



***The Optronics 6EM Patternless Edger System***

***User's Manual***

*Rev. 1.01*

*May 20, 2004*

## *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.

## 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 6EM produces sound levels within the requirements of the Occupational Safety and Health Administration Regulations. However, the use of the 6EM 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 6EM 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 6EM 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 6EM 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 6EM (Standard Operation):** Includes tasks performed while using the 6EM in a standard operation, such as pulling down a job, edging (roughing and finishing).
- Chapter 5. Calibrating the 6EM:** Includes instructions on all aspects of calibration.
- Chapter 6. Performing As Needed 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 6EM 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 usually password protected.
- Appendix A. Screen Field Definitions:** Includes reference information including definitions of the fields on the screens you will see on the 6EM's monitor.
- Appendix B. 6EM System Messages:** Describes and gives more detail about the messages you will see on the 6EM's monitor (warnings, information, etc.).
- Appendix C. Statement of Warranty:** Includes the Warranty Statement for the 6EM.

**This manual was released with Software Version 1.03. Future software upgrades do not necessarily affect the manual. Call technical support if you feel you need a newer manual.**



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# Chapter 1

## *Before You Begin*

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### Before You Begin

#### General Description

The 6EM 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. The clamping pressure applied by the 6EM's electric chuck is automatically adjusted by the selection of lens material, addressing A/R crazing issues.

In addition to its superior mechanics, the 6EM'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, Inc.  
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:**

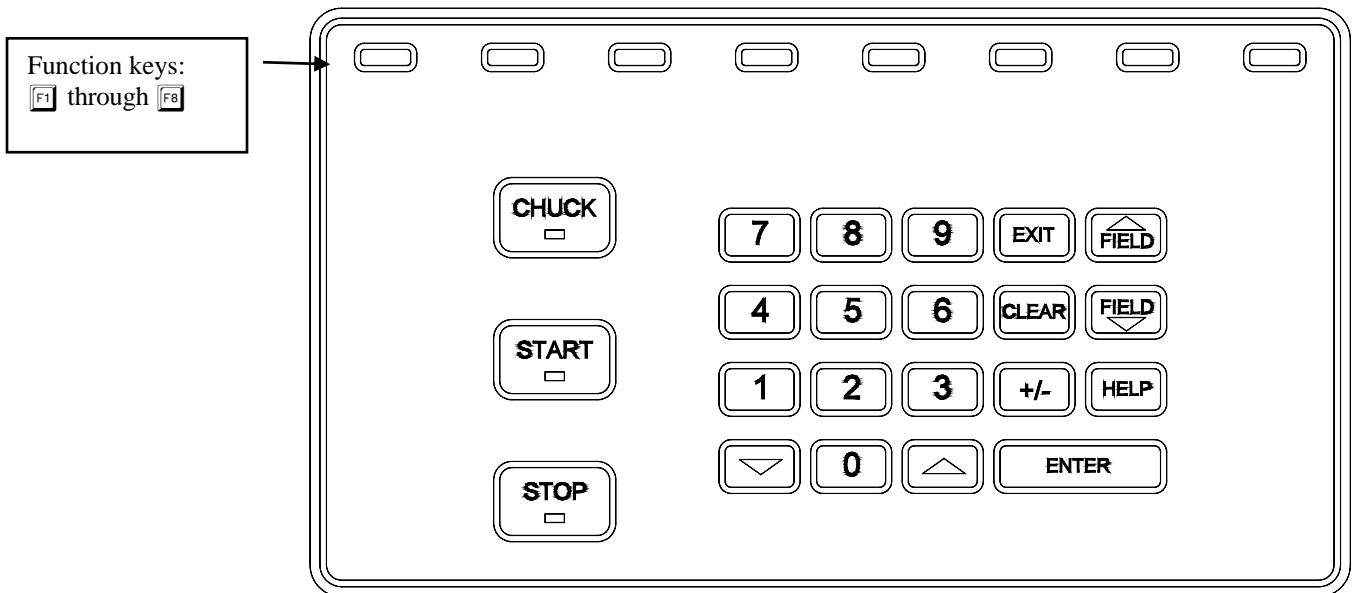
Please call our Technical Service Department at 800-247-9796 ext. 314 and know the serial number of your machine and Customer Account Number. If you purchased your equipment from National Optronics, Optical Works Corporation, Salem Vision Group, or Rozin Optical, there is no charge for telephone support. If, however, you purchased your Optronics equipment from any vendor other than the ones listed above, you will be charged for telephone support at the rate of \$98.80 per 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 \$45.00 per hour for travel to and from the equipment location and \$95.00 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 6EM keypad are identified with a graphic representation of the key, such as, the  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  through , such as the *Job* function key .



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 6EM Patternless Edger System should be on a dedicated 20 amp circuit (no other electrical loads connected to the same circuit) to ensure a uniform, consistent power supply. The 6EM 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

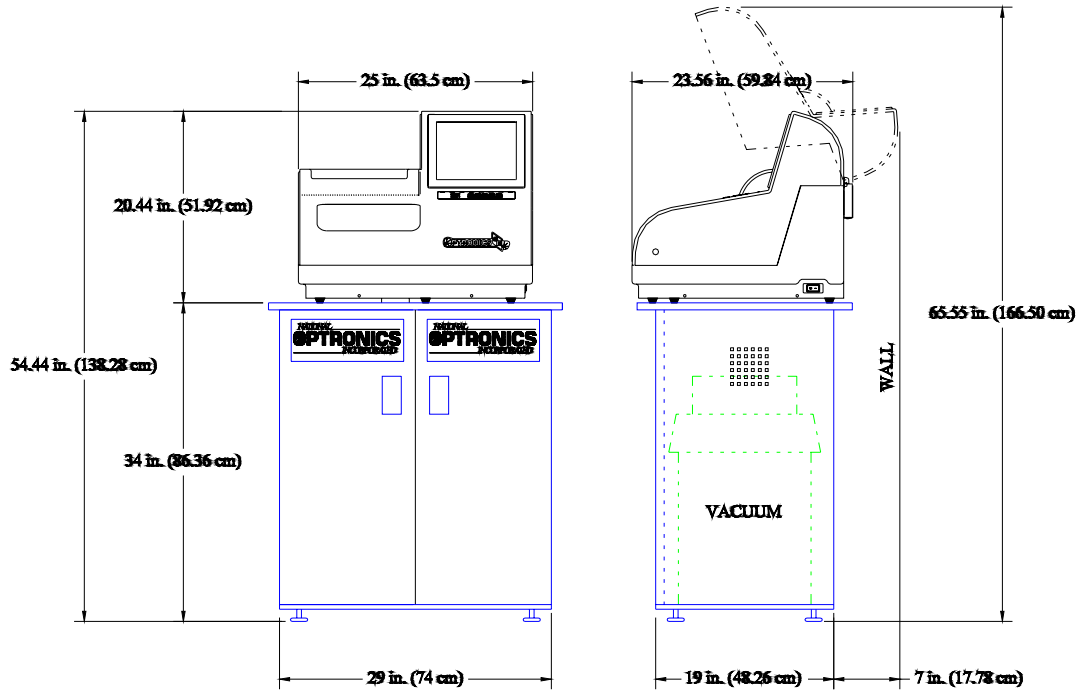
The 6EM is available for 230V 50 Hz installations. It is also recommended for 230V units to be installed on a dedicated circuit.

## Operating Conditions

The 6EM 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 6EM Patternless Edger System:



General Specifications

## Cutters

Coated carbide and carbide.

## Cutter Motor

Adjustable speed (up to 20,000 RPM) DC Brushless, ¾ Hp.

## Bevel Placement

3-Axis Numerical Control; for each blade, 8 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 6EM edger is designed to edge **plastic lenses only**. Any other use of the machine will compromise its safety protection features.

Caution

**The 6EM 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*

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### *Section 1: Initial Installation*

National Optronics can provide field technicians who will install your equipment and set up the Optronics 6EM 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 6EM in a standard operation, such as pulling down a job and edging (roughing and finishing), refer to Chapter 4, “Operating the 6EM (Standard Operation).” To learn about calibration instructions, refer to Chapter 5, “Calibrating the 6EM.”

There are four phases to setting up the 6EM:

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 6EM Edger itself (physical setup)

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

1. Placing the 6EM on the cabinet and connecting the vacuum unit
2. Removing the shipping brackets
3. Connecting the 6EM to your electric outlet

#### **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 2-11) to aid in both the installation and subsequent operation. The 6EM 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

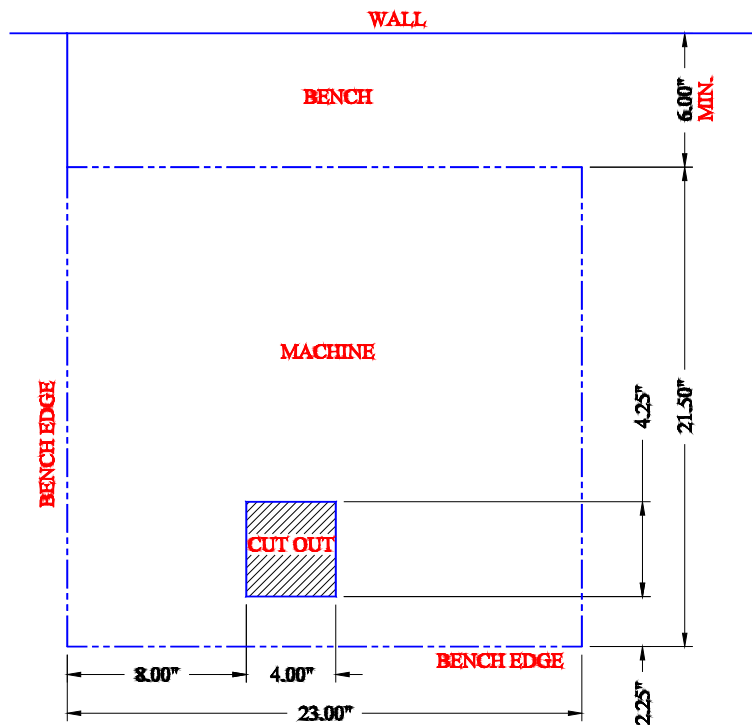
If the edger is being installed on a workbench already present in the lab, proceed to “Preparing the Workbench” below for making the necessary cutouts.

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 6EM itself. The power connection for the 6EM 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

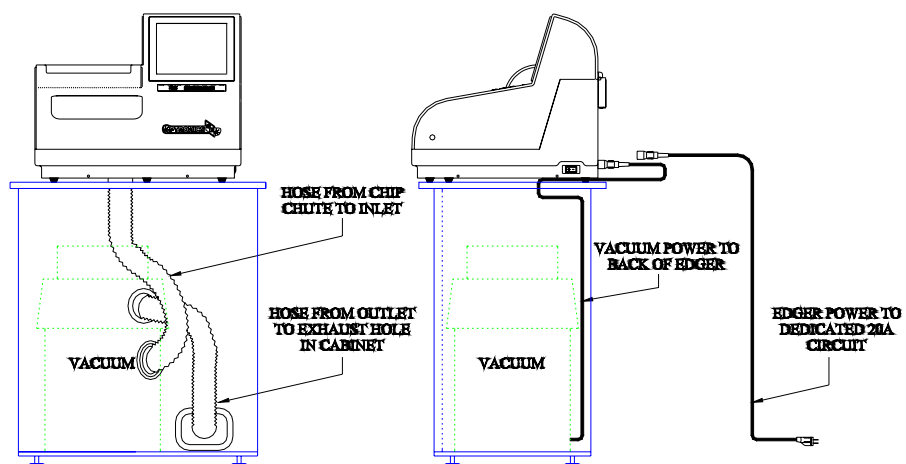
To assemble the vacuum, follow these steps:

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 6EM on the workbench, plug the vacuum power cord into the back of the 6EM (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 6EM

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

1. Placing the 6EM on the cabinet and connecting the vacuum unit
2. Removing the shipping brackets
3. Connecting the 6EM to your electric outlet

### Placing the 6EM on the Cabinet

To place the 6EM 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 brackets and the wire tie marked with the yellow tags (refer to the picture shown below). The brackets can be removed with a 3/16-inch hex wrench found in the hex key set. Each item to be removed is identified with a yellow tag.



