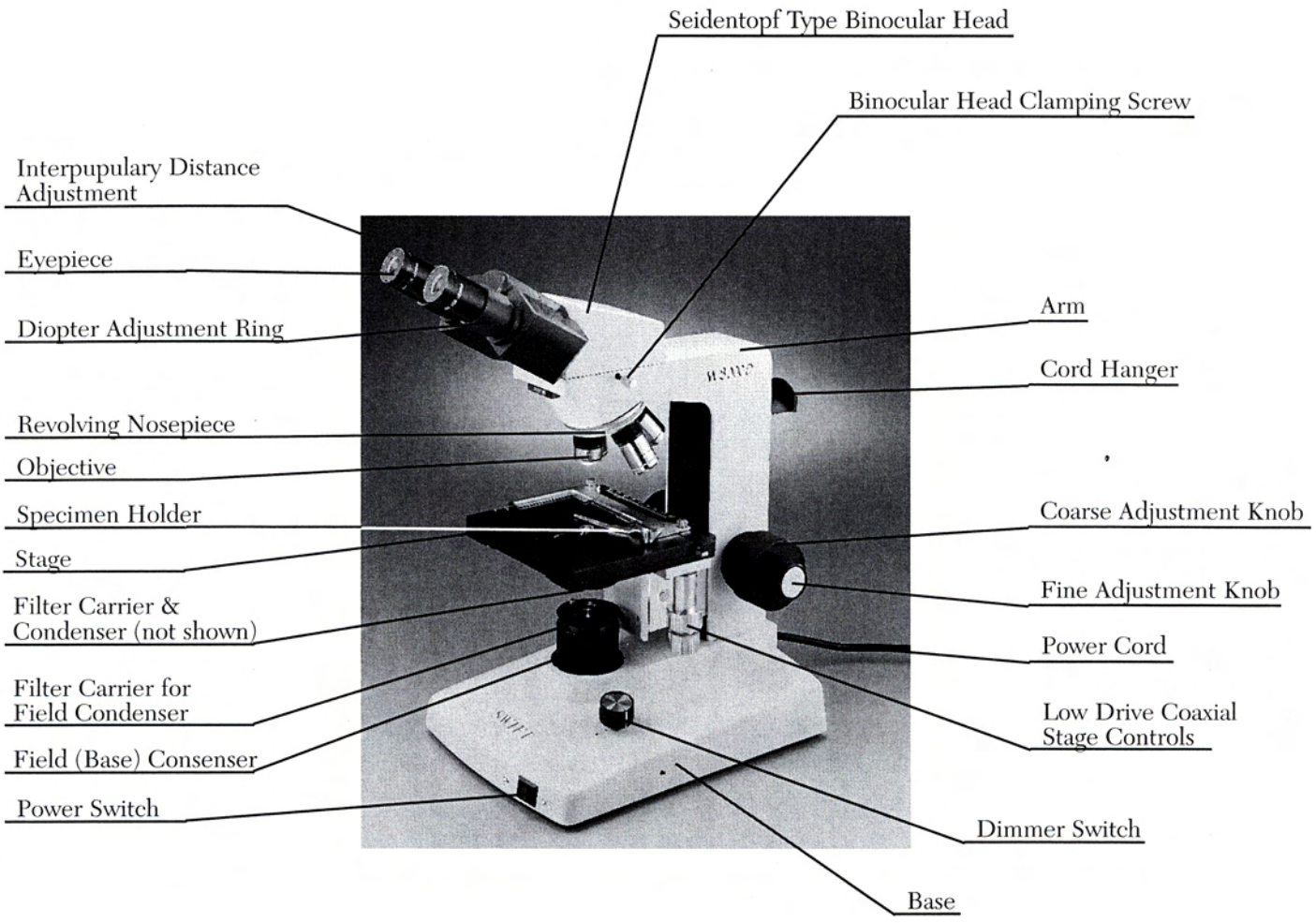
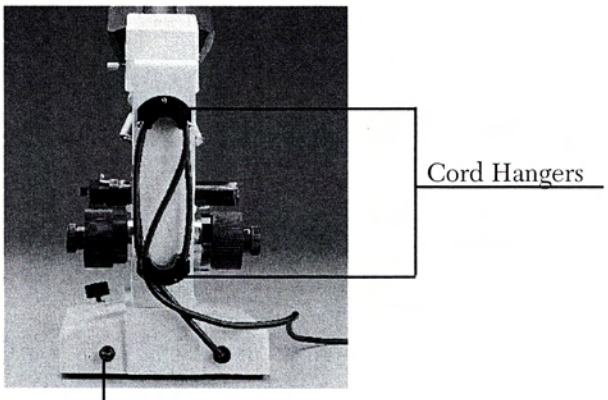
INDEX


