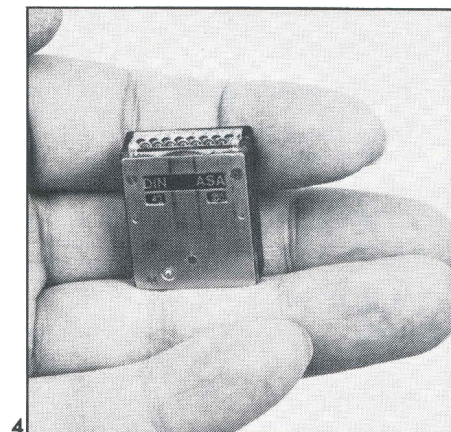
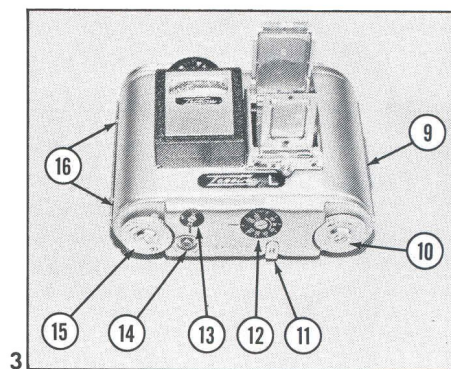
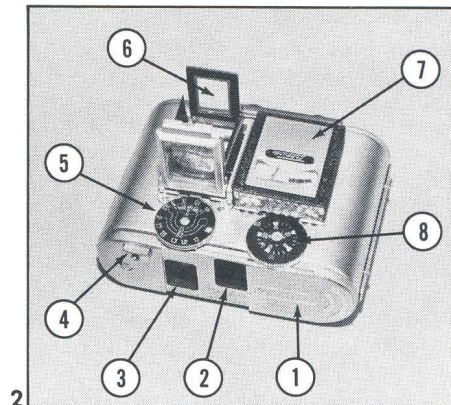


The Tessina



One of the most unusual of the pocket cameras, the Tessina is manufactured in Switzerland and has long been imported to the United States by Karl Heitz Inc. of New York. A twin lens reflex, the Tessina produces the largest (14x21mm) of the pocket camera negatives. Its use of regular 35mm film loaded into special cartridges makes it not only a pocket camera but the world's smallest 35mm camera. A favorite tool of the CIA, FBI and other investigative agencies, the Tessina doesn't really

resemble the traditional camera (or other pocket cameras) in appearance and so makes a fine companion for travelers who like to take candid photos—by the time the subject has figured out that his picture is being taken, a half-dozen or more are in the camera.

CROSS-COUPLED EXPOSURE CONTROL

The Tessina is equipped with twin 25mm f/2.8 Tessinon lenses—one for viewing and one for taking the pic-

ture. Its taking lens has a built-in haze filter, can be closed down to f/22 and focuses from 12 inches to infinity. A rotary shutter provides a full range of speeds from 1/2 to 1/500 second and Bulb. The Tessina can be used as any other nonautomatic camera—that is, you determine the correct combination of lens opening and shutter speed by using a separate meter, then set the camera controls and take the picture. Or you can use the cross-coupled exposure meter, which fits into an accessory

The Tessina

Once all exposures have been made, the film must be rewound into the Tessina cartridge. This is accomplished by flicking the little arm marked R on the camera back out and upward 90 degrees to disengage the film transport system. Now pull the knurled rewind knob (marked R) out and turn in the direction of the engraved arrow until the film is rewound. As with any other camera of its type, the sudden reduction in tension when you turn the rewind knob signals that the film has separated from the take-up spool and a few more winds will finish drawing it all into the cartridge.

Everything about the Tessina operates with a clockwork feel of precision, although you may feel a bit uneasy about snapping candid shots when the film transport takes over and advances the film to the next frame. If that whirring sound bothers you, two special Tessina models designed to pacify the nervous are available—a noise-reduced Tessina using nylon gears, and a noiseless one without the spring advance motor; you must wind the film after each exposure. Personally, I enjoy the advantage of the regular spring motor and have found that there is a way to render the film advance almost inaudible in situations where you might possibly feel embarrassed by the sound of the transport mechanism in action. Hold the rewind knob tightly while shooting to prevent slack in the exposed cartridge. After taking the picture, let up on the shutter button and gradually release the tension on the rewind knob, allowing the advance to operate slowly. This cuts film advance noise to almost zero.

LOADING THE TESSINA

Tessina cartridges preloaded with a variety of film emulsions are cut, re-spooled and packaged by Concava Ltd., the manufacturer of the camera, and are available from most larger photographic dealers. You can also purchase empty Tessina cartridges (or save the preloaded ones for reuse after processing the film) and load your own with any 35mm film. If you send your exposed cartridges to a commercial photofinisher, tape a small piece of paper to them requesting return of the empty cartridges.

To prepare the Tessina for picture-taking, push the sliding latch positioned on the camera's right side to the rear and remove the bottom. Pull out both the wind and rewind knobs completely, then turn the camera's take-up spool toward the mirror until its black spring clip faces the film path. You'll notice two raised metal teeth, one on each side of the clip.

These must engage the film's sprocket holes to secure it to the take-up spool as the film is inserted under the spring clip.

You'll also see the traditional-type 35mm film transport wheel along the rear edge of the film path. This sprocket wheel advances the film once the bottom is replaced. Clean the camera's interior carefully, paying particular attention to the mirror. Now pull an inch or two of film from the cartridge to act as a leader and fasten it to the take-up spool, then continue pulling the cartridge back until it drops into place in the opposite chamber. Check to make sure that the sprockets on the take-up spool engage the sprocket holes and that the film is tight, with the two visible film transport sprockets engaging the film; then replace the camera bottom.

This is done by first fitting the bottom over the two pins at the left side of the camera, then gently seating it into position. Lock it by moving the sliding latch forward. You'll find it easiest to squeeze the camera top and bottom together while sliding the latch forward. Film tension is checked by pushing the rewind knob in to about 1/8-inch from the camera body and turning it gently in the direction of the engraved arrow until a slight resistance is felt. Now wind the spring motor until the wind knob stops—don't force! Push the wind and rewind knobs in completely, then set the exposure counter dial by rotating it with the nail of your index finger until its red dot is opposite the red index mark on the surrounding black ring. Press the shutter button twice to transport the first frame of film into picture-taking position and watch the rewind knob; it should turn each time you hear the spring motor advance the film. If the knob doesn't turn, it indicates that the film end was not secured to the take-up spool correctly. You'll have to repeat the entire loading procedure, which will reduce the number of pictures on that cartridge by two frames.

USING FLASH

Equipped with a standard PC flash connector, the Tessina is synchronized for use with flash bulbs at 1/30 second, or electronic flash at any shutter speed. Just to the right of the rewind knob, you'll find the PC connector and above that, a tiny black dial marked X and M. When using the camera with the Emolux flash gun supplied by Karl Heitz Inc., the dial should be revolved until the M is opposite the black line. The X position is for use only with electronic flash.

A special Tessina adapter plate on the base of the Emolux gun allows it to be used directly on the camera. Remove the meter and replace it with

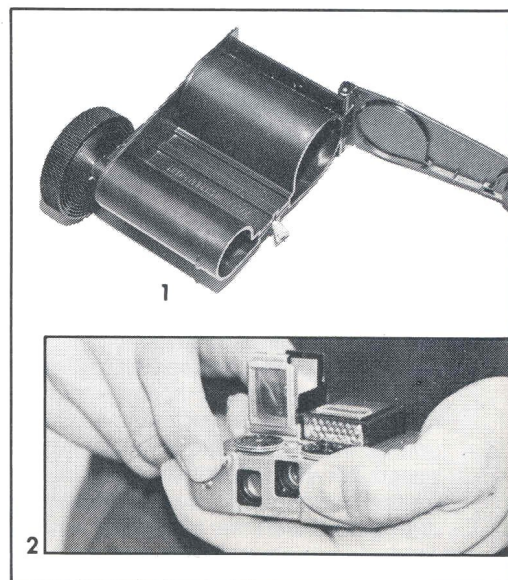
the flash. Be sure to plug the short connector cord into the PC receptacle. With its tiny reflector that slides into the unit when not in use, the Emolux is an ideal choice for pocket camera use with the Tessina; it accepts AG-1B bulbs and is powered by a standard 15-volt Mallory M-504 (or equivalent) battery, which should easily last a year or more.

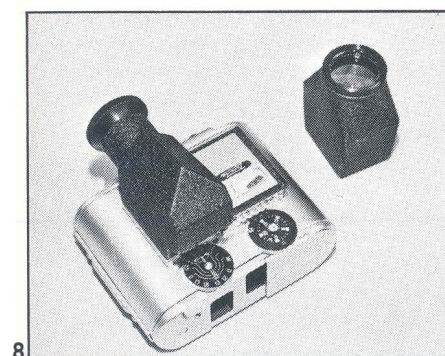
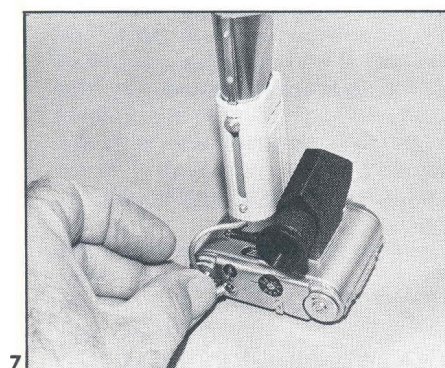
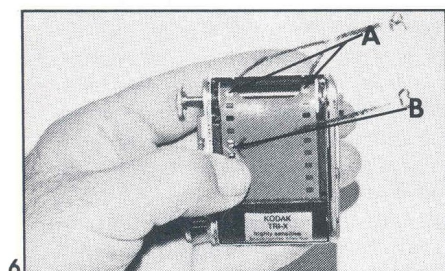
Other flash guns, including electronic units, can be used with the Tessina, but as the camera has no built-in tripod socket, you'll need the accessory tripod plate (\$9.95) and flash bracket (\$5.95) to accommodate your unit to the camera. To attach, the black instruction guide plate on the camera bottom must be removed. This is done by depressing the locking pin in its center and sliding the plate back toward the sliding latch. Lift the guide plate up and off the four rivets and replace with the tripod plate. Be sure its red dot coincides with the red dot on the camera bottom, then slide the tripod plate into position until the locking pin engages the center hole. The flash bracket can now be fastened to the tripod socket and your flash unit fitted into the accessory shoe on the bracket. Personally, I find the Emolux gun ideally suited for use with the Tessina, primarily because it is so compact and so easily attached for quick use.

Exposure for flash is computed the same as for the Minolta and other pocket cameras with mechanical shutters. Determine the guide number for the particular film in use and divide this number by the distance between flash and subject to find the correct lens opening, then set the lens opening dial and take the picture.

TESSINA ACCESSORIES

The Tessina system offers a wide range of accessories that makes it





shoe on the camera's top plate. This masterpiece of equipment miniaturization has an ASA sensitivity range of 12 to 800 and can be set to lock into the Tessina's lens opening ring. Turning the ring to open and close the lens moves a shutter speed scale to match with the meter needle. Once you've determined the correct shutter speed for the situation, transfer the meter reading to a separate speed dial on the camera back and you're ready to take the picture.

To use the cross-coupled feature,

you must first set the meter to the ASA index of the film in use. This is done by removing the meter from the camera and turning it over. On the back, you'll find two tiny windows (one for DIN ratings, one for ASA ratings) and a tiny milled dial just beneath the light cell. Turn the dial until the correct film speed is centered in the ASA window. Then set the lens for coupling to the meter by turning the lens opening dial until f/4 appears in its window. Carefully slide the meter into the accessory shoe all the way; a ball bearing mechanism then comes into play to prevent an accidental uncoupling of the meter and lens.

The meter scale is composed of three shutter speeds—1/30, 1/125, 1/500—separated by two white lines. The line between 1/30 and 1/125 represents 1/60 second while the one between 1/125 and 1/500 equals 1/250 second. In use, the Tessina meter will read light situations ranging from 1/30 at f/2.8 to 1/500 at f/22. When turning the lens opening dial to determine the correct shutter speed, you may find that there is not enough light to get a shutter speed reading, even at f/2.8. In such cases, you'll have to make an educated guess at which speed below 1/30 second will give a correct exposure and then refer to the back of the Tessina, where the entire shutter speed range from 1/2 to 1/500 second appears in silver numbers (the 1/125 and B settings are both in red) on a black dial. The dial revolves counterclockwise and the speed desired is set opposite a heavy black line engraved on the camera body. In actual use, you should brace the Tessina or use a tripod when any speed below 1/60 second is chosen.

OPTICAL SYSTEM

Unlike other cameras, the Tessina uses a 45-degree front surface mirror in its optical system. Light enters the lens, hits the mirror and is reflected downward onto the film emulsion, which runs horizontally along the bottom of the camera body. This system is the answer to how such a small camera (2 1/2x2x1 inches) can accommodate 35mm film. A vertical 14x21mm picture is thus formed on the horizontal strip of film, but the negative is laterally reversed from left to right because of the mirror. Tessina negatives must be placed in an enlarger with the emulsion facing upward instead of toward the enlarging paper to correct this reversal.

Each time the camera bottom is removed for loading or unloading of film, this mirror is exposed and so care must be taken not to accidentally smudge its face. The small brush included with the camera should be

used to clean both lens and mirror, as any specks of dust or lint on the mirror will reflect their appearance down to the film.

FILM ADVANCE

The standard Tessina is equipped with a spring-wound motor. To wind, pull the knurled film advance dial straight out, just as you would a watch stem, and turn in the direction of the engraved arrow until the motor is fully wound. Push the winding dial back into place and you're ready to take pictures. When the shutter button positioned at the top right of the camera face is depressed, you'll hear a tiny click as the rotary shutter opens and closes. Release the button and you then hear a rather loud whirring noise as the spring film transport moves the film to the next exposure and recocks the shutter. As one winding gives five to eight shots, it's possible to shoot short sequence bursts, especially useful in a candid photo situation. When the motor lacks enough power to move the film a full frame, it locks until it's wound again, making impossible overlapped pictures due to insufficient power.

1. Quality of enlargement from 14x21mm Tessina negative is best of any pocket camera and comparable to full-sized single-frame 35mm. Camera was set at hyperfocal distance setting (nine feet); exposure 1/125 at f/8 on Adox KB 21.

2. Tessina 35L features sliding lens cap (1), taking lens (2), viewing lens (3), shutter button (4), distance scale and depth of field indicator (5), reflex viewer and sportsfinder (6), exposure meter (7) lens opening scale and exposure counter (8).

3. Tessina 35L features sliding bottom latch (9), motor wind knob (10), rewind release lever (11), shutter speed dial (12), flash sync dial (13), flash contact (14), rewind knob (15), bottom cover latch pins (16).

4. Before using the Tessina in its cross-coupled mode, turn the milled dial below the meter cell until the ASA index of the film can be seen in the ASA window. Then set the lens opening dial to f/4 and slide the meter in place until it locks.

5. Tessina film is prepackaged in 18 and 24 exposure loads. Tiny cartridge can be reused and loaded with any 35mm emulsion.

6. When film is properly loaded in Tessina, sprocket holes will engage sprockets A and B. Camera bottom can now be replaced.

7. Tiny Emolux flash gun fits into meter accessory shoe. Reflector slides into gun for carrying. Be sure to connect short cord to PC terminal as shown.

8. The accessory prismfinder gives a 6X magnification and allows use of the Tessina at eye level. Shown beside camera is the 8X magnifier for precision ground glass focusing.

Instructions for use of **Haka - Autoknips**

Model I

Wind up clockwork with winding lever until it stops, and arrest with small lever on side.

Suspend Autoknips from cable-release and set the shutter.

Put clockwork into action by pushing small lever on side backwards and join the group. **Please note position of red disc when exposure is taking place.** Immediately after exposure is made, arrest clockwork so that the shutter will not be under pressure for longer than necessary.

Wind clockwork again. By so doing, it is easier to remove the Autoknips from cable-release.

Should Autoknips release the shutter too early so that there is not time enough to join the group, pinch off a millimetre from inside cable with a pair of sharp tweezers, whereafter Autoknips will release the shutter 3 to 4 seconds later.

Should a minor repair be necessary, despite the solid construction, please send Autoknips to us for repairing.

KLAPPROTT & LAMPE

Autoknipsfabrik

HAMBURG-RAHLSTEDT

Am Hegen 17

Printed in Germany.

one of the most versatile of the pocket cameras. Four interchangeable finders give a choice of viewing modes: waist-level, eye-level or 90-degree angle candid shots; with reflex sportsfinder, 8X magnifier or 6X prismfinder. The latter two have individual eyepiece adjustment to provide the sharpest image possible. A compact table clamp/tripod, or combination table tripod/close-up/copy stand allows users to take full advantage of the Tessina's continuous focusing range to 12 inches; four snap-on filters add impact to outdoor photos.

The camera can be carried on a neck chain, which snaps onto the tripod plate, on a watch strap, in a soft leather zip case or hard cover leather case with a belt loop. For the fashion

conscious, the Tessina can be purchased in a choice of chrome, black, red or gold finish and there's even a 17-jewel precision Swiss watch that slips into the meter shoe, giving you the only combination pocket camera/watch in the world.

Available are a film trimmer for cutting color transparencies to fit the special Tessina glass or cardboard slide mounts and a daylight self-loader for transferring film from regular 35mm cartridges to those used with the Tessina. Pneumatic and electric remote shutter releases are also available for serious amateurs interested in specialties like nature photography, and Karl Heitz is continually expanding the list of accessories available to the Tessina owner.

PICTURE TAKING

How you hold the Tessina to take pictures will depend upon which viewfinder you're using. When equipped with the reflex sportsfinder, or the 8X magnifier, cup the camera in your left hand, place the right index finger on the shutter button with the thumb resting on the wind knob. Release the shutter by squeezing thumb and finger together slowly, as if you're trying to break the camera. While this sounds a bit on the vicious side, it isn't really; it provides the best grip for a sure, steady release of the shutter without taking a chance of camera movement.

The 6X prismfinder allows the Tessina to be used at eye-level and again, a variation of the cupped left hand to support the camera seems to be the most natural way of holding the Tessina to avoid camera movement. This position also removes the possibility of inadvertently covering the lens or changing the lens opening. When using the cross-coupled meter, take care in adjusting the lens opening dial to obtain a reading, as the dial rests in front of the meter cell and it's quite easy to end up with a misleading reading if too much of your finger gets in the way.

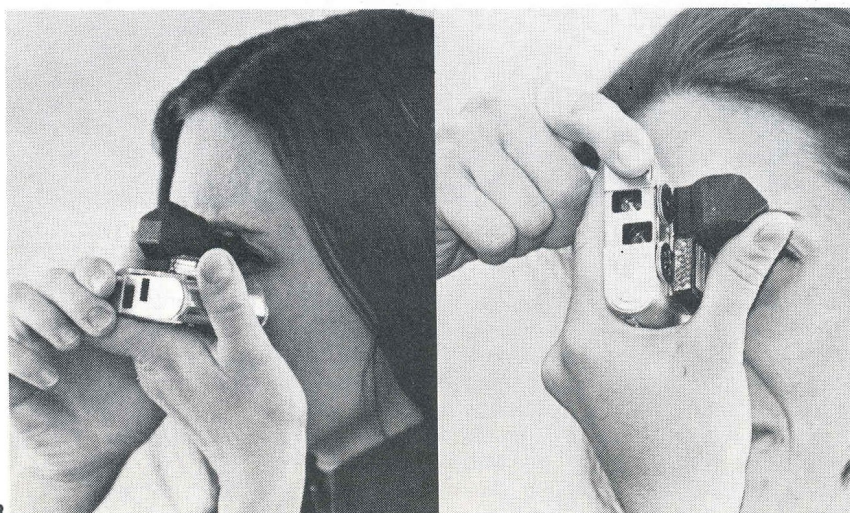
Horizontal pictures are easiest with the prismfinder. Cup your hand as if you were going to hold the camera for a waist-level shot, then turn the camera on its side with the thumb resting on the prism roof and the fingers along the camera bottom. Sighting with the left eye, press the Tessina against the nose and use the right index finger to press the shutter button. If the Emolux flash gun is in place for indoor pictures, let the gun rest on the left thumb as you won't be able to reach the prismfinder; this is equally comfortable and steady.

The Tessina is a good choice for those interested in fine craftsmanship, unusual cameras and larger negatives. By following instructions carefully, the novice can take excellent pictures without difficulty, while those who demand a great deal from their pocket camera will find that the Tessina is capable of delivering even under difficult conditions.

SPECIFICATIONS

TESSINA 35L

LENS:	Tessinon 25mm f/2.8 in continuous focusing mount from 12 inches to infinity
SHUTTER:	Mechanical rotary type with speed range of 1/500 to 1/2 seconds; MX flash synchronization
FILM/FRAME SIZE:	Standard 35mm film in Tessina cartridges, 18 or 24 exposures 14x21mm
VIEWFINDER:	Reflex sportsfinder; 8X magnifier or 6X prismfinder optional
EXPOSURE METER:	Selenium cell cross-coupled to lens, removable
MEASURING RANGE:	ASA 12 to 800
FILM ADVANCE:	Precision miniature spring motor provides 5-8 automatic one-by-one pictures without rewinding; double exposure prevention
OTHER FEATURES:	Built-in haze filter, cable release socket, twin lens reflex viewing with ground glass for framing, focusing and depth-of-field control
SIZE/WEIGHT:	2 1/2x2x1 inches; 5 1/2 ounces



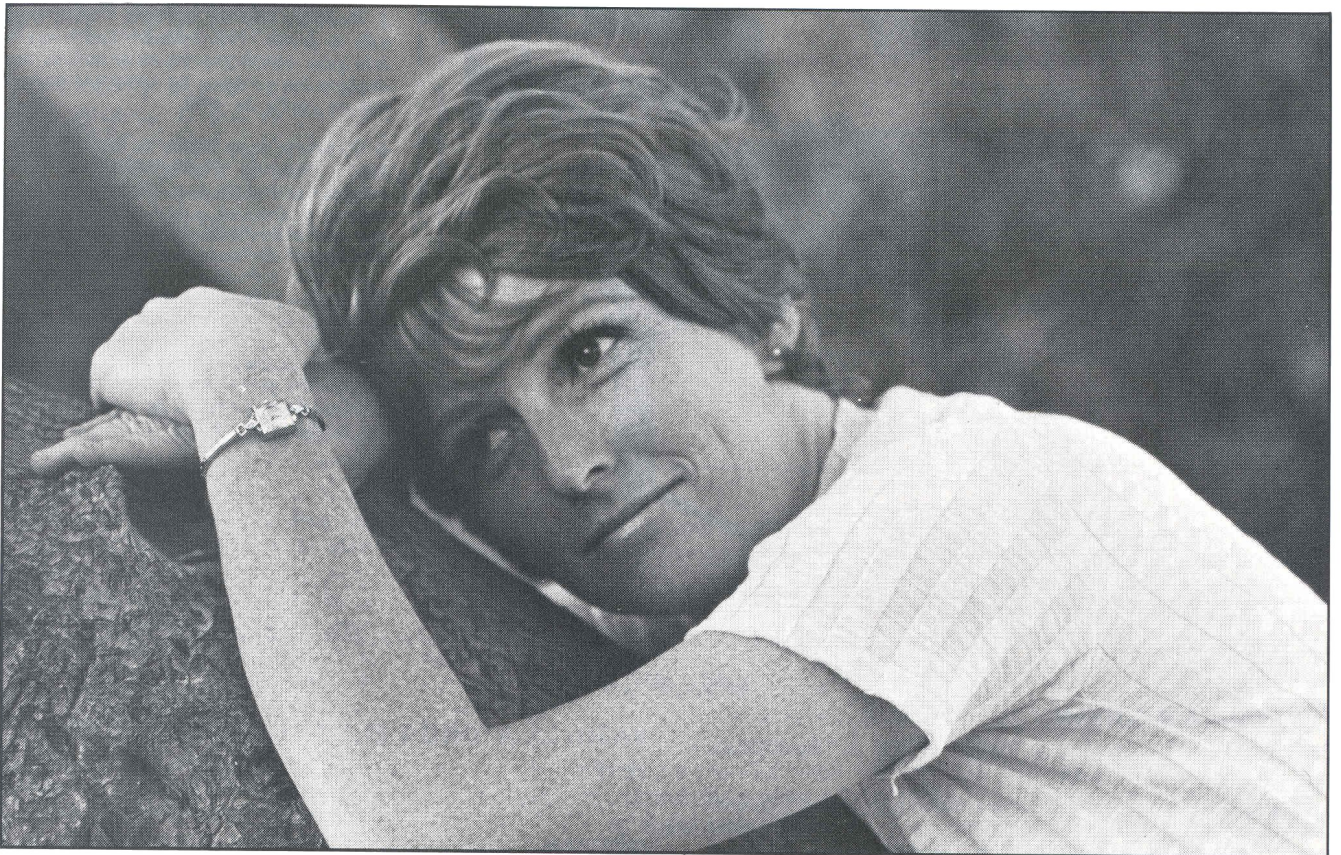
1. Tessina self-loader accepts standard 35mm cartridge of film for reloading into Tessina cartridges in daylight. Built-in knife blade cuts film leader when reloading is complete.

