

PETERSEN'S Guide to

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# POCKET CAMERA PHOTOGRAPHY

By Kalton C. Lahue and the Editors of Photographic Magazine

## CURRENT CAMERAS

Full details on Kodak Pocket Instamatic, Minolta, Minox, Tessina and Yashica Atoron

## HOW THEY WORK

Shutters, lenses, focusing, exposure, film transport

## THE LITTLE FILMS

What's available / Getting the most from mini-negatives

## THE WHOLE STORY

History of pocket cameras / Creative photography with the small format / Avoiding the pitfalls / Techniques



Photographic  
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# POCKET CAMERA PHOTOGRAPHY



# Introduction

The world of subminiature cameras has always been presented as one of excitement and intrigue. Who among us has not been thrilled by scenes in spy movies, or adventuresome television fare, in which the hero, armed only with a subminiature camera, photographs secret documents by the light of a single glowing candle, and thus saves a nation? Yet, despite the spy status stigma accorded these compact marvels of optical and mechanical precision, despite the drawbacks which used to be associated with such small format cameras, the singular fact remains that subminiature photography has finally come of respected age.

Today, thanks largely to incredible advances in optical quality, and, more specifically, advances in film manufacturing techniques, these tiny, jewel-like cameras are now capable of an extraordinary range of performance.

Subminiature photography *is* different. Subminiature photography *is* challenging. Yet, despite the difference and the challenge, subminiature photography has advanced to a point where the convenience, compactness and performance must be investigated

and understood. And so, with this in mind, the editors of Petersen's *PhotoGraphic Magazine* decided to call upon an expert in the field, Kalton C. Lahue, to prepare this working manual of photography with subminiature cameras.

In the following chapters, you'll find page after page of useful, pertinent information. You will learn about the long history of subminiature cameras; you will read and learn about the different cameras and camera systems currently available. Also, a detailed description of current films, both color and black-and-white, is provided—plus invaluable instruction on bulk-loading empty cassettes to increase the cameras' versatility and save money. Speaking of films, there is also a section devoted to basic dark-room techniques, plus advice on how to obtain maximum quality when making big enlargements from the tiny negatives. In addition, there is information on the various types of flash photography, and all phases of photographic usage are covered in full.

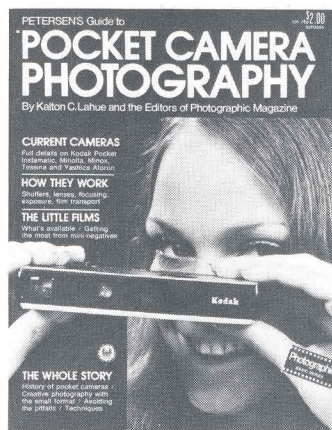
We feel this book is a significant attempt to bring the full advantages of the subminiature format to the attention of photographers.

Paul R. Farber / Editor  
*PhotoGraphic Magazine*

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## COVER

Jim Cornfield photographed model Mary Pat Bonney shooting with Kodak's Pocket Instamatic camera Model 50. The cover was designed by Robert I. Young.

## PETERSEN'S GUIDE TO POCKET CAMERA PHOTOGRAPHY

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# Wave of the Future

**H**ave you lost that sense of excitement with which you approach photography these days? Has the ol' SLR (single lens reflex) become just too much of a burden to carry around constantly? Ever wish you had room to take a camera with you on a business trip? Is your gadget bag so overburdened with accessories that while you're deciding on the right combination, you lose the picture opportunity? Do you look wistfully at your bulky, cumbersome box with a yen to return to those simpler days when you could sling a camera over your shoulder without an aching back at day's end? I could go on forever with such questions, but if I've struck any kind of responsive chord in your soul at this point, rejoice—and return with us right now to the good old days of photography—courtesy of the pocket camera!

When 35mm was a youngster some 40 years ago, photography in America as a hobby held forth a sense of real adventure—available light and candid photography were new forms of self-expression with a camera, and for almost a decade, the casual, informal picture held sway as photo-conscious Americans explored the world around them with delight and perception. But somewhere along the road to maturity, the magic faded and the so-called "miniature" 35mm cameras began to grow into today's oversized, automated beasts of burden. Now, there's no doubt that the current crop of cameras is probably the best we've ever enjoyed, but much of the spontaneity of the hobby has disappeared for all but those casual snapshotters carrying around today's equivalent of yesterday's Brownie—the easy-loading cartridge camera.

But thanks to significant advances in lens and shutter design, film coating technology and the art of miniaturization in the last few years, the pendulum is now swinging in the other direction. While tiny cameras have been with us almost from the beginning of photography, as we'll see, the combination of factors needed to make a small camera truly popular was lacking until now. In the past, we've commonly referred to these cameras as "subminiatures" or "ultraminatures," but Kodak's recent introduction of a series of small cameras called Pocket Instamatics gave

rise to the concept of a "pocket camera," a term that has captured the imagination of the camera-conscious American public with astounding success. There's little doubt that the pocket camera is where it's happening today for all but the die-hard amateur, but even he will be affected by this revolution in camera design before it's over.

Photography with the pocket cam-

era is basically the same as with any other camera, but because of the very small negative and camera, there are special problems in pocket camera photography that you'll not encounter with larger formats. For those who have used a tiny camera before, this will come as no great revelation, but as millions of Americans will soon receive their initiation to photography via a pocket camera,





this book has been created to help all get the most from their hobby.

