

**THE USE AND CARE OF SWIFT STEREO SM90
WIDEFIELD MICROSCOPE**

SWIFT INSTRUMENTS, INC.



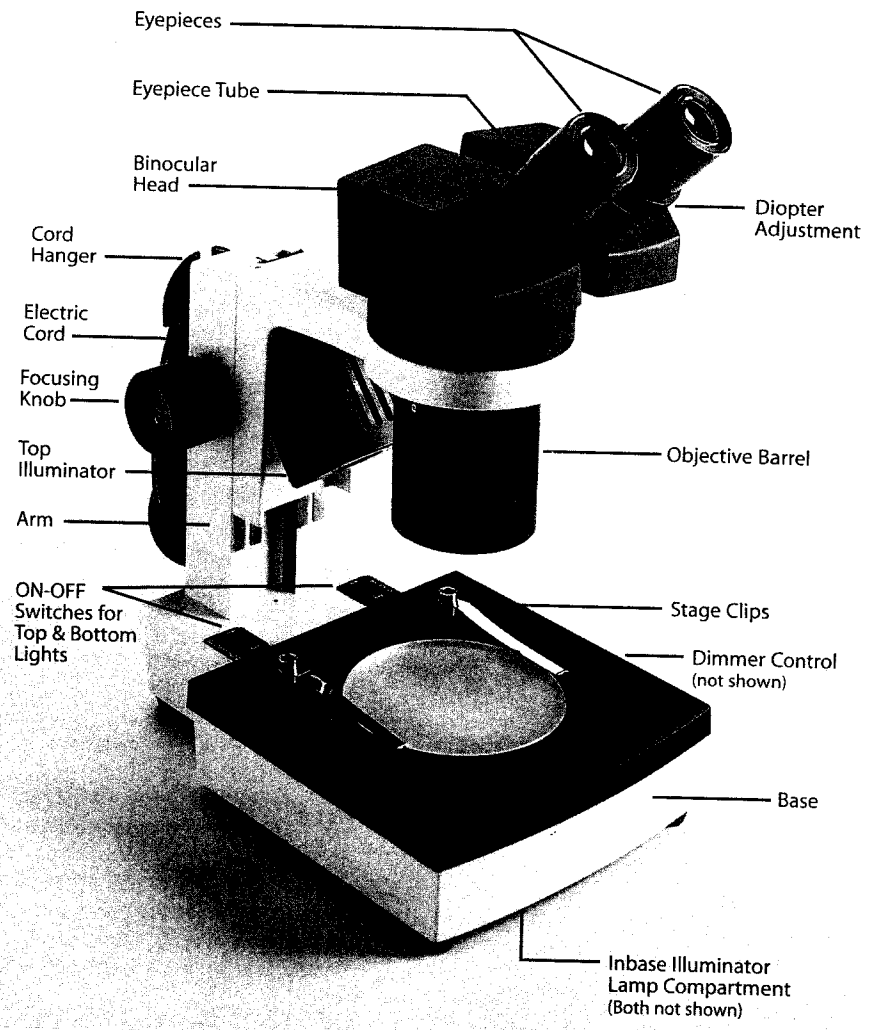
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YOUR SWIFT STEREO SM90 WIDEFILED MICROSCOPE

The Swift series SM90 microscope is a full size, well-balanced, stereoscopic instrument producing an erect, three-dimensional image of unparalleled definition with a large, comfortable field of view.

This series SM90 incorporates features, exclusive with this series, to enhance and provide maximum versatility of the instrument for classroom use, and is built to the highest, most rigid optical and mechanical standards. The scope is the result of the continuing progress of Swift Instruments, Inc. to provide a durable, modern instrument to meet the exacting requirements of both the classroom and laboratory.

Like all Swift microscopes, series SM90 is covered by the limited lifetime warranty, and is backed by a highly selective organization of microscope specialists.

SM90 STEREO MICROSCOPES

CAT. NO.	BODY	EYEPIECES	STAND	ILLUMINATOR	
				(INCIDENT)	(IN-BASE)
SM91-90HF	1X 2X	W10X	SM90HF	Halogen 6V 20W w/ Dimmer control	5 Watt 4100K
SM95-90HF	1X 3X	W10X	SM90HF	Halogen 6V 20W w/ Dimmer control	5 Watt 4100K
SM98-90HF	2X 4X	W10X	SM90HF	Halogen 6V 20W w/ Dimmer control	5 Watt 4100K