2. For waist-level viewing with the Tessina, hold camera as shown. This gives a firm grip without interfering with the lens or meter.

3. Variations of the same cupped hand position are used to hold the camera at eye level when using the prismfinder or sportsfinder for horizontal or vertical pictures.

Silver, Silver, on the Film-- Which One Is Best of All?

POCKET CAMERA FILMS



Silver, Silver, on the Film

is viewed under a magnifying glass, the eye cannot determine the grain structure, but enlarging the negative beyond a certain size quickly reveals the true nature of this characteristic. The tonal areas that looked so uniform under very slight magnification suddenly begin to break up into coarse-appearing areas when enlargement is increased and we then say that the picture is "grainy." Details that once appeared sharp now seem to have a fuzzy, poorly defined edge, causing them to lose this sharpness. While a film's grain structure cannot be eliminated, it can be controlled by selecting the proper film for the job and giving it correct exposure and development.

ACUTANCE

At one time, grain was considered to be the chief characteristic (or culprit) in determining image sharpness, but more attention has been focused in recent years on another characteristic known as contour sharpness, or acutance. This term refers to the degree to which one tonal area visually blends into another and it seems to be psychologically more important than grain. Acutance is most easily visualized by photographing a white circle on a black background. Films with a poor acutance quality will deliver a fuzzy separation between the two contrasting tones, while those with good acutance will show a quite distinct break between the tonal masses. As depth of field is the lens's range of apparent sharpness, acutance is the film's corresponding range of sharpness.

While grain and acutance are interdependent to a degree in producing apparent sharpness, it is possible for a film to have one characteristic without the other. Like grain, acutance is partially dependent upon correct exposure and development of the film. In the past this put much of the burden on the photographer, but with today's mostly automatic pocket cameras incorrect exposure is seldom at fault unless the user chooses to disregard the camera's warning that insufficient light exists for a good picture. Thus, proper development remains the major area of concern for most pocket camera users.

EVERYDAY USE

For general picture-taking sessions with pocket cameras, the slower films are sufficiently light-sensitive to handle all but unusual situations. As they generally combine both fine grain and excellent acutance, these films will give you the sharpest negatives and prints. But slow films are also a bit on

the contrasty side and tend to build additional contrast quickly if subjected to overexposure and/or overdevelopment. Yet many pocket camera users seem to like a slight amount of tonal contrast, as it adds to the illusion of sharpness. While I suggest that you standardize on the use of one particular emulsion, it's also a good idea to try one cartridge of each different film loaded for use with your particular pocket camera to explore both the film characteristics discussed, as well as determining exactly what they will do under varying circumstances.

BLACK-AND-WHITE PHOTOGRAPHY

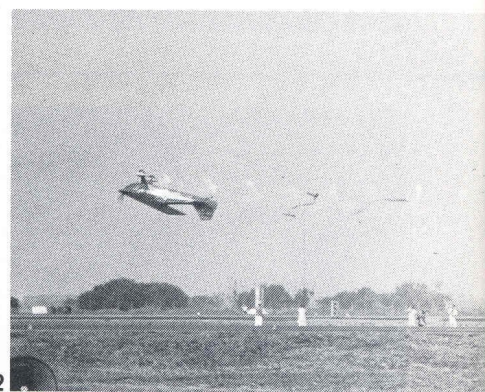
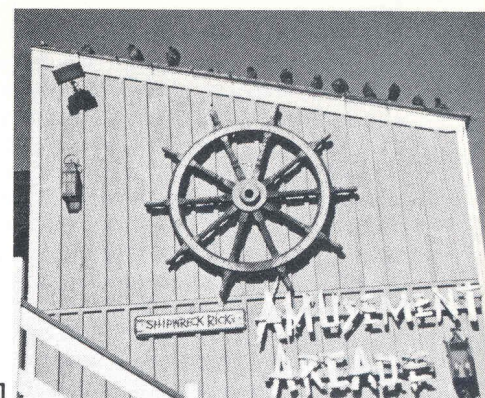
Some pocket camera systems like the Minox or Atoron allow the use of several different black-and-white emulsions; others like the Kodak Pocket Instamatic camera and Rollei 16 have only one or two black-and-white films packaged for their use. If yours uses a reloadable cartridge, we'll examine other unusual films later on that you can use; meanwhile, here's how the factory-loaded films compare.

ASA 12/An ortho copy film, this is the slowest emulsion packaged for Minox use and the only one that can be developed under a red (Ortho) safelight. Intended for reproduction of black-and-white line drawings, type-written pages, printed material, books, documents, etc., rather than continuous tones like those of paintings or pictures, the film is virtually grainless and allows great enlargement without loss of image definition. Available only for Minox/Atoron use.

ASA 25/Minox recommends this relatively slow but extremely fine grain film for all general black-and-white use except copy work. As it is somewhat on the contrasty side, ASA 25 can also be used in place of ASA 12 for line copying by extending its development time. As the film produces very sharp enlargements, ASA 25 is an ideal choice for reproducing continuous tones. Atoron cartridges are sold under the name XT-Pan.

ASA 50/If you don't mind a slight loss of fine grain, this film is another good choice for general Minox or Atoron photography. The extra speed extends the picture-taking capability of your pocket camera to include overcast and dull days without risking the use of a too-slow shutter speed.

ADOX 20 and 40/These two thin emulsions are actually Alox KB14 and KB17, ultrafine grain films with very good image sharpness; but both require care in exposure and development, since they build contrast rapidly. Available only for the Tessina,



they compare quite favorably with the ASA 25 and 50 provided for Minox/Atoron use, as they're essentially the same film.

ILFORD PAN F/Available for use with the recently discontinued Rollei 16 and Edixa 16 only, this ASA 50 film has the wide latitude of Ilford FP4 (see following) and an even better grain structure. The contrast of both Ilford films is about average if used under normal exposure/development conditions.

PLUS-X/A universal choice among pocket camera films, Plus-X uses an emulsion coating quite similar to the new 110 Kodak Verichrome pan film packaged for use with the Kodak Pocket Instamatic cameras. Contrast

Silver, Silver, on the Film

in bright sunlight without a neutral density filter is not recommended, since its speed is so great that overexposure is unavoidable under such conditions and the resulting negatives are unprintable. But use this one sparingly and you'll be amazed at what it will do for you. Tri-X is packaged for use with the Minox, Atoron and Tessina. A comparable high-speed (ASA 320) 16mm movie film, Double-X, is provided for Minolta camera owners.

COLOR PHOTOGRAPHY

Color has assumed an increasingly larger role in amateur photography in the past few years and there's no reason why you shouldn't enjoy full color pictures with your pocket camera. All color emulsions are now balanced for use in daylight or with flash and are of two types: the positive or reversal films that produce transparencies returned as slides ready for projection, and negative films that are used to make color prints. Although transparencies once dominated amateur color photography almost completely, color prints from negative films now account for approximately 75 percent of all color pictures taken. In addition to their distinct edge in popularity, negative color films have triple-threat versatility. They can be used to make black-and-white prints as well as transparencies for

projection; if you want both color and black-and-white prints from a vacation trip, you can get both by using just one type of film.

COLOR TRANSPARENCY FILMS

MINICHROME/A sharp and brilliant color film, rated at ASA 20, this is the slowest of all pocket camera positive color films and the only one available for Minox users.

EKTACHROME MS/Respoiled from 16mm movie stock by Minolta, this emulsion is used by professional cinematographers who prefer the bright colors characteristic of Ektachrome film. It provides excellent color rendition and gives sharp images with low grain. For all practical purposes, Minolta users will find it comparable to Ektachrome-X film, although it's only rated at ASA 50. This recently replaced Kodachrome II film (ASA 25) in the Minolta pocket film line-up.

EKTACHROME-X/Rated at ASA 64, this moderately high-speed color transparency film combines great image sharpness and low grain. Those who enjoy bright colors will like the brilliance of Ektachrome-X film and its tendency to emphasize warm colors. Packaged for use in Kodak Pocket Instamatic, Minox, Atoron and Tessina cameras.

KODACHROME-X/Also rated at ASA 64, this transparency emulsion exhibits its remarkable sharpness and free-

dom from grain. Its colors are quite natural but more subdued in comparison to Ektachrome-X film. At present, it's available only in 110 film cartridges for the Kodak Pocket Instamatic cameras.

HIGH SPEED EKTACHROME/Recommended for color slides of outdoor action or interiors lighted by daylight, this fast (ASA 160) Kodak still camera emulsion is available only in Tessina loads. A comparable 16mm movie emulsion designed for use under very low illumination levels, Ektachrome EF film (ASA 160) is respoiled by Minolta for its pocket camera line.

COLOR NEGATIVE FILMS

AGFACOLOR CN14/An ASA 20 color print film with characteristics of very fine grain and excellent sharpness, CN14 is packaged only for Minox/Atoron cameras.

KODACOLOR II/A remarkable advancement in negative color emulsions, this moderately high-speed (ASA 80) film is a very recent development and primarily responsible for the popularity of the Kodak Pocket

1. Yashica Atoron Electro camera — Tri-X film, camera on tripod.

2. Minox C camera — Tri-X film.

3. Minolta 16 MG-S camera — ASA 320 (Double-X) film, available light.



For pocket camera use in most circumstances, you'll want a general purpose film, one that lets you take good, sharp pictures under the majority of conditions you'll encounter by producing negatives that will make snappy prints. Every film, whether black-and-white or color, is subject to three characteristics that govern what can be done with it—speed, grain structure and acutance, or image sharpness. Of course, external factors such as correct exposure and proper processing, as well as the subject and lighting you choose, will affect the quality of your final picture, but selecting the film that best suits your requirements is an important

first step and depends upon a basic understanding of film characteristics.

SPEED

When we talk about the "speed" of a film, or how "fast" it is, we mean its sensitivity to light. This quality of light sensitivity is commonly expressed in the U.S.A. by an ASA rating; in Europe, the system used is DIN. The higher the ASA or DIN number, the faster or more sensitive the film is to light. This rating system gives you a basis for film comparison; an ASA 100 emulsion is twice as fast as one designated ASA 50. As a "fast" film requires less exposure than a "slow" one to deliver the

same negative, the high-speed film extends the picture-taking capability of your pocket camera considerably, but not without extracting a price in terms of grain and acutance.

GRAIN

Every photographic emulsion is composed of light-sensitive silver particles. When light strikes these sensitized particles, a chemical reaction takes place, forming a latent image—one that exists but cannot be seen. To make the latent image both visible and permanent, the film is subjected to the further chemical action of a developer, which turns the affected silver particles various shades of gray or black, depending upon the tonal composition of the subject photographed. Thus those silver particles that constitute a white sweater would turn almost black upon development, while others representing a black sweater (and which reflected little or no light back to the film) would remain practically unchanged.

Grain simply refers to the size of the silver particles forming the developed silver image. To achieve its greater speed, a fast or highly sensitive emulsion uses more and larger particles of silver than one that is slow, or less sensitive to light. The chemical action of development also affects the grain structure. Violent, fast-acting developers will create a coarse grain pattern that tends to bring the silver particles together in clumps, while a slower acting developer minimizes this clumping action. As a result, a film coated with microscopically minute particles will produce a smoother appearing image than one coated with coarser particles, providing, of course, that both are properly exposed and developed in suitable formulas.

When your pocket camera negative

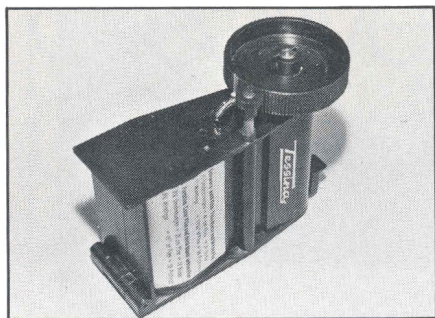


4

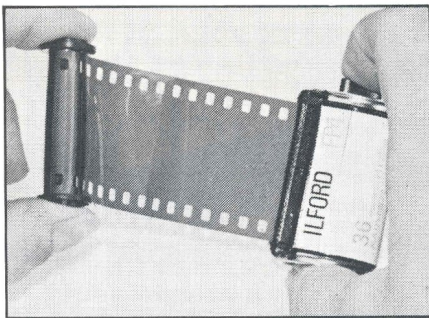


5

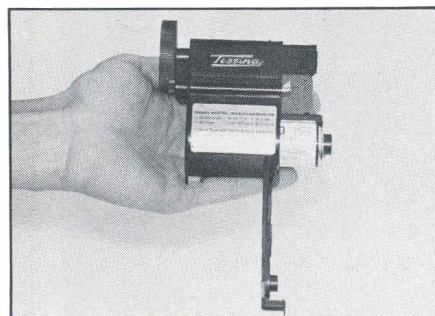
1. Minox camera — ASA 25 film.
2. Yashica Atoron camera — ASA 50.
3. Tessina camera — Adox 40 film.
4. Tessina camera — Adox 20 film.
5. Tessina — Ilford Pan F film.



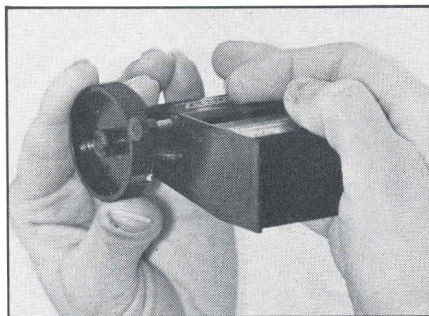
1. Tessina self-loader is used to transfer film from standard 35mm cartridge to special Tessina cartridge.



2. Cut end of 35mm film off square, insert under clip on Tessina cartridge spool and fasten sprocket holes over spool sprockets. Insert Tessina spool in its cartridge and replace top, then fit into self-loader.



3. Insert Tessina and 35mm cartridges into self-loader as shown. Rotate knife blade to fit in its slot and close cover tightly.



4. Wind off specified number of turns by matching mark on large wind knob to corresponding mark on body of self-loader. When finished, pull up on smaller knob to cut film. Open bottom latch and you've got a fresh Tessina load ready to use.



Instamatic cameras. With much finer grain than the older Kodacolor emulsion, the new Kodacolor II film has softer, richer and more natural color rendition than other print films. Presently available only in 110 film cartridges, it gives big camera results with the small Kodaks.

MINICOLOR/This faster (ASA 80) color negative film for Minox/Atoron users has a slightly coarser grain pattern than CN14 but will prove quite acceptable for those who find the slower emulsion too restricting.

EKTACOLOR S/The professional equivalent of Kodacolor-X film (not available in pocket camera loads), this versatile Kodak negative color film is rated at ASA 80 when used with the Atoron and Minox and ASA 100 with the Tessina, Rollei 16 and Edixa 16. Minolta provides cartridge loads of Eastman 16mm negative color film (motion picture stock rated at ASA 80) for use in its cameras.

GAF COLOR PRINT FILM/Just introduced in 110 cartridges for use with the GAF 220 pocket camera, this is GAF's competitive (ASA 80) offer-

ing to Kodak's older Kodacolor film and will be warmly greeted by all those who have used it in the larger 126 film cartridges. Striking reds and brilliant blues characterize this negative color emulsion. You can expect GAF to make improvements in the grain structure shortly.

UNIFILM/Yashica offers this for use as a color negative, transparency and black-and-white film. Rated at ASA 100, it's not stocked by many dealers and color rendition is somewhat dependent upon the processor, but it's worth a try for Minox/Atoron users.

LOADING YOUR OWN

For those Minolta or Tessina users who wish to experiment with the wide variety of emulsions not offered in factory loads, it's possible to reload your own cartridges using bulk film at a cost of 10-20 cents each (depending upon the film and where you buy it), extending the useful range of your camera considerably. For example, those partial to the color rendition of GAF Color Slide film will be able to use all four emulsions (look for GAF to package one or more in 110 cartridges), and if far-out effects intrigue you, infrared film and a red filter provide a fascinating side trip along one of photography's more exotic avenues. Unfortunately for their users, the Kodak 110, Minox and Atoron cartridges cannot be satisfactorily reloaded—the 110 film cartridge is intended for one-time use and 9.5mm film for the Minox/Atoron cartridges is difficult to come by in the U.S.—and so those cameras are currently restricted to films provided by the camera manufacturers.

With the daylight film loader and extra cartridges offered by Karl Heitz Inc., Tessina owners can use any 35mm film currently on the market, including Kodak Recording film for picture taking under very adverse light conditions. The Tessina film loader turns the challenge of respooling cartridges for Tessina use from a darkroom chore into a simple task that can be done anytime, anywhere. As always, the primary pitfall to avoid here is dust—and since the plastic loader attracts the enemy, take care to keep it *clean*.

Reloading Minolta cartridges is not quite as convenient, but with a little care and patience, it can be done with ease, although only in total darkness. The variety of 16mm films available for reloading is quite extensive but in virtually every case, you'll have to do your own processing, as commercial labs are not equipped to handle emulsions other than those offered in factory loads. The trick here is to reload only those films that can be processed at home. For



is good, with an exceptionally fine grain structure for a medium-speed film (ASA 125), yet it's fast enough to allow the use of filters for effect or high shutter speeds to avoid possible camera movement. Plus-X is obtainable in cartridges for the Minox, Ato-ron, Tessina and Minolta, but the last rates it as ASA 100.

VERICHROME PAN/Although still rated at ASA 125, Kodak's all-purpose black-and-white film has been updated with a new emulsion designed to improve both sharpness and grain. But comparative tests indicate that under general use conditions, it does not surpass the Plus-X loaded for other pocket cameras in either respect.

ILFORD FP4/A microthin emulsion that gives crisp, fine grain detail, this ASA 125 film has very good latitude and compares quite favorably with other medium-speed pocket camera films. Available only in cartridges for use with the Rollei 16 and Edixa 16 pocket cameras.

TRI-X/If grab shots under dim available light conditions are your cup of tea, here's the film for it. You'll also find it ideal for outdoor action shots in bad weather or indoor scenes where flash is not practical or possible. But as Tri-X is quite grainy in comparison to other pocket camera emulsions, you pay for the extra speed (ASA 400) with some loss of sharpness and contrast. Outdoor use

1. Minolta 16 QT camera — Plus-X film, with yellow filter.

2. Minolta 16 MG-S — Plus-X film.

3. Kodak Pocket Instamatic 40 camera — Verichrome Pan film, Magicube.

4. Kodak Pocket Instamatic 50 camera — Verichrome Pan film.

5. Kodak Pocket Instamatic 50 camera — Verichrome Pan film, with orange filter held over lens and meter cell.

6. Tessina camera — reloaded Ilford FP4 film, with red filter.

Creative Pocket Camera Techniques



PHOTOS 1-8 BY JIM CORNFELD

Photo 1

The uses to which you put your pocket camera will depend entirely upon your own personal photographic tastes. Some find it an ideal photographic notebook or device with which to capture and preserve interesting and personal moments in everyday life. Others will treat it as an all-around instrument with which family, friends and vacation trips can be recorded. And a few will even regard the pocket camera as a means of expressing their artistic inclinations. And while there are dozens of different motivations in using a pocket camera, many will simply lie idle because their owners cannot see "anything" to photograph. To make certain that yours isn't among this last group, I want to pass along a few ideas in the following pages on

how to expand your own photographic horizons with the pocket camera.

Put simply, you have a choice of using it to take snapshots or photographs. While it may sound as if I'm talking in riddles, there is a definite difference between what these two terms, so often used interchangeably, represent. Now, what makes that difference? Certainly it's not technical quality; both can be sharp and correctly exposed, yet you can immediately recognize that one is far more interesting than the other.

THINK LIKE A PRO

Obviously then it must be the content, or more appropriately, the way in which you select and approach your subject. Take Photo 1 as an example. Here's an everyday example

of a typical amateur picture. It has that essential ingredient which makes life so enjoyable for the male of the species and to many who look at it, it is considered to be a good "snapshot." But as you and I know that it's really not very good, let's see what can be done to elevate it step-by-step from the category of good "snapshot" to that of good "photograph."

To begin with, the photographer stood too far away, a common failing and a deadly one with the tiny pocket camera negative. The first improvement we can make is to move the camera closer to the subject, as in Photo 2. This solves some of the problems of our original picture, but the background is still too cluttered and there's far too much for the eye to accept comfortably.

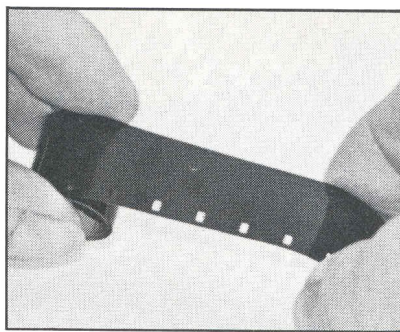
Silver, Silver, on the Film

black-and-white photography, stick with 16mm negative film only, but you can use either negative or positive color films as long as processing kits are available for home use. This means that while you can use the various GAF color films, you'll have to forego Kodachrome II film.

