



*MICROMANIPULATOR*

# **MICROMANIPULATOR**

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## **1.0 INTRODUCTION:**

A Laser steering and focusing device is often referred to by the generic name micromanipulator. Several manufactures have attached brand names to their particular version of these devices such as Micro-slاد™ or Micro-man™.

This manual will refer to the device as a micromanipulator.

The micromanipulator must be securely attached to an adapter ring, which first must be securely mounted to a microscope. There are many types of microscopes and the appropriate adapter must be ordered when ordering a micromanipulator (prices vary depending on the microscope). Adaptor rings may be ordered for other microscopes at additional cost.

Two types of micromanipulators are available. One is for general use on OR microscopes or Colposcopes where aiming the laser down a narrow channel is not required. This version has a slightly off center bending mirror out of the path of the viewing optics. Little or no vignetting occurs. Most users prefer this type.

In the second type the bending mirror is directly between between the two stereo optic paths. This allows for precise beam steering down confined channels (like a speculum) directly with microscope viewing. Because of this mirror location the viewer may notice a small amount of vignetting.

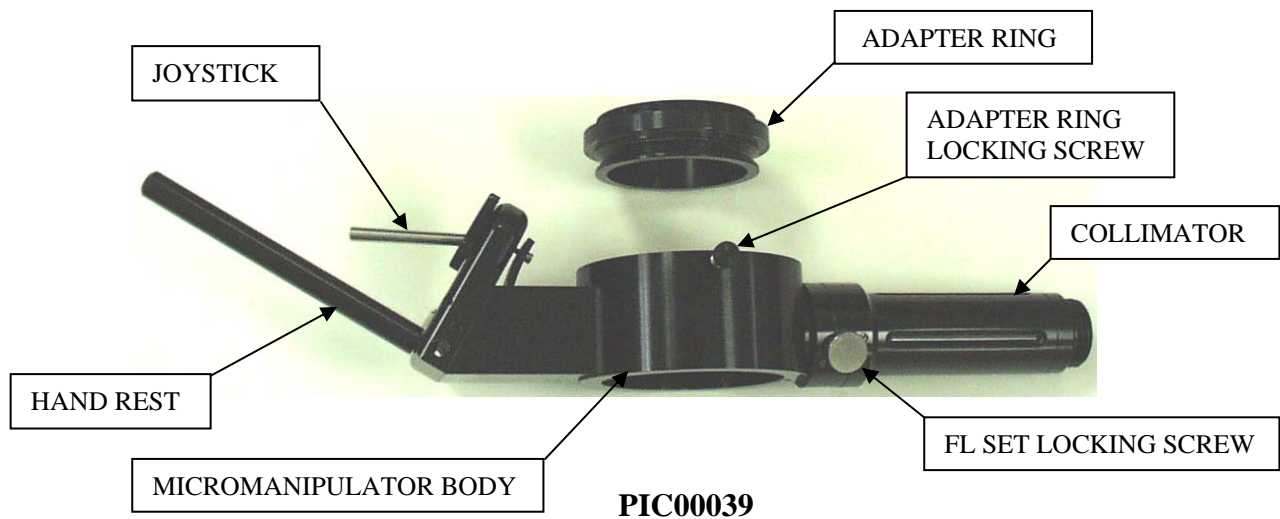
The operation of the micromanipulator is simple. The user is able to manipulate the laser within the viewing area by moving the joystick. It is important that the user become familiar with the movement and sensitivity of the manipulator before it is used in a procedure.

The user is also able to focus and defocus the laser by rotating the focus/defocus barrel on the micromanipulator to suit the procedure. If the procedure does not require changing the focus the focus/defocus barrel does not have to be adjusted.

## **2.0 SAFETY**

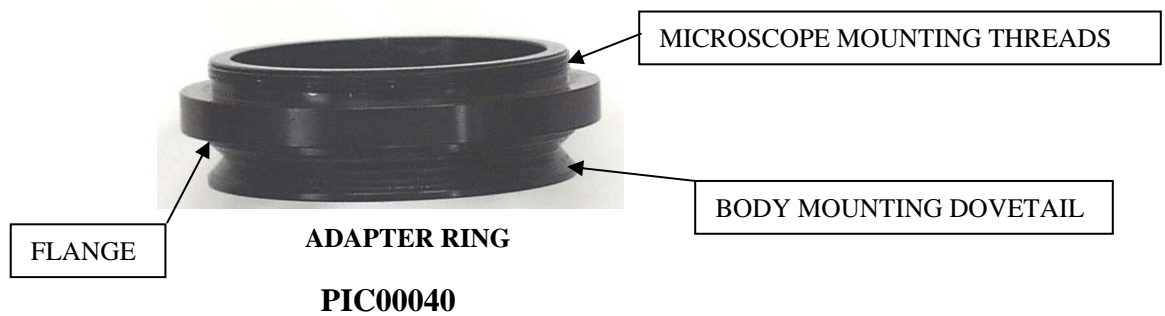
- 2.1 Always turn off the power on the laser before installing any device on the laser or the beam delivery system.
- 2.2 When operating a laser always wear laser safety glasses designed for laser being used.
- 2.3 Never look into the output of any laser device.
- 2.4 Secondary reflections are dangerous; never point the output of the laser at a reflective surface such as instruments, table tops, etc.
- 2.5 Never put anything flammable in the path of the laser.
- 2.6 Always read the instruction manual before attempting to install or operate any laser device.

