

# **3B BLOCKER**

## **User Manual**



## *Warnings, Cautions, and Notes as Used in This Publication*

### **Warning**

**Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, 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.

# **C** **1**

This product has been tested to the requirements of CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements.



## 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.
- Plug power supply 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 is ON—do not attempt any maintenance until you have verified it is OFF.
- Never turn the machine on while someone is performing maintenance or repair.
- Make sure your hair and clothing are kept clear of the machine while it is in operation.
- This product is not intended to be used in an explosive environment.

**THINK SAFETY FIRST—ALWAYS PRACTICE SAFE WORK HABITS.**



# *Preface*

---

## Content of This Manual

- Chapter 1. Introduction and Interface Overview:** Introduction to the functionality of the 3B and its standard interface.
- Chapter 2. 3B Setup:** Information about setting up the 3B including initial setup and communication setup.
- Chapter 3. Standard Use of the 3B:** Details the standard operation of the 3B during typical work and explains how to block each type of lens.
- Chapter 4. Calibration and Diagnostics:** Details how to calibrate the 3B.
- Chapter 5. Maintenance:** Details how to update software and how to change the lamp assembly.





# Table of Contents

---

## Chapter 1

### Chapter 2 Introduction and Interface Overview ..... 1-1

General Specifications .....	1-1
General Requirements.....	1-1
User Interface Overview .....	1-2
Key Pad.....	1-2
NUMERIC KEYS.....	1-2
ENTER.....	1-2
EXIT.....	1-3
CLEAR.....	1-3
HELP.....	1-3
MODE.....	1-3
MOVE.....	1-3
THE ARROW KEYS AND SUN BUTTON.....	1-3
PLUS/MINUS KEY (+/-) .....	1-4
FUNCTION KEYS .....	1-4
Display .....	1-4

### Chapter 3 3B Setup ..... 2-1

Setting Up the 3B.....	2-1
Removing the 3B Shipping Bracket.....	2-1
Connecting the 3B to an Electric Outlet .....	2-1
Initial Hardware Configuration Steps for a 3B .....	2-2
Com 1 – Host or 4T Connector .....	2-2
Com 2 – Edger Connector.....	2-2
Com 3 – Barcode Scanner Connector .....	2-2
For Operation with a 4T.....	2-2
Cabling.....	2-2
4T Configuration.....	2-3
3B Configuration.....	2-3
For Operation with a 4T and a 6E or 7E .....	2-4
Cabling.....	2-4
4T Configuration.....	2-4
Edger Configuration.....	2-4
3B Configuration.....	2-5
For Operation with a Host Computer.....	2-6
Cabling.....	2-6
Host Configuration.....	2-6
3B Configuration.....	2-6
Connecting the 3B to the Alternative Footswitch Connector .....	2-7
Adjusting the Brightness of the Screen Display .....	2-7
Standard Software Setup of the 3B.....	2-8
Setup Screen (Blocking Options).....	2-9

# Table of Contents

---

	User Preferences.....	2-10
	Fiducial Adjustment.....	2-12
	Advanced Setup.....	2-13
	Communication Software Setup.....	2-14
	Setting Up Password Protection.....	2-16
	Changing Password.....	2-16
	What Happens If I Forget My Password.....	2-16
	Software Screen.....	2-17
	Job Storage Options.....	2-18
<b>Chapter 4</b>	<b>Standard Use of the 3B.....</b>	<b>3-1</b>
	Introduction.....	3-1
	Geometric Center – Calc.....	3-2
	Geometric Center.....	3-3
	Optical Center – Calc.....	3-4
	Optical Center.....	3-5
	Changing Blocking Functions.....	3-6
	Entering a Job Number and Blocking a Lens.....	3-7
	Blocking for Single Vision, Progressive, and Segmented Lenses.....	3-11
	For Single Vision Lenses.....	3-11
	For Progressive Lenses (using fitting cross).....	3-12
	For Progressive Lenses (using engraved reference marks).....	3-13
	For Segmented Lenses.....	3-14
	For Executive Segmented Lenses.....	3-15
	For Round or Curve Top Segmented Lenses.....	3-16
	Editing Decentration.....	3-17
<b>Chapter 5</b>	<b>Calibration and Diagnostics.....</b>	<b>4-1</b>
	Calibration.....	4-1
	Axis Calibration.....	4-2
	Diagnostics.....	4-3
<b>Chapter 6</b>	<b>Maintenance.....</b>	<b>5-1</b>
	Updating Program Code.....	5-1
	Replacing the Program Code Chip.....	5-1
	Replacing the Lamp Assembly.....	5-3

# Chapter 1

## *Introduction and Interface Overview*

---

---

The 3B Finish Blocker provides precision blocking, reducing errors during the blocking steps by using a projected image to display the front face of the lens. This virtually eliminates positioning errors caused by parallax and unintended refraction.

### General Specifications

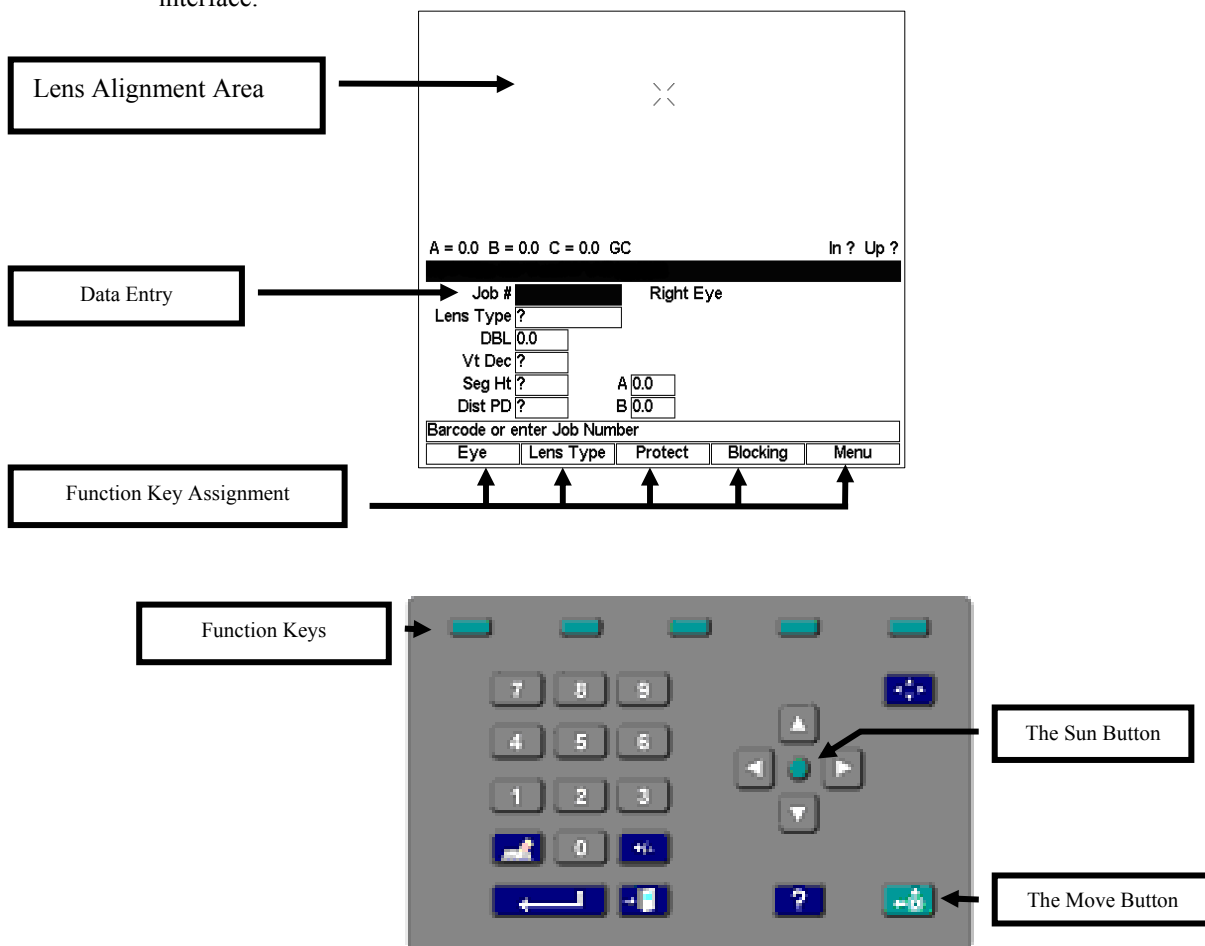
- Weight – 19 lbs.
  - Power Supply – Input: 100—200 VAC 50/60 Hz, 4 Amps.
  - Input ratings on the 3B are 24 volts and 3 amps.
  - Size– Approximately 19 inches (48 centimeters) deep/8.5 inches (22 centimeters) wide/18 inches (46 centimeters) high
  - Job Storage - 200 jobs. Stored in flash memory, no batteries to replace.
  - Communications
    - OMA
  - Serial port parameters - 8 data bits, No parity, 1 stop bit, selectable baud rate: 9600-57,600
  - Bar Code Scanner - optional
- UL Conforms to UL Std 61010-1
- CE Conforms to EN 61010-1

### General Requirements

- The 3B has a rated ambient operating temperature range of range of 50° F (10° C) to 95° F (35° C).
- The 3B must be powered by a Class 1 power supply having safety recognition and output ratings of 24 volts and 3 amps, and the AC power cord must be rated at 230 VAC and 4 amps.
- The 3B must not be dropped or handled roughly.
- A 3" minimum clearance should be maintained above the machine in order to allow for proper machine cooling and ventilation.