## Connecting the 6EM to an Electric Outlet

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

### Note

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



Connect the 6EM 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.

## Powering Up and Calibrating the Probe

Each time you turn on the power switch for the 6EM, 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 6EM 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 and the 58-mm calibration disc into the Chuck and press the  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  and wait while the probe calibrates itself.
5. When the 6EM is finished calibrating the probe, remove the PDA and calibration disk.



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

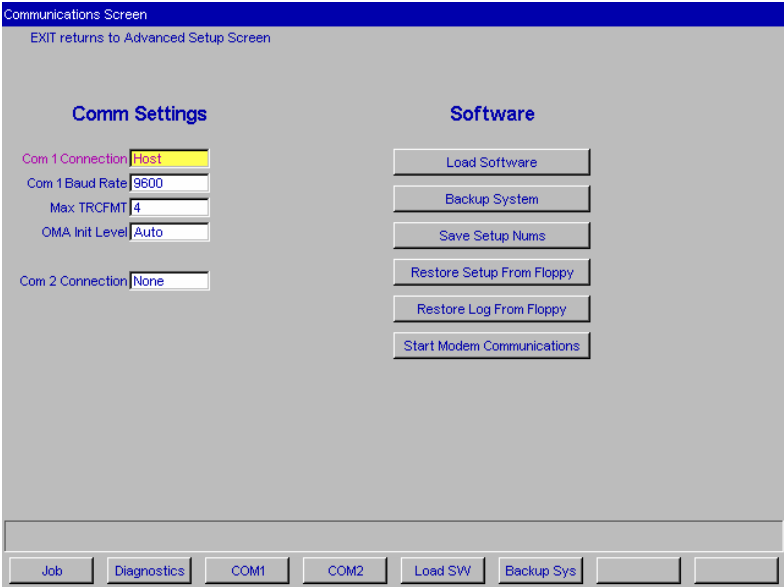


**Probe in Incorrect Position—Note that the tips are slanted, not straight down.**

# 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

### Com1 and Com2 Connection

The choices for Com1 and Com2 vary depending on what you have selected in the Com 1 and 2 Connection fields. Your choices include “4T,” “3B” and “Host,” as well as “Barcode” and “None.” You can only have one Barcode selection.

### Baud Rate

(This field only appears when the Com 1 Connection has a Barcode, Host, 3B, or 4T configured.) This field shows the baud rate for the Com 1 or Com 2 Connection. The default is 9600 except for Barcode, which is 300. Normally, the 6EM 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.

### Max TRCFMT

(Appears on the screen only if Host, 3B, or 4T is selected as the Com 1 Connection.) This field allows the operator to set the highest trace format used by the 6EM 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.

### OMA Init Level

(Appears on the screen only if Host, 3B, or 4T is selected as the Com 1 Connection.) 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.

## Changing Communications Settings

To change the current communications settings, follow these steps:

1. From the *Setup Screen*, press the *Advanced Setup* function key .
2. Press the *Communications* function key .
3. From the *Communications Screen*, use the *Field Down* key  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 barcode 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 6EM

### Daily Cleaning of the 6EM

Keeping the 6EM 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 .
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 6EM's operation.
4. Vacuum the debris from the inside of the 6EM 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  or make sure the cursor is on the *Move Size Carriage* option and press the  key to move the size carriage. Then vacuum the spots you could not reach before.
6. Then press the *Bevel* function key  or use the *Field Down* key  to move the cursor to the *Move Bevel Carriage* option and press the  key to move the bevel carriage. Then vacuum the spots you could not reach before.
7. Move the rocker switch on the front left side of the center wall back to "CYCLE" position—see label next to the switch.
8. Press the *Home* key  or move the cursor to the *Home Carriages* option and press the  key to move the carriages back to the home position and reconnect the hose.
9. 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.

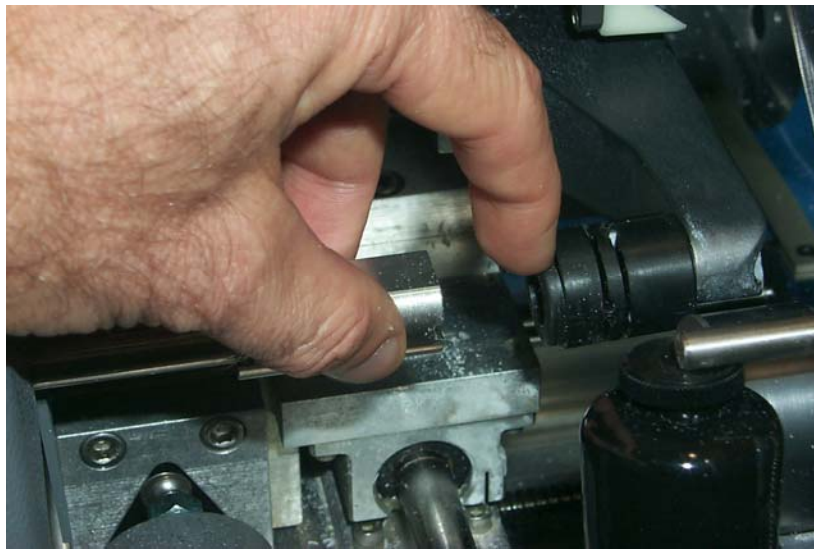
## Other Daily Maintenance

### 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 6EM.”

### Checking the Clamp Pad

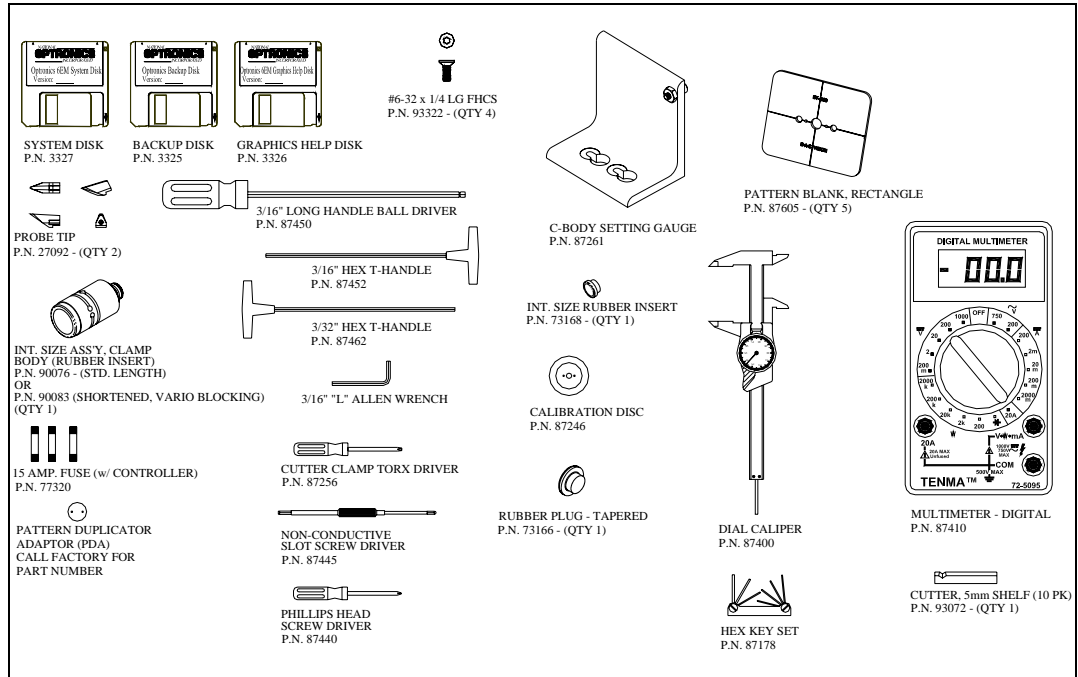
If the pad is torn or loose, replace with a fresh pad. Notice the clamp pad in the picture shown below:



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.

# 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 6EM.





# 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 Blades

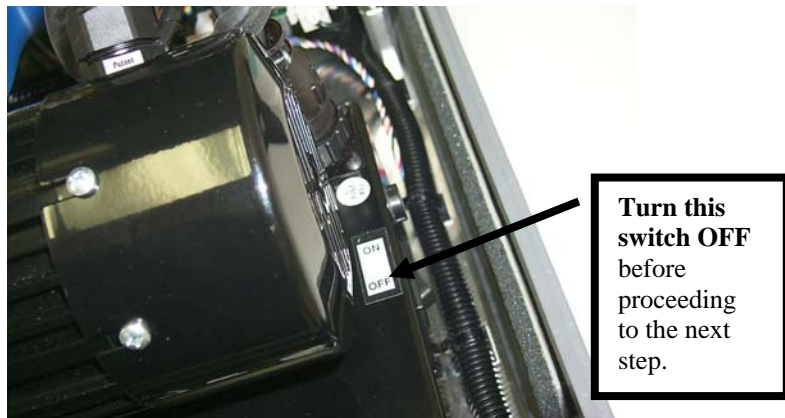
The blades need to be changed approximately every 300 cycles for a carbide blade or every 3,000 cycles for a coated carbide blade. There is a *Status Indicator* in the lower right corner of the *Job Screen* (the Status area) that shows how many cycles since the last change. This *Status Indicator* turns yellow at 90% of the blade's life (according to the blade types and lives specified on the *Advanced Setup Screen*), so that you can ensure that you have a replacement blade in stock. When the indicator turns red, it is time to change the cutter blade.

#### Note

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

To change the blade, follow these steps:

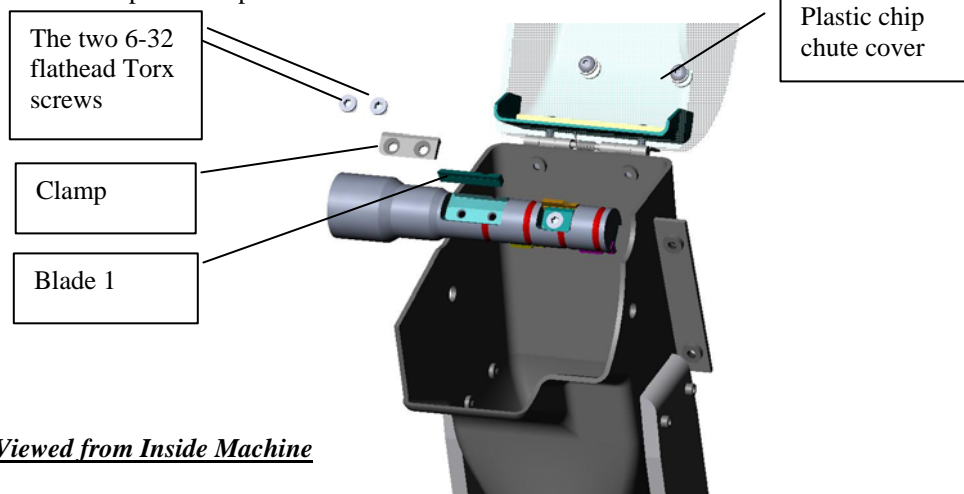
1. Press the case top release buttons and lift the case top.
2. Turn off the power switch on the cutter motor controller (far right side of the 6EM).



#### 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 6EM 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. 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 (toward the cutter motor) 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. Return the chip chute cover back to its original position.
12. Turn on the motor controller power switch that you turned off in Step 2 above.
13. Close the case.

#### Note




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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 correct *Reset Blade* function key F3, F4, F5, or F6 or use the *Field Down* key FIELD to move to the appropriate *Reset Blade* field and press ENTER.
16. Type the password if prompted. The blade count resets to zero.
17. Edge a 58mm 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.




