

**USE AND CARE OF YOUR
ZOOM STEREO MICROSCOPE
SERIES M28**



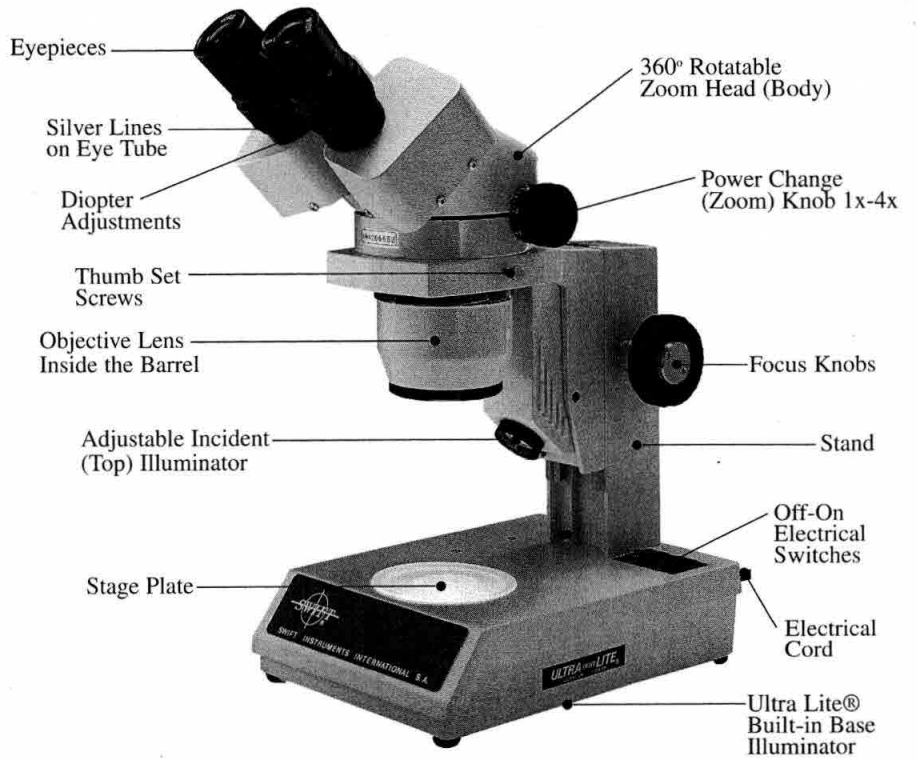


www.Swift-MicroscopeWorld.com
800-942-0528 Toll Free
760-438-0528 International
info@swift-microscopeworld.com

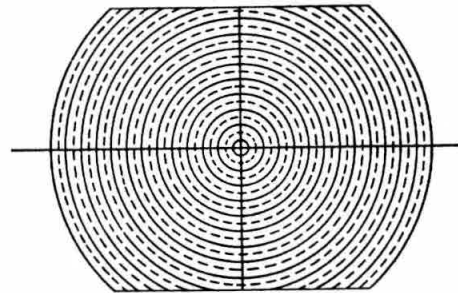
© Copyright 1996

www.Swiftoptical.com
877-967-9438

1996



SCALE FOR CHECKING ALIGNMENT OF STEREO MICROSCOPES



TARGET CARD
Use this for optical alignment inspection

SWIFT ZOOM STEREO MICROSCOPE

The Swift Series M28 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 M28 body, is an objective range of 1X to 4X providing a total magnification with Widefield 10X eyepieces (part # MA2610) of 10X to 40X. Other combinations of the magnifications are simply multiples of Widefield 15X (part # MA2609) with the objective ranges. Swift Focus mechanisms are provided with a tension adjustment to prevent any focus drift.

UNPACKING YOUR SERIES M28 ZOOM STEREO MICROSCOPE

Your instrument has been carefully packaged with the head and stand separately and 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. It is recommended that you save the packing material for re-use.

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 pod, making sure it is completely in the opening, and tighten the locking screws to secure the body to the stand. The body may be rotated 360° by simply loosening the set thumb screws and then re-tightening 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 M28 zoom stereo microscope 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 10X to 40X. Higher magnifications are accomplished by utilizing a combination of higher value eyepieces, such as 15X. For example, 15X eyepieces multiplied by 1X objectives equals 15X. 15X multiplied by 4X objectives equals 60X.

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 made by top illumination or sub-base cool illumination through a transparent stage plate.