SPECIFICATIONS

EYEPIECE	MODEL	SM91		SM95		SM98	
		1X	2X	1X	3X	2X	4X
	OBJECTIVE						
	WORKING DISTANCE	113mm		82.5mm		64.3mm	
W10X	Total Magnification	10X	20X	10X	30X	20X	40X
F.N. 23	Field of View	23mm	11.5mm	23mm	7.67mm	11.5mm	5.75mm
W15X	Total Magnification	15X	30X	15X	45X	30X	60X
F.N. 15	Field of View	15mm	7.5mm	15mm	5mm	7.5mm	3.75mm

MICROMETER SCALES

MA6653W	Scale	#111
MA6655W	Scale	#333
MA6656W	Scale	#444
MA6657W	Scale	#555
MA6658W	Scale	Whipple Disc
MA6659W	Scale	10mm
MA8811W	Scale	#999

FEATURES OF YOUR SWIFT SM90 STEREOMICROSCOPE

Optical System: All optical surfaces are hard-coated to reduce reflection and increase light transmission.

The SM90 stereomicroscope has an easily adjustable interpupillary control to space the eyepieces the exact proper distance apart for the user's eyes.

Optical Body: The entire optical body is rotatable and permits the user to view the specimen from any point 360° around the stage. This is ideal in dissecting or manipulation of the specimen while it is imaged in the field of view.

Magnification Control: Series SM90 has two built-in magnifications, and magnification is increased or decreased merely by rotating the nosepiece from one stop to another.

Focus Controls: The focus knobs are located on both sides of the microscope and may be used with either hand. These controls incorporate a unique clutch system, which prevents over or under focusing. The rack travel is restricted by an upper and lower restrictor, which prevents the body from traveling either low or high enough to disengage the pinion or contact the stage. When either limit is contacted, further turning of the focusing knobs engages the clutch system, thus preventing damage to mechanical parts.

Illumination: All models of series SM90, with the suffix "HF" following the model number, incorporate this tri-illumination system. The type of illuminator is controlled by two on-off switches located on the base of the microscope next to the upright arm. The position of the switch is listed as follows: "bottom," which indicates trans-illumination from the base and "top," which indicates incident light from the upper illuminator. "H" of the suffix "HF" stands for Halogen incident light, while "F" stands for Fluorescent in-base light.

The incident illuminator is used for opaque specimens, while the trans-illuminator effectively illuminates the internal structure of transparent specimens. Translucent specimens may be more accurately studied if both illuminators are operated simultaneously.

Note that the entire contrast plate is illuminated which prevents shadows and more evenly exposes the specimen.

Diagonally Adjustable Top Light: The top light, which is enclosed in the square-shaped housing, is diagonally adjustable so that the illuminator shines onto the desired spot on the stage plate. Also note, this 6 volt, 20 watt incident light may be adjusted to your preferred brightness (1 through 10) by use of a dimmer control located on the side of the base.

Large Stage Plate: 90mm (3 7/8") diameter stage plate enables you to utilize a large space for the specimen, which can be held by a pair of stage clips.

Lamp Compartment: Fluorescent lamp of the bottom illuminator can easily be replaced simply by loosening the thumbscrew and opening the lamp compartment cover. This compartment is entirely partitioned separately from the electrical parts for the maximum safeguard.

Cord Hangers: For convenience of storage when the instrument is not in use, the electrical cord can be wound around the cord hangers, installed on the back of the arm.

Electrical: All wiring is of the three-wire, grounded system, includes a molded plug - meeting the requirements of the most critical electrical and safety codes, and is tamper-proof.

Measuring Devices: Swift has available a wide variety of eyepiece micrometer scales. The most useful in the SM90 series microscopes is scale No. MA8811W, which is graduated in increments of .001" and may be read directly when viewed at 20X. Swift eyepiece micrometers are designed to mount in Swift widefield 10X eyepieces.

Note the eyetubes of your SM90 microscope. One tube is fixed, while the other is adjustable to compensate for differences in vision from one eye to the other. The W10X eyepiece with scale should be installed in the fixed or non-adjustable eyetube.

OPERATING YOUR SERIES SM90 STEREOMICROSCOPE

1. Place the specimen onto the stage plate and select the type of illumination. If the specimen is transparent, turn on the bottom illumination, if the specimen is opaque, turn on the top illumination.
2. Your SM90 is a model equipped with two built-in magnifications. Rotate the nosepiece one direction or the other as far as it will move. This will place one pair of objectives in alignment for viewing. The power is marked on the objective barrel.
3. Look through the eyepieces and rotate the focus controls to image the specimen sharply in the field of view.
4. Grasp the eyetubes and move them either closer together or farther apart, to see one field of view. Note, if two separate fields are observed, the eyetubes are too far apart and should be moved together; while if two overlapping fields are evident, the eyetubes are too close together and should be moved apart.
5. Close your left eye and adjust the focus controls to be sure the image is sharp, while viewing with the right eye only.
6. Close your right eye and while viewing with the left eye only, adjust the diopter ring on the left eyetube to bring the image of the specimen into sharp focus.