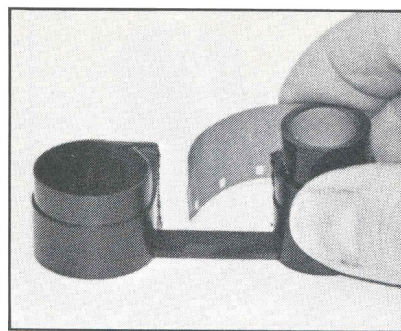
To reload Minolta cartridges, you'll need a completely dark work area. While a closet probably comes to mind first, it's a poor choice because of the close quarters in which you'll have to work and the omnipresent dust problem. Like pockets, closets seem to collect more dust and dirt than any other part of a house. Without a permanent photographic darkroom to do the reloading, you'll have to rely on two possibilities—darkening a kitchen or bathroom completely at night, or using a changing bag. For many amateurs, the changing bag is a frustrating experience, so I suggest using the most dust-free area in the house—the shower cabinet—provided you can satisfactorily darken the whole bathroom.

Before loading the Minolta cartridge, use a syringe to blow out the dust, taking special care to clean the felt light trap. Place the necessary items for reloading on a table where you can work conveniently—bulk film container, measuring rod, cartridges, scissors and a roll of 1/4-inch Scotch Magic Transparent tape. Of all cellophane tapes, this one works best, as its adhesive does not have the same tendency to "bleed" that is common to others. If you use the shower cabinet, I'll leave it to you to figure out where to put these items—mine has a good size seat built along one wall.

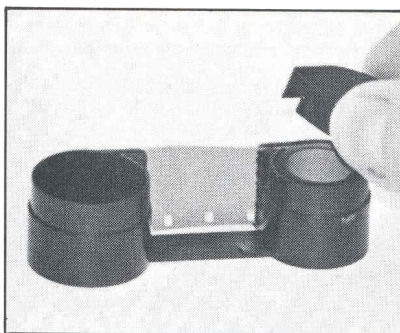
A yardstick makes a good measuring rod; if you want a full 18-exposure load, you'll need 18 inches of film, so cut the stick in half. Fewer exposures can be loaded if you desire; allow 7/8 inch for each frame and add four more inches to the total for leader—a 10-exposure load would thus require 13 inches of film. As you can see by the accompanying photo how-to-do-it sequence, there are eight steps in reloading a Minolta cartridge; the first three must be carried out in absolute darkness, while the last five can be done under dim illumination. Before turning off the lights, arrange all of the necessary items where you can locate them by touch in the dark. Once you've practiced this procedure in daylight with a discarded piece of film until you can accomplish all eight steps without difficulty, you're ready to reload your own for greater variety and more fun with your hobby—better pocket camera pictures.



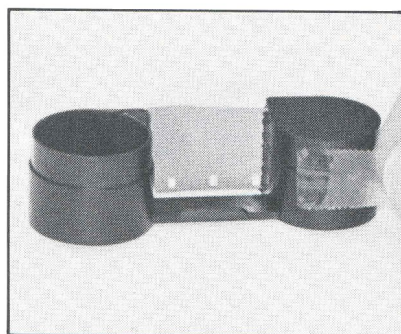
1. To reload Minolta cartridges, cut 18-inch strip of film and wind into small roll with emulsion side in. Steps 1-3 must be done in dark.



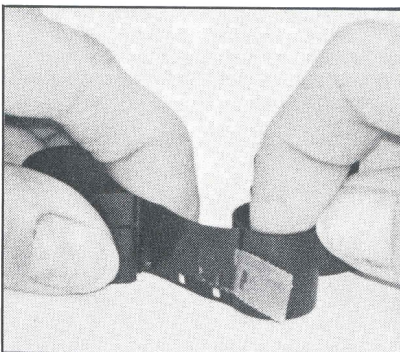
2. Place film roll in smaller cartridge chamber, threading about an inch through the light trap.



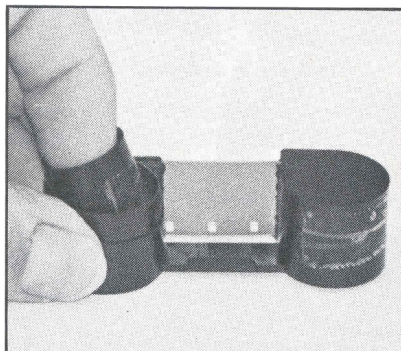
3. Put chamber cover on tightly.



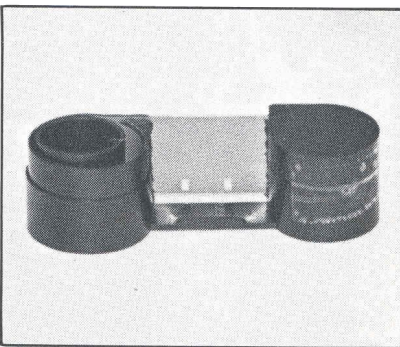
4. Tape cover securely with a piece of pressure-sensitive tape as shown.



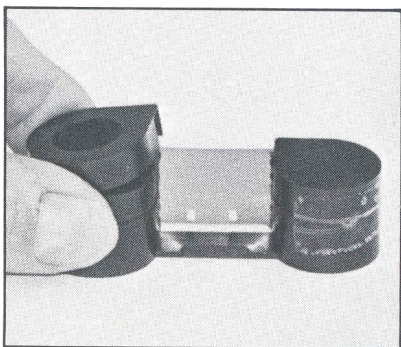
5. Attach a piece of tape to end of film and hold film winding drum on forefinger like thimble. Line up drum with film, attach tape with right thumb.



6. Wind film around drum 1 1/2 turns to make sure it rolls straight, then place drum in larger chamber, threading it through light trap.



7. Cartridge should look like this. Be sure that film perforations face down toward cartridge bridge.



8. Fit chamber cap in place, secure with tape and then label magazine as to film type inside. Wrap cartridge in paper or use one of the Minolta plastic boxes that film comes in if you do not plan to use it immediately.



Photo 2

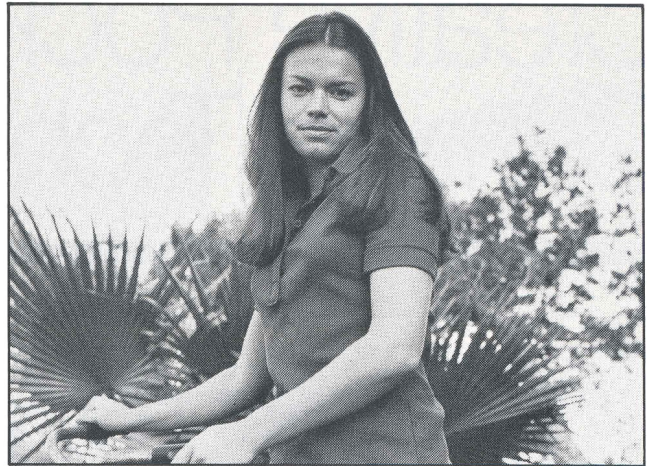


Photo 3



Photo 4



Photo 5

Creative Techniques

So let's move our subject away from that confusion behind her. If the subject can't be moved, you can always change the camera position—and sometimes it may be necessary to move both subject and camera. Photo 3 shows how this step improves the picture but we're still far from the effect we want. The picture lacks spontaneity and our subject looks like she's deliberately posing.

To overcome that, we'll give her something natural to do. Now we're getting closer to our goal with Photo 4 and many would quit at this point, satisfied with their considerably improved work. But we can see the lack of tonal contrast between the subject and the background. This calls for the use of a yellow or green filter to lighten the greenery behind her. And while we're at it, let's move in even closer and de-emphasize that prop by lowering the camera angle. Now we've created an entirely different effect than in Photo 1 and have changed our picture from one classified in the

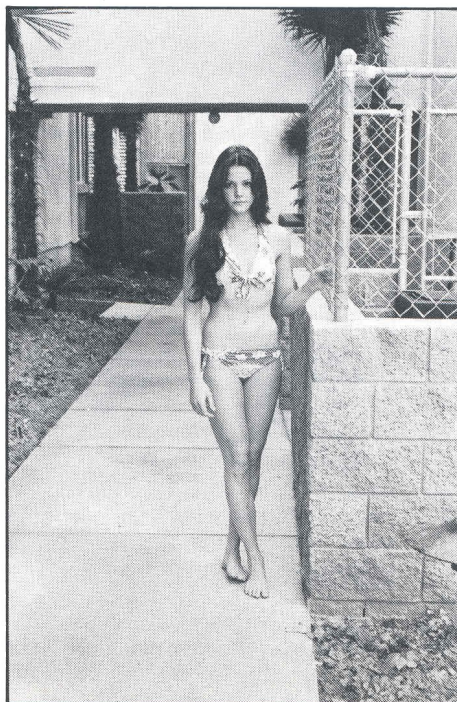


Photo 6



Photo 7

snapshot category to one that can be called a photograph with Photo 5.

While it is true that composition is essentially a personal arrangement of the elements that make up the picture, what we've accomplished was achieved by simply applying a few basic rules to an amateur snapshot: move closer . . . watch that background . . . change the subject's position . . . vary the camera angle . . . and fill the frame. Because such a great degree of enlargement is necessary to produce a print from the tiny pocket camera negative, you can't depend upon cropping the center of interest to get rid of distractions—you've got to compose the final picture in your viewfinder before taking it—something most amateurs never even think about.

WATCH THAT BACKGROUND!

Unless you pay strict attention to what you're doing, it's quite possible that you'll never "see" the background until the pictures come back from the finisher—and then it's too late to do anything about it. Remember, whatever's behind your subject becomes a part of the picture and if it doesn't blend with the subject, you have to introduce a form of control, either by changing your location or by removing those background elements that distract from the main interest you've chosen.

We can see that Photo 6 is a visual mess, yet it's another snapshot that we often see. The cluttered background distracts the eye and has no

real relation to the subject. By moving in closer and changing the camera's position to remove the distractions as in Photo 7, we can improve the picture. But the background still has no connection to the subject—you just don't find pretty girls in bathing suits standing around in doorways. So in Photo 8, we've changed the location to match the subject. Now the simple yet effective background relates directly to the main interest. The same result could have been achieved by changing the clothing she wore in Photo 7 from a bathing suit to a blouse and shorts.

ADD DEPTH OR CONTRAST

Many scenes look very attractive to your eye, but remember that the eye's wide angle of view takes in many related objects to give the brain a unified three-dimensional picture. The camera can't do this; it simply reproduces that which its more limited angle of view sees, and so the resulting two-dimensional print is often a disappointment. Despite the depth of field inherent in the short focal length lenses with which pocket cameras are equipped, scenic landscapes are not really their forte, especially for those models whose point of focus is preset. If you photograph a distant scene, as in Photo 9, you can expect that it will lose a good deal in the finished print—there's no contrast between objects or hint of depth.

Add contrast in a situation like this by using an orange or red filter. No-

tice how the tonal effect of the water and sky in Photo 10 changes in relation to the rest of the picture. Although there's still no feeling of depth, at least the contrast adds a spark of life to an otherwise dull and meaningless snapshot. A different approach can be taken by including a person or some other object in the foreground about 12 feet from the camera. You not only add interest to the composition in Photo 11, but also provide the eye with a sharp focal point that increases the apparent depth and sharpness of the rest of the picture. The use of a filter for contrast now would compete with the dark jacket for eye attention, so forego it. If your pocket camera has a focusing lens, always focus on the foreground object to maximize the total apparent sharpness in a picture like this. If you focus at infinity and rely upon depth of field, nothing in the picture will be completely sharp and you'll lose the sought-after effect.

Filters have many other uses. You can use them to lighten, darken or separate tones, in addition to adding or reducing contrast. The proper use of filters depends upon your remembering one simple rule—a filter lightens its own color and darkens certain others. Table 1 gives a simplified explanation of those filters commonly used in black-and-white photography and suggestions for their use. Photos 12 through 16 provide one example of how filters affect a subject. Photo 12 was taken with no filter. A light yellow filter used in Photo 13 dark-



Photo 8

TABLE 1

FILTERS FOR BLACK-AND-WHITE FILM

FILTER	FACTOR*	USE
Yellow	1½-2	Absorbs excess blue outdoors, darkening the sky slightly and emphasizing clouds.
Green	2-4	Pleasing flesh tones in portraits against the sky; landscape, flowers, blossoms and sky more natural in appearance.
Orange	4-6	Recommended for mountain and sea scenes, haze penetration. Lightens red and yellow and darkens green and blue.
Red	8	Use to create dramatic sky effects, simulated "moonlight" scenes in midday (by slight underexposure). Absorbs reds and yellows, darkens blues and greens.

* Depends upon manufacturer—check data sheet that accompanies filter for exact factor. Filter factor of 2 is equivalent to one lens opening.

Creative Techniques

ened both the sky and its reflection in the water and emphasized the clouds. A deep yellow or orange filter carried the differentiation further (Photo 14), almost to the effect that a red filter gives (Photo 15). Note here that shadows are also darker with a red filter, as they are illuminated primarily by light reflecting from the water and sky. The effect of a green filter is shown in Photo 16.

You can create virtually any effect you want with filters, provided you use them thoughtfully and with care. Ask yourself exactly what you want the final picture to look like and which filter will help you achieve it. With those pocket cameras for which limited or no filters are offered as accessories, it is still possible to get the effect you want. Mount the camera on a tripod and hold a filter used on a larger camera lens in front of the pocket camera lens while you take the picture. If your pocket camera has an electric eye, like the Kodak Pocket Instamatic camera, try to use a filter large enough to cover both lens and electric eye and you won't have to increase the exposure to compensate for the filter—the electric eye will do it for you. If this is not possible, or if your pocket camera has no electric eye, you'll have to increase your exposure time. The filter factor tells you by how much—just open the lens one stop for each factor of two. Thus if the filter factor is four and the correct exposure calls for a lens opening of $f/11$, set the camera at $f/5.6$ to compensate for the light blocked by the filter. And while you're learning the use of filters under different circumstances, take one picture with and one without the filter for comparison later. Studying the results will give you a good idea of how to select the right filter for similar situations in the future.

STOP THAT ACTION!

Even with the pocket camera's versatile shutter, there are times when you'll try to capture a moving object on film and wind up with little more than a blur for your trouble. While there are all kinds of complicated formulas to tell you at what angle to stand from the moving object and how fast the shutter must open and close to sharply freeze the action, my intent is to help you get better pictures with less effort, to learn to shoot for the peak of action.

In any repetitive movement, there's a fraction of a second when the action stops to reverse itself. The subject of many amateur cameras, a child on a swing, is a good example. A fairly slow shutter speed ($1/30$

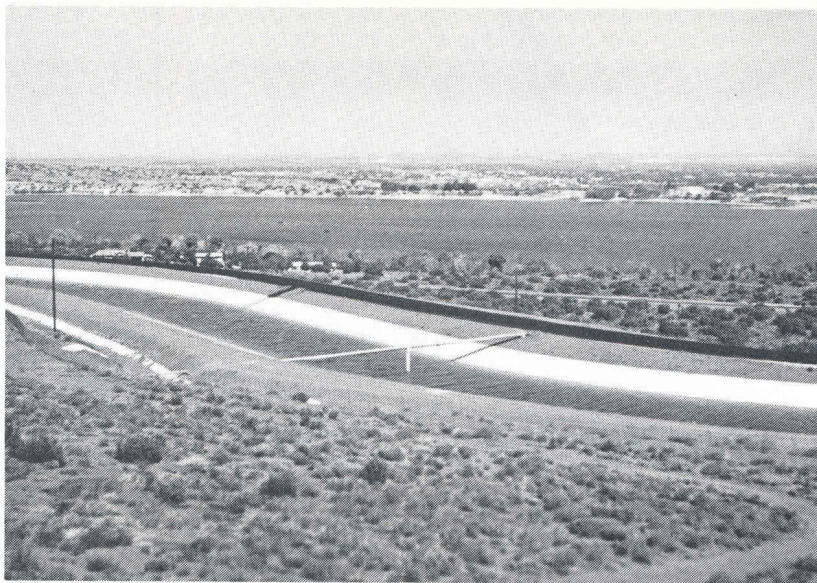


Photo 9

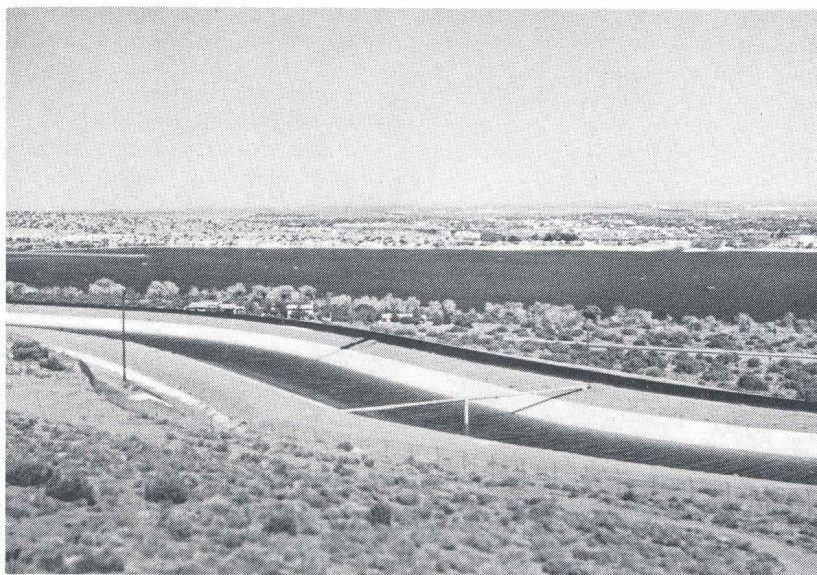


Photo 10



Photo 11



Photo 17



Photo 18



Photo 19

TABLE 2 ACTION STOPPING GUIDE

SUBJECT	DISTANCE IN FEET	SHUTTER SPEEDS		
Ordinary activity like people walking, slow sports like shuffleboard, sail boating, etc.	10-15	1/500	1/250	1/125
	15-25	1/250	1/125	1/60
	30+	1/125	1/60	1/30
Fast action like football, horse racing, autos traveling at speeds up to 35 mph.	10-15	*	*	1/500
	15-25	*	1/500	1/250
	30+	1/500	1/250	1/125
Very fast action like planes, trains and autos traveling at 50 mph and faster.	20-40	*	*	1/500
	50-75	*	1/500	1/250
	100+	1/500	1/250	1/125

* Set camera at highest speed and pan with action.

TABLE 3 FLASH GUIDE NUMBERS

FILM SPEED	25-32	40-64	80-125	160-200	320-500
1/30	55	75	100	130	200
1/60	36	50	70	90	130
1/100	30	42	60	75	110
1/200	24	34	48	60	90

Creative Techniques

you freeze four jet planes traveling at the speed of sound as in Photo 22, taken at an air show when they passed low over the crowd's head. As the sky forms the background in this picture, there's no hint of movement other than the slight vapor trails from each plane. However, as we know that planes cannot stay in the air unless they are moving, the lack of a background to which their speed can be related does not disturb the eye of the viewer.

Generally speaking, there will be less chance of a subject blurring if it approaches the camera from an angle, and a greater chance if the action takes place parallel to the camera. Or to put it another way, the sharper the angle of movement toward the camera, the less apparent its motion becomes. When the subject approaches the camera head-on or moves directly away, its motion is hardly noticed and a slow shutter

speed will be sufficient. Check Table 2 for specific situations.

Sometimes you can fill the frame and still have a poor picture; when this happens, it's best to break the subject up and isolate a portion of it for the camera. Watching the U.S. Army's precision parachute team in action is always a thrill but as the Golden Knights descend to the ground in Photo 23, our picture does not convey this feeling. In a case like this, wait until Photo 24 appears in your finder before releasing the shutter. Like the jet planes in Photo 22, the feeling of movement and action are captured, along with a hint of the danger involved in the descent and an exact identification of the subject.

LIGHTING FOR EFFECT

Many amateur photographers do not appreciate proper light and the difference it can make in the quality of their pictures. To them, light is simply light and if there's enough to take the picture, that's exactly what

they do. But correct lighting is very important, especially when working with small negatives. The kind of light and the way in which it falls on the subject affects the apparent sharpness of the picture and can mean the difference between achieving an eye-catching photograph or getting an unflattering snapshot.

Light casts shadows, adds form to a shape and affects the texture of the subject. Various treatises have been written on this subject and for the serious pocket camera photographer, an explanation of the topic in depth is recommended, but for our purposes here, the goal is to make you aware that light is not just light, but a creative tool. Would you believe that some professional photographers actually wait for months in order to get just the right sunlight they want on a subject? But you don't have to go to such extreme lengths; sometime between sunrise and sunset you should be able to get the effect you desire.

An awareness of what light can do

Creative Techniques

into open shade where the lighting is more even. But the use of flash outdoors as a fill will let you control both the subject and the light to get exactly the same effect a pro would come up with. Fill flash is simple to use. First determine the proper guide number (GN) for the film/bulb combination you're using—this chart is found on the bulb cube box (see Table 3) and varies according to the ASA speed of your film. Now compute the correct outdoor exposure and divide the guide number by the lens opening to find the correct camera-to-subject

distance— $GN \div f/8 = 10$ feet. Stand this distance from your subject, compose and take the picture using flash. The difference in effect is seen in Photos 28 and 29.

As it's impossible to determine the exact exposure combination selected when using the Kodak Pocket Instamatic cameras with electronic shutters, the results of fill flash are somewhat unpredictable. Photo 30 was taken under the shade of the tree with no flash; Photo 31 with flash. At 12 feet from the subjects, fill flash didn't make that much difference, but as any degree of correction however slight is preferable to none at all, don't be afraid to pop on a

cube and shoot just the same.

I find the Minolta Electroflash-P an ideal substitute for bulbs or cubes when shooting fill flash pictures, as its guide number of 45 for an ASA 100 film is small enough to let me work at a head-and-shoulder range (four feet) in bright sunlight. AG-1 bulbs and flashcubes with their guide number of 100 throw out too much light for such close work. To keep your fill flash pictures from appearing artificial, you'll have to stay about nine feet from the subject or drape a single layer of handkerchief over the cube (taking care not to obscure the lens or electric eye) to cut down the illumination.