## Verifying Size and Bevel Placement

When performing this task, remember that there are four blades; therefore, you may need to verify size and bevel placement for each blade.

1. Go to the *Setup Screen* ( from the *Job Screen*).
2. Press the *Calibration* function key .
3. Press the *Single Blade Calibration* function key .

### Note

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

4. Enter a password if prompted.
5. Load a 6 base plano lens of at least 2 mm thickness by pressing the Chuck button  to lock the lens in place.
6. Press the Start button  on the 6EM.
7. When done, press the Chuck key  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—refer to Chapter 5, “Calibrating the 6EM,” for a more detailed discussion of this.
9. Visually check to see if the peak of the bevel is in the center of the lens edge. If not, adjust Bevel Offset.
10. Repeat for each blade as appropriate.



## 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 (ESC) 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.

## Backing Up the System









National Optronics strongly recommends backing up your system before loading software or make sure that you have a working backup disk before loading new software. Try to keep that backup disk up-to-date with the software that is installed on your 6EM.

**To backup the 6EM's software**, do the following:

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

## Saving Setup Numbers










National Optronics recommends that you save all calibration and setup numbers (all data saved across power cycles) to disk for future retrieval with the *Restore Setup from Floppy* feature prior to loading new software. It is also a good precaution to perform this task frequently whether or not you are loading new software. To perform this function, follow these steps:

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

## Updating Software

Update to new software using a 3 ½-inch disk through the floppy drive inside the 6EM. National Optronics strongly recommends that you back up your system—refer to previous page—before loading software.

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

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



This chapter includes directions for standard tasks performed while using the 6EM in a standard operation, such as pulling down a job and edging (roughing and finishing). 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 6EM will go automatically if you just started it up.
2. Type in the number of the job to pull down from a Tracer, Blocker or from a Host computer.

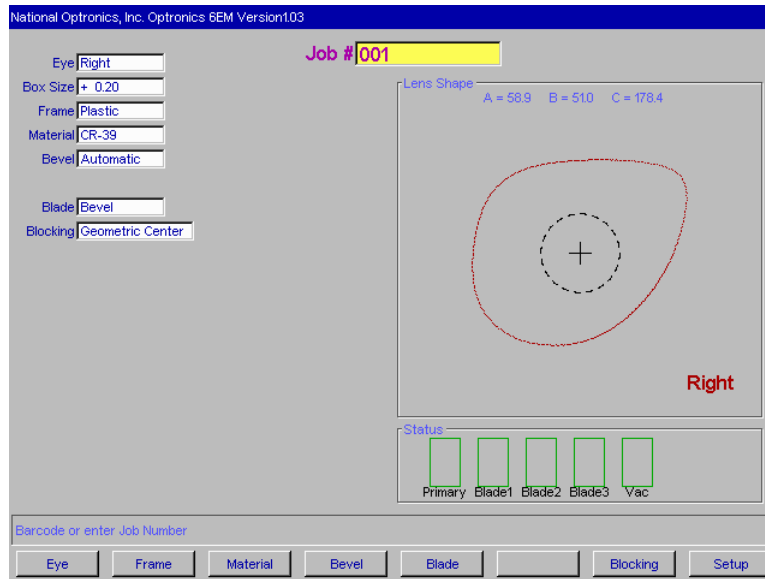
### Note

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.

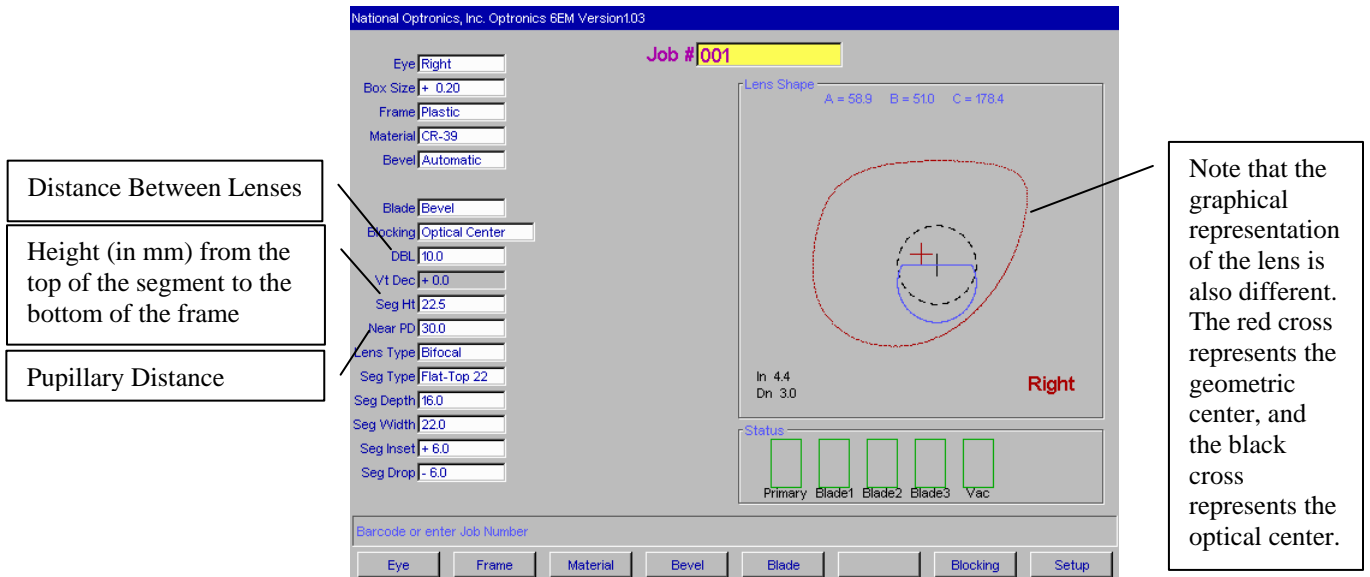
## Job Screen Display Variations

The 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



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






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

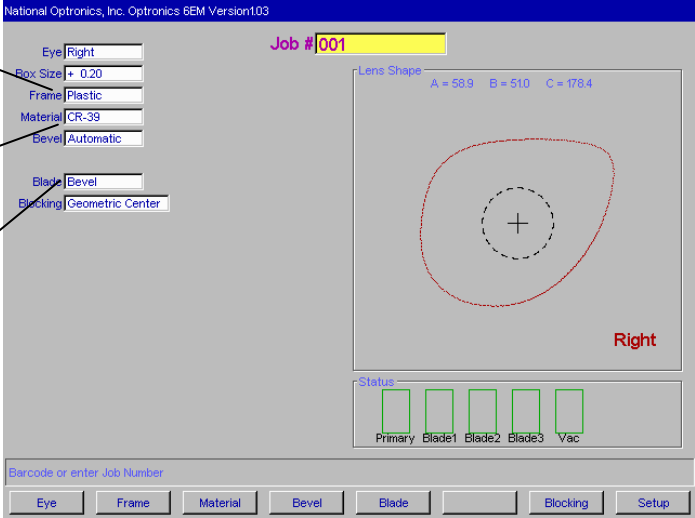
# Edging

The basic steps involved in edging are:

- 1. After pulling down a job, put the lens in and press the Chuck button  to lock it in place.
- 2. Press the Start button  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  ) if changing frame.
- Modify the *Material* field (press the Material function key  ) if changing material.
- Modify the *Blade* field (press the Blade function key  ) if selecting a different blade for this job.







# Chapter 5

## Calibrating the 6EM

The 6EM 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:**

	Probe	Axis	Initial Bevel	Initial Size	Primary Bevel	Primary Size	Blade 1 Bevel	Blade 1 Size	Blade 2 Bevel	Blade 2 Size	Blade 3 Bevel	Blade 3 Size	Rimless Size
<b>Change:</b>													
Cutter Insert in Position 1					*	*							*
Cutter Insert in Position 2							*	*					
Cutter Insert in Position 3									*	*			
Cutter Insert in Position 4											*	*	
Cutter Assembly			*	*	*	*	*	*	*	*	*	*	*
Cutter Motor			*	*	*	*	*	*	*	*	*	*	*
Probe Tips	*		*	*									
Probe Assembly	*		*	*									
Axis Gear Box	*	*	*	*									
Axis Home Switch		*											
Bevel Home Switch	*		*	*									
Size Home Switch	*		*	*									




The following procedures should be followed in order to properly calibrate the 6EM. 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 many other parts. Also, note that Probe Calibration is part of the power-up process; for more information, refer to the steps detailed below:**

## Calibrating the Probe

Each time you turn on the power switch for the 6EM, 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  on the *Calibration Screen*.
4. You will see a message box on the initial 6EM 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 and disk into the Chuck and press the  key to lock it into place). Also, verify that the Probe tips are in the correct position—see pictures shown below.
5. Press the  key and wait while the probe calibrates itself.
6. When the 6EM 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.**

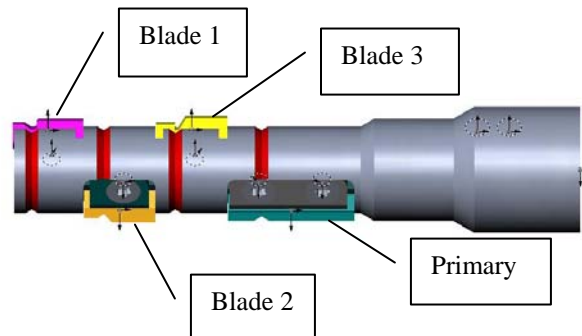
## Calibration: Overview

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

- Use the SBA shape (with pattern) to calibrate everything needed for Primary edging calibration (except rimless), specifically bevel size, axis, and bevel placement.
- Use the circle for size (both bevel and rimless) and bevel calibration (but not axis).

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

Refer to the following drawing of the cutter body for identification of the blades:

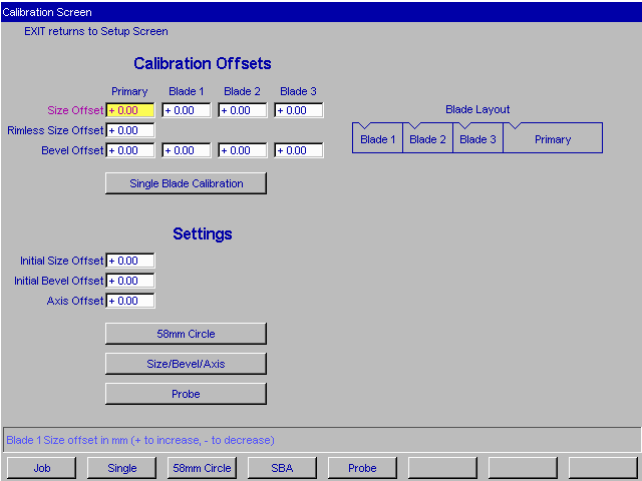


# Calibrating Initial Axis, Size, and Bevel Placement

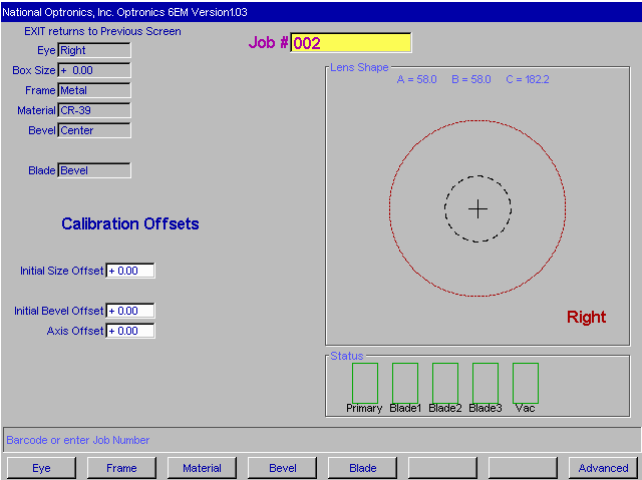
This section deals with the “Initial” settings, commonly used after replacing the cutter body, cutter motor or probe tips. This type of calibration affects all blades. As stated earlier, use the SBA shape for axis, size, and bevel placement calibration.