The optical system is now adjusted to your particular vision.

MEASURING WITH YOUR SWIFT SERIES SM90 MICROSCOPE

Scale No. MA8811W is graduated in increments of .001" and may be read directly at 20X, that is, with W10X eyepieces and the 2X objectives in position. If you purchased this scale separately from the microscope, it is installed as follows:

1. Remove the W10X eyepiece from the right eyetube, the one without diopter ring. Note the eyepiece consists of an eye lens and a field lens. The field lens is the unit in the lower portion of the eyepiece and below this a shelf is visible.
2. Take the scale from its capsule. Note, also, that a retaining wire spring is supplied with the eyepiece scale.
3. Make sure the scale is free of dust and drop it onto the shelf, from the bottom of the eyepiece, making sure the scale is right side up. Now, carefully drop in the retaining wire spring and force tightly against the scale to lock the same in place and securely on the shelf.
4. Return the eyepiece to the microscope and the specimen may be measured by focusing the microscope upon the specimen and counting the graduations superimposed in the field of view. **Caution:** this scale may be read direct in .001" with only the 2X objective in position. If you desire measurements at other magnifications, the value of the graduations of the scale must be recomputed as follows: place a vernier caliper, in thousandths of an inch, upon the stage plate and focus its graduations sharply in the field of view. Note: the eyepiece scale is now superimposed over the graduations of the vernier caliper. By counting the number of graduations of the eyepiece scale that appear to fit between the graduations of the vernier caliper, the value of the scale may be readily determined.
5. Compensating the eyepiece scale for accuracy: if the scale does not read accurately in .001" on the vernier when installed in a W10X eyepiece and used with the 2X objective on the Stereo SM90, the compensation should be corrected by an authorized Swift microscope agency. Microscopes ordered from the factory, with scales included in the eyepiece are compensated, if necessary, at the factory without charge.

For more information on eyepiece scales, ask for separate instruction manual, "Measuring with Swift Microscopes: How to install and use Swift eyepiece scales."

PHOTOMICROGRAPHY/VIDEOMICROSCOPY

For 35mm photomicrography, the Swift MZ872D phototube attachment is a special eyepiece tube fitting over the eyepiece and tube, which accepts adapters to fit the most popular 35mm, single lens reflex cameras.

For video microscopy along with the SwiftCam II, use Swift SVMA23W, stereo video adapter. Use Swift MA875W, video adapter, for a video microscope with CCD camera. Call 1-800-523-4544 or the nearest Swift dealer for more information.

SERVICE

The replacement bulb in the top illuminator is Swift MA780, 6V, 20W and the trans-illumination bulb in the base is Swift MA2202F, 5W fluorescent bulb.

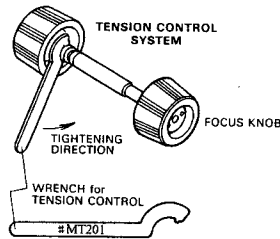
The upper bulb may be replaced by removing the screws found on each side of the illuminator housing.

The lower bulb may be replaced by carefully laying your SM90 on its side and loosening the thumbscrew that secures the compartment cover. Lift off the cover to expose the lamp.

The focus tension adjustment is unique and exclusive, Swift patent No. 3,451,739 and is easily adjusted by using Swift wrench No. MT201. This wrench fits the tension collar found on the focusing controls, between the knob and upright support. A clockwise turn of this collar moves it toward the upright support and increases tension, while a counter-clockwise turn moves the collar toward the knob and decreases tension, (see illustration).

TENSION CONTROL OF FOCUSING MOVEMENT

Illustrated below is the way to adjust the tension of the focusing movement, using "C" wrench (MT201) enclosed with the microscope.



CLEANING

Eyepieces should be cleaned as often as necessary to maintain them in good condition to allow easy viewing. Clean the eyepieces by brushing away dust particles, using a soft camel hair brush, then moistening the lens by breathing onto it. Wipe the lens carefully with good quality lens tissue folded several times. If dirt or other foreign matter still remains, it may be necessary to use a mild solvent such as Xylol. Note: the lens tissue

should be moistened, not saturated, with Xylol for cleaning, after which the lens should be dried, also with good quality lens tissue.

Painted surfaces should be cleaned frequently with mild detergent and a soft cloth.

