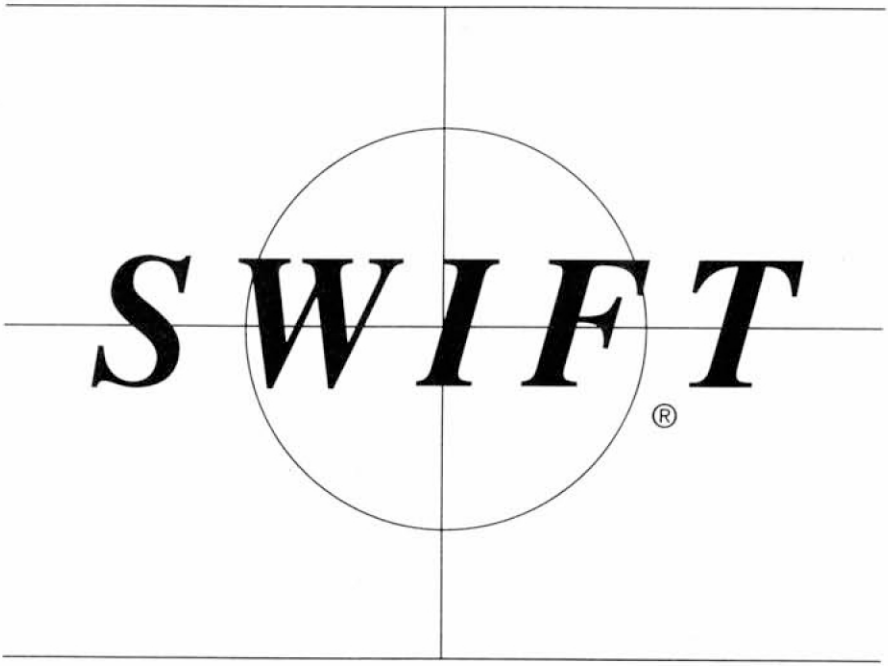
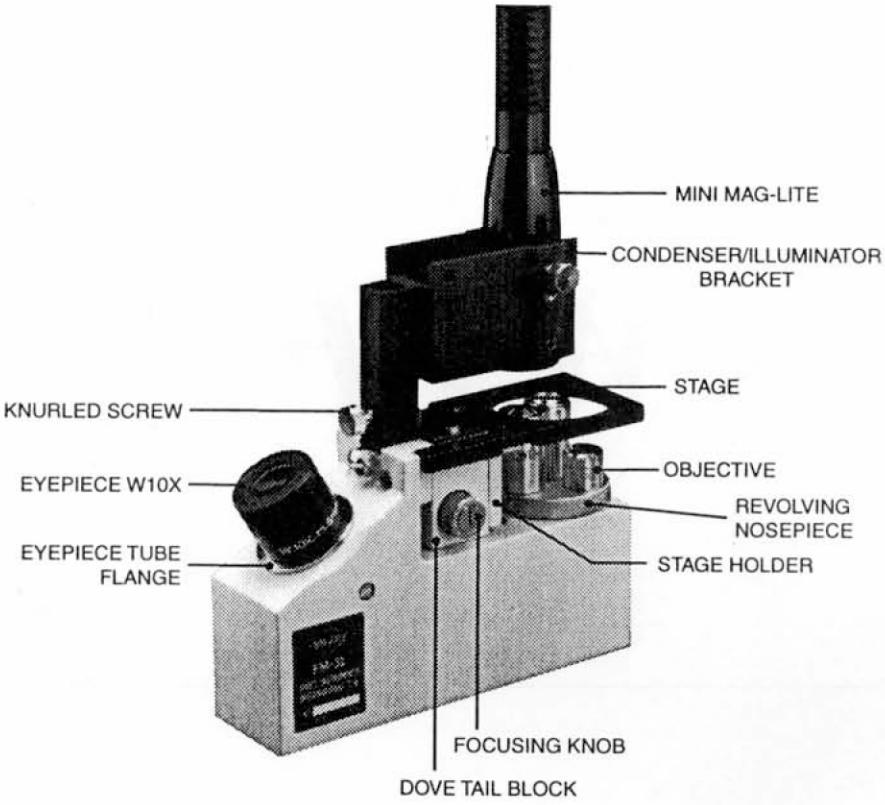
USE AND CARE OF SWIFT SERIES FM-31 LWD FIELD-MICROSCOPE