To calibrate using the SBA shape:

- 1. Get a pattern out and ready to use.
- 2. If you have installed a different cutter body, go to the *Advanced Setup Screen* (F8 from the *Setup Screen*) and set all Primary Blade Bias numbers to 0.00. Otherwise, proceed to Step 3.
- 3. Go to the *Calibration Screen* (F3 from the *Setup Screen*).




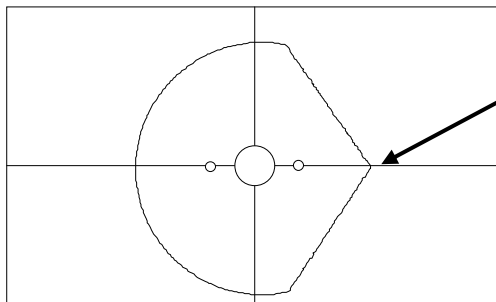
- 4. Press the *SBA* function key (F4), which takes you to the *Job Screen* (set up for an SBA calibration).



### Note

**All job parameters are read-only. Use a pattern even though the Materials field show “CR-39.”**

5. Chuck the pattern using the PDA (meaning insert the pattern and its PDA into the Chuck and press the  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).



Check the point to make sure it lines up with the 180° line.

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.

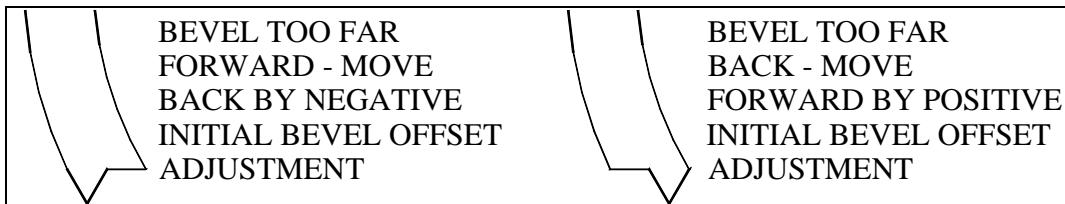
**Note**

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.

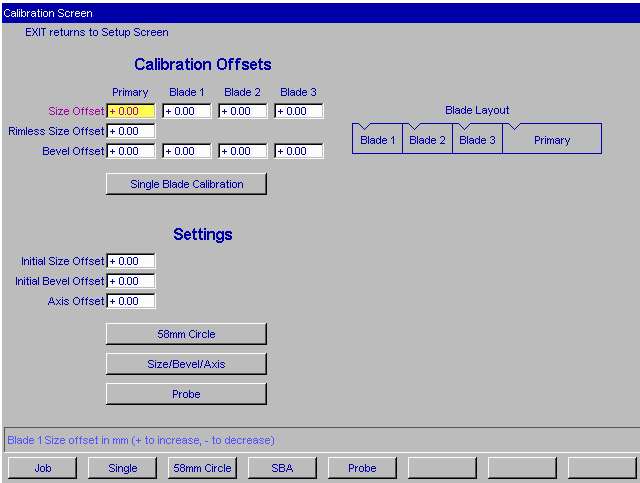
If the calipers do not read 58 mm and the lens was cut with a bevel, adjust the *Initial Size Offset* and recut. (A positive adjustment will increase the size; a negative adjustment will decrease it.) Repeat until the size is 58 mm.

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

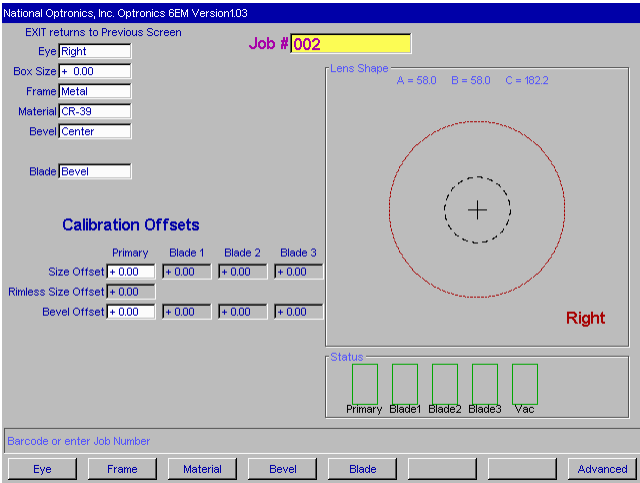


# Calibrating the Size and Bevel for Single Blades

- 1. Ensure that the Initial Size is correct—refer to the “Calibrating Initial Axis, Size, and Bevel” on Page 5-4 before proceeding with the single blade calibration. If “Initial” calibration is complete, you need to calibrate the Rimless Size on the Primary Blade before proceeding to Blades 1—3. If you replaced the Primary Blade, check both the bevel placement and rimless size.
- 2. Go to the *Calibration Screen* (F3) from the *Setup Screen*).



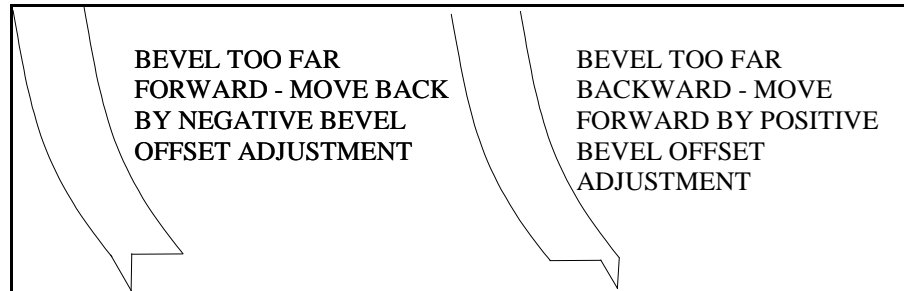
- 3. From the *Calibration Screen*, press the *Single* function key (F2), which will take you to a modified *Job Screen*.



- 4. Use the *Blade* field to select the blade you plan to calibrate.
- 5. Cut a lens and check the size using calipers. The diameter should be 58 mm.

If the calipers do not read 58 mm, 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.


6. Check the bevel placement. It should be centered (see drawing below).



### 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, **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 6EM 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  and modify the Bias numbers directly.

7. Repeat Step 3-5 for Blades 1, 2, and 3 if applicable.

## 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 6EM.
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 Adj.* 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 is too large, decrease the number in the *Trace Size Adj.* field.**
    - **If the lens is too small, increase the number in the *Trace Size Adj.* field.**
  - D. Repeat this process until the 6EM edges accurately with the trace data received.



# Chapter 6

## *Performing As Needed Maintenance*

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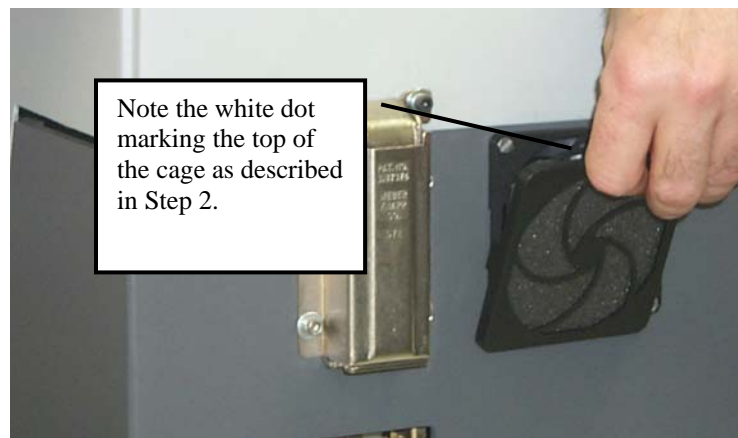
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### Air Intake Maintenance

#### Maintenance of the Air Filter

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

1. Turn off the power switch on the side of the 6EM.
2. 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.
3. Remove the outer part of the air filter cage as shown below. (The cage will snap out.)



4. Remove the filter as shown below:

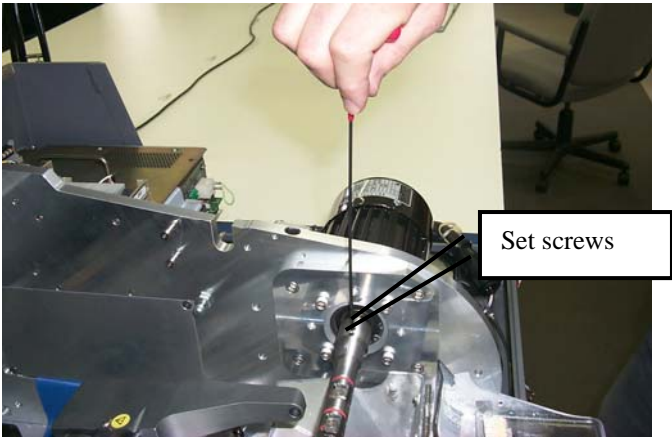


5. Clean the filter with soap and water or replace it with a new filter (Part #: 3069).
6. Place the new or cleaned filter back in the air filter cage and snap the outer part of the cage back in place. NOTE: When performing this step, use the mark you placed on the outer part of the cage to ensure that you replace the piece the same as it came out.
7. Turn the power switch back on.

# 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:

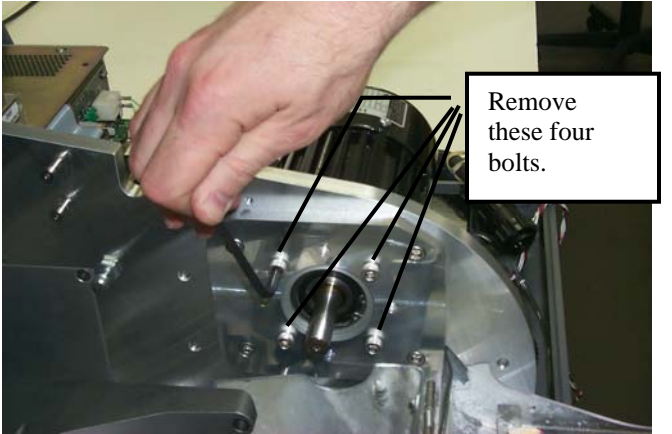
- 1. Turn the cutter motor and the edger OFF. Unplug the motor from its connection to the controller unit.
- 2. Loosen the two screws on the Cutter Body using the 3/32-inch T-handle Allen wrench provided in the toolkit, as shown in the picture below:



**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.**

- 3. Remove the Cutter Body from the motor shaft.
- 4. With the 3/16-inch hex wrench from the accessory kit, unscrew the four bolts on the adapter plate that hold the motor on the bracket.