# User Interface Overview

This section explains the basic functions you will use during your interaction with the 3B user interface.



## Key Pad

Refer to the drawing above when reading the descriptions of the keypad buttons that follow.

### NUMERIC KEYS

The numeric keys 0-9 are used to enter numeric values.

#### ENTER

Use the ENTER key to complete entries or to perform an action like entering a screen.



## EXIT

The EXIT button will exit the presently displayed screen and will cause the program to return to the previously displayed screen.



## CLEAR

The CLEAR button is used to delete incorrectly entered data.



## HELP

The HELP button performs limited functionality in this version of the 3B program, but it is intended to provide help text when you press the button.



## MODE

The MODE button allows you to switch between arrow and regular mode when using the geometric center blocking.



## MOVE

Press the MOVE button to move the carriage, usually done prior to blocking a lens—refer to Chapter 2, “Standard Operations.”



## THE ARROW KEYS AND SUN BUTTON

In Standard Mode:

The up (▲), and down (▼) arrow keys move the cursor from field to field when applicable.

The left (◀) and right (▶) keys allow you decrement and increment values in a field.

In Arrow Mode:

The arrow keys move the graphics around in the top portion of the screen.

The Sun button:

The Sun button (the round button in the middle) allows you to override the default 3B action if you are connected to a 3B or Host Computer and want to view a job stored in the 3B—refer to Chapter 2, “Standard Operations.”

## PLUS/MINUS (+/-) KEY

The Plus/Minus Key allows you to toggle in checkbox or textbox fields or change the sign of the number in numeric fields.

## FUNCTION KEYS

The small greenish colored keys along the top of the keypad are called the function keys. These keys are responsible for providing the flexibility and simplicity of the 3B user interface. The function keys change function dependent upon the screen being displayed. The function or action the key will perform will be shown on the display above the function key. The function keys will be referenced from leftmost key to rightmost key as F1 through F5.

The specifics of what each function key does on a given screen will be described fully throughout the rest of this manual.

## Display

Use the top portion of the 3B Display to align the lens. The image of the lens is magnified, not actual size, to allow more precise placement. Use the bottom portion for entering data, giving commands, and other types of interface with the 3B.

Information will be displayed as normal (black on a white background) or highlighted (white text on a black background). For example, on the *Job Screen*, you might see “DBL **17.2** highlighted, and all other displayed text normal.

A highlighted item indicates that the cursor is resting in that field or that a user response is required or the status of a selection that can be changed by the user.

Normally displayed text is either simply informational text or an action that a function key will perform.

# Chapter 2

## 3B Setup

---

---

This chapter covers setting up and preparing the 3B Blocker for operation.

### *Setting Up the 3B*

After removing the 3B from the shipping box, do the following:

1. Remove the shipping bracket.
2. Connect the power supply to an electrical outlet and to the 3B.
3. Configure the 3B for Communication interface.
4. Configure the 3B for various software preferences and options.

### Removing the 3B Shipping Bracket

To protect the 3B from damage, there is a shipping apparatus that holds the carriage in place. Remove this shipping bracket and the thumbscrew before operating the unit. Retain these shipping pieces in case the unit needs to be shipped sometime in the future.

### Connecting the 3B to an Electric Outlet

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

Connect the 3B to power following these steps:

1. Before connecting power, make sure that the 3B ON/OFF switch is “OFF.”
2. Plug the round connector from the external power supply unit into the back of the 3B. Then plug the 115V/230VAC male plug into the wall outlet, making sure that the connections are secure.

## Initial Hardware Configuration Steps for the 3B

### Com 1 – Host or 4T Connector

This is the bottom 9-pin male (pins) D connector located along the rear left hand side of the 3B. This should be connected to the source for job data: either a host or a 4T Tracer.

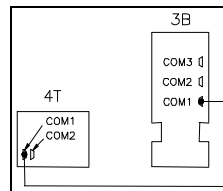
### Com 2 – Edger Connector

This is the middle 9-pin female (sockets) D connector located along the rear left hand side of the 3B. This should be connected to an edger in a stand-alone configuration (no Host computer)

### Com 3 – Barcode Scanner Connector

The Barcode Scanner cable should be connected to the top 9-pin male (pins) D connector located along the rear left hand side of the 3B. This is an optional device used to enter job numbers.

## For Operation with a 4T



### Cabling

1. Connect a straight serial cable from the COM1 Host port of the 4T to COM1 (the bottom port) of the 3B.
2. If using a barcode reader, plug it into COM3 (the top port) of the 3B.



## 4T Configuration

1. Turn the power off on the 4T.
2. Turn the 4T power back on and press the 4 key immediately after turning the switch. You will see a screen that says, “Set max OMA mode to 4?” Press the Yes key.
3. Once the 4T has powered up, press the Menu key, then press 3 for Setup, followed by 2 for Communications.
4. On the *Communication Screen*, configure the Serial To field to “Device,” the Protocol field to “OMA,” and the COM1 kBaud field to “19.2.”
5. Press the ENTER key and then press the Save key to save the changes.

## 3B Configuration

1. Press the Menu key (F5), then Setup (F4).
2. On the *Setup Screen*, set the Default Lens Blocking value to Geometric Center – Calc.
3. Press the User Prefs key (F2).
4. On the User Preferences screen, make sure the Save Job Data check box contains a checkmark.
5. Press the EXIT key to return to the menu; then press the Adv. Setup key (F3).
6. From the *Advanced Setup Screen*, press the Comm key (F2) to configure communications options.
7. Make sure the following options are set under COM1:  
Device: 4T  
Baud: 19200  
Max TRCFMT: 4  
Init Level: None
8. To configure a barcode reader, make sure the following options are set under COM3:  
Device: Barcode  
Baud: 9600  
Do not change the Null modem checkbox unless a null cable is used.
9. Press the Job key (F1) to return to the *Job Screen* and save your changes.

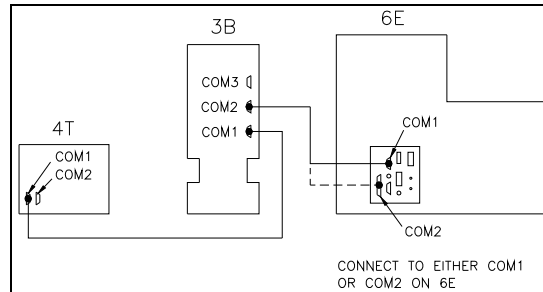
### Note

#### Minimum Software Versions Needed:

3B: 1.11

4T: 1.28

## For Operation with a 4T and a 6E or 7E



### Cabling

1. Connect a straight serial cable from the COM1 Host port of the 4T to COM1 (the bottom port) of the 3B.
2. Connect a second straight serial cable from COM2 (the middle port) of the 3B to either COM1 (9-pins) or COM2 (25 pins) on the 6E or 7E.
3. If using a barcode reader, plug it into COM3 (the top port) of the 3B.

### 4T Configuration

1. Turn the power off on the 4T.
2. Turn the 4T power back on and press the 4 key immediately after turning the switch. You will see a screen that says, “Set max OMA mode to 4?” Press the Yes key.
3. Once the 4T has powered up, press the Menu key, then press 3 for Setup, followed by 2 for Communications.
4. On the *Communication Screen*, configure the Serial To field to “Device,” the Protocol field to “OMA,” and the COM1 kBaud field to “19.2.”
5. Press the ENTER key and then the Save key to save the changes.

### Edger Configuration

1. Navigate to the *Communication Screen* of a 6E or the *Setup Screen* on a 7E and configure COM1 or COM2 (depending on your cable) to:

Device: 3B

Protocol: OMA

Baud: 19200

Max TRCFMT: 4

OMA Init Level: Auto

2. Press the Job key (F1) to return to the *Job Screen* and save your changes.

## 3B Configuration

1. Press the Menu key (F5), then Setup (F4).
2. On the Setup Screen, set the Default Lens Blocking value to “Geometric Center – Calc.”
3. Press the User Prefs key (F2).
4. On the *User Preferences Screen*, make sure the Save Job Data check box contains a checkmark.
5. Press the EXIT key to return to the menu, then press the Adv. Setup key (F3).
6. From the *Advanced Setup Screen*, press the Comm key (F2) to configure communications options.
7. Make sure the following options are set under COM1:  
Device: 4T  
Baud: 19200  
Max TRCFMT: 4  
Init Level: None
8. Make sure the following options are set under COM2:  
Device: 6E or 7E  
Baud: 19200  
Max TRCFMT: 4  
To configure a barcode reader, make sure the following options are set under COM3:  
Device: Barcode  
Baud: 9600
9. Do not change the Null modem checkbox for any of the ports.
10. Press the Job key (F1) to return to the Job screen and save your changes.