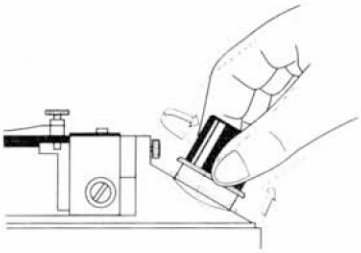


Swift's Field Microscope is the most convenient and inexpensive, high-quality instrument on the market. It provides users with up to 600X and was deliberately designed not to provide higher magnifications, which require oil-immersion techniques, because it is intended for use in the field, where such techniques are often more trouble than they're worth.

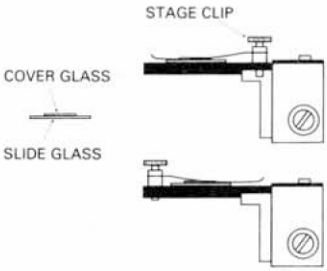


INSTRUCTIONS FOR USE

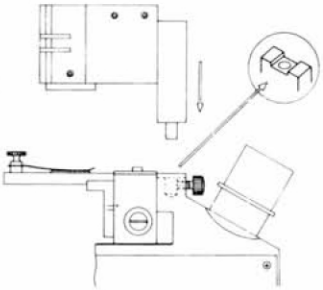
1.Grasp eyepiece tube flange and pull it out until it is fully extended. Then twist it to the right to lock it in position.



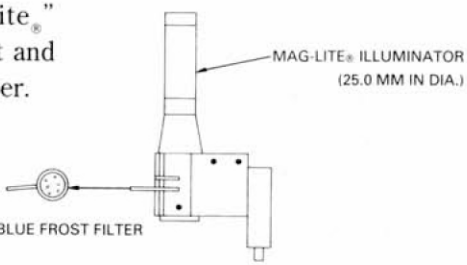
2.Place a specimen slide on the stage with cover glass up. Note that the stage clip can be used on either side of the slide.



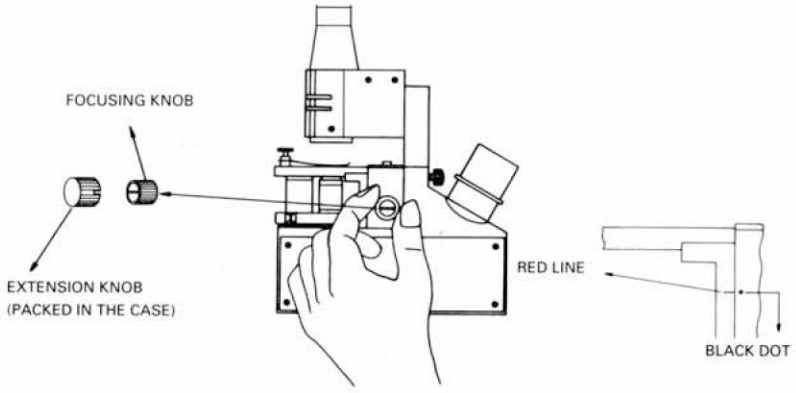
3.If you need high-intensity illumination, install the illuminator bracket, by inserting its mounting stud in the hole in the countersunk groove just in front of the eyepiece, and secure it by tightening the knurled screw.



4.Insert a "MINI Mag-Lite®" illuminator in the bracket and line it up with the condenser.



5.Note the red indexing line on the stage carrier and the dot on the focusing block. Use the focusing knob (with extension for convenience, if you wish) and line them up. Then turn the knob in either direction until your specimen comes into focus.



OPTICAL SPECIFICATIONS

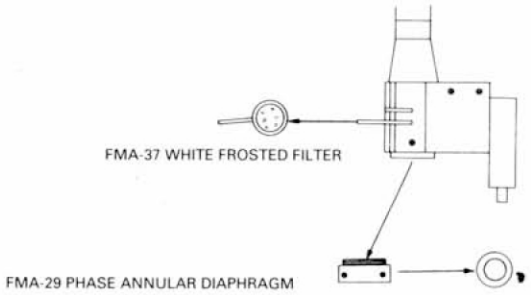
Cat.#	Eyepiece	Field View	Focal Length
MA749	W10X-15.5mm	18.0mm	25.0mm
MA740BK	W15X-12.6mm	13.0mm	16.7mm
MA739BK	W20X-9.8mm	10.0mm	12.5mm