Your Swift SM90 stereo microscope is designed to function satisfactorily with only ordinary maintenance. The instrument should be periodically serviced by a qualified, authorized service technician, who will clean, re-lubricate and perform routine adjustments at that time. Unauthorized personnel should never disassemble lens assemblies or other precision components. For information regarding service, contact your authorized Swift dealer or write to: Swift Instruments, Inc., Technical Instrument Division, 1190 N. Fourth Street, San Jose, California 95112-4946 or call 1-800-523-4544.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE OR REMEDY
No Illumination	<ul style="list-style-type: none"> - Is the power plug connected to an active A.C. outlet? - Is on/off power switch working properly? - Check the bulb and also try a new one. - Check contact points of socket and bulb. - If all the above fails, contact your authorized dealer.
Poor Optical Image	<ul style="list-style-type: none"> - Check that the eyepieces and illuminator lens are clean and in the right position.
Broken Stage Clip	<ul style="list-style-type: none"> - Remove and return the stage clip assembly to the dealer for service or replacement.
Need Parts?	<ul style="list-style-type: none"> - Acquire the following information: <ol style="list-style-type: none"> 1. Model or Series for which the parts are needed. 2. Serial number of the microscope. 3. Contact your authorized dealer.
Where to Get Swift	<ul style="list-style-type: none"> - Contact your local authorized Swift Service Dealer or <p style="text-align: center;">Swift Instruments, Inc. 1190 North Fourth Street San Jose, CA 95112 Phone: (800) 523-4544 Fax: (408) 292-7967</p>