Seidentopf Type Binocular Head
Binocular Head Clamping Screw
Interpupulary Distance Adjustment
Eyepiece
Diopter Adjustment Ring
Arm
Cord Hanger
Revolving Nosepiece
Objective
Specimen Holder
Coarse Adjustment Knob
Stage
Fine Adjustment Knob
Filter Carrier & Condenser (not shown)
Power Cord
Filter Carrier for Field Condenser
Low Drive Coaxial Stage Controls
Field (Base) Consenser
Power Switch
Dimmer Switch
Base


Cord Hangers
Back View
Fuse Case

YOUR SWIFT M8000D SERIES MICROSCOPE is a precision instrument, both optically and mechanically, which will last a lifetime with a minimum of maintenance. It is built to the highest and most rigid optical and mechanical standards and has many built-in features to insure durability and high performance in the hands of both student and professional users. It is designed to withstand the rigors of daily use with only normal care.

BEFORE USE

UNPACKING:

Your Swift M8000D series microscope arrived packed in a styrofoam container, all the components assembled, except for the binocular head. Install the head to the top of the arm, by loosening the binocular head clamping screw and removing the plastic cap for the arm top opening.

As a precautionary measure, please hold this instrument with both your hands, as it is very heavy.

NOMENCLATURE

Familiarize yourself with the components of the M8000D microscope, referring to the instructions above.

Binocular Head: The unit comprising the inclined eyetubes and prisms which control the path of light to the eyepiece. M8000D has a Seidentopf-type binocular head. **Make sure to turn the eyepiece prism housing upward when the binocular head is rotated, so that it will not scratch the arm.**

Binocular Head Clamping Screw: The thumb screw which secures the head to the arm.

Eyepiece: The upper optical component that further magnifies the primary image and brings the light rays to a focus at the eyepoint.

Nosepiece: The revolver which carries the objectives.

Objective: The optical system which does the initial magnifying to form the primary image.

Specimen Holder: A device on the mechanical stage to hold a slide, (also known as the "finger assembly"). The M8000D is designed to hold two at a time.

Stage: The square surface upon which the specimen is placed.

Condenser: The optical lens built below the center of the stage.

Filter Carrier: The ring located under the sub-stage condenser and also on top of the field

condenser that holds round filters.

Arm: The frame that supports all M8000D microscope components above the base.

Mechanical Stage: An accessory that attaches to the top of the fixed stage which carries the slide in either an E-W or N-S direction across the focal point. Directional adjustment knobs are found below the stage on the right hand side.

Coarse Adjustment: The outside focusing ring which facilitates rapid and heavy movement of the focusing mechanism.

Fine Adjustment: The inside focusing adjustment which allows for **s**low and subtle focusing movement.

Pre-Focusing Lever: A device which allows the user to lock the focusing movement.

Tension Adjustment Ring: A knurled ring, which, when turned clock-wise, increases the tension of the coarse adjustment.

Field (Base Condenser): The optical lens built over the center of the base, designed to intensify the light from the in-base illuminator.

Base: The component which supports the entire instrument. This component houses an illuminator which directs light through the condenser to the specimen.

Power Switch: The point at which power for the illuminator is turned off and on.

Cord Hangers: The device around which the power cord can be wound for safe, easy storage.

Fuse Case: A covering for the 0.75 fuse that prevents the electrical system in the microscope from being damaged by a power surge.

Bottom Plate: The plate which covers the base.

Dimmer Switch: A device for adjustment of light intensity.

ASSEMBLING AND GETTING READY TO USE YOUR M8000D

Please hold this microscope with both your hands, as it is very heavy.

1) Carefully unpack and remove the microscope stand and head from the styrofoam. As all of the components for the microscope have been assembled, pre-aligned and adjusted at the factory, it is now ready to use.

2) Carefully insert the bayonet base mount of the binocular head into the opening in the top of the arm, align the head straight as shown in the photo, tighten the binocular head by clamping the thumb screw firmly.

WARNING: Make sure to turn the eyepiece prism housings upward when the head is rotated, so that it will not scratch the arm.