For those of you still wondering if you should take the plunge, there's a complete section on all cameras fitting the pocket camera definition to help you decide exactly which one is your cup of tea. I've created a basic primer on holding and using the various pocket cameras, as well as pointing out pitfalls peculiar to the format that can be avoided to give you better results. A section on improving your photo technique with the small cameras will let you take fuller advantage of their complete portability. And for the do-it-yourself fan, I've delved into basic pocket camera darkroom

and film reloading techniques. There's even a touch of nostalgia provided for those who might wonder where it all began.

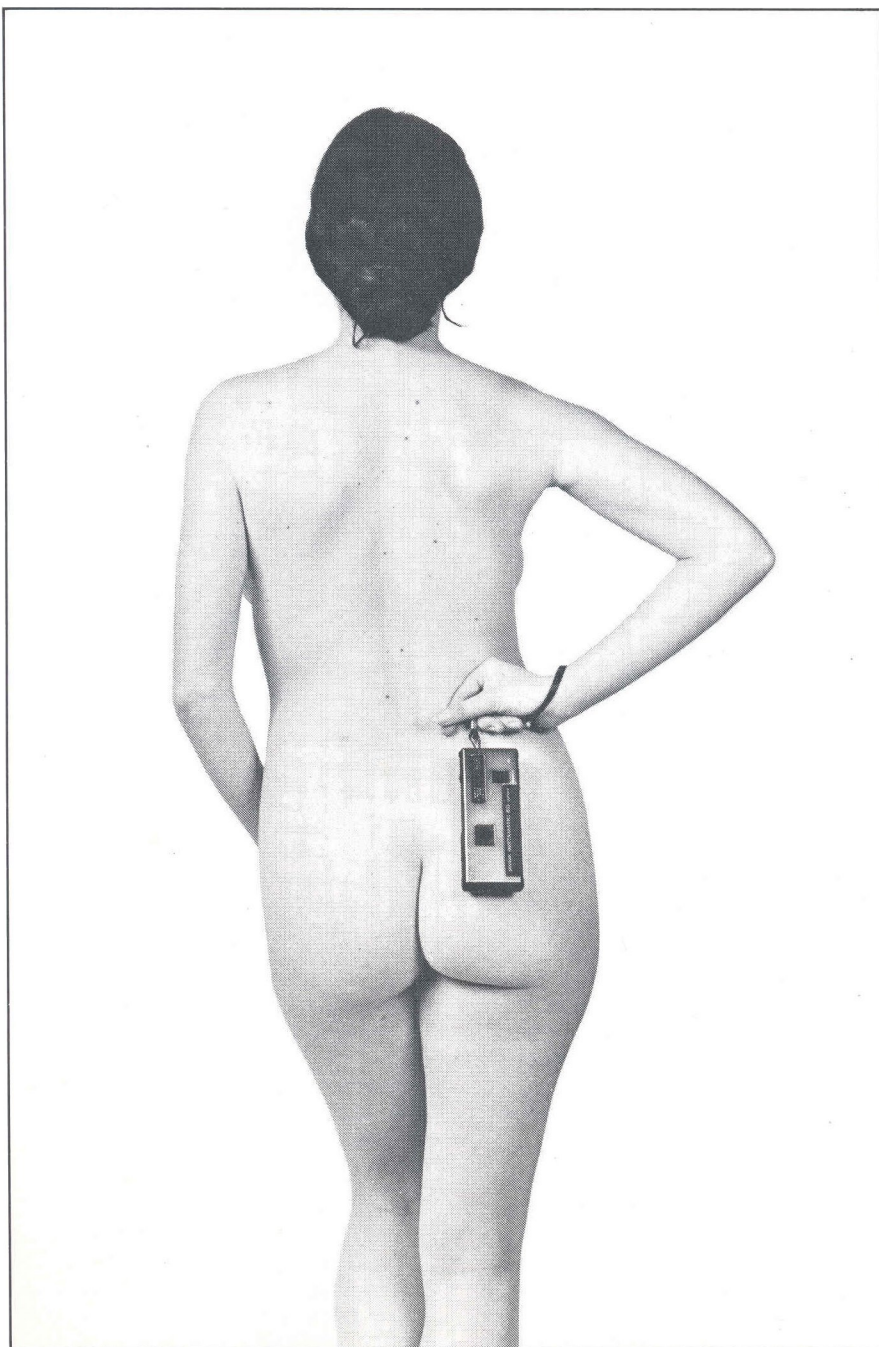
All of the pocket cameras presently available are quality photographic instruments capable of providing you with any size picture you could reasonably want, from the standard album-size to 5x7-inch or even 8x10-inch enlargements. And when you show friends the camera you used, they won't believe it. While the size of the finished print will depend upon what you want to do with it, the quality of your pictures can be improved by understanding and practicing those techniques that let you use a

pocket camera's unique capabilities to the fullest. The following pages are aimed at helping you achieve professional results, regardless of which pocket camera you call your own.

We at *PhotoGraphic Magazine* firmly believe that pocket camera photography is the wave of the future, so everything you might want to know about buying, using and enjoying a pocket camera is here, along with a guarantee that once you've given the pocket camera concept a try, you'll agree that it goes a long way toward restoring that sense of immediacy and excitement that first brought you to photography as a hobby. And if you're a newcomer to the game and a pocket camera is your first experience, welcome aboard!