Cat.#	Objective	N.A.	Working Distance	Focal length	Field of View
FMA-611	4X-Achromat	0.10	17.5mm	30.0mm	4.5mm
FMA-104	LWD10X-Achromat	0.25	7.15mm	16.7mm	1.8mm
FMA-105	LWD20X-Achromat	0.40	3.40mm	8.63mm	0.9mm
FMA-106	LWD40X-Achromat	0.65	1.75mm	4.48mm	0.45mm

FMA-107, 108 and 109 are the same as #104, #105 and #106 but PHASE objectives.

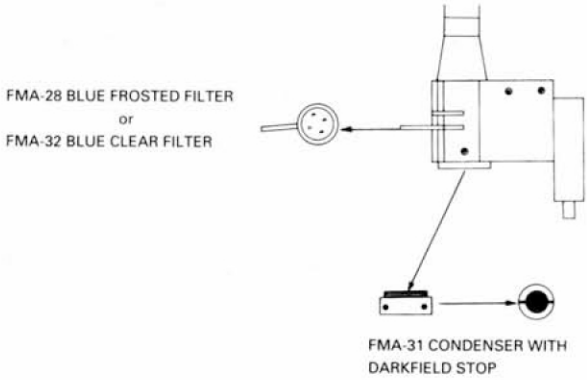
PHASE CONTRAST MICROSCOPY

Chemical staining is the traditional technique used to bring out the details in nearly transparent specimens so that they are not swamped out by the light from a powerful illuminator. But stains can damage delicate animal or plant tissues. Phase Contrast is an optical technique that gets the good effects achieved by staining with none of the bad ones. An annular diaphragm (FMA-29) is screwed into the base of the illuminator as an adjustable light control and three different types of optical filters enhance the results: the White Frosted filter is used for most specimens but a Blue Frosted or Clear Green filter can be substituted if the specimen requires the enhancement (or suppression) of certain light wavelengths.



DARKFIELD MICROSCOPY

Microscopists often have to examine quite thick, translucent specimens (or specimens that are suspended in liquids) so that the specific objects they want to observe are at different depths. Swift's FMA-31 darkfield Condenser has a darkfield stop, which in effect reverses the light and dark images and provides greater depth of field. This enables the user to find particular objects of interest more easily and then switch to phase contrast so that details can be seen more clearly.

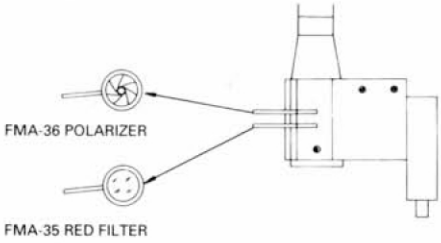


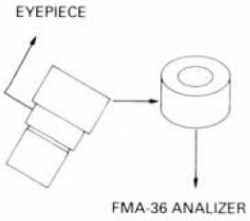
POLARIZING MICROSCOPY

Many mineral samples reflect light in many different directions and in different planes, which tend to interfere with each other and produce glare. By using two polarizing filters and adjusting their radial relatiionship to each other, the user is able to concentrate on light in a single plane and so clarify the image by eliminating glare.

Simply insert the polarizer filter in the upper filter slot of the illuminator housing and fit the other polarizer over the eyepiece. Rotating the eyepiece attachment polarizes the light and eliminates glare.

A red filter is available for users who wish to filter out certain wavelengths in order to enhance the images of specimens that reflect light at other wavelengths.





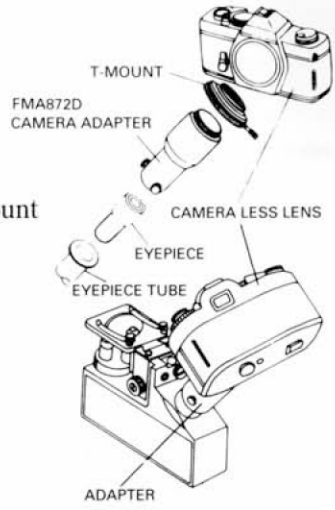
MICRO-PHOTOGRAPHY

Swift offers more than a dozen different adapters that enable microscopists to attach a wide range of 35mm cameras to the FM-31 Field Microscope and record photographic images of specimens that are photographed in the field ... in case they deteriorate or are lost before the user gets back to the lab.