### Note

#### Minimum Software Versions Needed:

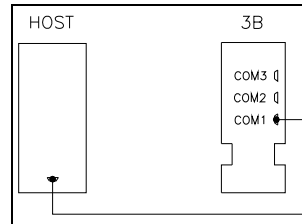
3B: 1.11

4T: 1.28

6E: 2.14 / 3.08

7E: Any software version

## For Operation with a Host Computer



First, remove the shipping bracket.

### Cabling

1. Connect a straight serial cable from the serial port of the computer to COM1 (the bottom port) of the 3B.
2. If using a barcode reader, plug it into COM3 (the top port) of the 3B.

### Host Configuration

1. Contact your host vendor if necessary to configure the host to communicate with an OMA Finish Blocker on the correct port at 9600 baud.
2. The baud rate may be increased, but make sure it matches the rate set on the 3B communication screen.

### 3B Configuration

1. Press the Menu key (F5), then Setup (F4).
2. On the *Setup Screen*, set the Default Lens Blocking value to Geometric Center.
3. Press the User Prefs key (F2).
4. On the *User Preferences Screen*, make sure the Save Job Data check box does not contain a checkmark.
5. Press the EXIT key to return to the menu, then press the Adv. Setup key (F3).
6. From the *Advanced Setup Screen*, press the Comm key (F2) to configure communications options.

- 
7. Make sure the following options are set under COM1:
    - Device: Host
    - Baud: 9600
    - Max TRCFMT: 4
    - Init Level: Auto
  8. Do not change the Null modem checkbox unless a null cable is used.
  9. To configure a barcode reader, make sure the following options are set under COM3:
    - Device: Barcode
    - Baud: 9600
  10. Press the Job key (F1) to return to the *Job Screen* and save your changes.

## Connecting the 3B to the Alternative Footswitch Connector

Press the pneumatic hose from the footswitch onto the connector located along the rear right of the 3B. The footswitch can be used as an alternate to the Move button on the 3B keypad.

## Adjusting the Brightness of the Screen Display

The Dimming switch is located on the back of the 3B.

## Standard Software Setup of the 3B

From the *Job Screen* (a blank one shown below), press the *Menu* function key (F5) key to go to the *Menu Screen* as shown on the following page.

A = 0.0 B = 0.0 C = 0.0 GC In ? Up ?

---

Job #  Right Eye

Lens Type

DBL

Dist PD

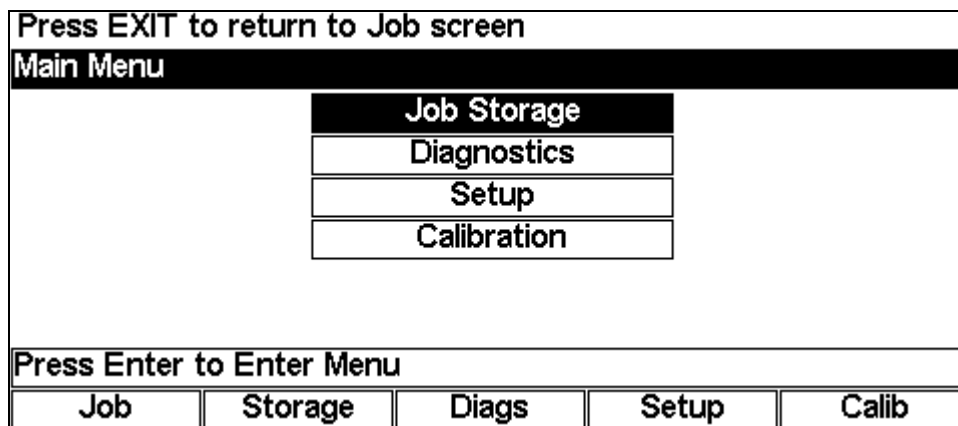
Seg Ht  A

Vt Dec  B

Barcode or enter Job Number

Eye	Lens Type	Protect	Blocking	Menu
-----	-----------	---------	----------	------

From the *Menu Screen*, press F4 on the 3B keypad to access the Setup functions.

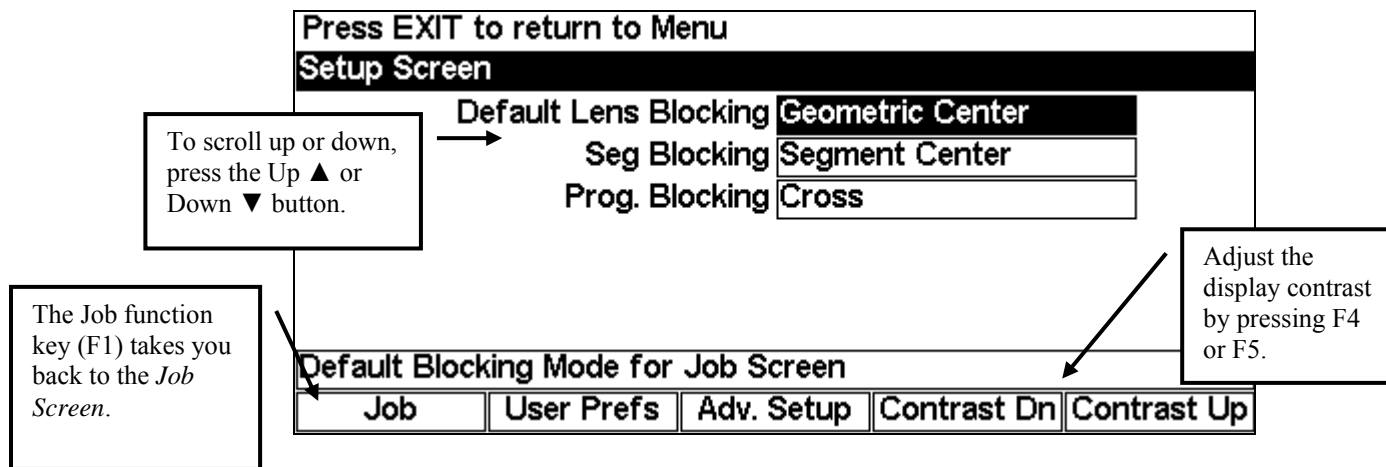


**Note**

As an alternative to pressing F4 on the 3B keypad, you can use the Down button ▼ to move the cursor down to the third option and press the ENTER key.

### Setup Screen (Blocking Options)

Use this screen to set the blocking defaults, to adjust the screen contrast, and to access the User Preferences or Advanced Setup options.

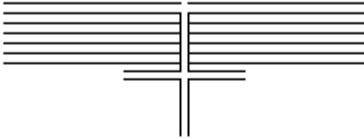


- To change the default **Lens Blocking** option (used on the *Job Screen*), press the Increment (▶) or Decrement (◀) button on the 3B keypad. Your choices are Geometric Center—Calc, Geometric Center, Optical Center—Calc, or Optical Center. (Refer to Chapter 3 for more information.)
- To change the default **Segment Blocking** option, press the Increment (▶) or Decrement (◀) button on the 3B keypad. Your choices are Segment Center (place the segment center directly on the block) or 5mm in and 5mm down (place the segment 5mm in and 5mm down from the block). This default only affects lenses blocked on the Optical Center.

- To change the default **Progressive Blocking** option, press the Increment (▶) or Decrement (◀) button on the 3B keypad. Your choices are Cross (place the fitting cross directly on the block) or 5mm up (place the fitting cross 5mm up from the block). The default only affects lenses blocked on the Optical Center. 5mm up is generally the preferred setting as it allows for better cutout of shapes.

## User Preferences

Use this screen to set various lab-specific defaults. To access the *User Preferences Screen*, press the *User Preferences* function key (F2) from the *Setup Screen*. The *User Preferences Screen* is displayed below:



Press EXIT to return to Setup screen

User Preferences	
Right Eye Toggle	<input checked="" type="checkbox"/>
Left Eye Refresh	<input type="checkbox"/>
Use Sound	<input checked="" type="checkbox"/>
Strip Leading Zeros	<input checked="" type="checkbox"/>
Save Job Data	<input checked="" type="checkbox"/>
Show Half-eye Msg	<input type="checkbox"/>
Lamp Timeout	5
Horizontal Line Separation	2
Vertical Line Separation	2
Axis Line Separation	5
Half-eye Radius	12.5

If checked, eye will automatically change after blocking right eye

Job				

To change most of the default settings shown above, scroll to the field using the up (▲) or down (▼) buttons, then press the Increment (▶) or Decrement (◀) button on the 3B keypad. You can also press the +/- key to check or uncheck a field.



