The Optronics 6E Patternless Edger System

User's Manual

Rev. 2.92 *December 23, 2003*

Warnings, Cautions, and Notes as Used in this Publication

Warning

Warning notices are used in this publication to emphasize that hazardous voltages, sharp edges, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

Caution

Caution notices are used where equipment might be damaged if care is not taken.

Note

Notes merely call attention to information that is especially significant to understanding and operating the equipment.

This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained herein does not purport to cover all details or variations in hardware or software, nor to provide for every possible contingency in connection with installation, operation, or maintenance. National Optronics assumes no obligation of notice to holders of this document with respect to changes subsequently made.

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Safety Reminders

- DO NOT operate this machine until you have read and understood this manual—if operating for the first time; ask your supervisor or a qualified operator for help.
- DO NOT attempt to bypass or circumvent the built-in safety features: the safety switches and the chip chute cover. They are in place for operator protection—any alteration, removal or damage can cause a serious safety hazard. Doing so will void your warranty.
- DO NOT attempt changing cutters or any machine maintenance or repair until you have turned the cutter motor switch to OFF.

ROTATING CUTTERS CAN CAUSE SERIOUS INJURY.
USE EXTREME CAUTION WHEN WORKING NEAR THE CUTTERS.

- Plug unit into a grounded receptacle ONLY! Do not cut off the ground prong or use any cord or adapter without a ground prong.
- Always assume that the power and motor switch are ON—do not attempt any cutter change or maintenance until you have verified they are OFF.
- When changing inserts, always make sure that the insert clamp(s) are tight before starting the machine.
- Never turn the machine or the cutter motor on while someone is performing maintenance or repair.
- Always wear safety glasses with side shields when servicing the machinery.
- Never operate this machine while on medication which may affect sight or coordination.
- Under normal operation, the 6E produces sound levels within the requirements of the Occupational Safety and Health Administration Regulations. However, the use of the 6E with other noise producing equipment may raise sound levels to a degree where hearing protection should be worn by the user. Therefore, if the users' environmental circumstances cause a projected noise dose of 85% or more (appropriate testing is recommended), the use of hearing protection is highly recommended. Further, sensitivity to noise levels may depend on the individual user. While the 6E operates within accepted noise standards, the use of hearing protection should be considered by the user should the user experience discomfort or abnormal hearing sensations during use.
- The 6E should be lifted very carefully by two people. Before attempting to move or lift the edger, ensure that all connections (electrical, communications, and vacuum) have been disconnected from the edger. To lift the edger, each person should carefully lift the edger from the bottom of each edge, using both hands.

THINK SAFETY FIRST—ALWAYS PRACTICE SAFE WORK HABITS.

Content of This Manual

Chapter 1. **Prerequisites:** Includes National Optronics contact information, requirements for use such as electrical supply and operating conditions, and general specifications of the Optronics 6E Patternless Edger System.

Chapter 2. **Getting Started:** Includes instructions on initial installation and daily maintenance.

Chapter 3. **Commonly Performed Tasks:** Includes instructions for changing the blade, verifying size and bevel placement, updating the software code, and changing the vacuum bag and paper filter.

Chapter 4. **Operating the 6E (Standard Operation):** Includes tasks performed while using the 6E in a standard operation, such as pulling down a job, edging (roughing and finishing), polishing, grooving, and safety beveling.

Chapter 5. **Calibrating the 6E:** Includes instructions on all aspects of calibration.

Chapter 6. **Performing Periodic Maintenance:** Includes instructions for performing non-daily maintenance tasks. (For daily maintenance tasks, refer to Chapter 2.)

Chapter 7. **Advanced Configuration & Special Considerations:** Includes instructions on less commonly performed tasks with the 6E Edger System such as changing display options on the *Job Screen*, creating alternate selections on the *Blank Materials* screen, reading and interpreting data collected in the *Log Screen*, and using less common calibration settings. These tasks are generally performed by a lab manager or a National Optronics technician and are password protected.

Appendix A. **Screen Field Definitions:** Includes reference information including definitions of the fields on the screens you will see on the 6E's monitor.

Appendix B. **6E System Messages:** Describes and gives more detail about the messages you will see on the 6E's monitor (warnings, information, etc.).

Appendix C. **Spindle Assembly:** Shows an exploded view of the spindle Assembly.

Appendix D. **Statement of Warranty:** Includes the Warranty Statement for the 6E.

Changes to This Manual from the Previous Edition

Probe Alignment:

On newer 6Es, there is a vertical alignment tool for the probe. The instructions on how to use this probe are detailed on page 6-6.

6E System Messages:

All 6E system messages are detailed and updated in Appendix B.

Calibration, Communications, and Blank Materials (Ver. 1.53):

With software version 1.53 and later, the *Communications Screen* (see Chapter 2) is different from the previous version. Also, you can use both Wheel 1 and Wheel 2 for polishing (see Chapter 5 for calibration guidelines).

The Frame Screen and Other New Features in Ver. 1.54 and later:

With software version 1.54 and later, the *Frame Screen* has a new column showing the default bevel positioning for different types of frames. You can adjust this setting or accept the defaults, as explained in the *Frame Screen* field definitions provided in Appendix A.

In addition, there is a newly tested, improved method of priming the pump on the water reservoir (if it runs completely out of water or for first time use setup) in Chapter 2.

With software version 1.56 and later, the *Setup Screen* has a new checkbox for dealing with rimless lenses. You can also adjust the default for right and left recut cursor position separately. (Previously, there was just one setting that affected both right and left.) The *Setup Screen* field definitions are provided in Appendix A.

With software version 1.57 and later, the *Advanced Setup Screen* has a new field, "Trace Size Adjustment," which provides additional adjustments for frame fit after size verification of the internal 58 mm circle (refer to its screen definition in Appendix A). In addition, as an effort to improve the Optronics documentation, there are minor changes and clarifications in several sections within this manual.

With software version 1.59 and later, the *Blank Material* screens (both Material screens) have a new default material, *ThinLens, designed to improve bevel placement on lenses with an extremely thin center.

With software version 1.63 and later, the *Job Screen* has some new functionality in regards to rimless lenses—refer to pages A-4 and A-5 for details.

With software version 1.65 and later, there are some new error messages—refer to Appendix B if you encounter an unfamiliar error message. There was also a minor change affecting the replacement of the sponge—refer to Chapter 6, "Periodic Maintenance," for more details. A more significant change appears at the end of Chapter 7, where there are instructions on handling thin lenses with AR coating.

New Features Discussed in This Edition of the *6E User's Manual*

Changes Beginning with the 2.0 Edition:

The 2.0 Edition of this manual documents recent hardware improvements and Version 2.0 software enhancements including:

- Special clamps for thin lenses with A/R coating—refer to page 7-7 and following for details.
- There are several enhancements to the 6E's backup and restore functionality. These are discussed in detail on page 3-8 and following, as well as the field definitions for the *Communications Screen* and the *Log Screen* in Appendix A for details.
- There is additional OMA protocol support, noted in the field definitions for the *Job Screen* in Appendix A.
- There is a new lab preference to probe after the roughing cycle and skip the probing at the beginning of a cycle—refer to the field definitions for the *Setup Screen* and the *Material Screen* in Appendix A for details.
- There are two new bevel types: "Fixed" and "Percent," which will place the center of the bevel either at a fixed or a percentage distance from the front of the lens—refer to the field definitions for the *Setup Screen* in Appendix A for details.
- There is a new filter on the coolant reservoir to protect the system from damage by debris. Periodic changing of this filter is discussed in Chapter 6.
- This edition explains the new Pause Mode and the existing Profile Mode for bevel placement.
- There are a few new fields, defined in Appendix A, and a few new error messages, defined in Appendix B.
- Software version 2.11 includes multiple improvements and refinements in operation and interface. The changes include, but are not limited to, an improved Status Area on the *Job Screen*, new options on the *Job Screen*, new features on the *Setup* and *Advanced Setup Screens* (see Appendix A and applicable parts of Chapter 4 and 5). Some 6Es also have a new air filter located on the back of the 6E instead of inside. Directions for changing the air filter are included in Chapter 6.
- Software versions 2.12 and 3.06 are identical in functionality and user interface. The only difference is in the hardware interface, one designed for a different servo card than the other. Both include a new field on the *Setup Screen* and on the *Advanced Setup Screen*.

- Software versions 2.13 and 3.07 (identical in functionality and user interface—see previous bullet) include enhancements to the *Setup Screen* and the *Communications Screen*—refer to Appendix A.

- Software versions 2.15 and 3.09 (identical in functionality and user interface—see previous bullets) include an enhancement to the *Servo Screen*—refer to Appendix A. This change is virtually invisible to the user because the two fields added to the *Servo Screen* should not be changed by the user unless directed to do so from an Optronics Technician. This manual revision also includes a drawing of the 6E Spindle Assembly for reference purposes—refer to Appendix C.

- Revision 2.9 of the User's Manual includes a new drawing of the Accessory Kit, which now includes a one-ounce cup to be used when mixing Tri-Cool with distilled water prior to filling the water bottle—refer to Chapter 2 for more information. Revision 2.91 has a new drawing of the Accessory Kit (Page 2-13).

- Revision 2.92 includes a modified drawing of the Accessory Kit in Chapter 2 and new information about A/R coating for thin lenses—refer to Chapter 7 for more information. There are also three new materials shown on the *Blank Materials Screen*, field definitions supplied in Appendix A. In addition, this software version includes a new method for cleaning the Polishing Wheel—refer to Chapter 3 for details.

This manual was released with Software Version 2.16/3.10. Future software upgrades do not necessarily affect the manual. Call technical support if you feel you need a newer manual.

Chapter 1

Before You Begin

Before You Begin

General Description

The 6E is a state-of-the-art 3-axis Patternless Edger manufactured by National Optronics, Inc. It will process Polycarbonate, Hi-index and CR-39 lenses with exceptional accuracy. Standard features include pin beveling, polishing, grooving, and automatic decentration. The clamping pressure applied by the 6E's electric chuck is automatically adjusted by the selection of lens material, addressing A/R crazing issues.

In addition to its superior mechanics, the 6E's unique software can accumulate statistical lens information that most operators now keep manually. Automatic prompts will remind operators to maintain their equipment.

For Further Assistance

If you should require any further assistance, National Optronics can be contacted directly between 8:30 AM and 5:00 PM ET Monday through Friday.

National Optronics
100 Avon Street
P.O. Box 1547
Charlottesville, Virginia 22902

Toll-free:	(800) 247-9796
Tel:	(434) 295-9126
Parts Order Fax:	(888) 239-0778
General Fax:	(434) 295-7799

To Order Parts:

Please call our Customer Service Department at 800-247-9796 ext. 317.

Please know your part number, serial number of the machine and Customer Account Number.

If you do not know the part number of the part you need to order, you will need to talk with Technical Assistance. The following guidelines for Technical Assistance will apply in that circumstance.

If you need to return a part, the Customer Service Department will issue a Return Authorization Number to you and explain the procedure for returning parts.

For Technical Assistance:

Please call our Technical Service Department at 800-247-9796 ext. 314 and know the serial number of your machine and Customer Account Number. If you purchased your equipment from National Optronics, there is no charge for telephone support. If, however, you purchased your Optronics equipment elsewhere, you will be charged for telephone support at the rate of $47.50 per half hour.

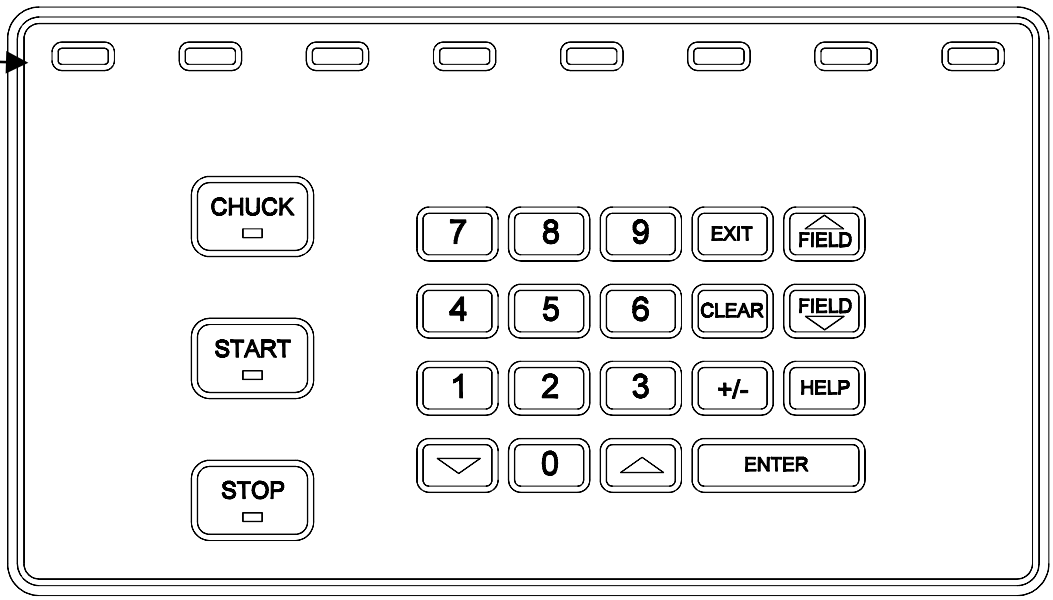
If you would like to schedule an on-site Technical Service visit, please call Technical Support at 800-247-9796 ext. 314. Please know the serial number of your machine and Customer Account Number for requesting a Technical Service visit. There is no charge for warranty service visits. If your machine is out of warranty, there is a charge of $55.00 per hour for travel to and from the equipment location and $125.00 per hour (two-hour minimum) for the Technician's time at the location. Any additional travel expenses incurred, such as airline tickets, hotel rooms, etc., are billed to the customer.

The rates published above may be subject to change without notice.

Conventions Used in This Manual

Wherever possible, keys on the 6E keypad are identified with a graphic representation of the key, such as, the FIELD key. The function keys run along the top of the keypad and are associated with buttons on the screen. These buttons have different meanings depending on which screen you are viewing. Although they are not marked, these keys will be identified as F1 through F8, such as the *Job* function key F1.

Function keys: F1 through F8



Names of screens and fields within screens will be placed in Italics, for example, the *Setup Screen*. Values in a field will be in quotation marks, as in, The default for the *New Code Source* field is "Floppy."

Requirements for Use

115 VAC 60 Hz 20A Electrical Supply

This is standard outlet power in the United States. The Optronics 6E Patternless Edger System should be on a dedicated circuit (no other electrical loads connected to the same circuit) to ensure a uniform, consistent power supply. The maximum continuous power consumption of the edger, including the vacuum, is 14.3 amps. The 6E must be properly grounded—do not use any adapter that will bypass the grounding plug.

Power fluctuations can adversely affect production and machine integrity. Please contact the factory if you have power glitches or questions about the power requirements.

Note

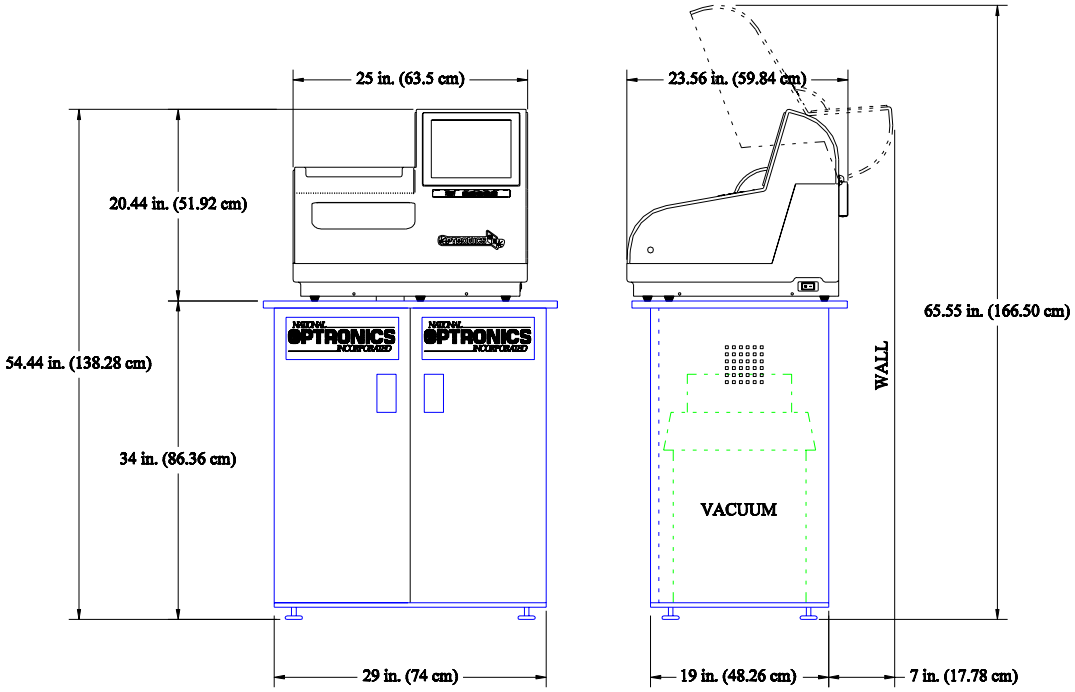
The 6E is available for 230V 50 Hz installations. It is also recommended for 230V units to be installed on a dedicated circuit.

Operating Conditions

The 6E edger is designed for indoor use only. The edger is designed to operate safely at a temperature range of 5° C to 40° C, at altitudes up to 2000 meters.

General Specifications

The following drawing illustrates the general specifications of the Optronics 6E Patternless Edger System:



General Specifications

Cutters

Special grade carbide.

Cutter Motor

Adjustable speed (10,000 RPM Nominal) DC Brushless, 1/3 Hp.

Bevel Placement

3-Axis Numerical Control; 7 bevel selections with independent point control.

Vacuum

2.5 HP, 109 CFM (9A).

Lens Materials

CR-39, Polycarbonate, All High Index, Trivex, NO GLASS.

Statement Against Misuse

The 6E edger is designed to edge **plastic lenses only**. Any other use of the machine will compromise its safety protection features.

Caution

The 6E will edge ONLY PLASTIC LENSES. Under no circumstances should any attempt be made to process a glass lens on this unit!

Chapter 2 Getting Started & Daily Maintenance

Section 1: Initial Installation

National Optronics can provide field technicians who will install your equipment and set up the Optronics 6E Patternless Edger System to meet the needs of your specific operation. You can, however, perform these tasks yourself. Use the information in this chapter as a guide through the initial installation and daily cleaning. To learn about the procedures for changing the cutter blades, checking size and bevel position, and vacuum bag replacement, read Chapter 3, "Commonly Performed Tasks." To learn about tasks performed while using the 6E in a standard operation, such as pulling down a job, edging (roughing and finishing), polishing, and safety beveling, refer to Chapter 4, "Operating the 6E (Standard Operation)." To learn about calibration instructions, refer to Chapter 5, "Calibrating the 6E."

There are four phases to setting up the 6E:

1. Setting up the cabinet (skipped if you already have one)
2. Preparing the work bench
3. Setting up the vacuum unit
4. Setting up the 6E Edger itself (physical setup)

Within the final phase, physically setting up the 6E, there are four main steps:

1. Placing the 6E on the cabinet and connecting the vacuum unit
2. Removing the shipping brackets
3. Connecting the 6E to your electric outlet
4. Filling the coolant reservoir (the water bottle)

Note

These procedures should be followed in sequence: the completion of one step may depend on the one previous to it. Tools are provided in the accessory kit (see the drawing on page 2- 13) to aid in both the installation and subsequent operation. The 6E can be shipped with a cabinet, which is custom designed for the application. The laboratory can either: (1) use the custom cabinet, or (2) mount the edger on a standard workbench.

Setting Up the Cabinet

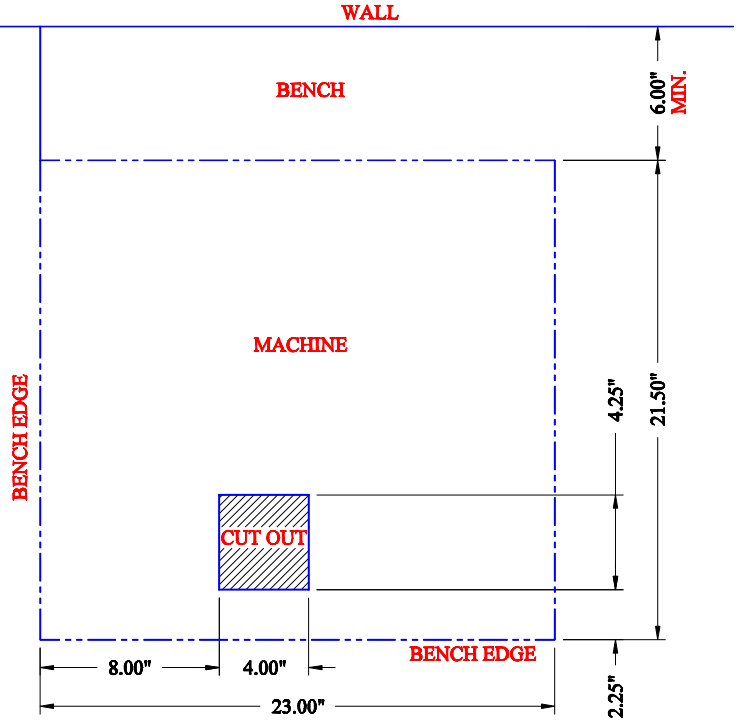
If the edger is being installed on a workbench already present in the lab, proceed to "Preparing the Workbench" below for making the necessary cutouts.

To set up the Optronics workbench, follow these steps:

1. Remove the cabinet and cabinet top from the box.
2. Place cabinet top, white side down, on floor.
3. Place cabinet upside down on cabinet top, with the doors on the same side as the cutout in the cabinet top.
4. Attach cabinet to cabinet top with screws provided.

Preparing the Workbench

Prepare the bench surface to be used by cutting an opening for the vacuum hose and vacuum power cord (if the opening does not already exist) as shown below:



Note

The Optronics cabinet has an additional hole in the back panel, approximately six inches from the floor, for the vacuum power cord. You may need to cut a hole in the cabinet or move the cabinet two inches out from the wall to supply power to the 6E itself. The power connection for the 6E is located on the back of the unit.

Setting Up the Vacuum Unit

There are two parts to setting up the vacuum unit: assembling the vacuum and setting it up inside the cabinet.

Assembling the Vacuum

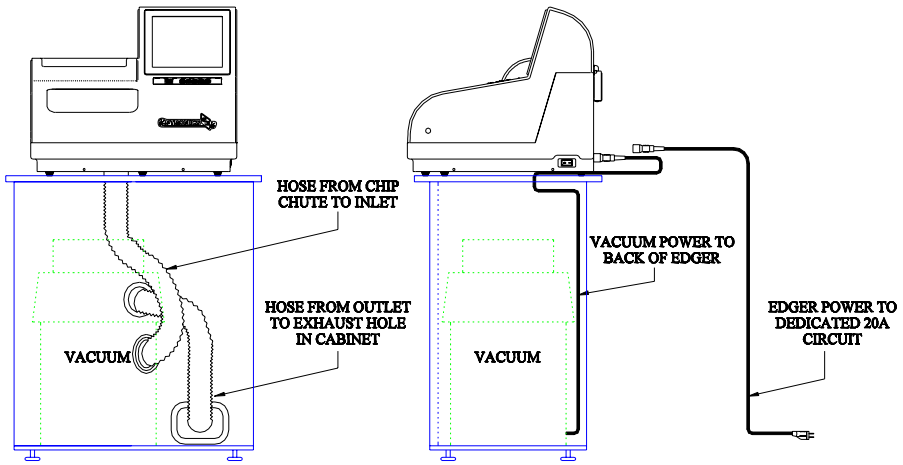
To assemble the vacuum, follow these steps:

1. Remove the vacuum from the box.
2. Open the vacuum and remove the accessories from inside the canister.
3. Install the small motor filter bag, and place the large dust collection bag around the inlet.
4. Replace the vacuum top, making sure the snaps are tight.
5. Turn the switch to the ON position—its cycling is controlled automatically.

Setting Up the Vacuum Inside the Cabinet

If you are using a different cabinet than the one Optronics provides, make sure that you have a hole in the top of the cabinet for the vacuum hose (refer to "Preparing the Workbench" on the previous page). To set up the vacuum correctly, follow these steps:

1. Place the vacuum unit under the workbench so that the short hose can reach from the vacuum inlet to the underside coupling of the edger chip chute (refer to the left portion of the drawing shown below).
2. Run the power cord through the vacuum/power cord hole in the top of the cabinet. After you have placed the 6E on the workbench, plug the vacuum power cord into the back of the 6E (refer to the right portion of the drawing shown below).



3. **Properly ground the vacuum:** A green, yellow-striped ground wire extends from the can of the vacuum with an eyelet attached to its end. There are three suggested methods to grounding the vacuum. In order of preference, these methods are: (1) Attach the eyelet directly to the ground frame inside the housing of an electrical outlet (preferred) or to the faceplate screw on

the front of the electrical outlet. (2) Attach the eyelet to a grounded metal water pipe. Make sure the water pipe is grounded, using an ohmmeter to check the continuity between the pipe and earth ground (grounding rod). (3) Attach the eyelet to the front right bolt of the left spindle support, running the ground wire up through the chip chute hole.

4. **Properly ground the vacuum hose:** The green, yellow-striped ground wire, attached to the anti-static segment of the vacuum hose, has an eyelet attached to its end. Attach this eyelet to the same ground as the vacuum itself if the wire will reach. (The three suggested methods to grounding the vacuum are the same as listed above for the vacuum itself, in that order of preference.)

Setting Up the 6E

There are four main steps to setting up the 6E:

1. Placing the 6E on the cabinet and connecting the vacuum unit
2. Removing the shipping brackets
3. Connecting the 6E to your electric outlet
4. Filling the coolant reservoir (the water bottle)

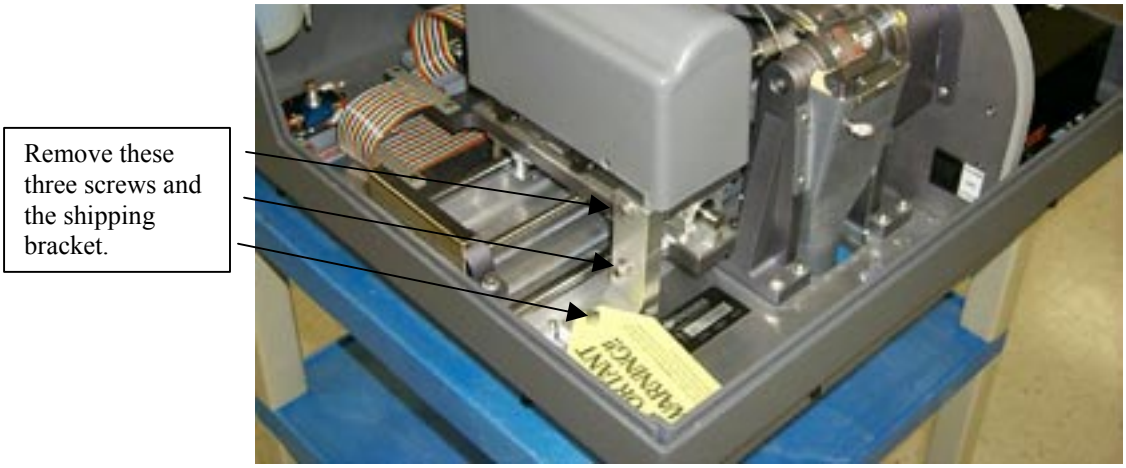
Placing the 6E on the Cabinet

To place the 6E on the cabinet and connect the vacuum correctly, follow these steps:

1. Remove the unit from its shipping foam and place it on the cabinet or table with all six feet on the bench top, and the cutout in the base plate roughly aligned with the cutout in the bench top.
2. Plug the vacuum power cord into the back of the edger.
3. Attach the vacuum hose from the bottom of the chip chute to the inlet (lower hole) of the vacuum.

Removing the Shipping Bracket

Remove the shipping bracket that holds the two carriages in place (refer to the drawing shown below). These can be removed with a 3/16-inch hex wrench found in the hex key set. The bracket is identified with a yellow tag.



Connecting the 6E to an Electric Outlet

As with all electrical equipment, you must ensure proper power connection for proper functionality.

Note

The 6E Edger must be connected to a dedicated 115V 20A circuit.

Connect the 6E to power following these steps:

1. Before connecting power, make sure that the edger ON/OFF switch is "OFF."
2. Plug the female end of the power cord into the back of the unit and the male end into the wall outlet, making sure that the connections are secure.

Filling the Coolant Reservoir (the Water Bottle)

The coolant reservoir feeds the coolant to the sponge used for keeping the polishing wheel from overheating. Ensure that there is always coolant (the mixture of distilled water and Trico's Tri-Cool coolant) in the reservoir. Failure to do so may damage the machinery.

To fill the coolant reservoir, follow these steps:

Using the one-ounce measuring cup from the 6ES Accessory Kit, mix one ounce of Trico's Tri-Cool coolant with one gallon of distilled water; then fill the reservoir from this mixture. This ratio of distilled water to Tri-Cool coolant is 128:1.

Note

If the coolant reservoir is totally empty, you may need to "prime the pump" before it will flow properly. The easiest way to do this is to follow these steps:

1. Go to the *Cleaning Screen* (from the *Setup Screen,* press the *Cleaning* function key F2).
2. Move the bevel carriage to the right (F3 on the *Cleaning Screen*) to gain access to the solenoid.
3. Set the *Water Flow* field to **20**.
4. Down by the solenoid, disconnect the water line running from the pump (to the solenoid).
5. Remove the lid of the water bottle.
6. Hold the water line you just connected so that it will squirt water back in the water bottle.
7. Press the *Pump on* function key F5 on the *Cleaning Screen*.
8. Watch the clear tubes to see if water is coming out—it should be shooting water into the bottle.
9. Ensure that the water is flowing properly, then press the *Pump off* key F6.
10. Reconnect the water line to the solenoid.
11. Turn the pump on again and wait for the air to be cleared from the hose leading to the sponge.
12. Turn the pump off once the air is cleared and the sponge is saturated.

Wetting the Sponge for Initial Use

For the first time you use the 6E, follow these steps to wet the sponge:

1. Go to the *Cleaning Screen* (from the *Setup Screen* press the *Cleaning* function key F2).
2. Press the *Pump on* function key F5 until the sponge is wet.
3. Press the *Pump off* function key F6 after the sponge is completely wet.

Note

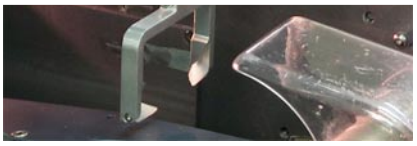
Using a water bottle is an alternative way of wetting the sponge, but this method ensures that the water line is full in addition to wetting the sponge.

Powering Up and Calibrating the Probe

Each time you turn on the power switch for the 6E, you will be prompted to calibrate the probe. Follow the steps discussed below:

To calibrate the probe:

1. Locate the black, 58-mm diameter, calibration disc and the Pattern Duplicator Adapter (PDA) in the accessory kit.
2. Turn on the power switch.
3. You will see a message box on the initial 6E screen stating, "WARNING 101 PLEASE VERIFY THAT PROBE TIPS ARE PULLED TO THEIR FULL FRONT LIMIT. Mount probe calibration disk. Press Continue to calibrate probe." When you see this prompt, chuck the probe disk (meaning insert the PDA into the Chuck and press the CHUCK key to lock it into place). Also verify that the Probe tips are pointed straight down—see pictures displayed below.
4. Press the Continue key F1 and wait while the probe calibrates itself.
5. When 6E is finished calibrating the probe, remove the PDA.



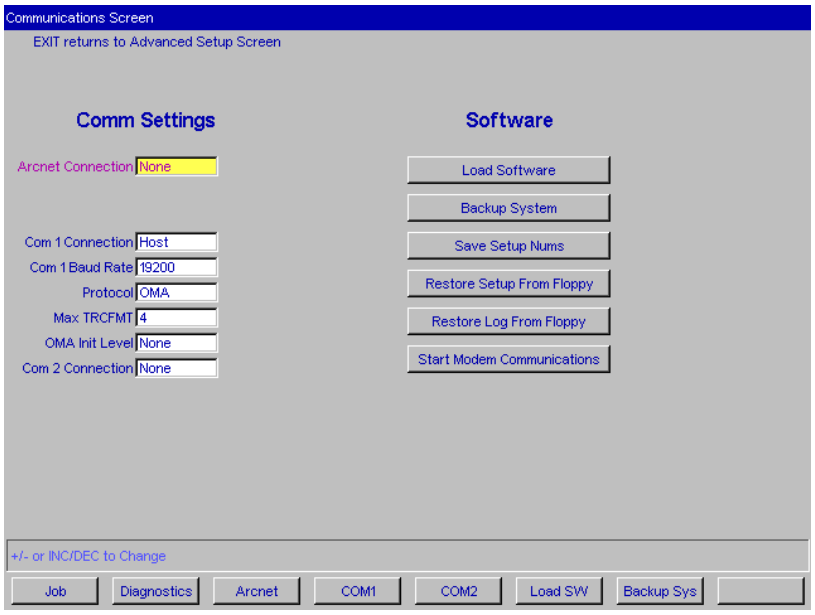
Probe in Correct Position—If the probe tips are *NOT* straight down, manually pull them forward into position.

Probe in Incorrect Position—Note that the tips are slanted, not straight down.

Setting Up Communications for Job Information

Overview

The settings on the *Communications Screen* are shown in the screen sample below and discussed in the sections that follow.



Comm Settings

Arcnet Connection

(Optional Equipment) Specifies the type of Arcnet connection (Host, 4T, Saturn, or None).

Machine Node ID

(This field disappears when Arcnet Connection is set to "**None**.") Specifies the Node ID of the Arcnet connection.