***The photos show the obvious advantages of portability and convenience to pocket camera users. Ready to use at a moment's notice, no special paraphernalia is required for instant picture-taking under a great variety of conditions and almost any circumstances.***





# Choosing Your Pocket Camera



**T**he question asked most frequently of any photographic author or magazine editor seems to be, "Which camera is the best?" My answer to this elementary plea for help is invariably, "What do you plan to use it for?" And without exception, the conversation dies when my friend emerges from deep thought with the reply, "To take good pictures." So if you're considering the purchase of a pocket camera and are slightly at sea as to which one is for you, try on the following selection process for size.

Start off by listing the range of pictures you intend to take—snapshots around the house and occasional flash pictures of the family? For this type of work, you can probably get by with a less expensive camera like a Kodak Pocket Instamatic 20 cam-

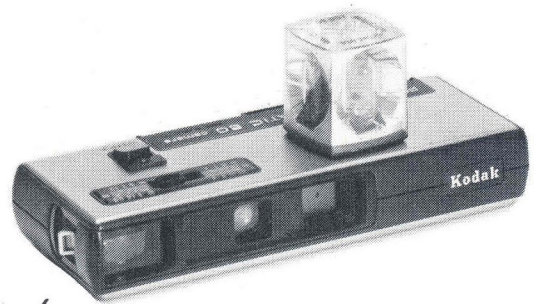
era, a GAF 220 or Minolta 16 Ps. But perhaps you'll want to work under a wide range of lighting conditions with and without flash, in black-and-white or color. If so, consider a Tessina or Minolta 16 II. And if you want to remove all of the headaches of taking correctly exposed pictures from your new venture in photography, there's the fully automatic Pocket Instamatic camera in four models, the Minox C, Minolta's 16 MG-S and the Yashica Atoron Electro.

Will a pocket camera be your only one, or are you buying it as a second camera to take along when you don't want to be burdened with the larger one? Will you expect it to function in specialized areas like copy work? If so, you will require one of the highly precise, expensive pocket cameras

like the Minox BL that gives you wide manual control over exposure. Or if you're fascinated with the "spy camera" potential of a pocket camera, you'll want one like the Tessina that lets you take pictures easily without attracting attention. In any case, be sure to give a great deal of scrutiny to any specialized demands that you expect to place on a pocket camera; you may find it more practical to use a larger camera for such work, restricting your use of the pocket camera to a more general nature.

Will album-sized (3 1/2 x 4 1/2 inches) prints satisfy your needs or are you anticipating salon-quality pictures? For large, sharp blow-ups, you'll need the finest focusing lens system available, or at least the largest negative size. You'll also need to





**1. Weigh the relative merits of each pocket camera against the kind of pictures you intend to use it for before settling on a particular one.**

**2. Typical of the inexpensive pocket cameras, the instant-load GAF 220 will take excellent pictures if used within its limitations.**

**3. Keep the pocket camera handy for off-the-cuff photos like this one of two Halloween visitors who arrived at the door a day early.**

**4. With its clockwork precision, wide range of accessories and use of standard 35mm film in special cartridges, the Tessina's versatility appeals to the serious pocket camera enthusiast.**

**5. Carrying a pocket camera with you at all times means you're always ready for the unexpected. There's both drama and humor in this futile attempt to extinguish a blazing car fire.**

**6. The Kodak Pocket Instamatic 50 camera combines all the traditional pocket camera features with an electronic shutter for correct exposures under any conditions. Leaving exposure determination to the camera lets you concentrate on the picture content.**

**7. Fast lens and film let the pocket camera enthusiast record almost anything of interest. The bemused onlookers at this auto show were caught with Minolta 16 MG-S and a hand-held exposure of 1/30 at f/2.8 on ASA 320 film.**

consider the types and speed of films available for the particular camera you have in mind; an f/2.7 focusing lens will do you little good in available light situations if no fast film is packaged for the camera.