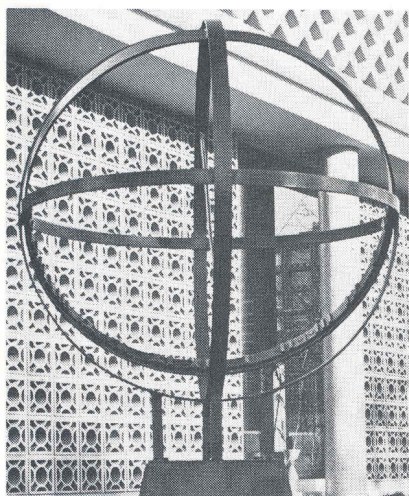


Photo 25

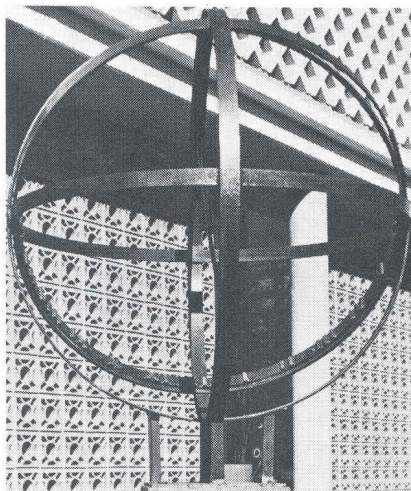


Photo 26

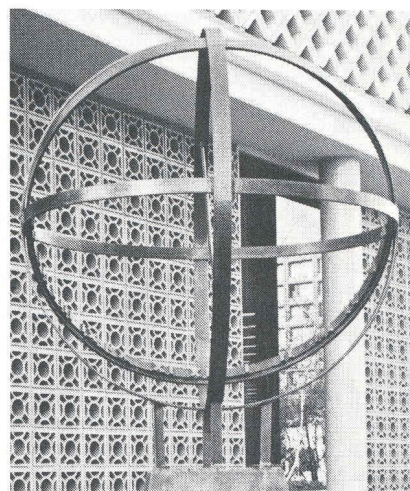


Photo 27

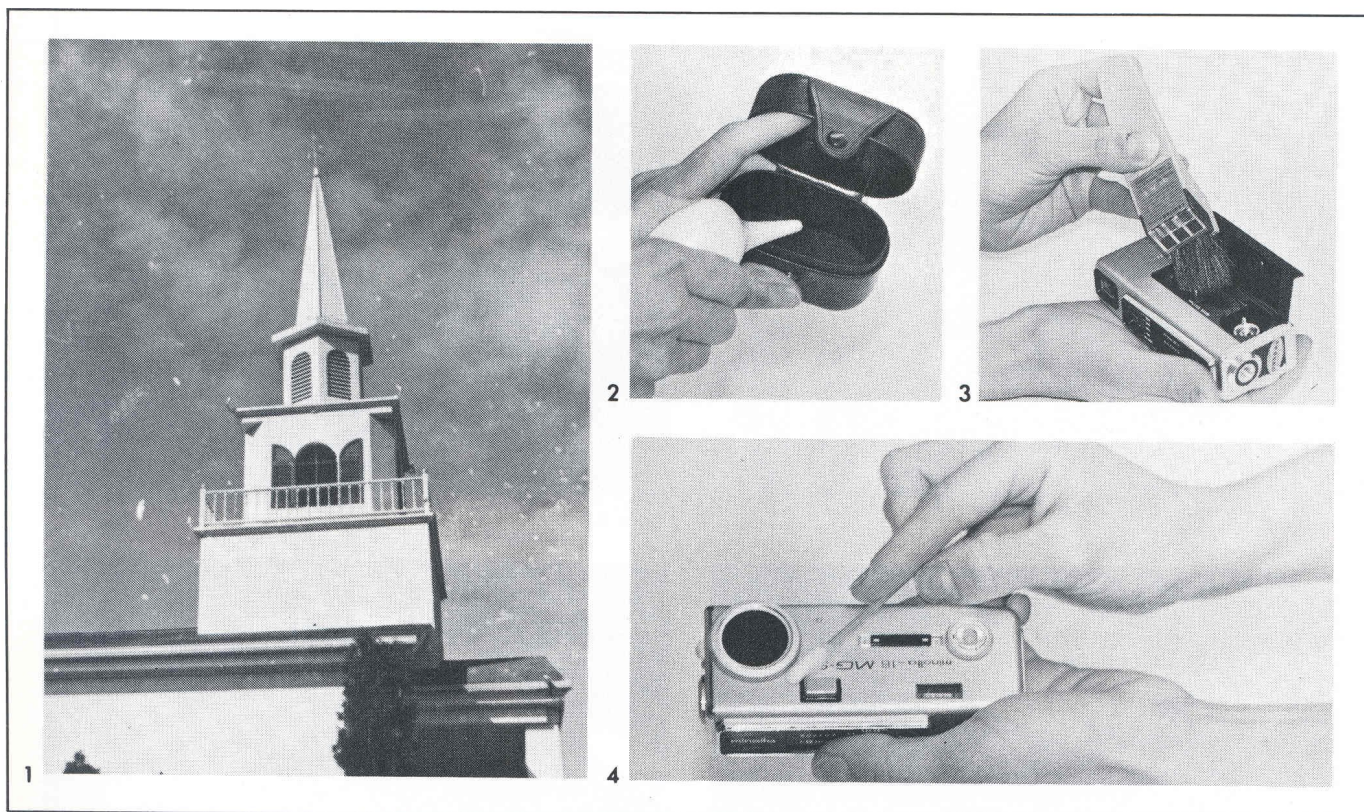


Photo 28



Photo 29

Avoiding the Pitfalls of Pocket Camera Photography



Old sayings have a universal application—that's how they become old sayings—and in the case of pocket camera photography, it would be difficult to come up with one more appropriate to the situation (any religious views notwithstanding) than the time-worn but still applicable, "Cleanliness is next to Godliness." Although dust, dirt and lint are a major nuisance to all photographers, this trio of headaches is the bane of existence to the pocket camera user. Unlike other cameras you might have used, your pocket camera produces negatives that are smaller than a thumbnail, and any foreign matter in the camera or on its lens that can interfere with the light rays striking the film is going to cause you immeasurable grief.

While cleanliness should be of concern to any photographer, it's a way of life for those of us with pocket cameras. Since the degree of magnification necessary to produce even a 3 1/2 x 4 1/2-inch print is so great that although a dust speck on a 2 1/4-inch negative will go almost unnoticed (comparatively speaking), that same speck on a pocket camera negative turns into a giant distraction that in many cases ruins the picture. And by its very nature, a pocket is the most insidious repository of dust, dirt and lint that human ingenuity has ever devised. So the first step in conquering these bugaboos is to keep the camera as clean as possible at all times.

To do this, some will enlist the aid of a carrying case, but while this

form of protection does help somewhat (especially in retaining that brand-new look), the case itself can become the very agent that transmits foreign matter to the camera and lens. Prevent your good intentions from being ruined after the fact—clean the interior of the carrying case periodically with a stiff brush or a vacuum cleaner, especially if it has a velveteen lining.

As for the camera proper, let's begin by cleaning the film chambers every time you load a new cartridge of film. A Staticmaster brush is ideal for this purpose; its polonium strip neutralizes static electricity and allows you to actually remove the dust and dirt instead of simply moving it around from one corner to another.



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16

second) can stop this kind of action if you catch the subject at rest, or just before the action reverses itself. Photos 17 and 18 show you the results of a too-slow shutter speed (1/60 second) during different stages of the forward movement. But Photo 19 was snapped at the peak and the same shutter speed froze the subject in mid-air. This is especially important when

using a pocket camera equipped with an electronic shutter, as you never know exactly what speed the electric eye has selected.

But continuous action has no brief halt in its movement. If you are standing at the wrong angle to the subject, or if the shutter speed is too slow, you'll get a blur across a sharp background like that in Photo 20. Take no

chances—stop the action by panning the camera. To do this, pick up the subject in the viewfinder when it's some distance away. Follow the action until it fills the frame, then snap the shutter. The result will be Photo 21, a sharp subject against a blurred background, emphasizing the speed of action involved.

Panning the camera will also let



Photo 20



Photo 21

for a particular subject can be gained from Photos 25-27. These three pictures were taken from the same position at 9:00 a.m., noon and 3:00 p.m. Just imagine the infinite variations possible in that six-hour span. Of course, if the object you want to photograph can be moved, it's possible to a large extent to control the shadows and where they fall. Under such circumstances, you should have little difficulty in using light to your advantage, especially if it will prove impossible for you to return to photograph the subject at a later time.

As sophisticated as today's camera users are, many still cling to the old notion that flash is primarily an indoor tool. Nothing could be further from the truth, yet the majority of outdoor pictures of family and friends are taken in bright sunlight and the great contrast results in a mass of deep, harsh shadows that obscure the very features we want most to see.

One solution is to move the subject



Photo 22



Photo 23



Photo 24



Photo 30



Photo 31



Photo 32

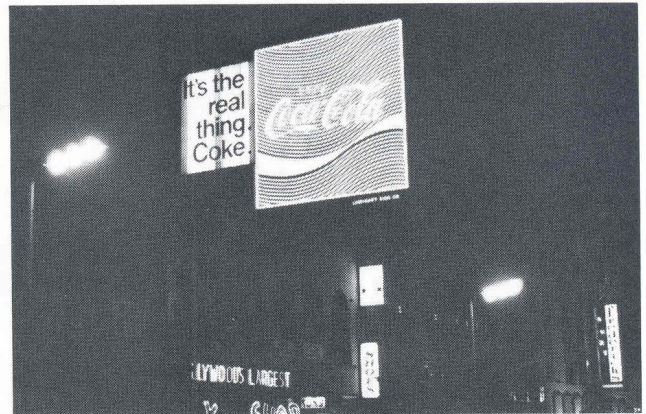


Photo 33

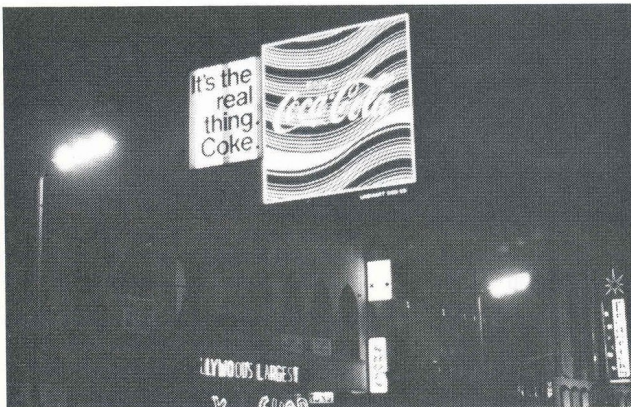


Photo 34

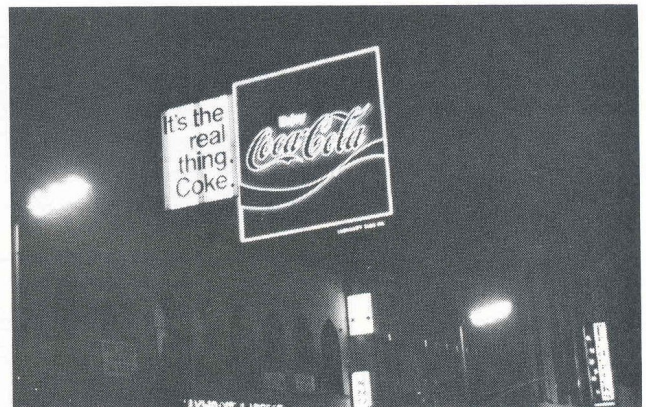


Photo 35

Tourists are perhaps the most notorious of snapshooters. Watch a few with cameras sometime and you'll see an interesting exercise in how not to take pictures. Invariably, they violate every principle we've discussed, and more to the point in this particular case, they pay absolutely no attention to light or its qualities—everyone snaps his shutter from the same position. If I could have the concession on one particular three-foot square of sidewalk in front of

Grauman's Chinese Theatre in Hollywood, I'd be so busy carrying deposits to the bank across the street that I wouldn't have any time at all to write books like this one.

Before I leave you to experiment on your own with some of the techniques I've outlined in this section, let me say a word about the absence of light—also an effect you might want to consider. Many subjects for your pocket camera come alive at night, assuming an entirely different view-

point. Subjects like Photo 32 lack interest during the day but after dark, the kaleidoscope of changing lights (Photos 33–35) brings it to life. The world changes constantly—no two moments are exactly alike. Film is the least expensive commodity to the pocket camera photographer; don't be afraid to use it. You'll never know the exact effect achieved in your pictures until it's too late to recapture the moment, so think before you shoot—but shoot, shoot, shoot!

Avoiding Pitfalls

precautions that should be followed for the best results:

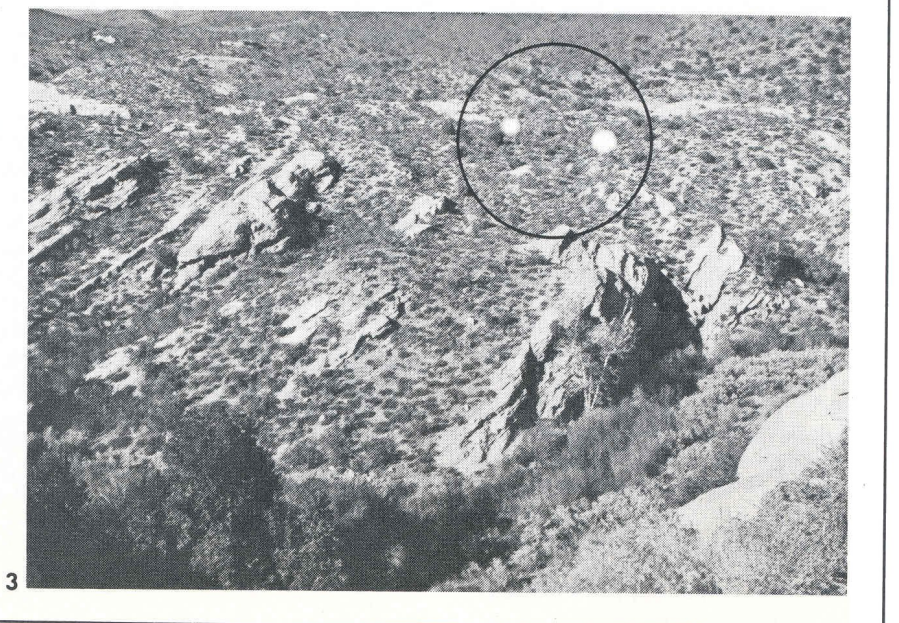
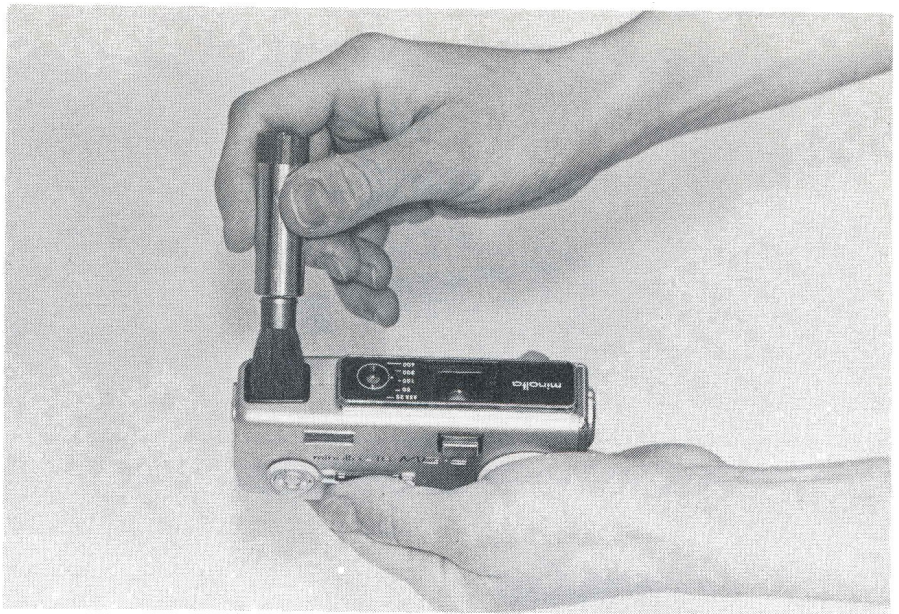
Use fresh developer each time you process film, and then throw it away; don't run the risk of chemical exhaustion or contamination. If you live in an area where water has a high mineral content (hard water), filter the chemicals and wash water thoroughly. Keep your negatives free from scratches and abrasions by handling the film only by its edges and storing negative strips in a transparent protective film wallet or sleeve. The less negatives are handled, the better. Take them out of the storage sleeves only when you plan to print; even then you'll have to remove accumulated dust. Static electricity is an ever-present problem with small negatives, so rely on the Staticmaster brush in this situation too.

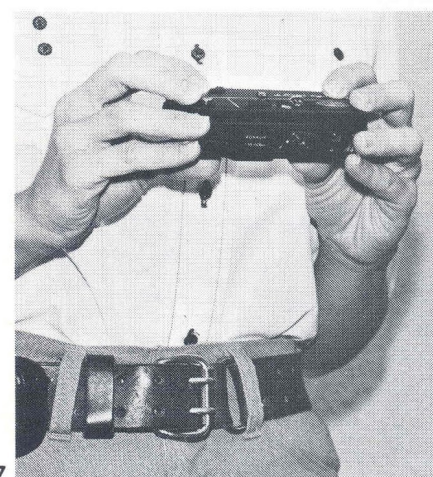
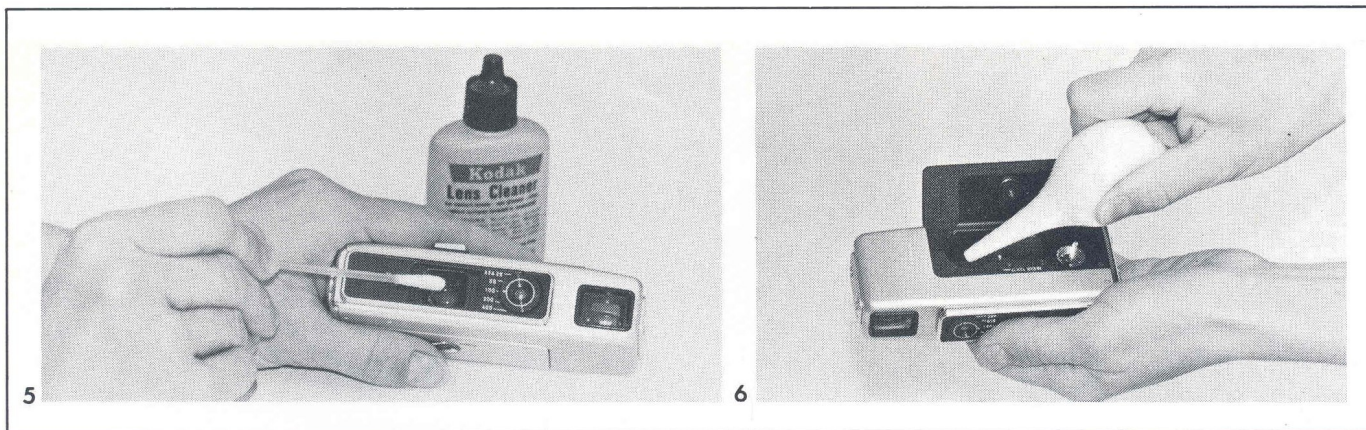
If the negative strip has been handled carelessly, fingerprints should be removed before printing. Use a good grade of nonabrasive commercial film cleaner (like Kodak Movie Film Cleaner or Edwal Film Cleaner) and a clean, lintless soft cloth that has been laundered without the use of fabric additives. Moisten the cloth with cleaner, fold it over the negative strip and draw the film through with a slow, gentle motion.

Unlike the other pocket camera films that use a pressure plate to hold the film flat during exposure, Kodak 110 cartridge film with its paper backing is designed to prevent negative scratches both from dirt in the camera and faulty cartridges. But if your camera is kept clean, you should have little trouble with abrasions regardless of which one you own. Most scratches come from rolling up, or "cinching," the negative strips, incorrect cartridge reloading or other improper handling such as pulling the strip through the enlarger carrier while printing.

If you do your own darkroom work, most scratches on the film base can be corrected before printing by applying a thin coating of liquid that has the same refractive index as the film. Edwal No-Scratch works very well, as does a very thin coat of Vaseline applied evenly over the entire negative. But scratches on the emulsion side are permanent and nothing can be done other than using a rough surfaced printing paper and retouching with spotting colors.

If you make cleanliness a part of pocket camera photography from the outset, you'll find that it all comes very naturally and really isn't a headache after all. Accept it as a part of your hobby and you'll turn out good pictures with amazing consistency. 🐾





1. Dust, dirt and lint on negative — the pocket camera owner's nemesis — show up clearly in this print made by a commercial photofinisher.

2. If the case has a velveteen lining, turn inside out and clean periodically.

3. Keep interior of camera clean by dusting with Staticmaster brush.

4. Keep exterior clean with a cotton-tipped swab dipped in rubbing alcohol.

5. Cotton-tipped swab and lens cleaner should be used for cleaning lens, meter cell and viewfinder.

6. Periodic blowing out of film chamber with small ear syringe will also help to prevent accumulation of dust / dirt.

7. Carrying your pocket camera in belt case will help avoid some pitfalls of pocket camera photography.

You'll also find a small rubber ear syringe useful. These can be purchased in any drugstore and make an excellent blower for removing fine particles without damaging the camera.

Even if your pocket camera has a protective sliding lens cover, you should also make it a practice to clean the lens between film loads, as any smear or dust accumulation which reduces light transmission will soften the image that strikes the film enough to spoil the picture. I suggest that you keep a bottle of lens clean-

ing fluid and a supply of cotton-tipped swab sticks handy. While most camera manufacturers will insist that you should only clean the lens with a soft sable brush and lens tissue, you'll find that it's quite difficult to clean the very small pocket camera lenses with these tools.

With my system, you merely apply a drop of cleaning fluid to one end of the swab, then gently clean the lens with a circular motion. Once you've moistened the entire lens area, turn the swab around and remove the excess fluid with the unused end. Any resulting lint from the swab can then be dusted off with the corner of the brush or blown away with the syringe. Clean the electric eye and viewfinder in the same manner. This advice also applies to any accessory filters or close-up lenses you use with the camera, but one caution—do not "scrub" any of these. A gentle wiping motion will suffice and prevents inadvertent scratching that will show up in your pictures.

Keep the camera body clean and free from smudges or stains that might attract dust and dirt. Use a soft cotton cloth to wipe the camera periodically, as if you were trying to remove fingerprints from a piece of evidence. Again, don't polish—just clean. Crevices between operating controls are favorite accumulation spots for the enemy, so you might also find a cotton-tipped swab handy in keeping the body clean. Stubborn spots will come clean with a swab dipped in rubbing alcohol. If you use your pocket camera at the beach or in dusty areas such as the desert, this is very important, since small particles of dirt can work their way into openings in the camera body and put the camera out of operation.

Every pocket camera user should carry a handy accessory known as a lipstick lens brush. If you haven't used the camera for several days, this brush can be helpful in a quick touch-up cleaning of the lens before taking that important shot. While keeping the camera and lens clean is

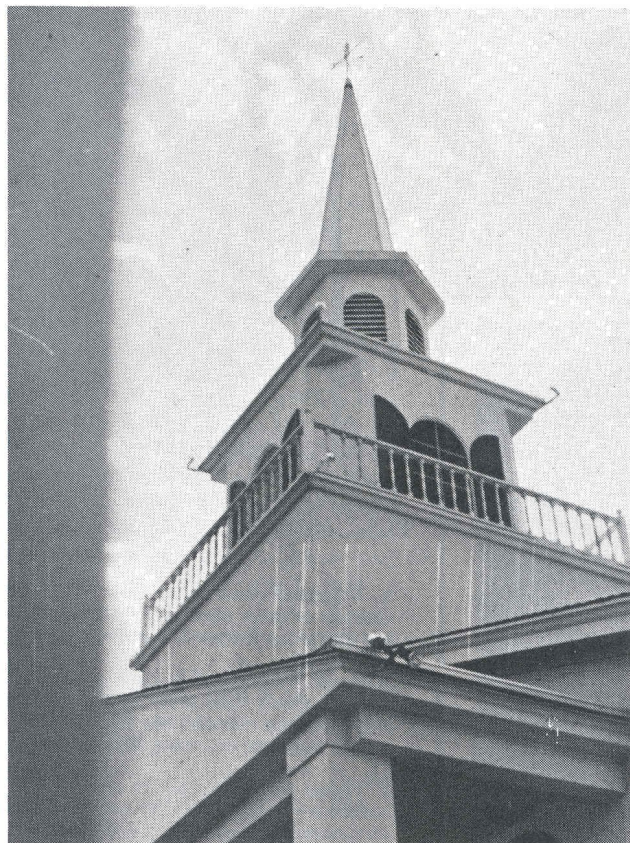
an extra effort that the salesman probably didn't mention when he took your money, it will repay itself many times over with sharp, clean negatives for printing.