Typical magnification ranges in a stereo microscope are from 10X to 40X. Higher magnifications are accomplished by utilizing a combination of higher value eyepieces, such as 15X. For example, 15X eyepieces multiplied by 1X objectives equals 15X. 15X multiplied by 4X objectives equals 60X.

For the more demanding high resolution applications, Swift offers the M28 zoom stereo which is designed for a wide variety of uses - including small parts inspection, assembly, dissection, or even micro-manipulation.

In addition, this zoom system features a continuous zoom range of 1X to 4X with a 45° inclined eyepiece and a 360° rotatable optical body.

PARFOCALING AND ADJUSTING YOUR M28 ZOOM STEREO

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 eyetubes) until silver lines on the eyetube 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 1.0X 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 1.0X 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.

**M28 ZOOM STEREO OPTICAL DATA
WITH W10X EYEPIECES (FN20)**

Objective	Total Magnification	Field of View	Working Distance
1X	10X	20mm	80mm
2X	20X	10mm	80mm
3X	30X	6.7mm	80mm
4X	40X	5mm	80mm

WITH W15X EYEPIECES (FN13)

1X	15X	13mm	80mm
2X	30X	6.5mm	80mm
3X	45X	4.3mm	80mm
4X	60X	3.2mm	80mm

ACCESSORIES FOR M28 ZOOM STEREO MICROSCOPE

MA2609, W15X paired eyepieces (interchangeable with M26 and M27 series).

MA2610, W10X paired eyepieces (interchangeable with M26 and M27 series).

MZ823BLB, 6V/10W halogen bulb for incident (top) light

MA2202F, 5W/4100K Ultra Lite fluorescent lamp, for in-base (bottom) illuminator.

MA2216, paired eyepiece shields.

MT201, wrench for tension control.

MA530, dust cover & care manual.

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 of M28 for the zoom stereo has the top lighting option or the bottom (trans-illumination) option.

Swift also offers MA788AM, fluorescent ring illuminator (shadow free) with transformer/starter built-in, MA794 fibre optic illuminator and also MA759, SL-23, free standing illuminator.

CARE AND MAINTENANCE

1. Before servicing the instrument, pull the 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 Xylene. 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 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

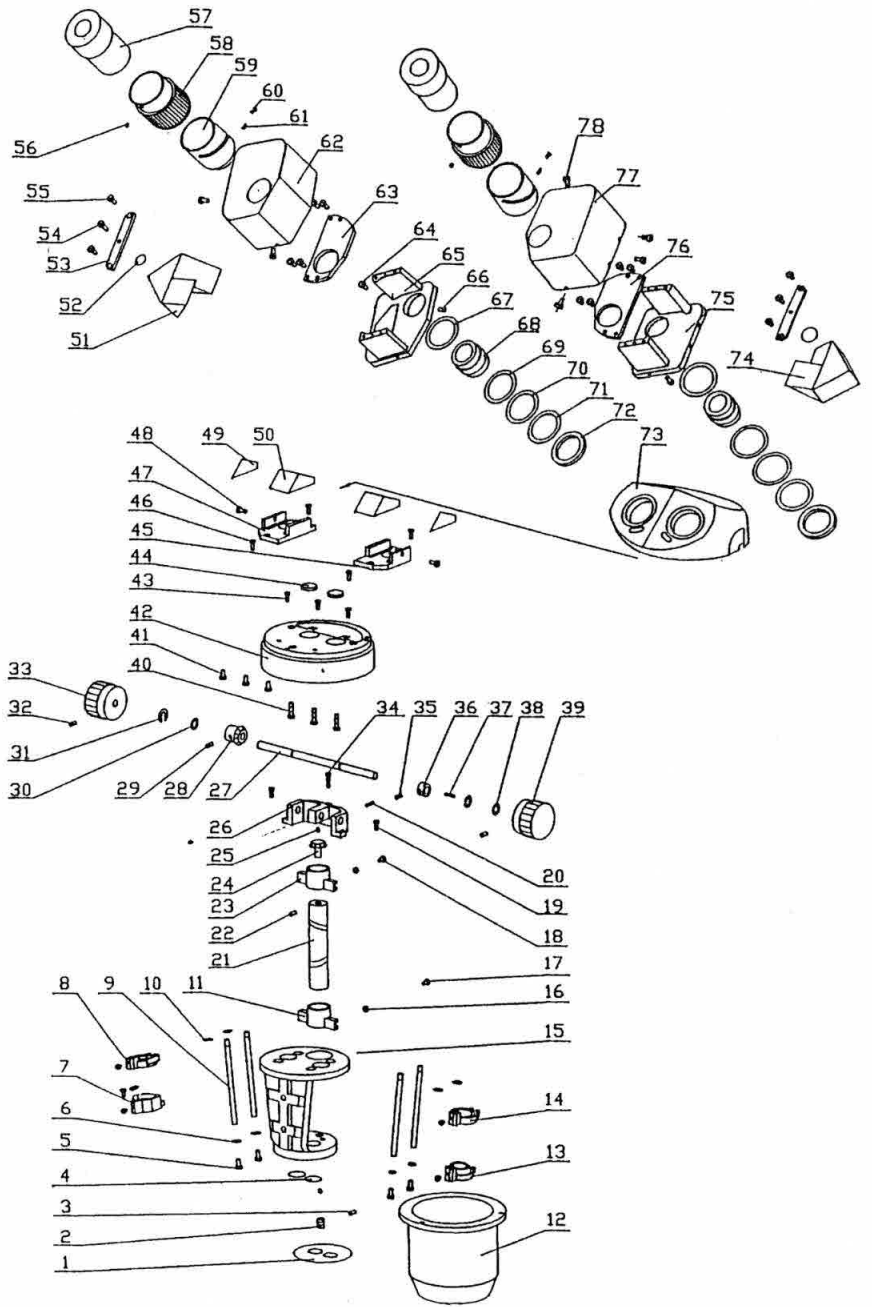
In order to avoid possible damage to the instrument, voiding the generous Swift warranty, do not tamper with or attempt to disassemble the mechanisms of your microscope. Servicing should only be accomplished by an authorized dealer, or service organization, who have been specially trained and are equipped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