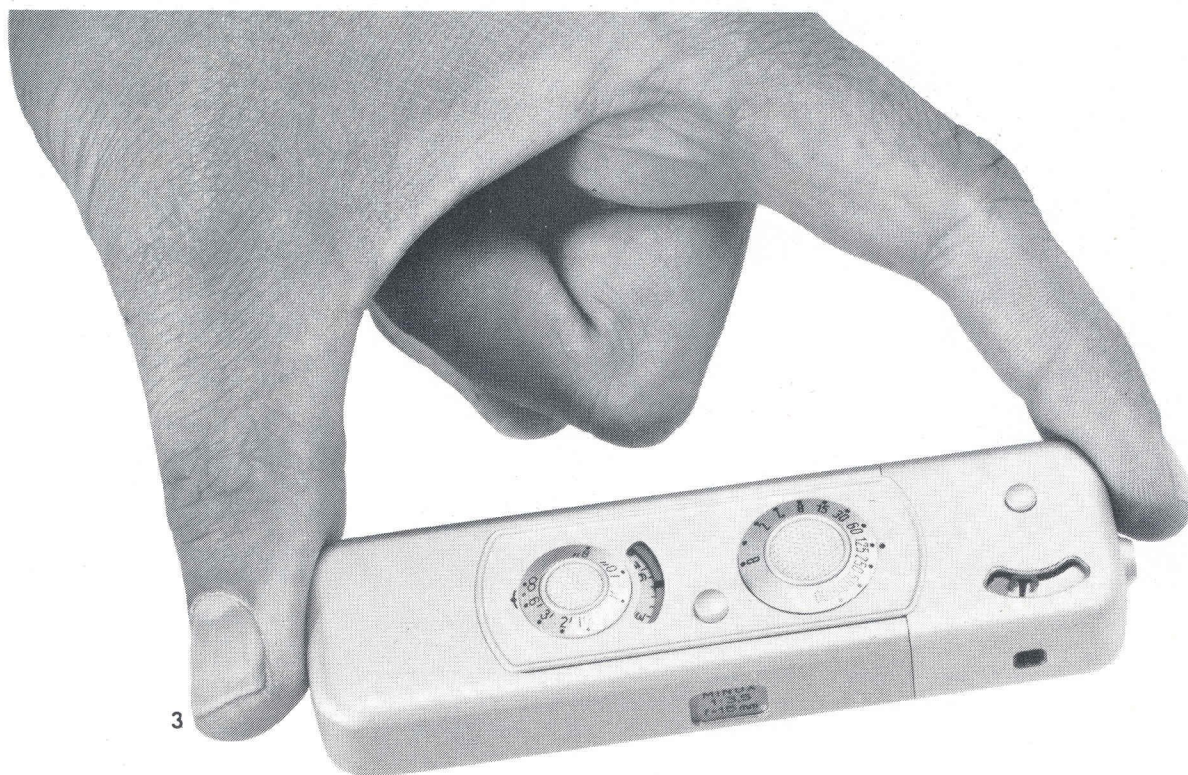
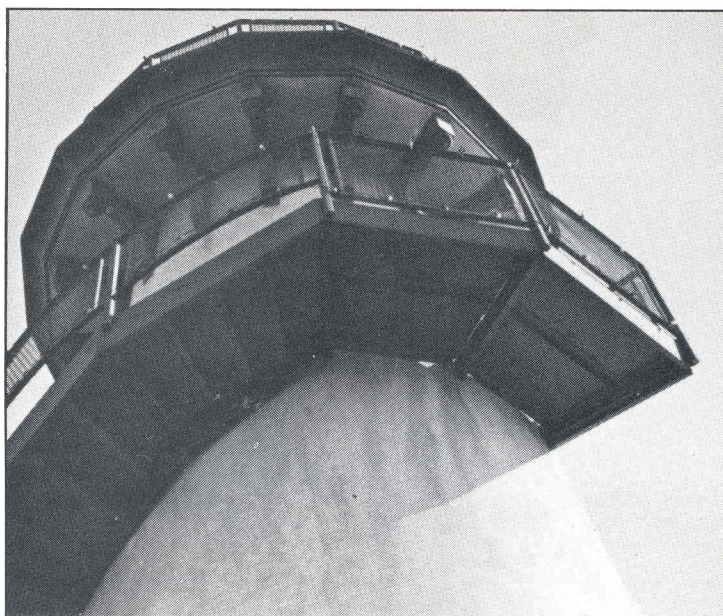
How portable is portable? As the pocket cameras range in size and weight from the slender 5/8x1 1/8x3 15/16-inch, three-ounce Minox BL to the 2 9/32x1x5 25/32-inch, nine-ounce Pocket Instamatic 60 camera, this may be a deciding factor. Do you really want to carry the camera in a pocket, or would a protective case that snaps onto your belt be more convenient? It may be a pocket camera, but what about the film cartridges? Are they equally portable or will you find yourself carrying a camera in your pocket and a bag of extra

film over your shoulder? Do you mind dragging flashcubes along in addition to extra film, or would you prefer to work with electronic flash or even available light? This single question alone can prove a major stumbling block in pocket camera selection. Think it over carefully, because unlike larger format camera systems for which you can buy many accessories provided by independent manufacturers, you'll be completely locked into the accessory system provided by the pocket camera manufacturer.

And what does your pocketbook say about sharing its position in life (and your pocket) with a camera—how much can you afford? Investigate the accessory systems (flash, filters, close-up attachments, copying stands, etc.) available for the pocket

cameras under consideration, adding their total cost to the basic camera. Although this is not exactly a fair factor to use in determining which pocket camera to buy (the Minox line with its comparatively wide range of accessories comes out a poor second by this criterion to the Kodak Pocket Instamatic cameras, for which only three accessories are available), it does give you a good idea not only of the camera's versatility but of how much money you can ultimately ex-





## Choosing Your Camera

pect to invest should you decide to go the entire route over a period of time. In a comparison of this nature, remember that many accessories can often be purchased secondhand in good condition for a lesser price.

And this brings up a tender point—what about a used pocket camera? There's nothing wrong with buying a previously owned camera if it's been well treated by its former owner(s).

But if you are thinking about acquiring a more versatile camera than you could otherwise afford at present over-the-counter prices, stick with current models, or previous models from manufacturers like Minox that have a lengthy track record and are not likely to fold up shop overnight, leaving you with a camera for which film and repairs are no longer obtainable. Sadly, there are many such used pocket cameras available in good condition but for which film and accessories are no longer provided.

