

USE AND CARE OF YOUR
ZOOM STEREO MICROSCOPE
SERIES MZ800

SWIFT®



www.Swift-MicroscopeWorld.com
800-942-0528 Toll Free
760-438-0528 International
info@swift-microscopeworld.com

Copyright 1990

www.Swiftoptical.com
877-967-9438

SWIFT STEREO ZOOM MICROSCOPES

The Swift Series MZ800 (zoom) stereo microscopes are designed to produce a crisp image (erect) with a generous field of view and an excellent depth of focus. The basic magnification range of the MZ801 body is an objective range of 0.8x to 4.0x providing a total magnification with Widefield 10x eyepieces (part MZ816) of 8x to 40x. Other combinations of the magnifications are simply multiples of Widefield 5x (part MZ815), Widefield 15x (part MZ817) or Widefield 20x (part MZ818) with the objective ranges.

Additional options include three auxiliary lenses that attach to the objective pod which doubles (part MZ822-2x lens) the inherent power of the magnification or halves it (in the case of the part MZ820—0.5x reducing lens). In using the MZ820, the (part MZ820A) adapter is required to allow for the additional working distance of that combination.

The various stand options offer an extremely smooth and reliable focusing system. Swift Focus mechanisms are provided with a tension adjustment to prevent any focus drift.

UNPACKING YOUR SERIES MZ800 STEREO MICROSCOPE

Your instrument has been carefully shipped in protective material. When unpacking, be careful not to discard any of the various parts shipped with your instrument — including all the basic parts, standard instruction manual, and accessories.

Basically, the instrument comes in two distinct parts: the stand (with receptacle for the body); illuminator and focusing system in the base; and the body which contains the complete optical system.

When the above parts are unpacked, insert the body in the receptacle ring, making sure it is completely in the opening, and tighten the locking screw to secure the body to the stand. The body may be rotated 360° by simply loosening the set screw and then retightening in any position desired.

FACTS ABOUT STEREOSCOPIC MICROSCOPES

Unlike the compound microscope, the stereoscopic microscope is designed to produce an erect, low magnification image which is viewed in the same perspective as the specimen. The instrument is always equipped with two objectives and two eyepieces, and is often referred to as a

“binocular” microscope by users. The objectives are not supposed to be parallel – but converge toward the specimen. Thus, the MZ800 produces a three dimensional image of the specimen and allows the study of even irregular specimens.

It should be noted that stereo microscopes are most effective at the lower magnification ranges, where it is possible to observe greater specimen depth than at higher powers.

It would, therefore, follow that the higher the magnification, the less actual three-dimensional detail may be observed. Stereoscopic microscopes are especially useful for studying larger specimens that are not practical for observation with the compound microscope – as well as opaque samples, and as specimens suspended in water, for which sub-stage illumination is necessary.

Typical magnification ranges in a stereo microscope are from 8x to 160x. This is accomplished by utilizing a combination of higher value eyepieces, such as 15x or 20x combined with auxiliary (objective) lenses such as 2x, which in effect doubles the objective/eyepiece ratio of the microscope. For example, 10x eyepieces multiplied by 0.8x objectives equals 8x. An additional doubling by objective auxiliary lens increases the power to 160x.

It may be noted that the 0.5x auxiliary lens reduces the inherent magnification and increases working distance requiring an adapter (spacer) that accounts for the additional focal distance, – at the same time, remaining within the focusing range of the stand. The spacer (part MZ820-A) is placed between the base of the body (MZ801) and the holding ring of the stand.

Stereo microscopes are traditionally employed for the following uses: dissecting tissue; observation of botany samples; small mechanical or electronic parts; and finally, live material contained in any suitable transparent container.

Stereo systems provide greater depth of observation. With the proper selection of illumination, one may observe the following opaque samples: wood; metals; and textiles. Observation may be by top illumination or sub-base cool illumination through a transparent stage plate. A choice from the Swift’s wide selection of bases is determined by the characteristics of the specimens to be observed.

For the more demanding high resolution applications, Swift offers the MZ-801 binocular body which is designed for a wide variety of uses –

including small parts inspection, assembly, dissection, or even micro-manipulation.