## MICROMANIPULATOR



### 3.0 SET UP

#### 3.1 MOUNTING THE ADAPTER RING TO THE MICROSCOPE



- 3.1.1 Record the focal length of the microscope objective lens before installing the SCOPE ADAPTER RING on the microscope. This number will be needed in step 3.2.2 when setting the focus.

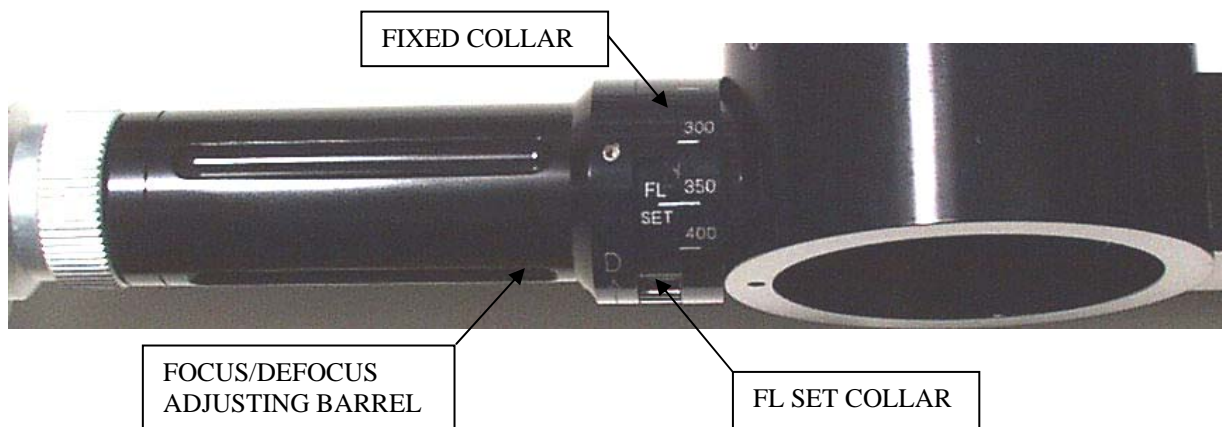
*Note:*

*The focal length is usually engraved on the objective lens at the bottom of the microscope.*

- 3.1.2 Install the SCOPE ADAPTER RING on the Microscope (see photograph PIC00040).

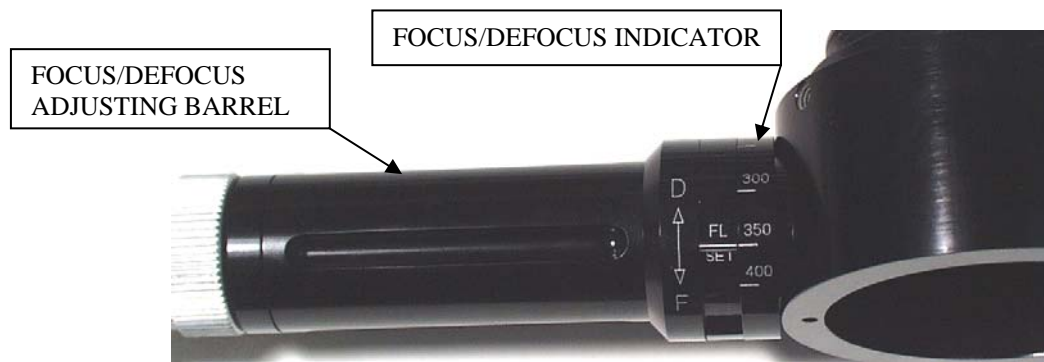
### 3.2 SETTING FOCUS

- 3.2.1 Turn the FL SET LOCKING SCREW (see photograph PIC00039) counterclockwise to loosen the FL SET RING.