**1. If specialized photographic interests like copying fascinate you, consider a pocket camera system with a full range of accessories like that of the Minox.**

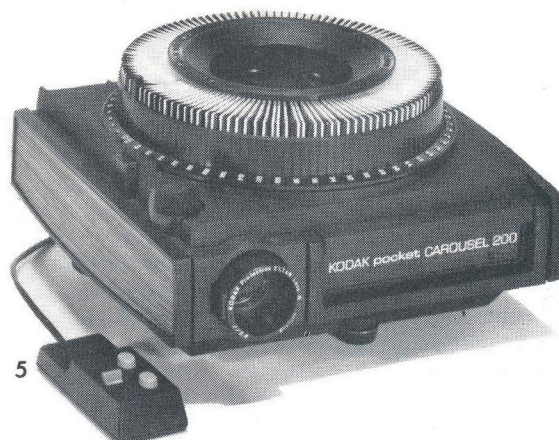
**2. Pictorial, abstract or candid photos—all fall within the province of the pocket camera. This lighthouse was photographed with a Minolta 16 QT and yellow filter on ASA 100 film. Exposure was 1/250 at f/5.6.**

**3. The "spy camera" potential of pocket cameras is best realized with one like the new Minox BL. It's one-third the size of a pack of filter cigarettes and weighs only 2 ¾ ounces.**

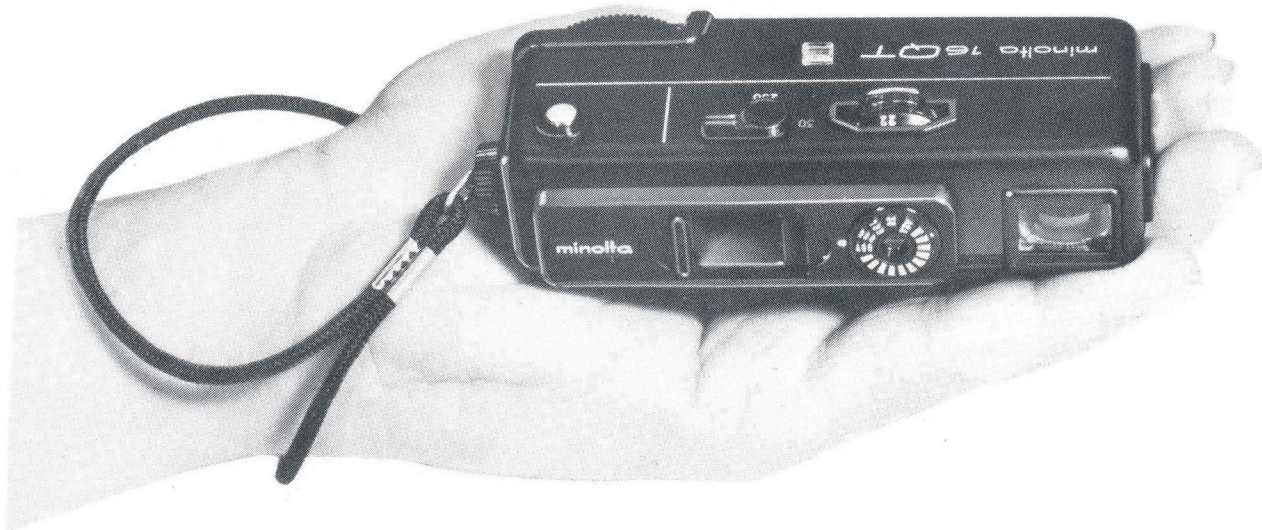




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If you do seriously consider a used pocket camera, it's a wise idea to return it to the manufacturer for a complete check-up and, if necessary, reconditioning—and be sure to count this cost as part of your purchase price. If the manufacturer is no longer in business, avoid the camera; this is especially true in the case of pocket cameras made abroad and imported into this country. The importer may still be around but no longer interested in dealing with a product he has stopped distributing.

A second aspect of cost to consider is whether or not you can afford to use the camera once you've bought it. You'll find that generally speaking, film and processing charges exceed what you're accustomed to paying for 126 or 35mm. And if you're a color slide bug, you'll either need an adapter for your present projector (if such is made) or a new one; this can add another \$25 to \$200 to your costs.

At the same time you're considering all these factors, don't overlook specific camera features in terms of construction and durability (some are mostly metal; others mainly plastic), ease of operation, general feel and

handling and legibility of dials, scales and markings. I'll tell you what to look for in the next section. All this has a distinct bearing on just how pleased you'll be once you've lived with the pocket camera as a constant companion for awhile. For example, if the shutter button proves awkward for you to release smoothly, or if you find the camera difficult to hold without covering the lens or electric eye with your finger, think twice about it before parting with the cash.

After narrowing the field to two or three cameras that seem suitable, the best bet is to find a few friends who'll let you use theirs for several days. Such a field test should be the clincher, but if it isn't possible, visit a reputable camera dealer in person and ask to look at and compare those in which you're interested. Don't waste the salesman's time but do handle each one sufficiently to get a basic idea of its characteristics. Above all, don't buy a pocket camera by mail order unless you're absolutely convinced that it's exactly what you want; returning your purchase for a refund if you don't like it might prove to be a greater hassle than it's worth.

The best advice I can give you at this point is to keep on reading. The recommendations and evaluations you'll find further on are based entirely on months and years (depending upon the camera's availability) of active use, and while I don't presume that all of my impressions are going to be the same as yours, they do represent a collective and, I hope, reasonably objective approach to the growing array of pocket cameras available today. Somewhere among the selection, you'll find that special one you're looking for. 