With a wide selection of auxiliary lenses allowing increased or reduced magnification for user selection, – this system features a continuous zoom range of 0.8x to 4x with a 45° inclined eyepiece and a 360° rotatable optical body.

PARFOCALING AND ADJUSTING YOUR MZ800

Taking into account the fact that everybody has different optical corrections for each eye, in using the microscope – the individual must make the proper interpupillary adjustment (to see one image only). The optical corrections must also be made for each eye (diopter adjustment).

To allow the instrument to be in focus up and down the power change (parfocal), the following procedure should be followed carefully:

1. Place a flat specimen – such as a semi-conductor chip – on the stage plate with adequate illumination.
2. Turn diopter adjustments clockwise (on the eye tubes) until black lines coincide.
3. Observing the specimen through the eyepieces, adjust the interpupillary distance for the observer until the two eyepiece fields merge comfortably into one.
4. Rotate the power change knob (zoom) and set at 4.0x. Now focus with focus knobs (on stand) only.
5. Rotate the power change knob (zoom) to 0.8x and focus each eye (one after the other) with the diopter adjustments only. (This may be achieved by closing one eye while the other is being adjusted).
6. Repeat adjustments 4 and 5 if further focus is required.
7. You will note that the focusing procedure is to focus the instrument with the stand focus knobs on 4.0x and with the diopter knobs at the 0.8x position.
8. Once the diopter rings are adjusted for each eye, new specimens may be focused by the user with the focusing knobs. Other users will have to go through the parfocaling procedure for their particular acuity.

Swift MZ800 Stereo Zoom Series

Catalog No.	Body	Eyepiece	Stand	Illuminator
MZ891	0.8X-4X	W10X.FN.20	MZ803	MZ823
MZ894	0.8X-4X	W10X.FN.20	MZ802/812	None
MZ896	0.8X-4X	W10X.FN.20	MZ803/813	MZ823
MZ897	0.8X-4X	W10X.FN.20	MZ812/MA913	None
MZ898	0.8X-4X	W10X.FN.20	MZ812/HBA	None

MZ800 Optical Data

MZ800 Optical Data

Working Distance	Without Supplemental Lens 100mm W.D.		With 0.5X Lens 185mm W.D.		With 2.0X Lens 37.7mm W.D.	
	Total Mag.	Field of View	Total Mag.	Field of View	Total Mag.	Field of View
MZ815 Widefield 5X FN:20	4X – 20X	25mm – 5mm	2X – 10X	50mm – 10mm	8X – 40X	12.5mm – 2.5mm
MZ816 Widefield 10X FN:20	8X – 40X	25mm – 5mm	4X – 20X	50mm – 10mm	16X – 80X	12.5mm – 2.5mm
MZ817 Widefield 15X FN:15	12X – 60X	18.75mm – 3.75mm	6X – 30X	37.5mm – 7.5mm	24X – 120X	9.4mm – 1.9mm
MZ818 Widefield 20X	16X – 80X	14.25mm – 2.85mm	8X – 40X	28.5mm – 5.7mm	32X – 160X	7.1mm – 1.4mm

Accessories and Components

Swift Body

MZ801 Objective zoom 0.8X-4X with W10X eyepieces

Swift Stands

NZ802 'LBP' stand 12" x 15" (300mm x 375mm) with post and clamp to accept MZ812 or MA912 pod

MZ803 7.2" x 10.6" (180mm x 265mm) stand with black and white contrast plate to accept MZ801 body

MZ805 Complete stand (ova transplant type) which combines MZ803 stand and MZ813 transmitted base

MZ812 Industrial pod to accept MZ801 zoom body for MZ802 LBP, MA807 and MA913 stands

MZ813 Transmitted base only, with clear stage plate

MA913 Attachable bench stand

MA807 HBA Boom arm stand with counter balance

Swift Eyepieces

MZ815 W5X, FN:20

MZ816 W10X, FN:20

MZ817 W15X, FN:15

MZ818 W20X, FN:11.4

MZ819 Eyepiece shields

Swift Amplifying Lens

MZ802 0.5X Reducing lens

MZ822 2.0X Lens

MZ820A Adapter for MZ820 lens

Swift Illuminator

MZ823 10 Watt halogen illuminator with transformer for transmitted base or incident light MZ803