Protocol

(This field disappears when Arcnet Connection is set to "**None**.") NOP is the protocol being used for each of the following job sources:

- A Saturn tracer
- A 4T tracer
- A host computer ("Host")

Com1 and Com2 Device

The choices for Com1 and Com2 vary depending on what you have selected in the Arcnet Connection field. If you have "Host," "4T," or "Saturn,"selected for the Arcnet Connection field, your choice for Com1 (or Com2) is "Bar Code" or "None." If you have "None" selected for the Arcnet Connection field, your choices include "4T" and "Host," as well as "Bar Code" and "None." You can only have one Bar Code selection.

Baud Rate

(This field only appears when the Com 1 Device has a Barcode, Host or 4T configured.) This field shows the baud rate for the Com 1 device. The default is 9600 (or 19,200 if the Protocol is GC). Normally, the 6E software will supply the correct baud rate automatically. The edger will not be able to communicate if this parameter is different from the baud rate of the attached device.

Protocol
Under Com1 or Com2 (When Com1 or Com2 is "Host" or "4T")

(This field only appears when Arcnet Connection is set to "None" and Com1 or Com2 has a 4T or Host configured.) The choices for Host are OMA or GC; the choice for 4T is OMA.

OMA Init Level

This field allows you to set the level of OMA initialization to Auto, Preset, or None. Auto is the best choice most of the time.

Max TRCFMT

This field allows the operator to set the highest trace format used by the 6E for OMA communications. This field defaults to 4 for Packed Binary communications. A value of 1 should be used when communicating with 4Ts earlier than Version 1.23.

Changing Communications Settings

To change the current communications settings, follow these steps:

1. From the *Setup Screen*, press the *Advanced Setup* function key F7.
2. Press the *Communications* function key F2.
3. From the *Communications Screen*, use the *Field Down* key FIELD to move to the field(s) you want to change and press the increment ▲ or decrement ▼ keys to change the selection. (Refer to the field definitions above and on the previous page.)
4. Enter the password if prompted.

Note

If you receive job numbers using a bar code reader or use a computer connected through a serial port, the COM ports should be set up on this screen.

Section 2: Daily Cleaning & Other Daily Maintenance of the 6E

Daily Cleaning of the 6E

Keeping the 6E clean is the largest single component in proper maintenance. Thorough daily cleanings are strongly recommended and will prevent many service problems and greatly extend the service life of the edger.

To clean the interior:

1. Go to the *Setup Screen*, and select the *Cleaning Screen* function key F2.
2. Remove the 1½-inch hose from the vacuum canister's inlet and install the 1½-inch hose fitted with the crevice tool.
3. Move the rocker switch on the front left side of the center wall to "CLEAN" position—see label next to the switch. This will turn on the vacuum, independent of the 6E's operation.
4. Vacuum the debris from the inside of the 6E with the crevice tool, being careful not to disturb the control wiring.
5. When ready to move on to the next stage of cleaning, press the Size function key F2 or make sure the cursor is on the *Move Size Carriage* option and press the ENTER key to move the size carriage. Then vacuum the spots you could not reach before.
6. Then press the Bevel function key F3 or use the Field Down key FIELD to move the cursor to the *Move Bevel Carriage* option and press the ENTER key to move the bevel carriage. Then vacuum the spots you could not reach before.
7. Press the Home key F4 or move the cursor to the Home Carriages option and press the ENTER key to move the carriages back to the home position and reconnect the hose.
8. Reverse steps 2 and 3 to return the vacuum to normal operation; that is, reconnect the hose and put the switch back to "CYCLE" position and connect the hose.
9. Pull the chip chute cover back and clean around the sponge, removing any debris.
10. The exterior may be cleaned with a mild, non-abrasive detergent.

Note

If you bump the probe during cleaning, you should perform the probe calibration procedure—refer to Chapter 5 for instructions on calibrating the probe.

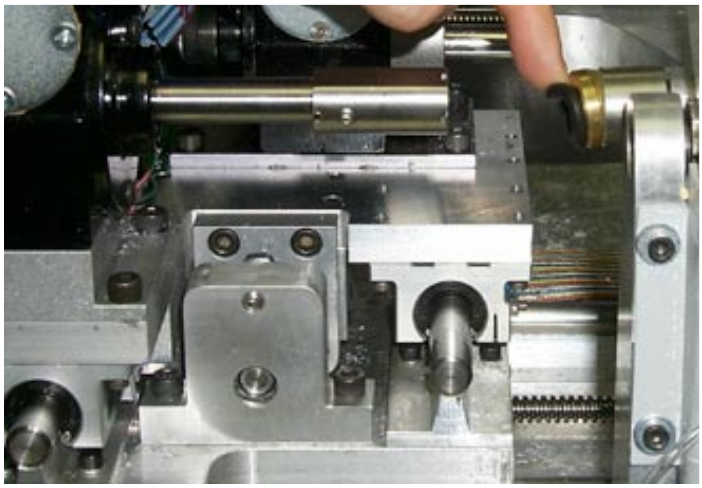
Other Daily Maintenance

Checking the Probe Tip for Wear

If excessive wear is present, replace the worn item. Run the probe calibration. Cut a test lens to verify calibration. For information about calibration, refer to Chapter 5, "Calibrating the 6E."

Checking the Clamp Pad

If the pad is torn or loose, replace with a fresh pad. Notice the clamp pad in the picture shown below:



To replace the pad, apply outward pressure to the edge of the pad and pull the old one out. Press the new one in its place.

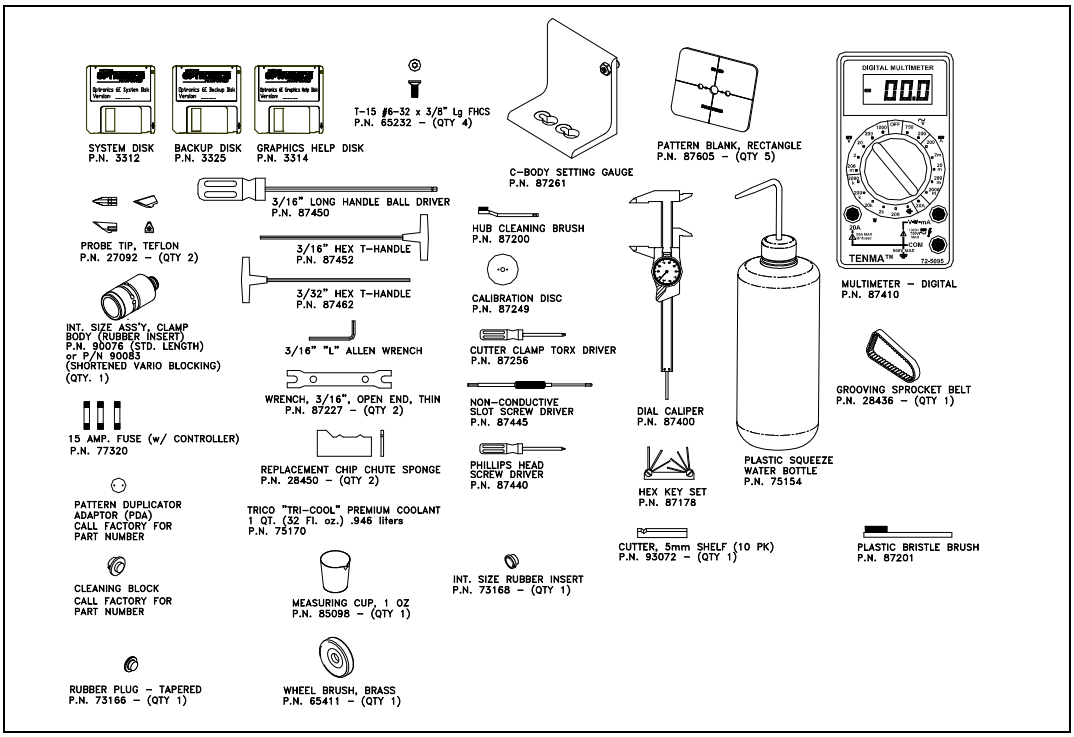
Cleaning the Polishing Wheel

You should clean the polishing wheel every day as part of your daily cleaning of the 6E. To clean the polishing hub, follow these steps:

1. Turn the motor controller's switch to Off.
2. From the *Setup Screen*, press the *Cleaning* function key F2 to access the *Cleaning Screen*.
3. On the *Cleaning Screen*, press the *Pump On* function key F5 to moisten the sponge.
4. After ensuring that the sponge is wet, manually rotate the hub until the entire surface of the hub is wet.
5. Use the small brass brush that came in the accessory kit to clean the polishing hub's surface.
6. After cleaning the polishing wheel, press the *Pump Off* key F6.

The Accessory Kit

Use the accessories provided to perform setup and other tasks such as daily cleaning. The drawing shown below identifies the accessories that are usually shipped with the 6E.



Chapter 3 Commonly Performed Tasks

To learn about the procedures for changing the cutter blades, checking size and bevel position, and vacuum bag replacement, read this chapter. For daily operation procedures, refer to Chapter 4.

Changing the Cutter Blade

The blade needs to be changed approximately every 300 cycles for a carbide blade or every 10,000 cycles for a diamond blade. There is a *Status Indicator* in the lower right corner of the *Job Screen* (the Status area) that shows how many cycles since the last change. This *Status Indicator* turns yellow at 90% of the blade's life (according to the blade type and life specified on the *Setup Screen*), so that you can ensure that you have a replacement blade in stock (Carbide Blade Part #: 93070; 10-pack: 93072). When the indicator turns red, it is time to change the cutter blade.

Note

We *strongly* recommend using the National Optronics cutter blade specified above. Using alternative cutter blades may cause size, bevel, and finish problems.

To change the blade, follow these steps:

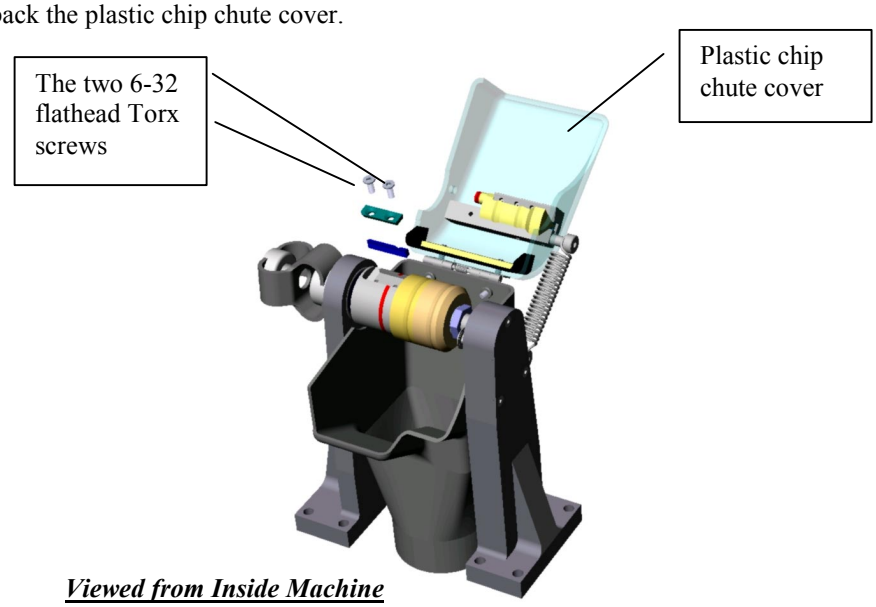
1. Press the case top release buttons and lift the case top.
2. Turn off the power switch on the cutter motor controller (far right side of the 6E).

Turn this switch OFF before proceeding to the next step.

Warning

Turn switch to cutter motor OFF before pulling the chip chute cover back and touching the cutter blade.

3. Pull back the plastic chip chute cover.



Viewed from Inside Machine

4. Use the Optronics driver (labeled "Optronics" on the handle) that came in the 6E accessory kit to remove the two 6-32 flathead Torx screws holding the clamp in place.

Note

Avoid dropping the two Torx screws down the chip chute into the vacuum bag. One method of avoiding that would be to stuff a paper towel or rag into the chip chute opening before removing the screws.

5. Remove the clamp. If you have trouble getting it to fall out, insert the end of the Torx wrench into the holes where the screws had been and lift the clamp out. Note that the rounded-off end is on the right side—you will place it back in the same way in Step 9 below.
6. Carefully lift the blade out—it may be advisable to wear tight-fitting gloves to avoid cutting your fingers. Note that the bevel is on the left. (You will need to place the new blade into place the same way the old one comes out.)
7. Blow the dust out of the blade and clamp area, then clean with alcohol.
8. Place the new blade in and slide it to the right (away from the hub) with the right edge of the blade touching the right edge of the pocket.
9. Replace the clamp with the rounded-off side on right.
10. Replace the screws while holding the blade in place.

Warning

A new blade is *very* sharp. Be extremely careful while holding the blade in place in Step 10 above to avoid cutting your finger on the blade.

11. Release spring loaded chip chute cover and make sure it springs back into its original position.
12. Turn on the motor controller power switch that you turned off in Step 3 above.

13. Close the case.

Note

If you bump the probe during this process, recalibrate the probe before cutting a lens—see Chapter 5 for instructions on calibrating the probe.

14. Go to the *Log Screen* (F6 from the *Advanced Setup Screen*).
15. Press the *Reset Blade* function key F3 or use the *Field Down* key FIELD to move to the *Reset Blade* field and press ENTER .
16. Type the password if prompted. The blade count resets to zero.
17. Edge a 58 mm circle using internal job 002 to ensure correct calibration. If the lens is not the correct size, recalibrate the size and bevel as discussed in Chapter 5.

Changing the Groover Wheel

The Groover wheel (Part Number 93410) needs to be changed when it becomes dull, approximately every 3000 cycles.

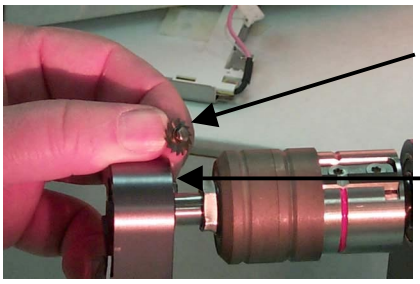
To change the Groover blade, follow these steps:

1. Turn off the motor—make sure the switch on the controller box is "OFF"—THIS IS A SAFETY ISSUE!

Warning

Ensure that the switch on the controller box is OFF any time you are touching the cutter blade or groover wheel. Failure to do so could lead to serious injury.

2. Place a cloth or plastic bag in the top of the chip chute. Make this a "screw catcher" so that if you should drop the screw or washer, etc., this cloth will catch the screw instead of it falling into the chip chute.
3. Take the two (2) supplied 3/16th-inch open end wrenches out of the accessory kit.
4. Place one 3/16th-inch open end wrench on the shaft flats and place the other on the screw (see picture).

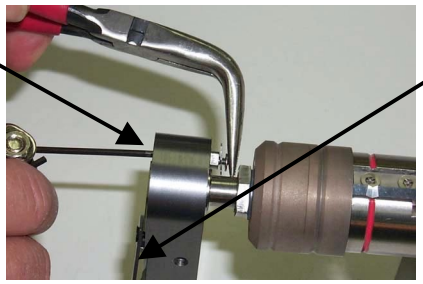


The screw (just removed) with the washer and the groover wheel.

The shaft—use one of the 3/16th-inch open end wrenches to hold this while using the other 3/16th wrench to loosen the screw.

5. Loosen the screw until it is about to come loose.
6. Remove the plate on the left side of the housing so that you can access the hex screw as shown in the picture below. Note that you can remove two screws and swing it open—see picture.
7. To avoid dropping the screw, hold the screw with a pair of needle-nosed pliers to hold the screw and turn the other end with a 3/32nd hex driver—one is available in the toolkit's hex tool cluster.

At this point in the process, it is better to use a 3/32nd hex driver to loosen the screw the rest of the way until the screw with the washer and groover wheel disconnects from the assembly.



Notice that we have removed two of the hex screw holding this plate (Step 6) so that it can swing open.

8. Remove the washer and groover wheel from the screw and set the washer and screw aside. The old groover wheel should be marked as used or thrown away.
9. Clean debris from around the bearing and shaft before installing the new grooving wheel.
10. Take new groover wheel (P/N 93410) out of the shipping bag.
11. Assemble the screw placing the washer and groover wheel onto the screw in the same manner as they came off.
12. To avoid dropping the screw, hold the screw with a pair of needle-nosed pliers to hold the screw and turn the other end with a 3/32nd hex driver—this is the same as done in Step 7 on the previous page except that you are now tightening instead of loosening.
13. After you have the screw secured in place, you can finish tightening with the two 3/16th-inch open end wrenches.

Note

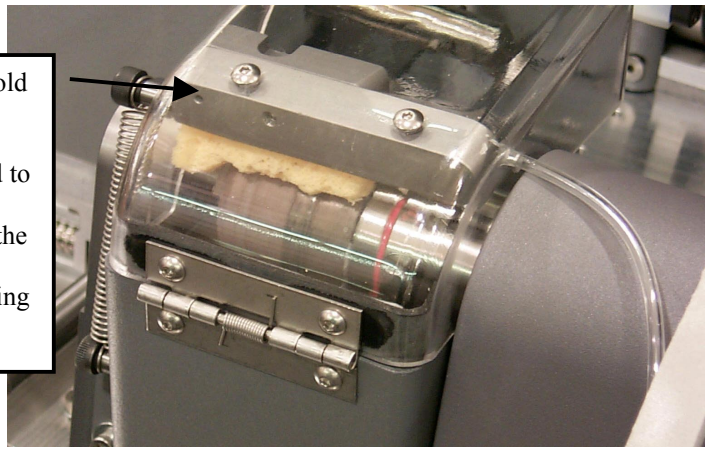
There is a small rim on the inside of the shaft flat. Make sure you have the wheel resting on the small rim prior to final tightening. You will probably need to lift it slightly to place it on there.

14. Using the two 3/16th-inch open end wrenches, hand tighten the screw until it is very snug.
15. Remove the cloth you placed in the chip chute during Step 2.
16. Turn the controller motor back on.
17. Go to the *Log Screen* (F6 from the *Advanced Setup Screen*).
18. Press the *Reset GBlade* function key F4 or use the *Field Down* key FIELD to move to the *Reset Groover* field and press ENTER .
19. Type the password if prompted. The groover count resets to zero.
20. Recalibrate the groover—refer to Chapter 5 for directions.

Sponge Replacement (Manifold on Cover)

The sponge should be replaced approximately every 300 cycles. Cleaning debris from the sponge may help extend the sponge life and ensure a consistent lens polish. There are two styles of manifold and chip chute cover. If your chip chute looks like the one in the first picture shown below, then please follow this procedure. If the manifold is attached to the chip chute metal, not the plastic cover, then follow the next procedure that begins on page 3-8.

Note that the manifold is attached to the plastic cover. If the manifold is attached to the metal inside the chip chute, refer to the next section for directions on changing the sponge.



The sponge should be replaced when it wears thin or becomes non-functional. This will vary from one machine to another depending on the amount of usage.

Before you begin, obtain an eyedropper filled with water (or some other small container of water).

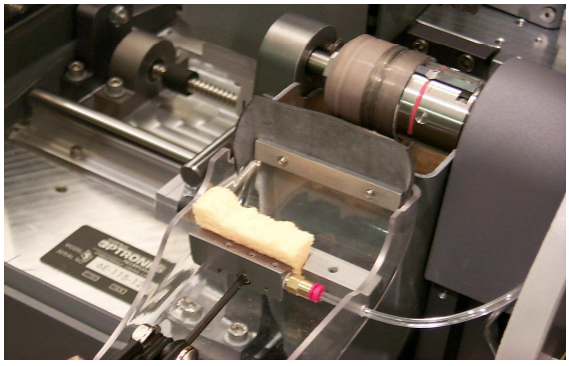
To replace the sponge, follow these steps:

1. Open cover of the 6E.
2. Turn motor switch Off.

Warning

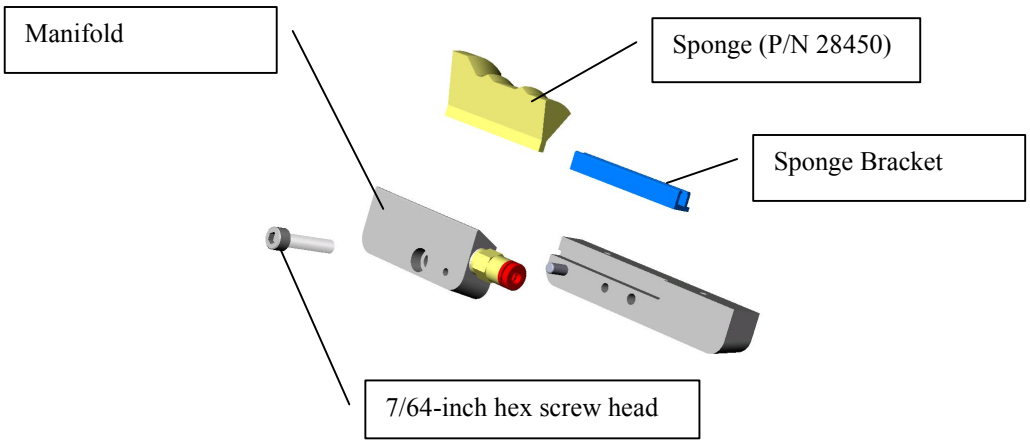
Make sure the switch to the cutter motor is turned OFF when handling the sponge, the hubs, and other parts of the spindle assembly.

3. Pull back chip chute cover and remove manifold screw using a 7/64-inch hex wrench as shown in the picture below:

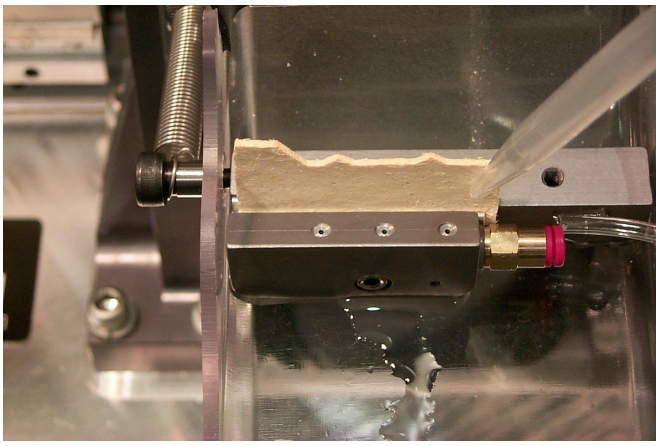


The hex key set (part number 87178) comes in the accessory kit provided with the 6E.

4. Remove the sponge and bracket from the assembly.



5. Slide or pull the old sponge out of the sponge bracket, noting where it is located so that you can place the new sponge into the same area of the bracket.
6. Clean debris from the area around the manifold and sponge bracket.
7. Take the new sponge out of its bag (Part number: 28450).
8. Place the dry sponge in the groove in the sponge bracket (where the old sponge came out).
9. Make sure that the right side of the sponge is aligned with the right side of the bracket. Doing so will align it with the grooves of the hubs.
10. Tighten the sponge manifold screw using a 7/64-inch hex wrench and wet a single corner of the sponge with the water bottle, as shown below. This will allow for any left-right adjustment in the next step.



11. Lower the chip chute and sponge assembly onto the polishing wheels. Make sure that the points of the sponge fit into the bevel grooves of the polish wheels. (If they do not fit, move the sponge until they do fit.)
12. Raise the chip chute cover and wet the sponge to ensure it is secure in the bracket.
13. Lower the chip chute cover and turn the cutter motor back on.
14. Close the lid of the 6E.

Sponge Replacement (Manifold in the Chip Chute)

The sponge should be replaced approximately every 300 cycles. There are two styles of manifold and chip chute cover. If the manifold is attached to the metal inside the chip chute (see picture below), not the plastic cover, then follow the steps detailed below.

The sponge should be replaced when it wears thin or becomes non-functional. This will vary from one machine to another depending on the amount of usage.

Before you begin, obtain an eyedropper filled with water (or some other small container of water).

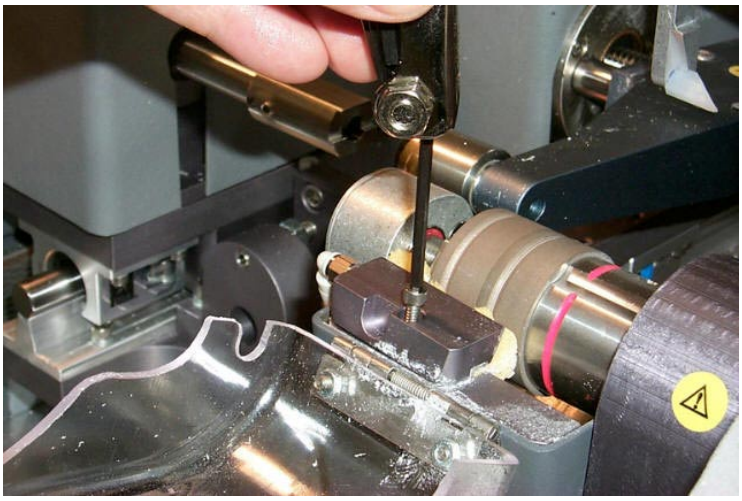
To replace the sponge, follow these steps:

1. Open cover of the 6E.
2. Turn motor switch Off.

Warning

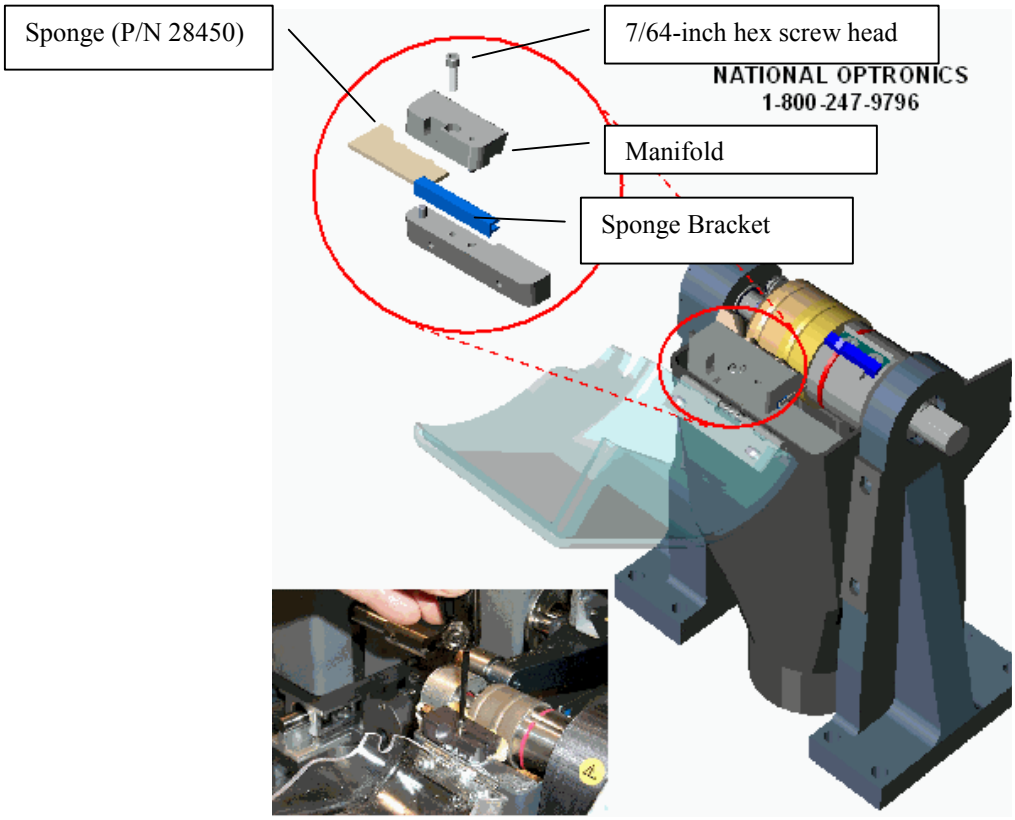
Make sure the switch to the cutter motor is turned OFF when handling the sponge, the hubs, and other parts of the spindle assembly.

3. Pull back chip chute cover and remove manifold screw using a 7/64-inch hex wrench as shown in the picture below.

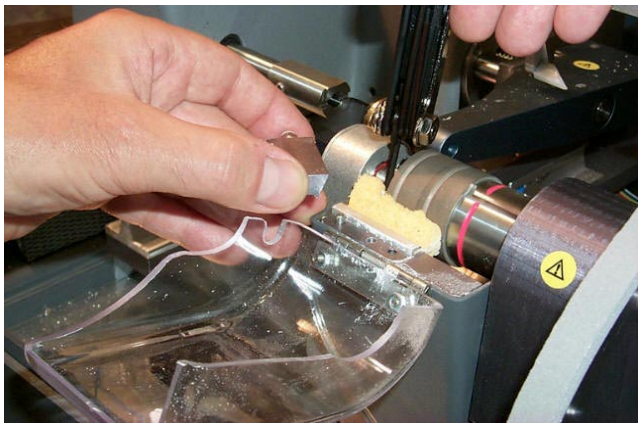


The hex key set (part number 87178) comes in the accessory kit provided with the 6E.

4. Clean debris from the area around the manifold.



5. Keep the old sponge from falling into the chip chute while removing the manifold. You can do this by holding the sponge in place with the hex wrench while pulling the manifold off as shown below:



6. Remove the sponge and bracket from the assembly.

7. Slide or pull the old sponge out of the sponge bracket, noting where it is located so that you can place the new sponge into the same area of the bracket.

8. Take the new sponge out of its bag (Part number: 28450).

9. Place the dry sponge in the groove in the sponge bracket (where the old sponge came out).

10. Make sure that the right side of the sponge is aligned with the right side of the bracket. Doing so will align with the grooves of the hubs.
11. While holding sponge in the correct position, wet the sponge so that it expands into place.
12. Clean debris from the interface around the sponge area.
13. Place the sponge bracket and sponge into position on the 6E. Note that the flanged edge of the sponge bracket should be on the bottom. Make sure that the points of the sponge fit into the bevel grooves of the hubs. (If they do not fit, move the sponge until they do fit.)
14. Reinsert the manifold screw and tighten it (snug).
15. Let the chip chute cover close and turn the cutter motor back on.
16. Close the lid of the 6E.

Verifying Size and Bevel Placement

1. Go to the *Setup Screen* (F8 from the *Job Screen*).
2. Press the *Calibration* function key F3.
3. Press the *58mm Circle* function key F2.
4. Enter a password if prompted.

Note

Pressing the *Size Calibration* function key F2 causes the *Job Screen* to choose Job: 002—this is the automatic job setup for checking size and bevel placement.

5. Load a 6 base plano lens of at least 2 mm thickness by pressing the Chuck button CHUCK to lock the lens in place.
6. Press the Start button START on the 6E.
7. When done, press the Chuck key CHUCK to release the lens; then remove the lens.
8. Using calipers, measure from the peak of the bevel to the other peak. The distance should be 58 mm. If it is not exactly 58 mm, adjust Size Offset.
9. Visually check to see if the peak of the bevel is in the center of the lens edge. If not, adjust Bevel Offset.

Changing the Vacuum Bag

The vacuum bag needs to be changed approximately every 300 cycles. There is a Status Indicator in the lower right corner of the *Job Screen* (the *Status* area—lower right of screen) that graphically shows how many cycles since the last change. This *Status Indicator* turns yellow at 90% of the vacuum bag life, so that you can ensure that you have a replacement bag and filter in stock (Bag and Filter 5-Pack Set Part # 87142). When it is red, it is time to change the vacuum bag and filter. This reminder feature can be disabled through the *Job Screen Layout* field on the *Setup Screen*. (Disabling this feature should only be done when using a central vacuum rather than one under the edger).

Caution

Wear an appropriate dust mask and eye protection when changing the vacuum bag, especially if you are sensitive to dust particles since the dust is small particles of plastic.

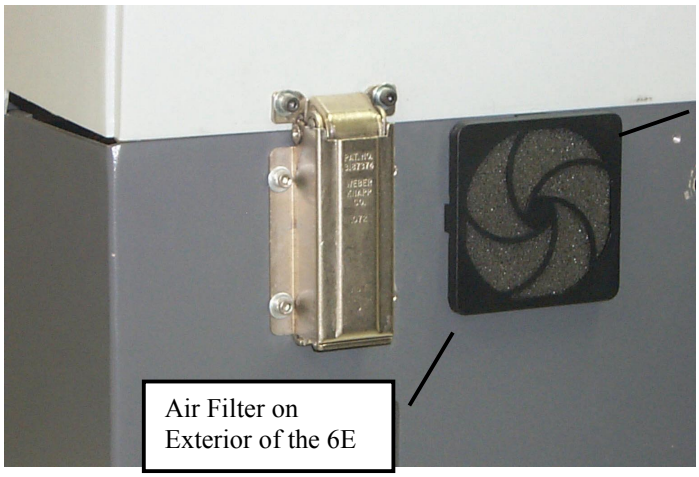
Change the vacuum bag when it gets full by following these steps:

1. Open the cabinet if applicable.
2. Make sure the vacuum is turned off.
3. Disconnect the vacuum hose from the back of the vacuum.
4. Undo the three clamps holding the top on the vacuum.
5. Lift the vacuum head out of the vacuum base and set it aside.
6. Pull the bag back from the inlet fitting.
7. Lift the large bag out and dispose of it.
8. Replace it with a new bag. (The bags and filters are often kept in the cabinet—Bag and Filter 5-Pack Set Part # 87142)
9. Change the paper filter.
   A. Examine the top piece that you set aside in Step 5 above. There is a steel ring (some have a thick rubber band) holding the paper filter onto the foam filter. Squeeze the prongs on that ring and pull the paper filter off, leaving the foam filter in place.
   B. Throw away the paper filter and put another one in its place (within the steel ring).
   C. Squeeze hard on the ring's prongs and slide the filter back into place.
10. Reinstall the vacuum head on the can, aligning the inlet and exhaust holes. Then secure it with the three clamps.
11. Close the cabinet.
12. Go to the *Log Screen* (F6 from the *Advanced* Setup *Screen*).
13. Press the *Reset Vac* function key F7 or use the FIELD key to move to the *Vacuum Bags* field and press the ENTER key.
14. Type the password if prompted. The bag count resets to zero.