3) Make sure that the power switch is off, the dimmer switch is at the "O" position, and that a white frosted filter is installed in the filter carrier. Unwind the electrical cord from the cord hanger and plug it in.

4) Turn the dimmer switch to the low position (1 or 2), to activate the illuminator.

5) Place a slide (or two slides), with care, between the two finger clips of the slide holder. Turn the revolving nosepiece to the 4X objective.

6) While looking through the eyepieces, focus the 4X objective on the specimen within the slide by turning the coarse and fine adjustment knobs slowly (the stage moves up and down) until you see the specimen very clearly. The specimen may have to be moved in X and Y directions, by turning the knob of the low-drive, coaxial stage controls.

7) With your right eye and right side eyepiece only, bring the specimen into focus. Then,using your left eye and eyepiece only, bring the specimen into focus, **turning the diopter adjustment ring on the left eyetube.**

8) Look through the eyepieces with both your eyes open, adjust the interpupilary distance, until you see one perfect image.

9) Turn the revolving nosepiece to the 10X objective, bringing the slide into focus, and to the center of the field of view, using the low-drive, coaxial stage controls. Turn the nose-piece to the 40X objective, and repeat the same procedure as with the 10X. Proceed with the 100X objective. Use the fine focusing mechanism for maximum crispness as you move from one magnification to another.

If the image in the field of view is too dark to observe, turn the dimmer switch to a higher position, and adjust the opening of the iris diaphragm, that is located just under the sub-stage condenser. Closing the iris diaphragm increases the contrast of the image, while it decreases the brightness.Find the proper contrast and brightness of the image by adjusting the iris diaphragm and dimmer switch.

AFTER USE OF YOUR MICROSCOPE

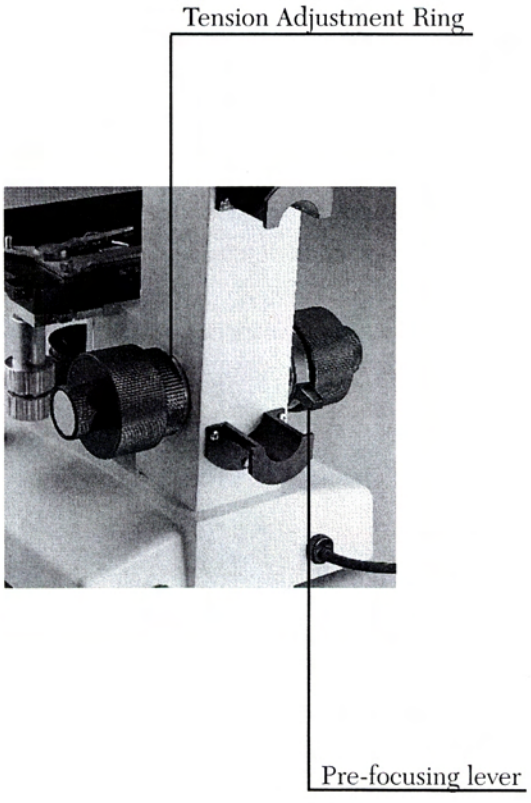
1)Lower the stage in order to prevent the objective lenses from being damaged.

2) Turn the dimmer switch to the "O" position.

3) Turn off the power switch and unplug the power cord.

4) Wind the cord onto the cord hangers. Cover the microscope with the dust cover (furnished with microscope).

TENSION ADJUSTMENT OF THE COARSE ADJUSTMENT KNOBS AND LOCKING OF THE PRE-FOCUSING LEVER



Tension Adjustment of the Coarse Adjustment Knobs

1)A tension adjustment ring is provided next to the coarse adjustment knob. With this device, the tension of the coarse adjustment is freely adjustable for either heavy or light movement, depending upon operator preference. Rotate the ring in the direction of the arrow to increase tension, or reverse the direction of the ring to loosen.

2)Do not loosen the tension adjustment ring too much, because this may cause the stage to drop or the fine adjustment knobs to slip.

Locking of the Pre-Focusing Lever

This lever is provided to prevent possible contact between specimen and objective, as well as to simplify coarse focusing. The lever is locked in the direction of the arrow, shown in the after coarse focus has been accomplished. This is convenient for liquid application or change of specimens, since it prevents further upward travel of the stage by means of the coarse adjustment knobs, and provides a limiting stop if the stage is lowered and then raised again. The pre-focusing lever does not restrict fine focusing. **Unlock the lever when not in use.**

USE OF IMMERSION OBJECTIVES

To utilize the full numerical aperture of an immersion objective (usually 50X or 100X "oil"), the objective and specimen are immersed in immersion oil in the following procedure:

1) Focus on the specimen with a low-power objective.

