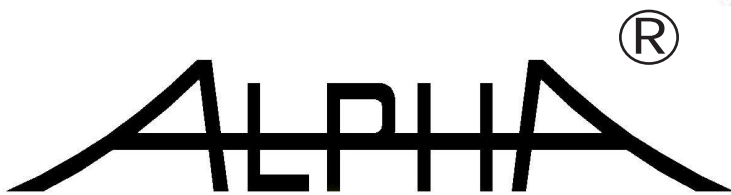
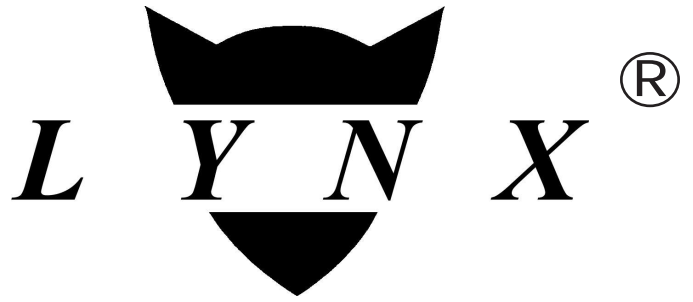




**Advanced Test Equipment Rentals**  
**www.atecorp.com 800-404-ATEC (2832)**



**User's Guide**

# Foreward

Use this manual only after assembling the *L Y N X*<sup>®</sup> or ALPHA<sup>®</sup> Stereo Zoom Microscope and familiarizing yourself with its various components. This manual is designed to be used in conjunction with the *L Y N X*<sup>®</sup> or ALPHA<sup>®</sup> Instruction Manual. This Users Guide will help you become familiar with the operation and use of the microscope as well as provide an explanation of the options available to increase the versatility of the system. Also included in this manual is a comprehensive maintenance and troubleshooting guide.

Page intentionally left blank

# Table of Contents

| <b>Contents</b>                          | <b>Page</b> |
|--|-------------|
| <b>The Basic Systems</b>                 |             |
| Lynx Bench Stand Packages                | 1-1         |
| Lynx Bench Stand System Diagram          | 1-2         |
| Lynx Boom Mount Packages                 | 1-3         |
| Lynx Boom Mount System Diagram           | 1-4         |
| Alpha Bench Stand Packages               | 1-5         |
| Alpha Bench Stand System Diagram         | 1-6         |
| Alpha Boom Mount Packages                | 1-7         |
| Alpha Boom Mount System Diagram          | 1-8         |
| Magnification Specifications             | 1-9         |
| <b>Getting Started</b>                   |             |
| Setting the Dynascope head angle         | 2-1         |
| Applying power                           | 2-3         |
| Using the Lynx                           | 2-4         |
| Using the Alpha                          | 2-5         |
| <b>Lighting Options</b>                  |             |
| 6-point ring light                       | 3-1         |
| 10-point ring light                      | 3-1         |
| 150 watt illuminator                     | 3-2         |
| 250 watt illuminator                     | 3-3         |
| Spot Lamps                               | 3-4         |
| Co-Axial Illuminator                     | 3-5         |
| Substage illumination                    | 3-5         |
| Dual Flex and Stay Fiber Optics          | 3-6         |
| Continuous Ring Light                    | 3-6         |
| Polarizing kit for Continuous Ring Light | 3-7         |
| Polarizing kit for Substage Illumination | 3-7         |
| UV Filter                                | 3-8         |

# Table of Contents

| <b>Contents</b>                       | <b>Page</b> |
|---------------------------------------|-------------|
| <b>Optical Accessories</b>            |             |
| Objectives                            | 4-1         |
| Switching Multipliers                 | 4-2         |
| 25 Degree Wedge                       | 4-2         |
| Motorized Oblique Viewers             | 4-3         |
| Manual Oblique Viewers                | 4-3         |
| Oblique Viewer Operating Techniques   | 4-4         |
| Oblique Viewer Optical Specifications | 4-4         |
| <b>Measurement Options</b>            |             |
| Reticles                              | 5-1         |
| Reticle calibration                   | 5-2         |
| 2" x 2" Measuring Stage               | 5-3         |
| <b>Stands and Stages</b>              |             |
| Extended Horizontal Bar               | 6-1         |
| 18" x 24" Table base                  | 6-1         |
| Weighted Base                         | 6-1         |
| Power assist boom stand               | 6-1         |
| Flex Arm Stand                        | 6-2         |
| 4" x 4" Floating Stage                | 6-2         |
| 12" x 10" <b>VS8</b> Scanning Table   | 6-2         |
| 18" x 18" <b>VS8</b> Scanning Table   | 6-2         |
| <b>Photo Attachments</b>              |             |
| Camera Arm                            | 7-1         |
| CCTV Camera                           | 7-2         |
| Nikon Coolpix Digital Camera          | 7-4         |

# Table of Contents

| <b>Contents</b>                   | <b>Page</b> |
|-----------------------------------|-------------|
| <b>Maintenance</b>                |             |
| Service                           | 8-1         |
| 150 Watt and 250 Watt Illuminator |             |
| Bulb replacement                  | 8-1         |
| Ceramic lamp socket replacement   | 8-1         |
| Fuse replacement                  | 8-2         |
| Fan cooling vents                 | 8-2         |
| Cleaning the Dynascope            | 8-2         |
| Spare parts list                  | 8-3         |
|                                   |             |
| Oblique and Direct Viewers        |             |
| Eliminate target orbiting         | 8-4         |
| Eliminate focus orbiting          | 8-5         |
| Centering the focus               | 8-6         |
| Centering the target              | 8-7         |
|                                   |             |
| <b>Troubleshooting Guide</b>      |             |
| Dynascope disk not spinning       | 9-1         |
| Bulb Life                         | 9-2         |
|                                   |             |
| <b>Warranty</b>                   | 10-1        |
|                                   |             |
| <b>Information</b>                |             |
| Contact Us                        | 11-1        |
|                                   |             |
|                                   |             |
|                                   |             |

# Table of Contents

Page intentionally left blank

# The Basic Systems

The Lynx and Alpha stereo zoom Dynascopes are versatile optical inspection systems. The patented Dynascope technology provides a bright, clear image in a fatigue free viewing position. Long working distance offers ample room for rework and part manipulation. These versatile systems are completely modular to allow a wide range of accessories that can be added at any time.

The systems are available in either a boom mount or bench stand configuration.

## **L Y N X<sup>®</sup> Bench Stand Packages**

The Bench Stand systems provide a bench stand with zoom and focus and a subject tray. These systems have the ability to be configured to provide substage illumination for backlighting.

### **L/S/1 150 Watt Bench Stand System**

*Includes:*

|                |  |
|----------------|--|
| L-001          | Lynx <sup>®</sup> stereo head  |
| C-003          | Bench stereo 7x - 40x zoom multiplier, focus assembly and glare shield |
| C-010          | Bench stand with 40 watt illumination transformer                      |
| C-011/N        | Subject tray for C-010 bench stand                                     |
| C-023 or C-024 | Six point ring light illuminator attachment                            |
| C-030/N        | 150 watt illuminator   |
| C-031/N        | 150 watt transformer with dimming control                              |

### **L/S/2 250 Watt Bench Stand System**

*Includes:*

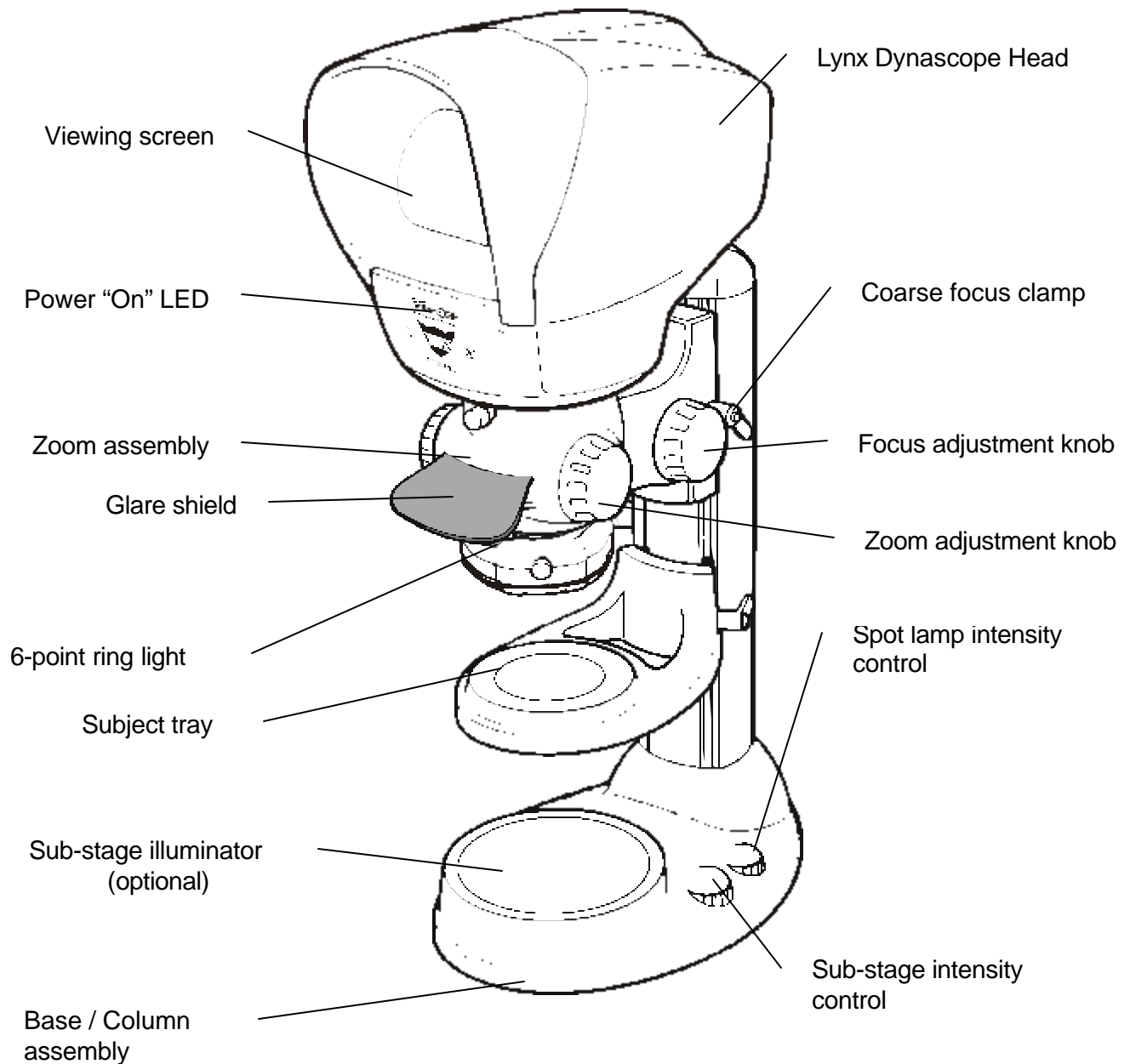
|                 |  |
|-----------------|--|
| L-001           | Lynx <sup>®</sup> stereo head  |
| C-003           | Bench stereo 7x – 40x zoom multiplier, focus assembly and glare shield |
| C-010           | Bench stand with 40 watt illumination transformer                      |
| C-011/N         | Subject tray for C-010 bench stand                                     |
| C-023 or C -024 | Six point ring light illuminator attachment                            |
| C-028           | 250 watt illuminator   |
| C-029           | 250 watt transformer with dimming control                              |



*An objective needs to be added to the package to complete each system. A range of objectives are available to configure the Dynascope to your specific needs for magnification, working distance and field of view. Please refer to page 1-10 for lens data.*



# The Basic Systems



## ***LYNX***<sup>®</sup> **BENCH STAND SYSTEM**

# The Basic Systems

## **LYNX<sup>®</sup> Boom Mount Packages**

In boom mount configurations, the zoom and focus are mounted on a boom arm that is mounted to a work surface or a separate mounting platform. These type of systems provide the flexibility required to inspect larger subjects such as PC Boards.