5. Note the position of the electric cord as it comes out of the cutter motor—how it comes out of the motor horizontal toward the back of the machine. In Step 7, you will need to place the new motor in with the same orientation.
6. Remove the motor from the bracket.
7. Install the new motor on the bracket. Make sure that the circular boss on the motor fits into the circular recess in the plate, and that the power cord comes out of the motor horizontal to the right of vertical, when viewed from the right hand side of the edger.
8. Replace and re-tighten the bolts gradually, going in an “X” pattern around the four bolts, to ensure even tightening.
9. Place the Cutter Body on the motor shaft, bottoming it out.
10. Re-tighten the two screws holding the Cutter Body to the motor shaft (loosened in Step 2 above).
11. Connect the new motor to the controller unit, and secure the wire so it will not interfere with other nearby wires. Turn the controller “ON.”
12. Check the lens size and bevel placement—refer to Chapter 3 for the procedure. It is possible the calibration numbers on the *Setup Screen* will have to be adjusted slightly. If so, refer to Chapter 5, “Calibrating the 6EM.”
13. Go to the *Log Screen* (F6) from the *Advanced Setup Screen*).
14. 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 the following conditions:

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

### Note

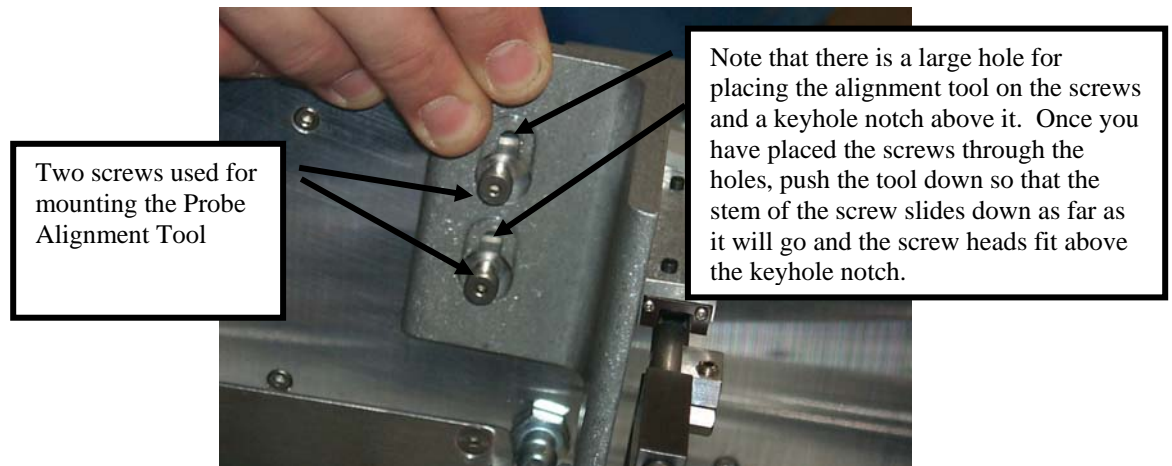
It will be necessary to recalibrate the probe and bevel placement after changing tips—refer to Chapter 5 for calibration instructions.

## Probe Vertical Alignment

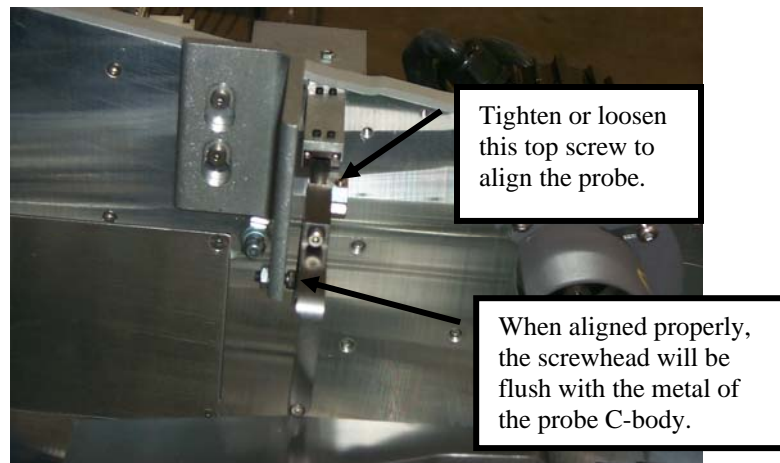
Align the probe if you suspect bad bevel placement or if you have replaced the probe or probe C-body (but not when you replace the probe tips).

Align the probe by following these steps:

1. Get the probe alignment tool out of the 6EM 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 lower screwhead 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 6EM; turning them counter-clockwise brings the tips in toward the front of the 6EM.

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.



# Chapter 7

## Advanced Configuration & Special Considerations

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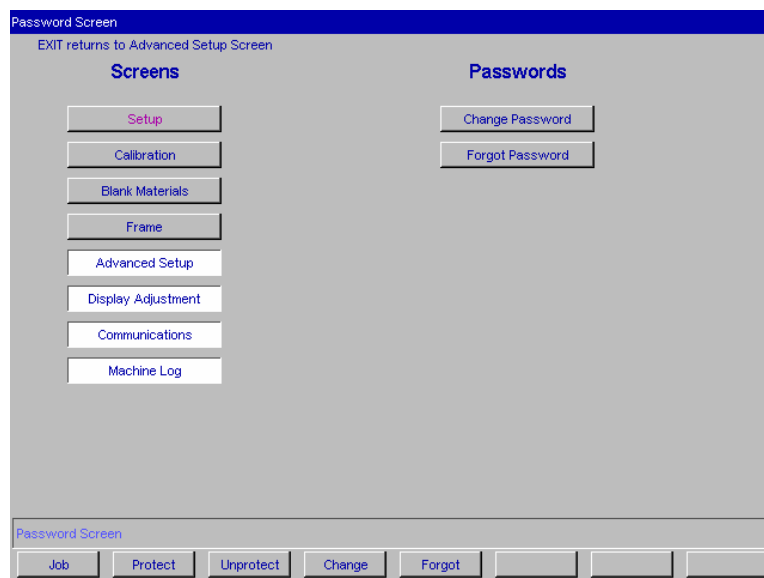
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### Customizing the 6EM to Meet Your Needs

There are several ways you can customize the 6EM 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*  or *Unprotect*  function key.
4. Enter the password if prompted.
5. Press the *Job* key  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 6EM 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 6EM is not designed to use). You may want to create a new “Material” that has special settings for special need jobs. The sample *Blank Materials Screen* below has the custom material “QPOLY.”

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

Blank Material Screen  
EXIT returns to Setup Screen

Name	Defaults			Roughing			Finishing		
	Chuck	Feed	Motor rpm	Feed	Lens rpm	Motor rpm	Feed	Lens rpm	Motor rpm
CR-39	8	20	15	14	4	12	15		
Poly	15	20	15	16	4	12	12		
Hi-Idx	9	20	15	16	4	12	12		
Trivex	8	20	15	16	4	12	12		
Thk Poly	15	12	12	16	4	12	12		
AR	6	8	8	16	4	10	12		
QPOLY	8	8	8	16	4	10	12		
	8	8	8	16	4	10	12		
	8	8	8	16	4	10	12		
Pattern	15	20	15	16	15	12	12		

(INC) Up (DEC) Down (ENTER) Next Letter

Job CR-39 Poly Hi-Idx Trivex Thk Poly AR Pattern

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 **UP** key to advance through the alphabet so that you can add a letter. Notice that the *Increment* and *Decrement* keys (**UP** and **DOWN**) 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 **DOWN** key to go to the letter *P*. (If you want to use lower case letters, keep pressing the **UP** 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 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 of the material, the 6EM will rough first, then probe 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 technique will be invoked each time you select that material.

## 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:

Frame Screen  
EXIT returns to Setup Screen

Name	Size Adj	Default Bevel
Plastic	+ 0.20	Automatic
Metal	+ 0.00	Automatic
Rimless	+ 0.00	Standard
	+ 0.00	Automatic
	+ 0.00	Automatic
	+ 0.00	Automatic
	+ 0.00	Automatic
	+ 0.00	Automatic
	+ 0.00	Automatic
	+ 0.00	Automatic

Press CLEAR to edit name

Job Plastic Metal Rimless

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 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 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 or 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  to go to the *Job Screen* and save the changes.

## Collecting and Resetting Statistics

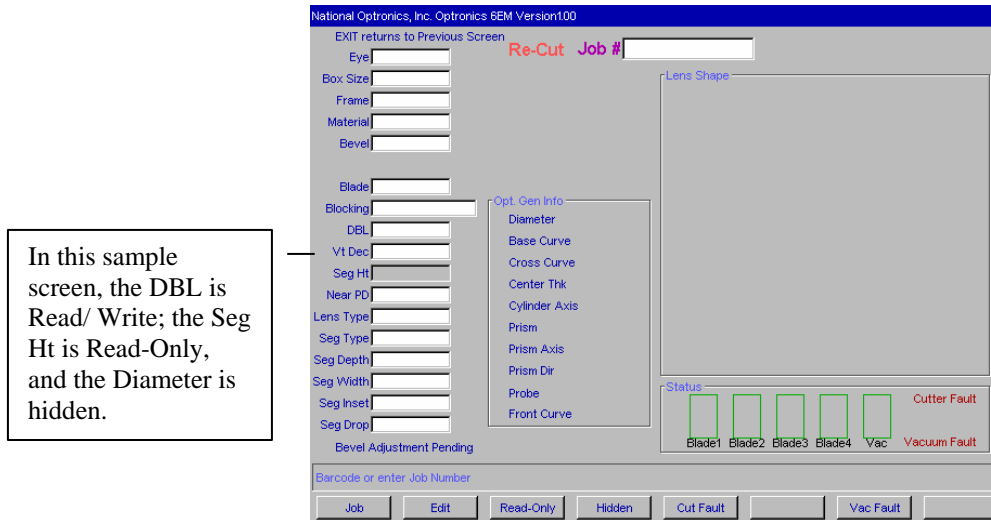
You can use the *Machine Log Screen* to collect statistics about the 6EM, including number of cycles since the last maintenance, etc. You will also use this screen immediately after replacing the vacuum bag, the cutter blade, etc. (Refer to Chapter 3, “Commonly Performed Tasks,” for instructions on vacuum bag and cutter blade replacement; refer to Chapter 6, “Performing As Needed 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, and for that reason, we recommend that resetting Cycle Statistics be performed or authorized by a manager or other authorized personnel.

## 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.

## 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) 6EM bevel placement features.

**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 provides front-to-back adjustment to the entire bevel. Pause Mode is also very similar to the method of adjusting the bevel on a Horizon III.

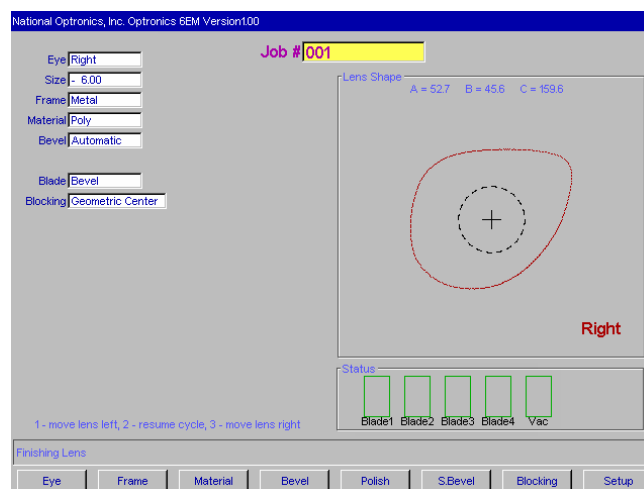
**Use Profile Mode** if you want precise bevel placement control where you can place the bevel on an image of the lens: Profile Mode provides point-by-point adjustment. This also gives you the ability to place the bevel at different positions (more towards the front or back) at different places along 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 6EM 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:



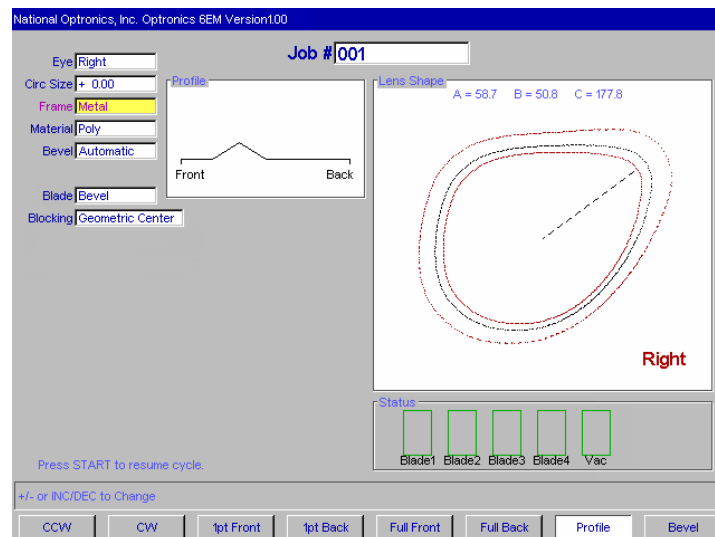
4. Visually examine the location of the bevel by looking at the orange bevel mark on the cutter blade to determine where the bevel will be on the lens. If you want to move it to your left or right, use the 6EM keypad numbers 1 or 3 to move the bevel placement. When it is in the exact location you want,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