---

The options on this screen are as follows:

- Right Eye Toggle:** Check this option to switch automatically to the left eye after a blocking operation on the right eye.
- Left Eye Refresh:** Check this option to automatically clear the Job Data after a blocking operation on the left eye.
- Use Sound:** Check this option to activate the sound feature; for example, if checked, the 3B will make a distinctive sound during blocking.
- Strip Leading Zeros:** Check this option to eliminate the leading zeros of numbers stored in the 3B or called from a Host Computer, for example, 005 would be stored as 5.
- Save Job Data:** Check this option to save jobs automatically in the 3B. If you are using a Host Computer, you probably would not need to save the jobs in the 3B because they will be saved by the Host.
- Show Half-eye Msg:** If checked, shows a message before blocking a lens that a half-eye block is required.
- Lamp Timeout:** You can change the number of minutes of wait time before the lamp shuts off by placing your cursor in the field and pressing the Increment (▶) or Decrement (◀) button on the 3B keypad or by typing the number while your cursor is in the field.
- Horizontal, Vertical, or Axis Line Separation:** These three parameters are used to adjust the amount of space between fiducial lines on the job screens—refer to the section below for more details.
- Half-eye Radius:** This is the largest shape radius that will trigger the Half-eye block icon or message—refer to Page 3-17 for further information.

## Fiducial Adjustment

You can adjust the amount of space between the crosshair lines on the job screens. This is an individual preference. For each type of separation (Horizontal, Vertical, or Axis), follow these steps:

1. Move the cursor to the type of separation you want to adjust (see screen capture below).
2. Use the left arrow (◀) or right arrow (▶) to increment and decrement the amount of distance between the lines. The screen will show you the changes as you change the settings. (You can also type in a number into the field.)

### Note

You can press the Move key to light the top of the screen if needed.

The diagram illustrates three types of line separations: Horizontal Line Separation (space between horizontal lines), Vertical Line Separation (space between vertical lines), and Axis Line Separation (space between the horizontal and vertical lines themselves).

**Press EXIT to return to Setup screen**

User Preferences	
Right Eye Toggle	<input checked="" type="checkbox"/>
Left Eye Refresh	<input type="checkbox"/>
Use Sound	<input checked="" type="checkbox"/>
Strip Leading Zeros	<input checked="" type="checkbox"/>
Save Job Data	<input checked="" type="checkbox"/>
Show Half-eye Msg	<input type="checkbox"/>
Lamp Timeout	5
Horizontal Line Separation	2
Vertical Line Separation	2
Axis Line Separation	5
Half-eye Radius	12.5

**If checked, eye will automatically change after blocking right eye**

Job				

### Note

Fiducials are any of the register marks, alignment marks, cross hairs, that appear on the 3B screen.

## Advanced Setup

The Motor Speed field on this screen is intended for use only by highly qualified persons, but you can access the setup of Communication, Password protection, and Software from here. To view the *Advanced Setup Screen*, press the *Adv. Setup* function key (F3) from the *Setup Screen*. The *Advanced Setup Screen* is displayed below:

<b>Press EXIT to return to Setup screen</b>				
<b>Advanced Setup Screen</b>				
Motor Speed <b>95</b>				
<b>Percentage of max speed for motor</b>				
<b>Job</b>	<b>Comm</b>	<b>Password</b>	<b>Software</b>	

### Note

The Motor Speed field may not be displayed on your screen. If it is, as mentioned previously, it is intended for service use only.

- To access the *Communication Screen*, press the *Comm* function key (F2) from the *Advanced Setup Screen*.
- To access the *Password Screen*, press the *Password* function key (F3) from the *Advanced Setup Screen*.
- To access the *Software Screen*, press the *Software* function key (F4) from the *Advanced Setup Screen*.

## Communication Software Setup

These settings should not require alteration after the initial communication interface completed or the previous pages. Communication setup is password protected by default and should be done by a highly qualified person. Usually, setup occurs only when first installing the machine.

Use the *Communication Screen* to change the communication ports, baud rate, etc. After pressing the *Comm* function key (F2) from the *Advanced Setup Screen*, the following screen will appear:

Press EXIT to return to Adv. Setup screen				
<b>Communication Screen</b>				
	COM1	COM2	COM3	
Device	Host	6E	Barcode	
Null modem	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Baud	9600	9600	9600	
Max TRCFMT	4	4		
Init Level	Auto			
What is this port connected to?				
Job	COM1	COM2	COM3	

The COM ports are hard-wired for communication with specific devices. Scroll to each field using the up (▲) or down (▼) buttons, or press the *COM1*, *COM2*, or *COM3* function key to place the cursor in the field you want to change. Then press the Increment (▶) or Decrement (◀) button on the 3B keypad to change the selections within each field. The table below details the devices and options for each COM port:

	<b>COM1</b>	<b>COM2</b>	<b>COM3</b>
<b>Device:</b>	Choices: 3B, Host (Computer), or None	6E, 7E, Other, or None	Bar Code, Diagnostics, or None
<b>Null Modem:</b>	The default is set when a Device is selected. Change the default if the cable you are using has the functionality of a null modem; otherwise, use the default setting.		
<b>Baud:</b>	Choices: 9600, 19200, 28800, 38400, and 57600	Choices: 9600, 19200, 28800, 38400, and 57600	Choices: 9600, 19200, 28800, 38400, and 57600
<b>Max TRCFMT:</b>	The highest OMA trace format when communicating with a 3B or a Host Computer: Choices 1 to 4 1= Datum is Basic ASCII 4= Datum is Most Compact Binary	The highest OMA trace format when communicating with an Edger: Choices 1 to 4 1= Datum is Basic ASCII 4= Datum is Most Compact Binary	None applicable
<b>Init Level:</b>	(Initialization Level—the communication information available upon initializing communication to another device) The default setting is “Auto,” which allows the 3B, Host, or 4T to specify which data items will be downloaded. The other options are “Preset,” which reduces the amount of data sent for each job, or “None,” which uses a default set of information each time the 3B communicates with another device. “None” is a slower method of communication but may be necessary depending on the host.		

## Setting Up 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. Changing any of the values on the *Password Screen* requires a password, and from this screen you can determine which other screens require passwords. The following sample screen shows the *Password Screen* with the default settings:

<b>Press EXIT to return to Adv. Setup screen</b>				
<b>Password Screen</b>				
	<b>Setup</b>	<input type="checkbox"/>		
	<b>Calibration</b>	<input checked="" type="checkbox"/>		
	<b>User Prefs</b>	<input type="checkbox"/>		
	<b>Communications</b>	<input checked="" type="checkbox"/>		
<b>If checked, screen is password protected</b>				
<b>Job</b>	<b>Change</b>	<b>Forgot</b>		

You can change the default settings by following these steps:

1. Go to the *Password Screen* (F3) from the *Advanced Setup Screen*.
2. Using the up (▲) or down (▼) buttons, scroll to the name of the screen you want to password protect or unlock. Then press the Increment (▶) or Decrement (◀) button on the 3B keypad. You can also press the +/- key to check or uncheck a field.
3. Enter the password if prompted.
4. Press the *Job* key (F1) to go to the *Job Screen* and save the changes.

## Changing Password

To change your password, press the *Change* function key (F2) 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* function key (F3) then call your contact for 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. Enter the special one-time use password that you received from Technical Service.
- 5. Follow the prompts that appear. You will be required to enter a new password and confirm it.

### Software Screen

This selection allows you to activate the downloading of software upgrades. This functionality requires that your 3B is interfaced to a computer or a 6E or 7E. Simply press Enter and follow the on-screen directions. Software code may also be updated by replacing the EPROM chip located inside the unit.

<b>Press EXIT to return to Adv. Setup screen</b>				
<b>Software Screen</b>				
<b>Download Code</b>				
<b>Press Enter to Download Code</b>				
<b>Job</b>				

## Job Storage Options

On the *User Preferences Screen* (refer to page 2-10), you can set whether or not you wish to “Save Job Data.” If you are using a Host Computer, you probably would not need to save the jobs in the 3B because they will be saved by the Host. If you are saving the jobs in the 3B, the following screen allows you to set your options for saving jobs:

Press EXIT to return to Menu				
<b>Job Storage Screen</b>				
Job #	<input type="text"/>	Delete This Job		
# Unprotected Jobs	0	Delete Unprot Jobs		
# Stored Jobs	0	Delete All Jobs		
Prompt before Deleting Jobs	<input checked="" type="checkbox"/>			
Always Protect	<input type="checkbox"/>			
Job Display Order	Numerical			
Barcode or enter Job Number				
Job	View			

Scroll to each field using the up (▲) and down (▼) buttons or right (▶) and left (◀) buttons on the 3B keypad. The table below details the fields and their functionality:

- Job #:** Allows you to enter a job number for the purpose of viewing the job data by pressing (F2) (the View function key) or deleting the job by moving the cursor to the *Delete This Job* field and pressing ENTER.
- # Unprotected Jobs:** Shows the number of jobs that are “Unprotected.” If the job is protected, an error message will be displayed when someone tries to overwrite it or delete it by using the *Delete This Job* field.
- # Stored Jobs:** Displays the number of jobs stored in the 3B. The maximum is 200 jobs. If you try to store another job after reaching 200, depending on how many jobs are unprotected, the 3B may overwrite the oldest unprotected job or prompt you to delete or unprotect a job.
- Delete This Job:** Deletes the job whose number is displaying in the *Job #* field. There is **no undelete feature**. Once the jobs are deleted, they are gone from the system permanently.
- Delete Unprot Job:** Deletes unprotected jobs. There is **no undelete feature**. Once the jobs are deleted, they are gone from the system permanently.
- Delete All Jobs:** Deletes all jobs, protected and unprotected. Remember, there is **no undelete feature**. Once the jobs are deleted, they are gone from the system permanently.
- Prompt before Deleting Jobs:** If checked, the 3B will prompt you before deleting a job when using one of the delete options.
- Always Protect:** If checked, all jobs saved from this point forward will be protected jobs.
- Job Display Order:** The order in which jobs will be displayed (numerical or chronological).