### **L/S/3 150 Watt Boom Mount System**

*Includes:*

|                |   |
|----------------|---|
| L-001          | Lynx <sup>®</sup> stereo head   |
| C-146          | Boom stereo 7x - 40x zoom multiplier, focus assembly and glare shield |
| C-023 or C-024 | Six point ring light illuminator attachment                           |
| C-030/N        | 150 watt illuminator  |
| C-031/N        | 150 watt transformer with dimming control                             |
| C-145          | Boom mount featuring 17" adjustable reach                             |
| C-148          | Illuminator mounting plate for boom mount (Quantity 2)                |

### **L/S/4 250 Watt Boom Mount System**

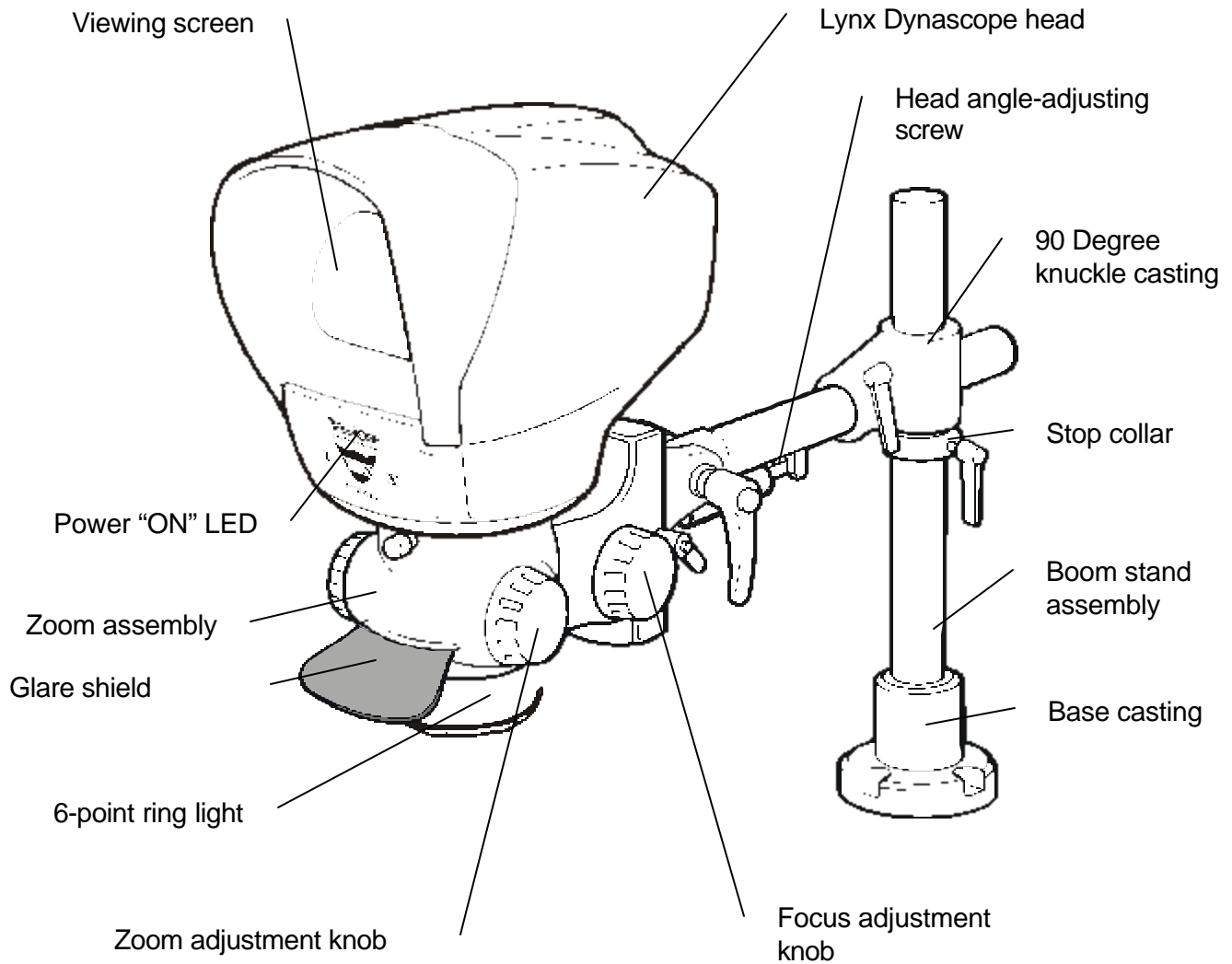
*Includes:*

|                |   |
|----------------|---|
| L-001          | Lynx <sup>®</sup> stereo head   |
| C-146          | Boom stereo 7x - 40x zoom multiplier, focus assembly and glare shield |
| C-023 or C-024 | Six point ring light illuminator attachment                           |
| C-028          | 250 watt illuminator  |
| C-029          | 250 watt transformer with dimming control                             |
| C-145          | Boom mount featuring 17" adjustable reach                             |
| C-148          | Illuminator mounting plate for boom mount (Quantity 2)                |



*An objective needs to be added to the package to complete each system. A range of objectives is available to configure the Dynascope to your specific needs for magnification, working distance and field of view. Please refer to page 1-9 for lens data.*

# The Basic Systems



## **LYNX<sup>®</sup>** **BOOM MOUNT SYSTEM**

# The Basic Systems

The Alpha system is available in two basic versions..

## ALPHA Bench Stand Packages

The Bench Stand systems provide a bench stand with zoom and focus and a subject tray. These bench stand systems have the ability to be configured to provide substage illumination or backlighting

### **IS-ALPHA1      ALPHA Bench Stand/ Dual Spot Illuminator System**

*Includes:*

|        |   |
|--------|---|
| IS-081 | Alpha Pod Complete                                  |
| C-003  | Bench stereo zoom 7x - 40x , focus assembly         |
| C-010X | Bench stand with universal illumination transformer |
| IS-013 | 60 Watt Dichroic illuminator                        |

### **IS-ALPHA3      ALPHA Bench Stand 150W Fiber Optic Ring Light System**

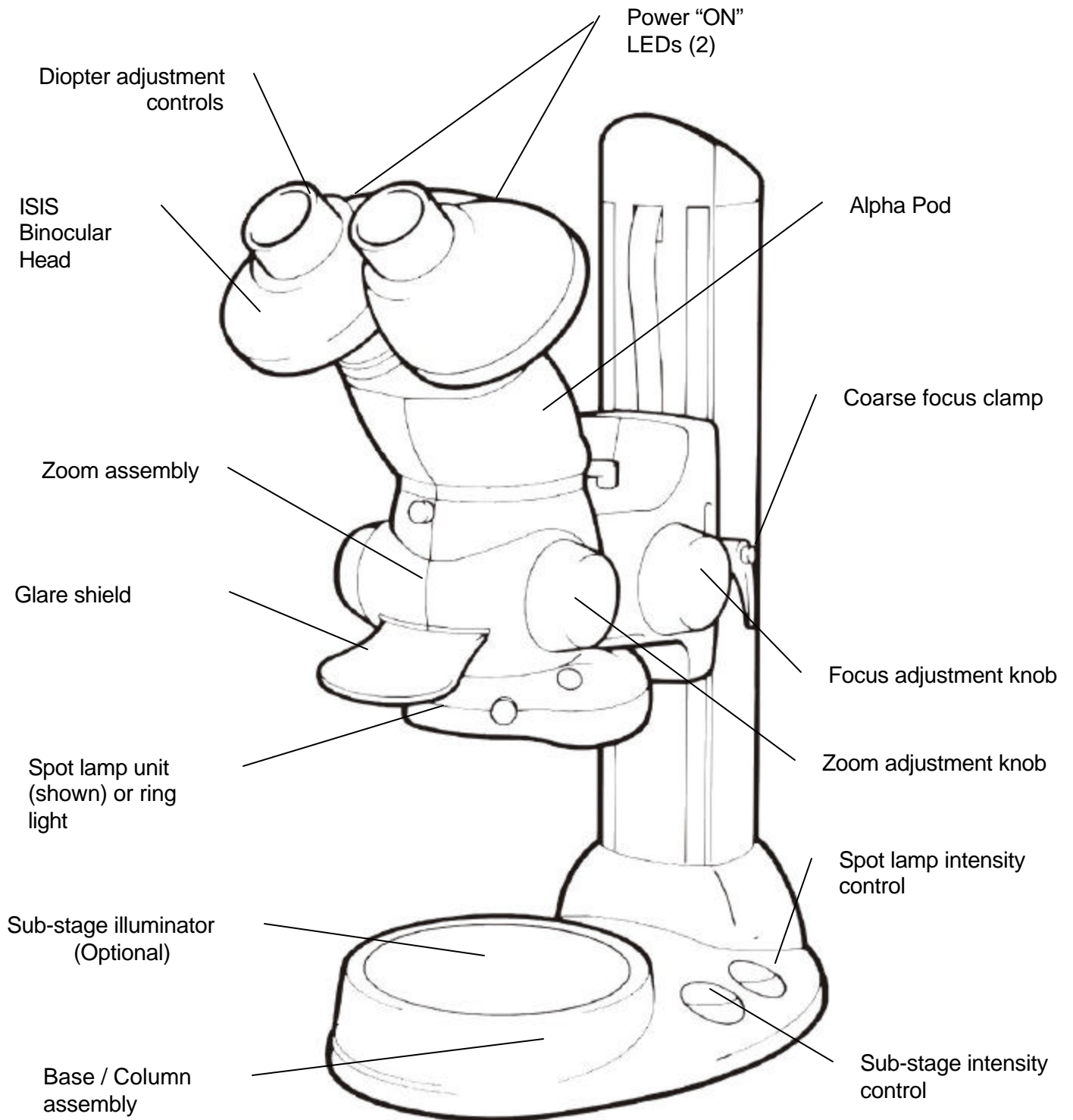
*Includes:*

|         |   |
|---------|---|
| IS-081  | Alpha Pod Complete                                  |
| C-003   | Bench stereo zoom 7x - 40x , focus assembly         |
| C-010X  | Bench stand with universal illumination transformer |
| HLS-001 | 150W Halogen Light Source, AC Non regulated         |
| CRL-036 | Continuous ring light with 36" fiber bundle         |



*An objective needs to be added to the package to complete the system. A range of objectives is available to configure the Dynascope to your specific needs for magnification, working distance and field of view. Please refer to page 1-9 for lens data.*

# The Basic Systems



**ALPHA**

**BENCH MOUNT SYSTEM**

# The Basic Systems

## ALPHA Boom Mount Packages

In the Boom Mount configuration, the zoom and focus are mounted on a boom arm, which is mounted to a work surface or a separate mounting platform. These types of systems provide the flexibility required to inspect larger subjects such as PC Boards.

### IS-ALPHA2 ALPHA Boom Mount/ Dual Spot Illuminator System

*Includes:*

|        |  |
|--------|--|
| IS-081 | Alpha Pod Complete                                   |
| C-146  | Boom stereo 7x - 40x zoom multiplier, focus assembly |
| C-145  | Boom mount featuring 17" adjustable reach            |
| C-034X | Transformer for spot illuminator                     |
| IS-013 | 60 Watt Dicroic spot illuminator                     |
| C-148  | Mounting plate for boom mount transformer            |