Swift Miscellaneous Accessories

MZ814BW Black and white stage plate, 100mm diameter

MZ814C Clear glass stage plate, 100mm diameter

MZ824 Adapter ring for MZ801 zoom body to accept MA788C fluorescent circular illumination

MZ823BLB 10 Watt halogen bulb for MZ823 illuminator

MZ825 cover glass

ILLUMINATION

The selection of suitable illumination for your stereo microscope is important as the instrument can do no better than the illumination employed will allow. You will note that the illuminator (part MZ823) is an inherent part of the models MZ891 and MZ896 combinations. The MZ891 would be used for opaque specimens – and the latter for either opaque or transparent materials, with the top lighting option or the bottom (transillumination) option.

Swift also offers MA788-C circular fluorescent illuminator (shadow free) with transformer/starter which attaches to the objective cover. Also offered is a separate fiber optic illuminator – MA794.

EYEPIECE SCALES

We offer the following standard eyepiece scales:

1. Part MA6653W 0.1mm increments
2. Part MA6655W 10mm square in 0.5mm squares
3. Part MA6656W Cross hair
4. Part MA6658W Whipple disc 7.0 squares
5. Part MA6659W Swift disc 100mm square in 1.0mm squares
6. Part MA8811W 0.001" increments

Scales may be made up on special order to the user's requirements – but would require a "setup charge" for special art work, etc.

Ideally, microscopes should be ordered with scales installed at the factory. However, scales may be ordered after delivery, and should be installed by a competent person. Subsequent calibration procedures can be made in the field to establish user accuracy.

CARE AND MAINTENANCE

1. Before servicing the instrument, pull primary power cord from receptacle.
2. **Cleaning of Optical Surfaces:**
To clean coated lens surfaces, only dust free cotton material (such as cotton swabs) should be used. The cotton should be lightly moistened with a good quality lens cleaner – such as water, alcohol, or acetone. In order to remove dust from lens surfaces, use clean air such as from a rubber aspirator or canned clean air. It is not an approved practice to blow on surfaces by mouth. When not in use, microscopes should be stored with dust covers in place and the illuminator turned off.
3. **Cleaning Painted Surfaces:**
Use soapy water or good quality (non-abrasive) cleaners to clean painted or plastic surfaces. Do not use organic solvents, or other inappropriate cleaners. Finally, a good quality spray wax may be used for final surface polishing. Be careful not to get wax on lens surfaces.
4. Use and store your instrument in a dry environment – avoiding the influence of direct sunlight, high temperatures, moisture, smoke, or fungus.