But a clean camera solves only part of the problem. Sending your exposed films to a commercial photofinisher and hoping for the best can often be disappointing. Sadly, even the largest and best commercial labs in this country have a very poor track record when working with pocket camera black-and-white negatives. Don't be surprised if your prints come back to you with little black or white spots, or irregular white lint or scratch lines. Should you encounter this kind of problem, change labs at once and let them know why you have taken your business elsewhere; customer complaints are the only way to improve service.

Improper developing and handling of pocket camera film can cause several defects that will also spoil your finished prints. The use of nearly exhausted, contaminated or nonfiltered chemicals leads to defective negatives, as does dust or air bubbles that cling to the film emulsion during development. The most common defects are: pinholes or tiny sharp clear holes in the film emulsion, contamination from wash water that dries on the film, haloed spots from uneven film drying, and scratches and fingerprints from careless negative handling. Improper fixing will also leave tiny cloudy areas or sunspots on the film that can take virtually any form. Such spots hold back the light when enlarging, and they result in white areas on the print.

The only sure way to prevent these problems is to process and print your own film. If you shoot more than a couple of cartridges per month, it will be to your advantage to do so. But if you don't want to be bothered with doing your own darkroom work, you'll have to expect a certain number of poor prints. While I've covered the proper processing techniques in another chapter there are general

Basic Darkroom Procedures



If you want the very best results from your pocket camera, develop your own black-and-white film! In the past, pocket camera users have been advised not to do so unless they were experienced in darkroom techniques, but I can't accept this as a valid admonishment. If you've never processed your own film before, you have to begin somewhere and by exhibiting the same care in the darkroom that you do when taking pocket camera pictures, there's no good reason why you can't or shouldn't do your own film developing.

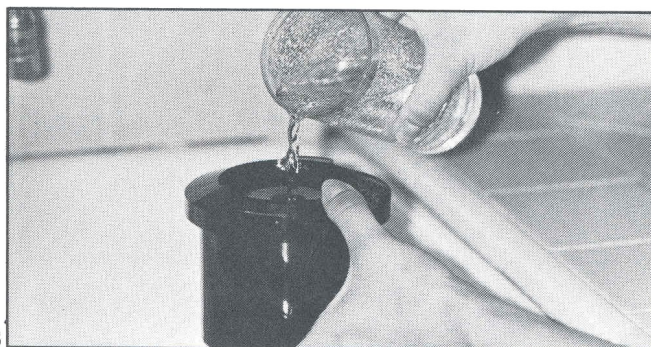
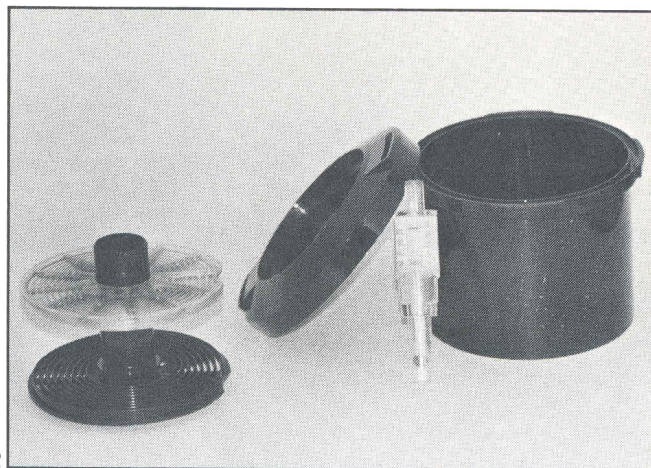
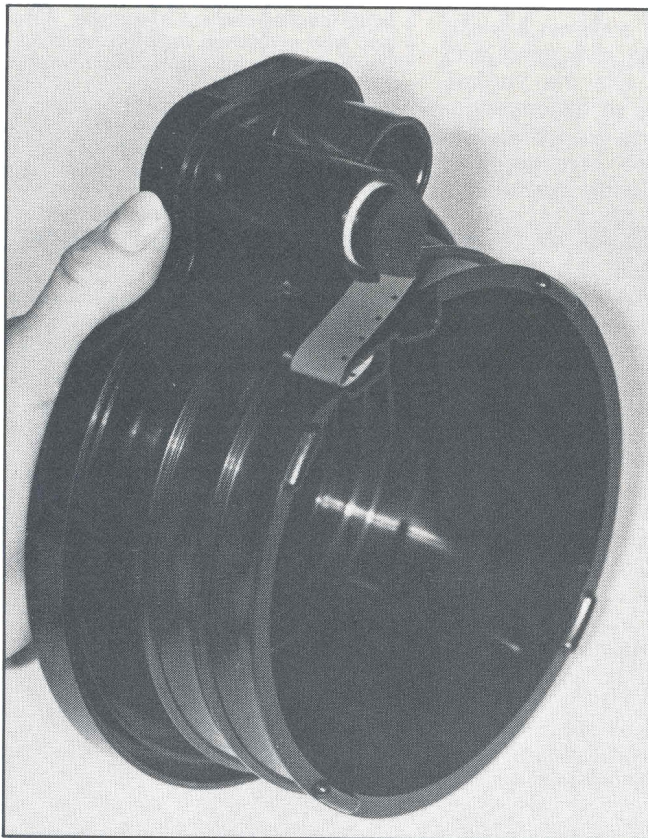
While commercial photofinishers won't admit it publicly, they dislike working with black-and-white pocket camera film. This fact becomes obvious the first time your negative strip is returned to you folded in accordion pleats, with badly focused prints that are incorrectly masked. Poor photofinishing has restricted the popularity of pocket camera photography in the

past and the situation has not materially improved, even though we've again embarked on a new love affair with the tiny cameras.

As the pocket camera negative is very small—about half the size of a postage stamp—any tiny scratch or blemish on the negative will be greatly exaggerated in the finished print. For good results, the small negative strip requires personal attention but with the huge quantity of film that passes through many labs daily, it's impossible to treat each one individually. So most labs splice your negative strip together with hundreds of others to form long rolls of film that can then run through their continuous processing machines. All too often, a tiny speck of dirt or contamination in the processing chemicals will undo all the extra care and attention that you've given to the film while it was in the camera. Even if you don't make your own prints, developing the

film is easy and fun. It can be done in about 45 minutes and insures that whoever does do the printing will at least have unscratched, unblemished negatives from which to work.

Those who have a regular darkroom, or those accustomed to doing their own processing already know what to expect; this discussion is for those who have never developed their own films before. My approach may strike some readers as unorthodox, but my darkroom technique is a very personal one, as I hope yours will be. If you don't have a regular photographic darkroom setup at home, you'll have to find a light-tight room in which you can load the film into a developing tank, or use the special Minox or Minolta tanks that can be loaded in daylight. In a pinch, even a closet will do for film loading, provided you use it at night and can turn out all nearby lamps to prevent light from leaking in around the door. If



Darkroom Procedures

quantities to make up a gallon of solution. As only 1 1/2 ounces of stock solution are necessary to develop up to four cartridges of pocket camera film, it's more practical from a storage standpoint to buy the smaller packages, unless you plan on developing a great deal of film within the several months considered to be the expected life of the mixed solution. Mix the powdered chemical or liquid concentrate according to the directions on the back of the package. Empty plastic bottles in which distilled water is sold make perfect storage containers for the unused chemicals.

You'll need a package of fixer/hardener; mix this according to the directions on the package and store in a second bottle. Write *Developer* and *Fixer* on the respective bottles with a marking pen to prevent confusion. To lengthen their shelf life and preserve their efficacy, these should be stored in a dark place, but if you insist on being fancy, buy a couple of amber-colored plastic bottles. These prevent chemical deterioration and maximize storage life by filtering the light reaching the unused solution.

Development has to be done in the tank where you can't see what's happening to the film, so how do you tell when the process is complete? Use the time/temperature method. Every

box, can or bottle of developer has this information printed on it (and most films come packed with an instruction sheet containing the same information). But since chemical formulas change from time to time, it's a good idea to double-check the data every time you mix up a new batch. Just because it has always been 11 minutes at 70 degrees is no reason to prevent the manufacturer from revising his recommendations. Not too many years ago, everything was done at 68 degrees; today 72-75 degrees seems to be the more popular working temperature.

SETTING TO WORK

Once you've accumulated the basic equipment specified above, you're ready to transfer the film from the cartridge to the developing tank reel. With Minox, Atoron and Minolta cartridges, the removal of a piece of tape around the cartridge provides quick access to the chamber containing the exposed film. When removing and threading the film onto the reel, be sure to handle it by the edge only to prevent fingerprint smudges and scratches. The unloading procedure with a 110 film cartridge is a bit different. Don't try to force the cartridge open, but insert a ball point pen through the little opening in the back of the cartridge and poke the paper leader out where you can reach it. Pull gently on the leader until you

can feel the film appear. Continue pulling the paper leader and the film will then come out of the cartridge without any difficulty.

If you should encounter resistance while pulling on the paper leader, stop at once. At this point, it becomes necessary to break the 110 cartridge apart in order to free the film without damage. For this reason, it's a good idea to have a common dinner knife in the darkroom with you. Slip the knife blade between the paper and cartridge and pry it apart. As this may take some effort, use caution and pry slowly. It's all too easy to slip and crease or puncture the film, ruining one or more pictures before you even start. Once you have freed the film of the cartridge, thread it onto the reel.

If you use a Nikor reel, the film is wound on the spiral reel from the center outward. This often requires a good deal of practice to do successfully in the dark, especially when handling the small 16mm film, another reason why I prefer the ratchet-action type of plastic reel supplied with the Yankee tank. With the plastic type the film is inserted into the reel opening and one half of the reel has ratchets that move back and forth to advance the film onto the reel. Up to four 110 films or three Minolta 16 films can be developed at one time with the Yankee reel, well within the chemical ca-

as an accessory (Tessina owners can use a standard 35mm tank) but if your pocket camera does not, consider one of the inexpensive tanks with an adjustable reel like the Yankee Clipper II. Once you've become serious about developing your own film, you might want to investigate a professional type with a stainless steel reel like the Nikor or Kindermann. Buying the right type can be more complicated than it sounds and while your choice really ends up as a matter of personal preference (mine is the Yankee for 16mm work and the Minox for 9.5mm), here are a few of the factors you should take into account before you choose one.

The Minox tank, which can also be used by Atoron owners, lets you load the film without working in the dark. After setting the cartridge to be developed in the loading compartment, hook the end of the film to the spiral cylinder. Now you can replace the tank lid and wind the film out of the cartridge and onto the reel. With its own thermometer and funnel, the compact Minox tank is ideal for traveling. Also a daylight loading tank, the one put out by Minolta works in a similar manner.

But should you plan on developing several cartridges at once, you'll need a Nikor or Yankee, as the Minox and Minolta tanks will only hold one cartridge of film at a time. When hot weather makes temperature control a problem, the stainless steel tank responds faster to the cooling effects of an ice pack or cold water stream than the heavy plastic of a Minox or Yankee tank. In theory, the fine spiral design of a stainless steel reel allows better circulation of developer than the plastic reels allow and so tends to give you more even development over the 10-12 minutes your film will be in solution.

In addition to the tank, you'll also need something with which to measure and mix the correct quantities of developer, a way of determining solution temperatures, a timer, and some method of hanging the developed film while it's drying. Although photo shops sell graduated measures, timers and film clips for these purposes, I suggest that you buy only a photographic thermometer to begin with. Practically every household has an unused glass baby bottle and some clothespins. Generally marked in ounces, these bottles can be used to measure out sufficient developer and water to process a 16mm film. A watch with a sweep-second hand will enable you to time the procedure steps and when processing is completed, the film can be hung up to dry with the clothespins. Use the money you've saved on all these items to buy more film.

1. You may get poor results from commercial photofinishing of black-and-white pocket camera negatives. This one was scratched and incorrectly framed, yet the lab charged 20 cents for it.

2. If scratching doesn't do in your negatives, contamination will. Note white specks all over the print and especially concentrated in upper right. While this picture has no aesthetic value, photo chemical contamination will ruin prize-winning photographs with equal vigor.

3. Kitchen counter and daylight loading tanks make an ideal combination for the pocket camera enthusiast who has no darkroom at his disposal.

4. Tiny Minox developing tank with built-in thermometer can be easily packed in a suitcase for traveling, letting you develop films taken on vacation. Minox chemicals are pre-packaged in one-shot quantities.



CHEMICALS

The minimum that you'll need are a developer, fixer/hardener and a wetting agent. Some darkroom workers like to use an acetic acid shortstop bath between the developer and fixer, but I much prefer a plain water bath. Just as I suggested earlier that you standardize on the use of one or two films, you should do the same with developers. The question of which developer is best depends upon the film you use. The instruction sheet that accompanies the film will list those developers recommended by the film manufacturer.

Photographers talk a great deal about "fine-grain" film and "fine-grain" developers, but most experts now agree that acutance has as great if not a greater bearing on the sharpness of the negative image than does grain. A diluted developer will build sharper image contours than one used at full strength and at the same time it will hold back the accumulation of undesirable contrast build-up, especially with those slower films that have an inherent tendency toward excessive contrast when care is not taken in their processing.

The entire subject of development is one of those murky areas of photography wherein every man is his own expert. I've discussed the topic with several of the best minds in the business and no two seem to agree on exactly what happens during development or why. While one could write several books on individual and exotic systems of negative development (and some have), I prefer to stick to a time-proven combination that gives me uniform, predictable results from cartridge to cartridge—two films (Plus-X and Tri-X) and one developer (Microdol-X diluted 1:3) for general use.

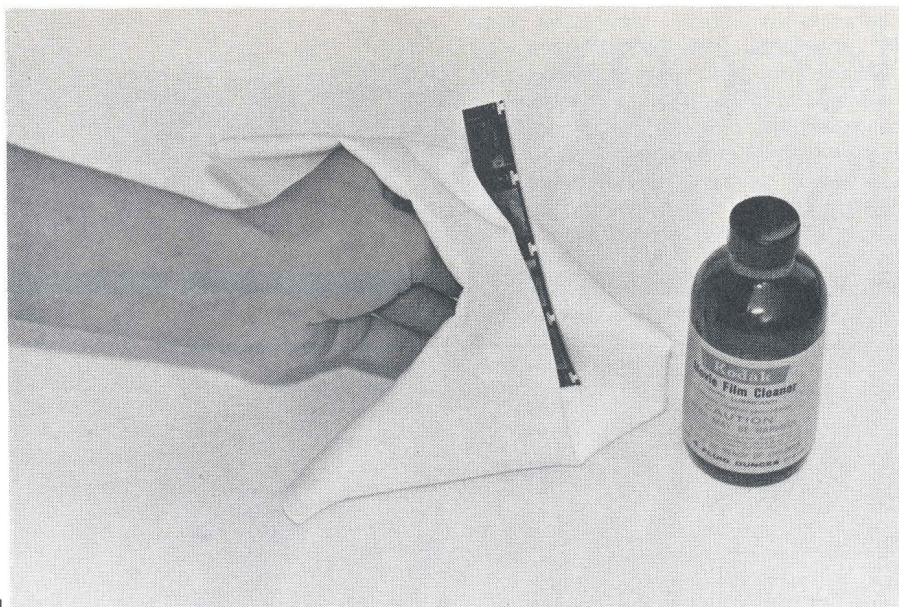
Developer can be purchased in individual packages for mixing small

you have to use a closet, run a vacuum cleaner over the floor periodically to keep the dust level down. I find a shower stall or cabinet to be most ideal; the moisture of its frequent use makes it the dampest but most dust-free room in any house or apartment.

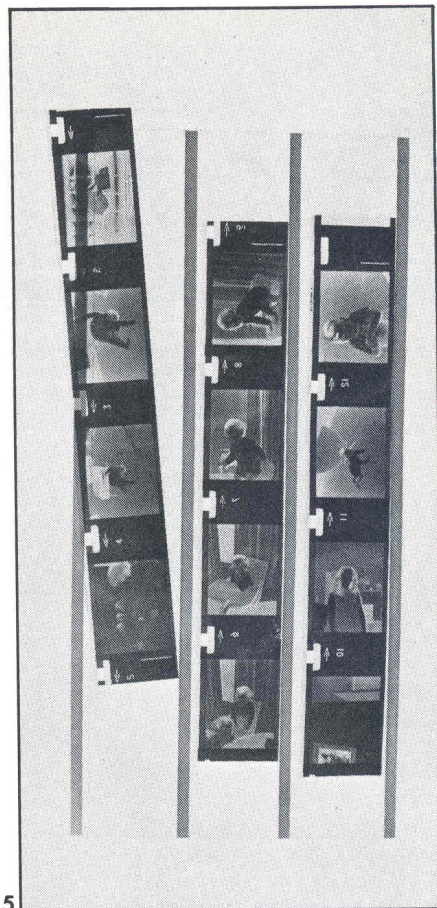
In addition to a place where the film can be transferred safely from cartridge to developing tank, you'll need a kitchen or bathroom sink with running water and a counter—a place where you can mix, pour, drain and even spill chemicals without creating a mess. Of course, the regular darkroom is ideal but many amateurs don't have the space for one, so my approach on the following pages is devoted to helping you get the best from a makeshift arrangement.

ABOUT DEVELOPING TANKS

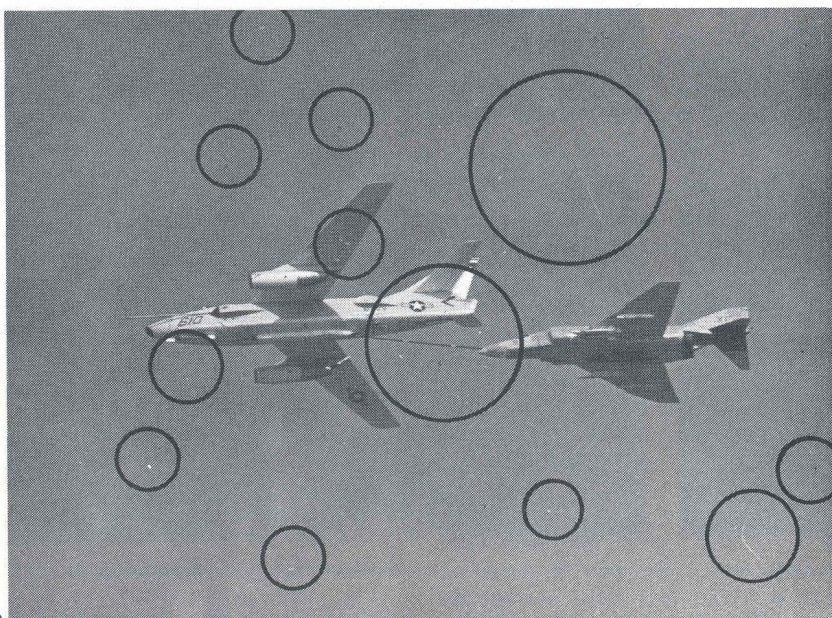
Some pocket camera systems like the Minox and Minolta include a special daylight loading developing tank



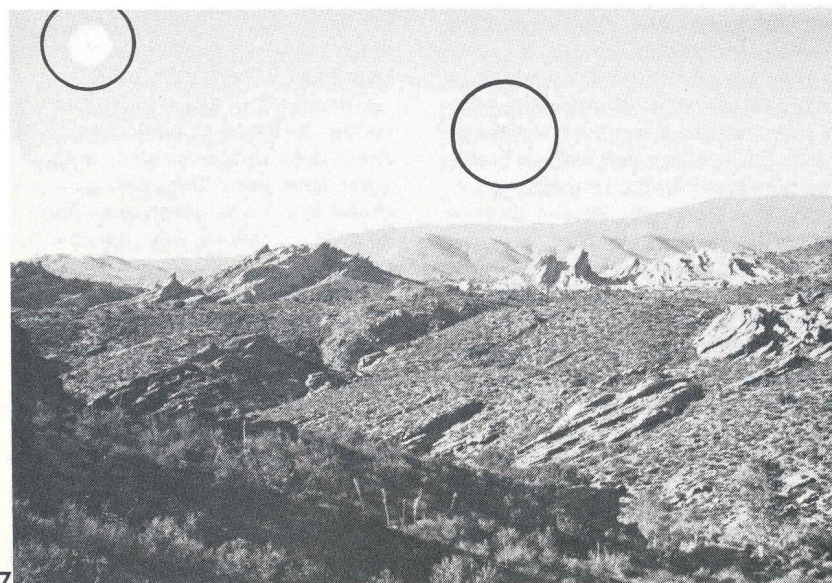
4



5



6



7

1. A lipstick lens brush can be easily carried in your pocket and is available for use on a moment's notice.

2. Hand-holding camera at slow shutter speeds when light level is too low will give you results like this. Find a firm support or use a tripod.

3. These two white spots are hypo bubbles — areas on film where trapped air prevented negative from clearing in the hypo. Be sure to leave film in hypo long enough to completely clear it, for the naked eye is liable to miss such areas on the tiny negative.

4. Bottle of film cleaner and clean, lintless cloth will remove fingerprints of those careless in film handling.

5. Pocket camera negatives should be kept in acetate sleeves to prevent scratching and dirt accumulation.

6. The closer you examine this shot of a jet refueling operation in midair, the more dust/lint spots you'll notice. When printing at home clean negatives with Staticmaster before printing.

7. Air bubbles will cause spots like these. While you could almost pass them off as the moon and North Star in this case, air bubbles can and should be avoided in your work.

Darkroom Procedures

available from many large photographic shops and processors. These enable you to protect the negatives, identify the exposures and find just the ones you want without difficulty or risk of damage to them. A 5X magnifier comes in handy for use in selecting negatives for printing. Tessina owners will find that standard 35mm glassine envelopes will meet their negative storage requirements.

With larger negative sizes, proof sheets are often made for purposes of filing and identification. The same can be done with pocket camera negatives by contact printing all negative strips stored in a film wallet on a single sheet of paper. The proof sheet can then be filed with the negative wallet and helps make it easy to locate a particular photo without handling the negatives.

MAKE YOUR OWN ENLARGEMENTS?

There isn't very much that can be done with an 8x11mm, 10x14mm or 12x17mm contact print; enlarging is a fact of life for pocket camera owners.

Essentially, this amounts to projecting a highly magnified image of the negative onto a sheet of sensitized paper long enough to transfer the image to the paper. When the enlarger light is shut off, you won't see any physical change in the paper's appearance, but a latent image is there, just as it is on film after you've taken a picture. To see this image, it's necessary to develop the paper and fix it, just as you do with film. Enlarging paper can be used under special red or amber lights called safelights, so you can see exactly what you're doing at every step of the way.

I'm not going to delve into the mysteries of the enlarging process itself; there are many excellent books on the subject (a specialty field of its own) and back issues of *PhotoGraphic Magazine* contain a wealth of information on both basic and advanced techniques. My primary concern here is to explore with you what you need in order to do your own pocket camera negative enlarging and why. And the first prerequisite for successful enlarging is a good negative.