Simply order the adapter that matches your camera and lock it onto the camera in place of its regular lens. Slip the adapter over the eyepiece of the FM-31. Focus the camera and release the shutter as you normally would.

POPULAR "T" mounts are listed as follows:

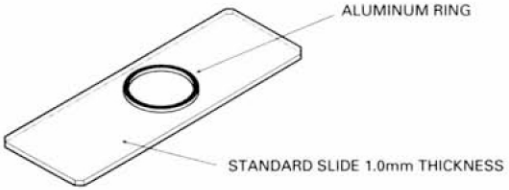
T-1	for	Praktica Asahi Pentax
T-4MSR	for	Minolta
T-4A	for	Minolta 5000, 7000 & 9000
T-5	for	Nikon
T-6CF	for	Canon
T-6A	for	Canon EOS650 & 670
T-13	for	Konica Autorex
T-14	for	Leicaflex
T-15	for	Olympus OM
T-16	for	Pentax K with bayonet mount
T-17	for	Leica M-1, M-2 or M-3
T-18	for	Yashica FR Series Contax RTS
T-18A	for	Yashica 230AF
T-19	for	16mm Cine ITV Camera "C" mount



EXAMINATION OF LIQUIDS OR DUST SAMPLES IN THE FIELD

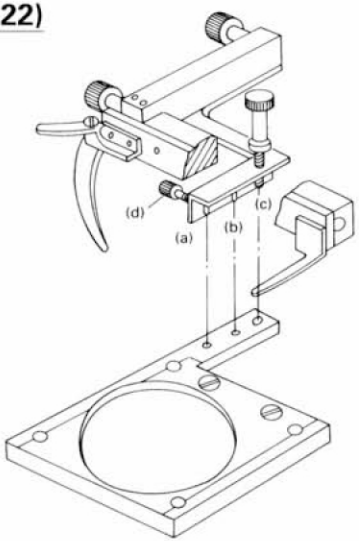
It is often inconvenient to use special slides, with builtin wells, for field work so Swift provides a simple, aluminum ring which can be used to form a temporary well on the surface of an ordinary slide. Be sure to put the microscope on a stable surface and out of the wind, while using this ring so that it is not blown or jogged out of position.

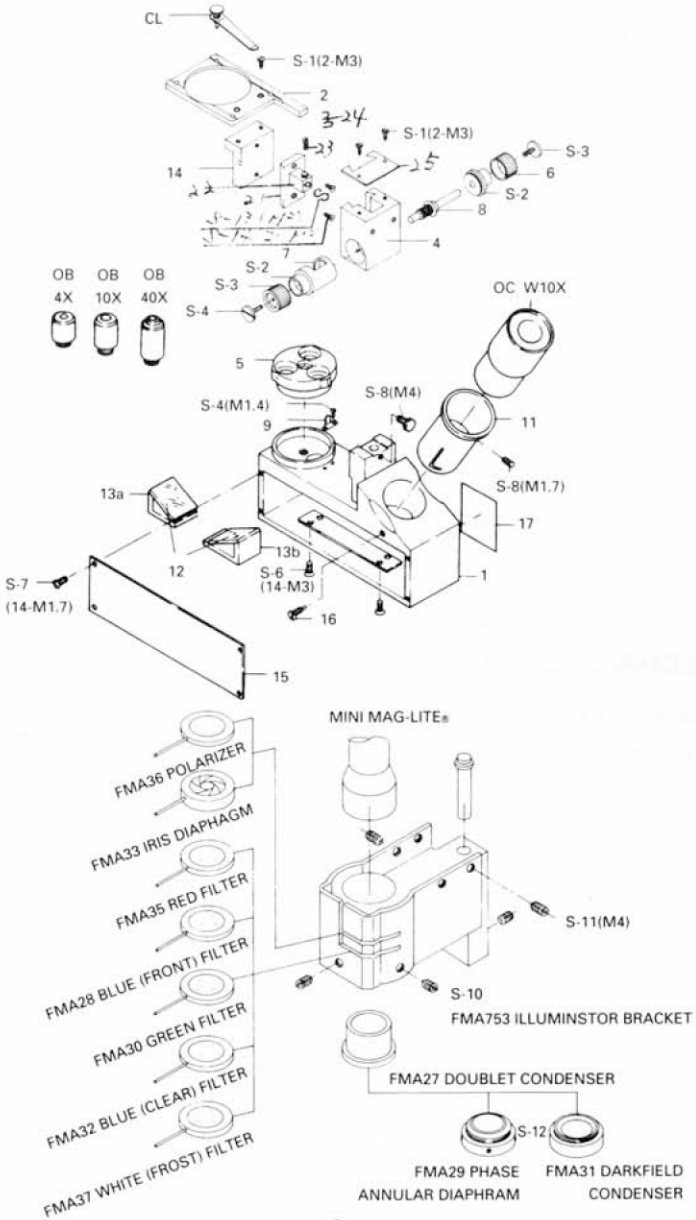
This device is specially useful for the field-examination of semen, urine, and blood samples as well as water contaminants or pollutants ... algae, parasites, bacteria and other micro-organisms and, for marine biology, the examination of plankton specimens.