# Chapter 3

## *Standard Use of the 3B*

---

---

### Introduction

The 3B supports both geometric center (the block is placed on the geometric center of the lens shape) and optical center blocking (the block is placed on the layout reference point of the lens). In addition, the 3B can rely on a host computer to calculate decentration or it can do the calculations internally based on information entered by the user or downloaded from a host. The combination of these two elements results in four choices for the Default Lens Blocking field on the 3B *Setup Screen*: Geometric Center – Calc, Geometric Center, Optical Center – Calc, and Optical Center. The “- Calc” indicates that the decentration calculations are done by the 3B. On the *Job Screen*, the Blocking softkey will cycle through these four choices. It must be noted that there may be different fields required when switching between blocking methods.

In general, the default lens blocking choice is driven by the lab itself and the equipment used to edge the lens after it is blocked. If lens information is entered at a computer that calculates a job ticket, the 3B should generally rely on the information provided by the host computer (Geometric Center). If the 3B is getting shape information directly from a tracer, no blocking information is available and so it will have to be entered at the 3B in order to calculate decentration (Geometric Center – Calc or Optical Center – Calc).

## Geometric Center – Calc

The figure below shows the *Job Screen* for geometrically centering the block on the shape using the decentration calculated by the 3B. This option should be used when interfaced to a 4T tracer or other host that provides shape data, but not blocking information.

Notice that the layout reference point (in this case, the center lensometer dot) will be placed or decentered 2.5 millimeters in towards the nasal side of the lens (in this example) from the block. The relationship between the block and the shape will never change regardless of the decentration. Changes in decentration only affect the relationship between the block and the layout reference point.

A = 58.9 B = 51.0 C = 178.4 GC In 2.5 Up 0.0

Int. Job # 001		Right Eye Job Unprotected	
Lens Type Single Vision		Instructions	
DBL	7.2		
Dist PD	30.5		
OC Ht	0.0	A	58.9
Vt Dec	0.0	B	51.0

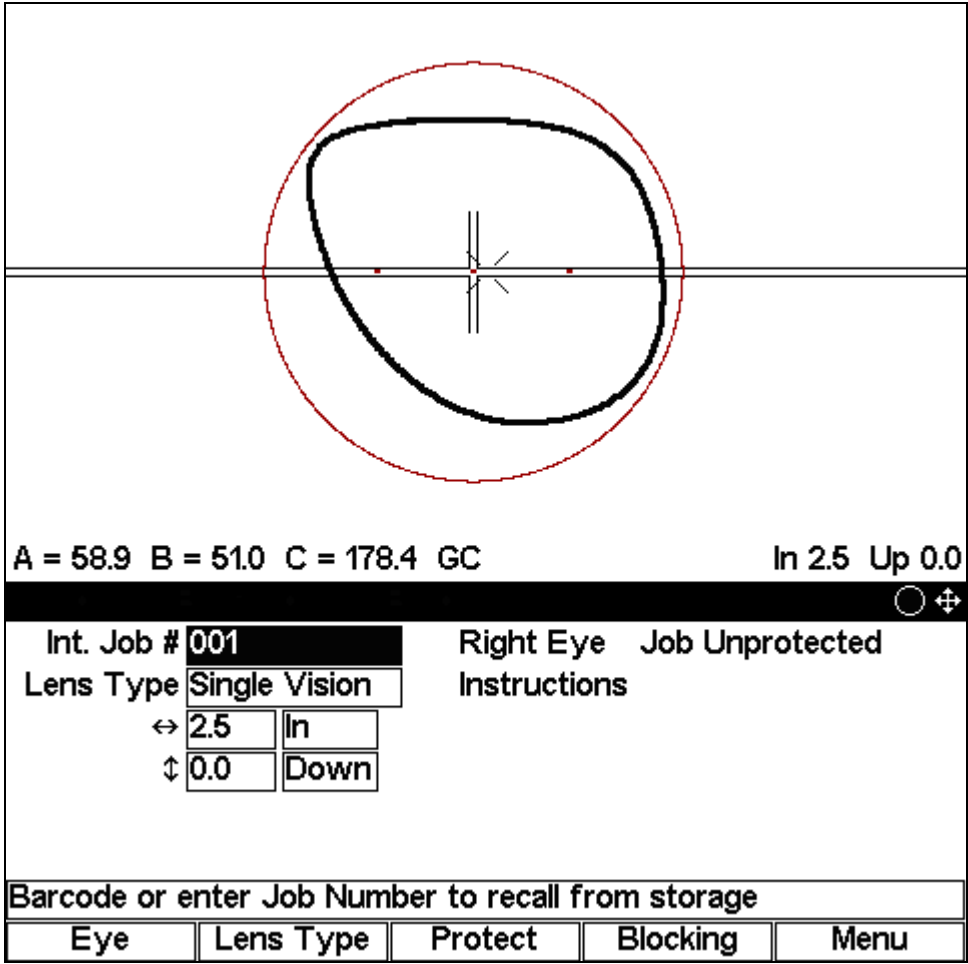
Frame DBL in mm

Eye	Lens Type	Protect	Blocking	Menu
-----	-----------	---------	----------	------

# Geometric Center

The figure below shows the *Job Screen* for geometrically centering the block on the shape using the decentration provided by a host. This option should be used when interfaced to a host computer that provides shape data and decentration information. This option may also be used if the operator prefers to calculate the decentration manually and enter it directly on the screen instead of entering the data fields required for the 3B to calculate decentration. It can also be used to slightly adjust the blocking location calculated by the “Geometric Center – Calc” for lens cutout.

Notice that the layout reference point (in this case, the center lensometer dot) will be placed or decentered 2.5 millimeters in towards the nasal side of the lens (in this example) from the block. The relationship between the block and the shape will never change regardless of the decentration. Changes in decentration only affect the relationship between the block and the layout reference point.

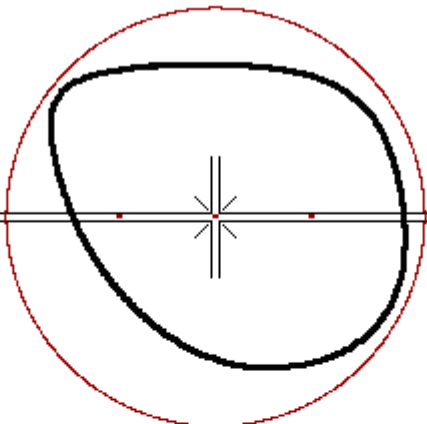


This blocking option also allows the use of Arrow Mode, that is, using the arrow keys to graphically change decentration. Press the MODE button to toggle between Arrow Mode and standard mode. The Arrow Mode icon will appear at the far right end of the title bar. The user can then use the arrow keys to change the decentration. Press the MODE button again to leave Arrow Mode and resume normal use of the arrow keys.

## Optical Center – Calc

The figure below shows the *Job Screen* for optically centering the block on the shape using the decentration calculated by the 3B. Optical center blocking is generally used when it is desirable for the edger to do the decentration. The Optical Center – Calc mode allows the operator to view the lens shape for cut out.

Notice that the layout reference point (in this case, the center lensometer dot) will be placed directly over the block. The relationship between the block and the layout reference point will never change regardless of the decentration. Changes in decentration only affect the relationship between the block and the shape. Alternatively, for progressive lenses, the fitting cross may be placed 5 millimeters above the block. For segmented lenses, the segment may be placed 5 millimeters down and 5 millimeters in from the block. These alternatives are specified in the Seg. Blocking and Prog. Blocking fields on the *Setup Screen*.