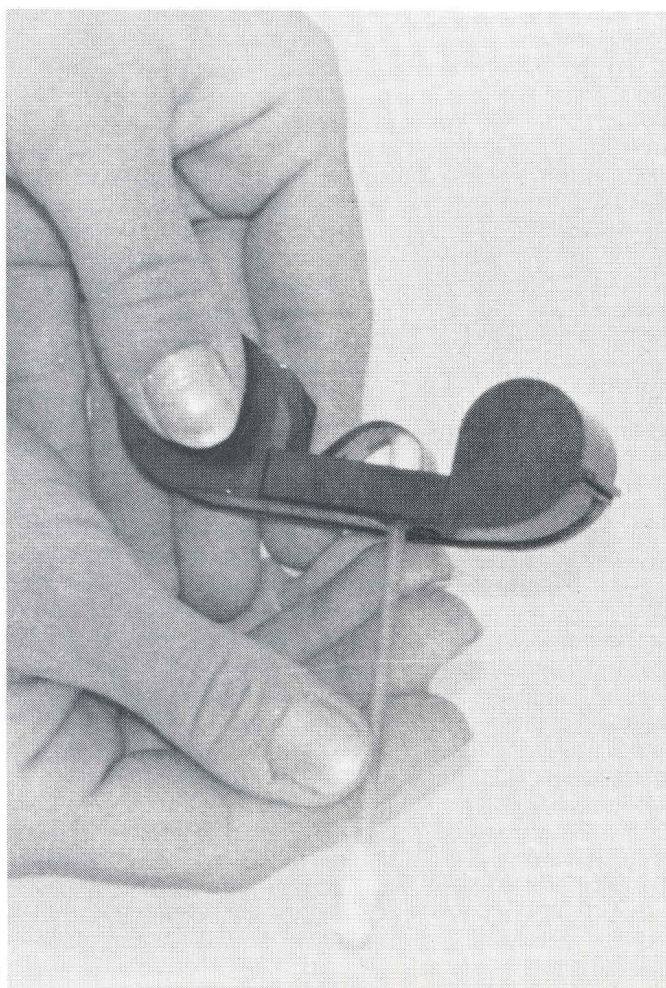
ABOUT THOSE NEGATIVES

The best pocket camera negative

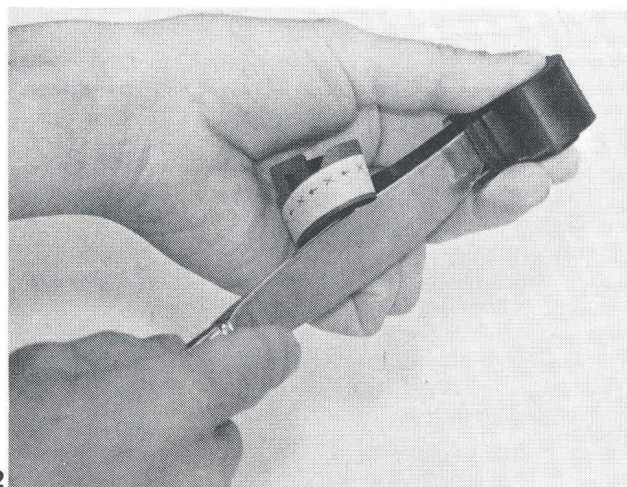
will have three distinct qualities: its density is on the thin side, there's ample detail in both shadow and highlight areas and the negative contains a full tonal range from light to dark. When a pocket camera negative has been overexposed or overdeveloped, it will be overly dense (dark) and contain a heavy accumulation of silver. Enlarging such a negative overemphasizes the grain pattern and destroys the film's natural acutance. A negative that's slightly on the thin side contains a lighter silver accumulation and will deliver more detail, tonal range and sharpness with a shorter exposure in the enlarger. You should work toward achieving an exposure/development formula that will consistently give you a negative with these three qualities.

WHICH ENLARGER?

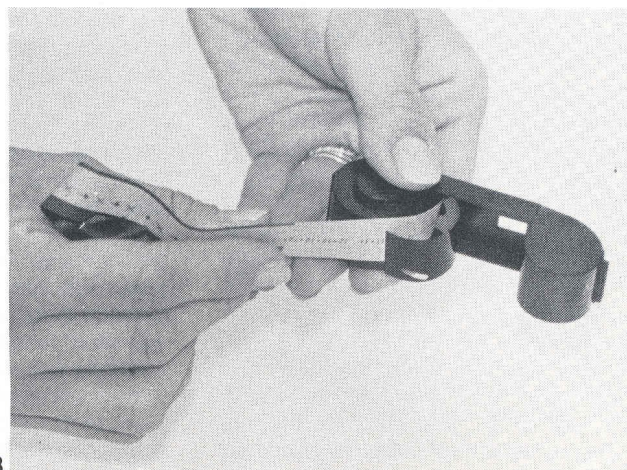
Enlargers specifically designed for pocket camera negatives give the best results, as their optical system and controls were all designed with the small negative in mind. It is possible to adapt most regular enlargers to accept the smaller film and if you already own one, or plan on using more than one negative size, this may



1



2



3

be the most economical way to go, but adaptation always has its disadvantages. Since enlargers are engineered to concentrate their light output most efficiently for a given negative size, smaller negatives will only use a portion of the light, requiring longer exposures for large images. To satisfactorily adapt a larger unit to accept pocket camera negatives, you'll need a suitable negative carrier and a shorter focal length lens, and if the manufacturer offers it, a supplementary condenser.

If you do not already own an enlarger, here are several factors you might consider before deciding on one. A diffusion-type enlarger will minimize dust and scratch marks, but at the same time, its image is on the soft side. Condenser enlargers produce the sharpest picture but they also emphasize every negative imperfection. In the past, miniature enlargers have often combined the two systems to give an acceptable compromise that retains the best of both.

The bigger your enlarger, the greater the chance of vibration that can blur your exposure. Small enlargers are better suited for the pocket camera enthusiast because of this

very factor. And even though the unit is small, make sure that it's a sturdy, well-constructed and rigid one.

As a short focal length lens will project a larger picture at the same height than that of a longer focal length lens, reducing exposure time and making a larger image possible, the enlarger lens should match as closely as possible the lens of the camera in focal length.

Stick to a dustless film carrier. While one that sandwiches the negative between two pieces of glass will hold it from buckling, you'll spend more time trying to keep those extra four sides of glass clean than you will enlarging. Make sure the carrier opening is the same size as that of your negative and that its surface is smooth enough to minimize the danger of scratching the negatives when moving from one to another on the film strip while enlarging.

Before you buy any enlarger, check to make sure that its operation is comfortable for you. The controls should fall in hand easily and not require that you stretch or bend in order to operate them efficiently. There should be an easy access to the optical system for cleaning and its design should keep out unwanted foreign matter as much as possible.

At present only Minolta and Minox offer pocket camera enlargers. A condenser enlarger equipped with a 30mm Rokkor lens, the Minolta accepts negatives from 9.5mm through 35mm with its four accessory carriers. Using the rapid shift 16mm carrier, you can make enlargements up to 5x7 inches. This is a good choice for use with most pocket cameras. If you own a Minox, however, you should definitely consider buying the Minox enlarger, as its negative carrier has the same concave film plane as that of the camera and is designed to extract maximum sharpness from the negative. The Minox enlarger uses four condensers with a light-diffuser, comes equipped with a four-element 15mm lens and will make enlargements up to 11x14 inches. Like the camera, the enlarger lens has a single opening; operation is simple, you need only focus and expose.

Minolta and Yashica both offer adapters for use with regular enlargers. These consist of a condenser, lens and negative carrier unit that screws into the lens board of any enlarger that accepts Leica screw-thread lenses. The Yashica adapter contains a 21mm f/3.5 lens and can be used only with 9.5mm film; the Minolta Enla-Unit is equipped with an f/2.8 Rokkor lens and negative carriers for both 10x14mm and 12x17mm formats. A 9.5mm carrier is also available separately. While these pre-

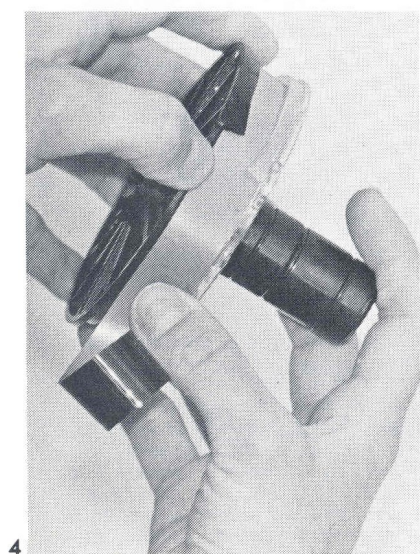
1. The 110 cartridge is unloaded by pushing a pen or swab through the cartridge window to poke the backing out.

2. If the 110 film jams, break the cartridge and use a knife as shown to pry the cartridge apart without doing any damage to the film.

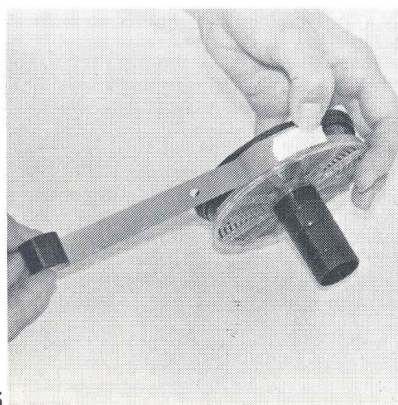
3. Pulling the paper backing then brings the film out with it.

4. The film is "walked" onto the Yankee reel by holding the left side of the reel and turning the right side back and forth to engage the ratchets.

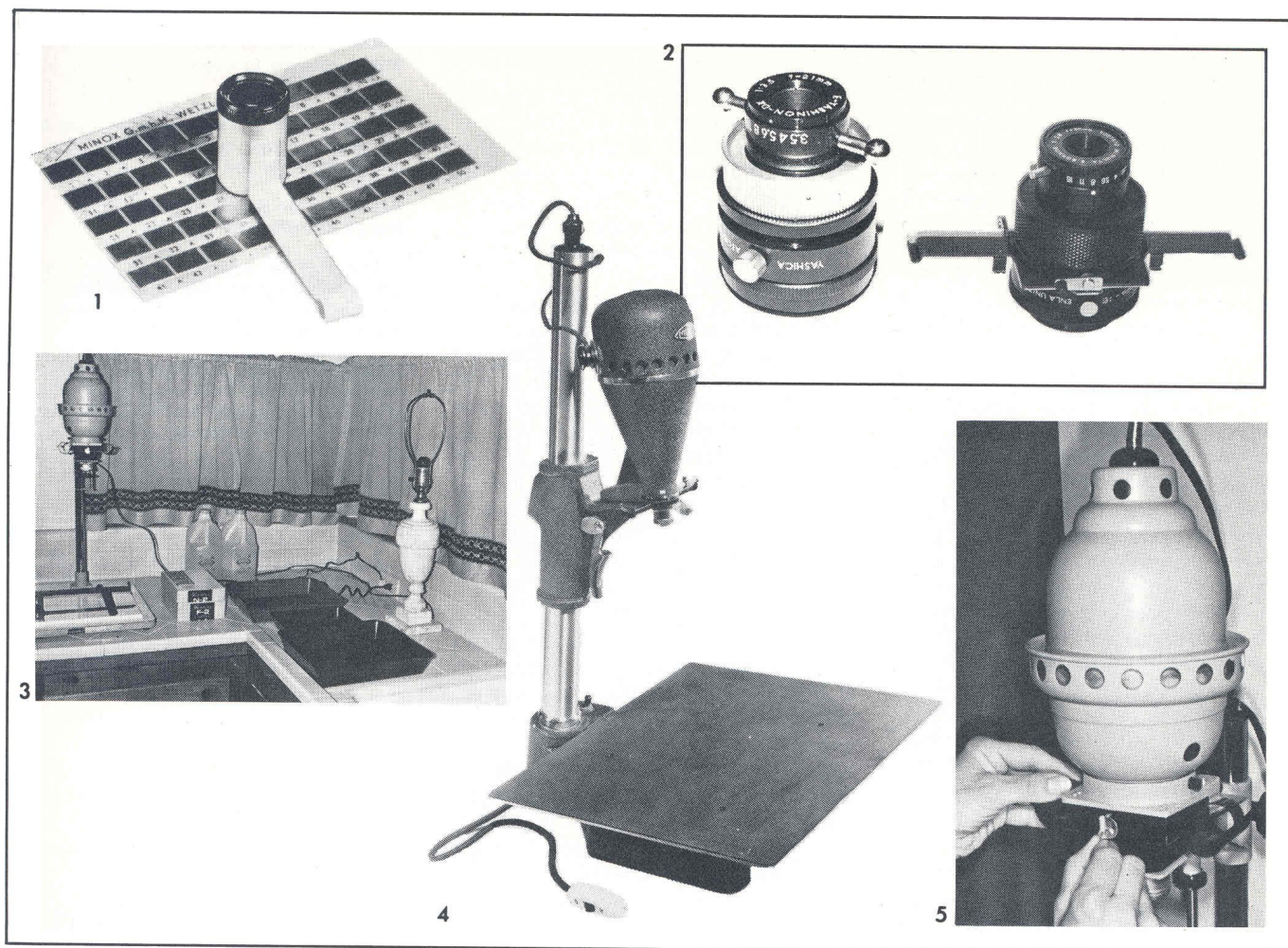
5. By taping films together, you can develop multiple films on a single reel at one time. Yankee reel will hold up to three 110 films safely.



4



5



Darkroom Procedures

cision adapters are delightful to have in a nearby drawer, to be attached to a regular enlarger whenever needed, their cost is sufficiently high to pay for a complete miniature enlarger, which probably should be your first choice, unless you already have one enlarger at home and lack the space for a second.

AND FINALLY . . .

In addition to the enlarger you'll need an adjustable easel to hold the paper flat during exposure, and three trays large enough to accept the biggest print you expect to make. Plastic print tongs should be used to handle the paper while it's in solution and should have a gripping surface that will not mar or otherwise damage the paper. An amber or red safelight will provide sufficient illumination to work by and a blotter book or roll to dry the finished prints will come in handy. At a later time, you might want to replace the blotter system of drying with an electrically heated dryer, but while this is nice, it is not necessary unless you're making a great number of prints at one time. Chemicals, storage bottles and printing paper com-

plete the supplies necessary to make your own enlargements.

Once again, try to standardize on a single paper developer and two or three types of paper. While the sheen of a glossy paper will add to the overall impression of sharpness, a matte finish helps to hide grain and diffuses any tiny negative defects that might slip by you while enlarging. To start with, buy several different paper surfaces in the smallest possible quantity and experiment. This sampling technique will let you pick the surface you like best and gives you an idea of how to complement particular subjects by the use of different types of paper surfaces.

Once you've developed a few cartridges of film and have made enlargements, you may get the urge to try your own color work. If you're a color transparency fan, I'd suggest you let a good color lab handle your film, but there's no reason why you can't make color prints from negative film once it's developed. While this is beyond the province of our pocket camera darkroom section, it's almost as easy as black-and-white, twice as much fun and infinitely more fascinating. But whatever you do, don't stifle your interest in pocket camera photography because of fear of the un-

known. Just tell yourself that you'll try anything at least once and plunge in—the water's fine.

1. The Minox negative viewer / magnifier simplifies the selection of negatives to be enlarged.

2. Yashica and Minolta provide enlarging units to fit standard enlargers with a Leica-screw thread lens board. The unit replaces the regular enlarger lens and has its own optical system / negative carrier built in. Minolta Enla-Unit (right) comes complete with carriers for 10x14mm and 12x17mm negatives, and red plastic sheets to fit enlarger negative carrier, serving as a red safelight.

3. My kitchen darkroom, complete with Minolta 16 enlarger. The makeshift safelight uses a standard-base 7½-watt red bulb and provides sufficient illumination for work without affecting the paper.

4. Especially designed for use with Minox negatives, the Minox enlarger has a concave film plane to extract maximum sharpness from the tiny 8x11mm negatives. Atoron users will not find this enlarger satisfactory, as the Atoron film plane is flat, not concave.

5. The Minolta 16 enlarger has a built-in lever to open the negative carrier without removing it. This prevents scratching of negatives as strip is moved from one frame to another.



1. Minolta tank will develop two films at once. Cartridge bridge is broken off and end with film is pushed into socket as shown. Staple in end of film keeps it from pulling out of lip. Once tank top shown is reassembled to bottom, it's turned to pull film out of the cartridge for development and solutions are poured into tank from top.

2. Yankee developing tank empties easily through vents when development of film is complete.

3. Yankee tank uses 5 ounces of chemical to develop pocket camera film. I use an ordinary water glass to mix the developer stock solution and water. After straining, the developer is poured into tank through the center hole.

4. When development is complete, the solution is poured out of tank through one of the side vents.

ly separate it and remove the film. After hanging the film up to dry with a clothespin, wet your fingers in the solution and gently squeegee the film between your first two fingers to help remove excess fluid; even drying without water spots is very important here. As 16mm film is so small, complete drying should not take over 30-45 minutes. I find the shower stall handy for this also, as dust blowing onto the wet film can ruin all of your previous effort.

To this point, everything has been accomplished on a minimum budget. If you enjoy processing your own black-and-white film, there's no reason why you can't buy or build some of the more exotic film processing equipment such as a wash unit, film drying cabinet, graduate measures, etc. Some may feel my approach is not sufficiently professional, but for the beginner, I question the advisability of initially investing more than is absolutely necessary in order to decide whether or not you enjoy the procedure. While you can easily spend upwards of \$100 preparing to develop that first cartridge of film, a \$10 bill will suffice as I've outlined it and you'll even have change coming back. Any equipment beyond that which I've specified will only make your procedure more efficient, it won't do a better job.

NEGATIVE STORAGE

Proper storage is very important with pocket camera negatives, and a step that should not be neglected. If you wind the strip into a roll or cut it apart and toss the pieces into a handy drawer, all those enemies—dust, dirt, lint and scratches—that you've fought so hard to this point will now wreak their vengeance on your negatives. Minox offers negative envelopes for the 9.5mm Minox/Ato-ron negatives and storage of 16mm negatives is best accomplished by using transparent celluloid film wallets,

pabilities of the five ounces of developer necessary to totally immerse the film. While it's possible to load one well down onto the reel and then load a second behind the first, I suggest you tape them together end-to-end if you plan on developing multiple films at one time; otherwise you run the risk of overlapping one on the other and ruining several negatives on each film. Insert the loaded reel into the tank, replace its cover and turn until it locks. From this point on, everything can be done under normal room illumination.

DEVELOPMENT

Before actually beginning development with the film, dilute your stock solution by mixing it with the necessary tap water (at correct temperature) in an ordinary 12-ounce water glass. Check the time/temperature data for the correct developing time as you strain the mixture through a folded paper towel or coffee filter to remove any minute undissolved chemical granules or other impurities that might otherwise affect the quality of your negatives. Bring all solutions including the wash water to the same temperature and then run about six ounces of water into the tank, agitate for 60 seconds and drain the tank.

This prewetting bath prevents air bubbles and specks of dust and dirt from being trapped on the film sur-

face when the developer first strikes it. Once the prewetting bath has been drained from the tank, pour in the developer slowly, keeping an eye on the watch. Development time is measured from the moment you start pouring the solution in until you begin to drain it out. Agitate according to the developer maker's recommendations and develop for the length of time specified. If you use a Nikor tank, agitate by turning the tank over and then back, rapping it sharply as you set it on the counter.

When development is complete, drain the solution and discard, replacing it with another plain water bath. Developer is inexpensive and replenishment for reuse is not really practical when using such small quantities. Agitate for 30 seconds, drain and refill with about 6 ounces of fixer. Agitate for the first 60 seconds, then let the film fix for another 9 minutes. Drain and save the fixer (a small funnel can be helpful in returning the solution to the bottle), unlock and remove the tank cover and let water run into the tank for 15-20 minutes to wash the film free of fixer. If you want to shorten the wash cycle, use a hypo neutralizer. When this step is completed, shut off the water, pour in a couple drops of a wetting agent like Kodak Photo-Flo and agitate for two minutes.

Lift the reel out of the tank, careful-

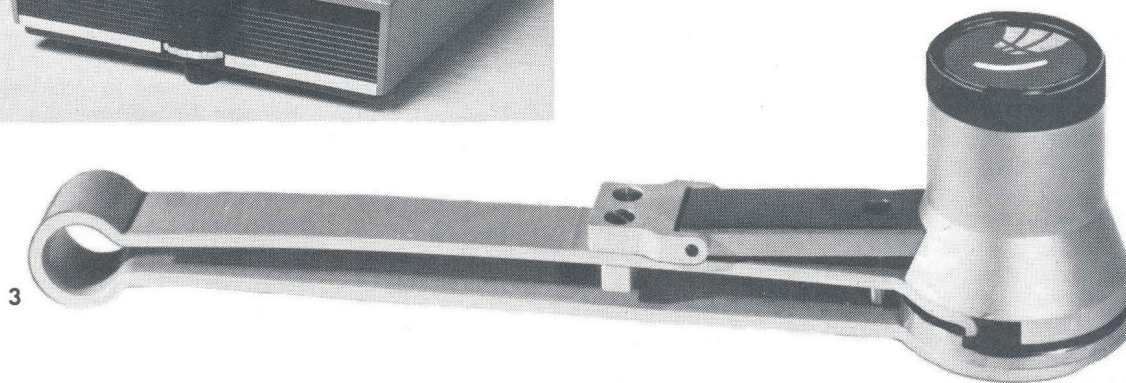
Pocket Camera Color Photography



1



2



3

Until very recently, pocket camera photography in color, like stereo photography, was somewhat of a frustrating experience that only the true devotee was willing to undergo. No really suitable color emulsions were available for the very small format pictures; the old ASA 10 Kodachrome film with its almost total lack of grain had been off the market for years, and most pocket camera manufacturers respooled Anscochrome film for their cameras. As users of this film are aware, it was an excellent choice for 35mm photogra-

phy, but the grain structure was somewhat too evident to provide the extreme sharpness needed in pocket camera transparencies.

But film alone was not the sole problem. Labs customarily returned pocket camera transparencies in strips or in 2x2-inch slide mounts; both ways proved eminently unsatisfactory. Users had to cut and mount the individual pictures from the strips; the 2x2-inch mount, standard in 35mm photography, produced a very small screen image when the tiny transparency was projected in a

1. Minox Minomat projector was especially designed for 30mm Minox slides and offers both push-button and remote controls, making it as versatile as any of the larger 35mm projectors.

2. Minox slide mounts are available for those who wish to mount their own.

3. Minox viewer-cutter lets you preview transparency strip before mounting the individual frames.

Color Photography

35mm projector. Only Minox recognized the problem, responding with its own 30x30mm mounts and projectors especially designed for them.

The last time pocket cameras made a serious bid for mass attention (the late fifties), the entire field of color photography was in a state of flux. Projectors were evolving from manually operated light boxes to self-focusing, fully automatic devices. New color emulsions were appearing with increasing rapidity and frequency, and perhaps more important, by the sixties the entire public attitude toward color was undergoing a fundamental alteration.