TROUBLE SHOOTING HINTS

Your Swift M28 Zoom stereo microscope should provide long and trouble free service. Following are a few solutions to simple problems.

Problem	Probable Cause	Corrective Action
Focus knob slipping or inherent loss of focus	Shaft tension adjustment by MT201 wrench loosen (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

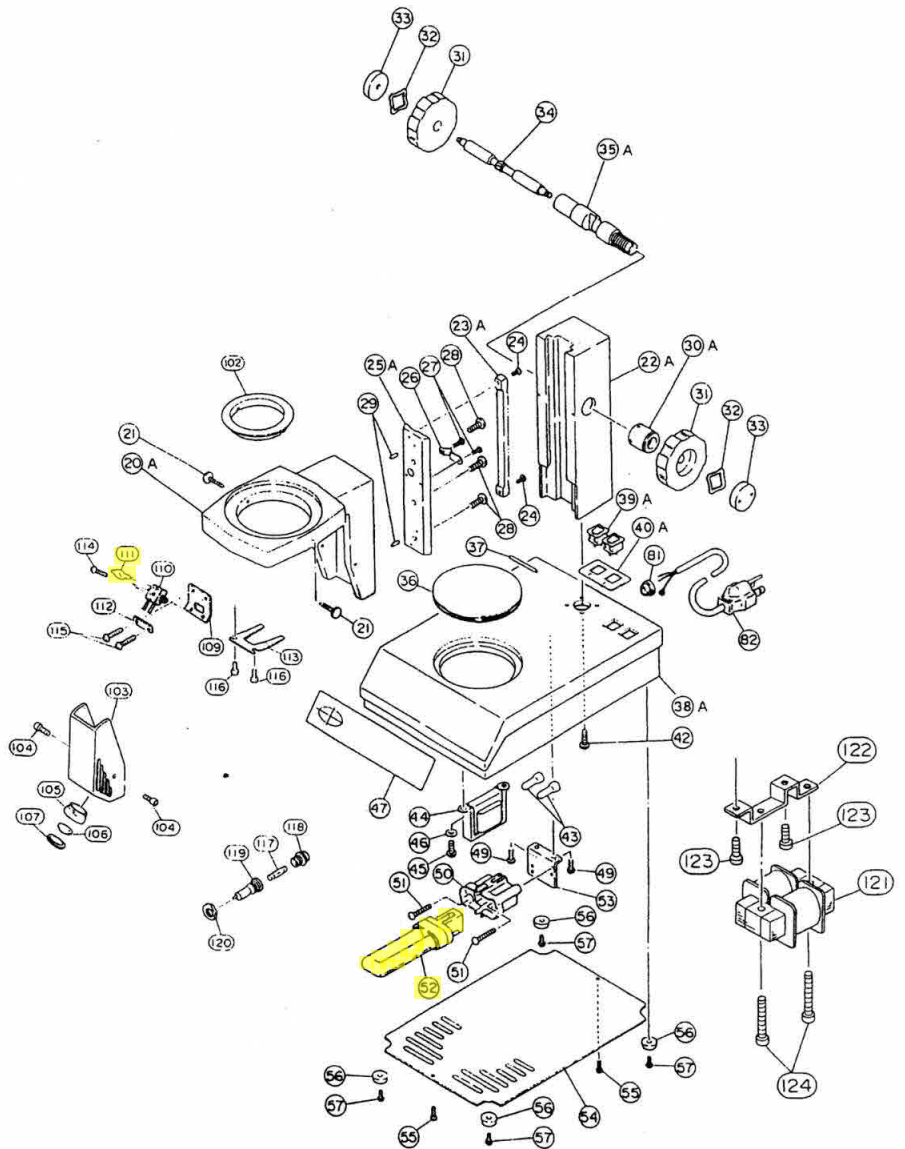
M28HFZ ZOOM HEAD SCHEMATIC



**M28HFZ ZOOM HEAD
PARTS LIST**

Parts Number	Description	Parts Number	Description
1	Decorative Ring	40	Screw
2	Screw	41	Screw
3	Adjusting Screw	42	Prism Hand Base (Swift)
4	Protecting Cover Glass	43	Screw
5	Screw	44	Lens
6	Washer	45	Right Prism Seat
7	Left Low Zoom Assembly	46	Screw
8	Left High Zoom Assembly	47	Left Prism Seat
9	Slide Rail	48	Screw
10	Retaining Ring	49	Prism Shield
11	Low Sliding Tube	50	Prism Left
12	Objective Cover	51	Left Poro Prism
13	Right Low Zoom Assembly	52	Prism Shield
14	Right High Zoom Assembly	53	Pressing Plate
15	Main Frame Zoom Assembly	54	Screw
16	Sliding Block	55	Screw
17	Screw II	56	Screw
18	Screw I	57	Eyepiece
19	Screw	58	Diopeter Tube
20	Pin	59	Left Eye Tube
21	Cylinder Cam	60	Screw
22	Screw	61	Sliding Stop
23	High Sliding Tube	62	Prism Housing Left
24	Bevel Gear	63	Prism Plate Left
25	Steel Sphere	64	Screw
26	Shaft Support	65	Prism Frame Left
27	Hand Wheel Shaft	66	Screw
28	Bevel Gear	67	Shim
29	Screw	68	Eyepiece Shaft