SM90 PARTS LIST

ENVIRONMENTAL CONDITIONS

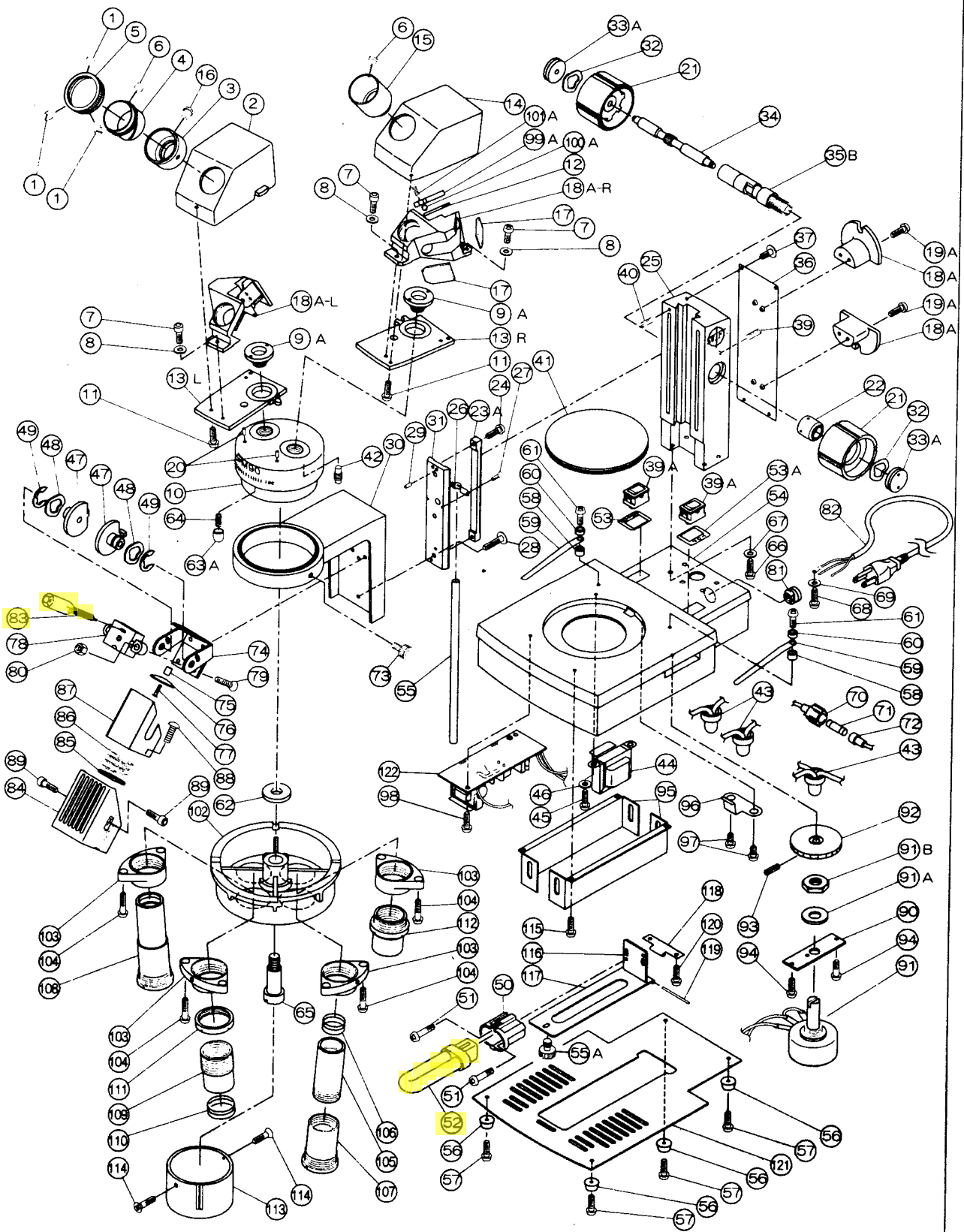
- Evaluated by U.L. Labs -

1. Altitude up to 2000m or above 2000m if specified by the manufacturer.
2. Temperature 0 to 40 deg. C.
3. Maximum relative humidity 80 percent for temperatures up to 31 deg. C decreasing linearly to 50 percent relative humidity at 40 deg. C.
4. Mains supply voltage fluctuations not to excel +/- 10 percent of nominal voltage.
5. Other supply voltage fluctuations as stated by the manufacturer.
6. Installation Category II.
7. Pollution Degree 2.

NOTE : The socket-outlet shall be installed near the equipment and shall be easily accessible

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
1	SCREW	46	WASHER
2	MIRROR HOUSING LEFT	47	SET WASHER
3	LOWER TUBE	48	WASHER
4	UPPER TUBE	49	E. RING
5	DIOPTER RING	50	SOCKET
6	P-1 (eyepiece) SCREW	51	SCREW
7	SCREW	52	MA2202F LAMP
8	WASHER	53	INDICATION PLATE (BOTTOM)
9A	RING	53A	INDICATION PLATE (TOP)
10	MIRROR SEAT	54	BASE
11	SCREW	55	INSULATING TUBE
12	MIRROR	55A	THUMB SCREW
13	L/R PLATE (L & R)	56	RUBBER FOOT
14	MIRROR HOUSING RIGHT	57	SCREW FOR RUBBER FOOT
15	EYEPiece TUBE	58	SPACER
16	SCREW	59	STAGE CLIP
17	MIRROR	60	SPACER
18A-L/R	MIRROR BLOCK (L & R)	61	SCREW
18A	CORD HANGER	62	WASHER
19A	SCREW	63A	METAL
19	MIRROR	64	SPRING
20	SPRING PIN	65	SCREW FOR NOSEPIECE
21	KNOB	66	SCREW
22	COUPLING	67	WASHER
23A	RACK	68	SCREW
24	SCREW	69	STAR WASHER
25	ARM	70	FUSE HOLDER A
26	METAL CLIP	71	FUSE
27	SCREW	72	FUSE HOLDER B
28	SCREW	73	SCREW
29	KNOCK PIN	74	SOCKET SEAT
30	POD	75	SPACER
31	DOVE SLIDE	76	REFLECTOR
32	WASHER	77	SCREW
33A	NUT	78	SOCKET
34	PINION	79	SCREW
35B	PINION METAL	80	NUT
36	BACK PLATE	81	GROMMET
37	SCREW	82	CORD
38A	NUT	83	MA780 HALOGEN LAMP
39	PIN	84	LAMP HOUSING
39A	SWITCH (TWIN)	85	COVER GLASS
40	SCREW	86	SPRING
41	STAGE PLATE	87	RADIATION PLATE
42	SCREW	88	SCREW
43	CONNECTOR	89	SCREW
44	BALLAST	90	VOLUME PLATE
45	SCREW	91	VOLUME CONTROL

STEREO SM90 SERIES



PART NO.	DESCRIPTION
91A	WASHER
91B	NUT
92	VOLUME KNOB
93	SCREW
94	SCREW
95	PROTECTION PLATE
96	SPRING
97	SCREW
98	SCREW
99A	MIRROR ADJUSTING PLATE
100A	STEEL BALL
101A	SCREW M3
102	NOSEPIECE
103	JOINT
104	SCREW
105	LENS MOUNT
106	LENS MOUNT
107	JOINT
108	Part # 105-107 ASSEMBLY
109	LENS MOUNT
110	LENS
111	RING
112	Part # 109-111 ASSEMBLY
113	OBJECTIVE COVER
114	SET SCREW FOR OBJ COVER
115	SCREW
116	SOCKET SEAT
117	SOCKET PLATE
118	HINGE
119	PIN
120	SCREW
121	BOTTOM PLATE
122	PRINTED CIRCUIT BOARD