From the day Kodachrome film had first appeared in the mid-1930s, most amateurs thought in terms of color transparencies and projection. Although negative color films like Kodacolor film came into existence just before and after World War II, the color slide syndrome was firmly implanted by that time. Older methods of producing a color print had either been far too expensive or quite unsatisfactory from a quality standpoint, and so the acceptance of color prints was one of very gradual transition. But in the past decade, amateur photographers have shifted their preference from slides to prints in overwhelming numbers, to the point where it's safe to say that 7 of every 10 color pictures taken today result in color prints rather than slides. And during that same period, the greatest advances in emulsion technology seem to have been in color negative films. Yashica's Unifilm was one manufacturer's attempt to ride out the turbulent years, but the all-purpose film (a color negative stock), used to make black-and-white prints, color prints or slides, was not promoted by other companies and does not appear to be the ultimate answer it was once thought to be.

Recent advances in film coating technology have made current films quite superior to those of just a few years ago and the pocket camera user of today can now produce color prints or slides that are far better than anything he's known in the past. With the advent of Kodak's new Pocket Carousel Projectors, the old problems that restricted projection have been largely solved. As you'll certainly want to take advantage of color with your pocket camera, let's look at the differences between color and black-and-white photography—they really aren't that great.

If you can take a good black-and-white picture, you can do the same in color. But some things are different when working in color and balance is

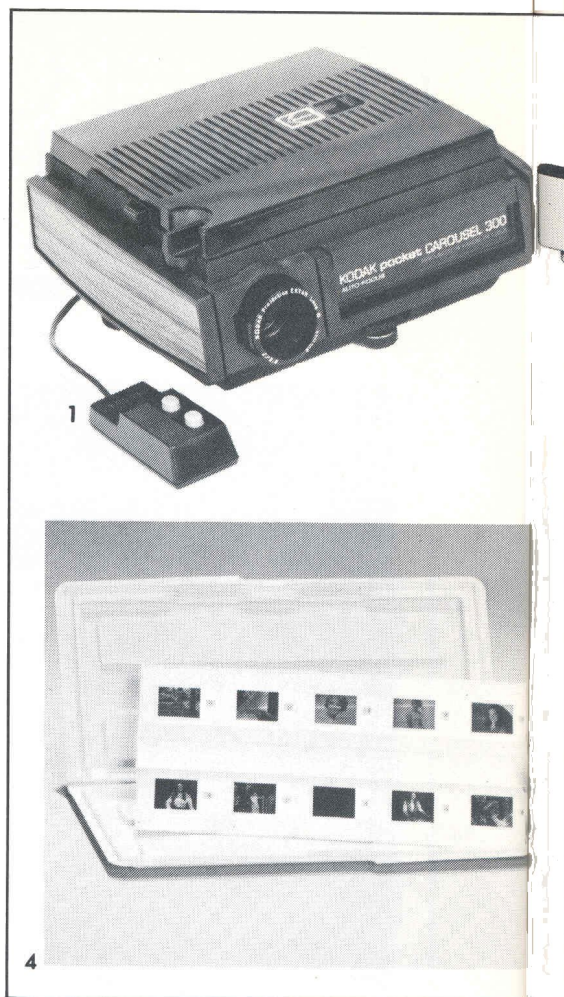
one. With black-and-white film, light is essentially light, regardless of its source and you can use it as such. But color films "respond" to the quality of the light. While we usually think of light as being white, it's actually composed of three basic colors—red, blue and green—and if the light you use contains an excess of one color, so will the pictures you take. Thus color films are balanced for either daylight or indoor illumination. Those packaged for pocket camera use today are all balanced for daylight use outdoors; if used indoors, you'll need a blue flash bulb, flashcube or electronic flash, all three of which are also balanced for use with daylight color film.

Should you take pictures under other types of illumination, you must expect the slide or print to have a coloration your eye did not notice. If the prevailing light source is other than the one the film is balanced for, the picture will be too reddish (warm) or too bluish (cold). For best results, take your pictures in daylight and use a skylight filter (if one is available for your pocket camera) to prevent a bluish cast in pictures of distant scenes or those taken with the sun directly overhead. Minox and Pocket Instamatic cameras have built-in haze filters that do the same thing as the skylight filter. When working indoors, use one of the three artificial light sources mentioned in the previous paragraph for balanced color.

Latitude is another difference. A film's ability to compensate for over- or underexposure while giving you an acceptable picture is called latitude. With black-and-white film, latitude or exposure range is quite great but color film possesses only a narrow latitude; that is, the range of deviation from correct exposure is limited. And of the two types of color films available, the positive or transparency films such as Ektachrome film have less latitude than the negative or print films like Kodacolor II film.

If your pocket camera has some form of exposure automation, you won't have trouble with latitude as long as you set the ASA index correctly and obey the camera—if it tells you that it can't take the picture, don't expect perfect results if you insist on shooting anyway. Any error in exposure affects both density and quality of color reproduction. Overexposure results in faded, washed-out colors that give the picture a light or flat appearance, while underexposure makes colors dull and muddy-looking, contributing to an overall dark and murky picture appearance.

Shadows and color contrast are also of a different nature in color photography. Because of the limited latitude, shadow detail is harder to



hold in color pictures. Side or back lighting causes harsh, dense and dramatic shadows that are undesirable in color work, especially when working with people as subjects in bright sunlight. It's always a good idea to use fill flash to control such shadows when shooting outdoors.

A related problem involves color contrast. Black-and-white photography is effective when contrast between light and dark is used to model and emphasize the subject. Thus flat lighting destroys much of the arrangement of tonal contrast and intensity sought in black-and-white work. But with color photography, colors themselves produce the contrast and so flat or evenly distributed lighting is most effective. It keeps the shadows weak and allows color contrast to create the picture for you. So bear in mind that unless you are experimenting with a special effect, lighting outdoor pictures in color is simple—keep the sun behind the camera to avoid excessive contrast that will result in unwanted shadows.

The psychology of color requires that you emphasize the main subject of interest whenever you can. This can be done in several ways. One is to come as close to the subject as possible to eliminate extraneous ma-

mere fraction of an inch can mean the difference between achieving a sharp picture or a blur.

Since photographing an object like a flower falls under the category of close-up photography rather than copy work, you'll find an ordinary camera tripod best suited for holding the camera while you measure and adjust the distance between subject and lens, focus and compose the picture, and release the shutter. Pay close attention to your lighting when working in so close to the subject; if the main light is coming from behind the camera, step to one side before taking the picture so that your body will not cast a shadow on the flower. For an accurate determination of camera-to-subject distance, use the beaded carrying chain (Minox) or scale chain (Minolta) provided with your camera. Hold it at a 90-degree angle from the camera lens, as any deviation from this angle can mean an out-of-focus picture.

Copy photography is best done with a vertical setup, and use of the copy stand made for your camera simplifies matters considerably. The copy stand consists of a camera holder into which four legs are screwed to form a quadrapod whose rectangular field of view when placed on a flat surface is slightly larger than that of the camera lens. The holder aligns the camera and aims its lens in the center of this area. In work of this kind, disregard the viewfinder completely; what you see in it is not what you'll get.

As the copy stand leg sections automatically position the camera at the correct height, no measurement of camera-to-subject distance is required. But if you're using a Minox, don't forget to adjust its focusing scale correctly. You can improvise other arrangements, such as inverting a center pole tripod so that the camera faces downward between the tripod legs, but the ease and convenience of the copy stand—no measurements, adjustment, alignment or guessing as to what the lens really sees—is well worth the price of this particular accessory.

Lighting is of equal importance in copy stand photography. While almost any light source can be used if necessary, the best results come with controlled artificial lighting. A two-light setup is best, with the lamps placed at a 45-degree angle to the lens, as shown in Figure 1. When copying an object with a shiny or glossy surface, increase the angle to 90 degrees as shown in Figure 2 to reduce the possibility of glare. You can also work with a single light as in Figure 3, but use a piece of white cardboard or aluminum foil as a reflector for even illumination.

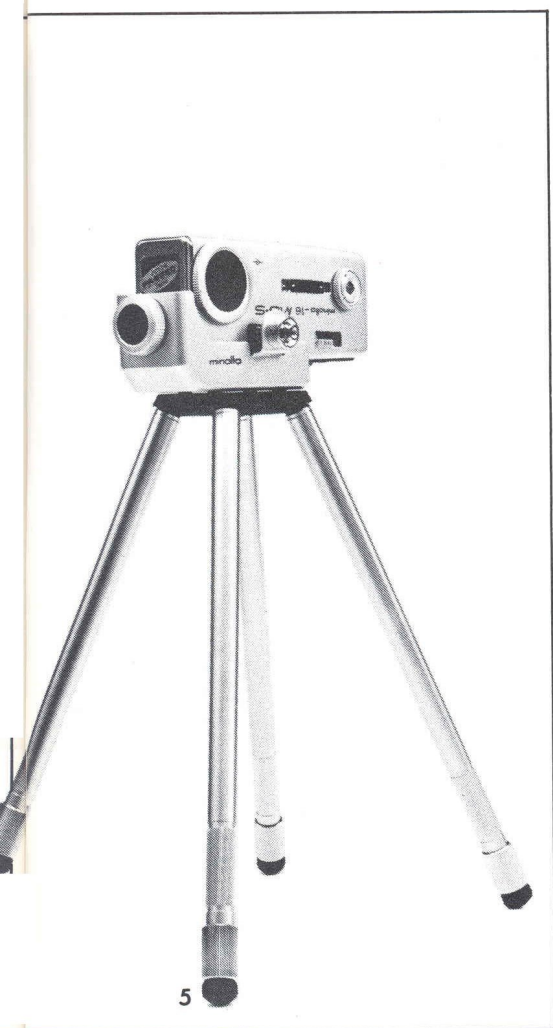
1. Capable of focusing down to 8 inches and equipped with a beaded measuring chain (shown in use here) that indicates distances of 8, 10, 12, 18 and 24 inches, the Minox is ideal for hand-held close-up photography.

2. This picture was cropped from a horizontal shot with Minox at 10 inches. You can expect at least this quality with ASA 50 film in bright sunlight.

3. ASA 100 film, sidelighting and f/2.8 lens opening give this rendition of red rose. Opening lens up completely throws background out of focus to concentrate attention on subject.

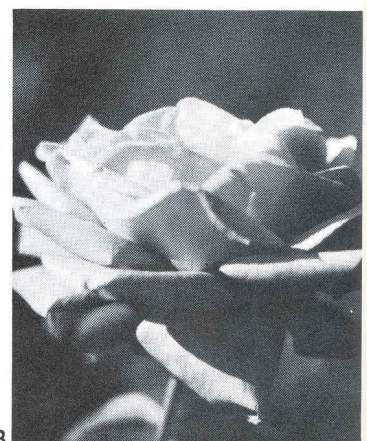
4. You'll find close-up work with the Minolta 16 MG-S easier on tripod. Measuring chain is used with close-up lens.

5. Quadrapod copy adapter for Minolta 16 MG-S has legs preset for 25cm close-up lens (9.84 inches); unscrew milled tips and they extend to 40cm (15.75 inches). Cable release is provided.



Because of its ultraclose focusing ability (to eight inches), the Minox is especially well-suited for both close-up and copy work, but with the variety of auxiliary lenses made available for the Minolta system, you can get much the same results with the less-expensive MG-S. When working at such close range the rigid support provided by a copy stand or tripod is highly desirable. While it is possible to take close-up photos with a hand-held camera, remember that depth of field is extremely shallow when working just inches from the subject; a

Explore Macrophotography: Come Closer, Closer, Closer!



These four lines extending from camera are copy stand legs.

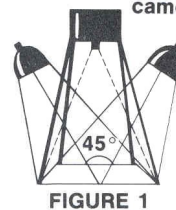


FIGURE 1

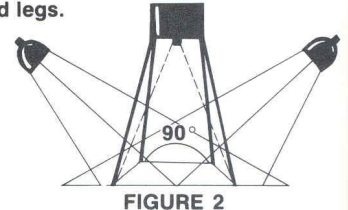


FIGURE 2

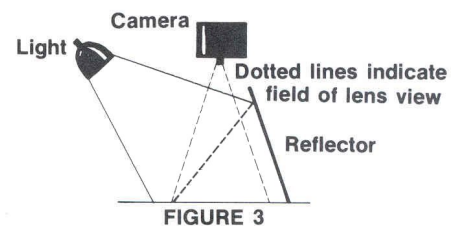


FIGURE 3

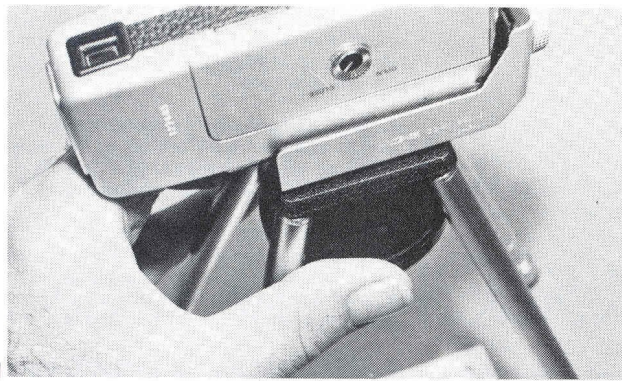
Throughout this book, I've urged you to come closer to your subject; if you own a Minox, Atoron or Minolta, here's how you can confront it eyeball-to-eyeball by extending the range of your pocket camera to include macrophotography. For portability and convenience, the pocket camera is ideal for occasional ventures into the ultraclose-up world of big pictures from little objects. Of course, if you plan on doing extensive work of this nature, a larger negative size is really more practical.

But pocket cameras have a use in

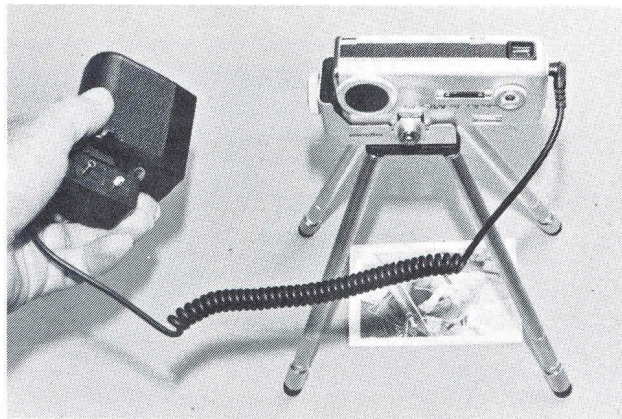
macrophotography; I have found mine to be indispensable in researching several of my books on cinema history. The documents and other information that I needed for reference were housed in such diverse locations as Hollywood's Academy of Motion Picture Arts and Sciences and the British Film Institute in London, and could not be checked out for home use. Users of the Academy library are limited to four Xerox copies per day and at that rate, I would never have been able to research and write four volumes a year without the help of

my Minox and Minolta cameras.

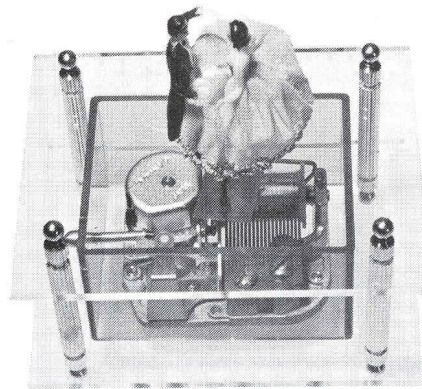
There's a whole new world out there in front of an auxiliary lens, but certain rules must be observed concerning what can and what cannot be copied. The government has legal restrictions against reproducing such materials as United States currency, copyrighted items, automobile drivers licenses, draft cards, immigration and naturalization papers, and postage stamps (except for restricted philatelic use). But there are many other legitimate aspects of copying that you are free to explore.



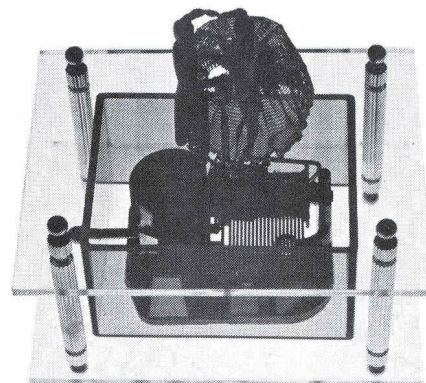
1



2



3



4

Macrophotography

Electronic flash gives a soft light and its high speed eliminates the possibility of camera movement. When using the Minolta with its Strobe Adaptor, connect it to the Electroflash-P unit with a flash extension cord. This allows you complete freedom in light placement.

When copying a flat object like a printed page, depth of field is not really helpful, so you can expose with the lens wide open if necessary. But if the subject is three-dimensional, close the lens down to at least $f/5.6$. You'll need the depth of field in this case and as most lenses offer the best definition at the midpoint of available lens openings, you'll get a crisper image at $f/5.6$ or $f/8$.

Due to the slight difference in angle between the lens and the CdS cell when the camera is used at extremely close range, I'd suggest that you bracket a series of three shots. If you're photographing a small object on a white background, or if the document contains more white than black, you may find the electric eye is more optimistic than the film, leading to an underexposed negative. So take one according to the electric eye's exposure, one with a larger opening and one with a smaller one. Thus, if the automatic exposure chosen by the camera is $1/30$ second at $f/8$, also shoot one at $f/5.6$ and one

at $f/11$. This will assure one correctly exposed negative and prevents the possibility that you might have to set up and shoot the picture over.

With the Minox, ASA 25 or 50 is a good choice for copying subjects with continuous tone; ASA 12 is effective for letters, documents and other line materials. Plus-X works fine with the Minolta for continuous tone work, but for good reproduction of line drawings, you'll have to reload your own cartridges with a slow high-contrast film like Kodak Microfilm. When the lighting is poor and can't be improved (as in many older libraries), go ahead and use a fast film like Tri-X; while the pictures won't be quite as good, at least you'll get them. Just be certain to process them in a high-contrast developer. Color film can also be used as long as it's balanced to the lighting. To convert daylight film for use under photoflood illumination, use an 80A filter.

As both filters and close-up lenses are snap-on accessories with the Minolta, it's not possible to use them both at once. But the Minox focuses to eight inches and contains its own built-in filters, so you can often improve the image contrast when reproducing line drawings other than those that are black on white. The orange filter will help in copying blue on white, or red on black; a green filter does the same with red on white, or black on green. If you find it neces-

sary to copy materials other than black on white with the Minolta, you can hold the desired filter beneath the lens but take care not to interfere with the CdS cell or to cast unwanted shadows on the subject with your arm or fingers.

There's a whole new and different world just inches beyond the lens of your pocket camera. Experiment with it and you'll be surprised at just how much the experience can help you in developing a picture sense for everyday objects. And along the way, you'll get some very interesting photographs for your efforts.

1. When copying with MG-S, you can hold a filter (for improving subject rendition) beneath lens. Use camera on manual setting and don't cause shadows on material to be copied.

2. Tiny Electroflash-P can be used as sole source of illumination for copy work. Use a fast shutter speed and experiment with the distance and angle between flash and copy subject for correct exposure. Once established, this will hold for virtually every subject.

3,4. Here's a tiny ballerina music box captured with MG-S. For a different effect, place music box on a sheet of opal glass and hold Electroflash-P below, facing camera.

It All Started with Steinheil

When the 35mm format captured the camera-buying public's imagination in the mid-thirties, professional photographers and photo dealers alike were fond of delivering periodic and solemn pronouncements predicting a very brief popularity span for the so-called "postage-stamp" negatives. But to their great surprise, 35mm survived despite the repeated dire prophecies of doom and rather crude film emulsions of the day. And with the introduction of Kodachrome film and synchroflash photography even the pros accepted 35mm, although begrudgingly at first. By the late forties, nearly all of the quality still cameras sold were 35mm, a market dominance that lasted until Kodak's fantastically successful introduction of the 126 cartridge in 1963.

And now, to the surprise of almost everyone, Kodak has done it again with the 1972 appearance of the 110 film cartridge for its new Pocket Instamatic camera series. Yet today's pocket cameras are essentially the ultraminiature cameras of the sixties and the subminiatures of the fifties. Both the concept and the cameras have been around almost from the beginning of photography, but standardization of the film format, one of the key ingredients in extending their popularity to a mass audience, now appears to be on its way, courtesy of Kodak. Pocket camera photography is here to stay and regardless of which of the four current film formats your camera uses, you're right in the swing of things if you now own one. To see how we made it to where we are today, let's take a backward look at the pocket camera's development.

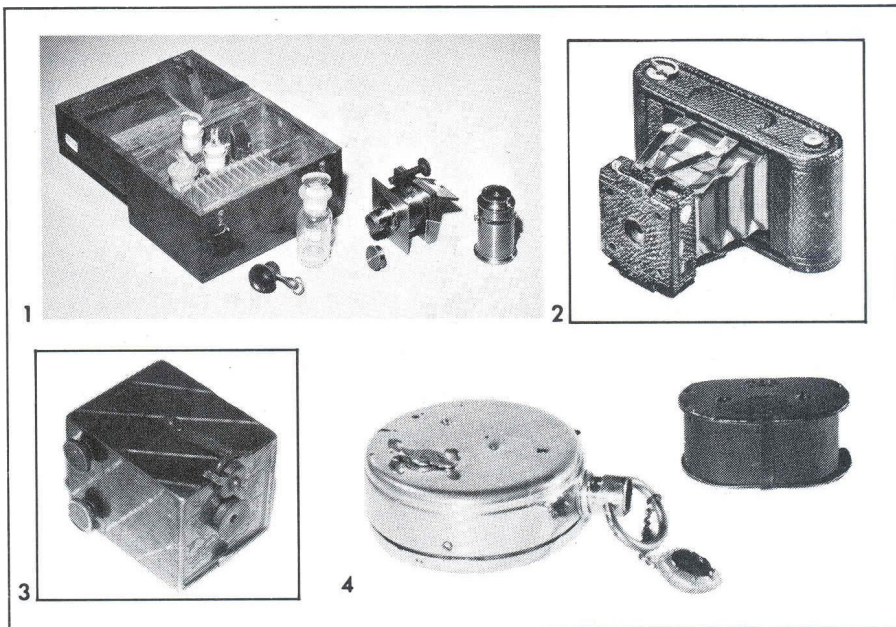
The pocket camera actually dates back at least to 1839, when Professor Carl Von Steinheil, a Bavarian scientist who founded the famed German optical works bearing his name, produced a small daguerreotype camera. Its 20mm two-element achromatic lens took 8x11mm pictures on highly polished, silver-plated copper disks. Iodine vapor was used to sensitize the disks and mercury vapor developed the exposed image. Records show that Steinheil manufactured only a dozen, and six of these eventually turned up in England. Locate one today and you've got a real collector's item.

Some two and a half decades later, Charles P. Smyth, a prominent En-

glish astronomer and Egyptologist, developed a small format camera using wet plates. Although he was successful in using it to photograph the Great Pyramids and other Egyptian relics, it remained for Maddox's invention of the dry plate in 1874 to really spur the pocket camera concept to commercial success. For the next two decades, the so-called "detective" or "spy" cameras enjoyed a healthy vogue as small cameras were incorporated in a variety of books, false parcels, hats, walking sticks, pocket watches and tie pins.

But public fascination with the hidden cameras was never really extensive and they gradually faded before the concentrated marketing of larger and more inexpensive roll film cameras such as those produced by Kodak. George Eastman was fond of advertising several of these as "pocket" cameras and the term was accepted by the public, who bought the large monstrosities (by today's standards) by the millions. The pocket concept was further refined by extending it to those cameras using No. 127 or "vest pocket" film, as it was popularly known, and once more cameras were sold by the millions.