**4. You'll find a pocket camera belt case to be much more functional than actually trying to carry the camera in a pocket.**

**5. If you're a color slide fan, plan on buying a projector especially designed for pocket camera slides like this Pocket Carousel 200. Its cost should be considered when determining how much you can afford to spend.**

**6. While this Minolta 16 QT will meet with approval from many pocket camera users, some will find it awkward to use; thus the general feel and handling of any pocket camera is an important consideration before actually buying.**



# What Makes It Tick?

**T**he majority of pocket cameras currently available are excellent precision photographic instruments incorporating the latest advances in photo technology. As all will produce fine results within the limitations of their design and intelligent use by their owners, let us examine the various approaches selected by their manufacturers with an eye toward making you aware of what's available and what to look for.

## FILM SIZE AND TRANSPORT

While most pocket cameras take 12x17mm negatives on single-perforated 16mm movie film, there are a few exceptions. The Kodak Pocket Instamatic cameras produce 13x17mm negatives on specially perforated, prefogged 16mm film stock; the Minox and Atoron models provide an 8x11mm negative on imperforate 9.5mm film, while the Minolta 16 II and 16 Ps give a 10x14mm negative on the same Minolta 16mm film load that fits other models of the line. The Tessina uses a special load of 35mm film to give a 14x21mm negative, the largest of all. With the high degree of optical and mechanical precision of today's pocket cameras, negative size is not really a critical determining factor in camera selection unless you plan on doing your own processing and printing. The 8x11mm Minox negative, however, will present a greater problem in the darkroom for the average enthusiast than will the 14x21mm negative of the Tessina.

Unfortunately, there is little standardization in pocket camera film loads, although the situation today has improved from what it has been in the past. In fact, the Atoron and Minox cameras can use the same film load. But with the entry of Kodak into the pocket camera field, we can expect that future designs will incorporate the 110 film cartridge, eventually eliminating the variety of cassettes, magazines and cartridges used today. As things stand presently, it's more difficult to obtain film for your pocket camera than for a 35mm camera, but Kodak's wide distribution of the 110 film cartridge for its Pocket Instamatic cameras makes this size easy to find at any corner drugstore or supermarket. Except in the case of Pocket Instamatic cameras and the Minox series (whose cartridges cannot be reloaded), you can even buy bulk film and reload your own film cartridges.

Film is transported, or advanced, in all current pocket cameras (except the Minox) by pushing or pulling a film advance slide/tab or turning a knurled wheel. The Minox is unique in that to use it, you must first pull the camera open and this telescopic movement advances the film to the next exposure.

## EXPOSURE CONTROL

When you receive your pictures back from the processor, their quality

will depend upon how much light was allowed to strike each frame of film that you exposed. There are four factors to consider here—the size of the lens opening (f/stop), the length of time the shutter remains open (shutter speed), brightness of the subject (how much light it reflects) and film speed (its sensitivity to light). With many cameras regardless of size, you must first determine the amount of light present, and how much of it your film requires, before you can se-



<div>8mm 11mm</div> <div>Minox Atoron</div>	<div>10mm 14mm</div> <div>Minolta 16MG 16II 16 Ps</div>	<div>12mm 17mm</div> <div>Kodak Pocket Instamatic Minolta 16 MG-S 16 QT</div>	<div>21mm 14mm</div> <div>Tessina</div>
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Pocket Camera Negative Comparison Chart



lect a combination of the other two factors that will give you a correctly exposed picture. This is done either by estimation or with a light meter made especially for the purpose.

Most pocket cameras contain a built-in light meter coupled to the lens or shutter, or to both. The semiautomatic Minox BL, Yashica Atoron and Minolta 16 MG-S use a meter coupled to a mechanical shutter, while the Minox C, Atoron Electro and Kodak Pocket Instamatic cameras models, 30, 40, 50, and 60 couple the meter to an electronic shutter. With the Minolta 16 MG-S, you first set the camera's meter to correspond with the film speed, then select the desired shutter speed to automatically give you the correct lens opening for proper exposure. With the Atoron, the

camera selects the proper combination of lens opening, and shutter speed for the subject when you align a needle on the camera's top housing. As the Minox BL uses a single lens opening of f/3.5 at all times, you simply set the film speed and then press the meter button, release and turn the shutter-speed dial until an indicator lines up with the meter needle.

With the fully automatic pocket cameras like the Atoron Electro, Kodak Pocket Instamatic cameras or Minox C, you need only to point the camera and trip the shutter. The meter's electric eye reads the light reflected from your subject and varies the shutter speed and/or lens opening to achieve a correct exposure. Again, the Minox C uses a fixed lens opening, so the only variable is the

shutter speed. While these cameras lack the creative control that the user can exercise by setting his own lens/shutter combination (the Minox C does have a manual override), they do offer accurate point-and-shoot photography as an alternative. With less sophisticated pocket cameras like the Minolta 16 Ps and 16 II that lack a built-in meter, you either guess at the correct combination or use a separate light meter.

## POCKET CAMERA LENSES

Try holding a magnifying glass to a window in a dimly lighted room. Now move a piece of tissue paper back and forth between the glass and your eye. At some point, you'll find a place where a fairly sharp image of the landscape beyond the window is pro-



2



3

### MINOLTA 16MM FILM

For Minolta 16MM Cameras Producing 18 or 20 Exp.

**IMPORTANT:** Load and Unload Film in subdued light

#### DAYLIGHT PICTURES

Exposures for Cameras not using a built-in meter.

#### SHUTTER SPEED:

1/125 Sec. unless otherwise noted.