### IS-ALPHA4 ALPHA Boom Mount/ 150W Fiber Optic Ring Light System

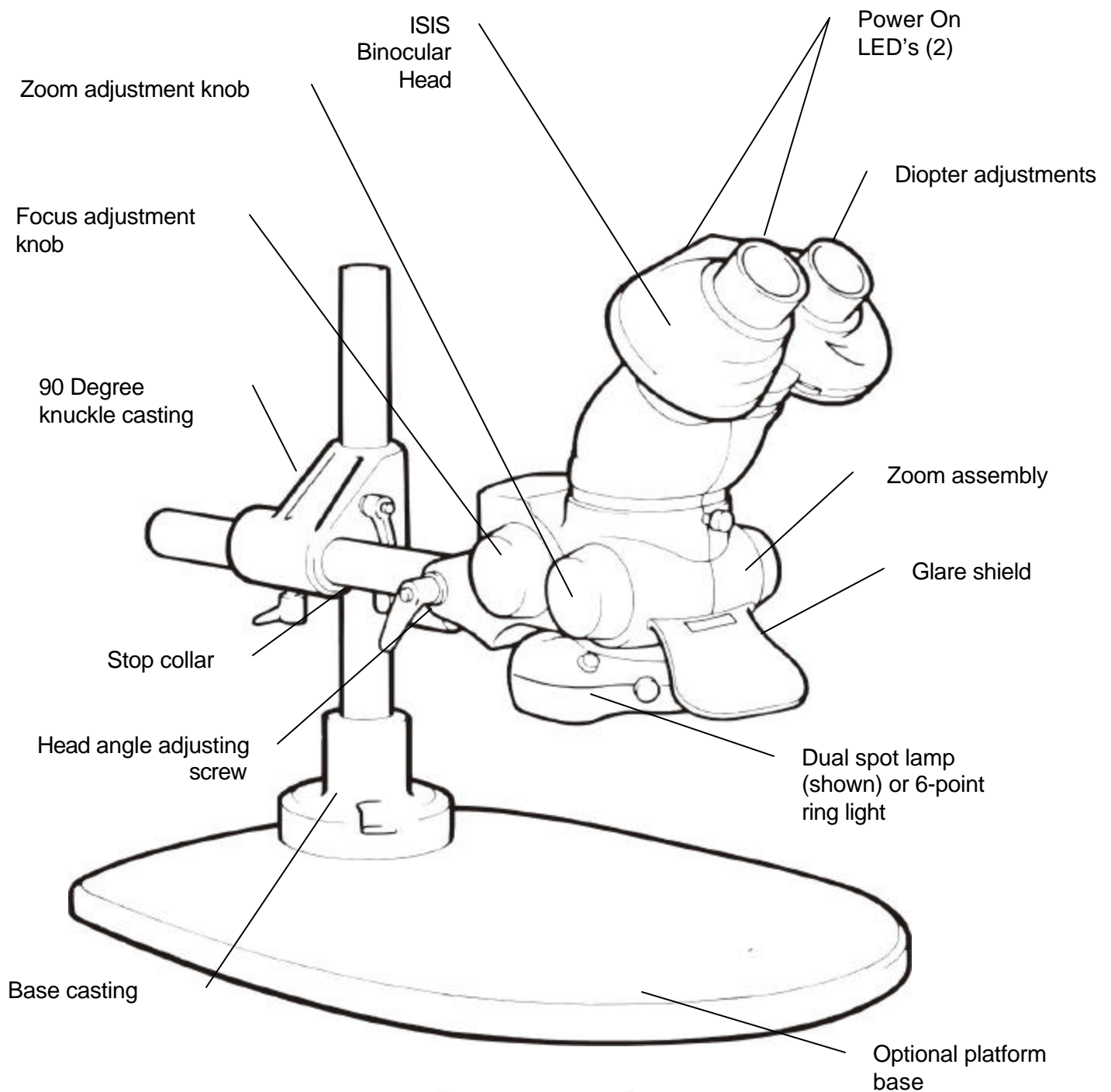
*Includes:*

|         |  |
|---------|--|
| IS-081  | Alpha Pod Complete                                   |
| C-146   | Boom stereo 7x - 40x zoom multiplier, focus assembly |
| C-145   | Boom mount featuring 17" adjustable reach            |
| IS-012  | Power supply   |
| HLS-001 | 150W Halogen Light Source, AC Non regulated          |
| CRL-036 | Continuous ring light with 36" fiber bundle          |
|         |  |



*An objective needs to be added to the package to complete the system. A range of objectives is available to configure the Dynascope to your specific needs for magnification, working distance and field of view. Please refer to page 1-10 for lens data.*

# The Basic Systems



**ALPHA**  
**BOOM MOUNT SYSTEM**

# The Basic Systems

## Magnification Specifications

The *L Y N X*<sup>®</sup> / ALPHA zoom microscope can achieve a variety of magnification levels ranging from a minimum of 2.1X to a maximum of 160X. Change magnification by using options discussed in this manual, such as objectives and multipliers. As magnification changes, field of view and depth of field also change.

### General Definitions:

**Working distance:** The distance between the objective lens and the subject when instrument is properly focused. As magnification increases, the working distance decreases.

**Field of View:** The area of subject that is visible in the viewing screen at any one time. As magnification increases, the field of view (FOV) decreases.

**Depth of Field:** Also referred to as focal depth. This is the maximum subject height variation that will remain in focus. As magnification increases, depth of field decreases.

The charts on the following page describe the optical characteristics that can be achieved with each system.



# The Basic Systems

## LYNX Optical Data

| Part No.     | Mag. | Range       | W/ 1.5x Multiplier | W/ 2.0x Multiplier | Working Distance | Field of View Max. Zoom | Field of View Min. Zoom |
|--------------|------|-------------|--------------------|--------------------|------------------|-------------------------|-------------------------|
| <b>C-050</b> | X0.3 | X2.1 - X12  | X3.15 - X18        | X4.2 - X24         | 312mm            | 12mm                    | 77mm                    |
| <b>C-055</b> | X0.5 | X3.5 - X20  | X5.25 - X30        | X7.0 - X40         | 175mm            | 7mm                     | 46mm                    |
| <b>C-051</b> | X0.7 | X4.9 - X28  | X7.35 - X42        | X9.8 - X56         | 127mm            | 5mm                     | 33mm                    |
| <b>C-052</b> | X1.0 | X7.0 - X40  | X10.5 - X60        | X14 - X80          | 85mm             | 3.5mm                   | 24mm                    |
| <b>C-053</b> | X1.5 | X10.5 - X60 | X15.7 - X90        | X21 - X120         | 45mm             | 2.5mm                   | 16mm                    |
| <b>C-054</b> | X2.0 | X14 - X80   | X21 - X120         | X28 - X160         | 25mm             | 1.75mm                  | 12mm                    |

## ALPHA Optical Data

| Part No.     | Mag. | Range       | W/ 1.5x Multiplier | W/ 2.0x Multiplier | Working Distance | Field of View Max. Zoom | Field of View Min. Zoom |
|--------------|------|-------------|--------------------|--------------------|------------------|-------------------------|-------------------------|
| <b>C-050</b> | X0.3 | X2.1 - X12  | X3.15 - X18        | X4.2 - X24         | 312mm            | 16.5mm                  | 88mm                    |
| <b>C-055</b> | X0.5 | X3.5 - X20  | X5.25 - X30        | X7.0 - X40         | 175mm            | 10mm                    | 53mm                    |
| <b>C-051</b> | X0.7 | X4.9 - X28  | X7.35 - X42        | X9.8 - X56         | 127mm            | 7mm                     | 38mm                    |
| <b>C-052</b> | X1.0 | X7.0 - X40  | X10.5 - X60        | X14 - X80          | 85mm             | 5mm                     | 26.5mm                  |
| <b>C-053</b> | X1.5 | X10.5 - X60 | X15.7 - X90        | X21 - X120         | 45mm             | 3mm                     | 18mm                    |
| <b>C-054</b> | X2.0 | X14 - X80   | X21 - X120         | X28 - X160         | 25mm             | 2.2mm                   | 13mm                    |

# Getting Started

## Setting the Dynascope Head Angle

The Boom Mount systems incorporate a mechanism to adjust the head angle. The mechanism is a threaded rod and knurled adjusting nut located behind the zoom unit and below the horizontal support arm.

For general inspection and rework tasks, the angle of the head does not have an affect on system performance. Simply adjust the knurled adjusting nut until the head is roughly horizontal or in a comfortable viewing position.

Other uses of the system may require further adjustment as follows:

### **For use with the 25 Degree Wedge**

A 25-Degree wedge (C-152) can be used to provide an angled or “oblique” view of the subject. This can be especially useful for looking under components without having to change the orientation of the subject under test.

Turn the knurled adjusting nut so the zoom assembly tilts downward approximately 25 degrees. Now the wedge can be installed between the zoom and head that will re-position the head for comfortable viewing.

### **For use with a measurement reticle**

To ensure measurement accuracy when a reticle is used, the Dynascope head needs to be parallel with the working surface directly below the ringlight.

Procedure:

1. Remove the ring light from the objective lens and set aside.
2. Use a tool with two straight, parallel edges such as a metal rule.
3. Lay the tool (on its edge) on the working surface below the objective lens.
4. Look from the sides of the Dynascope and carefully adjust the vertical position until the bottom of the objective lens is very close to the tool upper edge. Use the focus knob to fine adjust the vertical position of the head / zoom assembly.
5. Adjust the head angle to equalize the light gap visible between the bottom of the objective lens and the tool edge at the front and back of the objective lens.
6. Repeat steps 4 and 5 until parallelism is established.
7. Install ring light back on system.

# Getting Started

## Setting the Dynascope Head Angle

### For use with Oblique and Direct Viewers

To ensure optimal operation of the Manual (C-161) or Motorized (C-162) Oblique Viewing Attachment, the Dynascope head needs to be parallel with the working surface directly below the ringlight.

Procedure:

1. Use a tool with two straight, parallel edges such as a metal rule.
2. Lay the tool (on its edge) on the working surface below the ring light on the Oblique and Direct Viewer.
3. Look from the sides of the Dynascope and carefully adjust the vertical position until the bottom of the Oblique and Direct Viewer is very close to the tool upper edge. Use the focus knob to fine adjust the vertical position of the head / zoom assembly.
4. Adjust the head angle to equalize the light gap visible between the bottom of the Oblique and Direct Viewer and the tool edge at the front and back of the unit.
5. Repeat steps 3 and 4 until parallelism is established.

.

# Getting Started

## Applying Power

### Bench Stand Systems

The main power switch is located directly behind the vertical column near the base of the unit. Putting the switch in the “ON” position will supply power to the Dynascope head and halogen spot lamps (if equipped). The power switch will illuminate as well as the red LED that is located on the front of the LYNX or on top of the ALPHA module.

### Boom Mount Systems

For boom mount systems, power is supplied to the Dynascope head by either a 60W Power Supply Unit or by the transformer for the illuminator.

### Fiber Optic Lighting

Fiber optic illuminators are available in **21Volt, 150-Watt** or **24 Volt, 250-Watt** modular Power Supply Unit (PSU) and Illuminator units. These systems provide power to the Dynascope head (boom mount systems only) in addition to providing power to the illuminator. While the operating specifications are unique to each unit, the basic functions are the same for each.

On boom stand systems, the illuminator and transformer can be affixed to mounting brackets (P/N C-148) attached to the horizontal boom arm. For Bench stand systems, the illuminator and transformer can be placed on either side of the Bench Stand. Turn the lighting system “ON” by switching the toggle switch on the back panel of the PSU to the “ON” position. The toggle switch will become illuminated.

The illuminator should be connected to the PSU via a special modular plug. For boom mount systems the Dynascope head power cord also has a special modular plug for connecting to the rear of the zoom assembly.



CAUTION !

***Always turn the Power Supply Unit/Illuminator off before covering with any dust covers as overheating may result.***

***Allow for adequate ventilation around the Power Supply Unit and Illuminator as overheating may result. Keep air vents clear from blockage.***



***Turning the Illuminator “ON” and “OFF” multiple times a day can significantly reduce bulb life. Voltage spikes associated with hard ignitions will degrade the filament as well as the ceramic lamp socket and pins. Re-igniting the bulb while it is still hot can also degrade the filament. It is best to allow the bulb to cool a minimum of 15 minutes before re-igniting.***

# Getting Started

## Using the LYNX

Center the subject to be examined under the six-point ringlight. Turn the zoom adjustment (refer to page 1-2 of this manual) counter clockwise to the end of its travel. This will set the unit at its lowest magnification (7X with the 1.0X objective lens). Look at the viewing screen (refer to page 2 of this manual). You should be able to see the object although it may be out of focus. By manually moving the subject up or down, determine which direction the focus assembly must be moved in order to provide a clear, focused image. With the 1.0X objective lens the Working Distance should be approximately four inches for proper focus.

### Focus

Focus the image by gently rotating the focus adjustment knob in the proper direction (refer to the system diagram at the front of this manual). Do not force the focusing adjustment. If the focus assembly runs out of travel without obtaining focus then a gross focus (height) adjustment must be made. See Below.



**CAUTION !**

***Do not force the focus adjustment as damage may result.***



*Now that the image is in focus at the lowest magnification it is advisable to fine-tune the focus at the highest magnification. Turn the zoom adjustment all the way clockwise. The magnification will then be at its maximum setting (40X with the 1.0X objective lens). Adjust focus as described above. By focusing at the highest magnification the unit is now parfocal. Parfocal means that the image remains in focus throughout the zoom magnification range. This feature makes it quick and convenient to inspect subjects at lower magnifications and then “zoom in” on specific areas without re-focusing.*

**Gross Focus (Height) Adjustment** -- Choose method for your system

### Boom Mount

Adjust the height of the Dynascope head by raising or lowering the assembly on the vertical support shaft. Support the weight of the Lynx / Alpha with one hand and loosen the locking lever on the vertical support with the other hand. Adjust the position and re-tighten the locking lever. After setting the vertical position, locate the stop collar directly below the vertical support and tighten into place. This will act as a secondary support.

The boom mount can also be adjusted horizontally. Loosen the horizontal support shaft-locking lever. Reposition the boom as required then re-tighten the locking lever.

## Getting Started



*For simplified height adjustments, use the Gas Assist Boom Stand option (P/N MSP/062). This accessory fits the existing base casting of the standard C-145 Boom Stand. It incorporates a gas charged counter balance to offset the weight of the Dynascope head and accessories while providing a stable mount to minimize vibration. Use this unit when the system needs frequent gross-height adjustments due to different subject sizes. Refer to the Stands and Stages section of this manual.*

### Bench Stand

The bench stand incorporates a dovetail slide for adjustment of the height of the Dynascope head. Support the weight of the Lynx / Alpha with one hand and loosen the coarse focus clamp handle on the right side of the zoom assembly. Refer to the system diagram on page 1-2 of this manual. Adjust the position, and re-tighten the clamping handle.