A = 58.9 B = 51.0 C = 178.4 OC In 0.0 Up 0.0

Int. Job #	001	Right Eye	Job Unprotected
Lens Type	Single Vision	Instructions	
DBL	7.2		
Dist PD	30.5		
OC Ht	0.0	A	58.9
Vt Dec	0.0	B	51.0

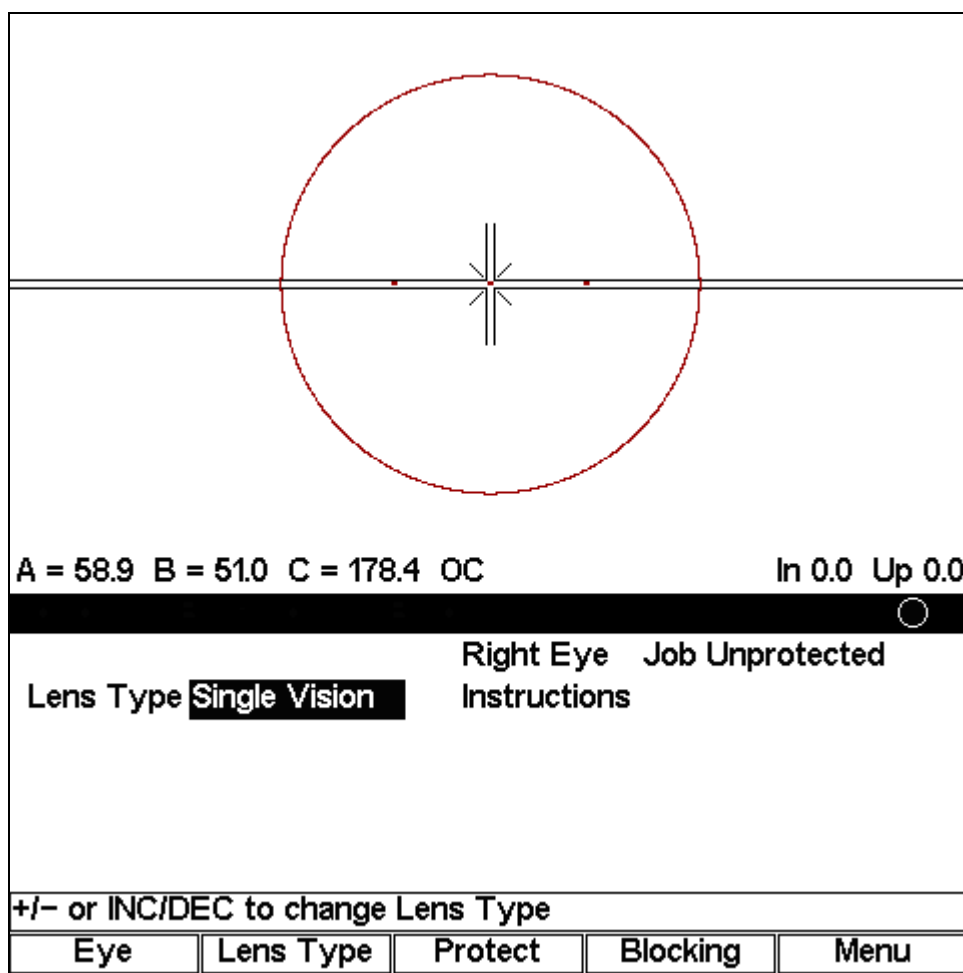
Barcode or enter Job Number to recall from storage

Eye	Lens Type	Protect	Blocking	Menu
-----	-----------	---------	----------	------

# Optical Center

The figure below shows the *Job Screen* for optically centering the block with the least amount of information. This option is a good choice for simply placing the block on the layout reference point of a lens. No shape data or blocking information is required or used for this option.

Notice that the layout reference point (in this case, the center lensometer dot) will be placed directly over the block. Alternatively, for progressive lenses, the fitting cross may be placed 5 millimeters above the block. For segmented lenses, the segment may be placed 5 millimeters down and 5 millimeters in from the block. These alternatives are specified in the Seg. Blocking and Prog. Blocking fields on the *Setup Screen*.



# Changing Blocking Functions

The default blocking style is a set-up item (refer to Chapter 2 for set-up changes), but you also can change both the blocking and the calculation mode from the *Job Screen*.

To change the blocking type, press F4 (the Blocking function key).

The screenshot displays the 'Job Screen' interface. At the top, a diagram shows a lens with a red dashed circle representing the blocking area. A callout box points to this circle with the text: 'Blocking Type: Geometric Center – Calc, Geometric Center, Optical Center – Calc, and Optical Center. Press F4 (the Blocking function key) to change blocking options.' Below the diagram, the screen shows 'A = 58.9 B = 51.0 C = 178.4 GC' with 'GC' circled. To the right, it says 'In 2.5 Up 0.0'. The main menu area includes 'Int. Job # 001', 'Lens Type Single Vision', 'Right Eye Job Unprotected', and 'Instructions'. Below this, there are input fields for '2.5 In' and '0.0 Down'. A callout box points to the 'F4' key with the text: 'F4 (the Blocking function key)'. At the bottom, there is a prompt 'Barcode or enter Job Number to recall from storage' and a row of buttons: 'Eye', 'Lens Type', 'Protect', 'Blocking' (circled), and 'Menu'. A 'Note' is centered below the buttons.

This is the preferred *Job Screen* (mode) for interfacing with a Host computer.

## Entering a Job Number and Blocking a Lens

The following screens are shown for the Geometric Center – Calc. Your screens may differ based on the configuration.

When you turn on the power switch on the 3B, it will power up and start with the right eye. The following screen will appear:

The screenshot shows a display interface with a large 'X' in the center. At the bottom, there is a status bar with 'A = 0.0 B = 0.0 C = 0.0 GC' on the left and 'In ? Up ?' on the right. Below this is a menu with a small circle icon. The main area contains a form for 'Right Eye' with fields for Job #, Lens Type, DBL (0.0), Dist PD, Seg Ht, and Vt Dec. To the right of these fields are 'A 0.0' and 'B 0.0' fields. Below the form is a 'Barcode or enter Job Number' field and a row of five buttons: Eye, Lens Type, Protect, Blocking, and Menu.

1. Enter a job number and press ENTER. If the 3B is connected to a 4T or Host Computer, the 3B will request the job data from the attached device. If the 3B is not connected to a 4T or Host, the 3B will display the internal stored job data. The 3B can store up to 200 jobs—jobs received from a 4T or from a host computer.

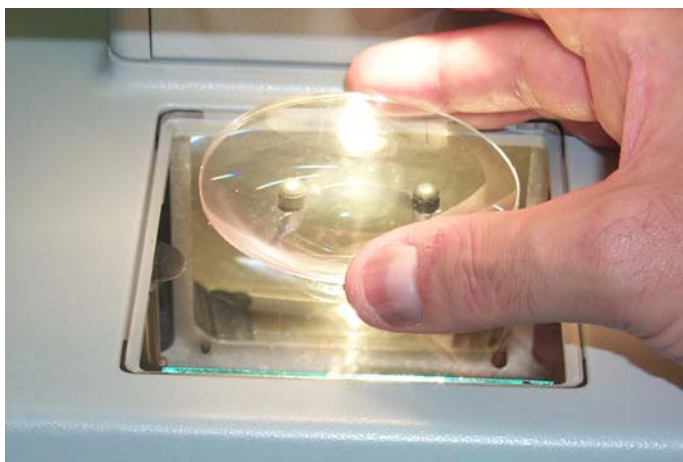
### Note

If you are connected to a 4T or Host Computer and also configured to store jobs internally (refer to the “User Preferences” section of Chapter 3), you can call an internal job and view it on the 3B Display by pressing the Sun button (the small round button in the middle of the arrow buttons) prior to entering the job number.

2. If the job data is coming directly from a 4T, you will probably need to fill in data not supplied by a tracer, such as the Vertical Decentration and the Distance PD for a single vision lens, additional fields for a bifocal lens.
3. Load the block onto the Block Holder, as shown below:

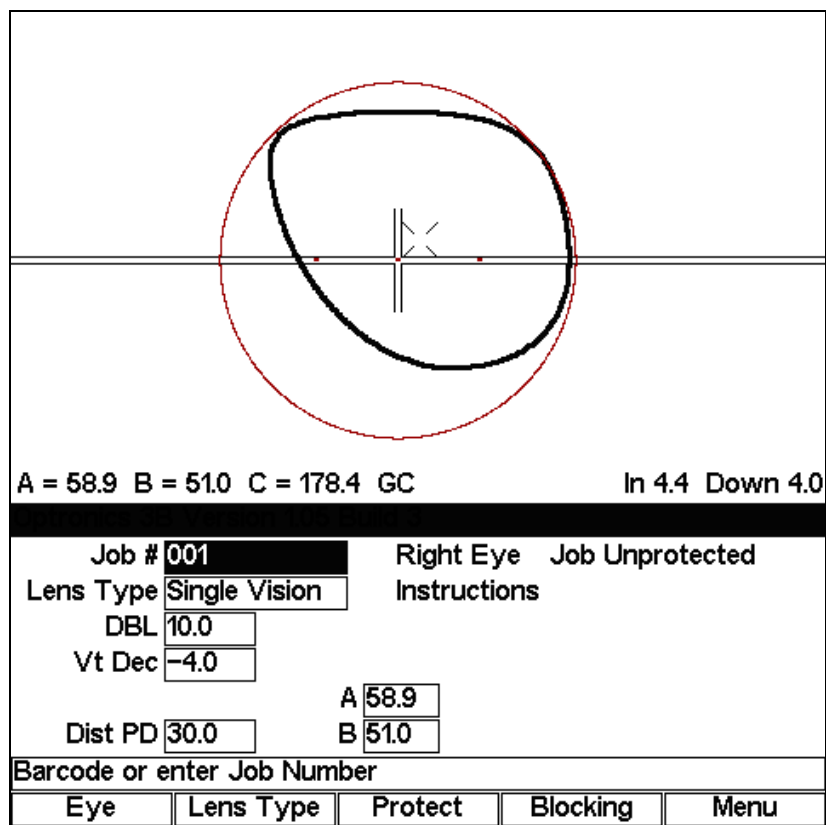


4. Press the Move button on the 3B keypad (or press the Foot Switch on 3Bs that are equipped with Foot Switches). This moves the Block Holder over to the side.
5. Place the lens on top of the Lens Holder.