FILM	Bright Sun**	Hazy Sun	Cloudy Bright	Cloudy Dull*
ASA 100 B&W Dark Blue Tape General Film	F/16	F/11	F/8	F/5.6
ASA 320 B&W Light Blue Tape Low Light Film	F/16	F/16	F/11	F/8
ASA 50 Color Slide Red Tape Outdoor-General	F/11	F/8	F/5.6	F/4
ASA 160 Color Slide Orange Tape Low Light Film (1/250 sec)	between F/16- F/11	between F/16- F/11	between F/11- F/8	between F/8- F/5.6
ASA 80*** Color Print Green Tape General Film	F/16	F/11	F/8	F/5.6

\*Also for subjects in open shade.

\*\*Close down one stop for scenes of sand or snow.

\*\*\*Do not expose at less than 1/30 Sec.

Use BLUE flashbulbs or electronic flash. On those cameras with marked speeds, set the shutter to 1/30 Sec.—Other cameras are set on F.

4

1. If you wear eyeglasses, make sure that you can see entire viewfinder area with your glasses on before you buy a particular pocket camera.

2. Since most separate photoelectric light meters (left) are as large as average pocket camera, if exposure automation is a feature that concerns you, consider a pocket camera with built-in meter, like Minolta 16 MG-S (right).

3. The four types of pocket camera cartridges in use today (from left): Kodak 110, Tessina, Minolta, Minox/Atoron.

4. Minolta furnishes exposure table like this with each cartridge of film, for cameras not using built-in meter.



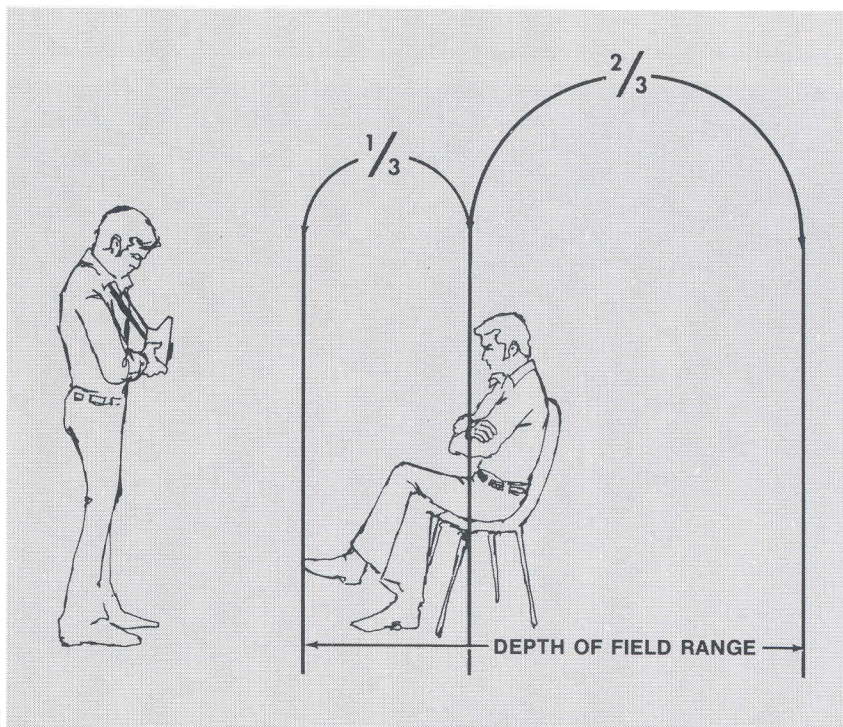
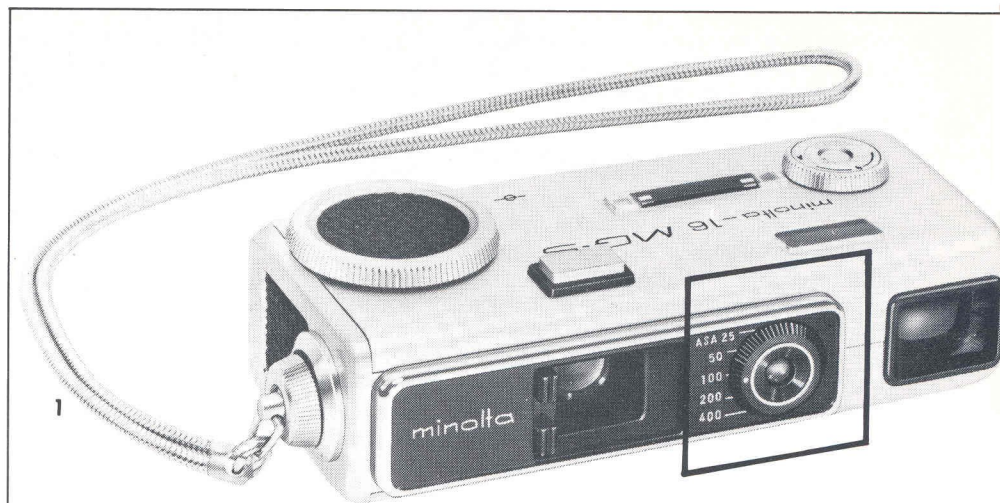
## What Makes It Tick?

jected upside-down on the paper. If you were to place a piece of film in the same position as the tissue paper and then enclose both film and magnifying glass in a light-tight box, you would find that you have a crude but working camera.

