USE AND CARE OF YOUR SERIES M240 MICROSCOPE

SWIFT®

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THE USE AND CARE OF SWIFT SERIES M240 MICROSCOPES

Swift Series M240 microscopes are the first professional quality microscopes ever made available to elementary science programs or those with limited budgets. The quality optical systems utilize high resolution objectives, highest quality prisms, and a wide choice of eyepieces including Huygenian, Widefield and Zoom types. All optical components are standard, as established by RMS (Royal Microscopical Society). These features are coupled with the most advanced and durable mechanical construction to provide an instrument that will perform satisfactorily for many years with only minimum maintenance.

UNPACKING YOUR M240 SERIES MICROSCOPE

If you ordered your M240 microscope with the attaché-type carrying case, it is only necessary to open the case and remove the microscope. The styrofoam liner of the case has compartments where all accessories may be stored.

If you ordered your M240 microscope without carrying case, care must be exercised to be sure no accessories are discarded along with the packing material.

Each M240 microscope is equipped, at no additional cost, with a heavy-duty, vinyl dust cover, which should be left on the microscope whenever the instrument is not in use.

Before attempting to use your M240 microscope, it is important you familiarize yourself with the terminology of the science of microscopy, and the purpose of each component of the microscope. By doing this you will be able to enjoy the microscope to its fullest extent.

COMPONENTS OF THE MICROSCOPE

BASE — this is the foot of the microscope which supports all other components. The base also contains either an illuminator or a mirror with both plano and concave surfaces, in a universal mount.

ARM — the frame that supports all components above the base.

STAGE – the table of the microscope on which the slide or specimen is placed. The stage usually has specimen clips to hold the slide or specimen securely.
BODY – the housing mounted on top of the arm. This contains the prisms, inclined eyetube and accepts the eyepiece.
NOSEPIECE – the revolver that carries the objectives.
OBJECTIVES – the optical system that does the initial magnifying to form the primary image of the specimen.
EYEPIECE – the upper optical element that further magnifies the primary image of the specimen and brings the light rays to a focus at the eyepoint.
CONDENSER – an accessory lens, available at slight additional cost, that mounts directly into the stage. This is recommended in Model M241 and M241B, or whenever the highest magnification is utilized. The condenser is actually a light collector to condense light rays and emit them at a particular angle to evenly illuminate the lens of the objective.
DISC DIAPHRAGM – the disc attached to the underside of the stage. The disc has five apertures (openings) and is used to increase or decrease contrast in the specimen.
FOCUS KNOBS – these are found on both sides of the arm. By rotating either or both knobs the stage is raised or lowered to bring the specimen into focus.

TERMINOLOGY

PARFOCAL – this means once the specimen is in focus with one objective, it will remain in focus with other objectives of the set with only a slight turn of the focusing knob.
WORKING DISTANCE – this is the distance from the lens of the objective, to the cover slip, on the slide, when the specimen is in focus.
FIELD OF VIEW – the actual circular area seen when viewing through the eyepiece.
EYEPOINT, or EYE RELIEF – the distance from the eyelens of the eyepiece to your eye where a full field of view is seen.

RESOLUTION, or RESOLVING POWER – the ability of a lens to define the details of the specimen at a maximum magnification. This is governed by the N.A. (numerical aperture) of the lens. For example, a 20x objective with N.A. 0.40 has a maximum resolving power of 400x, equal to 1000 times the N.A. This rule of N.A. x 1000 is true of all achromatic objectives.

"COATED" LENS – in attempting to transmit light through glass, much of the light is lost through reflection. Coating a lens increases the light transmission by reducing or eliminating reflection, thus allowing more light to pass through.

USING YOUR SWIFT SERIES M240 MICROSCOPE

Once you have learned the terminology and purpose of each component of the microscope, use of the microscope is simple and enjoyable. By following these easy steps, you will be able to begin studying the specimen quickly and easily:

1. Place the slide on the stage, and secure it under the slide clips. Be sure the specimen is directly over the opening in the stage.
2. Rotate the disc diaphragm to align the largest aperture with the opening in the stage.
3. If your M240 microscope is equipped with the SSL-10E illuminator, plug the power cord into the regular 117V wall outlet. Early models of SSL-10E have a switch in the power cord which must then be turned on, – while later models require only plugging into the outlet. If your M240 microscope is equipped with mirror, it is necessary to adjust the mirror to reflect enough light to illuminate the field of view.
4. Rotate the nosepiece to place the lowest power objective into position over the specimen. Be sure the objective "clicks" in its lock.
5. While viewing through the eyepiece, rotate the focusing knobs to bring the specimen into focus. This should be done slowly and carefully.
6. If the image of the specimen appears weak or pale, the

disc diaphragm should be rotated to align the next smaller aperture with the opening in the stage. Each successively smaller aperture of the disc diaphragm will increase contrast in the specimen's image.