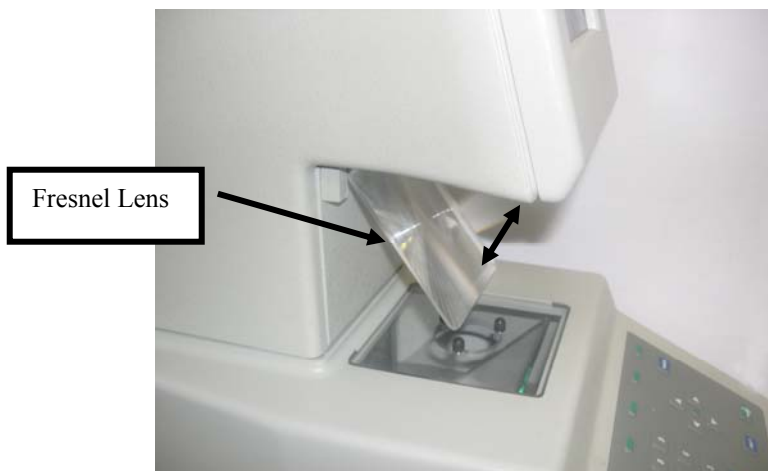
- 6. Line up the features on the lens (lensometer dots on single vision lenses, fitting cross on progressives, or segment on bifocal, trifocal, or quadrafocal lenses) with the fiducial marks (also called registration marks or alignment image—see Note below) on the 3B screen.



**Note**

Fiducials are any of the register marks, alignment marks, or cross hairs that appear on the 3B screen.

Also, note that you can swing the Fresnel lens into position for better viewing of high minus lenses, especially -10 and above.



7. After ensuring that the lens features on the lens line up with the fiducial marks on the screen, hold the lens and press the Move button on the 3B keypad (or press the Foot Switch). The recommended way of holding the lens while pressing the Move button is to use your thumb and middle finger to hold the lens. You may also want to press down on the center of the lens with your index finger.
8. Remove the blocked lens from the 3B block holder.
9. If you have the Auto-eye Toggle feature activated, the 3B will automatically switch to the left eye for the same job. If not, press the F1 key on the 3B keypad to switch to the left eye.
10. Repeat the process for the left eye lens. When finished, enter a new job number if you want to continue blocking lenses.

### Note

You have the option of saving or not saving the job using the *Save Job Data* checkbox on the *User Preferences Screen*. The 3B saves up to 200 jobs.

# Blocking for Single Vision, Progressive, and Segmented Lenses

## Note

The image of the lens is magnified, not actual size, to allow more precise placement.

The following pictures show the layout reference points for each type of lens:

### For Single Vision Lenses

Center the middle lensometer dot between the two horizontal lines and the two vertical lines as shown here.

Center the three lensometer dots between the two horizontal lines shown here.

A = 58.9 B = 51.0 C = 178.4 GC In 2.5 Up 0.0

Int. Job #	001	Right Eye	Job Unprotected
Lens Type	Single Vision	Instructions	
↔	2.5 In		
↕	0.0 Up		

Barcode or enter Job Number to recall from storage

Eye	Lens Type	Protect	Blocking	Menu
-----	-----------	---------	----------	------

For Progressive Lenses (using fitting cross)

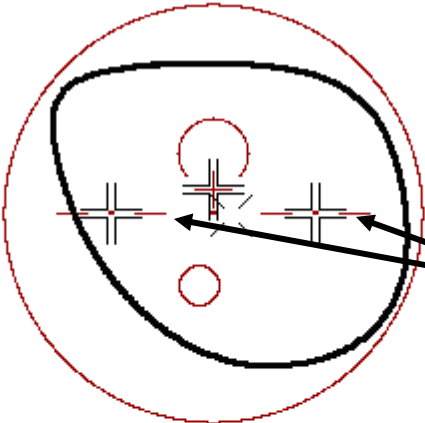
A = 58.9 B = 51.0 C = 178.4 GC In 4.4 Up 4.5

Job # <input type="text" value="001"/>	Right Eye Job Unprotected
Lens Type <b>Progressive</b>	Instructions
DBL <input type="text" value="10.0"/>	
Seg Ht <input type="text" value="30.0"/>	A <input type="text" value="58.9"/>
Dist PD <input type="text" value="30.0"/>	B <input type="text" value="51.0"/>

+/- or INC/DEC to change Lens Type

Eye	Lens Type	Protect	Blocking	Menu
-----	-----------	---------	----------	------

For Progressive Lenses (using engraved reference marks)



Line up the engraved reference marks within the lines of the fiducial crosses on the screen.

A = 58.9 B = 51.0 C = 178.4 GC In 3.0 Up 4.5

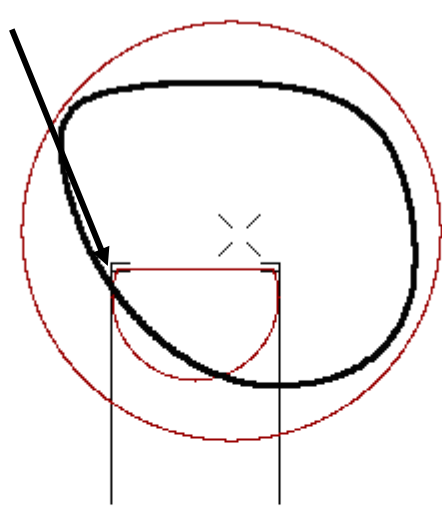
Int. Job #	001	Right Eye	Job Unprotected
Lens Type	Progressive	Instructions	
↔	3.0	In	
↕	4.5	Up	

Barcode or enter Job Number to recall from storage

Eye	Lens Type	Protect	Blocking	Menu
-----	-----------	---------	----------	------

### For Segmented Lenses

Line up the lens so that the sides of the segment are within the vertical fiducial lines on the screen, and the top corners of the segment are between the two horizontal fiducial lines on the screen.



A = 58.9 B = 51.0 C = 178.4 GC In 7.4 Down 5.5

Int. Job #	001	Right Eye	Job Unprotected	
Lens Type	Bifocal	Instructions		
↔	7.4	In		
↕	5.5	Down		
		Seg Type	Flat-Top 28	
		Seg Width	28.0	
Barcode or enter Job Number to recall from storage				
Eye	Lens Type	Protect	Blocking	Menu

### For Executive Segmented Lenses

Center the middle lensometer dot between the two vertical lines as shown here.

Line up the executive segment between the two horizontal lines.

Additional horizontal lines to ensure proper axis with the lensometer dots

A = 58.9 B = 51.0 C = 178.4 GC In 7.5 Down 5.5

Int. Job #	001	Right Eye	Job Unprotected
Lens Type	Bifocal	Instructions	
↔	7.5	In	
↕	5.5	Down	
Seg Type Executive			

Barcode or enter Job Number to recall from storage

Eye	Lens Type	Protect	Blocking	Menu
-----	-----------	---------	----------	------

### For Round or Curve Top Segmented Lenses

Line the circle up so that it fits inside the three-sided fiducial shape.

A = 58.9 B = 51.0 C = 178.4 GC In 7.5 Down 5.5

Int. Job #	001	Right Eye	Job Unprotected
Lens Type	Bifocal	Instructions	
	↔ 7.5 In		
	↓ 5.5 Down		
		Seg Type	Round 22
		Seg Width	22.0

Enter horizontal decentration

Eye	Lens Type	Protect	Blocking	Menu
-----	-----------	---------	----------	------



# Editing Decentration

The 3B will show the proper decentration, that is, the distance between the finish block and the layout reference point. (On a single vision lens, the layout reference point is the Optical Center; on a progressive, it is the fitting cross, etc.) You can change this calculated number manually though, as shown in the sample screen below:

This icon shows that you can use a full-eye block. The half-eye icon looks like a half-eye block.

A = 58.9 B = 51.0 C = 178.4 GC In 2.5 Up 0.0

Int. Job # 001 Right Eye Job Unprotected  
 Lens Type Single Vision Instructions

Use these two fields to adjust the decentration. ↔ 2.5 In  
 ↓ 0.0 Down

This icon represents Arrow Mode.

Barcode or enter Job Number to recall from storage

Eye Lens Type Protect Blocking Menu

To change the calculated decentration, move the cursor to one of the numeric fields next to the *In* or *Down* field and either type in a different number or use the left and right arrow buttons (◀ and ▶) to change the values. If you want to change the direction, you can move the cursor to the *In* or *Down* field and change *In* to *Out* and *Down* to *Up*. You can also press the MODE button to switch to Arrow mode and use the arrows to graphically adjust the decentration or the cut out.