MECHANICAL STAGE (FMA-122)

This accessory is easily attached by inserting pins "a" and "b" into the holes in the regular stage and tightening the locking screw "c". The graduated mechanical stage is vernier-adjustable ... a real convenience for users who need the added flexibility that this provides for moving slides back and forth and precisely locating objects of special interest that are widely separated from each other on a slide.




CL
S-1(2-M3)
2
3
24
S-1(2-M3)
S-3
6
S-2
8
14
4
7
OB
4X
OB
10X
OB
40X
S-2
S-3
S-4
OC W10X
5
S-4(M1.4)
S-8(M4)
9
11
S-8(M1.7)
13a
17
12
13b
S-6
(14-M3)
1
S-7
(14-M1.7)
16
15
MINI MAG-LITE®
FMA36 POLARIZER
FMA33 IRIS DIAPHAGM
FMA35 RED FILTER
FMA28 BLUE (FRONT) FILTER
FMA30 GREEN FILTER
FMA32 BLUE (CLEAR) FILTER
FMA37 WHITE (FROST) FILTER
S-11(M4)
S-10
FMA753 ILLUMINSTOR BRACKET
FMA27 DOUBLET CONDENSER
S-12
FMA29 PHASE
ANNULAR DIAPHRAM
FMA31 DARKFIELD
CONDENSER

PARTS LIST

Parts Number	Description	Parts Number	Description
1.	Body	CL	Stage clip
2.	Stage	CW	Washer
3.	Cover	SW	Spring washer
4.	Block	Screws:	
5.	Revolving nosepiece	S-1	(2-M3)
6.	Focusing knob	S-2	(2-M3)
7.	Housing	S-3	(2-M4)
8.	Spindle	S-4	(M3)
9.	Metal	S-5	(M1.4)
10.	Stopper	S-6	(4-M3)
11.	Eyepiece tube	S-7	(4-M1.7)
12.	Mirror	S-8	(M1.7)
13.a.b.	Shelf	S-9	(2-M)
14.	Stage holder	S-10	(5-M4)
15.	Cover plate	S-11	(5-M4)
16.	Stopper screw	S-12	(4-M)
17.	Name plate	Optics:	
18.	Dovetail	W10X	Eyepiece
19.	Spring	4X	Objective
20.	Extension knob	10XLWD	"
		40XLWD	"

21. Dovetail metal
22. Spring case
23. Pin
24. Spring
25. Lid
S-13(M2)
S-14(2-M3)

Chart of Components Required

Application		Brightfield	Phase	Darkfield	Polarization
Components					
Illuminator Bracket		X	X	X	X
FMA27	Doublet Condenser	X	X	X	X
FMA28	Blue Frosted Filter	X		X	
FMA29	Phase annular Diaphragm Condenser		X		
FMA30	Clear Green Filter		X		
FMA31	Single Condenser for Darkfield			X	
FMA32	Clear Blue Filter			X	
FMA33	Iris Diaphragm			X	
FMA35	Red Compensator				X
FMA36	Polarizer & Analyzer				X
FMA37	White Frosted Filter	X	X		
FMA38	10X with Spider Mount			X	

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