7. Now, the slide is moved to place the specimen directly into the center of the field of view.
8. Rotate the nosepiece to the highest power objective. A slight turn of the focusing knob may be required to bring the image of the specimen into sharp focus. Once the specimen is in focus with the highest power objective, it will be in focus with each lower power objective.

FOR YOUR INFORMATION

The focusing knobs of SWIFT Series M240 microscopes are equipped, at no additional cost, with a built-in slip clutch. This is designed to protect the precision gears of the mechanism from damage. The clutch is activated at both upper and lower limits of travel and will allow only the knob to turn once either limit is reached.

Note Models M245 and M245B are equipped with only one objective, 10x, and a 10x–20x zoom eyepiece. These models offer distinct advantages in that the 10x objective has an extremely long working distance eliminating the possibility of contacting the specimen by its lens. This working distance remains constant throughout the entire range of magnification since magnification is increased or decreased by rotating the knurled collar on the zoom eyepiece.

Field of view changes in diameter from one objective to another and from one type eyepiece to another, as you will note from the following chart:

EYEPIECE	OBJECTIVE	MAGNIFICATION	FIELD OF VIEW
H10x	4x	40x	3.4 mm
H10x	10x	100x	1.27 mm
H10x	20x	200x	0.655mm
H10x	40x	400x	0.33 mm

EYEPIECE	OBJECTIVE	MAGNIFICATION	FIELD OF VIEW
W10x	4x	40x	4.5 mm
W10x	10x	100x	1.8 mm
W10x	20x	200x	0.90 mm
W10x	40x	400x	0.45 mm
Z10	10x	100x	1.064mm
Z15	10x	150x	1.04 mm
Z20	10x	200x	0.94 mm

COMMON PROBLEMS IN MICROSCOPY

A. PROBLEM – image appears "washed out" or weak.
CORRECTION – 1. Rotate disc diaphragm to smaller aperture.
2. Objective lens is dirty. Clean as described under "Cleaning".
3. Eyepiece is dirty. Clean as described under "Cleaning".

B. PROBLEM – hairs or dust seem to be moving in the image.
CORRECTION – Disc diaphragm is at too small an aperture. Rotate to larger aperture.

C. PROBLEM – unable to bring specimen into focus with any objective.
CORRECTION – Eyelens of the eyepiece is partially unscrewed. Remove the eyepiece and screw the two sections together.

D. PROBLEM – image of the specimen goes out of focus all by itself.
CORRECTION – Use Swift wrench MT-202 to tighten the collar found on the spindle of the focus knobs.

E. PROBLEM – focusing knobs turn hard even with tension-collar loosened.
CORRECTION – Microscope should be disassembled by qualified, authorized repairman, cleaned and relubricated.

CARE OF YOUR SWIFT SERIES M240 MICROSCOPE

Swift Series M240 microscopes are designed to function satisfactorily with only minimum maintenance. Certain components should be cleaned frequently to insure ease of viewing.

The eyepiece and objective lenses should never be wiped while dry as this will surely scratch or otherwise mar the surface of the glass. These surfaces should first be brushed with a soft, camel hair brush or blown off with air pressure from a rubber syringe, to remove dust particles. In most instances, the lens may then be cleaned by moistening its surface with your breath, then wiped with good quality lens tissue folded several times. If the lens surface remains soiled, lens tissue folded several times and moistened with Xylene will easily remove the contaminant.

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

CAUTION: Objectives should never be disassembled by the user. If repairs or internal cleaning should be necessary, this should only be done by qualified, authorized repairmen.

Periodically, the microscope should be disassembled, cleaned and lubricated. This should be done only by qualified, authorized repairmen.