## Using the ALPHA

Center the subject to be examined under the spot lamps or the six-point ringlight, depending upon your specific configuration. Turn the zoom adjustment (refer to the system diagram at the front of this manual) counter clockwise to the end of its travel. This will set the unit at its lowest magnification (7X with the 1.0X objective lens). Look through the ISIS Binocular Head (refer to page 11 of this manual). Adjust for your eye spacing by moving the eyepieces closer together or farther as required for a comfortable view. You should now be able to see the object although it may be out of focus. By manually moving the subject up or down, determine which direction the focus assembly must be moved in order to provide a clear, focused image. With the 1.0X objective lens the Working Distance (the distance between the bottom of the ringlight and the subject) should be approximately four inches for proper focus.

### Focus

Focus the image by gently rotating the focus adjustment knob in the proper direction (refer to the system diagram at the front of this manual). Do not force the focusing adjustment. If the focus assembly runs out of travel without obtaining focus then a gross focus (height) adjustment must be made. See Below.



**CAUTION !**

***Do not force the focus adjustment as damage may result.***



*Now that the image is in focus at the lowest magnification it is advisable to adjust the focus at the highest magnification. Turn the zoom adjustment all the way clockwise. The magnification will then be at its maximum setting (40X with the 1.0X objective lens). Adjust focus as described above. ALPHA allows you to further fine-tune the focus by adjusting the Diopter on each eyepiece. Rotate the eyepieces until the image is sharply in focus in each eye.*

# Getting Started

## Parfocality Adjustment

*At this point you should have the zoom knob fully clockwise to maximum zoom and with a clear, sharp image in the ALPHA. Turn the zoom knob for minimum magnification setting. View the image. If it is not perfectly in focus, turn the parfocal adjusting knobs that are located on the backside of the ISIS Binocular Head until the image is sharp. The unit is now parfocal and can be used normally. Parfocal means that the image remains in focus throughout the zoom magnification range. This feature makes it quick and convenient to inspect subjects at lower magnifications and then “zoom in” on specific areas without re-focusing.*

**Gross Focus (Height) Adjustment** -- Choose method for your system

## Boom Mount

Adjust the height of the Dynascope head by raising or lowering the assembly on the vertical support shaft. Support the weight of the Lynx/ Alpha with one hand and loosen the locking lever on the vertical support with the other hand. Adjust the position and re-tighten the locking lever. After setting the vertical position, locate the stop collar directly below the vertical support and tighten into place. This will act as a secondary support.

The boom mount can also be adjusted horizontally. Loosen the horizontal support shaft-locking lever. Reposition the boom as required then re-tighten the locking lever.



*For simplified height adjustments, use the Gas Assist Boom Stand option (P/N MSP/062). This accessory fits the existing base casting of the standard C-145 Boom Stand. It incorporates a gas charged counter balance to offset the weight of the Dynascope head and accessories while providing a stable mount to minimize vibration. Use this unit when the system needs frequent gross-height adjustments due to different subject sizes. Refer to the Stands and Stages section of this manual.*

## Bench Stand

The bench stand incorporates a dovetail slide for adjustment of the height of the Dynascope head. Support the weight of the Lynx / Alpha with one hand and loosen the coarse focus clamp handle on the right side of the zoom assembly. Refer to the system diagram on page 1-2 of this manual. Adjust the position, and re-tighten the clamping handle.

## Lighting Options

### 6-Point Ring Light (Low Magnification); P/N C-023

This ring light is designed for use with the 150W or 250W light sources on systems with reducing objectives. Reducing objectives are defined as the objective lenses with a magnification of less than 1.0x. The C-023 ring light is also very effective with the 1.0x objective, making it a good choice for building a versatile system capable of attaining excellent working distances for rework and yet achieving higher magnification for general inspection needs.

A Fresnel lens assembly is included with each C-023 ring light for use with the 0.5x and 0.3x Reducing Objectives. The purpose of this attachment is to re-focus the light from the ring light when used with these longer working distance objectives.



*Use the Fresnel Lens Attachment with the 0.5x and 0.3x objectives only. Light will be too dispersed if used with the 0.7x or 1.0x objective.*

### 6-Point Ring Light (High Magnification); P/N C-024

This ring light is designed for use with the 150W or 250W light sources on systems with the 1.0x or multiplying objectives. Multiplying objectives are defined as the objective lenses with a magnification greater than 1.0x. The C-024 ring light is optimized for the shorter working distances associated with the higher magnification objectives. Use this 6-point ring light for general inspection needs or when the system will be used at magnifications greater than 40x.

A Fresnel lens assembly is included with each C-024 ring light for use with the 1.5x and 2x Multiplying Objectives. The purpose of this attachment is to re-focus the light from the ring light when used with these objectives.



*Use the Fresnel Lens Attachment with the 1.5x and 2x objectives only. Light will be too dispersed when used with the 1.0x objective.*

### 10-Point Ring Light (Low Magnification); P/N C-181

When used with a 250 Watt illuminator, this ring light addresses lighting requirements for those applications that are light intensive such as viewing dark or non reflective subjects.

It can also be configured with a 150-Watt illuminator, which will provide a longer lamp life when used for general inspection applications.

Similar to the 6 point ring lights described above, this ring light is designed for use with the 150W or 250W light sources on systems with reducing objectives. Reducing objectives are defined as the objective lenses with a magnification of less than 1.0x.

A Fresnel lens assembly is included with each C-181 ring light for use with the 0.5x and 0.3x Reducing Objectives. The purpose of this attachment is to re-focus the light from the ring light when used with these longer working distance objectives.



*Use the Fresnel Lens Attachment with the 0.5x and 0.3x objectives only. Light will be too dispersed if used with the 0.7x or 1.0x objective.*



## Lighting Options

### 10-Point Ring Light (High Magnification); P/N C-180

When used with a 250 Watt illuminator, this ring light addresses lighting requirements for those tough applications that are light intensive such as viewing dark or non reflective subjects. It can also be configured with a 150-Watt illuminator that will provide a longer lamp life when used for general inspection applications.

Similar to the 6 point ring lights described above, this ring light is designed for use with the 150W or 250W light sources on systems with multiplying objectives. This ring light is designed for use with the 150W or 250W light sources on systems with the 1.0x or multiplying objectives. Multiplying objectives are defined as the objective lenses with a magnification greater than 1.0x. The C-180 ring light is optimized for the shorter working distances associated with the higher magnification objectives.

A Fresnel lens assembly is included with each C-024 ring light for use with the 1.5x and 2x Multiplying Objectives. The purpose of this attachment is to re-focus the light from the ring light when used with these objectives.



*Use the Fresnel Lens Attachment with the 1.5x and 2x objectives only. Light will be too dispersed when used with the 1.0x objective.*

### 150 Watt 21 Volt Power Supply Unit; P/N C-030/N

#### 150 Watt Illuminator; P/N C-031/N

This illuminator system is designed for use with the six or ten point ringlight and incorporates an electronic dimming control. It should be used on Lynx where subjects are too reflective for use with higher power lighting systems or on ALPHA when a very bright image is desired. Special soft start circuitry improves bulb life.

#### Use:

The Power Supply Unit should be located to your left as you face the Dynascope head. It can be attached to mounting brackets (P/N C-148) when used with boom mount systems or placed on a bench. The power switch is located on the rear panel of the unit. The rotary knob on the front of the unit is the intensity control and adjusts the brightness of the illuminator. Turning this knob clockwise increases lamp brightness.

It is recommended to use the lowest setting that will produce a suitable image as this will generate less heat and increase bulb life significantly.

#### Bench Mount

For Bench mount systems the Power Supply Unit and Illuminator should be placed on the same work surface as the Dynascope system.

The Power Supply Unit main power cord should be plugged into a standard wall outlet or suitable power source.

## Lighting Options

### Boom Mount

For Boom Mount systems, brackets (C-148) are available for mounting to the left and/or right side of the horizontal boom shaft.

The Power Supply Unit main power cord should be plugged into a standard wall outlet or suitable power source.



**CAUTION !**

***Always turn the Power Supply Unit / Illuminator off before covering with any dust covers as overheating may result.***

***Allow for adequate ventilation around the Power Supply Unit and Illuminator as overheating may result. Keep air vents clear from blockage.***



*Turning the illuminator on and off multiple times a day can significantly reduce bulb life. Voltage spikes associated with hard ignitions will degrade the filament as well as the ceramic lamp socket and pins. It is best to allow the bulb to cool a minimum of 15 minutes before re-igniting. The illuminator can be left turned "ON" for extended periods if the "Lamp Intensity" control is turned down (counterclockwise) all the way.*

### **250 Watt 24 Volt Power Supply Unit; P/N C-028 250 Watt Illuminator; P/N C-029**

This illuminator system is designed for use with the six or ten point ringlight and incorporates an electronic dimming control. It should be used on Lynx for general inspection/rework tasks and where options such as Oblique and Direct Viewer or the 25-Degree Wedge are used. It can be used with ALPHA when a very bright image is desired. Special soft start circuitry improves bulb life.

#### Use:

The Power Supply Unit should be located to your left as you face the Dynascope head. It can be attached to mounting brackets (P/N C-148) when used with boom mount systems or placed on a bench. The power switch is located on the rear panel of the unit. The rotary knob on the front of the unit is the intensity control and adjusts the brightness of the illuminator. Turning this knob clockwise increases lamp brightness. It is recommended to use the lowest setting that will produce a suitable image as this will generate less heat and increase bulb life significantly.

### **Bench Mount**

For Bench mount systems the Power Supply Unit and Illuminator should be placed on the same work surface as the Dynascope system.

The Power Supply Unit main power cord should be plugged into a standard wall outlet or suitable power source.

# Lighting Options

## Boom Mount

For Boom Mount systems, brackets (C-148) are available for mounting to the left and/or right side of the horizontal boom shaft.

The Power Supply Unit main power cord should be plugged into a standard wall outlet or suitable power source.



**CAUTION !**

***Always turn the Power Supply Unit / Illuminator off before covering with any dust covers as overheating may result.***

***Allow for adequate ventilation around the Power Supply Unit and Illuminator as overheating may result. Keep air vents clear from blockage.***

*Turning the illuminator on and off multiple times a day can significantly reduce bulb life. Voltage spikes associated with hard ignitions will degrade the filament as well as the ceramic lamp socket and pins. It is best to allow the bulb to cool a minimum of 15 minutes before re-igniting. The illuminator can be left turned "ON" for extended periods if the "Lamp Intensity" control is turned down (counterclockwise) all the way.*



## Spot Lamps; P/N IS-013

The 20-Watt dual spot lamp unit is designed primarily for use with ALPHA. The unit contains two adjustable halogen lamps and can be used on the bench stand or boom mount system. The spot lamp unit fits over the objective lens and is secured in place with a thumbscrew at the front.

Use:

### **Bench Stand systems**

Power is supplied to the IS-013 Spot Lamp Unit by the bench stand and it connects to a phono-plug on the underside of the zoom body.

The intensity of the spot lamps can be adjusted with the thumb wheel on the right hand side of the bench stand base. Turn the thumb wheel until the desired lighting effect is achieved.

### **Boom Mount systems**

A 60-Watt Power Supply Unit (C-034X) is required to energize the spot lamp unit when used with a boom mount system. Connect the special molded cable from the rear panel of the PSU to the connector on the rear of the zoom assembly.

The Power Supply Unit main power cord should be plugged into a standard wall outlet or suitable power source.

## Lighting Options



CAUTION !

***Always turn the Power Supply Unit / Illuminator off before covering with any dust covers as overheating may result***



*Once the spot lamp unit is operational, adjust the position of the halogen lamps to optimize the lighting. While looking into the Dynascope, cover one of the spot lamps with your hand. Adjust the position of the remaining lamp for maximum brilliance at the subject using the thumb slide on top of the spot lamp unit. Repeat procedure for the other lamp.*

### **Coaxial Illumination; P/N C-139**

Applications such as inspection of blind holes or when trying to see into a cavity require the use of co-axial illumination. This illuminator can be used with the 250-Watt Halogen lighting system to provide the required lighting affect. Light is placed into the axis of the optical path, thereby putting light directly through the objective lens, down to the subject.

Use:

The Coaxial Illuminator body fits between the Lynx head or Alpha head and the zoom assembly. It has a fixed 1.5x multiplier making the basic range of magnification 9 – 60X. The flexible fiber optic cable is then connected to the illuminator. No further adjustments are required. The full range of multipliers, objectives and photo adapters can be utilized.