2) Put a tiny drop of immersion oil on the specimen slide.

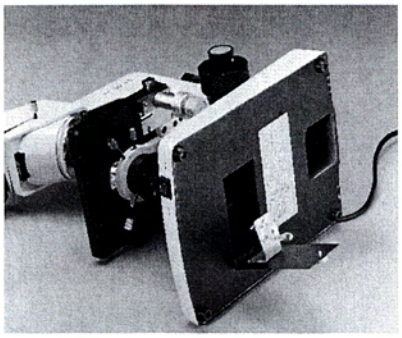
3) Turn the nosepiece to bring the immersion objective into the light path, and focus with the fine adjustment knobs.

Use of the pre-focusing lever facilitates the steps described above.

Care should be taken to prevent oil bubbles from forming in the oil film, since these bubbles greatly reduce the lens performance. If any do occur, re-apply immersion oil.

Be careful not to stain other objectives with immersion oil, and after use, carefully wipe off the immersion oil from the objective and slide completely.

BULB INSTALLATION AND REPLACEMENT



1. Make sure that the power switch is off and the electrical cords are unplugged.

2. Turn the microscope on its side and loosen the thumb screw to open the lamp cover, following the instructions on the label.

3. Install the 6V, 20W halogen bulb (MA780). Keep the halogen bulb in its polyethylene bag to avoid leaving fingerprints on the bulb, and insert the contact pins into the bulb socket as far as they will go.

4.Close the lamp housing cover and secure the thumb screw.

SPECIAL TERMINOLOGY FOR MICROSCOPY

Following is important terminology common to the science of microscopy:

Compound Microscope: a microscope having a primary (the objective) and a secondary lens (the eye-piece) to further magnify the image and bring the light rays to a focal point (the eyes).

Achromatic Objective: an optical system corrected for two colors chromatically and one color (yellow-green) spherically.

Condenser: a lens or system of lenses which collect light rays and converge them to a focus.

Cover Glass: a thin piece of glass cut in circles, rectangles or squares, for covering the specimen; specimens magnified 40 or more times should be covered by a cover glass to improve clarity.
Appropriate thickness of cover glass for Swift microscopes is #1, 0.13 - 0.17 mm, as the working distance of Swift 100X objective is 0.18 mm. You will not be able to focus if you use cover glasses with the wrong thickness (#2 is too thick).

Depth of Field: the ability of a lens to furnish a distinct image above and below the focal plane; depth of field decreases with the increase in aperture or with the increase of magnification.

Din: "Deustche Industrial Normen" or an industry-wide standard for durability and reliability.
(As in DIN objectives which have a standard length of 45mm).

Field of View: the entire area which is seen through the lens system; it may range in diameter from several millimeters to less than 0.1 mm, depending upon the total magnification.

Focal Plane: a plane that is perpendicular to the axis of the lens or mirror and passes through the focus.

High Power: the high power objective on the nosepiece is usually the 40X objective; often called "high-dry" because the oil immersion lens (100X) is referred to separately (Swift Instruments also offers a 60X "high-dry" lens).

Intermediate power: the middle power objective; usually 10X.

Low Power: the lowest power objective is usually the 4X, otherwise referred to as the scanning lens.

Magnification: the number of times an object is increased in size by the lens system.

Numerical Aperture (N.A.): a mathematical formula devised by Ernst Abbe for the direct comparison of objective lenses to resolving power; the sine of half the angular aperture of the objective multiplied by the refractive index of the medium between the front lens of the objective and the cover glass on the slide.

Parfocal: parfocality is achieved when all the objectives are in close focus on a given object, so that when objectives are switched from one power to another, only a small fine focus readjustment is necessary.

Ocular Lens: the lenses closest to the eye; also called eyepieces; usually 10X.

Objective Lens: any of the lenses on the nosepiece directly above the stage.

Oil Immersion: a very high powered objective lens which requires a medium of oil between the lens and the slide to conduct light through the lens to the specimen, usually 100X (Swift also has a 50X oil immersion objective lens).

WARNING: Immersion oil is only used for 100X, 60X, (oil), 50X (oil) objectives or any other objectives as specified "OIL".