30	Washer	69	Washer
31	Retainer Ring	70	Wave Washer
32	Screw	71	Washer
33	Left Hand Knob	72	Retainer Ring
34	Screw	73	Prism Housing Frame
35	Screw	74	Right Poro Prism
36	Positioning Block	75	Prism Frame Right
37	Pin	76	Prism Plate Right
38	Washer	77	Prism Housing Right
39	Right Hand Knob	78	Screw

SM80HF WITH ADAPTER RING FOR SM80 SERIES
MA28HFZ WITHOUT ADAPTER RING FOR M28 SERIES



**SM80HF WITH ADAPTER RING FOR SM80 SERIES
MA28HFZ WITHOUT ADAPTER RING FOR M28 SERIES**

Parts Number	Description	Parts Number	Description	Parts Number	Description
20A	Pod	50	Socket	120	Nut
21	Screw	51	Screw	121	Transformer
22A	Arm	52	MA2202F Lamp	122	Trans. Holder
23A	Rack	53	Socket Seat	123	Screw
24	Screw	54	Bottom Plate	124	Screw
25A	Dove Slide	55	Screw		
26	Metal Clip	56	Rubber Shoes		
27	Screw	57	Screw		
28	Screw	81	Grommet		
29	Knock Pin	82	Cord		
30A	Coupling	102	Adapter Ring		
31	Knob	103	Lamp Housing		
32	Washer	104	Screw		
33	Nut	105	Incident Cell		
34	Pinion	106	Condenser Lens		
35A	Pinion Metal	107	Retaining Ring		
36	Stage Glass	109	Socket Metal		
37	Pin	110	Socket		
38A	Base	111	Halogen Bulb		
39A	Switch (Twin)		(MZ823BLB 6V/10W)		
40A	Indication Plate	112	Wire Clamp		
42	Screw	113	Lamp House Spring		
43	Connector	114	Screw		
44	Ballast	115	Screw		
45	Screw	116	Screw		
46	Washer	117	Fuse		
47	Marking Plate	118	Fuse Holder		
49	Screw	119	Fuse Holder		