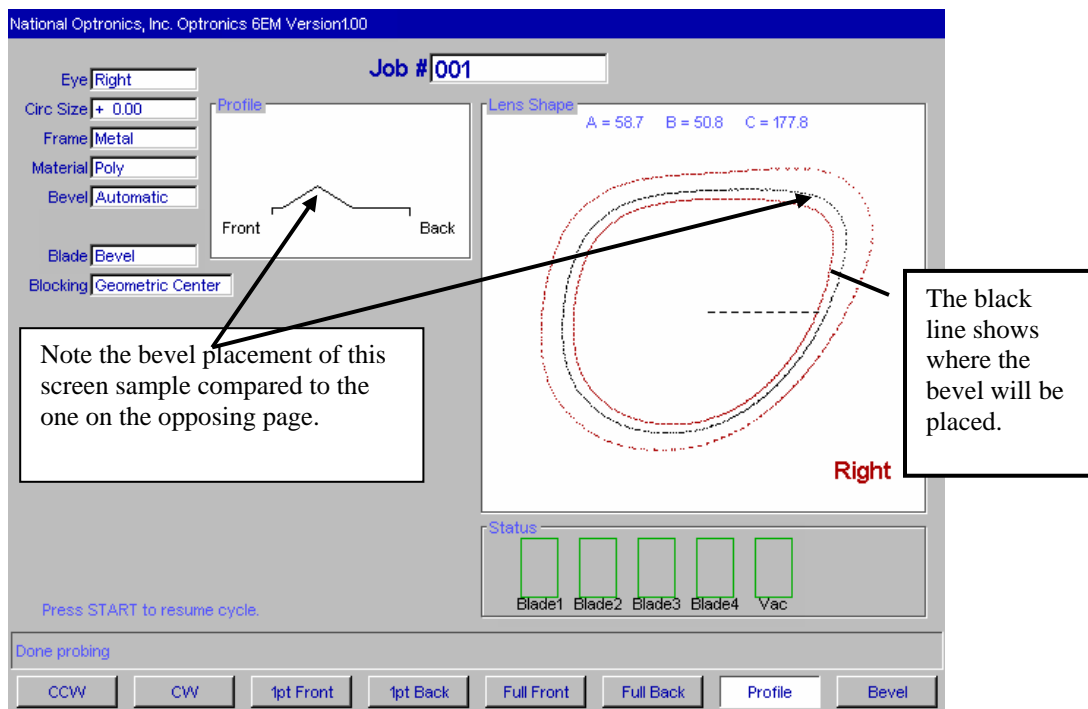
The third and fourth function keys are *1pt Front*=move the bevel in towards the front 1 point at the location where the pointer is located and *1pt Back*, which moves the bevel back one point. This will position the bevel in the manner shown in the next screen capture.

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

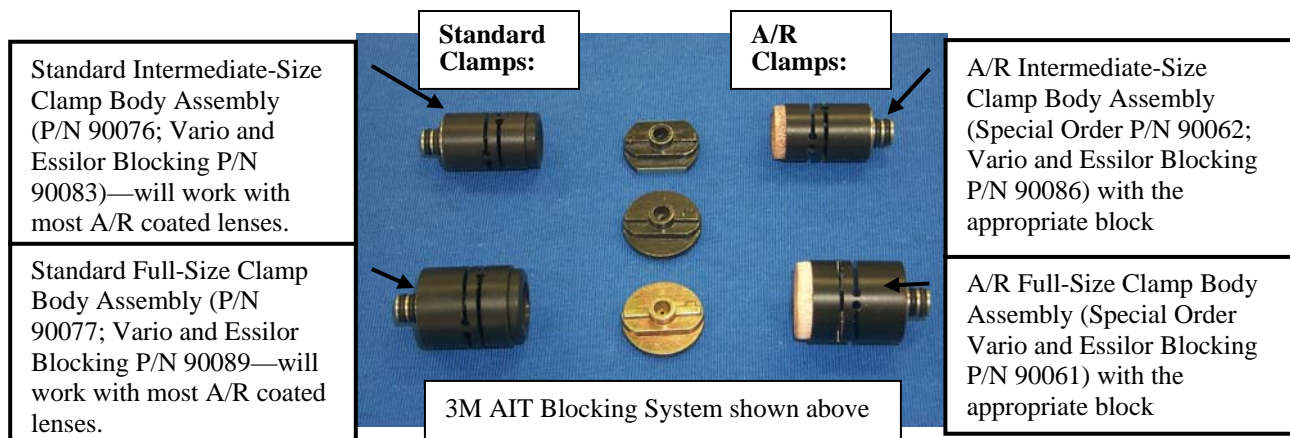
here as “Automatic”; for example, you could change it to “Front,” which would position the bevel towards the front.

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



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

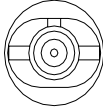
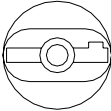
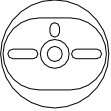
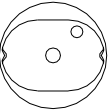
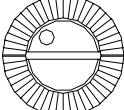
1. Ensure that your cutter blade is in good condition.
2. Select the correct A/R clamp assembly, depending on the size of the lens being edged.
  - If the shape of the lens has a 23 “B” or higher, use the full-size A/R clamp.
  - If the shape of the lens has a “B” size lower than 23, use the intermediate A/R clamp.
3. **For 3M blocking**, 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!

**For Vario blocking**, use a solid block, and match the block curve with the lens curve.
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.”
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	6	8	8	16	4	10	12



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	65	60	62



## Standard Flow of Work on the 6EM

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:** (Neither appears when a specialty lens shape is selected.) 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, or rimless.

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 <i>Frame Screen</i> (refer to the <i>Frame Screen</i> field definitions on page A-26).
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 <i>Bevel</i> field changes to <i>Probe Mtd</i> (Probe Method)—see definition on the following page.

**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-8). 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
Trivex	Fast roughing cut, moderately slow finishing cut.
Thk Poly	(Thick Poly) Same as Poly except for a slower Feed and Lens RPM.
AR	Use when edging very thin AR-coated lenses of any material using the special A/R clamps—refer to Chapter 7 for more information.
Pattern	A very fast cycle for cutting a pattern blank to match the job trace. When selected, the <i>Frame</i> field becomes “Rimless” because you wouldn’t have a bevel on a pattern.



## 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 and chuck pressure defaults are controlled with this selection.

<b>Bevel:</b>	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 6EM 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.

<b>Probe Mtd:</b>	Appears when “Rimless” is the frame type. There are two selections available: “Executive” and “Standard.” Use Executive for executive lenses.
<b>Blade:</b>	The Blade function key  allows you to change from Optical Center to Geometric Center from the <i>Job Screen</i> .
<b>Blocking:</b>	The Blocking function key  allows you to change from Optical Center to Geometric Center from the <i>Job Screen</i> .
<b>Lens Shape:</b>	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.
<b>Status Area:</b>	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 (“Primary,” “Blade 1,” “Blade 2,” “Blade 3,” and “Vac”) on the <i>Job Screen</i> represents the number of cycles since the last blade 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.

**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

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

National Optronics, Inc. Optronics 6EM Version 1.03

Job # 001

Eye: Right  
 Box Size: + 0.20  
 Frame: Plastic  
 Material: CR-39  
 Bevel: Automatic  
 Blade: Bevel  
 Blocking: Optical Center  
 DBL: 10.0  
 Vt Dec: + 0.0  
 Seg Ht: 22.5  
 Near PD: 30.0  
 Lens Type: Bifocal  
 Seg Type: Flat-Top 22  
 Seg Depth: 16.0  
 Seg Width: 22.0  
 Seg Inset: + 6.0  
 Seg Drop: - 6.0

Lens Shape: A = 58.9 B = 51.0 C = 178.4  
 In 4.4 Dn 3.0 Right

Status: Primary Blade1 Blade2 Blade3 Vac

Barcode or enter Job Number

Eye Frame Material Bevel Blade Blocking Setup

These fields are not shown unless Optical Center is selected.

These fields appear when Lens Type is Bifocal, Trifocal, or Quadrafocal.

- DBL:** Distance Between Lenses value for the frame of the current job
- Vt Dec:** Specifies the vertical decentration of the optical center of the lens, typically 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 6EM 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.

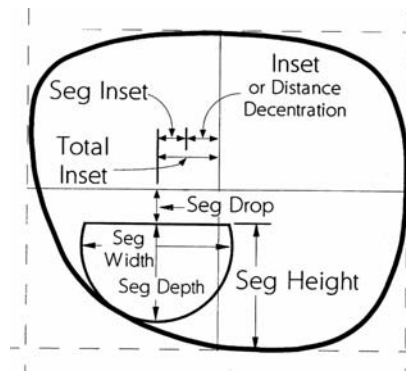


### Note

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.

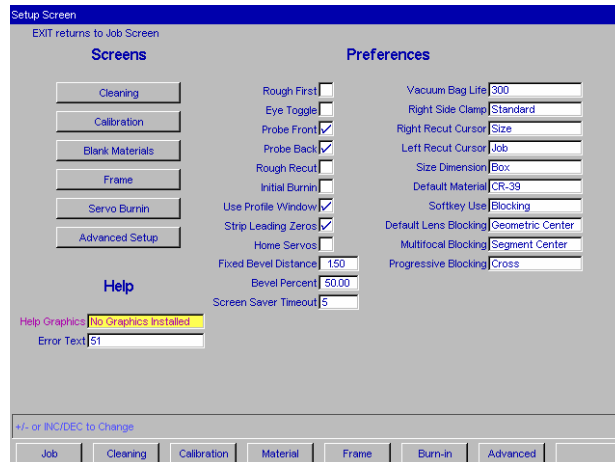
- Seg Type:** Type of segment (Flat-top, Round, Curve Top, Executive)—choosing a pre-set Seg Type will automatically fill in the rest of the fields (Seg Depth, Width, etc.).
- Seg Depth:** Segment Depth (see drawing below)
- Seg Width:** Segment Width (see drawing below)
- Seg Inset:** Segment Inset (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 6EM,” 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 or bevel location 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  key to display. Press any key to return to the *Setup Screen*.

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

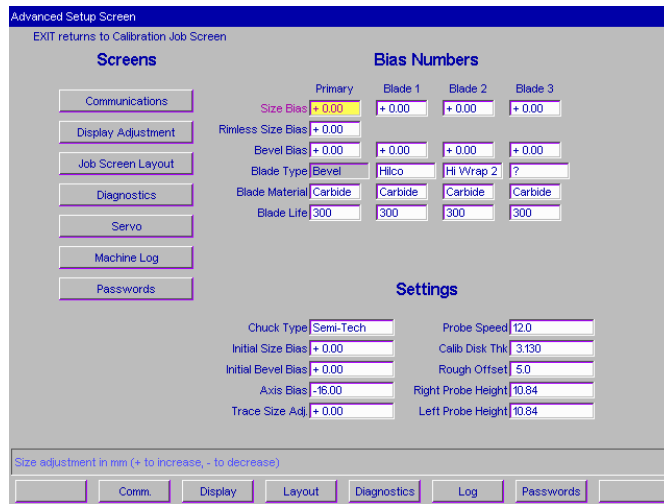
## Preferences

- 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*.
- Probe Front:** If unchecked, the 6EM 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 6EM will not probe the back 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 6EM 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, 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.
- Home Servos:** If checked, the 6EM will home the servos with each cycle. The default is unchecked, which saves time in the cycle.
- 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 apex 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.
- Vacuum Bag Life:** Specifies the number of cycles the 6EM 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.

- 
- 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  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 6EM 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 6EM’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.