Thoroughly clean the objective tip and the surface of the slide after immersion oil is used.

Low power objectives such 40X, 20X and 10X, if their objective tip is stained by oil, wil be seriously damaged, resulting in costly repair.

Reflected Light: light bouncing directly off the object and entering the lens system as opposed to light passing through the specimen to the lens from the bottom (see transmitted light).

Resolving Power: the capacity of an optical system to distinguish and separate fine structural details in a specimen; the resolving power is limited by the N.A. of the objective, and it also depends upon the working N.A. of the sub-stage condenser; the higher the effective N.A. of the system, the greater the resolving power will be.

Slide: a piece of glass usually 1 x 3 inches in size and approximately 1/10th inch thick upon which the specimen is placed for viewing, and which is placed upon the stage of the microscope.

Transmitted Light: light which originates below the specimen and passes through the specimen to the lens system.

PHASE CONTRAST WITH THE SWIFT M8000D SERIES MICROSCOPE

The Phase Contrast microscope reveals fine detail in transparent objects which possess very little contrast. Unstained living organisms and cells can be studied without the risk of their being killed by fixing or staining reagents. Before the advent of Phase Contrast, such specimens could only be examined in transmitted light by closing down the substage condenser diaphragm to a small aperture. The narrow cone of illumination produced diffraction with destruction of detail.

The Swift Quodmaster®, Phase unit may be ordered as a complete Phase Contrast microscope in model M8004DP or M8005DP.

The Quodmaster®, Phase Contrast Set includes the following:

4XD Achromatic (scanning lens), 10XD and 40XRD phase objectives. Substage, mount centerable, N.A. 1.25 condenser. Four-aperture rotatable disc containing one phase annulus common to both 10XD and 40XRD phase objectives. One darkfield stop common to 4XD 10XD phase and 40XRD phase objectives. One open aperture to an iris diaphragm for brightfield use at all magnifications.

Note: A 100XRD objective requires an iris diaphragm for brightfield oil immersion microscopy.

The Swift Quodmaster®, 100 is the same as above with the addition of a 100XRD phase annulus in the disc and a 100XRD phase objective, affording the phase technique with 10XD, 10XD & 100XRD objectives; the darkfield technique with 4XD, 10XD, 40XRD objectives; brightfield with 4XD, 10XD and 40XRD including 100XRD oil immersion.

The Swift M8004DP and M8005DP Quodmaster®, Phase System offers phase contrast techniques in a simple form - yet produces results comparable to units costing much more.

Its use is simple and effective - just match the objective to the condenser position.

The M8004DP Quodmaster®, 100 condenser, has the following pre-set optical specifications and markings:

B = **Brightfield** (position), which has an N.A. 1.25 condenser with iris for use with the 4X, 10X, 40XRD and 100XRD (oil) objectives. The condenser is on a rack & pinion.

▲ = **Green Triangle** - this position has a phase annulus for use with the phase 10X and 40XRD objectives. Please note: the condenser must be racked to the full up position during this procedure.

▲ = **Red Triangle** - this position has a phase annulus for use with phase 100XRD (oil) objective. The condenser must be in the full up position.

D = **Darkfield Stop**, for low power darkfield with the 4X, 10X and 40XRD objectives only. The condenser must be in the full up position.

Specifications for the M8005DP Quodmaster®, Model are the same as above, except it is without the 100XRD phase annulus (Red Triangle position), which allows only brightfield use with the 100XRD oil objective, (for blood platelet use).

PHOTOMICROGRAPHY WITH M8000D

You are required to have a single lens reflex (SLR) 35mm camera, "T" system mount compatible with your SLR camera and MA8117 trinocular head with photo tube, along with S 2.5X eyepiece locked in.