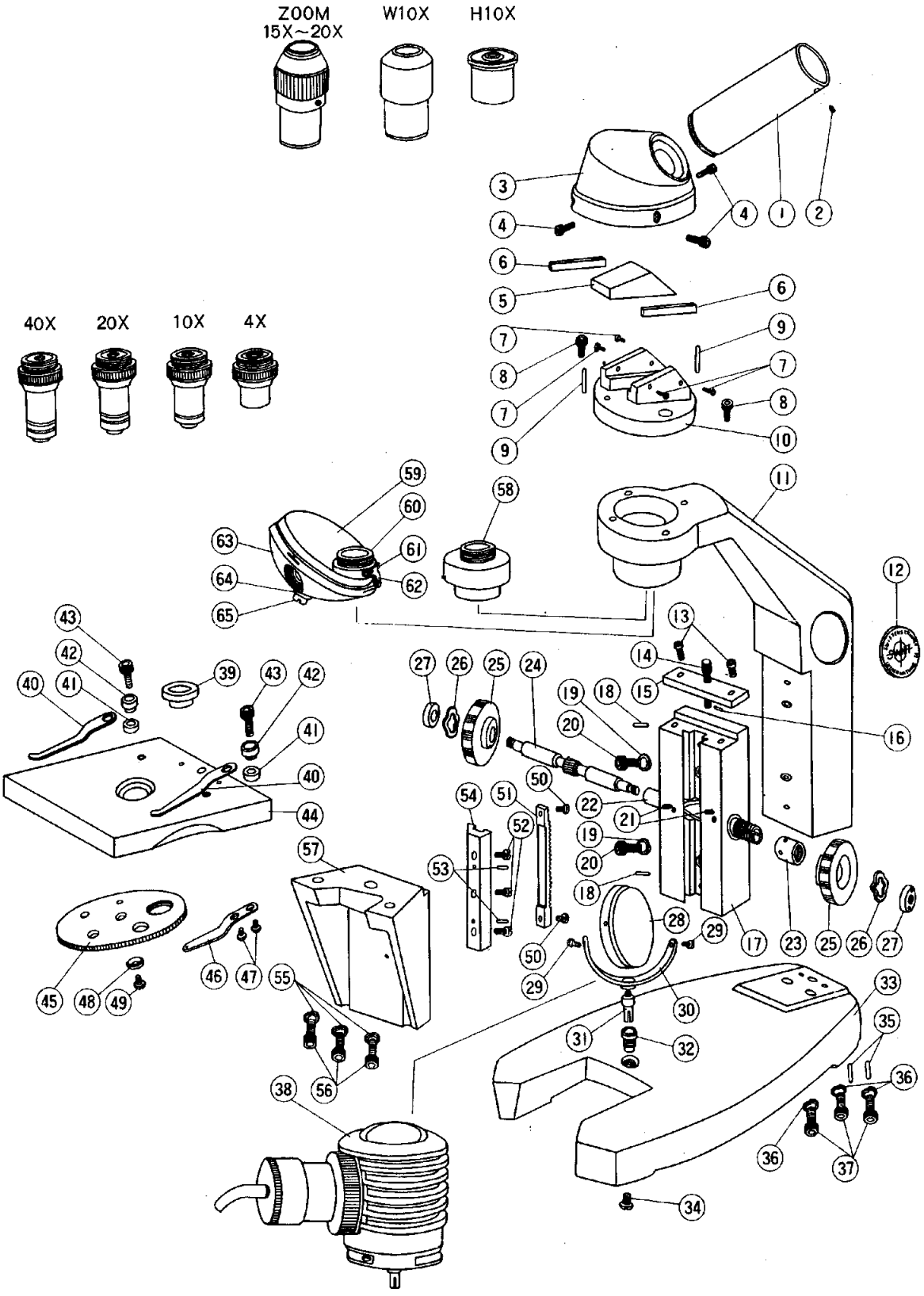
Your Swift Series M240 microscope is designed and constructed to never become obsolete. Many accessories are available to further enhance its use, and others are under development.

The new SWIFT QUODLIBET PHASE SET, Catalogue MA743, is easily adaptable to series M240 microscope, at nominal cost. This is designed to be installed by the user and requires no special tools. The QUODLIBET renders hard-to-see or live specimen visible without the need for staining.

Information may be obtained from your authorized Swift dealer or by writing to:

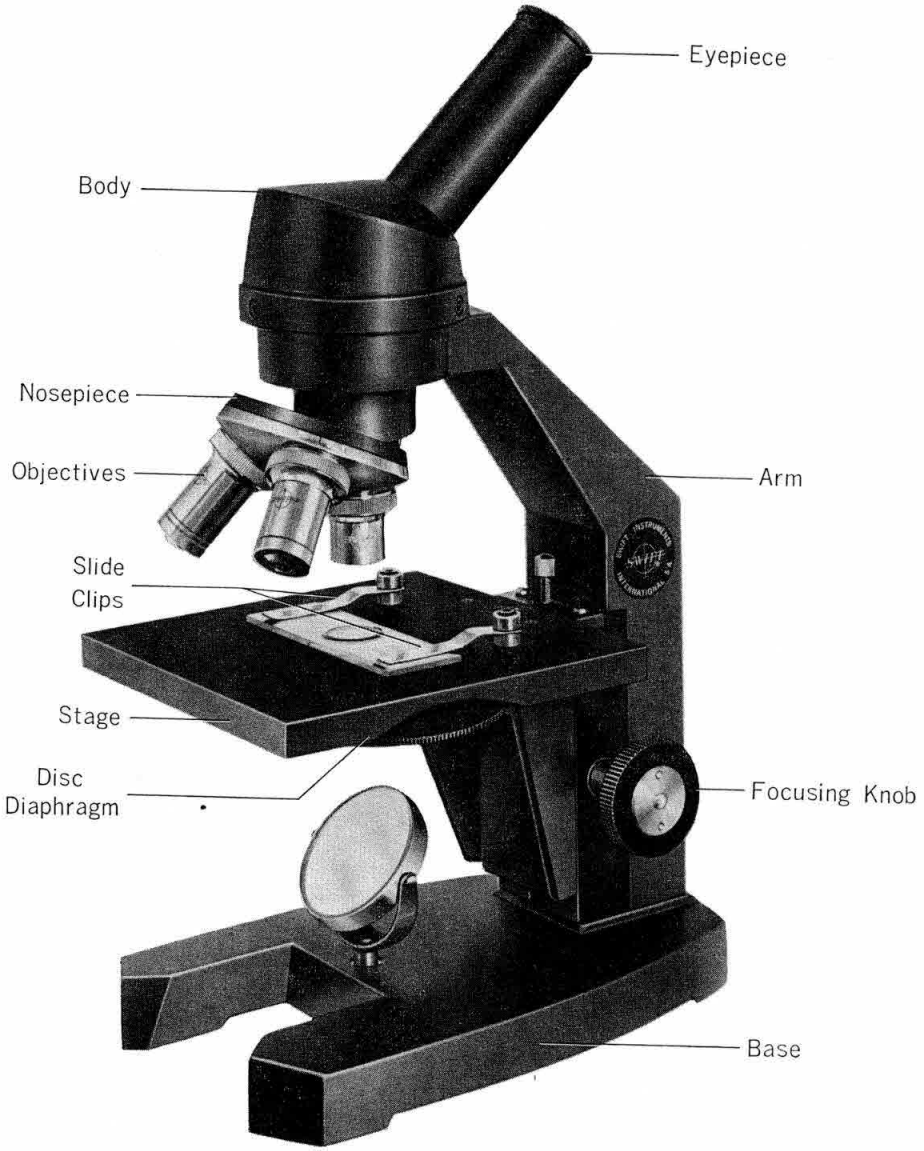
Swift Instruments, Inc.
Technical Instrument Division
P.O. Box 562
San Jose, California 95106

MODEL 240 SERIES



PARTS LIST

Part Number	Description	Part Number	Description
1	Eyepiece tube	36	Washer
2	Screw	37	Screw
3	Prism housing	38	Illuminator, SSL – 10E
4	Screw	39	Condenser
5	22° 30' Prism	40	Stage clip
6	Prism adjusting plate	41	Washer
7	Screw	42	Washer
8	Screw	43	Screw
9	Knock pin	44	Stage
10	Seat, 22° 30' Prism	45	Disc diaphragm
11	Arm	46	Spring
12	Marking plate	47	Screw
13	Screw	48	Washer
14	Screw	49	Screw
15	Gimic cover	50	Screw
16	Knock pin	51	Rack
17	Coarse adj. block	52	Screw
18	Knock pin	53	Knock pin
19	Washer	54	Rack guide
20	Screw	55	Washer
21	Screw	56	Screw
22	Pinion metal	57	Stage holder
23	Adjuster, pinion tension	58	Single nosepiece
24	Pinion	59	Upper nosepiece
25	Coarse adj handle	60	Connector
26	Washer	61	Screw
27	Nut	62	Spring
28	Mirror	63	Revolving nose-piece
29	Screw	64	Washer
30	Mirror bow	65	Set screw
31	Mirror fork		
32	Screw		
33	Base		
34	Screw		
35	Knock pin		


Eyepiece
Body
Nosepiece
Objectives
Arm
Slide
Clips
Stage
Disc
Diaphragm
Focusing Knob
Base