Air Intake Maintenance

Determining Which Type of Filter You Have

Air filters need to be replaced approximately every month, or as needed based on dust build-up. Some 6Es come with an air filter placed on the outside of the unit, as shown below:



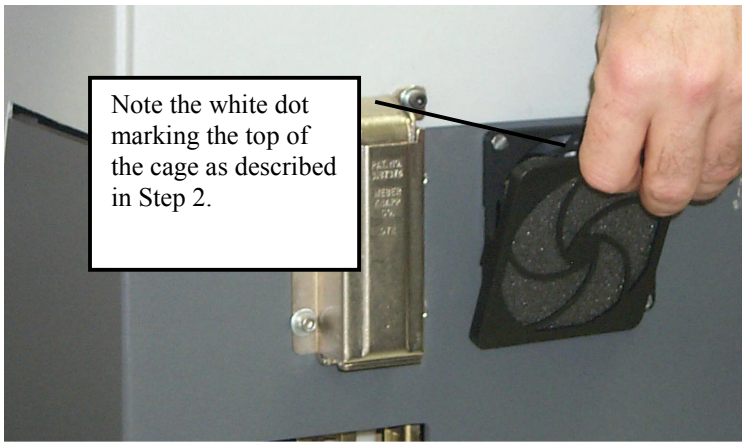
If your 6E has the air filter as shown above, follow the directions immediately below ("Maintenance of the External Air Filter") to change the filter. If not, skip to the next section, "Maintenance of the Internal Air Filter."

Maintenance of the External Air Filter

For proper maintenance of your air filter, follow these steps:

15. Turn off the power switch on the side of the 6E.
16. Mark the top of the air filter cage with either masking tape, Scotch® tape, Liquid Paper®, or Wite-Out® (or some other method) so that you will know which side goes on top when you replace the air filter cage.

17. Remove the outer part of the air filter cage as shown below. (The cage will snap out.)



18. Remove the filter as shown below:

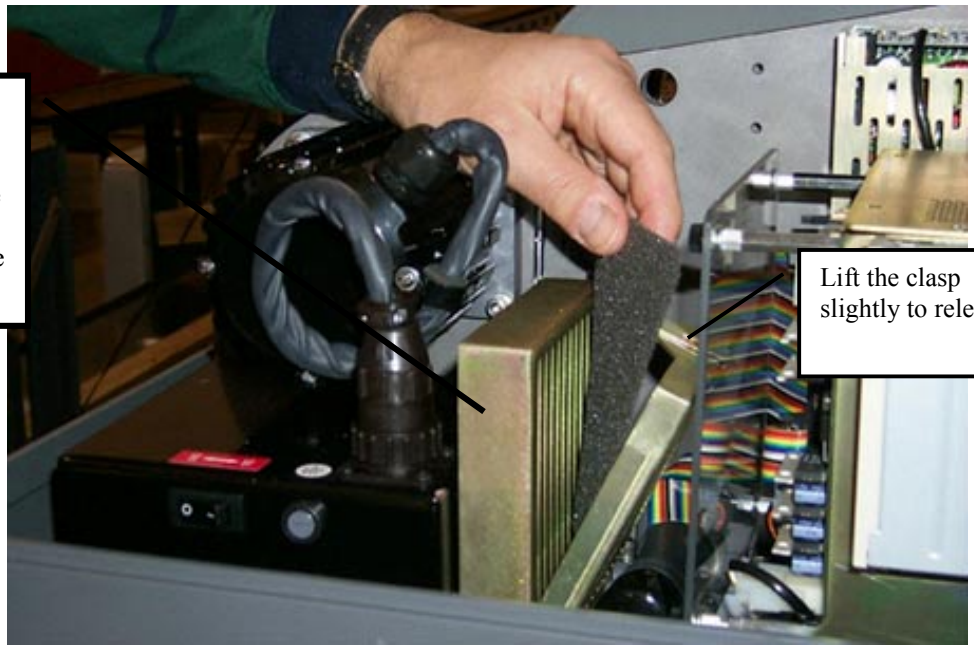
19. Clean the filter with soap and water or replace it with a new filter (Part #: 3069).

20. Place the new or cleaned filter back in the air filter cage and snap the outer part of the cage back in place. NOTE: When performing this step, use the mark you placed on the outer part of the cage to ensure that you replace the piece the same as it came out.

21. Turn the power switch back on.

Maintenance on the Internal Air Filter

With the internal air filter, the right side of the 6E has a fan and a separate air intake (see picture below).



For proper maintenance of your air filter, follow these steps:

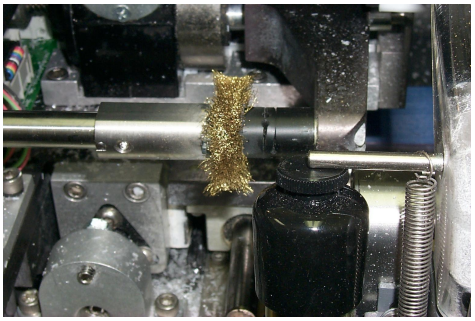
1. Press the two latch release buttons on the 6E's case and lift its top.
2. Turn off the power switch on the side of the 6E.
3. On the right side of the 6E, release the clasp on the brass box shown above.
4. Push the brass door open as shown above.
5. Lift the filter out of the air intake box.
6. Clean the filter with soap and water or replace it with a new filter (Part #: 3067).
7. Place the new or cleaned filter back in the air intake box and clip the brass box shut.
8. Turn the power switch back on.

Cleaning the Polishing Wheels

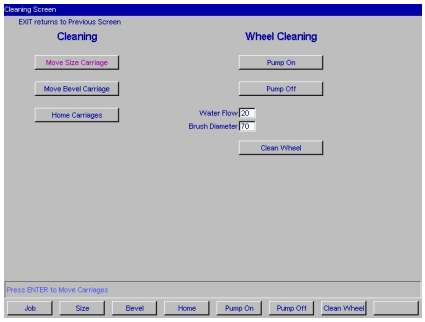
Clean the Polishing Wheels when experiencing poor polish quality and when there is visual evidence of lens material buildup.

To clean the Polishing Wheels, follow these steps:

1. Turn the cutter motor off.
2. Remove the cutter (but not the clamp).
3. Turn the cutter motor back on.
4. Remove the Wire Brush and Cleaning Block from the Accessory Kit.
5. Using calipers or a ruler, check the diameter of the Wire Brush.
6. Attach the Wire Brush to the Cleaning Block; then chuck the Wire Brush.



7. Go to the *Cleaning Screen* (F2 from the *Setup Screen*).
8. On the *Cleaning Screen*, confirm that the "Brush Diameter" field reflects the actual diameter of the Wire Brush. If not, type in the correct diameter or use the Up or Down Arrow keys to adjust the diameter setting.
9. Press F7, the *Clean Wheel* function, and follow the directions on the screen.



Note

The Wire Brush will make three sweeps across the Polishing Wheel. While it is making these sweeps, you can adjust the Brush Diameter by pressing the Up Arrow key to increase or Down Arrow key to decrease the Brush Diameter setting. When you decrease the Brush Diameter setting, the Size Carriage will move towards the wheel, which will clean more aggressively.

10. Reinstall the cutter.

Updating Software

New software is usually updated through the floppy drive inside the unit. Currently, the floppy drive is the only software updating option supported.

To update the 6E's software, do the following:

1. Go to the *Setup Screen*—from the *Job Screen*, press the *Setup* function key F8 to select the *Setup Screen*.
2. Press the *Advanced Setup Screen* function key F7 to go to the *Advanced Setup Screen*.
3. Press the *Comm* function key F2 or use the Field Down key FIELD to move the cursor to the *Communications* field, then press the ENTER key.
4. Backup the System if needed.
5. Press the *Load SW* function key F7 or use the Field Down key FIELD to move the cursor to the *Load Software* button and press the ENTER key.
6. Enter the password if prompted. If loading from a diskette, make sure it is in the disk drive.
7. Press the ENTER key after placing the update disk in the floppy drive. Follow the screen instructions.

Backing Up the System

It is always a good idea to back up your system before loading software.

To backup the 6E's software, do the following:

1. Go to the *Setup Screen*—from the *Job Screen*, press the *Setup* function key F8 to select the *Setup Screen*.
2. Press the *Advanced Setup Screen* function key F7 to go to the *Advanced Setup Screen*.
3. Press the *Comm* function key F2 or use the Field Down key FIELD to move the cursor to the *Communications* field, then press the ENTER key.
4. Press the *Backup Sys* function key F7 or use the Field Down key FIELD to move the cursor to the *Backup System* button and press the ENTER key.
5. Enter the password if prompted. If loading from a diskette, make sure it is in the disk drive.
6. Press the ENTER key after placing the disk in the floppy drive. Follow the screen instructions.

Saving Setup Numbers

It is a good precaution to save all calibration and setup numbers (all data saved across power cycles) to disk for future retrieval with the Restore Setup from Floppy feature. To perform this function, follow these steps:

1. Insert a 3 ½-inch disk into the 6E's disk drive.
2. Go to the *Setup Screen*—from the *Job Screen*, press the *Setup* function key [F8] to select the *Setup Screen*.
3. Press the *Advanced Setup Screen* function key [F7] to go to the *Advanced Setup Screen*.
4. Press the *Comm* function key [F2] or use the Field Down key [FIELD] to move the cursor to the *Communications* field, then press the [ENTER] key.
5. Use the Field Down key [FIELD] to move the cursor to the *Save Setup Nums* button and press the [ENTER] key.
6. Enter the password if prompted and make sure your 3 ½-inch disk is in the disk drive.
7. Press the [ENTER] key. Follow the screen instructions.

Chapter 4 Operating the 6E (Standard Operation)

This chapter includes directions for standard tasks performed while using the 6E in a standard operation, such as pulling down a job, edging (roughing, finishing, and grooving), polishing, and safety beveling. For calibration instructions, refer to Chapter 5.

Pulling Down a Job

For standard operations, there are only two steps to this part of the process:

1. Go to the *Job Screen*, which is where the 6E will go automatically if you just started it up.
2. Type in the number of the job to pull down from a Tracer or from a Host computer.

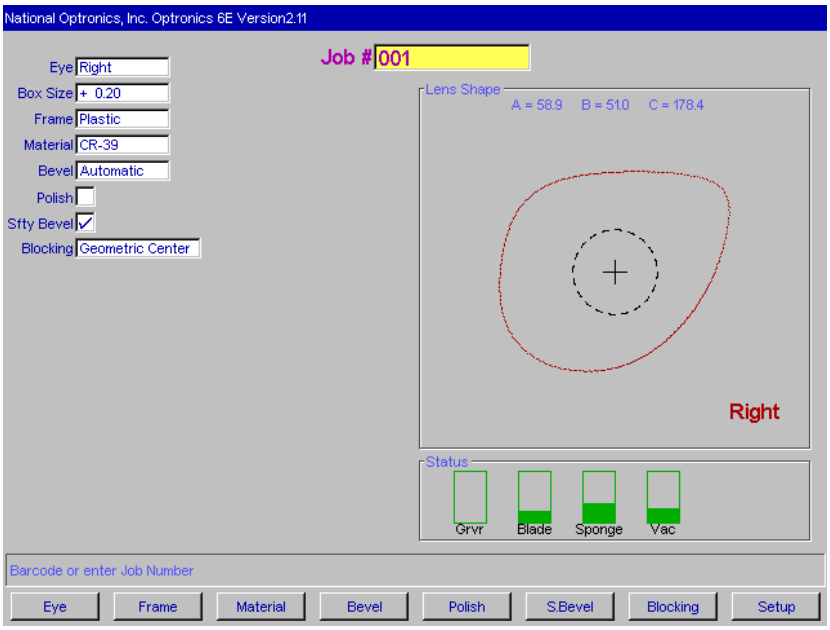
Note

Another way of pulling down a job is to scan the job tray with the bar code reader. (Bar code readers are optional accessories—call National Optronics technical support if you want information about this.)

The *Job Screen* parameters can be tailored to meet the specific needs of the user.

Job Screen Display Variations

The three screens displayed in this section show the default parameters based on the blocking mode and protocol.



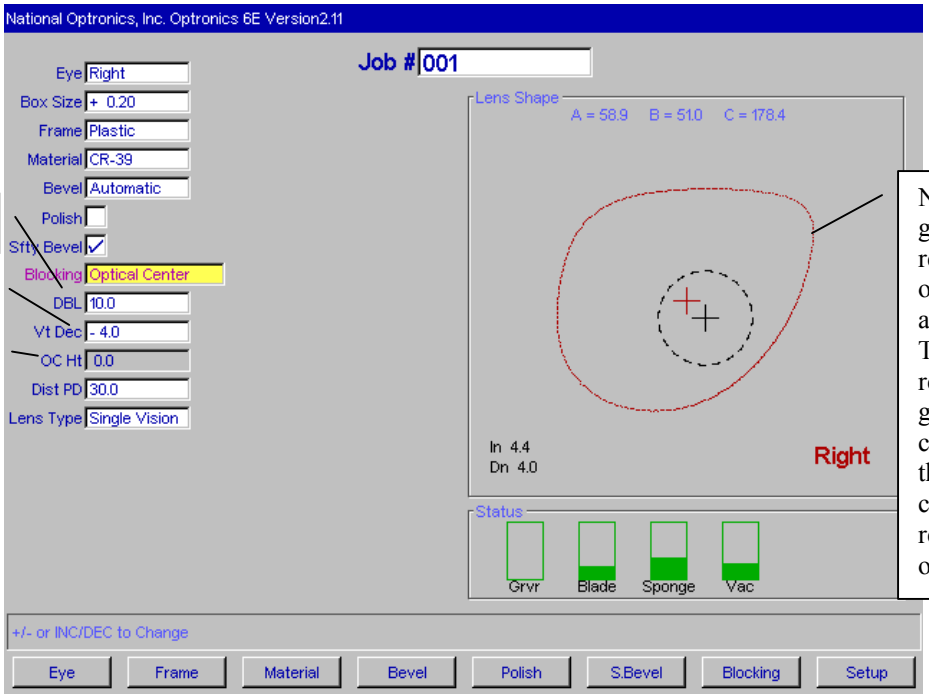
The *Job Screen* for Single Vision Lens with Geometric Center Selected (OMA or NOP Protocol)

The *Job Screen* looks different when you select "Optical Center" for *Blocking Mode*.

Distance Between Lenses

Pupilary Distance

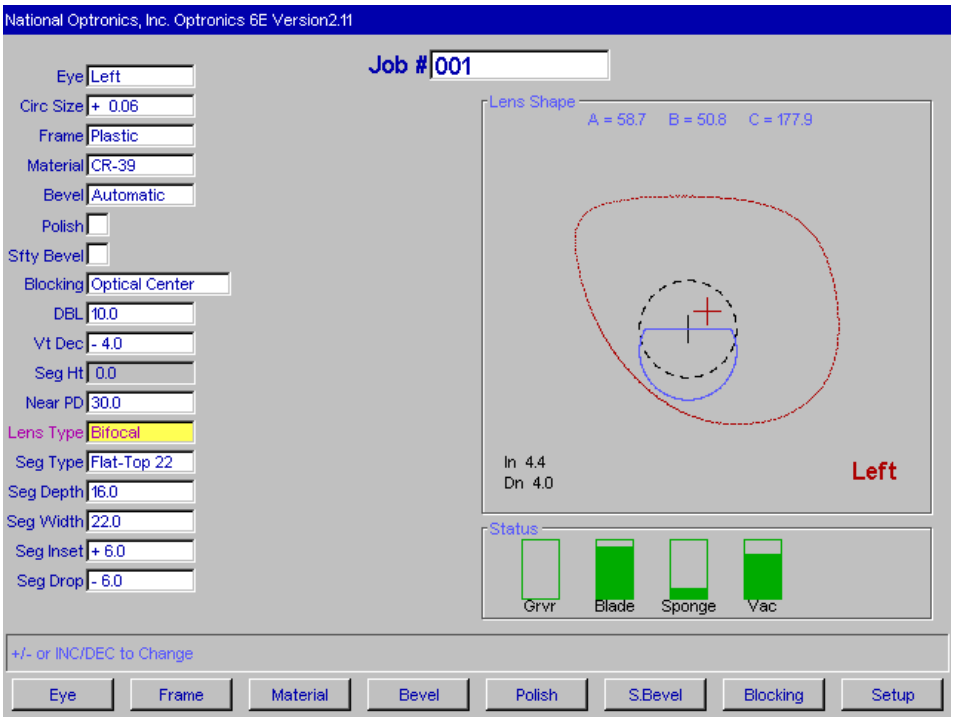
Height (in mm) from the top of the segment to the bottom of the frame



Note that the graphical representation of the lens is also different. The red cross represents the geometric center, and the black cross represents the optical center.

The *Job Screen* with Optical Center Selected (NOP Protocol)

Additional lens blank information is displayed when you use OMA protocol instead of NOP as shown in the screen shown directly below.



The *Job Screen* Display with Optical Center Selected (OMA Protocol)

Edging, Polishing, Grooving and Safety Beveling

The basic steps involved in edging, polishing and creating a safety bevel are:

1. After pulling down a job, put the lens in and press the Chuck button CHUCK to lock it in place.
2. Press the Start button START to begin the process.
3. Wait until the process finishes and remove the lens.

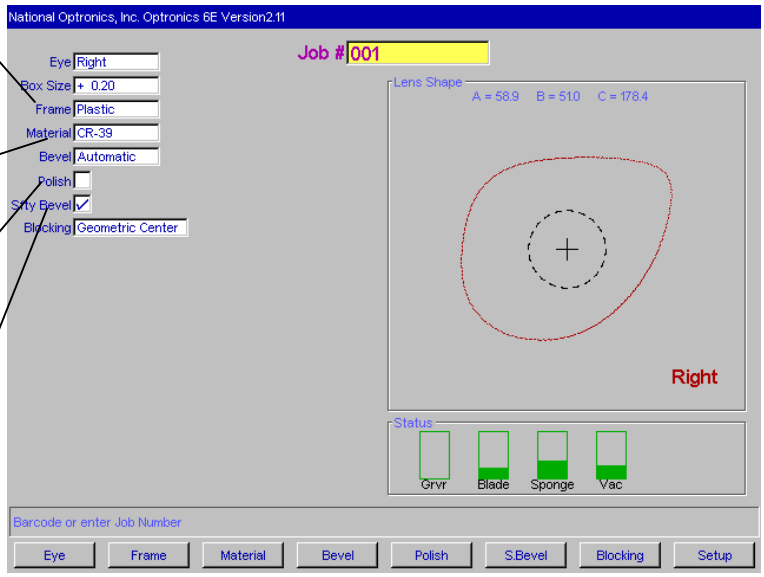
Depending on the materials and the job, there might be a few adjustments. The picture shown below illustrates the fields you would be most likely to modify:

Modify the *Frame* field (press the Frame function key F2) if changing frame. To perform grooving, choose "St. Groove" or "W. Groove."

Modify the *Material* field (press the Material function key F3) if changing material

Check this field to polish the lens or uncheck it to skip the polishing—use the Polish function key F5 to check or uncheck.

Check this field to create a safety bevel or uncheck it to skip the safety bevel—use the SBevel function key F6 to check or uncheck.



Note

If the *Frame* type is "St. Groove" or "W. Groove" and you have the Grooving spindle arrangement, then the cycle will include grooving of the lens.

In addition, if you place an exclamation point (!) within the name of the frame, the 6E will include standard grooving for the job (for example, "metal!"). If you place a # sign within the name (for example, "plastic#"), the 6E will include wide grooving for the job.

Chapter 5

Calibrating the 6E

The 6E arrives from the factory already tuned and calibrated and ready to go into production immediately. You should check the calibration occasionally, and adjust it if necessary. The table shown below indicates times when calibration should be checked.

	Calibrate:							
Change:	**Probe**	**Axis**	**Bevel**	**Size**	**Rimless Size**	**Polish**	**Safety Bevel**	**Groove Depth & Placement**
Cutter Insert	*		*	*	*			
Cutter Assembly	*		*	*	*	*	*	*
Probe Tips	*		*				*	
Probe Assembly	*		*				*	
Axis Home Switch		*						
Bevel Home Switch	*		*				*	*
Size Home Switch	*			*				*
Grooving Blade								*

The following procedures should be followed in order to properly calibrate the 6E. It is very important to proceed in order, as one step may require previous steps to be completed properly. **Note that Probe Calibration is required prior to calibrating all other parts. Also, note that Probe Calibration is part of the power-up process—for more information, refer to the steps detailed on the following page**.

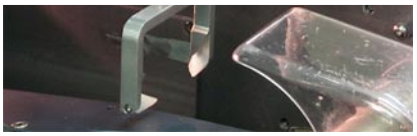
Calibrating the Probe

Each time you turn on the power switch for the 6E, you will be prompted to calibrate the probe. Follow the prompts.

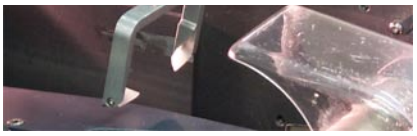
If you wish to calibrate the probe after bootup, before performing other calibration, follow the following steps.

To calibrate the probe:

1. Locate the black, 58-mm diameter, calibration disk and the Pattern Duplicator Adapter (PDA) in the accessory kit.
2. Go to the *Calibration Screen*.
3. Press the *Probe* button F5 on the *Calibration Screen*.
4. You will see a message box on the initial 6E screen stating, "WARNING 101 PLEASE VERIFY THAT PROBE TIPS ARE PULLED TO THEIR FULL FRONT LIMIT. Mount probe calibration disk. Press Continue to calibrate probe." When you see this prompt, chuck the probe disk (meaning insert the disk into the Chuck and press the CHUCK key to lock it into place). Also, verify that the Probe tips are in the correct position—see pictures shown below.
5. Press the ENTER key and wait while the probe calibrates itself.
6. When the 6E is finished calibrating the probe, remove the PDA and disk.



Probe in Correct Position—Note that the tips are straight down, not slanted as shown below.



Probe in Incorrect Position—Note that the tips are slanted, not straight down.

Calibration: Overview

There are several ways of calibrating the 6E: cutting an SBA (Size/Bevel/Axis) shape, cutting a circle, cutting an aviator, and cutting a grooved circle. Each has its own advantages and disadvantages:

- Use the SBA shape (with pattern) to calibrate everything needed for edging calibration, specifically size (both bevel and rimless), axis, and bevel placement.
- It is ***strongly recommended*** to use the circle for polish and groover calibration. It can also be used for size and bevel calibration (but not axis).
- Use the aviator shape to calibrate the safety bevel.
- Use the grooved circle to calibrate groove placement and depth.

Read this chapter to learn the steps involved in each of the types of calibration.

Calibration Using the SBA Shape

As stated earlier, use the SBA shape for axis, size, rimless size, and bevel calibration.

To calibrate using the SBA shape:

1. Get a pattern out and ready to use.
2. If your 6E software version is prior to 2.10, go to the *Setup Screen* and make sure the *Default Lens Blocking* field is set to "Geometric Center" or "Traced Center."
3. Go to the *Calibration Screen*.
4. Press the *SBA* function key F3 which takes you to the *Job Screen* (set up for an SBA calibration).

Note

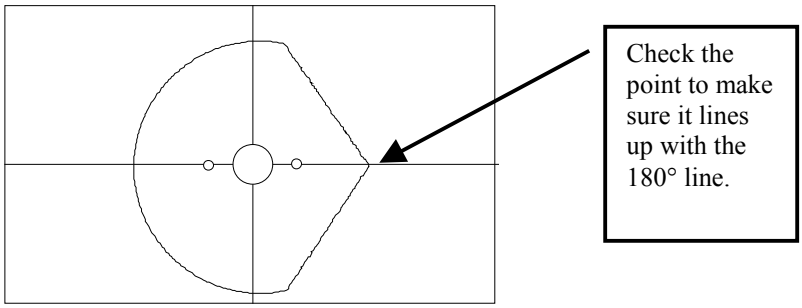
Make sure the *Material* field says, "CR39," even though you will be using a pattern.

ALSO:

- **If you are calibrating the size, set the *Frame* field to "Metal."**
- **If you are calibrating a rimless, set the *Frame* field to "Rimless."**

5. Chuck the pattern (meaning insert the pattern into the Chuck and press the CHUCK key to lock it into place).
6. Press the *Start* button, then wait until the cycle ends.
7. Remove the pattern and physically examine it:

   A. **Check the axis.** The point should be on the 180° line (see drawing shown below).



If the point does not line up with the 180° line, adjust the *Axis Offset* and recut. If the point is above the line, make a negative adjustment to the *Axis Offset* (a positive adjustment if the point is below the line) and then recut. Repeat the process until the point lines up with the 180° line.

Note

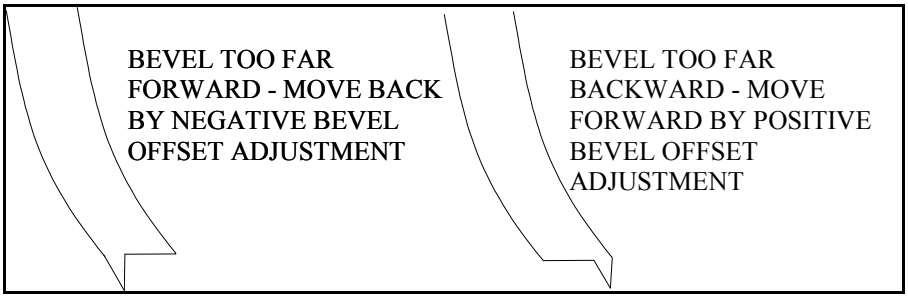
If you prefer to think of moving the line relative to the point of the SBA, you can adjust the *Axis Offset* positive to move the line clockwise, negative to move the line counter-clockwise.

B. **Check the size.** Using calipers, measure from the peak of the bevel to the other peak (on round sides, not the point). The diameter should be 58 mm.

If the calipers do not read 58 mm and the lens was cut with a bevel, adjust the *Size Offset* and recut. (A positive adjustment will increase the size; a negative adjustment will decrease it.) Repeat until the size is 58 mm.

If the calipers do not read 58 mm and the lens was cut as a rimless, adjust the *Rimless Size Offset* and recut. (A positive adjustment will increase the size; a negative adjustment will decrease it.) Repeat until the size is 58 mm.

C. **Check the bevel.** It should be centered (see drawing).



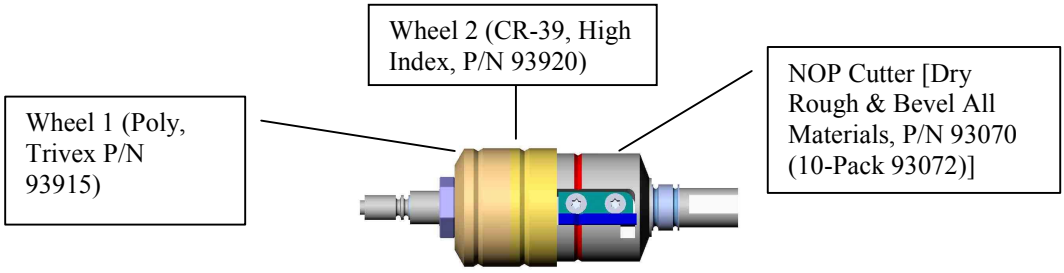
Calibrate Trace Size Adjustment

Perform the following steps if you receive jobs from a tracer.

1. Trace a medium weight metal frame on a tracer.
2. Transfer the trace data to a 6E.
3. Edge a lens. If the lens fits precisely, no adjustments are needed. If not, perform these steps:
   A. Measure the circumference of the lens and calculate the approximate difference between the lens and the size it should be.
   B. Go to the *Advanced Setup Screen*.
   C. Enter a number in the *Trace Size* field (or change the existing number) that would be approximately the radius difference; for example, if the circumference difference is 3 mm, enter 1 or change the existing number by 1.
      - If the lens fits is too large, decrease the number in the *Trace Size* field.
      - If the lens is too small, increase the number in the *Trace Size* field.
   D. Repeat this process until the 6E edges accurately with the trace data received.

Calibrating the Polishing Wheel

During the process of calibrating the polishing wheels, it is very important that the following steps be performed in order, and that each step is completed before moving on to the next step. There are two wheels in a groover spindle arrangement: Wheel 1 is used for polycarbonate lens; Wheel 2 is used for high index or CR39 (see Note below).



Note

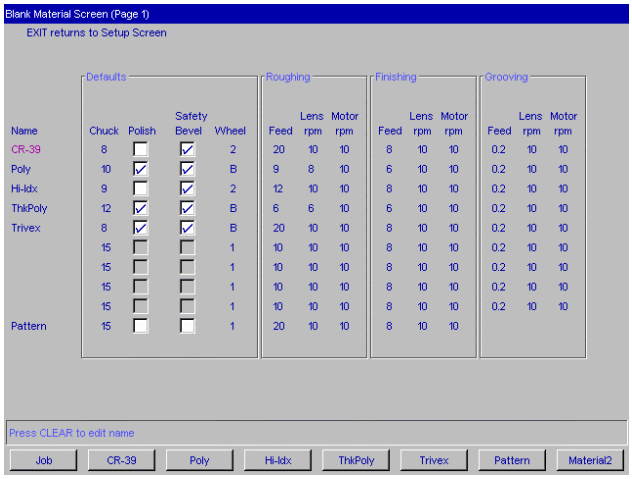
CR-39 and High Index are polished on Wheel 2 only. The best finish for Poly and Trivex requires polishing first on Wheel 1, then on Wheel 2. The directions provided below assume that you are calibrating both wheels and that you begin with Wheel 2.

Calibrating Wheel 2

1. Ensure that the "dry" size is calibrated correctly before proceeding with the polish calibration—refer to the "Calibration Using an SBA Shape" on Page 5-4, or edge the internal 58 mm shape (Job # 002) using a medium thickness, 6.0 base, 75-mm diameter or less, CR-39 lens, similar to ones used for Poly polish calibration.

2. Go to the *Blank Material Screen* (press the *Materials* function key F4 from the *Setup Screen*) and press the *CR-39* function key F2 on the *Blank Material Screen*. Ensure that *Polish* has a check mark and that *Wheel 2* is selected.

When calibrating Wheel 2, use "**CR-39**" as the material with the values shown in this sample screen. Ignore grooving parameters.



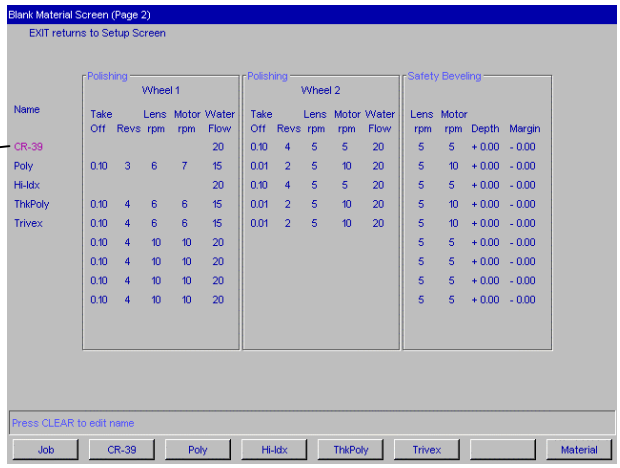
Note

CR-39 Wheel=2 is a key parameter setting.

3. Press the *Material2* function key F8 to access the *Blank Materials 2 Screen*.

4. Use the following settings for the material *CR-39* as shown on this sample screen:

When calibrating Wheel 2, use "**CR-39**" as the material with the values shown in this sample screen. Ignore safety beveling parameters.



Note

CR-39 Takeoff=0.00, Revs=1 are key parameter settings.

5. Go to the *Calibration Screen* (F2 from the *Setup Screen*).

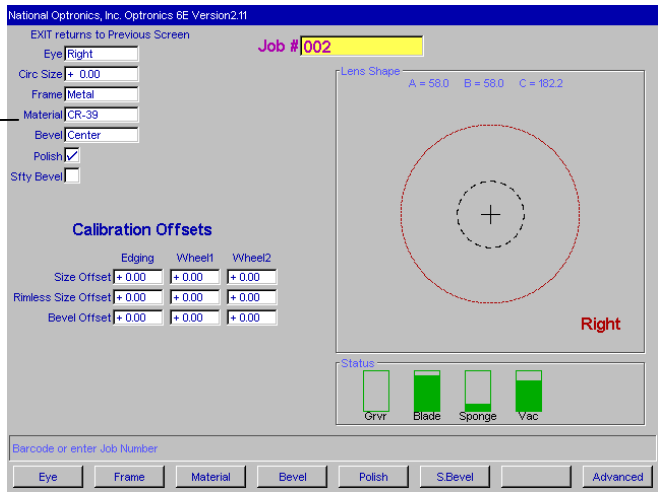
6. From the *Calibration Screen*, move the cursor to *58 mm Circle* and press the ENTER key (or press the *58 mm Circle* function key F2). This will take you to a modified *Job Screen* (one set up for 58 mm circle calibration).

Note

If your 6E software version is prior to 2.10, go to the *Setup Screen* and ensure that the "Default Lens Blocking" is Geometric or Trace.

7. Use the following setting on the *58 mm Circle Calibration Screen*:

When calibrating Wheel 2, use "**CR-39**" as the material with the values shown in this sample screen.



Note

Material=CR-39 is a key parameter setting.