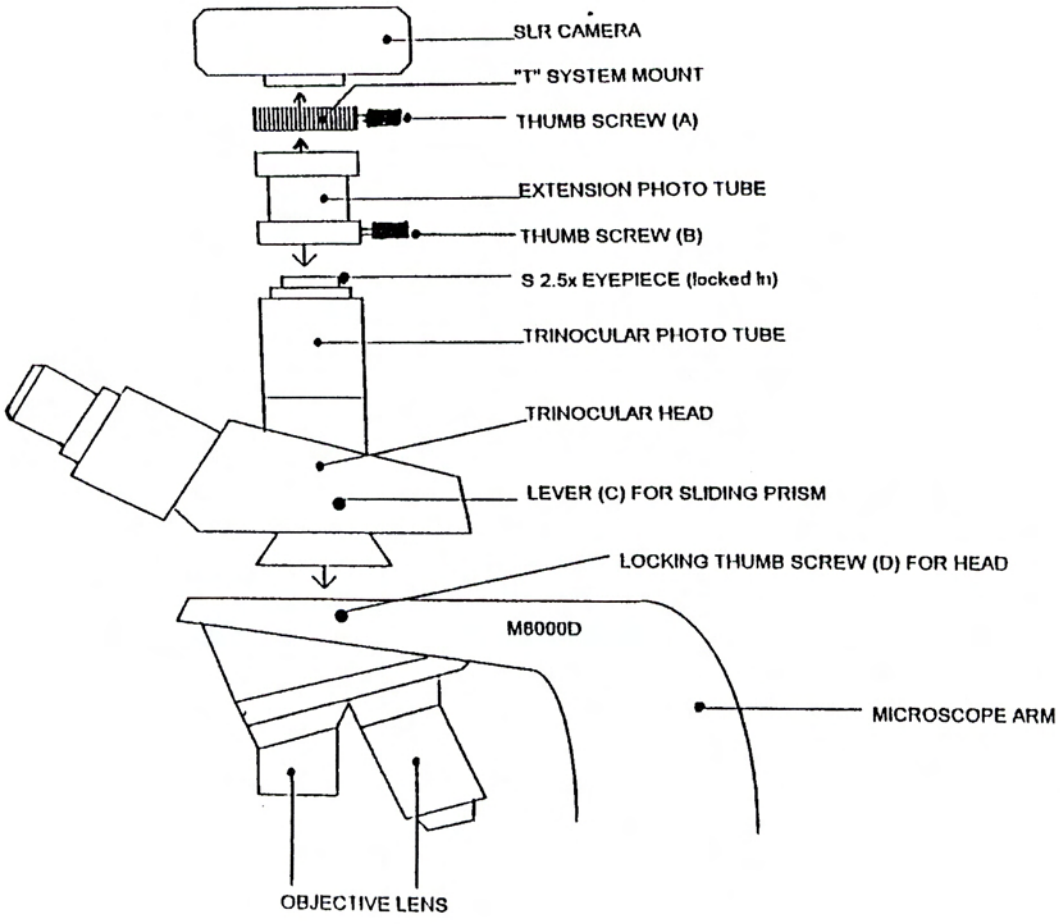
1. Firmly install the "T" system mount onto your SLR camera, then the extension photo tube, (packed with the trinocular head), must be screwed into the "T" system mount. Lock it with the thumb screw (A).

2. Make sure that the **S 2.5X eyepiece** is firmly locked inside the photo tube (factory assembled) of the trinocular head, which must be installed onto the arm of the microscope. Secure the head with the thumb screw (D) located on the side of the arm.

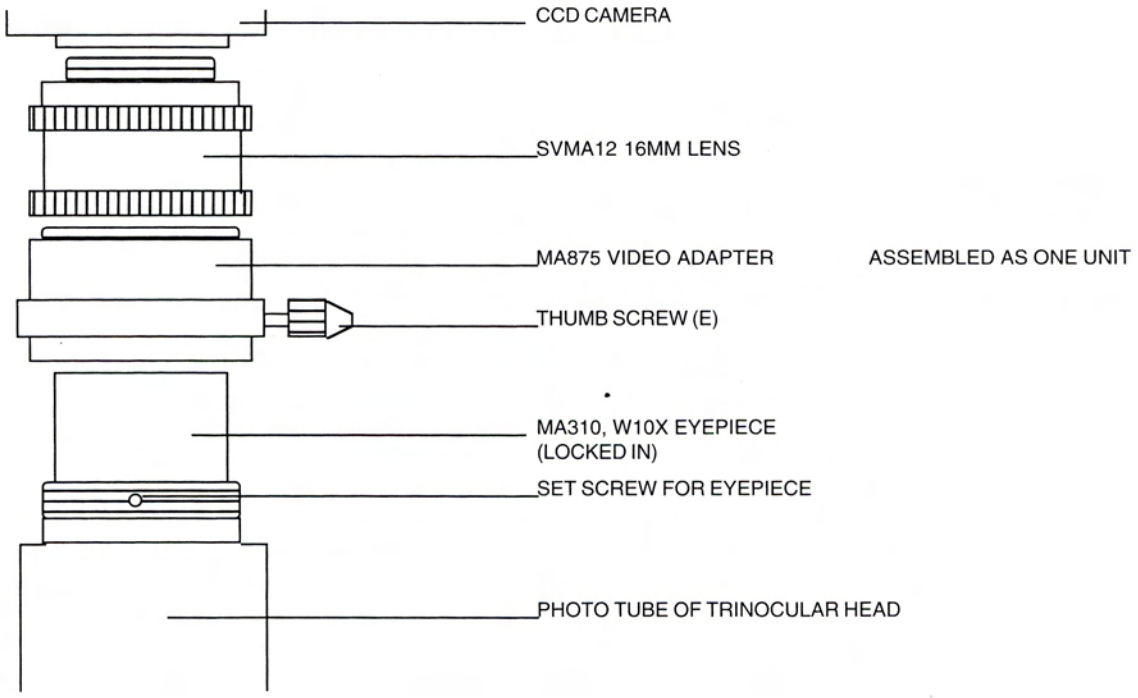
3. Carefully place the extension photo tube, which was assembled with the SLR camera's "T" mount, over the trinocular head photo tube and lock firmly with the thumb screw (B), in the proper position.