### **Sub-Stage Illumination; P/N IS-014**

This is a special attachment that can only be used on bench stand configurations. Sub-Stage lighting (also known as “bottom” or “back” lighting) provides illumination from the underside of a subject and can be helpful in certain inspection situations.

Use:

The Substage Illuminator assembly is designed to be installed into the bottom of the bench stand. It is held in place by two socket head screws installed from the top of the bench stand base. The large round plate at the bottom of the stand must to be removed to gain access to install the substage illuminator assembly. On the substage illuminator bracket, install the bulb into the socket and slip the bulb under the retaining clips. Install the assembly bulb – first, into the base of the bench stand. Secure with the 2 screws provided. Plug the Sub-Stage Illuminator power jack into the receptacle in the base of the stand. There is a thumb wheel on the right side of the bench stand base that will adjust the brightness of the sub-stage lighting. Using a lower setting improves bulb life significantly.

The sub-stage illuminator includes a base plate that has an internal condensing lens to better concentrate the light. The lens is mounted in a slide arrangement so the position of the light can be adjusted by manually moving the condensing lens. A blue diffuser lens is also provided in the kit. It screws onto the OD of the condensing lens.

# Lighting Options

## Dual Flex & Stay Fiber Optics; P/N C-153

Some inspection applications require lighting from the side or lighting that can be focused intensely onto a small area. The Flex and Stay Fiber Optic system includes dual flexible fibers with condensing lenses and an illuminator with a special weighted base. The system is powered by the available C-031/N Power Supply Unit.

Use:

Assemble the weighted base to the bottom of the special illuminator housing. This illuminator utilizes a special keyed adapter and retaining knob to hold the Flex & Stay Fiber assembly. Position the illuminator on the work surface adjacent to the Dynascope. The flex & stay fiber optic connects to the illuminator and can independently aimed to provide optimal lighting.



***Always turn the Power Supply Unit / Illuminator off before covering with any dust covers as overheating may result***

**CAUTION !**



***Each flex & stay cable is fitted with an adjustable focus to intensify the light where it is needed. Loosen the thumbscrew on the condenser lens to move the lens assembly in and out, which will focus the light as required.***

## Continuous Ring Light with 150 Watt Illuminator unit; HLS-001/S

This illuminator / ring light combination provides a uniform lighting effect for viewing certain subjects. It is best suited for use on the ALPHA systems. Common applications are for viewing clear, opaque subjects or highly reflective subjects.

Use:

The Fiber Optic Ring Light guide attaches to the front of the special illuminator/power supply unit. Attach the ring light to the objective lens by tightening the 3 thumbscrews. No further adjustments are required.



***Always turn the Power Supply Unit / Illuminator off before covering with any dust covers as overheating may result***

**CAUTION !**

# Lighting Options

## Polarizing Kit for continuous ring light; P/N MSP-076

A polarizing kit is available for use with the HLS-001/S illuminator to polarize the continuous ring light. Use this illumination in cases where faults, inclusions or impurities are being looked at in plastic, film, glass and liquids. The MSP/076 Polarizing Kit requires the HLS-001/S illumination option. The kit consists of the following parts:

- One 46mm circular analyzer; for use with the 0.3x, 0.5x, 0.7x and 1.0x objectives
- One 40.5mm circular analyzer; for use with the 1.5x objective.
- One Polarizer assembly for the CRL-036 continuous ring light

Use:

1. Snap the polarizer on the OD of the continuous ring light. This will polarize the light.
2. Screw the 46mm or the 40.5mm circular analyzer ( depending upon the objective you are using ) to the bottom of the objective
3. Focus the Dynascope and illumination on the subject.
4. Rotate the analyzer on the objective with your fingertips until the subject has the color that shows the faults best.



*Circular polarization has 2 points where the light spectrum cuts out as the analyzer is rotated. This results in a complete loss of light at these settings.*

## Substage Polarizing Kit; P/N C-096

This polarizing kit is available for use with bench stand systems to polarize the sub-stage illumination in cases where faults, inclusions or impurities are being looked at in plastic, film, glass and liquids. The C-096 Polarizing Kit requires the IS-014 sub-stage illumination option. The kit consists of the following parts:

- One 46mm circular analyzer; for use with the 0.3x, 0.5x, 0.7x and 1.0x objectives
- Two 40.5mm circular analyzers; for use with the 1.5x objective and the substage condensing lens.

Use:

1. Remove the diffuser
2. Screw the 40.5mm circular analyzer to the condenser on the sub-stage illuminator. This will polarize the light
3. Screw the 46mm or the 40.5mm circular analyzer ( depending upon the objective you are using ) to the bottom of the objective
4. Focus the Dynascope and illumination on the subject.
5. Rotate the analyzer on the objective with your fingertips until the subject has the color which shows the faults best.

## Lighting Options



*Circular polarization has 2 points where the light spectrum cuts out as the analyzer is rotated. This results in a complete loss of light at these settings.*

### **UV Filter Assembly for 6-point ring lights; P/N C-167**

Some rework and assembly operations include the use of UV curing epoxies and sealant. The UV Filter assembly fits over the end of the ring light to provide a 400nm filter for the light. This will prevent the UV sensitive products from curing prematurely.



*This filter can only be used with the 0.7x and 1.0X objectives.*

# Optical Accessories

## Magnification and Optical Accessories

Through the use of objective lenses and switching multipliers, the magnification of the system can be configured as required to provide a maximum of 160X. Objective lenses are mounted at the bottom of the zoom body and provide primary magnification. Typically, as magnification increases, field of view, depth of focus, and working distance decrease. For this reason it is advisable to use the lowest magnification settings that allow proper viewing. For applications requiring a combination of high magnification and long working distance, the use of a switching multiplier is advised.



*Switching Multipliers are an inexpensive way to increase the versatility of the Dynascope. Multipliers are mounted between the zoom body and Dynascope head and provide secondary magnification allowing the use of reducing objectives to provide long working distances.*

## Objectives

The standard LYNX / ALPHA system when configured with a 1.0X objective lens will provide 7X to 40X magnification. Other available objective lenses are 0.3X, 0.5X, 0.7X, 1.5X and 2.0X. Optical specifications of the objective lenses are as follows:

| Part No.     | Mag. | Range       | W/ 1.5X Multiplier | W/ 2.0X Multiplier | Working Distance |
|--------------|------|-------------|--------------------|--------------------|------------------|
| <b>C-050</b> | X0.3 | X2.1 - X12  | X3.15 - X18        | X4.2 - X24         | 312mm            |
| <b>C-055</b> | X0.5 | X3.5 - X20  | X5.25 - X30        | X7.0 - X40         | 175mm            |
| <b>C-051</b> | X0.7 | X4.9 - X28  | X7.35 - X42        | X9.8 - X56         | 127mm            |
| <b>C-052</b> | X1.0 | X7.0 - X40  | X10.5 - X60        | X14 - X80          | 85mm             |
| <b>C-053</b> | X1.5 | X10.5 - X60 | X15.7 - X90        | X21 - X120         | 45mm             |
| <b>C-054</b> | X2.0 | X14 - X80   | X21 - X120         | X28 - X160         | 25mm             |

Use:

Objectives are centrally located at the bottom of Dynascope zoom body on a dovetail mount. Remove the ring light or spot light unit. Hold the objective lens with one hand and loosen the thumbscrew on the lower front of the zoom body. Remove the existing lens, position the new one and tighten the thumbscrew. Replace the ring light or spot light.



# Optical Accessories

## Switching Multipliers

The Switching Multiplier can be used to increase the zoom magnification by either 1.5X or 2.0X. This additional magnification can be particularly useful to restore the overall system magnification when a reducing objective is used to increase working distance. Alternatively, use of a high power objective lens and a multiplier can bring total system magnification to 120X or 160X.

| Part Number  | Description   |
|--------------|---|
| <b>C-040</b> | 1.0x and 1.5x Switching Multiplier                              |
| <b>C-041</b> | 1.0x and 2.0x Switching Multiplier ( not recommended for Lynx ) |

Use:

The Switching Multiplier mounts between the Dynascope head and zoom body. There is a slide lever on the front of the multiplier. With the lever moved to the extreme right position (directly in front) the multiplier lens is by-passed and the zoom range is at normal magnification. Slide the lever towards the rear of the unit to engage the multiplier lens. The zoom range is now multiplied by 1.5x or 2x depending upon model.



*The 250-Watt Illuminator and Power Supply should be used when a multiplier is used on the Lynx Dynascope. This is to overcome light losses from the lenses in the multiplier.*

## Oblique Viewing Attachments

### 25 Degree Wedge; P/N C-152

The 25-Degree Wedge enables the Dynascope head and zoom assembly to be tilted to get an angled view of a subject. For use only on boom mount systems, this accessory adds versatility to the unit by allowing for inspection tasks as well as rework applications. It can be used with any of the objective lenses or multipliers to create a flexible system.

Use:

Loosen the clamping handle that is behind the zoom pod on the right hand side of the boom arm. Turn the knurled adjusting nut that is located under the boom arm so the zoom assembly tilts downward approximately 25 degrees. Now the wedge can be installed between the zoom and head that will re-position the head for comfortable viewing.

# Optical Accessories

## Oblique and Direct Viewers

Inspecting at an oblique angle rather than a direct overhead view can be helpful when inspecting certain items. It can be a significant advantage for applications such as assembled printed circuit boards. In situations where some subjects require an overhead view and others require an oblique view the Oblique and Direct Viewing Attachments are the perfect accessories. Oblique viewing attachments allow the LYNX/ALPHA to view subjects at the normal overhead direct view and then quickly switch to a 34 Degree oblique view by engaging the oblique viewer. The oblique view can then be rotated to view 360 degrees around a subject. The Oblique and Direct Viewers are available in manual and motorized versions and are equipped with their own objective lenses and lighting assemblies. In addition, they can be used with the full range of multipliers and photo attachments.



*Oblique views require additional light and are recommended for use only with the optional 24 volt 250 watt Illuminator (See Options - Lighting).*

### **Motorized Oblique and Direct Viewer; P/N C-162 (w/ 6-point ring light) P/N C-183 (w/10-point ring light)**

The C-162 or C-183 Oblique and Direct Viewer are the most popular viewer because they are fully motorized. An Oblique/Direct View control box is included that must be turned “On” (via the front panel switch on the control box) to power the drive motors. Also included with this viewer is a wired remote control for switching between the normal and oblique views and for rotating the oblique view. There are three buttons on the remote control, arranged in a triangle with two buttons above and one button below. When viewing in the normal mode, bring the oblique viewer into position by pressing the single, lower remote control button once. This will bring the oblique viewer into position. Pressing the same button again will return to the normal, top down view. In the oblique mode, rotate the view by pressing one of the two upper buttons. The left button will rotate the view clockwise and the right button will rotate counter-clockwise. The view can be endlessly rotated in either direction. A speed control on the Oblique/Direct View control box adjusts the rotational speed of the oblique view. Rotate the control clockwise to increase the rotational speed.

### **Manual Oblique and Direct Viewer; P/N C-161 (w/6-point ring light) P/N C-182 (w/10-point ring light)**

Manual oblique viewers require the operator, viewing in the direct or overhead view, to manually swivel the viewer into position. The oblique can be manually rotated by turning the knurled ring on the viewer to view “around” the subject.



*Set-up and adjustment of the oblique viewing systems is done at Vision Engineering before shipment. Due to the complexity of these adjustments the unit should be returned to Vision Engineering Inc. for repairs when required.*

# Optical Accessories

## Oblique Viewer Operating Techniques

When properly set up on the Dynascope system and when viewing in the oblique mode, the center of the image will be sharply in focus. The fringes of the field of view will not be as sharp as the center due to the angle of the optical paths. At the lowest magnification settings, it is normal to have a dark area at the edge of the field of view. This is also due to the angle of the optical paths and diminishes as the zoom magnification is brought up from its minimum.

Procedure:

1. Swing the Oblique Viewer to the Direct View position.
2. Rotate the zoom knob fully clockwise to adjust for maximum magnification.
3. Adjust the focus knob as required to get a sharp image of the subject. The system is now parfocal. The zoom magnification can be adjusted to any position and the image will stay clearly in focus.
4. Swing the Oblique Viewer to the oblique view position. The center of the image will be in focus on the subject.
5. To view a section of the subject that is not in focus, move the subject into the focused area. Do not adjust the focus knob on the zoom body.
6. The Oblique and Direct Viewer is now set up and ready for use.