8. Set the *Wheel 2 Bevel Offset* by cutting a medium thickness, 6.0 base, 75-mm diameter or less, CR-39 lens. The polishing wheel should lightly touch both the front and the back of the bevel.
   - If just the back is polished, enter a negative *Wheel 2 Bevel Offset*.
   - If just the front is polished, enter a positive *Wheel 2 Bevel Offset*.
   - If the lens is not polished, enter a negative *Wheel 2 Size Offset*.
   - If the lens is completely polished, enter a positive *Wheel 2 Size Offset*.
   - Repeat as necessary until both sides of bevel are lightly touched. Try adjusting in 0.05 mm increments.

Note

To conserve lenses, the test cuts can initially be oversized, and then decreased by 3 mm per iteration. For example, by setting the Box Size to +6.00 for the first cut, it can then be edged at +3 mm, then +0.00, –3.00, and finally –6.00 mm, resulting in 5 test cuts per lens. Once adjustments are close enough that the lens touches the Polishing Wheel, **do not use re-cut mode**—this will result in inaccurate bevel placement.

If you use Circ Size, instead of Box Size, you can accomplish the same thing by downsizing the Circ Size by –10.00 mm each time.

In addition, please note that setting the *Offset* is a quick and easy way of adjusting the bias. When you enter an *Offset*, the 6E automatically adjusts the bias numbers on the *Advanced Setup Screen*. If this is changed on the *Calibration Screen*, when you return to this screen later, you will see that the *Offset* is zero (0) rather than the number you have entered. That shows that it has made the adjustment on the bias numbers—the bias numbers will change by the amount (positive or negative) that you enter in the *Offset*. If you change this on the *Job Screen* (the special one set up for 58 mm circle calibration), the *Offset* will change to zero when you press the *Start* button. Alternatively, you can press the *Advanced Setup* function key F8 and modify the Bias numbers directly.

9. Set the *Wheel 2 Polish Size, CR-39 Takeoff*, and *CR-39 Lens Revs* using the following procedure:

   A. On the *Blank Material 2 Screen*, change the "CR-39" settings to the following:
      - Polishing Take Off 0.10
      - Polishing Number of Revs 4

   B. Go back to the *58 mm Circle Calibration Screen* and edge a medium thickness CR-39 lens as described in Step 8.

   C. Make the following adjustments based on lens size and presence of edge striations:

	Lens Striations Not Present	**Lens Striations Present**
On Size	Proceed	Increase TakeOff
Over Size	Decrease TakeOff Enter a negative Wheel 2 Size Offset	Increase Revs to 5 Enter a positive Wheel 2 Size Offset
Under Size	Unusual - Check "Dry" size Enter a positive Wheel 2 Size Offset	Unusual - Check "Dry" size Enter a positive Wheel 2 Size Offset

Note

If the water flow seems incorrect, refer to the "Adjusting the Water- Flow" section on Page 5-14.

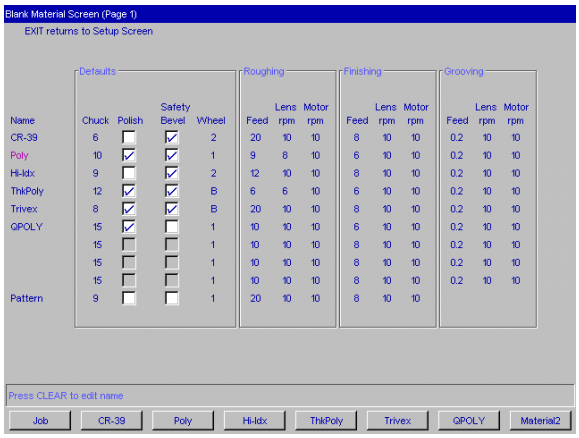
   D. Verify the polish on a non-round shape. This can be done by going to the *Calibration Screen* (F3 from the *Setup Screen*). Then move the cursor to *Aviator* and press the ENTER button. Any adjustments should be made according to the table in Step C. Wheel 2 is now calibrated.

Calibrating Wheel 1

1. Ensure that the "dry" size is calibrated correctly before proceeding with the polish calibration—refer to the "Calibration Using an SBA Shape" on Page 5-4, or edge the internal 58 mm shape (Job # 002) using a medium thickness, 6.0 base, 75-mm diameter or less, Poly lens, similar to ones used for CR-39 polish calibration.

2. Go to the *Blank Material Screen* (press the *Materials* function key F4 from the *Setup Screen*) and press the *Poly* function key F3 on the *Blank Material Screen*. Ensure that *Polish* has a check mark and that *Wheel 1* is selected.

When calibrating Wheel 1, use "**Poly**" as the material with the values shown in this sample screen. Ignore grooving parameters.



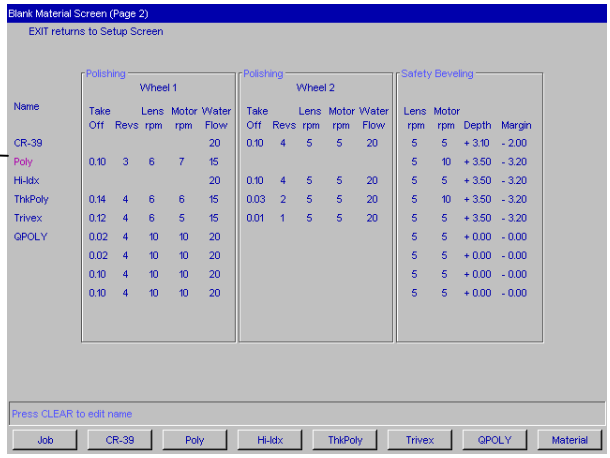
Note

Poly Wheel=1 is a key parameter setting.

3. Press the *Material2* function key F8 to access the *Blank Materials 2 Screen*.

4. Use the following settings for the material *Poly* as shown on this sample screen:

When calibrating Wheel 1, use "**Poly**" as the material with the values shown in this sample screen. Ignore safety beveling parameters.



Note

Poly Takeoff=0.00, Revs=1 are key parameter settings.

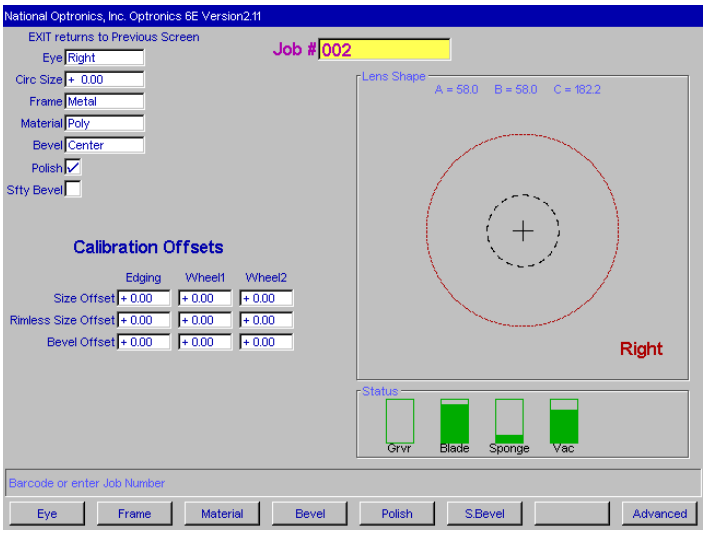
5. Go to the *Calibration Screen* (F2 from the *Setup Screen*).

6. From the *Calibration Screen*, move the cursor to *58 mm Circle* and press the ENTER key (or press the *58 mm Circle* function key F2). This will take you to a modified *Job Screen* (one set up for 58 mm circle calibration).

Note

If your 6E software version is prior to 2.10, go to the *Setup Screen* and ensure that the "Default Lens Blocking" is Geometric or Trace.

7. Use the following setting on the *58 mm Circle Calibration Screen*:



Note

Material=Poly is a key parameter setting.

8. Set the *Wheel 1 Bevel Offset* by cutting a medium thickness, 6.0 base, 75-mm diameter or less, Poly lens. The polishing wheel should lightly touch both the front and the back of the bevel.
   - If just the back is polished, enter a negative *Wheel 1 Bevel Offset*.
   - If just the front is polished, enter a positive *Wheel 1 Bevel Offset*.
   - If the lens is not polished, enter a negative *Wheel 1 Size Offset*.
   - If the lens is completely polished, enter a positive *Wheel 1 Size Offset*.
   - Repeat as necessary until both sides of bevel are lightly touched. Try adjusting in 0.05 mm increments.

Note

To conserve lenses, the test cuts can initially be oversized, and then decreased by 3 mm per iteration. For example, by setting the Box Size to +6.00 for the first cut, it can then be edged at +3 mm, then +0.00, -3.00, and finally –6.00 mm, resulting in 5 test cuts per lens. Once adjustments are close enough that the lens touches the Polishing Wheel, **do not use re-cut mode**—this will result in inaccurate bevel placement.

If you use Circ Size, instead of Box Size, you can accomplish the same thing by downsizing the Circ Size by –10.00 mm each time.

In addition, please note that setting the *Offset* is a quick and easy way of adjusting the bias. When you enter an *Offset*, the 6E automatically adjusts the bias numbers on the *Advanced Setup Screen*. If this is changed on the *Calibration Screen*, when you return to this screen later, you will see that the *Offset* is zero (0) rather than the number you have entered. That shows that it has made the adjustment on the bias numbers—the bias numbers will change by the amount (positive or negative) that you enter in the *Offset*. If you change this on the *Job Screen* (the special one set up for 58 mm circle calibration), the *Offset* will change to zero when you press the *Start* button. Alternatively, you can press the *Advanced Setup* function key F8 and modify the Bias numbers directly.

9. Set the *Wheel 1 Poly Takeoff* and *Poly Lens Revs* using the following procedure:
   A. Subtract 0.10 mm from the current Wheel 1 size offset
   B. On the *Blank Material 2 Screen*, change the "Poly" settings to the following:
      - Polishing Take Off 0.10
      - Polishing Number of Revs 3
   C. Go back to the *58 mm Circle Calibration Screen* and edge a medium thickness Poly lens as described in Step 8.
   D. Make the following adjustments based on lens size and presence of edge striations:

	Lens Striations Not Present	**Lens Striations Present**
On Size	Proceed	Increase TakeOff
Over Size	Decrease TakeOff Enter a negative Wheel 1 Size Offset	Increase Revs to 4 or 5 for Thick Poly Enter a positive Wheel 1 Size Offset
Under Size	Unusual - Check "Dry" size Enter a positive Wheel 1 Size Offset	Unusual - Check "Dry" size Enter a positive Wheel 1 Size Offset

Note

If the water flow seems incorrect, refer to the "Adjusting the Water- Flow" section on Page 5-14.

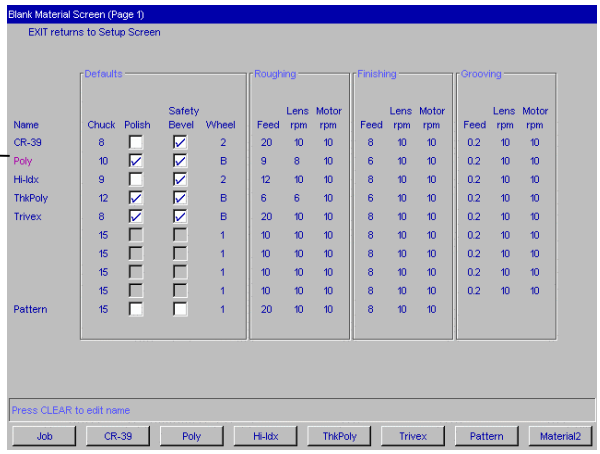
   E. Verify the polish on a non-round shape. This can be done by going to the *Calibration Screen* (F3 from the *Setup Screen*). Then move the cursor to *Aviator* and press the ENTER button. Any adjustments should be made according to the table in Step D. Wheel 1 is now calibrated.

Using Wheel 1 and Wheel 2 Together

It can sometimes be beneficial to use both wheels together to obtain a high luster finish. This would typically be used with Polycarbonate. Selecting this feature will cause the machine to first polish on Wheel 1 (the coarser wheel), then polish on Wheel 2 (the finer wheel) according to the parameters on the Materials screen—Material2 Polishing Parameters.

1. Ensure that Wheel 1 and Wheel 2 have been calibrated according to the previous steps.
2. Go to the *Blank Material Screen* (press the *Materials* function key F4 from the *Setup Screen*) and press the *Poly* function key F3 on the *Blank Material Screen*. Ensure that *Polish* has a check mark and that *Wheel B* is selected.

When calibrating both wheels, use "**Poly**" as the material with the values shown in this sample screen. Ignore grooving parameters.

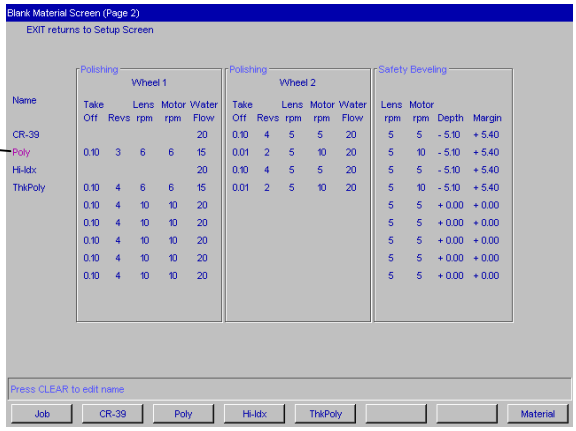


Note

Poly Wheel=B is a key parameter setting.

3. Press the *Material2* function key F8 to access the *Blank Materials 2 Screen*.
4. Use the following settings for the material *Poly* as shown on this sample screen:

When calibrating both wheels, use "**Poly**" as the material with the values shown in this sample screen. Ignore safety beveling parameters.



Note

Poly Takeoff on Wheel 1=0.10, Revs=3 (Wheel 1), Motor RPM=6 (Wheel 1) and Poly Takeoff on Wheel 2=0.01, Revs=2 (Wheel 2), Motor RPM=10 (Wheel 2) are key parameter settings.

5. No further calibration should be required. From the *Job Screen*, pull down Job 002 (58 mm) or internal Job 001 (Aviator) and edge a Poly lens to verify edge polish. If problems are encountered, refer back to individual wheel calibration.

Adjusting the Water Flow

If you have cut a couple of lenses and the water flow does not seem correct (too much flow or not enough), you can adjust the water flow by following these steps:

1. Go to the *Blank Materials Screen* (from the *Setup Screen* press the *Material* function key F4).
2. Move the cursor to the material you are using; then move the cursor to the *Water Flow* field.
3. Increase the value in this field to increase the water flow; decrease it to decrease the water flow. Enter a password if prompted.
4. Test the water flow by running another cycle. If the water flow is still not adjusted correctly, readjust the flow. See Note below for an alternative way of testing.

Note

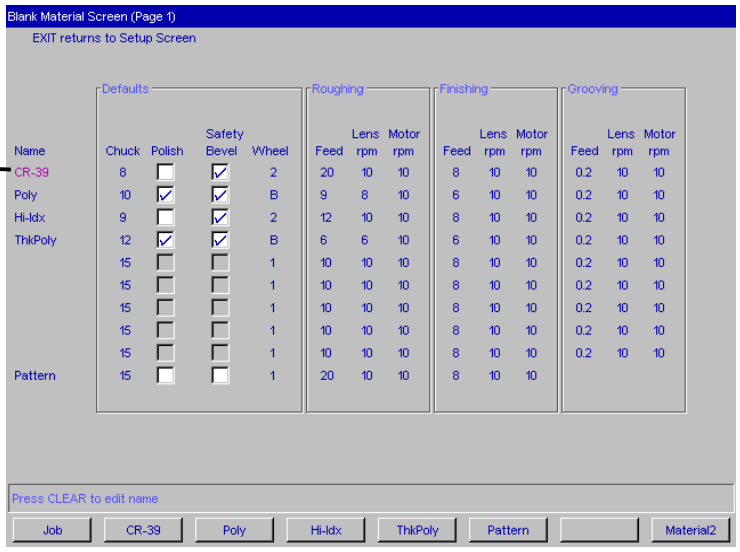
You can also test the water flow on the *Cleaning Screen*. The numbers on the *Water Flow* field there directly correspond to the numbers on the *Blank Materials Screen*.

Calibrating the Groover

The process of calibrating the Groover is almost identical to calibrating the Polishing Wheels. It is very important that the following steps be performed in order, and that each step is completed before moving on to the next step.

1. Go to the *Blank Material Screen* (press the *Materials* function key from the *Setup Screen*) and press the *CR-39* function key [F2] on the *Blank Material Screen* and ensure that the CR-39 grooving settings are the same as shown below:

When calibrating the groover, use CR-39 as the material with the values shown in this sample screen.



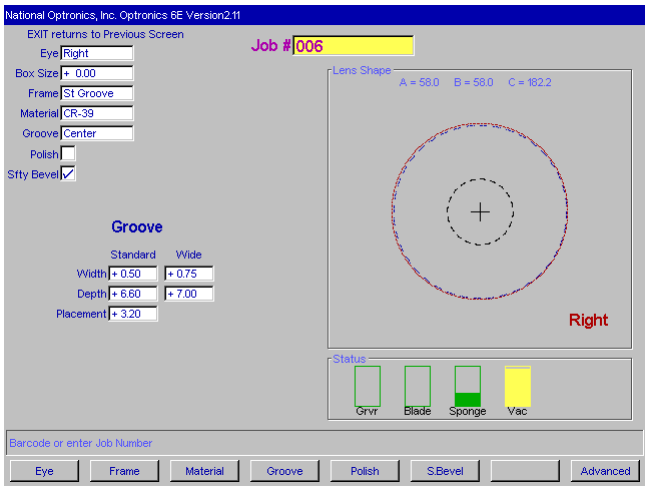
Note

CR-39 Grooving Feed=0.02, Lens RPM=10, Motor RPM=10 are key parameter settings.

2. Go to the *Calibration Screen* ([F3] from the *Setup Screen*).

3. From the *Calibration Screen*, move the cursor to *Groove* and press the [ENTER] key (or press the *Groove* function key [F5]). This will take you to a modified *Job Screen*.

4. Use the following setting on the *Groove Calibration Screen*:



Note

Size=0, Frame=St. Groove, Material=CR-39, Bevel=Center, Polish=No, and Safety Bevel=No are key parameters.

5. Set the *Standard Groove Placement* by cutting a 3-5 mm finished edge thickness CR-39 lens. The groove should be centered on the lens.
   - If the groove is too far forward, use a negative number to adjust the Standard Placement.
   - If the groove is too far backward, use a positive number to adjust the Standard Placement

Note

To conserve lenses, the test cuts can initially be oversized, and then decreased by 3 mm per iteration. For example, by setting the size to +6.00 for the first cut, it can then be edged at +3 mm, then +0.00, -3.00, and finally –6.00 mm, resulting in 5 test cuts per lens. **Do not use re-cut mode**—this will result in inaccurate bevel placement.

If you use Circ Size, instead of Box Size, you can accomplish the same thing by downsizing the Circ Size by –10.00 mm each time.

6. Set the *Standard Groove Depth* using the following procedure:
   - If the groove is too deep, use a negative number to adjust the Standard Depth.
   - If the groove is too shallow, use a positive number to adjust the Standard Depth.

The Standard Groove Width is factory set and should reflect the actual geometry of the groove blade installed.

7. Set the Wide Groove Placement and Depth in the same manner as Steps 6 and 7.

8. Set the *Wide Groove Width* using the following procedure:
   - If the groove is too wide, enter a smaller number to adjust the Wide Groove Width.
   - If the groove is too narrow, enter a larger number to adjust Wide Groove Width.

9. If you made any adjustments, re-cut a lens to test the calibration.

Calibrating the Safety Bevel

Calibrating the Safety Bevel is generally the last step in calibrating the 6E; that is, you would generally perform this calibration after you have performed all the other calibrations. The suggested steps for the process are as follows:

1. Prepare a blank lens for cutting. Use a lens that has a thick enough edge to leave a shelf behind the bevel.
2. Go to the *Calibration Screen* (F3 from the *Setup Screen).*
3. Press the *Aviator* function key F4, which takes you to the *Job Screen*.
4. On the *Job Screen,* make sure the *Safety Bevel* field has a check mark (✓) in it.
5. On the *Job Screen*, use the following values for the initial Safety Bevel cut:

   Safety Bevel Depth: +1.00
   Safety Bevel Margin: 0.0

   Note

   These settings will apply for the material selected and are the same parameters found on the *Material Screen*.

6. Cut a lens and examine the safety bevel. You should not adjust the margin at this point.

   Adjust the *Safety Bevel Depth* according to the following guidelines (and afterwards cut another lens and re-examine it):

   - **To increase the depth of the safety bevel, increase the number in the *Safety Bevel Depth* field.**
   - **To decrease the depth of the safety bevel, decrease the number in the *Safety Bevel Depth* field.**

7. When you have the Safety Bevel correct for a thick lens, cut a thin lens to calibrate the safety bevel margin:

   A. Chuck a thin lens.

   B. Using the *Aviator* selection as discussed above, cut a lens that will have an edge thinner than the bevel. The safety bevel should lightly touch the back of the frame bevel.

      Adjust the *Safety Bevel Margin* according to the following guidelines:

      - **If the safety bevel cuts too deeply into the frame bevel, increase the number in the *Safety Bevel Margin* field.**
      - **If the safety bevel is too light, decrease the number in the *Safety Bevel Margin* field.**

8. Repeat process for each material used.

You can use the *Copy to All Materials* button to copy the Safety Bevel Depth and Margin currently displayed to all materials defined on the *Materials Screen*.

Chapter 6

Performing As Needed Maintenance

Cutter Motor Replacement

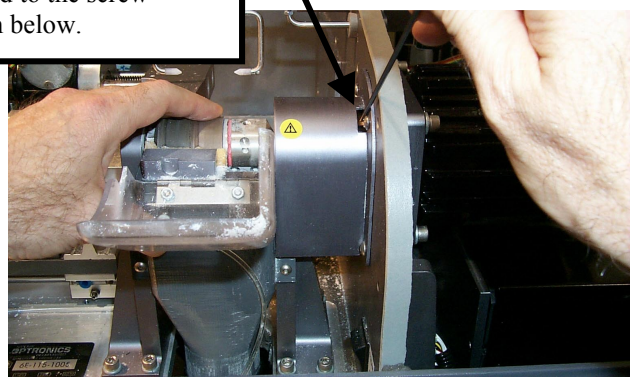
The life of an electric motor is long but finite. Motor bearings are the primary limitation on the motor's life, and increasingly loud operation is the most common sign for replacement. The motor should be replaced following these steps:

1. Turn the cutter motor and the edger OFF. Unplug the motor from its connection to the controller unit.
2. Loosen the screw on the coupler connecting the motor to the chip chute (see picture below). You may need to manually turn the polishing wheel to make the screw align with the hole as is being done in the picture below.

Caution

Avoid stripping the hexagonal screw on the coupler in Step 2 above. Make sure that the 3/32-inch hexagonal driver (Allen wrench) you use for the removal of the coupler is not badly worn. A new 3/32-inch T-handle Allen wrench is provided in the toolkit.

Note the new 3/32-inch T-handle Allen wrench (from the tool kit) is being applied to the screw shown below.



3. With the 3/16-inch wrench from the accessory kit, unscrew the four bolts on the adapter plate that holds the plate to the wall.
4. Remove the adapter plate and motor.
5. Remove the four screws that secure the motor to the adapter plate.
6. Install the new motor on the adapter plate. Make sure that the circular boss on the motor fits into the circular recess in the plate, and that the power cord coming out of the motor is at 45º to the right of vertical, when viewed from the right hand side of the edger.
7. Install the motor/adapter plate assembly by re-tightening the bolts, going in an "X" pattern around the four bolts, to ensure even tightening.
8. Re-tighten the screw holding the coupler in place (loosened in Step 2 above).
9. Connect the new motor to the controller unit, and secure the wire so it will not interfere with other nearby wires. Turn the motor "ON."
10. Go to the *Log Screen* (F5 from the *Advanced Setup Screen*).
11. Press the *Reset Motor* function key F8 or use the FIELD key to move to the *Reset Motor* field and press the ENTER key.

Probe Tip Replacement

Replace the probe tips when bevel placement seems erratic and probe calibration does not fully correct the problem. Probe tips should have a fairly distinct point. Well-worn or rounded tips are a sign for replacement.

Remove the old tips by following these steps:

1. Hold the tip tightly with one hand while performing Step 2.
2. Remove the #4-40 screw with a 3/32-inch hexagonal wrench (that is, an Allen wrench).

When reinstalling the new tips, adhere to that the following conditions:

- Make sure the tips line up.
- Make sure the tips are pointed at the operator and slightly down from horizontal.

Note

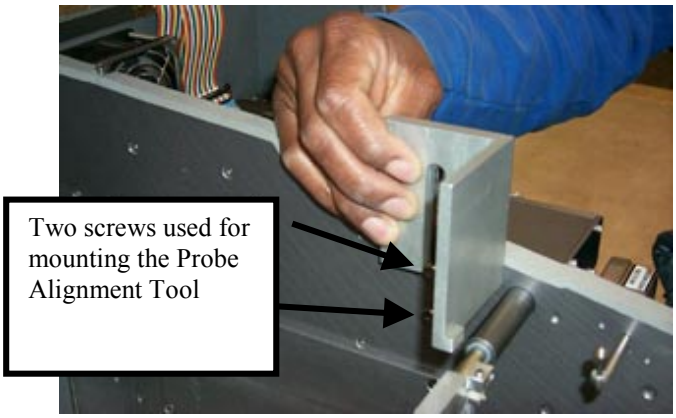
It will be necessary to recalibrate the probe and bevel placement after changing tips—refer to Chapter 5 for calibration instructions.

Probe Vertical Alignment

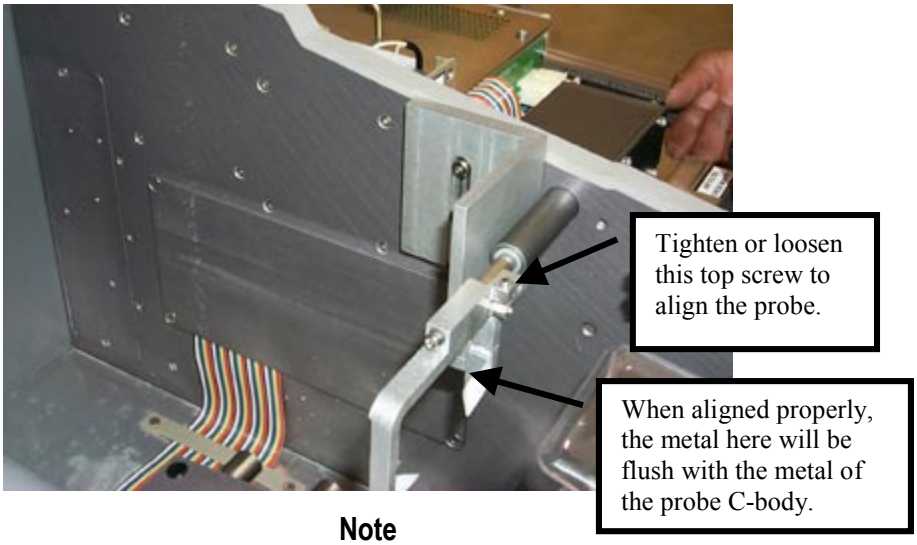
Align the probe if you suspect bad bevel placement or if you have replaced the probe or probe C-body (but not when you replace the probe tips).

Align the probe by following these steps:

1. Get the probe alignment tool out of the 6E toolkit and place it on the two screws as shown below:



2. With the probe alignment tool in place, tighten or loosen the probe alignment adjustment screw using the 5/64-inch hex driver from the hex key set. The metal of the alignment tool will be flush against the metal of the probe C-body when it is perfectly aligned—**do not over tighten this screw—as soon as metal touches metal, stop tightening it.** (If you tighten too far, the probe will spring outward when you remove the probe alignment tool.)



Note

Turning the screw clockwise forces the probe tips toward the back of the 6E; turning them counter-clockwise brings the tips in toward the front of the 6E.

3. Pull the probe to the left and ensure it slides to the right past the alignment tool. If it doesn't, refer back to Step 2.

4. Remove the probe alignment tool and place it and the hex key set back into the tool kit.

O-Ring Drive Pulley Change

On some models of the 6E, there are two o-rings that make the grooving wheel turn. (Other models have a drive belt—refer to the directions on the next page for maintenance of that type.) If both break, the wheel will not turn. If there is a noticeable weakening in the groover, check these two o-rings to see if one has broken.

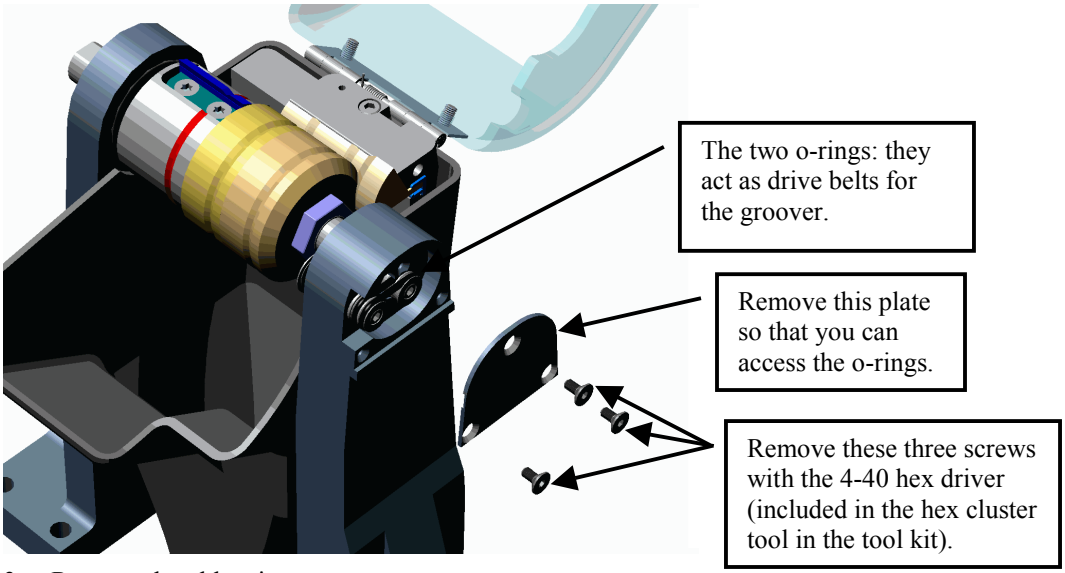
To replace the groover's o-rings, follow these steps:

1. Turn off the motor—make sure the switch on the controller box is "OFF"—THIS IS A SAFETY ISSUE!

Warning

Ensure that the switch on the controller box is OFF any time you have your fingers close to the cutter blade or groover wheel. Failure to do so could lead to serious injury.

2. Remove the plate on the left side of the housing to access the o-rings (see drawing below).



3. Remove the old o-rings.

Note

If the old o-rings are broken, clean out the pieces of o-ring from this area before installing the new ones. If you are replacing one that is still in tact, use a small screwdriver to lift first one side then the other off the pulley.

4. Clean cavity of any debris build-up.

5. Place the new o-rings on. The easiest way of doing this is to place one side onto the pulley. Then use a small screwdriver to lift the other side into place. Replace the back o-ring first, then repeat the process with the front o-ring.

6. Reattach the plate removed in Step 2 and turn the cutter motor back on.

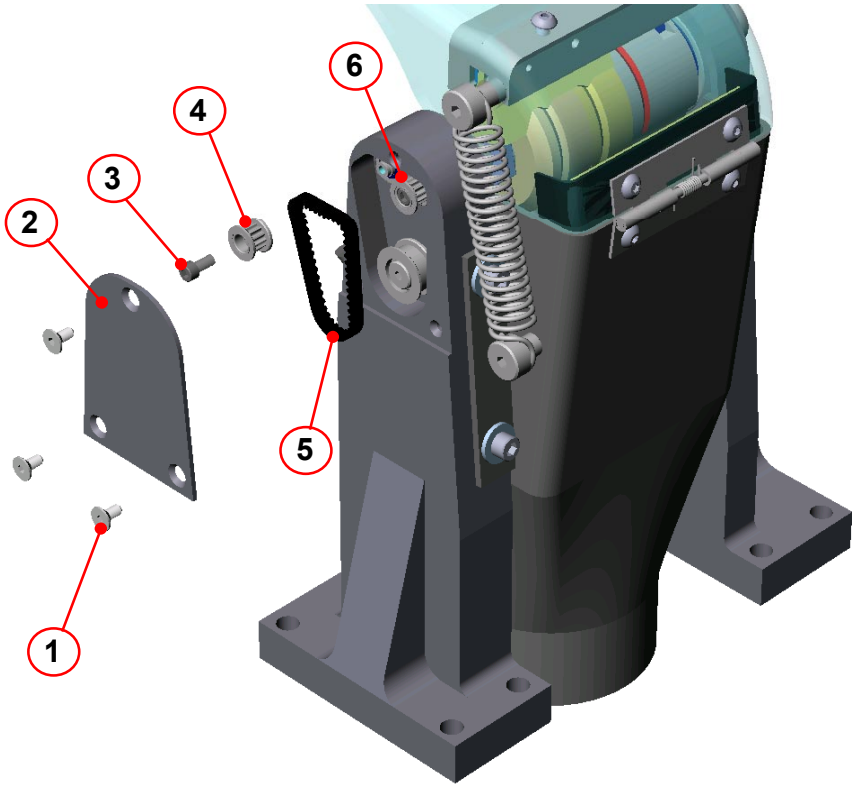
Replacing the Groover Drive Pulley or Belt

On some models of the 6E, there is a drive belt that make the grooving wheel turn. (Other models have o-rings—refer to the directions on the previous page for maintenance of that type.) If the belt breaks, the wheel will not turn.

Replacing the Groover Drive Belt

To replace the Groover Drive Belt, follow these steps:

1. Use the switch on the controller box to turn the motor OFF—**this is an important safety step. Always make sure the controller box switch is OFF before placing your hands near the cutter.**
2. Remove the three (3) #4-40 flat head (or socket head) screws (Item 1 in the drawing shown below).