4. The sliding prims in the trinocular head opens toward the photo tube for photomicrography when the lever (C) is pulled out, while the scope is ready for normal microscopy when the lever is pushed in.

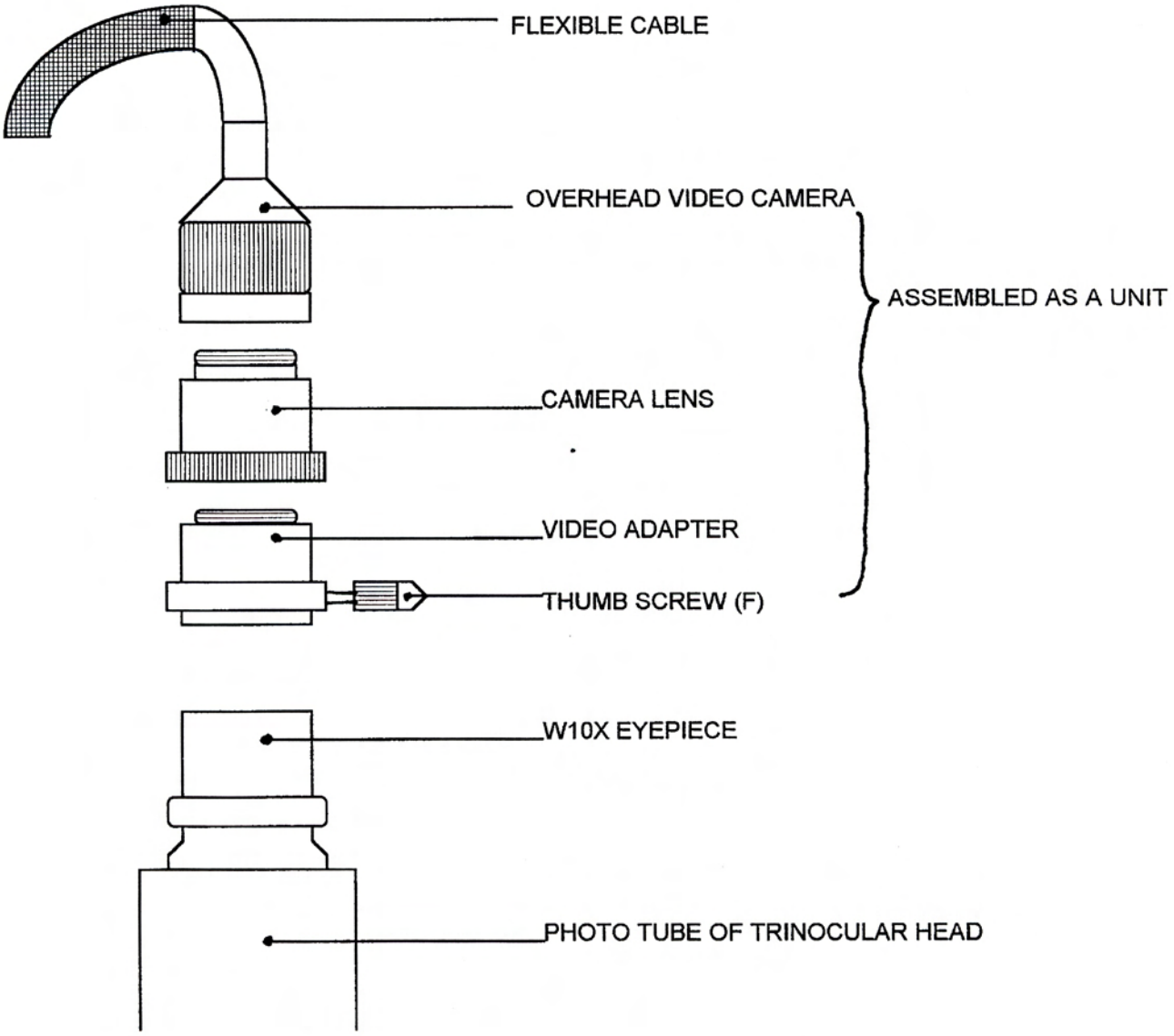
As to the details of photo micrography, please refer to "Swift Photomicrography with the Microscope".