*The use of the 4" x 4" Floating Stage (C-070) greatly increases the efficiency of "scanning" the subject so that all areas are properly covered and inspected without the need to move the part. Scanning Tables (C-163 and C-164) are available for inspecting printed circuit boards.*

## Oblique and Direct Viewer Optical Specifications

| Viewing Angle from Vertical | Magnifications                 |                                | Working Distance |
|-----------------------------|--------------------------------|--------------------------------|------------------|
|                             | Direct View                    | Oblique View                   |                  |
| 34 Degrees                  | 7-40X                          | 4.8-28X                        | 28mm             |
|                             | 10.5-60X<br>w/ multiplier 1.5X | 7.35-42X<br>w/ multiplier 1.5X |                  |
|                             | 14-80X<br>w/ multiplier 2.0X   | 9.8-56X<br>w/ multiplier 2.0X  |                  |

# Measurement Options

## Reticles

Reticles are clear glass inserts that can be placed into the optical path of the Lynx or Alpha. The reticle can be simple such as a fine crossline, or it can be more complex such as a graduated scale for measuring subjects. Vision Engineering Inc. offers a variety of standard and custom reticles for any application.

### **Installation in Lynx:** (Refer to Lynx Assembly / Instruction manual)

1. Squeeze the securing clip at the base of the front cover and lift the front cover off.
2. The reticle can be located in the right or left optical path. Loosen the appropriate knurled retaining knob and slide the reticle assembly into position and tighten the knob slightly.
3. Focus the reticle image by moving the reticle assembly up or down as required until a sharp image is attained.
4. Tighten the retaining knob.
5. If required, rotate the reticle by inserting a small dowel (supplied) into a hole in the rotation ring on the reticle assembly and turning to desired position.
6. Replace the dowel to its storage position and close the front cover.

### **Installation in Alpha:** (Refer to the ISIS Instruction manual)

1. Remove a rear cover from the ISIS head. It is held in place with 3 Philips head screws.
2. Unscrew the extending lens holder and remove it from the head. It is held in place with 3 Philips head screws
3. Remove the blank (field stop) that is under the extending lens holder and install the new reticle assembly in its place, ensuring the serration on the OD of the reticle assembly engage with the small gears in the head assembly. The small gear is installed on an eccentric bushing and its position can be adjusted to ensure smooth rotation of reticle when turning thumbwheel.
4. Replace the extending lens holder.
5. Replace the rear cover.

# Measurement Options

## Reticle calibration

Crossline reticles can be used at any magnification. Reticles with measuring scales must be calibrated (using a calibration scale) to a specific magnification. It is good practice to verify the calibration of the reticle at the start of each shift, operator change or if the scope was used at other magnification settings. Calibration scales are available from Vision Engineering Inc. See below for calibration procedure.

- 1) Install the reticle as described above.
- 2) Place a reticle measuring scale under the Dynascope and center it with respect to the reticle graduations in the viewing screen. Focus on the measuring scale at the highest magnification.
- 3) Adjust the zoom magnification to the approximate magnification required for the reticle. Look into the viewing head and fine tune the magnification and measuring scale position until the appropriate measuring lines are superimposed over each other.
- 4) Loosen the clamp screw on the index ring that is located on the right hand zoom knob.
- 5) Adjust the position of the ring so the indicator mark corresponds to the mark on the right front of the zoom body. Tighten thumbscrew.

The zoom control can now be rotated for viewing as required. When the reticle is to be used for a measurement, rotate the zoom knob until the index marks are in alignment. The magnification and reticle are calibrated at this setting and measurements can be taken.

## Standard reticles for Lynx:

| Part Number      | Description  |
|------------------|--|
| <b>C-094</b>     | Lynx, Vertical micrometer scale: 10mm in 100 divisions                 |
| <b>C-134</b>     | Lynx, Cross line reticle featuring 0.0006" line width                  |
| <b>LYNXB0302</b> | Horizontal reticle featuring 0.001" divisions calibrated at 30x        |
| <b>LYNXB0307</b> | Horizontal reticle w/ crossline and 0.001" divisions calibrated at 30x |
| <b>LYNXB0827</b> | Horizontal reticle featuring 0.001" divisions calibrated at 25x        |
| <b>LYNXB0828</b> | Horizontal reticle w/ crossline and 0.001" divisions calibrated at 25x |

## Measurement Options

### Standard reticles for ALPHA:

| Part Number       | Description                                     |
|-------------------|---|
| <b>AL-NE7</b>     | Scale with crossline: 10mm in 100 divisions     |
| <b>IS-070/NE8</b> | Cross line reticle featuring 0.0006" line width |

### Reticle Calibration Scales:

| Part Number     | Description  |
|-----------------|--|
| <b>VS4/0005</b> | Metric calibration scale: 25mm in divisions of 0.1mm     |
| <b>VS4/0006</b> | English calibration measuring scale: 1" in 200 divisions |

Custom reticles can be designed to meet your specific requirements. Contact Vision Engineering for more information.

### 2" x 2" Measuring Stage; P/N C-136

The 2" X 2" measuring stage is designed for use only with the C-010X bench stand. It is supported by linear bearings for smooth, accurate linear motion. It however, is not a floating stage. It is supplied with two digital micrometer heads to provide the X and Y measurements of stage motion. The use of a cross-line reticle is required (See Options - Reticles).

In general, stereo microscopes are not ideal as measuring tools. Accuracy is somewhat compromised due to the fact that there are two optical paths. This option is designed to provide a quick measurement for dimensions of low to medium tolerance. Accuracy can be improved by taking measurements with the Camera activation knob (See Options - Cameras) activated. This eliminates one optical path and will improve the repeatability of the measurements.

# Measurement Options

Page intentionally left blank

## Stands and Stages

### Extended Horizontal Bar; P/N 169-A0674/B

This option provides an extra 8" of throat depth to the standard C-145 boom stand. The overall length of the bar is 23". This extended bar should be used when large objects such as printed circuit boards, machined parts or molds are being examined or reworked.

### 18" x 24" Table Base; P/N TS3/263

Used in conjunction with the C-145 boom stand, this accessory allows the Dynascope system to be set up in a location where drilling mounting holes is not practical. Also permits the unit to be moved from one location to another with minimal effort. The base is covered with a static dissipative laminate to offer ESD protection to  $>10^6 - <10^9$  Ohms @50%RH.

### Weighted Base; P/N MSP/081

Used as an accessory to the C-145 boom stand, this allows the system to be set up in locations where bench space is at a premium and portability is required. The base is 10" x 10" and is pre-drilled with the bolt pattern for the boom stand base casting. This accessory is designed to be used only with ISIS/ALPHA systems.



**CAUTION !**

*There is risk of a tip –over condition if excess weight is placed on the end of the boom arm. Only use the weighted base option with ALPHA systems. Not to be used with Lynx systems.*

### Power assist boom stand upgrade; P/N MSP/062

This accessory fits the existing base casting of the standard C-145 Boom Stand. It incorporates a gas charged counter balance to offset the weight of the Dynascope head and accessories while providing a stable mount to minimize vibration. Use this unit when the system needs frequent gross-height adjustments due to varying subject sizes.

Installation:

The Power Assist Boom Stand Upgrade comes with a new vertical shaft and 90-Degree knuckle assembly, complete with gas charged piston. Install this unit onto your existing boom stand as follows:

1. Remove Dynascope head, zoom and illuminators from the existing stand by loosening the clamping handle under the 90-Degree knuckle.
2. Support the weight of the system and slip the horizontal boom arm out of the 90-Degree knuckle.
3. Loosen the set screw located on the rear of the round base casting for the boom stand. Slip the vertical shaft out of the base.
4. Transfer the black stop collar and clamp handle to the new vertical shaft.
5. Install Power Assist assembly into the base casting and tighten the set screw to secure it in position.



## Stands and Stages

6. Re-assemble the Dynascope head and horizontal shaft into the knuckle on the power assist assembly.
7. The system is ready for use.

### Use:

The basic components of the Power Assist boom stand are similar to original stand. Loosen the clamping handle on the front of the knuckle casting to enable vertical movement of the boom. Support the weight of the Dynascope head at the very front of the system and apply slight upward pressure to move the system higher on the column. To make a downward adjustment, with one hand, apply light upward pressure at the very front of the system (at the front of the zoom) while applying downward pressure directly at the 90-degree knuckle with the other hand. Once the height is set, securely tighten all clamping handles and position the stop collar below the 90-degree casting.



*While the gas charged counter balance would support the weight of the Dynascope and accessories unaided, it is recommended that the clamp handle for the boom is tightened and the stop collar is placed under the 90-degree casting.*

### Flex Arm Stand; P/N FAS25-TC

This stand provides the greatest flexibility for ALPHA systems. The unit clamps to a bench or suitable vertical / horizontal support and has an articulated motion to provide coverage over a large surface area and adjusts easily for variations in height requirements. Recommended for use with the HLS-001/S illuminator that features a 36" fiber bundle to permit the greatest flexibility.

### Use:

- 1) Clamp the base to a suitable surface that will support the weight of the microscope.
- 2) Attach the articulated arm assembly to the base by sliding the post into the brass bushing in the base.
- 3) Slide the zoom pod C-146 into the dovetail assembly at the end of the articulated arm and tighten the 3 set screws on the side of the dovetail assembly securely.
- 4) Assemble the remaining components as described in the Instruction Manual.

### 4" x 4" Floating Stage; P/N C-070

The 4" X 4" floating stage is designed for use only with the C-010X bench stand. The floating stage is supported by linear bearings for smooth operation. The center of the stage is glass which allows the stage to be used with sub-stage illumination (See Options - Lighting).

The floating stage quickly mounts to a C-010X bench stand with 4 socket head cap screws

## Stands and Stages

### 12" x 10" VS8 Scanning Table; P/N C-163 and 18" x 18" VS8 Scanning Table; P/N C-164

These large scanning tables with floating stages are designed to be used in conjunction with Oblique and Direct Viewing Attachments to enhance printed circuit board inspection. Available in two sizes, the tables have a smooth running X – Y stage supported on bearing slides featuring X and Y position locks. Quick release board fixtures permit easy change-out of boards being inspected. Lynx / Alpha units configured with a scanning table are referred to as a VS8 Inspection System.

Use:  
Coarse Focus (Height) Adjustment

The VS8 incorporates an adjustment for the height of the Dynascope head. Support the weight of the VS8 with one hand and loosen the locking knob on the back of the bench stand. Adjust the position, and re-tighten the locking knob.



*This adjustment is not counterbalanced and the weight of the Dynascope head is considerable. It may helpful to support the weight with two hands and have a second person loosen the locking knob and make the adjustment.*

Now that the image is in focus at the lowest magnification it is advisable to fine-tune the focus at the highest magnification. Turn the zoom adjustment all the way clockwise. The magnification will then be at its maximum setting. Adjust focus as described above. By focusing at the highest magnification the unit is now *parfocal*. Parfocal means that the image remains in focus throughout the zoom magnification range. This feature makes it quick and convenient to inspect subjects at lower magnifications and then “zoom in” on specific areas without re-focusing.

Floating Stage Adjustment



*Before attempting to use the floating stage remove the transit screws used to lock the stage during shipment.*

The floating stages incorporate a quick release feature specifically designed for printed circuit boards. When adjusted correctly a simple spring release clamp allows quick loading and unloading of similar sized P.C. boards. Follow these steps to set-up the quick release feature.

1. Loosen the left side thumbscrew furthest from the front of the stage.
2. Move the adjustable horizontal bar close to the fixed horizontal bar.
3. Check to see that the adjustable horizontal bar is parallel to the fixed horizontal. If not then adjust parallelism using the parallel adjustment thumbscrew located to the right of the vertical bar.
4. Move the adjustable horizontal bar away from the front of the stage by an amount at least as much as the width of the P.C. boards to be inspected.

## Stands and Stages

5. Place the P.C. board to be inspected into groove in the fixed horizontal bar.
6. Adjust the position of the adjustable horizontal bar such that the P.C. board extends 3mm past its top edge. Re-tighten the thumbscrew.
7. Activate the quick release feature by pressing the front of the vertical bar upward with your thumb while bracing your index finger against the thumb screw on the left of the upper stage plate. This will cause the adjustable horizontal bar to move up and the P.C. board will drop into place.
8. Release the spring bar to clamp the P.C. board.

The floating stage also comes equipped with separate work holder clamps for use when a P.C. board will not fit into the quick release holder.

One or both axes of the floating stage can be locked. The stage locking mechanism is located on the right hand side of the stage. Rotate the thumb wheel in the direction of the arrow to lock the stage and backwards (opposite the direction of the arrow) to release it.

### ESD Protection

The VS8 S.M.D. Inspection System is designed for use with delicate electronic components. Many of these components are sensitive to electrostatic discharge (ESD). To protect sensitive components from damage the VS8 system incorporates features to safeguard against ESD.

The base table of the VS8 is covered with a protective laminate. This laminate is anti-static and dissipative. It is in contact with a grounding post located on the bottom side of the base table. This grounding post should be connected to earth ground through a one Megohm resistor.