**PIC00044**

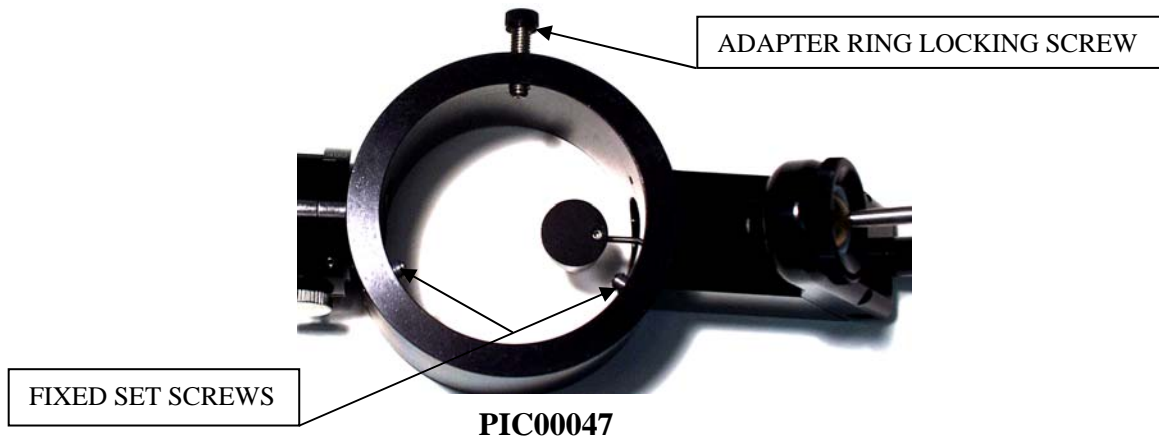
- 3.2.2 Set focal length by rotating the FL SET COLLAR so that the white line on the FL SET COLLAR is aligned with desired focal length engraved on the FIXED COLLAR (see photograph PIC00044).
- 3.2.3 After the focal length is set turn the FL SET LOCKING SCREW clockwise to lock the FL SET COLLAR.



**PIC00046**

- 3.2.4 Focus the MICROMANIPULATOR by rotating the FOCUS/DEFOCUS ADJUSTING BARREL so the silver indicator is aligned with FL SET mark (see photograph PIC00046).

### 3.3 MOUNTING THE MICROMANIPULATOR TO THE MICROSCOPE



- 3.3.1 Back out the ADAPTER RING LOCKING SCREW until the tip of the SCREW is flush with the MICROMANIPULATOR BODY by turning the SCREW counterclockwise (see photograph PIC00047).

*NOTE:*

*Do not remove the ADAPTER RING LOCKING SCREW.*

- 3.3.2 Slip the BODY MOUNTING DOVETAIL of the ADAPTER RING that is mounted to the microscope into the MICROMANIPULATOR BODY. Be sure that the two FIXED SET SCREWS (see photograph PIC00047) are engaged in the DOVETAIL.

- 3.3.3 Rotate the microscope to the preferred position with respect to the MICROMANIPULATOR BODY.