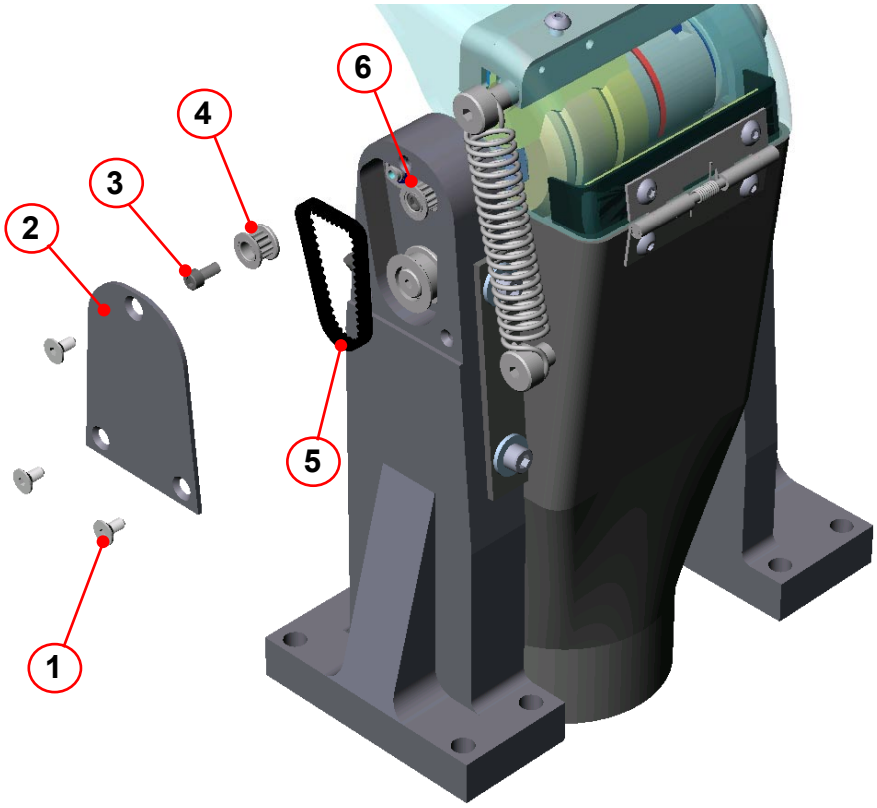


3. Remove cap plate to expose the drive mechanism (Item 2).
4. Remove the groover drive pulley (Item 4).
5. Clean out any debris or build-up before replacing the drive belt.
6. Remove the old drive belt (if broken, remove all parts of it) and place a new drive belt in its proper place (Item 5).
7. Reverse Steps 5 through 2 to re-install the screws and cap plate.

Replacing the Groover Drive Pulley(s)

To replace the Groover Drive Pulleys:

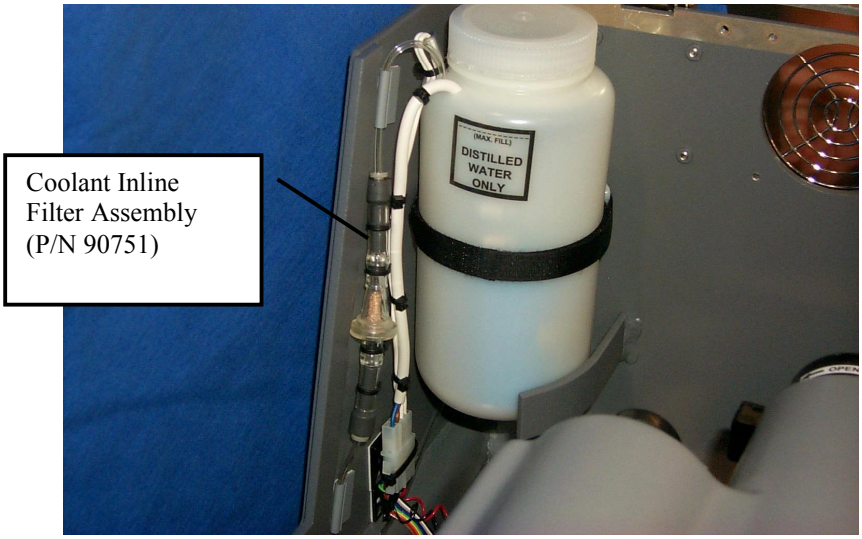
1. Use the switch on the controller box to turn the motor OFF—**this is an important safety step. Always make sure the controller box switch is OFF before placing your hands near the cutter.**
2. Remove the three (3) #4-40 flat head (or socket head) screws (Item 1 in the drawing shown below).



3. Remove cap plate to expose the drive mechanism (Item 2).
4. Clean out any debris or build-up before replacing the pulley(s).
5. Remove the #4-40 socket head cap screw (Item 3) to release the pulley from the threaded shaft.
6. Replace the pulley (or both pulleys) with the new one(s) you have received from Optronics.
7. Reverse Steps 5 through 2 to re-install the screws and cap plate.

Replacing the Coolant Filter Assembly (P/N 90751)

Approximately every six months or as needed, replace the water filter shown below:

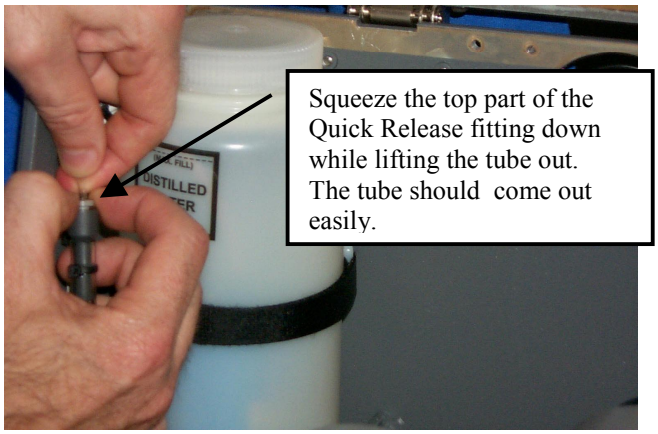


Note

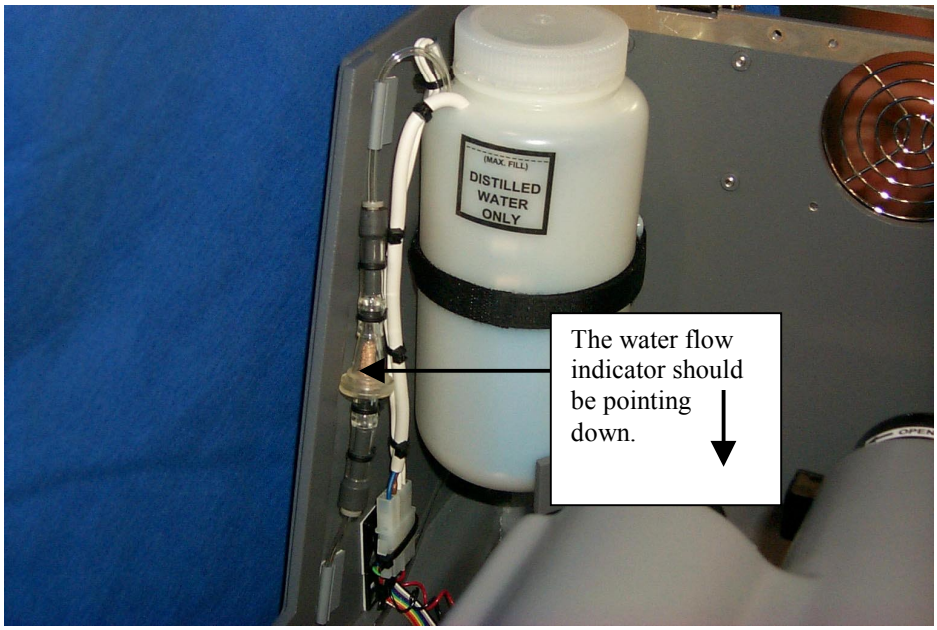
Small amounts of debris can get into the coolant reservoir during normal use. You may need to change the filter more often than every six months if you see a significant accumulation of debris in the filter or notice restricted water flow.

To change the filter, follow these steps:

1. Remove lens from the 6E chuck if you have not already done so.
2. Close the chuck by pressing the Chuck button CHUCK.
3. Move the bevel carriage over to the right by going to the *Diagnostic Screen* and pressing the Bevel Right function key F2 (the *Diagnostics Screen* is an option from the *Advanced Setup Screen*).
4. Turn off the 6E's power switch.
5. Press and hold the top part of the top Quick Release fitting and pull the hose away from the filter. Repeat with the bottom Quick Release fitting.



6. Discard the used filter.
7. Using the Quick Release fittings on the new filter, install the new filter into the place where the one was removed. **NOTE**: There is a water flow indicator arrow on the filter. The water flow indicator should be pointing down.



8. Turn the power back on and check for leaks by going to the *Cleaning Screen* and turning on the pump. If there are any leaks, push the tube farther into the Quick Release fittings.

Chapter 7

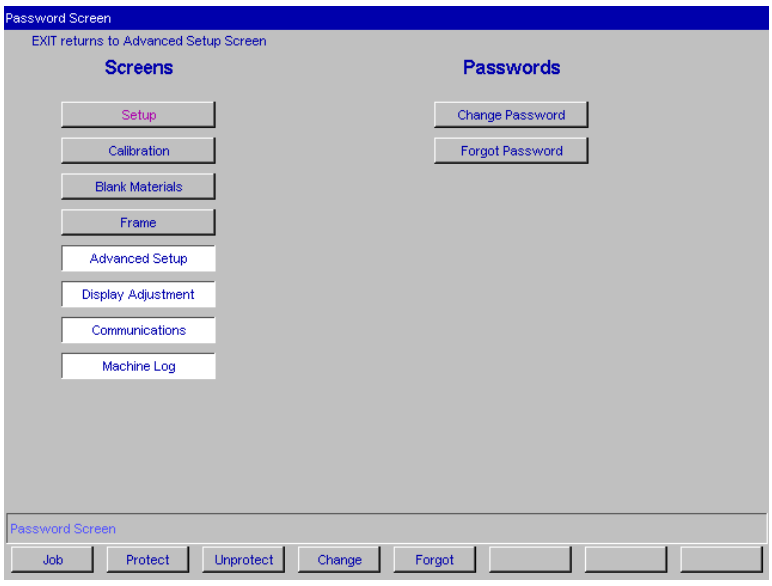
Advanced Configuration & Special Considerations

Customizing the 6E to Meet Your Needs

There are several ways you can customize the 6E software to meet the needs of your organization. Customizing tasks tend to be performed by lab managers or supervisors.

Password Protection

Certain screens are password protected by default, meaning that a user cannot change the settings on a given screen without typing in the password. The screen capture below shows the default settings (white background indicates password protected screens).



You can change the default settings by following these steps:

1. Go to the *Advanced Setup Screen* (F7 from the *Setup Screen*).
2. Go to the *Password Screen* (F7 from the *Advanced Setup Screen*).

3. Move the cursor to the button of the screen you want to password protect or unlock and press the *Protect* F2 or *Unprotect* F3 function key.
4. Enter the password if prompted.
5. Press the *Job* key F1 to go to the *Job Screen* and save the changes.

Changing Password

To change your password, press the *Change Password* button and follow the prompts. The password must be 6 digits in length.

What Happens If I Forget My Password

If you forget the current password, follow these steps:

1. Press the *Forgot Password* button; then call National Optronics Technical Service.
2. Provide them with the password code displayed in the message box.
3. They will provide you with a special (one-time use) password that can be used in place of the current password.

Note

This special password is only valid for use this one time. A new special password will be required each time you forget your password.

Special Note

The special password is based on the password code, and the password code changes on a regular basis, so do not exit this screen before receiving and using the special password.

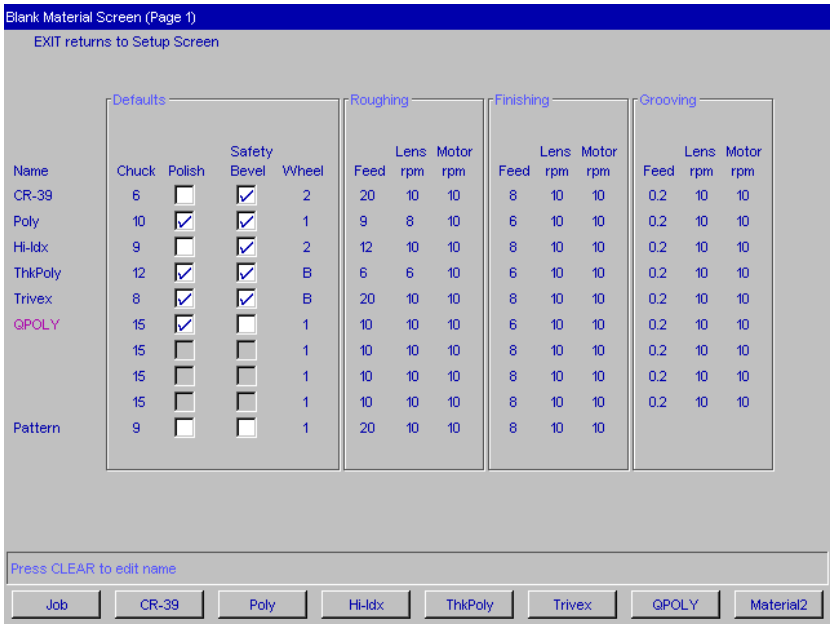
4. Press the *Change Password* button.
5. Enter the special one-time use password that you received from National Optronics.
6. Follow the prompts that appear. You will be required to enter a new password and confirm it.

The 6E will display a "Password has been changed" message box.

Defining Customized Materials

The *Blank Materials Screen* includes all the standard materials used for lenses (except glass, which the 6E is not designed to use). You may want to create a new "Material" that has special settings for special need jobs. Below is a *Blank Materials Screen* with the default materials listed (that is, no special ones created).

On this sample screen, we have created a custom material, "QPOLY."



To add a new Material onto this screen, follow these steps:

1. Move the cursor to the first blank space in the *Name* field.
2. Press the CLEAR button.
3. Enter the password if prompted.
4. Use the ▲ key to advance through the alphabet so that you can add a letter. Notice that the *Increment* and *Decrement* keys (▲ and ▼) move forward or backward through the alphabet. Press the ENTER key to accept the letter that is displaying and proceed to the next space to the right. The next space to the right will begin with the letter you just entered; that is, if you are entering the word "SPECIAL," after entering the *S*, the letter next to it will begin with the letter *S* and you will need to use the ▼ key to go to the letter *P*. (If you want to use lower case letters, keep pressing the ▲ key and lower case letters will display.)
5. Press the FIELD ▲ or FIELD ▼ key to complete the name and leave the field.
6. After you have entered the name of the Blank Material, you can add the edging and polishing settings. Then press the *Job* key F1 to go to the *Job Screen* and save the changes.

Special Characters

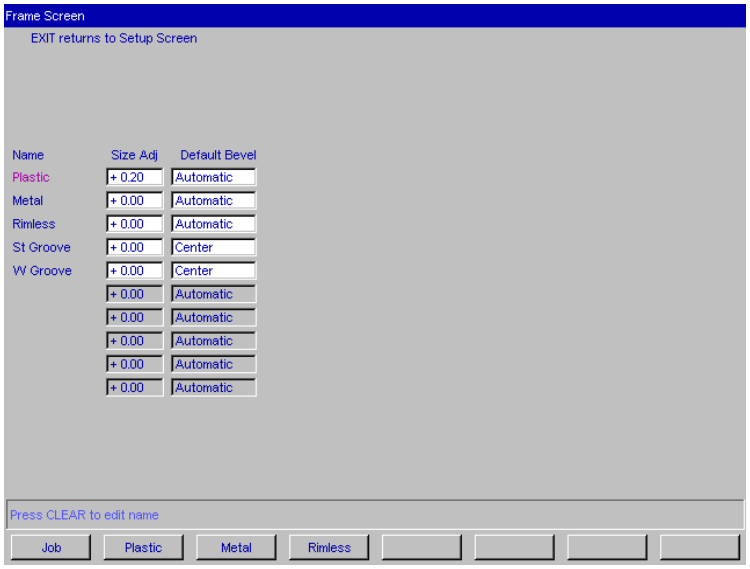
If there is an asterisk (*) anywhere within the name, the 6E probes and roughs normally, then probes again to ensure proper bevel placement for very thin lenses that might flex due to clamping. For example, if you create a custom material called CR39*, this double probing technique will be invoked each time you select that material. **This only works when "Rough First" is unchecked on the *Setup Screen*.**

If there is an ampersand (&) anywhere within the name, the 6E checks the lens thickness from the probe data and if the lens is thinner than 3 mm., the 6E will reduce the feed rate to half of what it would normally be. **This only works when "Rough First" is checked on the *Setup Screen*.** (The selection "Poly" works this same way by default.)

Working with the Frame Adjustment Fields

You may need to set up unique frame types to accommodate different sizing needs. These sizing offsets will automatically be applied to the sizing field on the job screen for the various frame types.

The default frame types and settings are shown below:



To add a new frame type, add a new Name in the Name field by following these steps:

1. Move the cursor to the first blank space in the *Name* field.
2. Press the CLEAR button.
3. Enter a password if prompted.
4. Use the ▲ key to advance through the alphabet so that you can add a letter. Notice that the *Increment* and *Decrement* keys (▲ and ▼) move forward or backward through the alphabet. Press the ENTER key to accept the letter that is displaying and proceed to the next space to the right. The next space to the right will begin with the letter you just entered; that is,

if you are entering the word "SPECIAL," after entering the *S*, the letter next to it will begin with the letter *S* and you will need to use the ▼ key to go to the letter *P*. (If you want to use lower case letters, keep pressing the ▲ key and lower case letters will display.)

5. Press the FIELD or FIELD key to complete the name and leave the field.

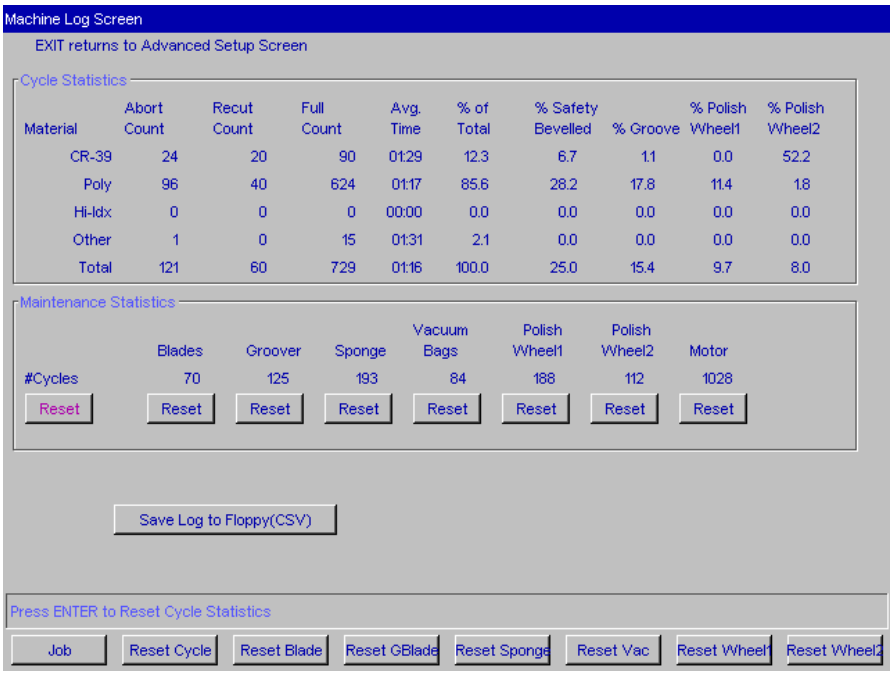
6. After you have entered the name of the Frame, you can add the size adjustments settings. Then press the *Job* key F1 to go to the *Job Screen* and save the changes.

Note

In addition, if you place an exclamation point (!) within the name of the frame, the 6E will include standard grooving for the job (for example, "metal!"). If you place a # sign within the name (for example, "plastic#"), the 6E will include wide grooving for the job.

Collecting and Resetting Statistics

You can use the *Machine Log Screen* to collect statistics about the 6E, including number of cycles since the last maintenance, etc. You will also use this screen immediately after replacing the vacuum bag, the cutter blade, etc. (Refer to Chapter 3, "Commonly Performed Tasks," for instructions on vacuum bag and cutter blade replacement; refer to Chapter 6, "Performing Periodic Maintenance," for instructions on motor replacement. For all other replacements, call National Optronics.)

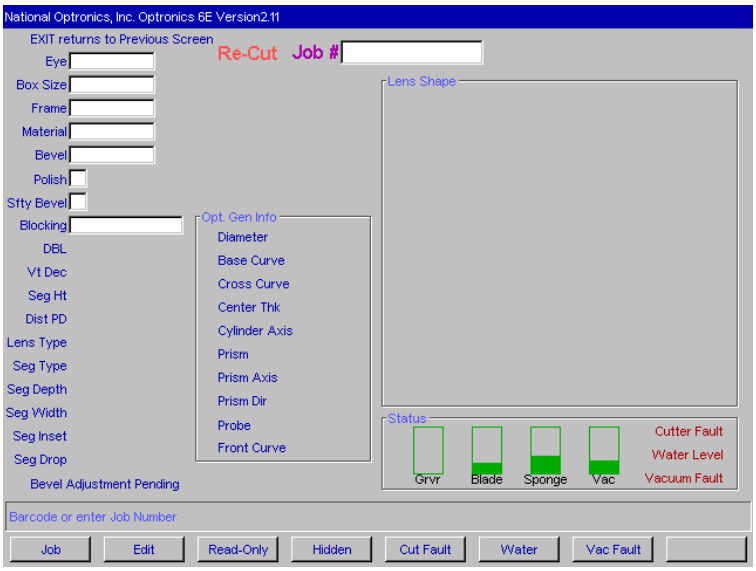


Note

National Optronics Service Technicians use the Cycle Statistics for data analysis and troubleshooting. Please call National Optronics before resetting the Cycle Statistics.

Customizing the Look of Your Job Screen

You can control many of the fields that display on the *Job Screen*, as well as the warnings for Vacuum fault, etc., through the *Job Screen Layout Screen* (shown below).



Each field can have one of three settings: (1) displaying and editable, (2) displaying but read-only, or (3) hidden—does not display on the *Job Screen*.

To modify the settings of fields on this screen, follow these steps:

1. Move the cursor to the field whose display or edit characteristics you want to modify.
2. Press the *Edit* button F2 if you want to make a field editable and displaying on the *Job Screen*. Press the *Read-Only* button F3 if you want to make a field non-editable (read-only) but displaying on the *Job Screen*. Press the *Hidden* button F4 if you want to make a field hidden (not displaying) on the *Job Screen*.
3. Then press the *Job* key F1 to go to the *Job Screen* and save the changes.

One of the common uses of this screen is to disable warnings such as disabling the vacuum fault warning if a central vacuum is in use. To modify the Vacuum fault warning, follow these steps:

1. Press the Vac Fault function key F7 to turn it off; press the Vac Fault function key F7 again to turn it back on. When off, the words *Vacuum Fault* display in black typeface, and the bar is gray. When on, the words *Vacuum Fault* display in red typeface, and the Vac bar is colored.
2. Press the *Job* key F1 to go to the *Job Screen* and save the changes.

If you are not using the 6E's polishing feature, you may want to disable the *Water Level* warning to keep the warning from appearing on the screen. If you want to disable the *Water Level* warning, use the same type of procedure to enable or disable the Water Level warnings: Press the *Water* function key F6 to turn it off; press the *Water* function key F6 again to turn it back on. When off, the words *Water Level* display in black typeface, and the Sponge bar will turn gray. When on, the words *Water Level* display in red typeface, and the Sponge bar is colored.

Using Pause Mode and Profile Mode for Bevel Placement

When to Use Pause Mode and Profile Mode

Both Pause Mode and Profile Mode allow you to place the bevel manually rather than using the automated (Auto, Front, Back, Center, Base, Fixed, and Percent) 6E bevel placement features. **Note: These two methods also work with the groove cycle, that is, placement of the groove.**

Use Pause Mode if you want to place the bevel by visually examining at the orange bevel mark on the cutter blade and the lens. Pause Mode is also very similar to the method of adjusting the bevel on a Horizon III.

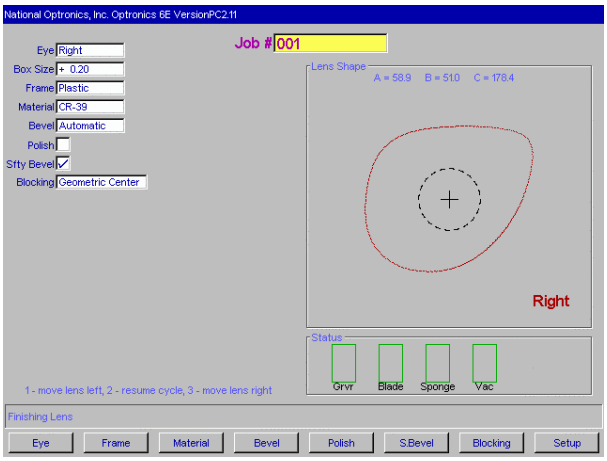
Use Profile Mode if you want precise bevel placement control where you can place the bevel on an image of the lens. This also gives you the ability to place the bevel at different positions (more towards the front or back) at different places along the lens's edge, perhaps more useful when you have a lens that is thicker on one side than the other.

Using Pause Mode

Follow these steps to use Pause Mode:

1. Make sure that the field *Use Profile Mode* on the *Setup* screen is unchecked.
2. Go to the job screen and set up a job, as you would normally do.
3. Press the start key—then press it again within five (5) seconds. (When you press the START button the first time, you will see the message, "Press START again to adjust bevel"; you will have to press the START button within five seconds or the 6E will proceed in its normal mode.) Note: Pressing START more than once has no effect on Rimless lenses in Pause Mode.

After several seconds, the message on the screen will change to the words, "Bevel Adjustment Pending." Before the finishing cycle, the lens will move in front of the bevel part of the blade. The words, "1-move lens left, 2-resume cycle, 3-move lens right," will then appear on the screen, as shown below:



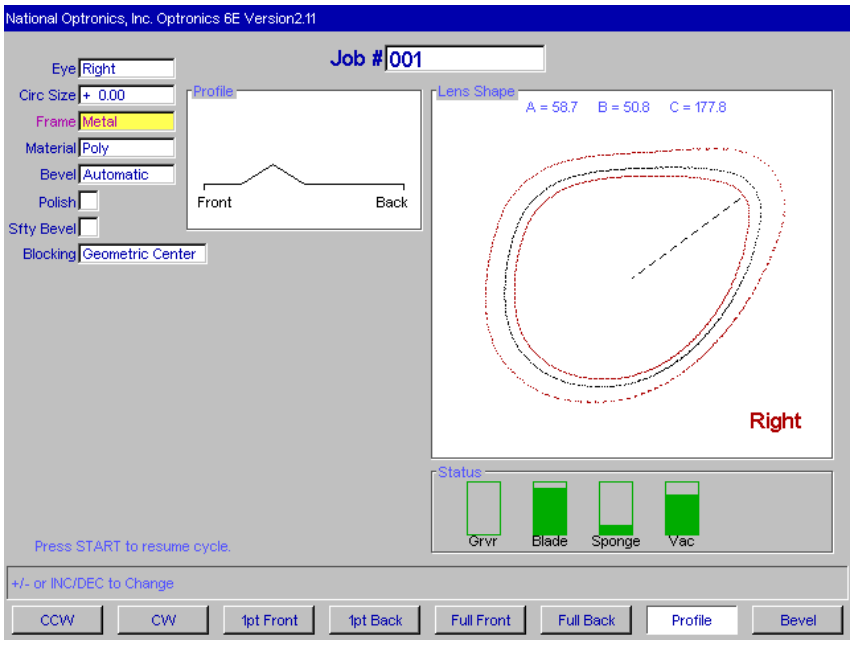
4. Visually examine the location of the bevel by looking at the orange bevel mark on the cutter blade to determine where the bevel will be on the lens. If you want to move it to your left or right, use the 6E keypad numbers 1 or 3 to move the bevel placement. When it is in the exact location you want, press [2] to finish the cycle.

Using Profile Mode

Follow these steps to use Profile Mode:

1. Make sure that the field *Use Profile Mode* on the *Setup* screen is checked.
2. Go to the job screen and set up a job as you would normally do.
3. Press the start key—then press it again within five (5) seconds. (When you press the START button the first time, you will see the message, "Press START again to adjust bevel"; you will have to press the START button within five seconds or the 6E will proceed in its normal mode.)

After several seconds, the message on the screen will change to the words, "Bevel Adjustment Pending." After the probing cycle, the screen will display an image representing the lens and bevel, looking similar to this:



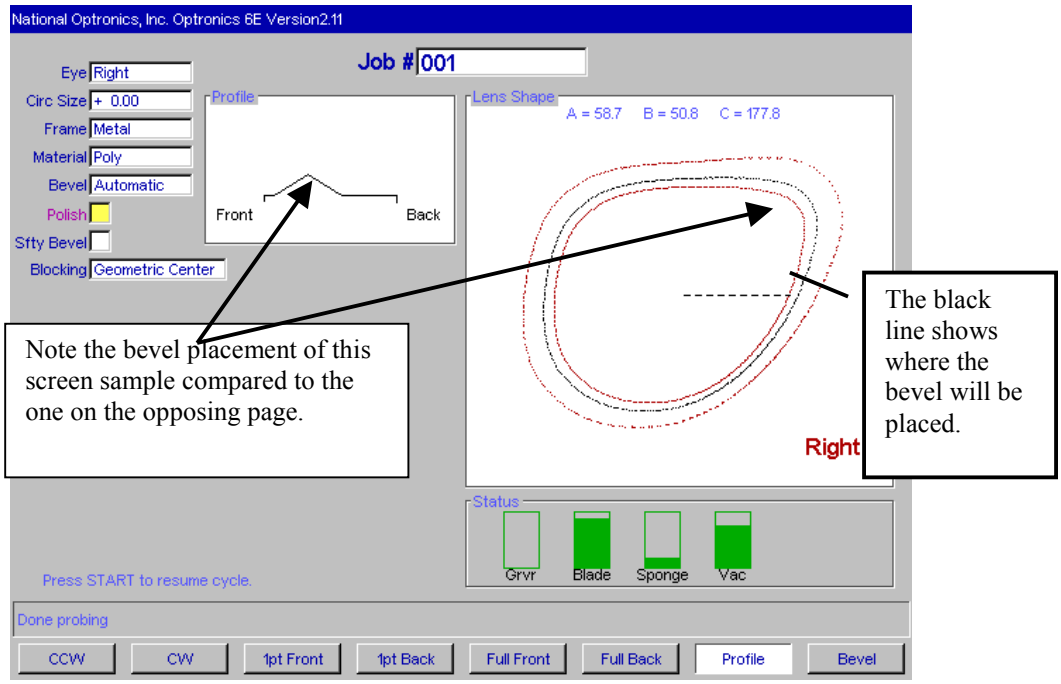
The first two function keys, from left to right, are *CCW*=move the pointer counter clockwise and *CW*=move the pointer clockwise. This controls where the pointer is located, to be used with the next two function keys.

The third and forth function keys are *1pt Front*=move the bevel in towards the front 1 point at the location where the pointer is located and *1pt Back*, which moves the bevel back one point. This will position the bevel in the manner shown in the next screen capture.

The next two function keys, *Full Front* and *Full Back*, lets you move the bevel in a uniform manner, around all of the lens, not focused at the point where the pointer is located.

The final two function keys are *Profile*, showing the mode selected (this is a toggle that will take you out of Profile Mode), and *Bevel*, which you would press to change the *Bevel* selection, shown here as "Automatic"; for example, you could change it to "Front," which would position the bevel towards the front.

4. Make adjustments to the bevel placement using the function keys defined above. In the following sample screen, we positioned the pointer, using CCW (the first function key) to a thick part of the lens and then placed the bevel using the fourth function key (*1pt Back*) to the position we believe would be optimal.

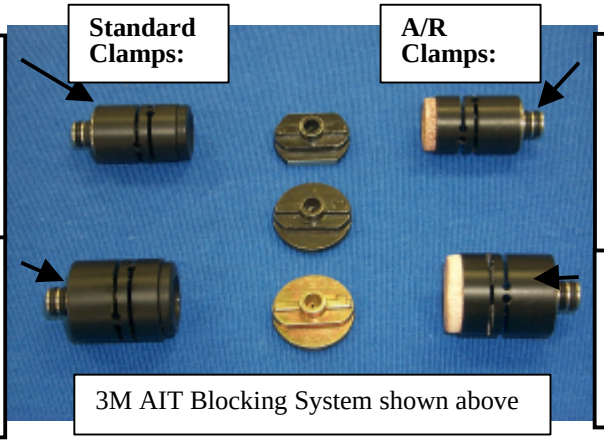


5. When you have positioned the bevel exactly where you want it, press the START button to finish the cycle.

Special Clamps for Thin Lenses with AR Coating

Standard Intermediate-Size Clamp Body Assembly (P/N 90076; Vario and Essilor Blocking P/N 90083)—will work with most A/R coated lenses.

Standard Full-Size Clamp Body Assembly (P/N 90077; Vario and Essilor Blocking P/N 90089—will work with most A/R coated lenses.



A/R Intermediate-Size Clamp Body Assembly (Special Order P/N 90062; Vario and Essilor Blocking P/N 90086) with the appropriate block*

A/R Full-Size Clamp Body Assembly (Special Order Vario and Essilor Blocking P/N 90061) with the appropriate block*

To edge AR-coated thin lenses, follow these steps:

1. Ensure that your cutter blade is in good condition.
2. Select the correct A/R clamp assembly, depending on the size of the lens being edged.

   If the shape of the lens has a 23 “B” or higher, use the full-size A/R clamp.