There is a female connector located on each side of the base table for connection to operator wrist straps. These connectors are hard wired to the grounding post under the base table.

The floating stage is directly connected to the laminate surface thereby allowing it to dissipate any charge.



*For maximum protection from Static generation it is recommended that the VS8 be regularly cleaned with anti-static cleaner.*

## Photo Attachments

Camera options allow for a variety of ways to capture images from the Dynascope optics. Each camera arrangement requires a photo adapter, focusing assembly and specific camera adapters. Any style of camera that can accept a “C – Mount”, “T2” or Polaroid mount can be interfaced to the LYNX / ALPHA. The most popular type of cameras in use as of this printing are the CCTV camera and Digital Camera.



*There are many digital cameras available on the market. In order for a digital camera to interface to the Dynascope, it must have a C-Mount interface. Check with the manufacturer of your camera to see if an adapter is available. Cameras and video equipment purchased through Vision Engineering have been tested for compatibility.*

### Camera Arm; C-069

The camera arm is the first component to be installed, regardless of camera type. It mounts between the zoom body and the Dynascope head. To see the image through the camera, slide the lever on the camera arm all the way to the left. The slide lever movement is from the front of the unit and to the left-hand side. This will re-direct one of the optical paths to the camera and eliminate that path from the viewing screen, thereby yielding a mono image. For this reason engage the camera only when needed and not for normal stereo viewing.

### Adapter / Focus Assemblies

The focus assembly attaches directly to the camera arm. There are a number of focusing assemblies available depending upon the camera type used:

#### Polaroid MicroCam Camera Mount; P/N C-061

Camera image focusing is accomplished with the focus ring. This is a knurled ring directly below the grooved camera mount on the focusing assembly. Rotating this ring will cause it and the grooved camera mount to move “up” or “down” vertically. When the camera is mounted, this vertical motion focuses the camera image.

#### 35mm Camera Extension; P/N C-062

Camera image focusing is accomplished with a slide mechanism. This is a knurled screw directly below the grooved camera mount on the focusing assembly. Loosening the screw will allow the vertical position of the camera to be adjusted. Move the slide “up” or “down” until the camera image is in focus.

Camera image centering is possible by adjusting the 2 positioning screws near the top of the focus assembly, just below the camera itself. Move the thumbscrews until the camera image is in the desired position.

# Photo Attachments

## **C-Mount CCTV Adapter; P/N C-063**

Camera image focusing is accomplished with a slide mechanism. This is a knurled screw directly below the grooved camera mount on the focusing assembly. Loosening the screw will allow the vertical position of the camera to be adjusted. Move the slide “up” or “down” until the camera image is in focus.

Camera image centering is possible by adjusting the 2 positioning screws near the top of the focus assembly, just below the camera itself. Move the thumbscrews until the camera image is in the desired position.

## **Nikon Coolpix Interface Assembly; P/N C-176**

Camera image focusing is accomplished with a slide mechanism. This is a knurled screw directly below the grooved camera mount on the focusing assembly. Loosening the screw will allow the vertical position of the camera to be adjusted. Move the slide “up” or “down” until the camera image is in focus.

Camera image centering is possible by adjusting the 2 positioning screws near the top of the focus assembly, just below the camera itself. Move the thumbscrews until the camera image is in the desired position.

Focus assembly installation procedure:

1. Orient the appropriate (see below) focusing assembly with the C-069 Camera Arm by aligning the dovetail on the focus assembly over the port on the camera arm.
2. Attach the focusing assembly by tightening the knurled thumbscrews at the end of camera arm near the base of the focus assembly.

# Cameras

## **CCTV Video**

CCTV Video offers viewing in real time on a separate monitor. Video is a great way to show images to groups of people for training or discussion. Complete color and black & white systems are available. They require the following components:

| <b>Part Number<br/>( Color Video )</b> | <b>Part Number<br/>( B &amp; W Video )</b> | <b>Description</b>   |
|--|--|----------------------|
| C-069                                  | C-069                                      | Camera Arm           |
| C-063                                  | C-063                                      | C-Mount CCTV adapter |
| CVC/001                                | BWVC/001                                   | Video Camera         |
| CPS/0001                               | BWPS/0001                                  | Camera Power Supply  |
| CVM/0001                               | BWVM/0001                                  | Video Monitor        |

## Photo Attachments

Use:

Assemble and adjust the CCTV camera system as follows

- 1) Screw the camera onto the adapter until it is snug.
- 2) Connect the power supply output cable to the terminals on the CCTV camera. Plug the power cord of the camera power supply into a wall outlet.
- 3) Plug the monitor power cord into a wall outlet. Using the supplied BNC cable, connect the camera to the monitor. Turn the monitor "ON".
- 4) Place a subject to be viewed under the LYNX or ALPHA and focus at the highest magnification. Once adjusted, place zoom to lowest setting.
- 5) Slide the camera activation lever located on the camera arm.
- 6) Adjust the slide on the focusing assembly while looking at the monitor until the image is in sharp focus.
- 7) Rotate the camera until the image is properly oriented by loosening the two thumbscrews at the base of the camera adapter. Re-tighten the two thumbscrews.
- 8) Adjust the two image centering thumbscrews located on the photo adapter while looking at the monitor to properly center the image.

The system is now ready for use.

# Photo Attachments

## Nikon Coolpix Digital Camera; P/N C-169

The components required to interface a Coolpix Digital camera are as follows :

| Part Number | Description                         |
|-------------|-------------------------------------|
| C-069       | Camera Arm                          |
| C-176       | Nikon Interface / Focus Assembly    |
| C-169       | Nikon Coolpix Digital Camera System |

1. Screw the camera onto the adapter until it is snug.
2. Follow Nikon's instructions for installing the camera hardware, drivers and software bundle on your computer.
3. Place a subject to be viewed under the LYNX or ALPHA and focus at the highest magnification.
4. Slide the camera activation lever located on the camera arm.
5. Adjust the slide on the focusing assembly while looking at the LCD screen on the back of the camera body until the image is in sharp focus.
6. Rotate the camera until the image is properly oriented by loosening the two thumbscrews at the base of the camera adapter. Re-tighten the two thumbscrews.
7. Adjust the two image centering thumbscrews located on the photo adapter while looking at the computer monitor to properly center the image.

The system is now ready for viewing.



*For general work at low magnifications, the Nikon Coolpix may be left in the Auto-Focus mode. The camera will stay parfocal with the Dynascope regardless of its focus setting. For very detailed work at higher magnifications the camera should be used in manual focus mode.*

It is beyond the scope of this document to provide detailed instruction on the use of the Nikon Coolpix Digital Camera. Please refer to the documentation supplied by the manufacturer.

# Maintenance

## Service

To keep the Dynascope system operating at peak efficiency, Vision Engineering recommends the use of a microscope service to clean and inspect the optics annually. If a suitable microscope service is not available the unit may be returned to Vision Engineering Inc. for servicing. Standard hourly labor rates will apply.

Contact Vision Engineering for a Return Authorization Number prior to sending any goods for repairs or cleaning. Shipping and packaging instructions will be given at that time.

## 21 Volt 150 Watt Illuminator and 24 Volt 250 Watt Illuminator



CAUTION !

*Illuminators and bulbs operate at elevated temperatures. Always allow at least 15 minutes for the bulb to cool before servicing.*

### Bulb Replacement

#### Service Interval: As required

Disconnect the Illuminator from its Power Supply/Transformer. After allowing sufficient time to cool, remove the back of the illuminator by squeezing the tabs at the top and bottom of the unit and pulling the back assembly out of the housing. Firmly hold the housing then, grasp the bulb with your thumb and forefinger, and pull the old bulb from the socket.

***Do Not touch the base, pins or filament assembly of the new bulb during installation. Oil from your hands can cause premature bulb failure. Hold the bulb only by its reflector.***

Insert the new bulb by pressing firmly and seating the two bulb pins into the two holes in the ceramic lamp socket. Full engagement of the pins is important. Replace the bulb housing assembly by sliding it into the rear of the illuminator until it “clicks” into position.

Be certain to inspect the ceramic lamp socket at each bulb change for heat discoloration, cracks and flaking at each bulb change.

### Ceramic Lamp Socket Replacement

#### Service Interval: 1000 Hours

Remove the bulb housing and bulb as described above. The ceramic lamp socket is attached to the rear housing and has two wires that connect to a terminal strip. Remove the 2 screws that attach the socket to the housing and loosen the appropriate 2 terminals on the terminal strip. Discard the old socket and install the new one.



# Maintenance



*When replacing the bulb socket, loosen both mounting screws with a hex key. After both screws can be turned easily with your fingers, continue to unthread them completely.*

## Fuse Replacement

The fuse is accessible from the back panel of the Power Supply Transformer or Bench stand. Use a screwdriver to remove the fuse holder. Replace with the proper rating fuse as indicated on the back panel of the power supply transformer.

## Illuminator Fan and Transformer Cooling Vents Service Interval: Weekly

Inspect the cooling fan and cooling fan vents for debris build-up. The front and rear vents must be clean to allow adequate airflow. Inadequate airflow results in increased operating temperatures and reduced bulb life. The fan should be running whenever power is supplied to the illuminator.

## Illuminators

The cooling fan is attached to the back panel of the illuminator case. The cooling fan vents are incorporated into the back panel directly behind the fan and at the bottom of the front cover.

## Power Supply Transformers

A cooling fan for the transformer unit is attached to the back panel of the case. The cooling fan vents are incorporated into the back panel directly behind the fan. Additional intake vents are located on the illuminator front panel. These intake vents must be kept clean and unobstructed.

## Cleaning the Dynascope

Keeping the exterior of the Dynascope clean will prevent dust and dirt from entering the system optics. Clean the exterior surfaces of the Dynascope with any mild, industrial cleaner. Anti-Static cleaners are recommended because reducing static reduces dust build-up.

Use a soft, lint free cloth for cleaning, especially when cleaning the viewing screen. Use a dust cover whenever possible.



**CAUTION !**

*When cleaning oblique viewers, do not wipe the angled mirrors directly as damage to the reflective coating may occur. Use only CLEAN, DRY compressed air to blow off any dust or debris.*

# Maintenance

## Spare Parts List

| Part Number | Description  |
|-------------|--|
| LAM- 0106   | 21V 150 Watt Halogen Bulb                                      |
| 64653       | 24V 250 Watt Halogen Bulb                                      |
| LAM-1300    | 12V 20 Watt Halogen Bulb                                       |
| F1A250V     | 1 Amp Fuse   |
| F2A250V     | 2 Amp Fuse   |
| F5A250V     | 5 Amp Fuse   |
| HX873       | Ceramic Bulb Base – 150 Watt Systems                           |
| LAM-0099    | Wire loom and bulb socket assembly – 150 Watt systems          |
| LAM-0213    | Bulb Socket Assembly - 250 Watt Systems                        |
| 190-A-0073  | Front viewing lens; LYNX                                       |
| 190-B0039   | Motor / Disk assembly ; LYNX                                   |
| 190-D0043   | Hinged front access cover; LYNX head                           |
| 192-A0035   | Illuminator PCB for C-030/N and C-028                          |
| 192-B0009   | Molded lower casing for illuminators and power supplies        |
| 192-B0011   | Cable; 150W PS to Illuminator ( Blue connectors)               |
| 192-B0012   | Cable; 250W PS to Illuminator ( Green connectors)              |
| 192-B0013   | Cable; Power supply to boom mount zoom                         |
| 192-B0013/S | Cable; Power supply to boom mount zoom. Special 10 ft version  |
| 192-A0140   | Cable; Power Supply to Beta Zoom                               |
| 192-B0024   | Ferrule; 250W  |
| 192-B0023   | Ferrule;150W   |
| 192-B0045/C | 250W Front panel PCB for C-029 transformer                     |
| 200-B0211   | Y Cable for Alpha head to zoom connector                       |
| 188-A0841   | Focus Knob Assembly  |
| 188-A0842   | Zoom Knob Assembly, LH, numbered                               |
| 188-A0565   | Zoom Knob Assembly, RH w/ index ring                           |
| C-103       | Dust cover   |
| C-120       | Replacement column cap for C-010X bench stand                  |
| C-122       | Replacement head & objective securing knobs (4 pack)           |
| C-123       | Replacement diffusers for C-011/N subject tray or C-010/N      |
| C-124       | Circular plate for C-020 substage illuminator                  |
| C-125       | Replacement anti-glare shield; Lynx, Alpha (flat style)        |
| C-149       | OEM Clamp assembly ( used on C-145 boom)                       |
| C-151       | Fresnel lens for C-022 6 point ring light for .3X & .5X        |
| C-165       | OEM adapter; Dovetail to 5/8 dowel                             |
| HAN-0097    | Clamp handle, for C-149 female thread                          |
| HAN-1157    | Clamp handle , male thread                                     |
| MSP/058     | Fiber optic cable retaining collar assembly; C-028 and C-030/N |
| MSP/075     | Fiber optic stop collar; HLS-001 & HLS-002 illuminators        |

# Maintenance

## Oblique and Direct Viewers; C-161 / C-162

### Eliminate Target Orbiting

Eliminating target orbiting requires that the angle of the adjustable angled mirror be changed until the centering target maintains its position throughout the oblique rotation.