WITH CCD VIDEO CAMERA



WITH SWIFTCAM VIDEO CAMERA



SIMPLE PROBLEMS AND SOLUTIONS

To save time and money, before you call for service, check this problem solver. If you have a problem, you may be able to correct it yourself. Just use this chart to locate your problem and then follow the suggested recommendations.

WARNING: When working on the electrical systems, checking exposed wires or replacing components, make sure to unplug the electrical cord.

CAUTION: Never disassemble mechanical or optical components. This servicing should only be done by authorized qualified Swift technicians. The **Swift Warranty** will be null and void if disassembled by a non-qualified person.

PROBLEM	POSSIBLE CAUSE AND REMEDY
No illumination	° Is the power plug connected to an active A.C. outlet? ° Check FUSE (if system uses voltage) and also try a new FUSE. ° Check the filament of the bulb, if broken try a new bulb. ° Check to see if you have the correct bulb and fuse. ° Check contact points of socket and bulb.
	If all above fails, contact your local authorized Swift dealer.
Illumination "HOT SPOTS"	° Is the WHITE DIFFUSING FILTER in and uneven brightness position in the filter carrier?
Illumination "HOT SPOTS" and uneven brightness	° Is the ABBE condenser in the right position? ° Is the condenser properly centered? ° Is your objective and nosepiece in the click stop position? ° Are the illuminator and bulb centered to the condenser?

PROBLEM	POSSIBLE CAUSE AND REMEDY
Poor Optical Image	* Check condition of your objective frontal lens and clean them if needed. To clean, use lens paper folded several times and moistened with approved lens cleaner such as Acetone. * Check condition of the seal of your 100X oil lens. If broken, return the objective to San Jose for correction and service. * Check to make sure retractable objective is in the correct forward position. * Check to see that other optical components such as your eyepieces, condenser, illuminator lens, etc., are clean and in the right position.
Flatness of field and	* All Achromat objectives have curvature. The curvature. correction to achieve a flatter field is to upgrade to a Micro Plan or Plan Achromat objective. * Check and clean objective front lens, if necessary.
Broken Finger Clip or Mechanical	* Remove and return the finger clip assembly on stage service problem the mechanical stage to an authorized Swift Repair Dealer or to Swift San Jose for correction and repair. **Do Not** send microscope or stage plate.

PROBLEM	POSSIBLE CAUSE AND REMEDY
Stage Driftage	° Swift M8000D is equipped with a tension adjustment, built as part of the coaxial focus knob. It is located in the smaller part of the split-coarse focus knob. See the section of "Tension Adjustment of the Coarse Adjustment Knobs".
Loose Nosepiece Tight Nosepiece	° Contact your Swift Authorized Dealer or Swift San Jose for correction. A special tool is needed to correct this problem.
Parfocality and Binocular	° See section # 7 - 9 of "Assembling" and "Ready To Use Your M8000D Microscope".
Need parts?	The following information will be required for ordering parts: ° Model or Series parts numbers are needed for ordering parts (model & serial numbers are found on the base of the Microscope) ° Part number & parts name ° If parts drawing is required to identify parts, contact Swift, San Jose.
Where to get Swift Service	Contact your local Authorized Swift Sales & Authorized Service dealer.

www.Swift-MicroscopeWorld.com
800-942-0528 Toll Free
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Printed in USA

SWIFT INSTRUMENTS, INC.

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Printed in U.S.A.
7/96/2M