   If the shape of the lens has a “B” size lower than 23, use the intermediate A/R clamp.
3. Select the correct block, depending on the clamp selection:

   When using the full-size clamp body, use only eight-base blocks—regardless of lens curvature.

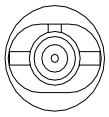
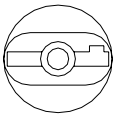
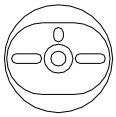
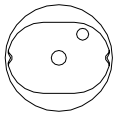
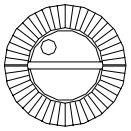
   When using the intermediate-size clamp body, use only two-base blocks—regardless of lens curvature.

   If a half-eye block is needed and you are using the 3M blocking system, use National Optronics-modified half-eye 3M blocks (see table on the following page for part numbers).

   Do ***not*** use a six-base block for any A/R work!
4. Use 3M Blue Chip (or equivalent) protective tape on both sides of the lens.
5. On the *Job Screen*, set the material to “AR Resin” if the lens material is High Index or CR39; use “AR Poly” if the lens material is Poly or Trivex.
6. Check the *Blank Materials Screen* to ensure that you are using standard, default feedrates and speeds appropriate for the material. These settings are listed below:

	Roughing				**Finishing**		
	Chuck Pressure	Feed	Lens Rpm	Motor rpm	Feed	Lens rpm	Motor Rpm
AR Resin	6	6	6	10	4	8	10
AR Poly	6	6	6	10	4	8	10

Use NOP Kit Number when ordering these parts and follow these guidelines for choosing the correct half-eye blocks when using the A/R clamp assembly:

Blocking System	Kit Number	Leap Block Intermediate Lowbase	Leap Block Full Size Lowbase	Leap Block Full Size Highbase
Semi-Tech 	90068	43	40	42
AIT 	90069	33	30	32
Coburn 	90071	23	20	22
Shuron 	90072	13	10	12
Vario 	90073	- - -	- - -	- - -

Appendix A

6E Screens: Field Definitions

Standard Flow of Work on the 6E

The graphical representation on the following pages shows the screens and common patterns of screen usage. Although work flow may vary from the graphic, these patterns account for the more common tasks.

Please unfold the next pages: We printed them on oversized paper to increase readability of the screen captures. These two pages show:

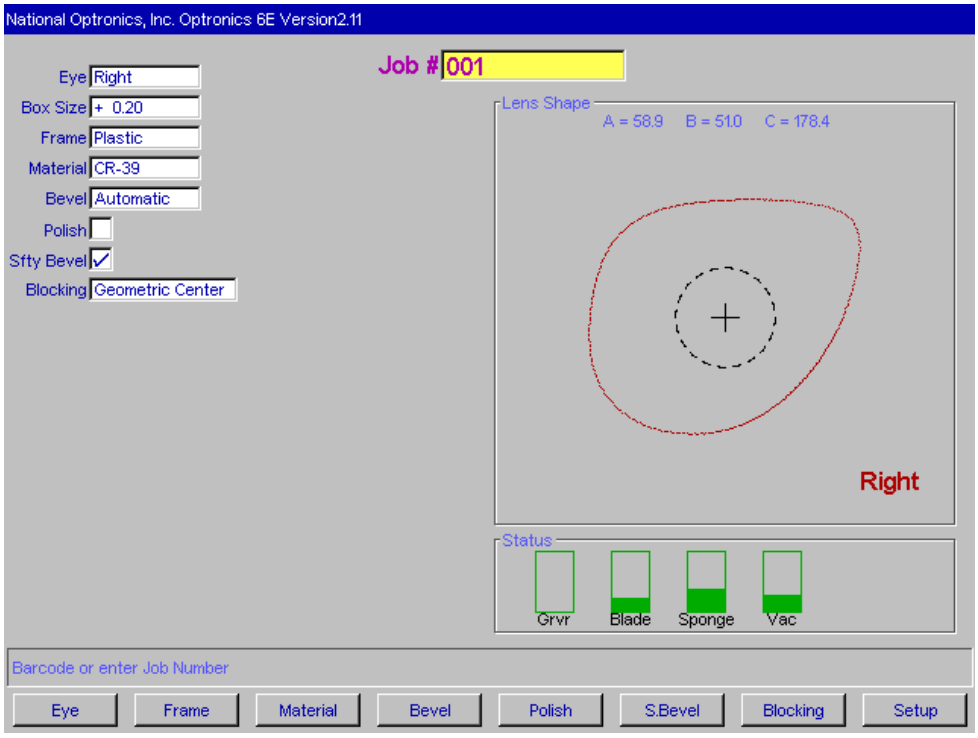
- Screen flow for standard usage
- Screen flow for advanced setup usage (usually performed by a lab manager)

Field Definitions

Job Screen

Job Screen with Geometric Center Selected

The *Job Screen* for a single vision lens with "Geometric Center" selected displays the fields shown below:



Job #: Job number may be entered with the keypad or with a bar-code wand. Bar-code requires 8 Bits, 1 Stop Bit and No Parity—also, CR or LF must be sent after the code when configuring for a bar-code reader. (Baud rate can be set on the *Communications Screen*.)

Eye: Denotes the eye for which the lens will be cut (Right or Left).

Note

If you check (place a checkmark "✓" in) the *Eye Toggle* field on the *Advanced Setup Screen* (under *Settings*), once you finish edging the lens for the right eye, it will automatically switch to the left eye.

Box or Circ Size: This field will appear as Box or Circ Size (circumference size) based on the *Size Dimension* field on the *Setup Screen*. For either Box or Circ Size, this field specifies a size correction if the size of the frame to be used is different from the size used when performing the trace, or a size adjustment to the downloaded shape for any other reason. A setting of 0.00 (mm) means that the frame to be used is the exact same size as the one that was traced to create the specific job (that is, no increase or decrease needed).

For Box Size, if the *Box Size* is less than 65 mm, the size offset will affect the "A" dimension (diameter). If the *Box Size* is greater than 65 mm, the lens will be edged to that circumference. If this number is 0.00, the edger will cut the shape exactly size-on-size with the trace. The operator may use this feature to manually oversize the first cut or do a light skim cut in the "Re-cut" mode. A *Size* value of –0.10 during a re-cut will give a 0.1 mm skim cut. Downsizing a re-cut by more than 3 mm from the previous size will require re-probing for correct bevel placement.

For Circ Size, if the *Circ Size* is less than 65 mm, the size offset will affect the circumference. If Circ Size is greater than 65 mm, the lens will be edged to that circumference. If this number is 0.00, the edger will cut the shape exactly size-on-size with the trace. The operator may use this feature to manually oversize the first cut or do a light skim cut in the "Re-cut" mode. Downsizing a re-cut by more than 9 mm from the previous size will require re-probing for correct bevel placement.

Note

Size adjustments are relative to the original size, not the previous cut.

Frame: Specifies whether the frame is metal, plastic, rimless, or a frame that requires a standard groove or a wide groove.

Metal	For metal frames; default size offset is 0.00.
Plastic	For plastic frames; automatically defaults to +0.20, but this default oversize may be adjusted on the *Frame Screen* (refer to the *Frame Screen* field definitions on page A-30).
Rimless	Cuts a rimless lens; roughs the lens out and finishes with a slow finish cut. Size overset is done automatically. When "Rimless" is selected, the *Bevel* field changes to *Probe Mtd* (Probe Method)—see definition on the following page.
St. Groove	Cuts a groove 0.5 millimeters wide—this is the standard for most grooved lenses.
W. Groove	Cuts a groove with a width that is user-defined on the *Advanced Setup Screen*.

Note

If the *Frame* type is "St. Groove" or "W. Groove" and you have the Grooving spindle arrangement, then the cycle will include grooving of the lens.

In addition, if you place an exclamation point (!) within the name of the frame, the 6E will include standard grooving for the job (for example, "metal!"). If you place a # sign within the name (for example, "plastic#"), the 6E will include wide grooving for the job.

Material: Specifies the material of the lens to be cut so that the edger can cut it at a specified rate set in the *Blank Material Screen* (refer to the *Blank Material Screen* field definitions on page A-10). The factory settings are as follows:

CR-39	Fast roughing cut, moderately slow finish cut
Poly	Moderately slow roughing cut, slow finish cut
HI-IDX	For high index materials; moderate roughing and finish cuts
ThkPoly	A very slow roughing cut.
Trivex	Fast roughing cut, moderately slow finishing cut.
Pattern	A very fast cycle for cutting a pattern blank to match the job trace. When selected, the Frame field becomes "Rimless" because you wouldn't have a bevel or a groove on a pattern. Also, when the material is "Pattern," the *Bevel/Probe Mtd* field disappears.

Note

You can add "materials" to the selections provided. This allows you to specify different settings even if the actual material is the same. In addition, please note that cutting speeds, water flow, chuck pressure, polishing settings, and polish/safety bevel defaults are controlled with this selection.

Bevel: You can choose from the following options when selecting bevel placement:

Front	Places the bevel along the front surface of the lens.
Automatic	Places the apex of the bevel 1/3 - 2/3 along the periphery and will automatically center the bevel on those portions of the lens where the edge is thinner than the full bevel. This option is recommended for most jobs.
Center	Centers the bevel on all points on the lens edge.
Back	Places the bevel along the back surface of the lens.
Executive	Centers the apex of the bevel along the periphery and will smooth the bevel over an executive shelf. Also uses a special probing technique.
Base	This option allows the operator to place a pre-selected base curve bevel around the edge for easy fit into frames. If selected curve cannot fit, the 6E calculates a range of legal values and prompts you to choose from those values after probing.
Fixed	This option specifies the default distance in millimeters that the peak of a fixed bevel will be from lens front.
Percent	This option specifies the location of the bevel peak from front of lens as a percentage of edge thickness.

Note

Automatic, Center, Back, Base, Fixed and Percent placements may be affected by National Optronics cutter geometry; specifically, the maximum front shelf is 4 mm. The front shelf is 3 mm for a polished lens.

Probe Mtd: Appears when "Rimless" is the frame type. There are two selections available: "Executive" and "Standard." Use Executive for executive lenses.

Polish: This value toggles between a checkmark "✔" and no checkmark (that is, blank) and determines if the lens to be edged should also be automatically polished. To change this value, press the *Polish* function key F5 key or move the cursor to the field and change its value by pressing the +/- key.

Sfty Bevel: This value will toggle between a checkmark "✔" and no checkmark (that is, blank) and tells the edger if it should place a safety bevel on the lens. To change

this value, press the *S.Bevel* function key F6 key or move the cursor to the field and change its value by pressing the ⇄ key.

Blocking: The Blocking function key F9 allows you to change from Optical Center to Geometric Center from the *Job Screen*.

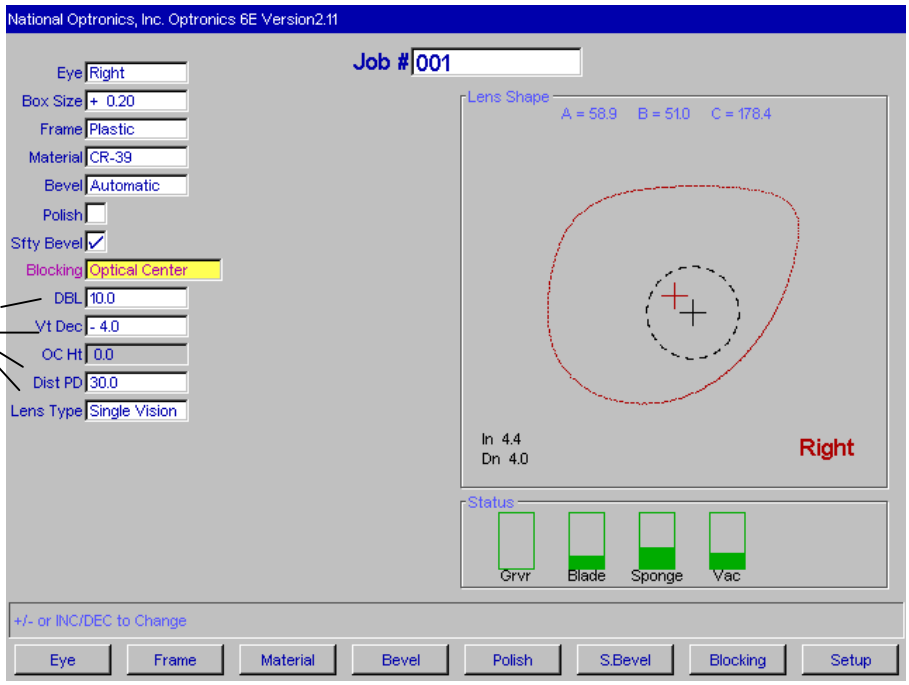
Lens Shape: Graphically represents the shape the lens will be cut—displays A, B, C. These change appropriately as the size setting is changed. In Optical Center mode, the decentration will appear in the lower left corner.

Status Area: Status Indicators and Fault Indicators display here. The warnings appear only if there is a Status or Fault warning. The following warnings may appear:

Status Indicators	The bar graphs ("Groover," "Blade," "Sponge," and "Vac" on the *Job Screen* represents the number of cycles since the last groover, blade, sponge, or vacuum bag replacement. This graphic turns yellow at 90% of the life expectancy of each and red when it is time for replacement—refer to Chapter 3, "Commonly Performed Tasks" for step-by-step instructions.
Cutter Fault	These words appear when the cutter motor fails to start up at the beginning of the cycle or stops running at any time during the cycle.
Water Level	These words appear when the sensing device on the coolant receptacle indicates that the water level is very low. A cycle requiring polishing cannot be started when the *Water Level* warning is visible.
Vacuum Fault	These words appear when the vacuum fails to start up at the beginning of a cycle or stops running at any time during the cycle.

Job Screen with Optical Center Selected Using NOP Protocol

If you specify "Optical Center" for *Lens Blocking* on the *Advanced Setup Screen*, the *Job Screen* will have additional fields displaying as shown below:



These fields are not shown unless Optical Center is selected.

DBL: Distance Between Lenses value for the frame of the current job

Vert Dec: Specifies the vertical decentration of the optical center of the lens, not used for multifocal lens types.

OC Ht or Seg Ht: Segment Height (or Optical Center Height) of the lens in mm. This changes to OC Ht for single vision and progressive lenses.

Dist PD or Near PD: Patient Pupillary Distance in mm. This changes to Dist PD (Pupillary Distance established when looking in the distance) for single vision and progressive lenses.

Note

The PD is considered binocular pupillary distance if the amount is greater than 40 mm. If the amount is less than or equal to 40, the 6E interprets that number as monocular pupillary distance. This is a near measurement for all multifocal lenses except Executive segments and a distance measurement for all other lens and segment types.

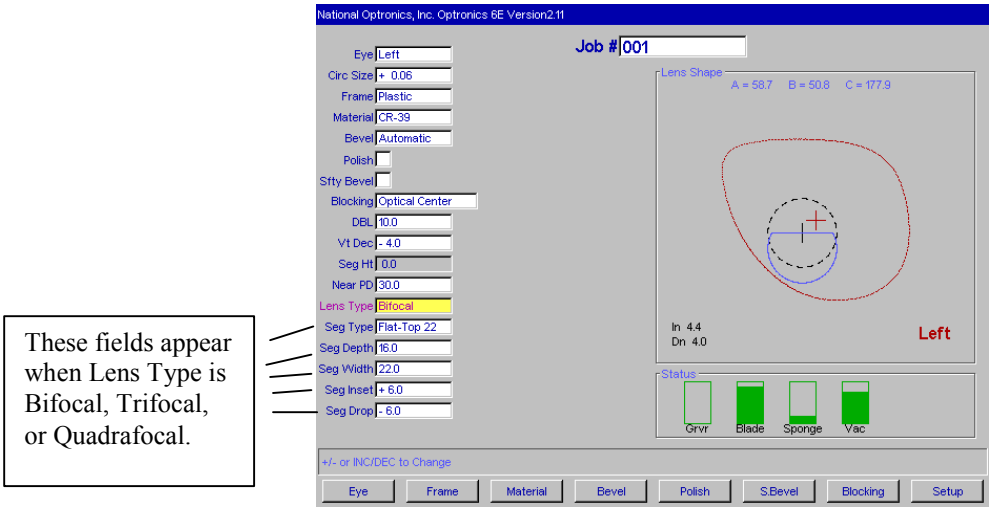
Lens Type: Specifies the type of lens being edged. The choices are Single Vision, Bifocal, Trifocal, Quadrafocal, and Progressive. If you select Bifocal, Trifocal, or Quadrafocal, several additional fields appear as shown on the following page.

Note

For all five of the fields defined above, the information (DBL, Vert Dec, Seg Ht, PD, and Lens Type) will be downloaded to the edger if it is available at the third-party computer.

Job Screen with Optical Center Using OMA Protocol

The fields defined below can only be downloaded using OMA protocol and are used to graphically represent the lens block.



Seg Type: Type of segment (Flat-top, Round, Curve Top, Executive)—choosing a pre-set Seg Type will automatically fill in the rest of the fields (Seg Depth, Width, etc.).

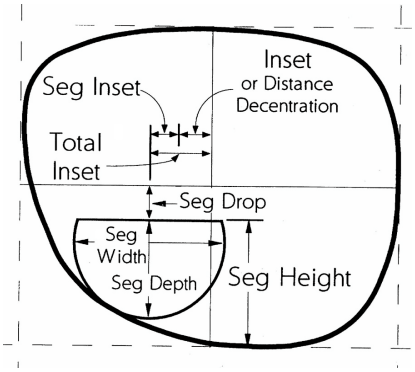
Seg Depth: Segment Depth (see drawing below)

Seg Width: Segment Width (see drawing below)

Seg Inset: Segment Inset (see drawing below)

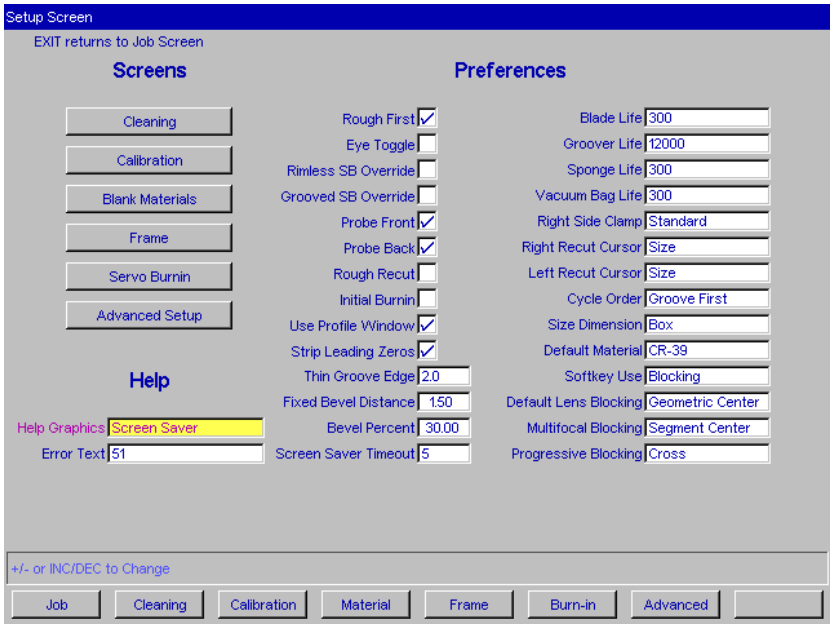
Seg Drop: Segment Drop (see drawing below)

The following drawing illustrates the concepts of Segment (Seg) Depth, Width, Inset and Drop—corresponding to fields on the *Job Screen*.



Setup Screen

If you are calibrating the machine, changing default material or frame settings, or cleaning the machine, the *Setup Screen* is often the starting point for your work, as suggested by the screen flow graphic on page A-2 (the fold-out page).



Screens (Left Side of the Setup Screen)

Cleaning: Takes you to the *Cleaning Screen* to begin cleaning procedures—refer to Section 2 of Chapter 2, "Getting Started & Daily Maintenance," for step-by-step instructions.

Calibration: Takes you to the *Calibration Screen* to begin calibration procedures—refer to Chapter 5, "Calibrating the 6E," for step-by-step instructions.

Blank Materials: Takes you to the *Blank Material Screen* for setting up a unique set of speeds etc. to be used on certain lenses; that is, custom materials can be set up for your specific needs.

Frame: Takes you to the *Frame Screen* for modifying size offset for a specific frame type.

Servo Burnin: Takes you to the *Servo Burnin Screen* to warm up the servo motors and check burn-in range and other information.

Advanced Setup: Takes you to the *Advanced Setup Screen*, which allows a lab manager to perform more advanced tasks such as changing the *Job Screen* layout, configuring communications, or trouble-shooting problems.

Help

Help Graphics: When performing maintenance or trouble-shooting, you may work with different pieces of the internal equipment. To assist you in these tasks, Optronics provides 3D drawings of several parts. To scroll through the names of each drawing, move the cursor to the *Help Graphics* field and press the Increment or Decrement keys. Press the ENTER key to display. Press any key to return to the *Setup Screen*.

Error Text: Enter error number in this field, and the 6E will display the text of the message for that error number.

Preferences

Rough First: If checked, lens will be probed after roughing for better bevel placement. The default is checked.

Eye Toggle: Determines whether the job screen will automatically toggle to the Left Eye after the Right has been cut. If set to "✔" (checkmark), then it will automatically toggle to the Left Eye after the Right has been cut. If it is blank (no checkmark), the screen will go to *Re-Cut* mode after Edging the Right Lens and the *EYE* field must be toggled to *LEFT*.

Rimless SB Override: Overrides the material safety bevel default (see *Material Screen*) for grooved lenses if checked. You may still safety bevel a grooved lens by checking the Safety Bevel box on the *Job Screen*.

Grooved SB Override: Overrides the material safety bevel default (see *Material Screen*) if checked. You may still safety bevel a rimless lens by checking the Safety Bevel box on the *Job Screen*.

Probe Front: If unchecked, the 6E will not probe the front of lenses when lens is beveled using Back bevel. This will also disable profile mode.

Probe Back: If unchecked, the 6E will not probe the front of lenses with no Safety Bevel when lens is rimless or beveled using Front or Fixed bevel. This will also disable profile mode and the option to turn on safety beveling in recut mode.

Rough Recut: If checked, recuts will always start at roughing stage. This is useful for cutting multiple lenses of the same type without the need to probe each one.

Initial Burnin: If checked, the 6E servos will burn in for 10 minutes on power up.

Use Profile Window: If checked, bevel adjustment is done using profile window. If unchecked, the lens will rotate in front of blade during finishing or grooving and the user can adjust bevel placement there.

Strip Leading Zeros: If checked, leading zeros will be stripped from entered job numbers. If not checked, the leading zeros will be left to match the HIII.

Thin Groove Edge: Controls the point at which you receive a warning when grooving a thin lens. The range is 1.5 mm to 3 mm with 2 mm as the default.

Fixed Bevel Distance: Specifies the default distance in millimeters that the peak of a fixed bevel will be from lens front

Bevel Percent: Specifies the location of the bevel peak from front of lens as a percentage of edge thickness.

Screen Saver Timeout: Specifies the number of minutes (1-60) of inactivity that will elapse before the screen saver activates. A setting of zero (0) deactivates the screen saver.

Blade Life: Specifies the number of cycles before the 6E will display a warning that the blade needs to be changed. Optronics recommends leaving this number at 300 for carbide cutters and 10,000 for diamond cutters. Increasing this number from the default may lead to decreased edge quality and axis slippage.

Groover Life: Specifies the number of cycles before the 6E will display a warning that the groover needs to be changed. Optronics recommends leaving this number at 3,000. Increasing this number from the default may lead to decreased edge quality and axis slippage.

Sponge Life: Specifies the number of cycles the 6E will run before showing a warning to change the sponge. National Optronics recommends 300.

Vacuum Bag Life: Specifies the number of cycles the 6E will run before showing a warning to change the vacuum bag. National Optronics recommends 300.

Right Side Clamp: Options are Standard and Half-Eye. Set to "Half-Eye" if you do not want to see the "Half-eye warning" appear and a half-eye clamp is installed.

Right Recut Cursor: Controls where the cursor goes when doing recuts on the right eye lens. Your choices are "Job" or "Size," referring to going to the *Job* field or going to the *Size* field.

Left Recut Cursor: Controls where the cursor goes when doing recuts on the left eye lens. Your choices are "Job" or "Size," referring to going to the *Job* field or going to the *Size* field.

Cycle Order: On jobs requiring both grooving and polishing, use this field to control which is done first, the grooving or the polishing.

Size Dimension: Specifies whether the *Job Screen* will include the field "Box Size" or Circ Size (Circumference Size), used for manually adjusting the size offset.

Default Lens Material: Specifies the material (from the list on the *Material Screen*) to use if the Lens Material is not provided by the 4T or host computer.

Softkey Use: Specifies whether the F7 key on the *Job Screen* toggles Blocking or Probe Order. If you choose for it to toggle Probe Order, then the softkey label on the *Job Screen* will toggle between Rough First and Probe First.

Default Lens Blocking: Determines the type of blocking that the 6E edger will use: "Geometric Center," "Traced Center," or "Optical Center." "Traced Center" is an option to accept the centering of a third-party software program.

You can choose one of the following options for how a lens is blocked for edging:

Optical Center: The block is placed on the optical center of the lens. If this option is chosen, the operator must also specify bifocal blocking options.

Traced Center: The block is placed on the traced center of the lens shape.

Geometric Center: The block is placed at the geometric center of the frame.

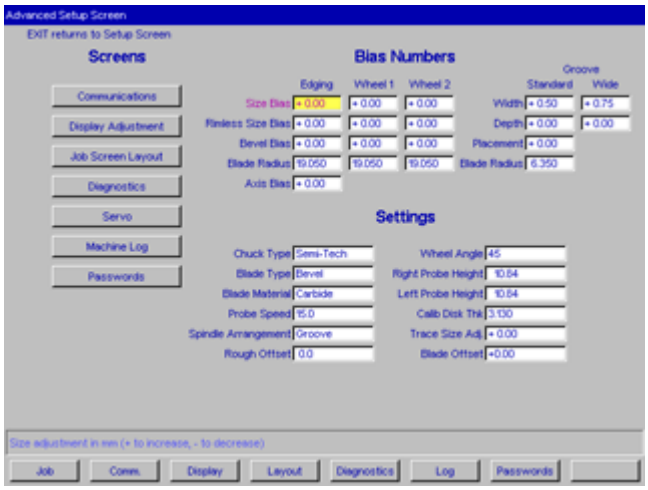
NOTE: If "Geometric Center" or "Optical Center" is chosen, the options for *Multifocal Blocking* and *Progressive Blocking* (below) will be available. Optical Center blocking is the ***only*** type that supports full graphical display of the blank and segment.

Multifocal Blocking: Sets the type of optical center decentration to use for multifocal lenses. The first option for this field is "Segment center," which will place the block on the center of the top of the seg (MRP). The second option is "5 mm down, 5 mm in" which will place the segment center 5 mm down, 5 mm in (refer to the drawing on page A-8 for a graphical presentation of these concepts). When a single vision lens is blocked, it will always be blocked on optical center, regardless of the setting in this field.

Progressive Blocking: Sets the type of optical center decentration to use for progressive lenses. When a progressive lens is blocked using the optical center blocking method, the operator can choose to place the block at the fitting cross or to move the fitting cross 5 above the center of the block. The two options are as follows in the field: (1) "cross"—this places the block on the fitting cross; (2) "5 mm up"—this places the fitting cross 5 mm up from the center of the block.

Advanced Setup Screen

The *Advanced Setup Screen* is often the starting point for a variety of tasks usually performed by a lab manager. These tasks include changing the *Job Screen* layout, configuring communications or trouble-shooting problems.



Advanced Setup Screen

The Screens Section

Communications: Takes you to the *Communications Screen* for setting up or changing the 6E's communication options—refer to Section 2 of Chapter 2, "Getting Started & Daily Maintenance," for step-by-step instructions.

Display Adjustment: Takes you to the *Display Adjustment Screen* for changing the system colors (the colors used in text boxes, etc.)

Job Screen Layout: Takes you to the *Job Screen Layout Screen* for changing the fields to be shown on the *Job Screen* and making other adjustments to the way the *Job Screen* will appear by default.

Note

Any change to the protocol setting or the *Default Lens Blocking* field will reset the *Job Screen* layout.

Diagnostics: Takes you to the *Diagnostics Screen* for checking servo encoders, communications, the keypad, and the home, door and water level switches.

Servo: National Optronics use only.

Machine Log: Takes you to the *Machine Log Screen* to check the log of various regularly performed maintenance tasks and job statistics.

Passwords: Takes you to the *Passwords Screen* to set password requirements for different screens.

The Bias Numbers Section

Size Bias: Sets the size of the offset for each lens. A 58 mm test lens should be cut using *58 mm Circle*. This lens should be measured, and this value should be changed by the difference between the measured amount and 58 mm. If the cut lens is larger than 58 mm, the difference should be subtracted from this value. Decrementing or incrementing this field may be confusing if there are negative numbers. For example, if the setting is -4.00 mm, an increase by 0.50 would be –3.5 mm.

Rimless Size Bias: An adjustment for correctly sizing rimless lenses. A round, 58 mm rimless test lens should be cut to help in adjusting this value. Adjustment is the same as that for the *Size Bias* setting.

Bevel Bias: Adjusts the 'front-to-back' position of the bevel on the lens. The proper setting places the center bevel (see the *Bevel* field on the *Job Screen*, described on page A-5) in the center of a pattern or lens. Increasing this number will move the bevel towards the front of the lens. Decrementing or incrementing this field may be confusing if there are negative numbers. For example, if the setting is –4.00 mm, an increase by 0.50 would be –3.5 mm.

Blade Radius: Defines the cutting radius of the blade or polishing wheel in millimeters (mm), which will change with blade type. These are factory set and should not be altered. This value may change with Blade Type.

Axis Bias: Sets the relative angular position of the rotating chuck. During calibration, this value is used to set the axis of the edger. Once set at the factory, this number normally should not change, except when installing a new axis home switch. To adjust, when the cut pattern is viewed from the PDA side, increasing this value will move the line clockwise. Decrementing or incrementing this field may be confusing if there are negative numbers. For example, if the setting is –4.00 mm, an increase by 0.50 would be –3.5 mm.

Note

When you change the *Offset* on the *Calibration Screen*, the 6E adjusts these Bias numbers automatically. This is probably easier than adjusting these numbers on the *Advanced Setup Screen*.

The Groove Section

(Groove) Width: Defines the width of the groove in millimeters for the standard or wide groove.

(Groove) Depth: Defines the depth of the groove in millimeters for the standard or wide groove.

(Groove) Placement: Adjusts the front-to-back position of the groove on the lens. Increasing this number will move the groove toward the front of the lens. Decrementing or incrementing this field may be confusing if there are negative numbers. For example, if the setting is –4.00 mm, an increase by 0.50 would be –3.5 mm.

(Groove) Blade Radius: Defines the cutting radius of the grooving blade in millimeters. This is factory set and should not be altered.

The Settings Section

Chuck Type: Sets the type of chuck used to hold block. Since the size varies from brand to brand, it is important to specify the type that you are using. When changing chuck types, follow these steps:

1. Update this field.
2. Reset the Front Size Stop.
3. Find the servo limits.
4. Recalibrate the probe.

Blade Type: Specifies the type of blade you are using.

Blade Material: Specifies that you are using a carbide blade or diamond. This affects the number of jobs required for the blade status indicator on the *Job Screen*.

Probe Speed: Specifies how fast the lens turns during probing. Set by factory—do not change.

Spindle Arrangement: Specifies the type of spindle (Dual Wheel or Groove). Set by factory—do not change.

Rough Offset: Distance in millimeters added to the start position for roughing. This is usually set to zero, but may be increased to around 5 to help prevent axis slippage.

Wheel Angle: Options are 45 and 45/60. Set by factory—do not change.

Right Probe Height: The height of the right probe tip above the center of the cutter. Set by factory—do not change.

Left Probe Height: The height of the left probe tip above the center of the cutter. Set by factory—do not change.

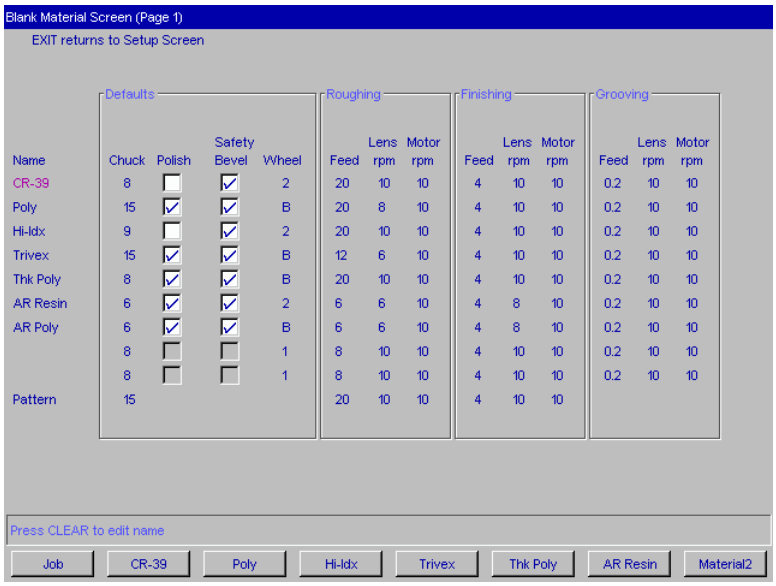
Calib Disk Thk: Thickness of the calibration disk in millimeters. **Note:** You will have to recalibrate your probe if you change this number, and both bevel bias and safety beveling may be affected.

Trace Size Adjustment: Adjust this parameter for frame fit after size verification of the internal 58 mm circle (job number 002). If the lens for frame fits large, decrease this number. If the lens is small, increase this number.

Blade Offset: Measured offset in mm between (or difference between) the polishing wheel and the blade radius. Set by factory—do not change.