### Note

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

- Blade Type:** Specifies the type of blade you are using. The standard “Bevel” blade is the only choice for Blade 1.
- Blade Material:** Specifies that you are using a carbide or coated carbide cutter blade. This affects the number of jobs required for the blade status indicator on the *Job Screen*. Both carbide and coated carbide blades are available for Blade 1. Carbide blades are available for Blades 2, 3, and 4.
- Blade Life:** Specifies the number of cycles before the 6EM will display a warning that the blade needs to be changed. Optronics recommends leaving this number at 300 for carbide cutters and 3,000 for coated cutter blades. Increasing this number from the default may lead to decreased edge quality and axis slippage.

## 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.
  5. Check Size and Bevel calibration.
- Initial Size Bias:** Sets the size of the offset for each lens for all blades; this is an initial setting—single blades may require additional offsets. 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.

<b>Initial Bevel Bias:</b>	Adjusts the ‘front-to-back’ position of the bevel on the lens for all blades; this is an initial setting—single blades may require additional adjustments. The proper setting places the center bevel (see the <i>Bevel</i> field on the <i>Job Screen</i> , 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.
<b>Axis Bias:</b>	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 deg., an increase by 0.50 would be -3.5 deg.
<b>Trace Size Adj:</b>	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.
<b>Probe Speed:</b>	Specifies how fast the lens turns during probing. Set by factory—do not change.
<b>Calib Disk Thk:</b>	Thickness of the calibration disk in millimeters. <b>Note:</b> You will have to recalibrate your probe if you change this number, and both bevel bias and safety beveling may be affected.
<b>Rough Offset:</b>	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.
<b>Right Probe Height:</b>	The height of the right probe tip above the center of the cutter.
<b>Left Probe Height:</b>	The height of the left probe tip above the center of the cutter.

## Blank Material Screen

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

Blank Material Screen							
EXIT returns to Setup Screen							
	Defaults	Roughing			Finishing		
Name	Chuck	Feed	Lens rpm	Motor rpm	Feed	Lens rpm	Motor rpm
CR-39	8	20	15	14	4	12	15
Poly	15	20	15	16	4	12	12
Hi-Idx	9	20	15	16	4	12	12
Trivex	8	20	15	16	4	12	12
Thk Poly	15	12	12	16	4	12	12
AR	6	8	8	16	4	10	12
	8	8	8	16	4	10	12
	8	8	8	16	4	10	12
	8	8	8	16	4	10	12
Pattern	15	20	15	16	15	12	12

Press CLEAR to edit name

Job CR-39 Poly Hi-Idx Trivex Thk Poly AR Pattern

### Defaults Portion of the Blank Material Screen

**Name:** The first two lines of the *Name* column, *CR-39* and *POLY*, and the last line *Pattern*, 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 forces Rough First Mode, particularly useful when dealing with thin lenses—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.

### 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.



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## Finishing Portion of the Blank Material Screen

<b>Feed:</b>	Maximum amount of material to remove per revolution of the lens. This value is expressed in millimeters.
<b>Lens RPM:</b>	The speed at which the lens rotates during the finishing portion of the cycle, measured in revolutions per minute.
<b>Motor rpm:</b>	Controls the speed of rotation of the cutter motor during the finishing cycle measured in thousands of revolutions per minute.

## Calibration Screen

Use this screen to perform size, bevel, and axis calibration (refer to Chapter 5, “Calibrating the 6EM” for step-by-step instructions).

### The Calibration Section

- Single:** Starts the procedure for individually calibrating the Primary and Blades 1—3. Refer to the “Calibrating the Size and Bevel for Single Blades” section of Chapter 5 for step-by-step instructions.
- 58 mm Circle:** A round, 58 mm diameter shape will be cut, so that the *Initial Size Offset* and All Blade *Bevel Offset* 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.
- Probe:** Activates the procedure for calibrating the probe. The 6EM edger will automatically measure the 58 mm calibration pattern to determine the relative locations of the probe tip, and the bevel and size 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 6EM 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 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 6EM for size differences between cutting surfaces. To increase the size, increase this number (units in mm).
- Rimless Size Offset:** Adjusts the 6EM for size differences for rimless 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.
- Initial Size Offset:** Adjusts the Initial Size Bias for all blades. Numbers entered here will increase (positive offset) or decrease (negative offset) the Initial Size Bias established on the *Advanced Setup Screen*.
- Initial Bevel Offset:** Adjusts the Initial Bevel Bias for all blades. Numbers entered here will increase (positive offset) or decrease (negative offset) the Initial Bevel Bias established on the *Advanced Setup Screen*.
- 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.

### Note

If adjusting all blades the same, such as after changing the cutter body, use the “Initial” function. Otherwise, adjust each blade individually. Refer to the “Calibrating the Initial Axis, Size and Bevel Placement” section and the “Calibrating the Size and Bevel for Single Blades” section of Chapter 5 for detailed explanation of when to use each and instructions on how to perform each type of calibration.

## 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:

The screenshot shows the 'Communications Screen' interface. At the top, it says 'EXIT returns to Advanced Setup Screen'. The screen is divided into two main sections: 'Comm Settings' and 'Software'. Under 'Comm Settings', there are four input fields: 'Com 1 Connection' (set to 'Host'), 'Com 1 Baud Rate' (set to '9600'), 'Max TRCFMT' (set to '4'), and 'OMA Init Level' (set to 'Auto'). Below these is a 'Com 2 Connection' field set to 'None'. The 'Software' section contains six buttons: 'Load Software', 'Backup System', 'Save Setup Nums', 'Restore Setup From Floppy', 'Restore Log From Floppy', and 'Start Modem Communications'. At the bottom of the screen, there is a navigation bar with buttons for 'Job', 'Diagnostics', 'COM1', 'COM2', 'Load SW', 'Backup Sys', and two empty buttons.

**Com 1 Connection:** The choices for Com 1 vary depending on what you have selected in the Com 2 Connection field. If you have “Host,” “4T,” or “3B,” selected for the Com 2 Connection field, your choice for Com1 is “Barcode” or “None.” If you have “None” selected for the Com 2 Connection field, your choices include “4T,” “3B” and “Host,” as well as “Barcode” and “None.” You can only have one Barcode selection.

**Baud Rate:** (This field only appears when the Com 1 Connection has a Barcode, Host, 3B or 4T configured.) This field shows the baud rate for the Com 1 Connection. The default is 9600. Normally, the 6EM 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.

**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 6EM communicates with another device. “None” is a slower method of communication but may be necessary depending on the host.
- Com 2 Connection:** The choices for Com 2 vary depending on what you have selected in the Com 1 Connection field. If you have “Host,” “4T,” or “3B,” selected for the Com 1 Connection field, your choice for Com 2 is “Barcode” or “None.” If you have “None” selected for the Com 1 Connection field, your choices include “4T,” “3B” and “Host,” as well as “Barcode” and “None.” You can only have one Barcode selection.
- Baud Rate:** This field only appears when the Com 2 Connection has a Barcode, Host, 3B or 4T configured. This field shows the baud rate for the Com 2 device. Normally, the 6EM software will supply the correct baud rate automatically.
- 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 6EM communicates with another device. “None” is a slower method of communication but may be necessary depending on the host.

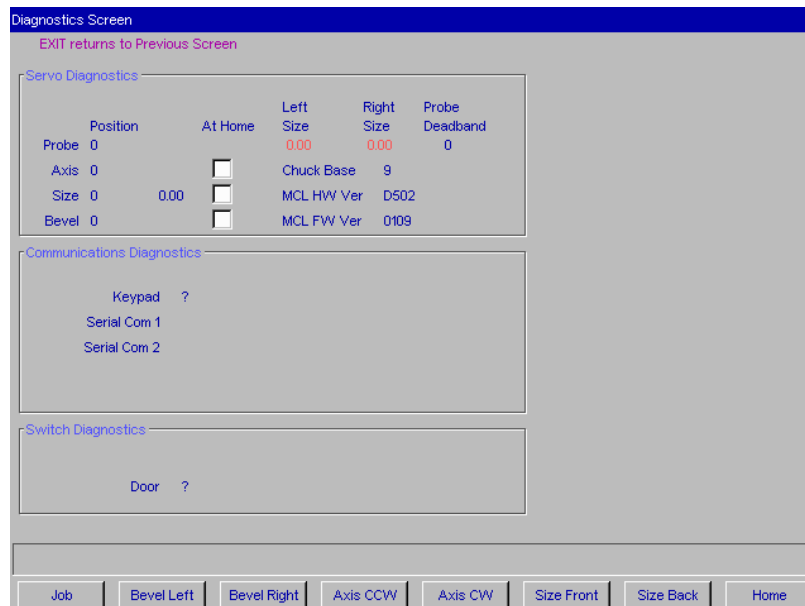
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**Buttons:**

<b>Load Software</b>	Allows you to load software code using a floppy disk.
<b>Backup System</b>	Backs up your complete system—recommended before loading software.
<b>Save Setup Nums</b>	Saves all calibration, log, and setup numbers (all data saved across power cycles) to disk for future retrieval with the <i>Restore Setup from Floppy</i> feature.
<b>Restore Setup from Floppy</b>	Restores from floppy the calibration and setup numbers saved to floppy with the <i>Save Setup Nums</i> feature.
<b>Restore Log from Floppy</b>	Restores Log saved to from floppy with the <i>Save Setup Nums</i> feature.
<b>Start Modem Communications</b>	(Visible only if the optional modem program is installed) Activates the modem transfer program.

## 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 first number is the “Position” representing 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. The second number shows the size in mm. of the diameter of the lens being cut if the size carriage remained in this position (used for diagnosing small “B” size problems only).

<b>Bevel:</b>	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.
<b>Chuck Base:</b>	For Optronics use only
<b>MCL HW Ver:</b>	Motion Control Library hardware version.
<b>MCL FW Ver:</b>	Motion Control Library firmware version.

### Communications Diagnostics Section of the Screen

<b>Keypad:</b>	Allows you to test the keypad to determine if each key is working. This field indicates the last key (or button) pressed.
<b>Serial Com 1:</b>	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.)
<b>Serial Com 2:</b>	Same as above for Loopback 1 but uses COM2.

### Switch Diagnostics Section of the Screen

<b>Door:</b>	Tells you if either the Plexiglas door or the lid is open or ajar.
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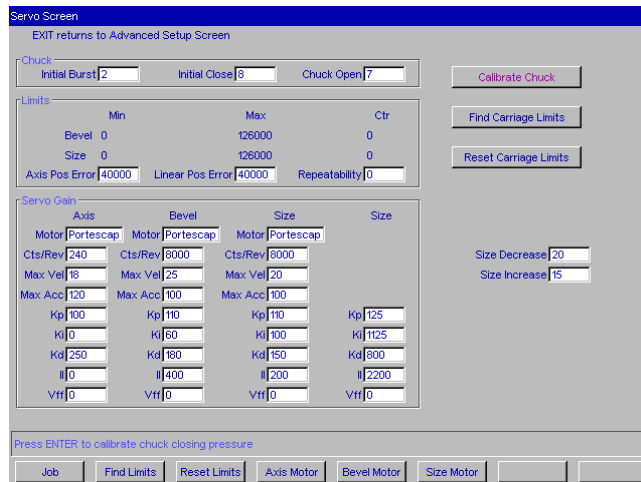
### Buttons Along the Bottom of the Diagnostics Screen:

<b>Job:</b>	Takes you to the <i>Job Screen</i> .
<b>Bevel Left:</b>	Moves the bevel one inch to the left. The encoder should decrease by 64,000.
<b>Bevel Right:</b>	Moves the bevel one inch to the right. The encoder should increase by 64,000.
<b>Axis CCW:</b>	Moves the axis counter-clockwise approximately 90° from the keypad-side view. The encoder should decrease by approximately 60,000.
<b>Axis CW:</b>	Moves the axis clockwise approximately 90°. The encoder should increase by approximately 60,000.
<b>Size Front:</b>	Moves the size one inch to the front. The encoder should decrease by 64,000.
<b>Size Back:</b>	Moves the size to the back. The encoder should increase by 64,000.
<b>Home:</b>	Homes the axes.