### Note

This is the preferred *Job Screen* (mode) for interfacing with a Host computer.



## Calibration

1. Turn the 3B power on.
2. Press the Menu function key F5.
3. When the *Menu Screen* appears, press the F5 key on the 3B keypad to select the *Calibration Screen*.
4. Load a Calibration Template onto the blocking mechanism.
5. Press the MOVE button to cause the blocking mechanism to retract and light to come on. The Calibration Template will now rest on the three rubber support feet on the light table. *Do not move the Calibration Template or jar the 3B.*
6. The upper part of the 3B display will show the projected image of the Calibration Template. The fiducial (see Note below) displayed is a crosshair. Use the left and right arrow keys to horizontally and vertically center the crosshair in the Calibration Template image. Enter the 3B password if prompted.
7. Remove the Calibration Template, then replace it onto the support feet and manually move it so that its image is horizontally and vertically centered with the displayed fiducials.
8. When the Calibration Template image appears centered, press the MOVE button to activate the blocking mechanism. Verify that the chuck re-engages the block on the Calibration Template. If the chuck does not re-engage the Calibration Template, repeat the procedure.

### Note

Fiducials are any of the register marks, alignment marks, or cross hairs, that appear on the 3B screen.

## Axis Calibration

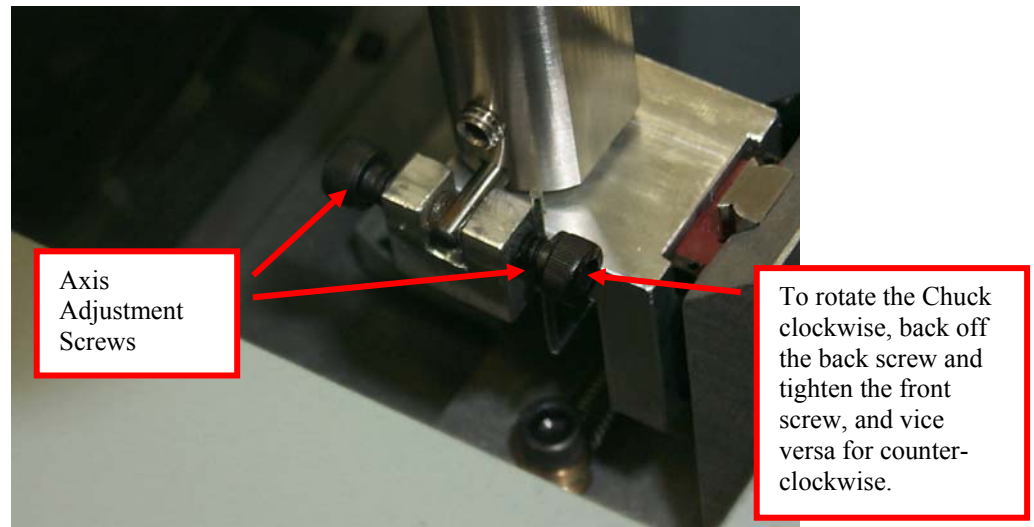
You should not need to calibrate the Axis. You will know if you need to do so because the Calibration Template, as viewed from the Display, would be off-clockwise or counter-clockwise; that is, the Chuck would need to be rotated one direction or the other. If the Axis is not even, follow these steps:

1. Remove the clear plastic stage on the top of the 3B (where you place the block).

### Caution

**This procedure requires moving the blocking carriage. Be very careful not to press the Move button or the footswitch while working on the Axis Adjustment Screws.**

2. Loosen one of the two screws shown below and tighten the other (see picture below) to adjust the Axis.
3. Check the Calibration Template Axis. Repeat the process until the Axis is calibrated.



# Diagnostics

The *Diagnostics Screen* is for viewing purposes only except for the *Keypad* field.

Press EXIT to return to Menu				
<b>Diagnostics Screen</b>				
Keypad ?		PCB Rev B		
Com 1 Loopback I				
Com 2 Loopback I				
Com 3 Loopback I				
Upper Limit				<input checked="" type="checkbox"/>
Lower Limit				<input type="checkbox"/>
Job				

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

**Com1, 2, and 3 Loopback:** (Service use only) The serial port can be tested by placing a jumper across pins 2 & 3 of COM1-3 on the back of the 3B. 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 on the *Communications Screen*.)

**Upper and Lower Limits:** Service use only

**PCB Rev:** Service use only



# Chapter 5

## Maintenance

### Updating Program Code

Users of the 3B may upgrade their unit's program code in three ways:

- Replace the memory chip in the 3B with a new memory chip containing the new code
- Load the new code using a PC running MS Windows
- Load the new code from a diskette using a 6E or 7E Edger

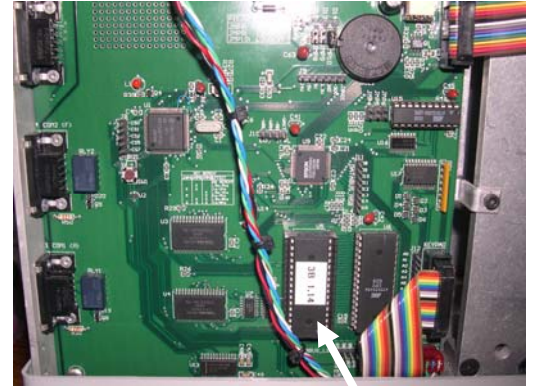
### Replacing the Program Code Chip

When you need to replace the program code memory chip, follow the directions given below:

1. Turn the 3B power off and unplug the power supply. Disconnect any serial cables and the foot switch, if applicable.
2. Prior to removing the panel in Step 3, visually note how the panels mate with the display, the right side panel, the base housing, and the panel behind the lens platform.
3. Using a 5/64-inch hex wrench, remove the two screws securing the upper-right panel to the metal chassis at the back of the 3B—see picture.
4. Remove the top screw securing the upper-left panel as well—see picture.
5. Gently disengage and remove the panel by pulling it upwards and towards the back of the 3B. This will expose the 3B's circuit board.



6. Locate the memory chip—see picture. It has a white label with the version of the software that is being replaced.
7. Grasp the chip at its ends using your thumb and index finger. Slowly and gently “rock” the chip out of the socket. This does not require much force, but should be done slowly to avoid bending any of the chip’s legs.
8. Note that the one end of the replacement chip is marked with a semi-circular indentation. Orient the replacement chip so that these markings are towards the base of the 3B (that is, downward). Carefully align the legs of the replacement chip with the socket and gently press the chip into the socket with a slight rocking motion. Inspect the chip for mal-alignment or bent legs.
9. Plug the power supply into the 3B and turn the unit on. Inspect the screen to verify that the desired software version number is displayed. If the unit does not power up properly, turn it off, unplug the power supply, and gently remove the chip to inspect for bent legs. Carefully straighten any bent legs and re-install (Step 7).
10. Once the chip is successfully installed, turn off the 3B power and unplug the power supply. Re-install the upper-left housing panel. A small flat-bladed screwdriver may be helpful in “tucking in” the edges of the panel where they meet with other panels.
11. Secure the panel with the two screws removed in Step 3; then reinstall the screw removed in Step 4.
12. Plug in the power supply, any serial cables and the footswitch, if applicable. Store the memory chip that you removed in the packing materials that the replacement chip was shipped in. If for any reason your 3B needs to be reverted to the prior firmware version, this chip can be re-inserted using these instructions.





## Replacing the Lamp Assembly

If the lamp burns out, replace it according to the directions given below:

1. Turn the 3B power off and unplug the power supply. Disconnect any serial cables and the foot switch, if applicable.
2. Prior to removing the panel in Step 3, visually note how the panels mate with the display, the right side panel, the base housing, and the panel behind the lens platform.
3. Using a 5/64-inch hex wrench, remove the two screws securing the upper-left panel to the metal chassis at the back of the 3B—see picture.

4. Gently disengage and remove the panel by pulling it upwards and towards the back of the 3B. This will expose the door to the 3B's lamp assembly—see picture.

5. Loosen the thumb screw (note where the arrow is pointing in the picture to the right). Then slide the bulb to its back position—see circled part of the bottom picture on this page—so that you can open the door.

6. Using the 5/64-inch hex wrench, remove the screw holding the door in place (where the arrow is pointing in the picture to the right).



7. Pull open the door and pull the small lever so that it presses the lamp out of its socket position.
8. Pull the lamp the rest of the way out with your fingers and throw it away.
9. Press the replacement bulb over into its socket position.
10. Make sure the lamp has pressed into the socket; then close the door.
11. Reverse Steps 3-6; that is, slide the thumbscrew forward, reattach the screw. Then replace and reattach the upper left panel.
12. Plug in the power supply and test the lamp. If it does not work, follow Steps 3-6 again and press harder to ensure that the lamp is seated.
13. Once you have ascertained that the lamp works, reattach the communication cables and footswitch if applicable.