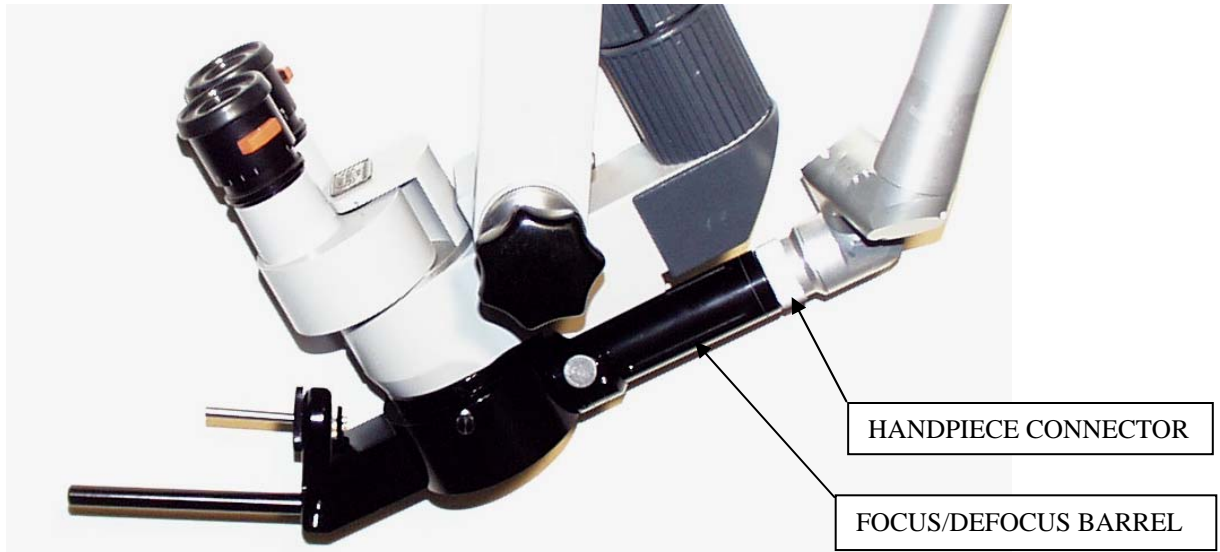
*NOTE:*

*The microscope may be adjusted after this set up is completed.*

- 3.3.4 Make sure that the flange on the SCOPE ADAPTER RING is in contact all the way around with the MICROMANIPULATOR BODY. Then tighten the ADAPTER RING LOCKING SCREW (see photograph PIC00047) by turning the SCREW CLOCKWISE until the microscope no longer rotates.

**WARNING: Failure to properly secure the MICROMANIPULATOR to the ADAPTER RING on the microscope may cause the MICROMANIPULATOR to be unstable or even fall off. Inspect the attachment between the MICROMANIPULATOR and the ADAPTER RING before each use.**

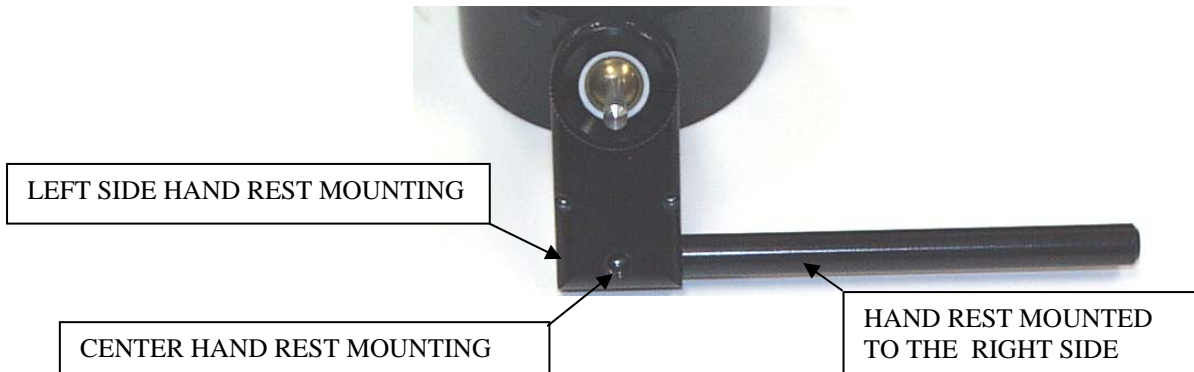
### 3.4 MOUNTING THE MICROMANIPULATOR TO THE ARM



**PIC00042**

- 3.4.1 Thread the **HANDPIECE CONNECTOR** on the arm, clockwise onto the **MICROMANIPULATOR** until it is tight (see photograph PIC00042).

### 3.5 MOUNTING THE HAND REST



**PIC00043**

- 3.5.1 The **HAND REST** can be mounted on the left side, the center or the right side of the **MICROMANIPULATOR BODY**. Install **REST** by threading it clockwise into the desired mounting hole until it is tight (see photograph PIC00043). To remove the **REST** simply turn it counterclockwise until it is free of the **MICROMANIPULATOR BODY**.