But the modern pocket camera concept did not materialize until the mid-1930s. This time, it was in the mind of Walter Zapp, who manufactured his original Minox design in Riga, Latvia, until World War II disrupted European commerce. The Minox



1. Not long after photography became a reality, this Bertch miniature wet-plate outfit (circa 1860) made one-inch plates in a camera not much larger. While the idea was good, it is difficult to imagine the usefulness of a pocket camera with wet plates.

2. The emphasis on pocket camera photography is not new; George Eastman was fond of tagging his folding cameras as "pocket" models. This nearly mint No. 1 Folding Pocket Kodak camera of 1898 is an early example, but it is many times larger than Kodak's current Pocket Instamatic cameras.

3. A fascinating little brass box covered with oxidized silver, the Kombi was manufactured for about a decade around the turn of the century. Its 25-exposure roll of paper-backed film gave 1 1/8-inch square negatives, or 1 1/8-inch circular negatives if you used the snap-in wooden film aperture provided. Like today's Hasselblad, the Kombi used a removable magazine back and could be converted for use as a viewer when you made positives from the negatives. At \$3, it seems a genuine bargain.

4. The Expo Watch Camera of 1904 housed a 25mm f/16 lens in its stem and had a single shutter (1/25 second) speed. The Expo cost \$2.50, took a 15x22mm picture on 17.5mm film contained in 25-exposure daylight loading cassettes. A fixed-focus enlarger that made 2x3-inch prints was available for an extra \$1.50.

It All Started with Steinheil

came to fame as an espionage tool used by the Allies as well as the Germans. The Japanese even got into the act with a camera concealed in a most logical place, in a Zippo-type cigarette lighter, one of which was used to photograph military installations at Pearl Harbor before the Japanese attack. As a result of the cloak-and-dagger publicity these cameras received in the movies and popular literature of the war years, the postwar photo market was primed for a pocket camera boom.

The boom began on the American photographic scene even before Minox GmbH returned to production in 1948. Bill Whittaker of Los Angeles had been a rather successful fabricator of aircraft parts during the war; with the cessation of hostilities, his market nose-dived. Firmly resolving to use his metal die-casting experience in the camera business, Whittaker began the manufacture of his Micro 16 in 1946. The camera carried an f/8 lens with three waterhouse stops and

a simple single-speed shutter, but at the quite reasonable price of \$29.95; some 250,000 were manufactured and sold in the five years the camera was marketed.

The popularity of the inexpensive Micro 16 and the precision Minox soon brought forth a host of competition from around the world—GaMi from Italy; Stylophot in two models from France; Mikroma and Stereo Mikroma from Czechoslovakia; Minicord from Austria; CamBinox, Steineck A-B-C and Mec 16 from Germany; Mamiya, Ricoh 16, Steky, Petal, Minolta, Echo and Yashica from Japan; and the domestic Tynar and Universal Minute 16.

While the price tags on this deluge of pocket cameras ranged as low as \$4.95, the majority were precision instruments of which the undisputed king remained the Minox, although its throne was briefly challenged by the system approach of the superb GaMi 16. But the GaMi was also the largest and most expensive of the pocket cameras and never quite captured the public imagination, as had the Minox, although both cameras possessed that same indefinable aspect of design and production sought by all camera manufacturers, but achieved by only a few—quality. Part of this aura of excellence can be explained when you realize that the Minox B, measuring a mere 3 7/8x1 1/8x5/8 inches and weighing only 3 1/4 ounces, required 1614 individual

steps to assemble its 237 parts. With mechanical tolerances held to 4/10,000 inch and optical tolerances of 1/50,000 inch involved in its manufacture, 388 separate inspections were used to control the 1973 separate dimensions involved, resulting in an ultraprecision product that has become the object of a virtual cult of enthusiasts over the years.

Originally introduced in 1954, the Italian GaMi was probably the best engineered and most superbly made pocket camera of that decade. A six-element 25mm Galileo Esamitar f/1.9 lens could be focused to 20 inches by its coupled rangefinder, and its synchronized all-metal shutter ranged from 1/2 to 1/1000 second and Bulb. Sequence photography in three-picture bursts was made possible by a built-in spring motor and the coupled extinction light meter was an attempt at exposure control. Its many accessories included supplementary telephoto lenses and gave the GaMi a versatility unmatched by any other pocket camera then or now, but the weight was a hefty 10 1/2 ounces and the price was \$297—pretty steep in dollars of that era.

The Austrian Minicord III held the distinction of being the world's smallest true twin-lens reflex (TLR) camera. Using a roof prism instead of a mirror, it provided a right-side-up and unreversed image through its 45-degree eyepiece. This allowed the user to follow action with ease, a fea-

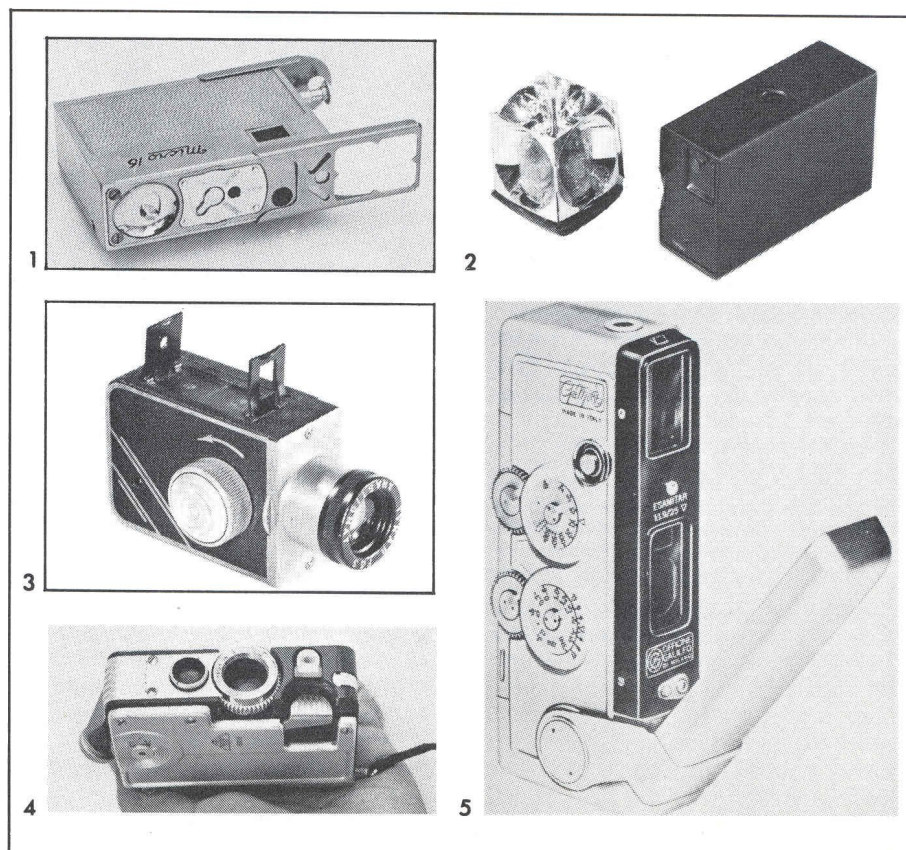
1. The postwar American pocket camera boom began with the Whittaker Micro 16. Although it had a simple spring shutter (1/50 second) and an f/8 lens that closed to f/16, the Micro was very popular at \$29.50. Normal viewing was reflex-type, but an accessory open frame finder (shown on camera here) simplified snapshot taking.

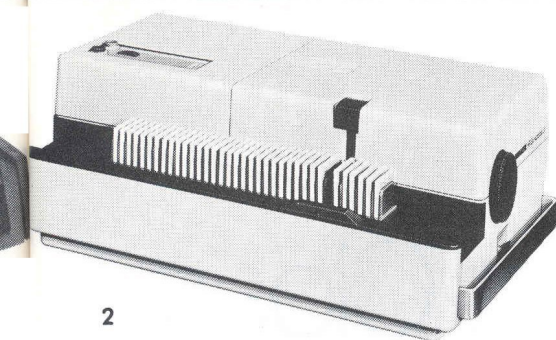
2. During World War II, Kodak packed up their dies for civilian cameras and went completely into military production, which included this little-known 16mm matchbox camera, shown here with a modern flashcube for comparison. The camera was packed as a spy outfit, complete with developing powders, film and accessories. Exactly how many were made and just what the government did with them is unknown.

3. A \$4.95 American pocket camera with cartridge loading, the sturdy Tynar took terrible pictures. Manufactured in California, the Tynar was deliberately designed as a "rip-off" (in today's vernacular) and like the Pixie, had mainly novelty value. Cameras like this helped kill the first pocket camera boom.

4. Another dandy pocket camera of the same era, the Austrian Minicord III was a TLR design and equipped with a six-element 25mm Goerz Helgor f/2 lens. Focusing to 12 inches, the Minicord had a metal focal plane shutter and a rapid advance trigger for sequence photography. Used Minicords are plentiful today but use special film cassettes long unavailable.

5. Introduced in 1954, the Italian GaMi 16 was a superbly engineered pocket camera that rangefinder-focused to 20 inches, used a six-element f/1.9 lens of fine quality and had a flash-synched all-metal focal plane shutter. Priced at \$297, it sold poorly and many in mint condition are available today. A complete accessory line was made available for the GaMi.





2



3



5

1. Like its larger Carousel brothers, Kodak's new Pocket Carousel 300 features autofocus and built-in timer.

2. Newest Minox projector, the HP24, has motorized forward/ reverse slide change and critical focusing. Both features are controlled from master panel that can be detached from the projector for remote control with 10-foot extension cord.

3. Remove distracting, unwanted backgrounds from pocket camera close-ups by placing sheet of colored poster board behind the subject.

4. Plastic mounted slides from 110-size color films are returned to customers mounted on detachable slide sticks and packed in a protective wallet.

5. Cut a square opening in bottom of aluminum baking cup and insert Magi-cube to hold in place. This throws cube light upward and avoids red-eye more effectively than Magicube extender.

planation, but I doubt that she'll forgive you. If you own a Kodak Pocket Instamatic camera, you can use one of the Magicube extenders. This raises the light three inches above the camera, but it's far from a guarantee that you won't continue to get red-eye in your pictures. Camera and flashcube manufacturers recommend that the subject avoid direct eye contact with the camera when the picture is being taken, but this may not be the most flattering pose and again, it doesn't always work.

If you have trouble with red-eye, I suggest you cut a hole in the bottom of an aluminum baking cup and set it over the cube. This will bounce the light upward and break that direct line of sight of the flash and lens that causes the problem. No exposure compensation is necessary if your camera is equipped with an electronic shutter like that in the Kodak Pocket Instamatic camera, but with other pocket cameras, you should open the lens up about 1 1/2-2 stops. In either case, this technique will absolutely eliminate the annoying red-eye syndrome and in many cases, the bounce light from the flashcube will improve your color pictures.

One last point—should you process your own color? Although it's almost as easy to do as processing black-and-white film, my answer would be no, unless you're very determined and dedicated. Of the limited number of color emulsions packaged for pocket camera use, only a very few can be handled in the home darkroom and there's no good reason to restrict yourself to those alone. Match the film to the occasion and let someone else worry about turning the tiny films into beautiful pictures. 

terial that would otherwise prove distracting. Another is to control the background, especially in informal portraits and pictures of small objects, where competition for the attention of the eye is annoying. This can be done by using a sheet of cardboard to create a plain background, or by using a camera angle or position that lets you achieve the same result. A third way is to work with a large lens opening. This will throw the background out of focus but works satisfactorily only if your lens can be focused. The depth of field of a fixed-focus pocket camera lens is far too great for effective use of this last technique.

Another problem not noted in black-and-white photography is the tendency of one color to be reflected onto another. Dress your best girl in white clothes, place her close to dense green foliage and the clothes will pick up a greenish tint. Again, your eye won't notice this effect because it has become accustomed to compensating for such tinting action. But the camera does not have a brain to do this for it and so you have to learn to anticipate such effects—position your subject or choose a camera angle that will avoid picking up such color reflections.

For the majority of color pictures you'll take, hazy sunlight is ideal. It's bright enough for short exposures and diffused enough to cast soft shadows. If you confine your picture taking activity to that period between two hours after sunrise and two hours before sunset, you'll get a "normal" color balance. Pictures taken before or after this time will have a warm tint and while the color rendering may not be "true," it will often be striking. Rules are made to be broken, so if you're looking for unusual effects, try breaking this one.

When working with flash and color indoors, pocket camera users find that their pictures of people suffer from a distressing syndrome we call "red-eye." That cute little blonde you want to impress had bright blue eyes when you snapped the shutter, but in the color picture that came back from the processor, they've turned bright red. You won't get to first base once she sees what you did to her.

Red-eye usually occurs when the light source and the camera lens are in the same plane; the flash of light penetrates the pupil of her eye, bounces around through the red blood vessels in the retina and reflects back to the film carrying the red coloration. You can try that ex-

It All Started with Steinheil

commercial labs, most of which capably botched the results of careful composition and exposure on the part of the camera user by returning scratched negatives and fuzzy prints in exchange for an exorbitant price. While nearly all camera manufacturers had authorized processing stations to which film could be sent, these seemed to be as bad as and more expensive than the independent labs. Incidentally, some processing labs are still living back in the fifties where this type of work is concerned.

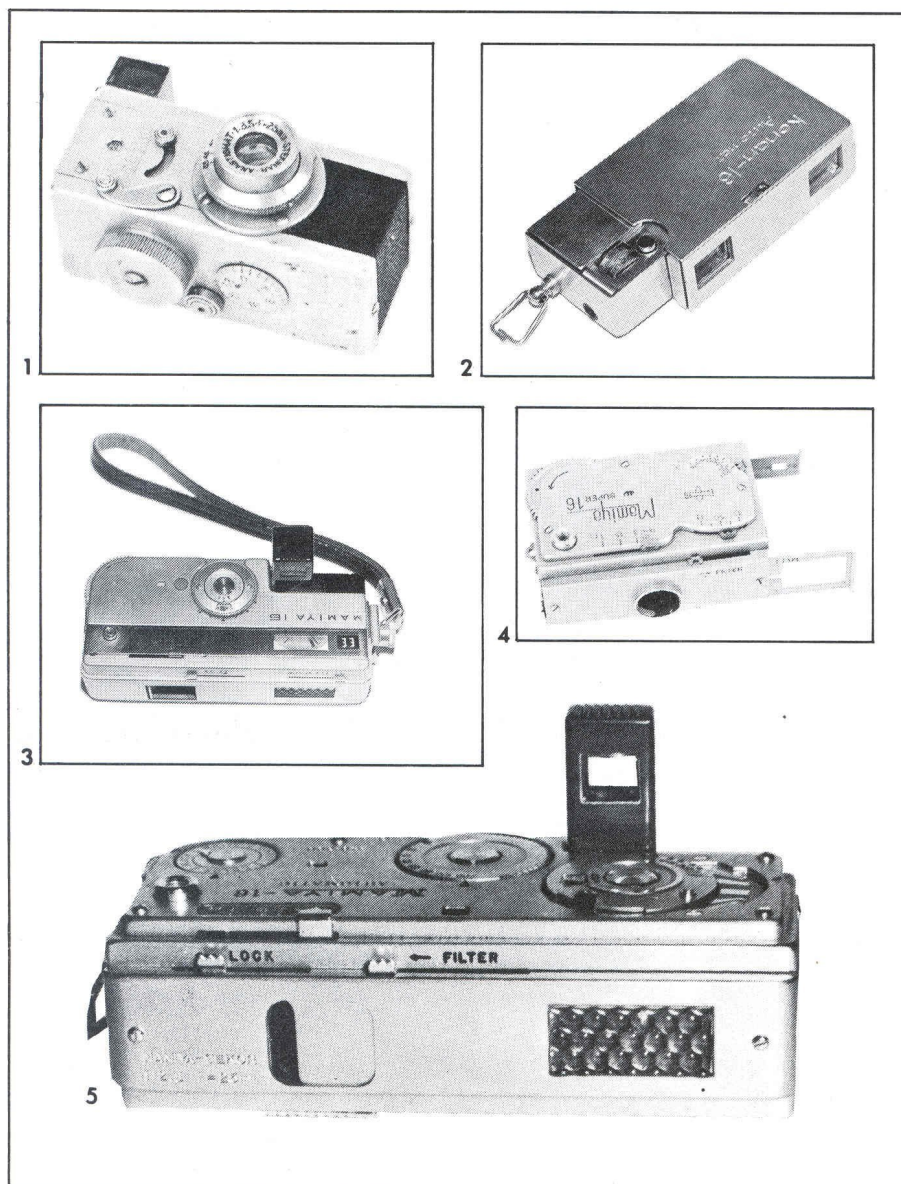
Several color emulsions were loaded for pocket camera use at the time, but only the old Kodachrome was really suitable. The lack of fine grain in other color films of that era contributed to a seemingly unsharp image when blown up. Processors customarily returned the tiny transparencies either in strips or in 2x2-inch paper mounts for use in standard 35mm

projectors. The strips were quite unsuitable for anything but hand viewing, unless the customer wanted to mount his own, which was both costly and time-consuming. When the 2x2-inch mounts with their tiny 8x11 or 12x17mm transparencies were projected in a 35mm machine, the results were immensely disappointing, as the four- to five-inch focal length lenses common to 35mm projectors produced a very small screen image. To enjoy his slides, the pocket camera enthusiast really had to buy a projector especially designed for the small format, and at a time when the projector market was rapidly automating, manufacturers were content to offer pocket camera users only the old-style manual push-pull changer, turning off a lot of potential buyers at the counter.

So what's brought the pocket camera back to life in the seventies? The same advantages that have always appealed to a small group—portability and convenience. Of course, the lat-

est technical advances in new models, such as exposure automation, electronic shutters and the like cannot be overlooked, nor should a changing public preference away from color transparency to color negative film. But probably the largest factor of all is the simplest, and it may seem insignificant at first.

When Kodak went to its advertising agency to have them develop a marketing campaign for its new 16mm cameras, it expected a profound and new idea that would take weeks to develop in order to properly sell the line to the public. But the ad agency's suggestion was one of absolute simplicity—just call them Pocket Instamatics. Kodak accepted, but not without some hesitation—it all seemed too simple, too easy. Yet this one word fired public imagination as never before and you can rest assured that pocket camera photography is not only here to stay, it's the wave of the future.



1. The Steky 16 was a popular pocket camera from Japan and took excellent pictures with its 25mm f/3.5 Stekinar lens. A 40mm telephoto was available and had the camera been marketed properly, it might have sold better than it did. Like most pocket cameras of its era, the Steky was ahead of its time.

2. Here's the original Minolta 16 design (circa 1950), when it was still known as the Konan-16 Automat. Equipped with a 25mm f/3.5 Rokkor lens and a four-speed (1/25 to 1/200 and B) shutter, the design carried through to the Minolta 16 II, which was discontinued in 1971.

3. Mamiya left the pocket camera business with its match-needle 16 EE model, a logical design evolution from the Automatic 16. All Mamiya models are still available in plentiful supply as used cameras, and while the company is still in business, the prices asked for used Mamiyas make a new pocket camera a much better buy for all but the collector.

4. The Mamiya Super 16 gave you a focusing f/3.5 lens with five openings, a seven-speed shutter (1/2 to 1/200 and B), a built-in filter and flash sync, and a collapsible open frame viewfinder with parallax compensation, all for \$39.95 in 1958. A very functional design, the Super 16 was also sold by Sears, Roebuck as the Tower 16 at \$29.95.

5. With its f/2.8 lens, nine-speed shutter and built-in photoelectric light meter coupled to the lens, the Mamiya Automatic 16 was an advanced version of the super 16 and priced at \$69.95. The swing-up optical viewfinder pivoted into a recess in the camera body when not in use.

ture lacking in all other TLRs of the time, pocket size or larger. The six-element 25mm Goerz Heigor f/2 lens was geared to the viewfinder objective and could be focused as close as 12 inches. The Minicord III also used a synchronized metal focal-plane shutter with speeds of 1/10 to 1/400 second and Bulb. Placed beside the shutter release, its rapid advance trigger also permitted sequence photography at the rate of one picture per second. Although priced at a more reasonable \$139.50, the Minicord III was the heaviest of the pocket cameras, weighing 12 ounces.

While European manufacturers were content to produce superior quality, it remained for the Japanese to introduce partial standardization and bring the pocket camera genuine popularity for about a decade. First discovered during the Korean conflict, the Japanese Mamiya and Minolta 16 were well received in post exchanges. The Mamiya Super 16 was also distributed for a time by Sears, Roebuck as the Tower 16, and with its f/3.5 lens and 1/2 to 1/200 second shutter range, proved a popular, low-cost (\$39.95) pocket camera. This model was gradually phased out in favor of the Mamiya Automatic 16 (which appeared at about the same time as the Minox B) with its built-in coupled exposure meter and \$69.95 price tag. Mamiya obligingly provided empty film cassettes for bulk loading by those owners far-sighted enough

to spot the end of the boom.

With all the advanced features incorporated in these tiny quality cameras, and the numerous advantages that the pocket concept had in its favor, what happened? Well, the manufacturers were partially at fault for its eclipse. Although all used drop-in cartridge or cassette film loads, each company designed its own and selected its own negative format, which ranged from the 6x6mm Echo 8 to the 12x17mm GaMi and 14x21mm Tessina. While the Japanese manufacturers were unable to agree on a universal cartridge, they did settle on a 10x14mm negative size and this helped prolong the popularity of their cameras; but strangely enough, even though the GaMi is long gone, its 12x17mm format seems to have won out. Had one single cartridge been adopted by several manufacturers, the pocket camera boom might have lasted longer, but film for a particular camera was available only from dealers that handled it, and most corner drugstores refused to stock the multitude of brands and sizes. And it's exactly this problem that Kodak's 110 cartridge will soon solve, as more and more manufacturers move into the field of pocket camera production with new and different models.

Few camera enthusiasts were interested in doing their own darkroom work during the fifties and so processing and printing of the pocket camera negatives were left to the

6. Perhaps the most fascinating of the Japanese pocket cameras, the Camera "A" No. 1 was a product of Tokyo's Okada Optical Company. Designed around 1950, the camera used a cassette load of 8mm film and came in a lined presentation case complete with tripod adapter, glass filters, close-up lens (all shown) and numerous other assorted goodies. A similar design, the camera "B" used 16mm film. Neither made it into serious production.

7. Equipped with an f/3.5 lens and seven-speed shutter, the Mikroma II won a gold medal for design at the 1958 Brussels World's Fair and was also produced in a unique stereo mode.

8. The Rollei 16 came to market with its own accessory system. Three different versions were manufactured in the early sixties and Rollei still packages film for the cameras. You may even be able to find a brand new one in some camera stores.

9. A most unusual Japanese gun camera, the Doryu 2-16 was equipped with an f/2.5 17mm wide-angle focusing Dorymar lens. The 2-16 contained its own flash in the form of magnesium-loaded cartridges about .32 in size. The clip of flash bullets was inserted, and when the trigger was squeezed to take a picture, the firing pin struck the cartridge primer to produce a brilliant flash of light.

10. A Japanese camera circa 1947, the Dan 35 used roll film loads of paper-backed 35mm film. Equipped with a focusing 40mm f/4.5 anastigmat, it took terrible pictures.