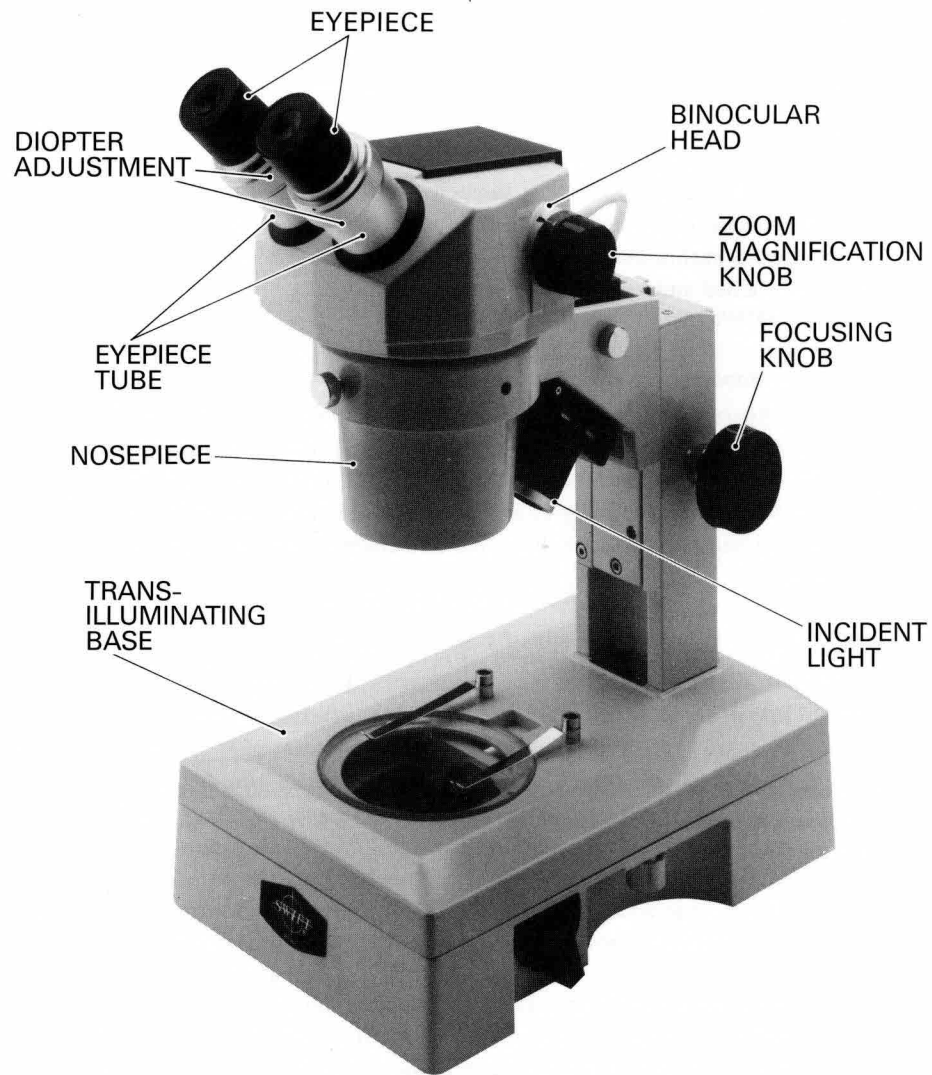
SERVICING RECOMMENDATIONS

In order to avoid possible damage to the instrument, voiding the generous Swift warranty, do not tamper with or attempt to disassemble the mechanisms of your microscope. Servicing should only be accomplished by an authorized dealer, or service organization, who have been especially trained and are equipped with special tools.

TROUBLE SHOOTING HINTS

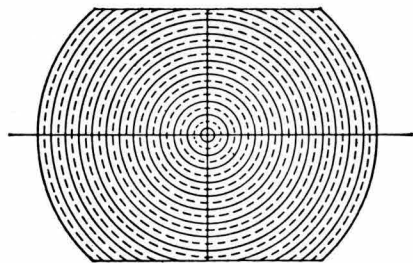
Your Swift stereo zoom microscope (MZ800 Series) should provide long and trouble free service. We urge that, when not in use, the instrument be kept covered. Under no circumstances should any attempt be made to disassemble the body or any of its components in the field, as the sensitive adjustments may be disturbed and the generous warranty could be voided.

<u>Problem</u>	<u>Probable Cause</u>	<u>Corrective Action</u>
Focus knob slipping or inherent loss of focus.	Shaft tension adjustment loose (right side) on focusing shaft.	Tighten tension adjustment clockwise to increase
Misalignment of Images: one eyepiece image to the other.	Severe jolt to the body, such as dropping.	Body should be returned to Swift for realignment.



PARTS LIST

Parts Number	Description	Parts Number	Description
1	Eyepiece	16	Body
2	Mirror Housing	17	Shaft
3	Cover Plate	18	Lens Assembly
4	Zooming Knob Assembly	19	Screw
5	Mirror Seat, right	20	Screw
6	Mirror Seat, left	21	Screw
7	Lens Assembly	22	Cam Assembly, right
8	Washer	23	Cam Assembly, left
9	Mirror Base, right	24	Body Cover
10	Mirror Base, left	25	Washer
11	Washer	26	Screw
12	Pin	27	Cover
13	Screw	28	Reducing Lens 0.5x
14	Washer	29	Amplifying Lens 2x
15	Washer		



MZ800 SERIES