## 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

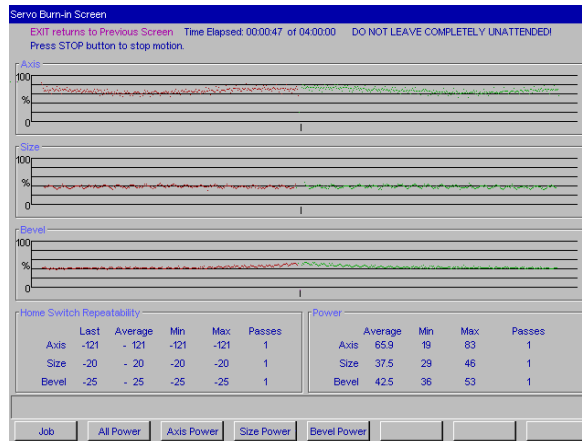
<b>Calibrate Chuck:</b>	For National Optronics Use Only.
<b>Find Carriage Limits:</b>	Moves carriages to find their limits.
<b>Reset Carriage Limits:</b>	Sets the carriages' range of motion to zero (used primarily by National Optronics). This will force the machine to find limits on the next boot-up.

### Buttons Along the Bottom

<b>Job:</b>	Takes you to the <i>Job Screen</i> .
<b>Find Limits:</b>	Moves carriages to find their limits.
<b>Reset Limits:</b>	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.
<b>Axis Motor:</b>	Moves the cursor to the top of the Axis column.
<b>Bevel Motor:</b>	Moves the cursor to the top of the Bevel column.
<b>Size Motor:</b>	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.

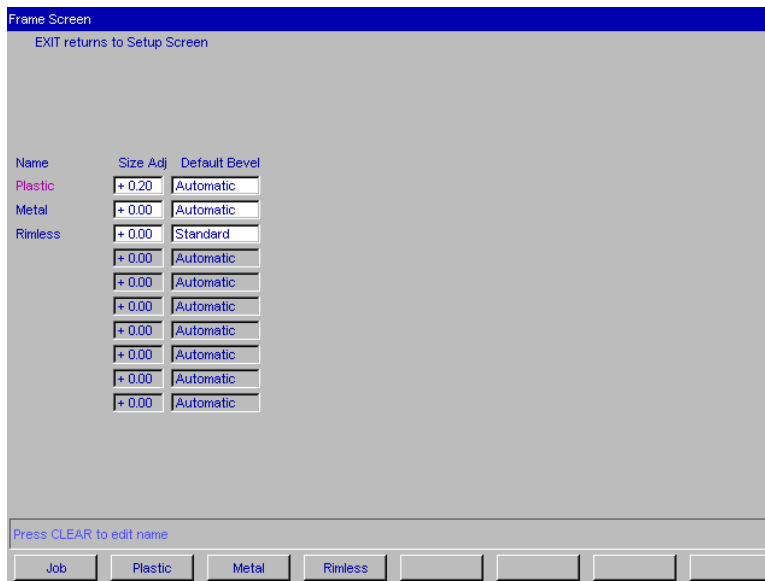
**Power:** Shows the average, minimum and maximum power for each carriage.

## Buttons Along the Bottom





- Job:** Takes you to the *Job Screen*.
- All Power:** Runs all three motors, one at a time
- Bevel Power:** Runs the bevel motor only.
- Axis Power:** Runs the axis motor only.
- Size Power:** 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 *Rimless* 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  or , then using the  or  keys to change the selection.

### Buttons Along the Bottom

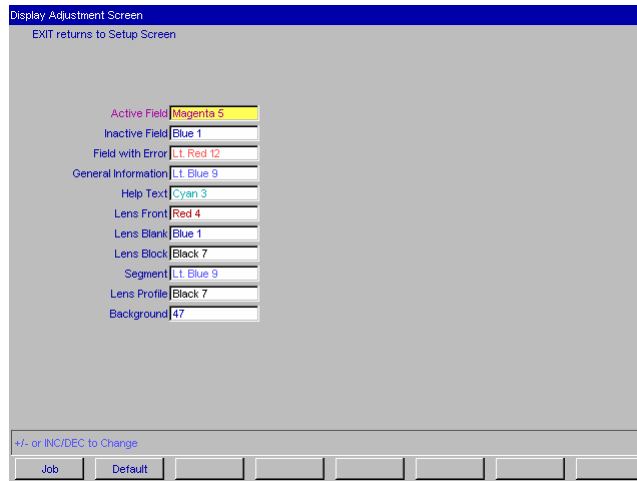
- Job:** Takes you to the *Job Screen*.
- Plastic:** Moves the cursor to the *Plastic* field.
- Metal:** Moves the cursor to the *Metal* field.
- Rimless:** Moves the cursor to the *Rimless* field.

#### Note

To start the process of adding a name, move the cursor to a blank spot and press the Clear button . 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 6EM 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 Text:** 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.

### Buttons Along the Bottom

- 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.

The screenshot shows the 'Job Screen Layout Screen' interface. At the top, it reads 'National Optronics, Inc. Optronics 6EM Version 1.03'. Below this, there is a blue bar with the text 'EXIT returns to Previous Screen'. The main area contains several input fields: 'Eye', 'Box Size', 'Frame', 'Material', 'Bevel', 'Blade', 'Blocking', 'DBL', 'Vt Dec', 'OC Ht', 'Dist PD', 'Lens Type', 'Seg Type', 'Seg Depth', 'Seg Width', 'Seg Inset', and 'Seg Drop'. A 'Re-Cut Job #' field is also present. To the right, there is a large 'Lens Shape' area. Below the 'Blocking' field, there is a section for 'Opt. Gen Info' with a list of parameters: Diameter, Base Curve, Cross Curve, Center Thk, Cylinder Axis, Prism, Prism Axis, Prism Dir, Probe, and Front Curve. At the bottom right, there is a 'Status' area with five green boxes labeled 'Primary', 'Blade1', 'Blade2', 'Blade3', and 'Vac'. To the right of these boxes are the labels 'Cutter Fault' and 'Vacuum Fault'. At the bottom of the screen, there is a bar with the text 'Barcode or enter Job Number' and a row of buttons: 'Job', 'Edit', 'Read-Only', 'Hidden', 'Cut Fault', and 'Vac Fault'.

### 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.**

**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  to turn it off; press the Vac Fault function key  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 screenshot shows the 'Machine Log Screen' interface. At the top, it says 'EXIT returns to Advanced Setup Screen'. Below this, there are two main sections: 'Cycle Statistics' and 'Maintenance Statistics'.

**Cycle Statistics:** A table with columns: Material, Abort Count, Recut Count, Full Count, Avg. Time, and % of Total. The data is as follows:

Material	Abort Count	Recut Count	Full Count	Avg. Time	% of Total
CR-39	0	0	0	00:00	0.0
Poly	0	0	0	00:00	0.0
Hi-Idx	0	0	0	00:00	0.0
Other	0	0	0	00:00	0.0
Total	0	0	0	00:00	0.0

**Maintenance Statistics:** A section with columns: #Cycles, Primary, Blade 1, Blade 2, Blade 3, Vacuum Bags, and Motor. All values are 0. Below each column is a 'Reset' button. There is also a 'Save Log to Floppy(CSV)' button.

At the bottom, there is a prompt 'Press ENTER to Reset Cycle Statistics' and a row of function buttons: Job, Reset Cycle, Reset Primary, Reset Blade1, Reset Blade2, Reset Blade3, Reset Vac, and Reset Motor.

### 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 6EM; 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 *Primary*, *Blade 1*, *Blade 2*, or *Blade 3* after every cutter change—refer to the “Changing the Cutter Blades” section of Chapter 3, “Commonly Performed Tasks” for detailed instructions on changing the cutter blade.



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**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.

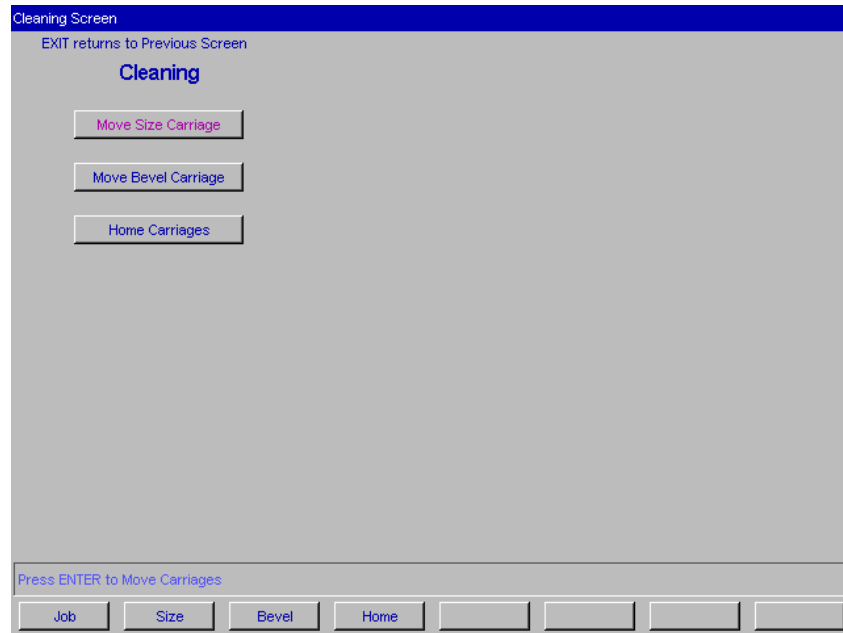
**Motor:** Shows the number of times the motor started since last reset. You will need to reset these cycles after every cutter motor change—refer to the “Cutter Motor Replacement” section of Chapter 6, “Performing Periodic Maintenance” for detailed instructions on changing the motor.

**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 of the 6EM—refer to Section 2, “Daily Cleaning and Other Daily Maintenance of the 6EM,” in Chapter 2.



- 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.

### Note

For step-by-step instructions for the cleaning functions mentioned above, refer to Section 2, “Daily Cleaning and Other Daily Maintenance of the 6EM,” in Chapter 2 of this manual.

## 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 6EM requires a password to change any value on that screen.

**Unprotect:** To “Unprotect” a screen means that the 6EM 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 6EM will display a “Password has been changed” message box.

## Explanation of Numbered Messages, Warnings and Errors

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.

### [51-99 Messages]

#### 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 6EM executable loaded.  
REMOVE FLOPPY DISKETTE!!

### Message 56

is your code

Please call National Optronics with this code.

A service technician will give you an unlock password so that the modem capabilities can be accessed.

## [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 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 122**

Check that floppy is not write protected.

---

## [200-299 Physical Machine Limitations]

### 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 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 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 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.



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**Warning 219**

Bevel placement may be affected by BEVEL carriage maximum limit.

**[300-399 Operator Error]****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 424**

Serial Receive Timeout

Check that serial cables are connected from 4T  
to 6EM 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 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 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 617**

Memory error 2!

**Error 618**

Memory error 3!

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**Error 619**

Memory error 4!

**Error 620**

Memory error 5!

**Error 623**

Toolpath alignment error!

**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 635**

Got a Position Error

**Error 636**

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

**[700-799 Operator Error]****Error 703**

Must recall job to go back to traced center

**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 726**

Calibration disk must be chucked to start calibration.

**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 732**

Unable to restore statistics log from floppy

Please remove diskette from floppy drive.

**Error 733**

Hit maximum software limit on BEVEL carriage

**Error 734**

Hit minimum software limit on BEVEL carriage

**Error 735**

Hit maximum software limit on SIZE carriage

**Error 736**

Hit minimum software limit on SIZE carriage

**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

## Statement of Warranty

National Optronics, Inc., warrants the 6EM 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, Inc. 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, Inc., to the customer is limited to the exclusive remedies set forth. National Optronics, Inc., 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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