Blank Material Screen

When you specify the material on the *Job Screen*, the 6E edges following the speeds and other data listed on the *Blank Material Screen*.



Defaults Portion of the Blank Material Screen

Name: The first two lines of the *Name* column, *CR-39* and *POLY,* cannot be altered except to put a suffix at the end. All other lines can be any combination of letters and symbol. The main requirement is that they make sense to the operator. Each material will appear in sequence on the *Job Screen* when scrolling through the material selections. Refer to Chapter 7, "Advanced Configuration" for step-by-step instructions for adding a new material to the list.

Putting an asterisk (*) anywhere in the name of a material causes additional probing, particularly useful when dealing with thin lenses—see Chapter 7, "Advanced Configuration & Special Considerations."

In addition, putting an ampersand (&) anywhere in the name of a material forces the feed rate to slow to half its normal speed when "Rough First" is checked on the *Setup Screen*—see Chapter 7, "Advanced Configuration & Special Considerations."

Chuck: The force the machine exerts in clamping the lens. For lenses with Anti-reflective Coatings (AR), the pressure can be reduced to prevent cracking or crazing of the lens.

Polish: This value toggles between a checkmark "✔" and no checkmark (that is, blank) and determines if polishing should occur by default. If this value is set to "✔" polishing will default to "✔" on the *Job Screen*. If the majority of the lenses of a certain material are to be polished, this setting should be set to "✔."

Safety Bevel: This value toggles between a checkmark "✔" and no checkmark (that is, blank) and sets the default value for the *Safety Bevel* on the *Job Screen*. If the majority of the lenses of a certain material are to be safety beveled, this setting should be set to "✔."

Wheel: Tells the edger which wheel to use for a specific material—refer to the drawing of the wheel in the "Calibrating the Polishing Wheel" section in Chapter 5 for a graphical representation of the wheels. The choices are 1, 2, or B for both (refer to Chapter 5, "Calibration," for instructions on how to set the 6E up for using both wheels.

Roughing Portion of the Blank Material Screen

Feed: The speed at which the size carriage moves forward during roughing, measured in millimeters per lens revolution.

Lens rpm: The speed at which the lens rotates during the roughing portion of the cycle, measured in revolutions per minute.

Motor rpm: Controls the speed of rotation of the cutter motor during the roughing cycle measured in thousands of revolutions per minute.

Finishing Portion of the Blank Material Screen

Feed: Maximum amount of material to remove per revolution of the lens. This value is expressed in millimeters.

Lens RPM: The speed at which the lens rotates during the finishing portion of the cycle, measured in revolutions per minute.

Motor rpm: Controls the speed of rotation of the cutter motor during the finishing cycle measured in thousands of revolutions per minute.

Grooving Portion of the Blank Material Screen

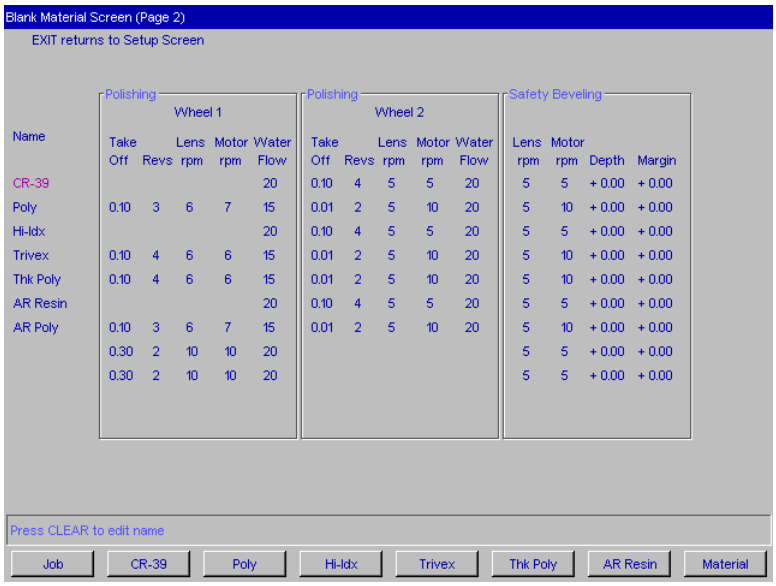
Feed: The speed at which the size carriage moves forward during grooving, measured in millimeters per lens revolution.

Lens rpm: The speed at which the lens rotates during the grooving process, measured in revolutions per minute.

Motor rpm: Controls the speed of rotation of the cutter motor during the grooving cycle measured in thousands of revolutions per minute.

Blank Material Screen—Second Part (Blank Material 2)

When you press the Material2 function key F8 on the *Blank Materials Screen*, you will see a screen that looks like the one shown below:



Polishing Portion of the Blank Material 2 Screen (Wheel 1 and Wheel 2)

Takeoff: Tells the edger how large to oversize the lens during the 'dry-cut' cycle. During polishing, this remaining material will be removed by the polishing wheel.

Revs: Tells the edger how many revolutions the lens should make during the polishing process. This number should be minimized, since the greater the number of revolutions, the longer the resulting cycle time.

Lens rpm: The speed at which the lens rotates during the polishing portion of the cycle, measured in revolutions per minute.

Motor rpm: Controls the speed of rotation of the cutter motor during the polishing cycle measured in thousands of revolutions per minute.

Water Flow: Adjusts the flow of water from the pump onto the sponge. Increase the number to increase the flow; decrease the number to decrease the flow. Water flow for Wheel 1 is also used during safety beveling.

Note

You can test the water flow numbers by adjusting them on the *Cleaning Screen*. Refer to page A-36 for information about the *Water Flow* field in the *Cleaning Screen*.

Note

The sample shown on this and the previous page has Poly set for both (B). For instructions on calibrating and using both Wheel 1 and Wheel 2 together, refer to the "Using Wheel 1 and Wheel 2 Together" section of Chapter 5.

Safety Beveling Portion of the Blank Material 2 Screen

Lens rpm: The speed at which the lens rotates during the safety beveling portion of the cycle, measured in revolutions per minute.

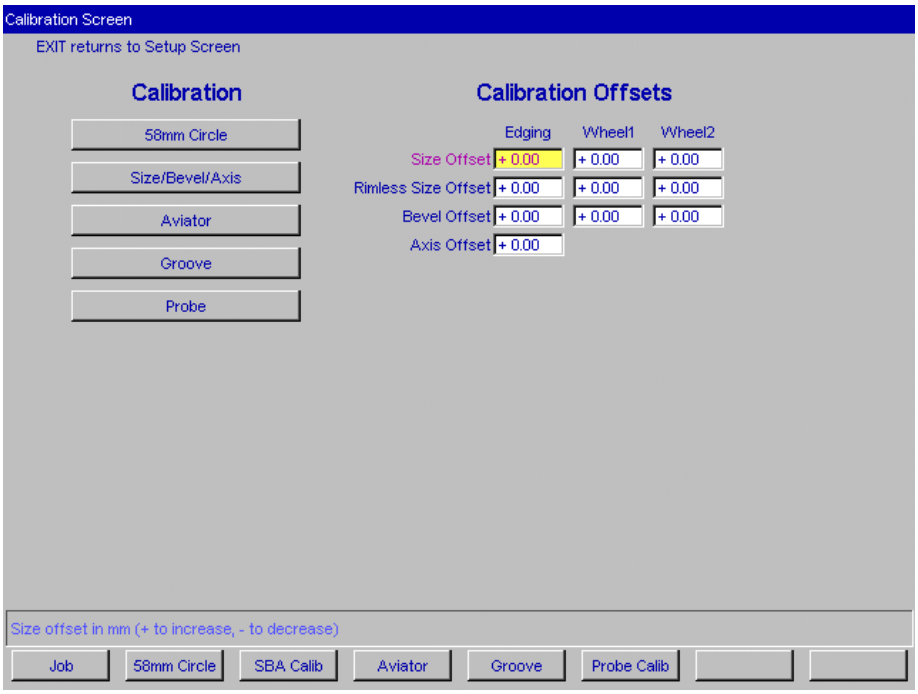
Motor rpm: Controls the speed of rotation of the cutter motor during the safety beveling cycle measured in thousands of revolutions per minute.

Depth: Determines how much material to remove when cutting the safety bevel. The larger the number, the deeper the lens will come into the hub during safety beveling, and hence, the safety bevel will be larger.

Margin: Influences the relationship between the safety bevel and the back of the lens bevel. This number should be adjusted so that the safety bevel does not cut into the bevel of a thin lens. Increasing this number will increase the 'margin' between the bevel and the safety bevel.

Calibration Screen

Use this screen to perform size, bevel, axis, probe and polish calibration (refer to Chapter 5, "Calibrating the 6E" for step-by-step instructions).



The Calibration Section

58 mm Circle: A round, 58 mm diameter shape will be cut, so that the *Size Offsets* and *Bevel Offsets* can be adjusted, and set as required. The *Job Screen* will display with Job # 002—this is the internal job setup for checking size and bevel placement. Refer to Chapter 5 for step-by-step instructions.

Size/Bevel/Axis: Cuts an internal shape that allows the user to calibrate all of the edging offsets. Refer to Chapter 5 for step-by-step instructions.

Aviator: Cuts an internal shape for calibrating the safety bevel.

Groove: Activates the procedure for calibrating the groover. Refer to the "Calibrating the Groover" section of Chapter 5 for step-by-step instructions.

Probe: Activates the procedure for calibrating the probe. The 6E edger will automatically measure the 58 mm calibration pattern to determine the relative locations of the probe tip, and the depth and radius carriages. The diameter of the 58 mm calibration pattern will be measured using both the right and the left probes. This information will be used by the 6E to determine size and bevel location. Refer to the "Calibrating the Probe" section of Chapter 5 for step-by-step instructions.

The Calibration Offsets Section of the Calibration Screen

This section is used to add offsets to the current calibration numbers, which are stored as bias numbers on the *Advanced Setup Screen*. These are intended to be a way of quickly making slight adjustments to your calibration without having to worry about absolute calibration numbers. For example, if your unpolished size is too large by 0.1 mm, you would set your *Size Offset* for *Edging* to –0.10. (Use the minus sign to decrement the size.)

Note

After editing these values and leaving the screen, the numbers will be zero (0) when you come back to this screen; however, the bias numbers on the *Advanced Setup Screen* will be adjusted correctly.

Size Offset: Adjusts the 6E for size differences between cutting surfaces. To increase the size, increase this number (units in mm).

Rimless Size Offset: Adjusts the 6E for size differences for rimless and grooved lenses. To increase the offset, increase this number (units in mm).

Bevel Offset: Adjusts the 'front-to-back' position of the bevel on the lens. The proper setting places the "center" bevel (see the *Bevel* field on the *Job Screen*, described on page A-5) in the center of the edge of the lens. Using a positive number will move the bevel towards the front of the lens; a negative number will move it towards the back.

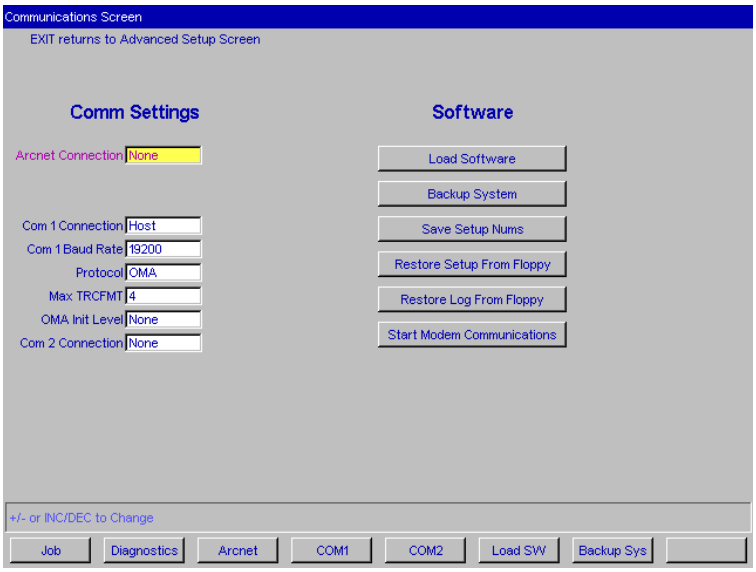
Axis Offset: Sets the relative angular position of the rotating chuck. During calibration, this value is used to set the axis of the edger. Once set at the factory, this number normally should not change, except when installing a new axis home switch. Increasing this value will move the point clockwise when the cut pattern is viewed from the PDA side.

Communications Screen

Use the *Communications Screen* for the following tasks:

- To set up communications to the edger and to change communications options (refer to the "Initial Installation" section of Chapter 2 for step-by-step instructions).
- To load new software (refer to Chapter 3, "Commonly Performed Tasks," for instructions on updating the software).
- To back up setup numbers and restore them if necessary.

A sample *Communications Screen* is provided below:



NOTE: The first three fields (Arcnet Connection, Machine Node ID, and Protocol) may display as read-only (gray background) if no Arcnet card is present—an Arcnet card is optional equipment.

Arcnet Connection: Specifies the type of Arcnet connection (Host, 4T, Saturn, or None).

Machine Node ID: (This field disappears when Arcnet Connection is set to **None**.) Specifies the Node ID of the Arcnet connection. The value can be 1-249.

Protocol: (This field disappears when Arcnet Connection is set to **None**.) NOP is the protocol being used for each of the following Arcnet connections:

- A Saturn tracer
- A 4T tracer
- A host computer ("Host")

Com 1 Device: The choices for Com 1 vary depending on what you have selected in the Arcnet Connection field. If you have "Host," "4T," or "Saturn," selected for the Arcnet Connection field, your choice for Com1 is "Bar Code" or "None." If you have "None" selected for the Arcnet Connection field, your choices

include “4T” and “Host,” as well as “Bar Code” and “None.” You can only have one Bar Code selection.

Baud Rate: (This field only appears when the Com 1 Device has a Barcode, Host or 4T configured.) This field shows the baud rate for the Com 1 device. The default is 9600. Normally, the 6E software will supply the correct baud rate automatically. The edger will not be able to communicate if this parameter is different from the baud rate of the attached device.

Protocol: (This field only appears when Arcnet Connection is set to “None” and Com1 or Com2 has a 4T or Host configured.) The choices for Host are OMA or GC; the choice for 4T is OMA.

Max TRCFMT: OMA Trace Format preference—4 is Packed Binary; 1 is ASCII.

OMA Init Level: Specifies the Initialization Level—the communication information available upon initializing communication to another device. The default setting is “Auto,” which allows the attached device to specify which data items will be downloaded. The other options are “Preset,” which sends the defaults for that type of device, or “None,” which means that no data items will be assumed before each time the 6E communicates with another device. “None” is a slower method of communication but may be necessary depending on the host.

Com 2 Device: The choices for Com 2 vary depending on what you have selected in the Arcnet Connection field. If you have “Host,” “4T,” or “Saturn,” selected for the Arcnet Connection field, your choice for Com 2 is “Bar Code” or “None.” If you have “None” selected for the Arcnet Connection field, your choices include “4T” and “Host,” as well as “Bar Code” and “None.” You can only have one Bar Code selection.

Baud Rate: This field only appears when the Com 2 Device has a Barcode, Host or 4T configured. This field shows the baud rate for the Com 2 device. Normally, the 6E software will supply the correct baud rate automatically.

Protocol: This field only appears when Arcnet Connection is set to “None” and the Com 2 Device has a Host or 4T configured. If the Com 2 Device is Host, then the protocol choices are OMA and GC. If the Com 2 Device is 4T; then the protocol choices are NOP or OMA.

Max TRCFMT: OMA Trace Format preference—4 is Packed Binary; 1 is ASCII.

OMA Init Level: Specifies the Initialization Level—the communication information available upon initializing communication to another device. The default setting is “Auto,” which allows the attached device to specify which data items will be downloaded. The other options are “Preset,” which sends the defaults for that type of device, or “None,” which means that no data items will be assumed before each time the 6E communicates with another device. “None” is a slower method of communication but may be necessary depending on the host.

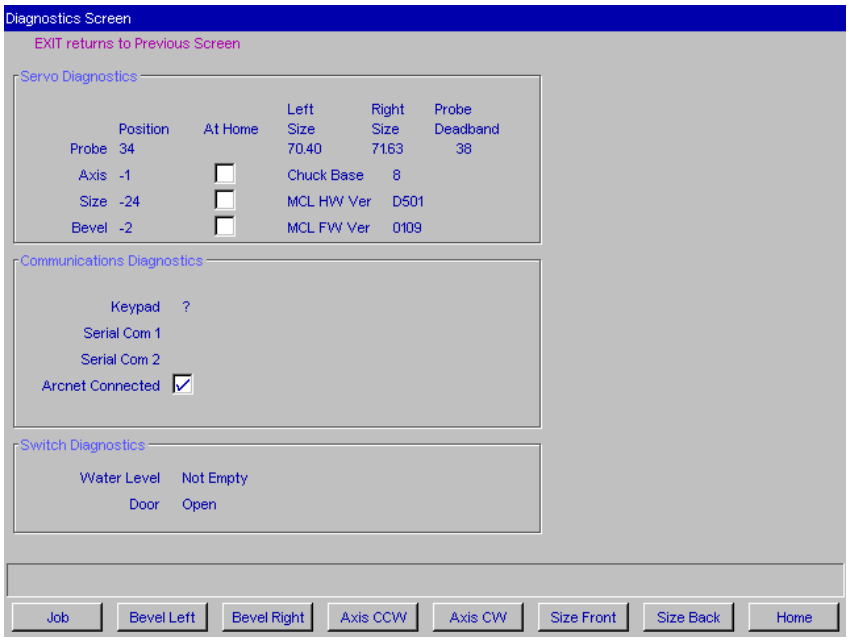
Buttons:

Load Software Allows you to load software code using a floppy disk.

Save Setup Nums	Saves all calibration, log, and setup numbers (all data saved across power cycles) to disk for future retrieval with the *Restore Setup from Floppy* feature.
Backup System	Backs up your complete system—recommended before loading software.
Restore Setup from Floppy	Restores from floppy the calibration and setup numbers saved to floppy with the *Save Setup Nums* feature.
Restore Log from Floppy	Restores Log saved to from floppy with the *Save Setup Nums* feature.

Diagnostics Screen

Use the *Diagnostics Screen* for checking servo encoders, communications, keypad, and the home, door and water level switches.



Servo Diagnostics Section of the Screen

Left Size: The position of the left probe tip in mm, from the Size home switch.

Right Size: The position of the right probe tip in mm, from the Size home switch.

Probe Deadband: Indication of probe movement ability. This field should be showing a number less than 50. A value greater than 50 here may indicate a probe that is sticking, and could result in probe inaccuracies or probe error messages.

Probe: The "Position" number represents the encoder count for the probe. Used to detect probe movement.

Axis: The "Position" number represents the encoder count for the axis servo motor. Each full rotation of the lens should change the count by 240,000. The "At Home" checkmark or blank indicates whether the axis is (✓) or is not (blank) in the home position.

Size: The "Position" number represents the encoder count for the size servo motor. Each full rotation of the servo coupler should change the count by 8,000. The "At Home" box indicates whether the axis is in home switch (✓) or is not (blank) in home switch.

Chuck Base: For Optronics use only

MCL HW Ver: Motion Control Library hardware version.

MCL SW Ver: Motion Control Library software version.

Bevel: The "Position" number represents the encoder count for the bevel servo motor. Each full rotation of the servo coupler should change the count by 8,000. The "At Home" checkmark or blank indicates whether the axis is (✓) or is not (blank) in home switch.

Communications Diagnostics Section of the Screen

Keypad: Allows you to test the keypad to determine if each key is working. This field indicates the last key (or button) pressed.

Serial Com 1: If you assigned a device to COM1, the continually changing series of letters, numbers, and symbols indicates what is being sent out of the serial port. The serial port can be tested by placing a jumper across pins 2 & 3 of COM1 on the back of the 6E. If the serial port is working properly, the display should change from a single character to the same character being printed twice. For example, the display should change from {A, B, C, …} to {AA, BB, CC, …} if the serial port is working properly. (There will not be a continually changing series of numbers if you do not assign a device to COM1.)

Serial Com 2: Same as above for Loopback 1 but uses COM2.

Arcnet Connected: Indicates whether the 6E is (✓) or is not (blank) properly connected to a network. If there is no checkmark, but the edger is physically connected to a network, it indicates a problem with the network. Possible causes are a bad co-axial (coax) cable, or a duplicate LAN ID.

Switch Diagnostics Section of the Screen

Water Level: Reports the water level in the coolant reservoir.

Door: Tells you if either the Plexiglas door or the lid is open or ajar.

Buttons Along the Bottom of the Diagnostics Screen:

Job: Takes you to the *Job Screen*.

Bevel Left: Moves the bevel one inch to the left. The encoder should decrease by 64,000.

Bevel Right: Moves the bevel one inch to the right. The encoder should increase by 64,000.

Axis CCW: Moves the axis counter-clockwise approximately 90° from the keypad-side view. The encoder should decrease by approximately 60,000.

Axis CW: Moves the axis clockwise approximately 90°. The encoder should increase by approximately 60,000.

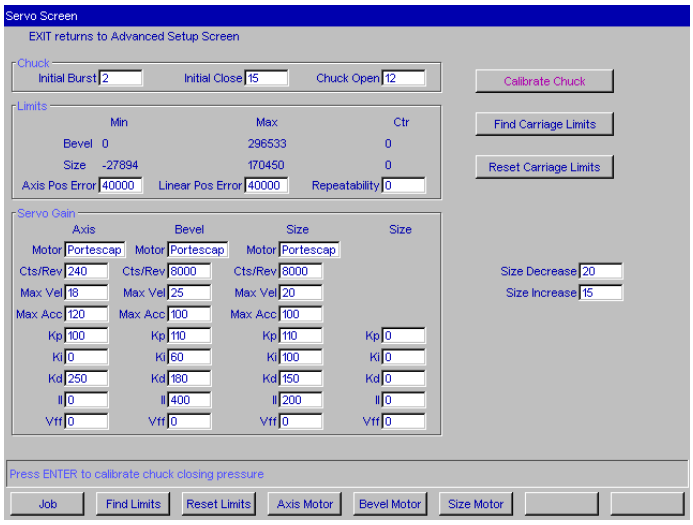
Size Front: Moves the size one inch to the front. The encoder should decrease by 64,000.

Size Back: Moves the size to the back. The encoder should increase by 64,000.

Home: Returns the motors to home position.

Servo Screen

Use the *Servo Screen* to view gain numbers and set carriage limits.



Sections

Chuck:

Initial Burst: Amount of time to start the chuck motor moving.

Initial Close: Initial closing force of the chuck.

Chuck Open: The force the machine exerts in opening the clamp.

Limits: The travel limits for the bevel and size carriages in encoder counts from the Home position.

Axis Pos Error: The amount of position error (in encoder counts) that triggers an error on the Axis.

Linear Pos Error: The amount of position error that triggers error on SIZE or BEVEL.

Repeatability: The amount of position error (in encoder counts) that triggers an error in the linear carriage homing routines. This is normally disabled with a value of zero, but it may be set to 250 if size or bevel problems appear.

Servo Gain: National Optronics use only.

Size Decrease: Slows down the Axis when the Size goes above this speed in mm/second. **Do not change unless instructed to do so by an Optronics technician.**

Size Increase: Speeds up the Axis when the Size goes below this speed in mm/second. **Do not change unless instructed to do so by an Optronics technician.**

Buttons Along the Side

Calibrate Chuck: For National Optronics Use Only.

Find Carriage Limits: Moves carriages to find their limits.

Reset Carriage Limits: Sets the carriages' range of motion to zero (used primarily by National Optronics). This will force the machine to find limits on the next boot-up.

Buttons Along the Bottom

Job: Takes you to the *Job Screen*.

Find Limits: Moves carriages to find their limits.

Reset Limits: Sets the carriages' range of motion to zero (used primarily by National Optronics). This will force the machine to find limits on the next boot-up.

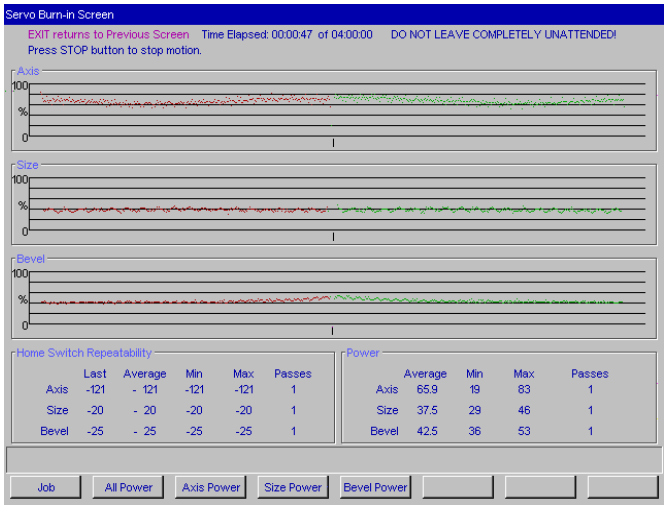
Axis Motor: Moves the cursor to the top of the Axis column.

Bevel Motor: Moves the cursor to the top of the Bevel column.

Size Motor: Moves the cursor to the top of the Size column.

Servo Burn-In Screen

Use the *Servo Burn-In Screen* to burn in the servo motors, or to view the power graphs for each servo motor, and to monitor the Home switch repeatability. It can also be used to warm up the servo motors after a period of shut-down, for example, after a weekend of non-use. This type of warm-up is not required, but some operations consider it a good practice.



Servo Test Screen Fields and Buttons

Graphs: The graphs show the power required for each of the servo motors (Bevel, Axis, and Size). A number above 50% for linear axes (bevel and size) or above 70% for axis may indicate some carriage binding or other mechanical problem. The red dots represent the first direction of movement—usually away from home; the green dots represent the movement back toward home position. (On the bevel, the red dots represent the power graph for a movement to the right; the green is to the left. For the axis, the green dots represent the power graph for a clockwise movement—when viewing from the back of the lens—and the red is counterclockwise. On the size, the red dots represent the power graph for backward movement; the green represents forward movement.)

Home Switch Repeatability: This section of the screen displays the repeatability of the home switch. A small number is desirable. If the average is higher than 50 for the Size or Bevel or higher than 100 for the Axis, then you may need to contact National Optronics.

Power: Shows the average, minimum and maximum power for each carriage.

Job: Takes you to the *Job Screen*.

All Power Button: Runs all three motors, one at a time

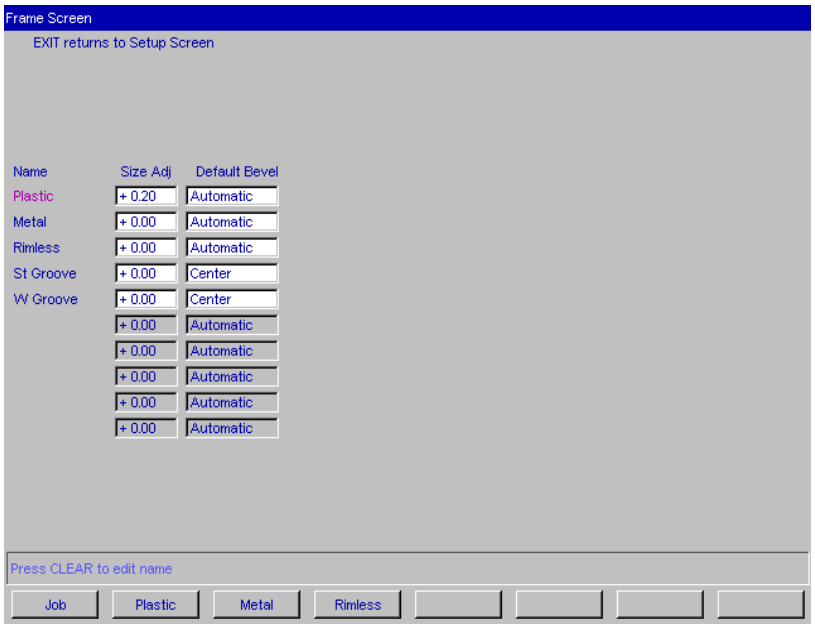
Bevel Power Button: Runs the bevel motor only.

Axis Power Button: Runs the axis motor only.

Size Power Button: Runs the size motor only.

Frame Screen

Use the *Frame Screen* to set defaults for size adjustment for each of the frame types listed below or for frame types you name (the blank area below *Groove* in the screen capture shown below).



Frame Screen Fields and Buttons

Name: Type of material or other designation for size adjustment purposes.

Size Adjustment: Amount (in millimeters) to increase or decrease based on the selection. For example, in operations that use Zyl frames, set this value for slightly larger. For operations that use "cold-snap frames," the tolerance is much tighter; therefore, this value should be set to zero or a very small value.

Default Bevel: Shows the default bevel position for each of the frame types listed. You can adjust these default settings by moving to the field with the FIELD or FIELD, then using the ▲ or ▼ keys to change the selection.

Job Button: Takes you to the *Job Screen*.

Metal Button: Moves the cursor to the *Metal* field.

Plastic Button: Moves the cursor to the *Plastic* field.

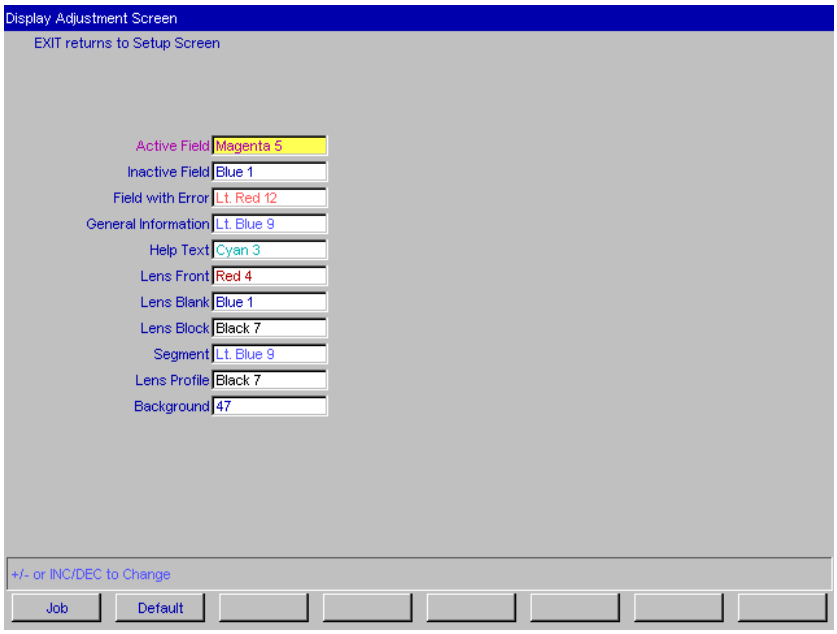
Rimless Button: Moves the cursor to the *Rimless* field.

Note

To start the process of adding a name, move the cursor to a blank spot and press the Clear button CLEAR. For step-by-step instructions on this procedure, refer to Chapter 7, "Advanced Configuration."

Display Adjustment Screen

Use the *Display Adjustment Screen* to change the default colors for fields and displays within the 6E software.



Display Screen Fields and Buttons

Active Field: Controls the colors used in the field where the cursor is located; that is, the active field.

Inactive Field: Controls the colors used in fields where the cursor is not located; that is, the inactive fields.

Field with Error: Controls the colors used to accentuate an error.

General Information: Controls the colors used for information boxes.

Help: Controls the colors used for help text.

Lens Front: Controls the color used on the *Job Screen* to represent the front of the lens.

Lens Blank: Controls the color used on the *Job Screen* to represent the lens blank.

Lens Block: Controls the color used on the *Job Screen* to represent the block of the lens.

Segment: (For representing multi-focal lens) Controls the colors used to represent the segment.

Lens Profile: Controls the color used on the *Job Screen* to represent the bevel of the lens when the *Profile* button is pressed.

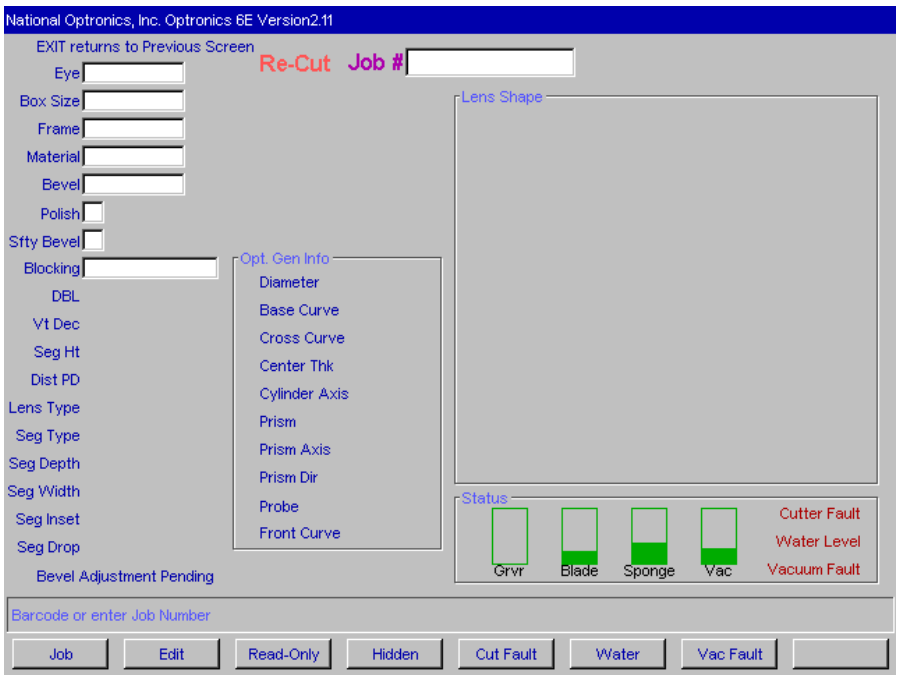
Background: Controls the background colors for all screens. The default gray is number 47. If you want to change that color, type in a different number.