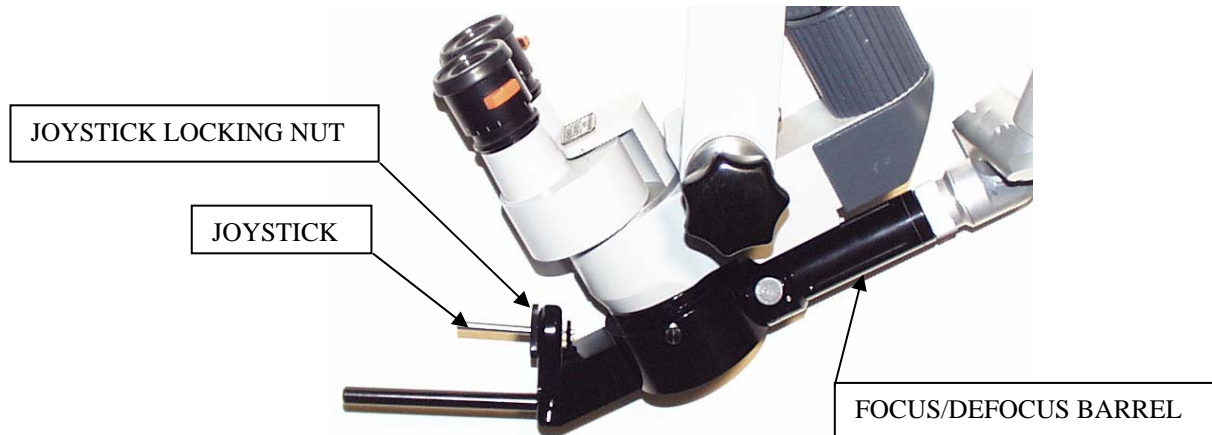
**NOTE:**

*The **HAND REST** is not intended to bear the entire weight of the operator's arm or hand. Excessive weight on the **HAND REST** might rotate the **MICROMANIPULATOR** or loosen it from the microscope.*



## 4.0 OPERATING THE MICROMANIPULATOR

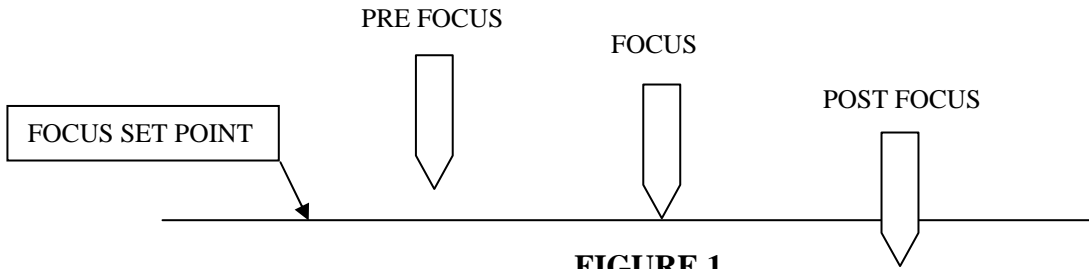
### 4.1.1 JOYSTICK



**PIC00042A**

- 4.3.1 Loosen the JOYSTICK LOCKING NUT (see photograph PIC00042A) by turning the NUT 1/8 of a turn counterclockwise.
- 4.3.2 The operator can now move the JOYSTICK (see photograph PIC00042A) while looking through the microscope to move the Laser within the viewing area.
- 4.3.3 Turning the JOYSTICK LOCKING NUT clockwise will lock the JOYSTICK in position.

## 4.2 FOCUS/DEFOCUS



- 4.2.1 By turning the FOCUS/DEFOCUS ADJUSTING BARREL (see photograph PIC00042A) it is possible to move the Laser focus above and below the focus set point (see figure 1). When the FOCUS/DEFOCUS BARREL indicator is set over the FL SET mark (FOCUS) and the barrel is rotated in the direction of the “D” the Laser will focus above the focus set point (pre focus). When the FOCUS/DEFOCUS BARREL indicator is set over the FL SET mark (FOCUS) and the barrel is rotated in the direction of the “F” the Laser will focus beyond the FL SET point (post focus)

### **WARNING:**

**The MICROMANIPULATOR is capable of focusing below the FOCUS the target might, in fact create the appearance of a defocused spot on the tissue. Always defocus by moving the focus above the focus set point (pre focus).**

## 5.0 MAINTENANCE

5.1 MIRROR: The mirror in the MICROMANIPULATOR should be inspected for debris before each use. If there is debris on the mirror

- 5.1.1 Try to blow the debris off with low-pressure (2 to 5 PSIG) dry nitrogen or air from a blow bulb. **WARNING: Do not use air from an air compressor.**
- 5.1.2 If the debris cannot be blown off, soak a cotton ball with reagent grade isopropyl alcohol then wipe the mirror in one direction. Repeat two or three times until the mirror is clean.

### *Note:*

*To avoid bending the mirror support apply very little force when wiping the mirror.*

5.2 CLEANING: Dampen a clean cloth with reagent grade isopropyl alcohol and wipe all the surfaces (not the mirror see step 5.1). **WARNING: Do not spray or pour the alcohol on any part of the MICROMANIPULATOR.**

## 6.0 SPECIFICATIONS

Standard arm input thread .....	15/16-12TPI
Focus/Defocus range .....	250 – 400mm
Joystick range .....	30 <sup>0</sup>
Input beam .....	To 12mm diameter
Allowable .....	633nm to 670nm (red)
Focus gauge .....	Numeric ring dial
Bending mirror .....	Durable solid aluminum



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