1. Set zoom control to the highest magnification. Do not move the centering target.
2. Move the oblique view into position. On manual systems this is accomplished by swiveling the unit into place by hand. On a the motorized system press the single, lower button on the wired remote control to bring the oblique view into position.
3. Remove the rotating mirror shroud located under the oblique-viewing head by loosening the 3 set screws (0.9mm key) from the bottom side of the conical shroud. Unscrew shroud from oblique.
4. Rotate the oblique view. On a manual system, spin the oblique assembly by hand to rotate the view. On a motorized system view rotation is accomplished by pressing the two upper buttons on the wired remote control. Rotate the oblique view until the adjustable angled mirror (visible under the oblique viewing head) is closest to you. In this position 3 small set screws and one knurled thumbscrew should be facing you. These are the mirror adjustment screws.
5. Mark this position "12" on the oblique housing using a small piece of tape. This is the "12 O'clock" position.
6. Rotate the view 180 degrees until the angled mirror adjustment screws are facing away from you. Mark this position "6" on the oblique housing using a small piece of tape. This is the 6 O'clock position.
7. Note: Marking these positions on the oblique eliminates the need to look under the oblique for set screw access every time an adjustment needs to be made.
8. Rotate the view to the 6 O'clock position. Observe the position of the target.
9. Note: At this point the target may not be centered in the field of view or properly focused. This will be addressed later in this procedure.
10. Rotate the oblique view into the 12 O'clock position. Did the target shift position between the two views? If it did then the target is orbiting and the angled mirror needs adjustment.
11. Loosen the thumbscrew located on the adjustable angled mirror. The thumbscrew is a locking device to prevent any drift of the 3 adjustment set screws. It must be loose before attempting any adjustments.
12. Alternate between the two views and adjust the set screws until the target maintains its position in both views. This center of rotation may not be in the center of the field of view. Please note that as magnification increases the adjustments become finer and fussier
13. Note: All adjustments must be made from the 12 O'clock position. Moving the target "up" in the 12 O'clock view moves it "down" in the 6 O'clock view and vice versa. When making adjustments move the target "halfway" between the two observed positions. The idea is to find the rotational center of the oblique view.

## Maintenance

14. Gradually increase the magnification and repeat step 10 until the target orbiting is eliminated throughout the zoom range..

### Eliminate Focus Orbiting

When viewing in the direct view the image (when properly focused) is clear throughout the entire field of view. The oblique view is different. Due to the mirror angles only a portion of the field of view is in focus. This portion is called the focused area.

Eliminating focus orbiting requires moving the adjustable angled mirror position (without changing its angle) until the focused area maintains its position throughout the oblique rotation.

1. Set zoom control to the highest magnification. Do not move the centering target.
2. Rotate the oblique view to the 6 O'clock position. Observe the focused area position in the field of view.
3. Rotate the view to the 12 O'clock position. Has the focused area changed position between the two views? If it has then the focus is orbiting and the angled mirror requires adjustment.
4. Check to see that the thumbscrew on the adjustable angled mirror is loose.
5. Observe the position of the target. Consider this position to be the "Home" position.
6. Adjust the three set screws equal amounts (in the same direction) to move the focused area in the proper direction. In theory, moving the three set screws equal amounts will move the mirror without changing its angle. In practice this is difficult to accomplish. Any change in mirror angle will shift the target from the "Home" position. The best adjustment method is to turn one set screw in the proper direction and then turn the other two set screws in the same direction until the target returns to the "Home" position.



*All adjustments must be made from the 12 O'clock position. Moving the focused area "up" in the 12 O'clock view moves it "down" in the 6 O'clock view and vice versa. When making adjustments move the focused area "halfway" between the two observed positions. The idea is to find the rotational center of the oblique focused area.*

7. Alternate between the two views and adjust the set screws until the target maintains its focused area in both views. The focused area may not be in the center of the field of view.
8. Gradually increase the magnification and repeat steps 6 and 7 until the focus orbiting is eliminated throughout the zoom range. Please note that as magnification increases the adjustment increments become finer.
9. Tighten the thumbscrew on the angled adjusting mirror to lock it in place.

# Maintenance

## Centering the Focus

At this point the oblique view position and focus are maintained throughout the rotation of the oblique. It is now necessary to adjust the oblique focus so that it is located at the center of the field of view.

Adjusting the focus requires that the oblique head be moved relative to the Dynascope frame.

1. Remove the plastic shroud from the Oblique and Direct Viewer by removing the 3 screws on top of the unit.
2. Loosen the 3-cap screw that hold the oblique viewer mounting flange to the Dynascope frame. It is important to loosen the screws as little as possible (1/4 turn maximum). Excessive loosening will cause the oblique viewer to drop to a lower position and thus alter the focus position.
3. Return the Oblique and Direct viewer to the Dynascope and set the magnification at the highest setting. Maintain the view in the Oblique position
4. Move the oblique viewer position until the focused area is in the center of the field of view.
5. Rotate the oblique viewer 90 degrees check for centering and adjust the 3 set screws positioned around the circumference of the mount if required. These set screws hold the oblique viewer onto its mounting flange. Focus centering can be achieved by loosening one set screw and tightening the other two to "shift" the oblique viewer location. Repeat steps 4 and 5 until the image is centered when checking between the two views.
6. Re-tighten the 3 cap screws being careful not to move the oblique viewer position.
7. After obtaining proper focus centering, tighten the set screws equally to hold the oblique viewer in place.

# Maintenance

## Centering the Target

At this point the Oblique view is optimized. The Direct view is in focus but not centered. It is convenient for the Direct and Oblique view to have the same center.

Centering the oblique/direct view is accomplished by adjusting the three radial set screws on the direct view assembly.

1. Set the zoom control to the highest magnification.
2. Set the viewer to the Oblique view position.
3. Center the target manually in the field of view.
4. Switch to the Direct view position.
5. Locate the three radial set screws on the Direct view lens assembly. The position of the target can be centered by loosening one set screw and tightening the other two set screws to "shift" the target position.
6. After obtaining proper target centering tighten the three set screws equally to hold the direct view assembly in place.

## Final check

After completing the preceding processes check the image throughout the zoom range for the following:

- Centering of the target in the Oblique View
- Centering of the focused area in the Oblique View
- Centering of the target in the Direct View
- Direct view to Oblique view focus

If any of these are not correct then go back to the appropriate section of these instructions and re-adjust as required.

# Maintenance

Page intentionally left blank

# Troubleshooting Guide

## Dynascope disc is not spinning

The Lynx head has an LED at the Vision Engineering insignia to indicate that power is present to the head. The ALPHA system has an LED at the top of each eyepiece near the electronic connector. If an LED is not lit, then check the following according to the type of system you have:

### Boom Stand System

The Power Supply Transformer for the ring light or the 60-Watt PSU via a connecting cable provides power to the Dynascope head.

1. Verify that the main power cord is properly plugged into the Power Supply Transformer.
2. Verify that the wall outlet supplying 120 VAC.
3. Verify that the power switch is turned "ON".
4. Verify that the connector on the rear of the LYNX Dynascope head (or the Y cable for ISIS ALPHA) is connected to the jack on the top of the zoom assembly.
5. Verify that the black supply cable is connected from the Power Supply Transformer to the connector on the zoom assembly
6. Verify that the fuse in the Power Supply Transformer is in good working condition.

### Bench Stand System

The bench stand provides the power to the Dynascope head and for the supplemental spot lamps where equipped. If the LED on the Dynascope head is not illuminated and/or the spot lamps are not functional, please check the following:

1. Verify that the main power cord is properly plugged into the column of the bench stand.
2. Verify that the wall outlet supplying 120 VAC.
3. Verify that the power switch is turned "ON".
4. If equipped, verify that the connector on the spot lamp assembly is connected to the jack on the underside of the zoom assembly
5. Verify that the connector on the rear of the LYNX Dynascope head (or the Y cable for ISIS ALPHA) is connected to the jack on the top of the zoom assembly
6. Verify that the main fuse in the column is in good working condition.
7. Check the condition of the fuse in the bottom of the bench stand. This fuse is accessed by setting the bench stand on its side and removing the oval shaped bottom cover. The fuse is mounted on a PCB that will be visible once the bottom cover has been removed.



# Troubleshooting Guide

## Bulb Life

Illuminator bulbs are consumable items with limited life. As is the case with traditional light bulbs, illuminator bulbs on the Dynascope will burn out. Manufacturers specified bulb life for the 21 volt 150 watt illuminator is 200 hours. Manufacturers specified bulb life for the 24 volt 250 watt illuminator is 50 hours. These ratings are based on usage at maximum intensity and increase when lamps are used at lower intensity settings. The ceramic lamp socket in both illuminators is subject to intense heat and should be replaced on a regular basis to ensure maximum performance. Ceramic lamp socket replacement procedures can be found in the “Maintenance” portion of this manual.



*Where practical, use the illuminators at a setting slightly below the maximum intensity to increase bulb life.*

If bulb life is consistently lower than the Manufacturers specified rating then check the following:

1. Is the bulb fully seated in the ceramic lamp socket?
  - The bulb must be fully seated for proper operation.
2. Is the ceramic lamp socket in good condition? Is there heat discoloration, cracks, flaking?
  - Degraded lamp sockets drastically reduce bulb life, check and replace if necessary.
3. Is the fan operating when power is supplied to the illuminator?
  - The fan should run at all times when power is supplied to the illuminator.
4. Are proper bulb handling procedures being followed?
  - Never hold the bulb by its base, pins or filament. Hold it only by the outer edge of the reflector.
5. Are the cooling fan vents clean and unobstructed?
  - Clean cooling fan vents are important to reduce heat and extend bulb life.
6. Are there significant variations in line voltage?
  - Voltage spikes should be avoided as they can damage the bulb filament.
7. Is the illuminator being turned “ON” and “OFF” frequently?
  - Frequent hard ignitions cause breakdown of the ceramic lamp socket and bulb filament. It is better to dim the lamp to minimum setting than completely turn the unit off in cases where there is intermittent use of the system through out the day.
8. Is the illuminator allowed to cool down a minimum of 15 minutes before re-igniting?
  - Re-igniting the bulb before allowing it to cool can damage the filament

## Warranty



This product is warranted to be free from defects in material and workmanship for a period of one year from the date of invoice to the original purchaser.

If, during the warranty period the product is found to be defective, it will be repaired or replaced at facilities of Vision Engineering Inc. or elsewhere, all at the option of Vision Engineering Inc. However, Vision Engineering Inc. reserves the right to refund the purchase price if it is unable to provide replacement, and repair is not commercially practicable or cannot be timely made. Parts not of Vision Engineering Inc. manufacture carry only the warranty of their manufacturer. Expendable components such as lamps and fuses carry no warranty.

This warranty does not cover damage caused in transit, damage caused by misuse, neglect, or carelessness, or damage resulting from either improper servicing or modification by other than Vision Engineering Inc. approved service personnel. Further this warranty does not cover any routine maintenance work which is reasonably expected to be performed by the purchaser.

No responsibility is assumed for unsatisfactory operating performance due to environmental conditions such as humidity, dust, corrosive chemicals, deposition of oil or other foreign matter, spillage, or other conditions beyond the control of Vision Engineering Inc..

Except as stated herein, Vision Engineering Inc. MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED BY LAW, WHETHER OR MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. Further, Vision Engineering Inc. shall not under any circumstances be liable for incidental, consequential or other damages.

Page intentionally left blank

# Information

## Contact Us

Vision Engineering Inc. is committed to providing top quality optical inspection systems. We employ a staff of trained Sales and Service engineers and have a network of Authorized distributors to assist you. Please call whenever you have questions.

For additional information contact your local Vision Engineering Distributor or call:

**Corporate Headquarters:**

Vision Engineering Inc.  
570 Danbury Road  
New Milford, CT 06776  
Phone: (860) 355-3776

**Western Region Sales Office:**

Vision Engineering Inc.  
745 W. Taft Avenue  
Orange, CA 92865  
Phone: (714) 974-6966

or

**Visit us on the web:**

[www.visioneng.com](http://www.visioneng.com)