Job: Takes you to the *Job Screen*.

Default: Reverts to default colors.

Job Screen Layout Screen

Use the *Job Screen Layout Screen* to modify the display and edit status of each field on the screen. Each field can have one of three settings: (1) displaying and editable, (2) displaying but read-only, or (3) hidden—does not display on the *Job Screen*. One of the common uses of this screen is to disable warnings such as disabling the vacuum fault warning if a central vacuum is in use—see "The Status Area" below.



Job Screen Layout Screen Fields and Buttons

You can modify each field (except the *Status* area) in the following ways:

- Use the *Job* button to store changes and go to the *Job Screen*.
- Use the *Edit* button to make the field one that is visible and can be edited by the user.
- Use the *Read Only* button to make the field one that is visible but cannot be edited by the user (that is, to make it a read-only field). Read-only fields will display with a gray background.
- Use the *Hidden* button to make the field disappear from the *Job Screen*.

The Status Area

The following buttons are used only for the display in the *Status* area of the *Job Screen*.

Cut Fault: Used to turn off or turn on the cutter motor fault during a cycle. In the default setting (on), if the cutter motor does not come on when you try to cut a lens, the cycle aborts and a cutter motor fault is displayed.

Caution

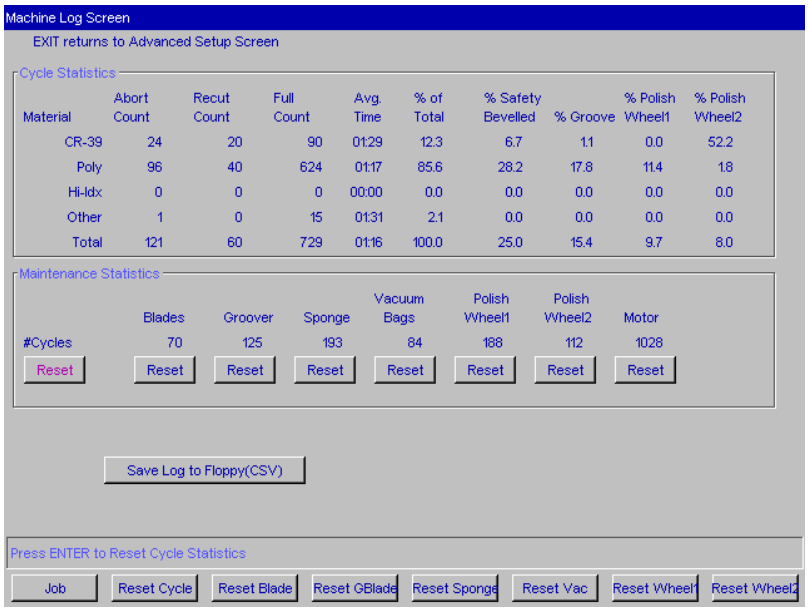
Turning off the *Cut Fault* is used primarily for diagnostics purposes by National Optronics service technicians. Without this warning, you might have a situation where you could damage the equipment.

Water: Used to turn off or turn on the refill-water reminder feature. Operations that never use the Polish or Safety Bevel feature of the 6E may want to turn this feature off. Press the *Water* function key F6 to turn it off; press the *Water* function key F6 again to turn it back on. When off, the words *Water Level* display in black typeface, and the Sponge bar is grayed out. When on, the words *Water Level* display in red typeface and the Sponge bar is visible.

Vac Fault: Used to turn off or turn on the vacuum-bag-replacement reminder feature, as well as the fault indicator if the vacuum does not start during the cycle. Customers using a central vacuum system instead of the National Optronics standard vacuum should turn this feature off. Press the Vac Fault function key F5 to turn it off; press the Vac Fault function key F5 again to turn it back on. When off, the words *Vacuum Fault* display in black typeface and the Vacuum bar is grayed out. When on, the words *Vacuum Fault* display in red typeface, and the Vacuum bar is visible.

Machine Log Screen

Use the *Machine Log Screen* to check maintenance statistics, to view statistics on materials edged, and to reset statistics when needed, and save the log to a CSV file on a floppy disk.



The Cycle Statistics Area

The statistics in this area show how many types of cuts have been performed, divided up by material. The *Reset Cycle* function button F2 (labeled "#Cycles" on the screen) zeroes out all the *Cycle Statistics* values. Normally, this should only be done at the instruction of a National Optronics service technician. These cycles are usually used to record statistics for the life cycle of the 6E; however, a lab manager may use them for other accounting analyses.

The Maintenance Statistics Area

This area shows how many cycles of cuts have been performed, divided up by material. The first button, however, pertains to the *Cycle Statistics* area. Use the *Reset Cycle* function button F2 (labeled "#Cycles" on the screen), as discussed above.

Reset Buttons

Use the maintenance cycle buttons to reset (zero out) the number of cycles for each of the items listed, for example, when you have just changed a blade, vacuum bag, etc.

Blades: Shows the number of cycles the cutter motor has run since this field was reset (after a blade change). You will need to reset *Blades* after every cutter change—refer to the "Changing the Cutter Blade" section of Chapter 3, "Commonly Performed Tasks" for detailed instructions on changing the cutter blade.

Groover: Shows the number of times the grooving wheel was used since last reset.

Sponge: Shows the number of cycles since the sponge was last reset. You will need to reset these cycles after replacing the sponge. Refer to the "Replacing the Sponge"

section of Chapter 3, "Commonly Performed Tasks" for detailed instructions on changing the sponge.

Vacuum Bags: Shows the number of times the vacuum started since last reset. You will need to reset these cycles after every vacuum bag change—refer to the "Changing the Vacuum Bag" section of Chapter 3, "Commonly Performed Tasks" for detailed instructions on changing the vacuum bag.

Polish Wheel 1: Shows the number of times the polish cycle started when using Wheel 1 since last reset. You will need to reset these cycles after changing Polishing Wheel 1.

Polish Wheel 2: Shows the number of times the polish cycle started when using Wheel 2 (typically Wheel 2, as defined in the Blank Material screen) since last reset. You will need to reset these cycles after changing Polishing Wheel 2.

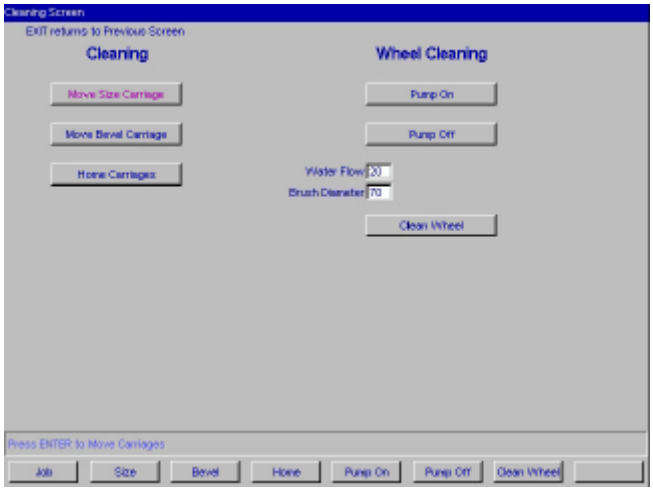
Motor: Shows the number of times the motor started since last reset. You will need to reset these cycles after every cutter motor change—refer to the "Cutter Motor Replacement" section of Chapter 6, "Performing Periodic Maintenance" for detailed instructions on changing the motor.

Save Log to Floppy (CSV): Saves the log to disk (in Comma Separated Variable format) for future retrieval with the *Restore Setup from Floppy* feature.

In addition, note that **the *Job* function key stores the changes made on this screen and takes you to the *Job Screen***.

Cleaning Screen

Use the *Cleaning Screen* for daily cleaning and cleaning the polishing wheel on the 6ES—refer to the "Daily Cleaning and Other Daily Maintenance of the 6E" section in Chapter 2 and the "Cleaning the Polishing Wheel" section in Chapter 3.



Job: Returns you to the *Job Screen*.

Move Size Carriage: Moves the Size carriage so that you can clean underneath it.

Move Bevel Carriage: Moves the Bevel carriage so that you can clean underneath it.

Home Carriages: Returns carriages to Home position after cleaning.

Pump On: Turns the pump on to wet the sponge and the Polishing Wheel for cleaning purposes.

Pump Off: Turns the pump off.

Water Flow: There is a *Water Flow* field on the *Blank Materials* screen that specifies the amount of water flow to the sponge needed for the polishing stage for each of the materials (CR39, Poly, etc.). Use this field to test the amount of flow. The valid range is from 5 to 20 with larger numbers increasing the amount of flow.

Brush Diameter: To be used with the Wire Brush from the Accessory Kit when cleaning the polishing wheel—see "Clean Wheel" below.

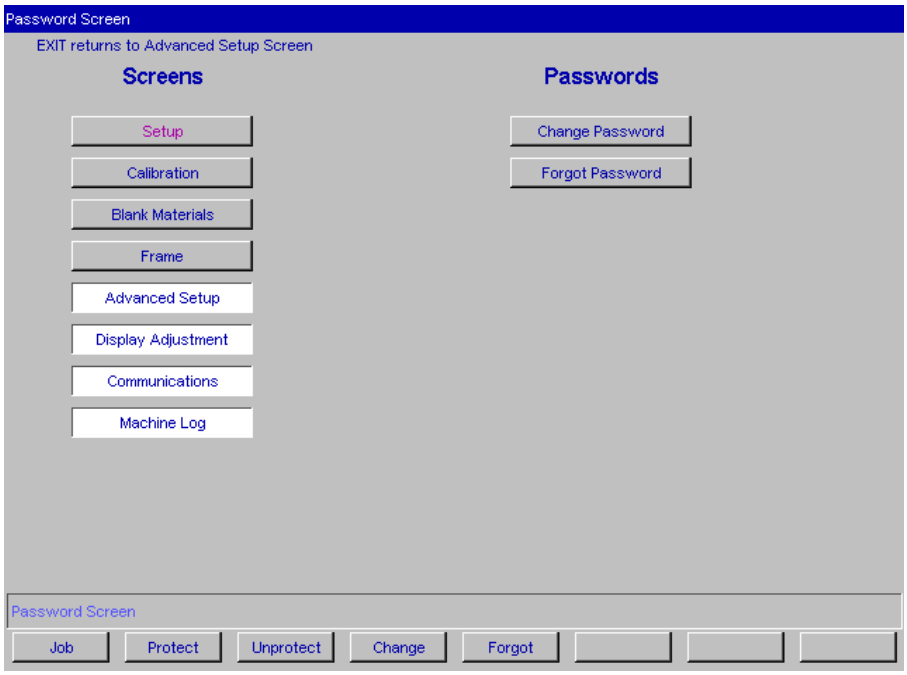
Clean Wheel: Use this function with the Wire Brush from the Accessory Kit when experiencing poor polish quality and when there is visual evidence of lens material buildup on the polishing wheels. Refer to the "Cleaning the Polishing Wheel" section in Chapter 3 for step-by-step instructions.

Note

For step-by-step instructions for the cleaning functions mentioned above except wheel cleaning, refer to Section 2, "Daily Cleaning and Other Daily Maintenance of the 6E," in Chapter 2 of this manual; for wheel cleaning instructions, refer to the "Cleaning the Polishing Wheel" section in Chapter 3.

Passwords Screen

The *Passwords Screen* allows the lab manager to determine which screens require passwords to change settings and values. The sample *Passwords Screen* shown below has the default settings. Notice that the bottom four buttons appear different; for example, they are white buttons and look pressed in, indicating that they are "Protected"—see button definitions of "Protect" and "Unprotect" below.



Job: Saves the changes and takes you to the *Job Screen*.

Protect: When you "Protect" a screen, for example, the *Communications Screen* as shown above, the 6E requires a password to change any value on that screen.

Unprotect: To "Unprotect" a screen means that the 6E no longer requires a password to change values.

Change: To change the password, press this *Change* button and follow the prompts.

Forgot: If you forget the password, follow the directions shown below:

What Happens If I Forget My Password

If you forget the current password, follow these steps:

1. Press the *Forgot Password* button; then call National Optronics Technical Service.
2. Provide them with the password code displayed in the message box.
3. They will provide you with a special (one-time use) password that can be used in place of the current password.

Note

This special password is only valid for use this one time. A new special password will be required each time you forget your password.

Special Note

The special password is based on the password code, and the password code changes on a regular basis, so do not exit this screen before receiving and using the special password.

4. Press the *Change Password* button.
5. Enter the special one-time use password that you received from National Optronics.
6. Follow the prompts that appear. You will be required to enter a new password and confirm it.

The 6E will display a "Password has been changed" message box.

Appendix
B

6E System Messages

Explanation of Numbered Messages, Warnings and Errors

Optronics 6E Version 2.0 or higher

There is a number attached to most system messages and all errors. These numbers are significant and can be useful in trouble-shooting. The text in this appendix describes each message and its meaning.

Message 51

Please call National Optronics with this code.
A service technician will give you a temporary password which
can be used to change the password to a password of your choice.

Message 52

Data has been saved.

Please remove diskette from floppy drive.

Message 53

Data has been restored.

Please remove diskette from floppy drive.

Message 54

Log has been saved.

Please remove diskette from floppy drive.

Message 55

New 6E executable loaded.

REMOVE FLOPPY DISKETTE!!

[100-199 General Warnings]

Warning 101

PLEASE VERIFY THAT PROBE TIPS ARE

PULLED TO THEIR FULL FRONT LIMIT.

Mount probe calibration disk.

Press Continue to calibrate probe.

Warning 102

You should only turn this fault off if
you are using a central vacuum system.
Are you sure you want to do this?

Warning 103

Turning off this fault is primarily done by Optronics service technicians. Without this warning, you might have a situation where you could damage the equipment.
Are you sure you want to do this?

Warning 104

Resetting cycle data will erase the entire machine history.
Are you sure you want to do this?

Warning 105

Display function is currently ENABLED.

Press softkey to keep or change setting.

Warning 106

Display function is currently DISABLED.

Press softkey to keep or change setting.

Warning 107

Insert diskette into floppy drive.

Press Continue to export message schedule data.

Warning 108

Insert diskette with message schedule data into floppy drive.

Press Continue to import message schedule data.

Warning 109

Optronics recommends leaving this number at 300 for

Carbide cutters and 10,000 for Diamond cutters. Increasing this

number may lead to decreased edge quality and axis slippage.

Are you sure you want to do this?

Warning 110

Optronics does not recommend changing the vacuum bag

life from the default of 300. Increasing this number

may lead to decreased machine performance or life.

Are you sure you want to do this?

Warning 111

Has the machine been cleaned?

Warning 112

Insert diskette into floppy drive.

Warning 113

Check that floppy is inserted in drive.

Warning 114

Insert System Diskette, or other diskette with new software.

CAUTION

File transfers may require several minutes.

DO NOT insert or remove floppy diskette unless prompted.

DO NOT turn off system power unless prompted.

If system shows NO activity for 3 minutes...

... remove diskette

... turn off power

... restart system again.

Warning 115

Cycle will pause during finishing to allow for bevel adjustment.

Warning 116

Cycle will pause during grooving to allow for groove adjustment.

Warning 117

Optronics does not recommend changing the groover

life from the default of 3000. Increasing this number

may lead to decreased machine performance or life.
Are you sure you want to do this?

Warning 118

Optronics does not recommend changing the sponge life

from the default of 300. Increasing this number may

lead to decreased machine performance or life.

Are you sure you want to do this?

[200-299 Physical machine limitations]

Warning 201

Probe tip fell off lens during probing.
Lens may be too small to cut out.
Reprobe lens 2mm smaller?
CAUTION
PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE
VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.
REPROBED LENS CANNOT BE SAFETY BEVELLED.

NOTE: If you receive this error message, you will go into Pause Mode—refer to the "Using Pause Mode" section of Chapter 7 (beginning in Step 3).

Warning 202

Probe tip fell off lens during probing.
Lens may be too small to cut out.
Reprobe lens 2mm smaller?
CAUTION
PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE
VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

Warning 203

Groove can not be placed as far back on lens as specified.

Warning 204

Lens edge may be too thin to groove.

Warning 205

Bevel is too far back to be polished.
Continuing will move bevel forward on lens.

Warning 206

Lens is too thick to be polished.
Continuing will turn polish off.

Warning 207

Lens is too thick to safety bevel.
Continuing will turn safety bevel off.

Warning 208

Half-eye clamp and block must be installed
to safety bevel this shape.
Do you want to continue?

Warning 209

Half-eye clamp and block must be installed to cut this shape.

Do you want to continue?

Warning 210

Lens edge too thin for base curve bevel.
If you continue, bevel placement will be
changed to automatic.
Do you want to continue?

Warning 211

Half-eye clamp and block must be installed to cut this shape.
Automatic safety bevel not allowed on lens this small.
Do you want to continue?

Warning 213

Probe data is irregular.
Lens may be too small to cut out.
Reprobe lens 2mm smaller?

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

REPROBED LENS CANNOT BE SAFETY BEVELLED.

Warning 214

Probe data is irregular.
Lens may be too small to cut out.
Reprobe lens 2mm smaller?

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

Warning 215

Probe appears to be stuck. Probe data may be incorrect.

Warning 216

Bevel carriage hit software limit before probe reached target.
Reprobe lens 2mm smaller?

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

REPROBED LENS CANNOT BE SAFETY BEVELLED.

Warning 217

Bevel carriage hit software limit before probe reached target.
Reprobe lens 2mm smaller?

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

Warning 218

Lens shape may be affected by SIZE carriage minimum limit.

Warning 219

Bevel placement may be affected by BEVEL carriage maximum limit.

[300-399 Operator Error]

Warning 301

No lens detected!
Reprobe lens 2mm smaller?

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

REPROBED LENS CANNOT BE SAFETY BEVELLED.

Warning 302

No lens detected!
Reprobe lens 2mm smaller?

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

[400-499 Communication Error]

Error 400

No Arcnet Error

Error 401

LAN Hardware Failure

Make sure the DIP switches on the Arcnet card are all in the same direction.

Error 402

Duplicate LAN ID

This Arcnet ID is already in use by another device. Try another ID.

Error 403

LAN Receive Error

Code mismatch in packet series.

Error 404

LAN Receive Error

Packet numbers received out of order.

Error 405

LAN Receive Error

HOST ID is not 255.

Error 406

LAN Transmit Timeout

No Arcnet connection detected.

Error 407

LAN Receive Timeout

Host received request but did not respond in time.

Error 419

Arcnet Not Connected

Tried to call host, but no Arcnet connection was found.

Error 420

Call Host Timeout

No response from Host to Gateway

Error 421

Job Not Found

Check that job number was entered
correctly and that job exists at host.

Error 422

Unknown Error

Network detected with no host.

Error 423

Edger Data NOT Found!

Error 424

Serial Receive Timeout

Check that serial cables are connected from 4T
to 6E and that the communications parameters
on both machines are set correctly.

Error 425

No communication device configured or unsupported protocol.
Please configure a device and/or a supported protocol
on the Communications Screen.

Error 426

Bad trace received!

[500-599 Hardware Error]

Error 501

Calibration disk not detected.

PLEASE VERIFY THAT PROBE TIPS ARE PULLED TO THEIR

FULL FRONT LIMIT AND RECALIBRATE PROBE.

Error 503

Possible failure of BEVEL axis home switch detected.

Check switch and wiring.

Error 504

Possible failure of SIZE axis home switch detected.

Check switch and wiring.

Error 505

BEVEL motor or encoder not responding.
Make sure motor wiring is intact and
carriage rails are clear of debris.

Error 506

SIZE motor or encoder not responding.
Make sure motor wiring is intact and
carriage rails are clear of debris.

Error 507

AXIS motor or encoder not responding.
Make sure motor wiring is intact and
carriage rails are clear of debris.

Error 508

Unable to detect AXIS home position.
Check AXIS home switch function and wiring.

Error 509

False HOME position reading on BEVEL axis.
Check BEVEL home switch and wiring.

Error 510

Probe could not detect calibration disk size.

Probe is probably sticking in left position.

Error 511

Probe could not detect calibration disk size.

Probe is probably sticking in right position.

Error 512

Bevel home switch repeatability error.
Bevel placement and size may be affected.
Please call National Optronics Technical Service
for help with this error.

Error 513

Size home switch repeatability error.
Bevel placement and size may be affected.
Please call National Optronics Technical Service
for help with this error.

Error 514

Size limit exceeds probe tip location. This may indicate missing rear size limit stops or a probe that is too far forward. Please call National Optronics Technical Service for help with this error.

Error 515

False HOME position reading on SIZE axis.

Check BEVEL home switch and wiring.

[600-699 Cycle Errors]

Error 601

Lens must be chucked to start cycle.

Error 602

Door must be closed to start cycle.

Error 603

Probe not calibrated!!

Please remove lens and calibrate probe before continuing.

Error 604

You are missing information needed for cycle.

Please fix and try again.

Error 605

Water level too low to polish or safety bevel.

Error 606

Block too close to or outside of edge of lens.

Error 607

Lens too small to probe!

Error 608

No lens detected!

Error 609

Cutter Motor Fault!

Error 610

Vacuum Fault!

Error 611

Lens hit probe arm! You may be in
re-cut mode using a full blank.

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

Error 613

Position error due to lens hitting cutter!

Error 614

Door opened before cycle complete!

Error 615

Lens too large or too decentered to cut. Try moving block and Multifocal blocking (on Setup Screen) to 5mm down, 5mm in or changing to Geometric Blocking.

Error 616

Memory error 1!

Error 617

Memory error 2!

Error 618

Memory error 3!

Error 619

Memory error 4!

Error 620

Memory error 5!

Error 621

Memory error 6!

Error 622

Memory error 7!

Error 623

Toolpath alignment error!

Error 624

Probe path alignment error!

Error 625

Bad toolpath calculated!

Error 626

Cannot align data.

Error 627

Probe data is irregular.
Lens may be too small to cut out.

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

Error 628

Not enough information for profile mode.

Profile cannot be used with back bevel

or if back is not probed.
Error 629

Bevel carriage hit software limit before probe reached target.

CAUTION

PROBE TIPS MAY HAVE BEEN PUSHED BACK. PLEASE

VERIFY THAT THEY ARE PULLED TO THEIR FULL FRONT LIMIT.

Error 630

Blocking is invalid. Please check blocking parameters.

Error 631

Axis servo could not maintain correct position during cycle.

This could be due to one of the following:

- a servo motor, encoder or wiring problem

- a driver chip problem

- too high a feed rate for the material being cut

- too high a lens rpm for the material being cut

- cutter motor never turned on and lens hit arbor

Please check your material settings and try again.

Error 632

Bevel servo could not maintain correct position during cycle.

This could be due to one of the following:

- a servo motor, encoder or wiring problem

- a driver chip problem

- too high a feed rate for the material being cut

- too high a lens rpm for the material being cut

- lens debris blocking carriage

Please check your material settings and try again.

Error 633

Size servo could not maintain correct position during cycle.

This could be due to one of the following:

- a servo motor, encoder or wiring problem

- a driver chip problem

- too high a feed rate for the material being cut

- too high a lens rpm for the material being cut

- lens debris blocking carriage

Please check your material settings and try again.

Error 634

Lens is too small to cut. Please check size and try again.

Error 636

Lens is too large to cut. Please check size and try again

[700-799 Operator Error]

Error 702

Default lens blocking cannot be Optical Center during calibration.

Please change your lens blocking and try again.

Error 703

Must recall job to go back to traced center

Error 704

Display function is currently DISABLED.
There is no message schedule file in the system.
File must first be Imported to enable function.

Error 705

Message file not found in 6E flash memory.

Export cancelled.

Error 706

Unable to delete old copy of file on floppy.

Export cancelled.

Error 707

Unable to copy file to floppy.

Export cancelled.

Error 708

Message file not found on floppy diskette.

Error 709

Unable to copy file to 6E memory.

Error 710

Unable to copy file to 6E memory.

Error 711

Unable to import message file from floppy diskette.

Error 712

Unable to copy message file to 6E memory.

Error 713

Cannot start calibration from left eye.

Error 714

Need to download job for cycle to be valid.

Error 715

is invalid.

Please fix it at host or make it editable.

Error 716

Cannot load job while calibrating.

Error 717

Cannot change layout while in recut mode

Error 718

Unable to save setup numbers to floppy

Please remove diskette from floppy drive.

Error 719

Unable to restore setup numbers from floppy

Please remove diskette from floppy drive.

Error 720

Chuck pressure is too low to be calibrated.

Error 721

Chuck pressure is too high to be calibrated.

Error 722

Please remove lens from chuck

Error 723

- Out of Range value

Valid range is from

Error 724

Illegal value!!

Check Value of

Error 725

Hit software limit

Error 726

Calibration disk must be chucked to start calibration.

Error 727

Grooving Spindle Arrangement must be installed
before Groove can be calibrated.

Error 728

Unable to save log to floppy

Please remove diskette from floppy drive.

Error 729

Load aborted. Unable to access diskette file.

Restoring previous main program...

Please remove diskette from floppy drive.

Error 730

Unable to do download.

No SETUP program exists.

Please remove diskette from floppy drive.

Error 731

Download aborted. Unable to copy SETUP program.

Please remove diskette from floppy drive.

Error 737

Chuck must be closed to find limits

[Floating Point Errors 800-899]

Error 801

INTO executed with OF flag set

Error 802

Integer Divide by Zero

Error 803

Invalid Operation

Error 804

Division by Zero

Error 805

Numeric Overflow

Error 806

Numeric Underflow

Error 807

Precision

Error 808

Program Generated Exception

Error 809

Stack Ovrflow

Error 810

Unknown Error

Appendix C Spindle Assembly

Spindle Assembly—Exploded View

The next page shows an exploded view of the spindle assembly.

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THIS PART WAS CREATED WITH SolidWorks ® AS A THREE-DIMENSIONAL SOLID MODEL. ELECTRONIC FILES MAY BE MADE AVAILABLE FOR THE PURPOSE OF NC MANUFACTURING.

ITEM	P/N	QTY	DESCRIPTION
1	28407	1	SUPPORT, SPINDLE, LEFT, GROOVING BELT
2	28410	1	SUPPORT, SPINDLE, RIGHT
3	28421	1	END CAP, SUPPORT, SPINDLE, LEFT, GROOVING BELT
4	28426	1	SHAFT, WHEEL, GROOVING BELT
5	28428	1	PULLEY, IDLER, GROOVING BELT
6	28430	1	SPACER, PULLEY, IDLER, GROOVING BELT
7	28436	1	BELT, SPROCKET, GROOVING BELT
8	65235	1	SCREW, #10-32 x 1/2", LOW HEAD, IDLER
9	65524	1	COUPLER, 1/2" x 1/2", SPINDLE, BALANCED
10	70076	4	BUSHING, SUPPORT, SPINDLE
11	70228	3	BEARING,CERAMIC, .1875 x .375 x .12
12	70363	1	BEARING,CERAMIC, 8mm x 16mm x 5mm
13	70360	1	BEARING - NOSE / BODINE #4
14	73102	2	WASHER, WAVE, .265" ID x .367" OD
15	73104	2	WASHER, WAVE, .440"' ID x .618" OD
16	90761	1	WHEEL SPROCKET ASSEMBLY, GROOVING BELT
17	90775	1	ARBOR SPROCKET ASSEMBLY, GROOVING BELT
18	90863	1	ARBOR ASSEMBLY, BEVEL/GROOVING, BELT DRIVEN
19	93410	1	WHEEL, DIAMOND, GROOVING
20	HDWR	3	#6-32 x 1/4" TORX FLAT HEAD CAP SCREW
21	HDWR	2	#4-40 x 1/4" SOCKET HEAD CAP SCREW
22	HDWR	1	WASHER, FLAT, #4 SS
23	65601	1	#4-40 x 1/4" SS TRIMMED HEX SCREW
24	HDWR	1	WASHER, FLAT, .388" ID x .625" OD SS

REV	EC#	BY	DATE	DESCRIPTION
-	1808	DWD	08-31-00	INITIAL RELEASE
A	2060	JDP	06-28-01	ITEM 22 WAS #4 NYLON WASHER
B	2124	DWD	09-07-01	ADDED P/N: 65601 FOR #4-40 x 1/4 SS TRIMMED HEX SCREW WAS HDWR
C	2211	SFH	01/31/02	UPDATED PICTORIAL TO REFLECT END CAP WITHOUT CHAMFERED HOLES; ITEM 20 WAS FLAT HEAD
D	2363	PEH	11-13-02	ITEM 11 - 70228 WAS 70227, ITEM 12 - 70363 WAS 70345
E	2419	SFH	11/20/02	ADDED LOCTITE, DAMPING GREASE, ALIGNMENT PLATE REQUIREMENTS; ADDED CLARIFYING VIEWS OF SPROCKETS
F	2433	DWG	12/5/02	ITEM 20 CHANGED FROM #4-40 X 1/4 TRIMMED HEX SCREW
G	2449	SFH	01/13/03	ADDED NOTE SPECIFYING USE OF AF-6E-10 FIXTURE FOR ASSEMBLING ITEM 10; ADDED NOTE CLARIFYING REBUILD REQUIREMENTS FOR ITEMS 1, 3 20

(E) APPLY LIGHT FILM OF NYE PG-44R DAMPING GREASE TO OUTER RACES OF BEARINGS BEFORE INSTALLATION

(E) NOTE DIFFERENCE BETWEEN ITEMS 16 AND 17 DO NOT INTERCHANGE LOCATIONS!

(G) ASSEMBLIES FOR REBUILDS ONLY DO NOT HAVE TO BE UPGRADED TO THE #6 TORX SCREW / END CAP DESIGN, AND MAY USE THE FOLLOWING DOWNLEVEL ITEMS: END CAP (ITEM 3), LEFT SPINDLE SUPPORT (ITEM 1), FASTENERS (ITEM 20) (MAY BE #4-40 FLAT OR HEX HEAD)

(E) 1. APPLY LOCTITE 609 SPARINGLY TO PULLEY BORE.
2. INSTALL BEARING (HAND PRESS ONLY) DOWN TO BOTTOM OF PULLEY BORE.
3. AFTER BEARING INSTALLATION, REMOVE ANY EXCESS LOCTITE FROM OUTSIDE OF BEARING.
4. MAKE CERTAIN THAT NO LOCTITE ENTERS BEARING!

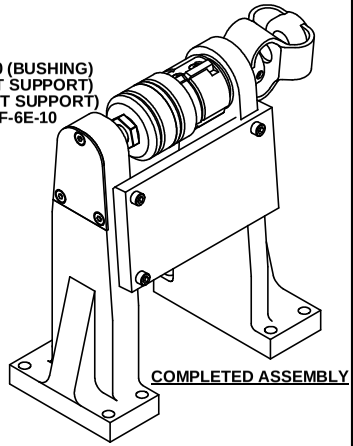
(G) PRESS 4X ITEM 10 (BUSHING) INTO ITEM 1 (LEFT SUPPORT) AND ITEM 2 (RIGHT SUPPORT) USING FIXTURE AF-6E-10

ATTACH ALIGNMENT PLATE 85006 TO COMPLETED ASSEMBLY WITH (2) #8-32 x 1/2" SHCS AND (1) #8-32 x3/8" SHCS.

ASSEMBLIES MUST BE STABILIZED WITH ALIGNMENT PLATE BEFORE DELIVERY TO STOCK OR INSTALLATION ON MACHINE!

NOTES:

1. ASSEMBLE COMPONENTS AS INDICATED.
2. APPLY LOCTITE 222 TO ALL FASTENERS UNLESS OTHERWISE INDICATED.



COMPLETED ASSEMBLY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

DEFAULT TOLERANCES ARE:

DECIMALS: .XXX ± .005" .XX ± .015" .X ± .03"

FRACTIONS: ± 1/32"
ANGLES: ± 1/2°
FLATNESS: 0.010"/FT MAX
PARALLEL: 0.010"/FT MAX
CONCENTRICITY: 0.003" T.I.R
SURFACE FINISH: 32µ" RMS MAX

DO NOT SCALE DRAWING

CAD GENERATED DRAWING DO NOT MANUALLY UPDATE

APPROVALS	DATE
DRAWN DWD	08/31/00
CHECKED	
RESP ENG	
MFG ENG	
QUAL ENG	

SPECIFICATIONS

MATERIAL: NOTED

FINISH: NONE

QTY PER ASSY: 1

NATIONAL OPTRONICS INCORPORATED
CHARLOTTESVILLE, VIRGINIA

TITLE: SUPPORT, SPINDLE, LEFT, GROOVING (BELT) ASSEMBLY

SIZE B | PART NO: 28460 | REV G

CAD FILE: 28460 - Support, Spindle, Left, Grooving (Belt) Assembly SLDDRW

SCALE: 0.75:1 | SHEET 1 of 1

FORMAT REVISION 03/13/02

Appendix D

Statement of Warranty

Statement of Warranty

National Optronics warrants the 6E Patternless Edger to be in good and serviceable condition upon shipment from the plant in Charlottesville, VA. The customer's sole remedy is to have defective parts replaced or repaired according to the following General Warranty:

> For a 1-year period from the date of shipment, National Optronics will replace or repair all defective parts. Replacement parts supplied under this Warranty will be covered for the remainder of the initial warranty period.

Exempted from this General Warranty are perishable tools and wear parts, specifically covering, but not limited to, cutting flutes, and clamps. These tools are warranted to meet normal operating specifications when shipped; they will be replaced or a credit issued if found to be defective upon return to the plant.

These warranties set forth are made in lieu of all other warranties, including merchantability, expressed or implied.

The liability of National Optronics to the customer is limited to the exclusive remedies set forth. National Optronics will not be held responsible for loss of use or any indirect or consequential damage.

As a general condition to recover in the General Warranty, the customer must establish that:

1. He is the original purchaser of the machine or part;
2. The unit was maintained in accordance with the instructions in the Manual provided with the unit;
3. The unit was operated under normal conditions; and,
4. National Optronics Inc. was notified of the defect within two weeks of the date of discovery.

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