When the lens is focused at a point of infinity (a theoretical distance that is for all practical purposes beyond 100 feet), the lens-to-film-image distance is called its focal length and is measured in inches or millimeters; the shorter the focal length, the smaller the image. This is why the pocket camera can reproduce exactly the same scene as a larger camera (when both are placed at the same distance from the subject) despite its much smaller size. Pocket camera focal lengths range from the 15mm Minox Complan to the Pocket Instamatic camera 50-60's 26mm Ektar. But as the lens fitted to any pocket camera is about equal in focal length to the diagonal of its negative, which is the usual measurement for a so-called "normal" lens, the pocket camera will give you virtually the same picture area as a 35mm camera when equipped with its "normal" 50-52mm lens.

While you could take pictures with our magnifying glass camera, they wouldn't be very good ones. A simple lens system such as this has many inherent imperfections and that's the reason why pictures made with many inexpensive cameras are often sharper in the center than at the edges. So optical designers have to take these imperfections into account and find ways to overcome them. This is usually done by combining several different lenses into one—a multielement lens—in which the different single lenses are used to cancel out each other's defects. The resulting objective or lens system is then said to be "corrected." The better your lens is designed, the more light that passes through it to the film, the sharper your pictures and the more expensive the lens is to produce.

Most pocket camera lenses use a three-element design with a speed of  $f/3.5$ . Some of the faster lenses like the  $f/2.8$  Minolta Rokkor, the  $f/2.7$  Kodak Ektar and even the  $f/3.5$  Minox Complan contain four elements and are capable of excellent optical performance. While the number of elements is not necessarily a true guide to lens quality, in the case of current pocket camera lenses the best do have four elements. None of the pocket cameras presently available have lens interchangeability.



Some pocket cameras have a movable distance scale used to focus the lens. When you adjust this scale to a particular setting, everything at that point will be sharp in the finished picture. Objects in front of and behind that point will appear in varying degrees of unsharpness. But within a certain range in front of and behind the focused distance, the degree of sharpness diminishes so slightly that under normal viewing conditions the human eye cannot detect it; we accept this entire range as being sharp, calling it the lens's depth of field.

The shorter the focal length, the greater the depth of field or range of apparent sharpness in front of and behind the subject at any given distance. This explains the reason for limited or no focus requirements with many of the pocket cameras. The

closer the subject on which you focus, the shallower the range of apparent sharpness; the farther away the subject is, the deeper this range. Depth of field is also dependent upon the size of the camera's lens opening. The larger the opening, the more light it will admit but the shallower the range of apparent sharpness; the smaller the opening, the less light it will admit and the deeper this range. Thus, you'll have to focus more accurately when opening the lens to  $f/2.7$  than when it's closed down to  $f/16$ .

As depth of field does increase with shorter focal lengths, it stands to reason that if the negative size is the same, a 22mm lens will give a greater range of apparent sharpness than that provided by a 26mm lens. But for all practical purposes, you won't be able to tell the difference between



## DEPTH OF FIELD FOR 25MM LENSES

DIST.	LENS OPENING					
	f/2.8	f/3.5	f/5.6	f/8	f/11	f/16
INF.	30'-Inf.	24'-Inf.	15'-Inf.	10½'-Inf.	7½'-Inf.	5¼'-Inf.
50'	18'-Inf.	16'-Inf.	11½'-Inf.	8½'-Inf.	6½'-Inf.	4¾'-Inf.
25'	14'-Inf.	12'-Inf.	9½'-Inf.	7½'-Inf.	6'-Inf.	4⅓'-Inf.
15'	10'-30'	9'-40'	7½'-Inf.	6'-Inf.	5'-Inf.	4'-Inf.
10'	7½'-15'	7'-17'	6'-30'	5'-Inf.	4½'-Inf.	3½'-Inf.
8'	6½'-11'	6'-12'	5'-17'	4½'-33½'	4'-Inf.	3⅓'-Inf.
6'	5'-7½'	4¾'-8'	4'-10'	4'-14'	3⅓'-28½'	2¾'-Inf.
4'	3½'-4½'	3½'-4¾'	3⅓'-5½'	3'-6½'	2½'-8½'	2¼'-17'
3'	2¾'-3¼'	2¾'-3⅓'	2½'-3¾'	2⅓'-4⅓'	2⅓'-5'	2'-7'

Shaded line indicates approximate depth of field for fixed focus lenses.

1. Pocket cameras with built-in meters have ASA index selection dial that must be set according to film in use to key the meter correctly.

2. Depth of field is that distance in front of and behind subject focused upon that appears sharp to the eye in the finished picture.

3. Depth of field for various lens openings and distances can be determined by using this chart. Approximate depth of field for fixed-focus cameras is indicated by shaded line.

4. The Tessina focusing wheel has a built-in depth-of-field scale. With camera set on 8 feet, everything from 3 feet to infinity is in focus at f/11. At f/4 and the same focus setting, depth of field is limited to that range between 4 and 10 feet.



the two, especially if both are fixed focus. With focusing lenses, you'll have to learn to estimate distances accurately; the Kodak Pocket Instamatic camera Model 60 solves the problem of sharp focusing with its combined coupled rangefinder/viewfinder that allows you to focus on the subject as you compose the picture.

### POCKET CAMERA SHUTTERS

While a shutter-speed range of 1/30 to 1/200 second is quite adequate for most situations, the really serious pocket camera bug will appreciate a greater range of speeds, such as that provided by the Minox C (7 seconds—1/1000 second), the Atoron Electro (8 seconds—1/350 second) or Kodak Pocket Instamatic camera models 50 and 60 (5 seconds—1/250 second).

Although all pocket cameras are synchronized for flash, each is designed to use an accessory flash unit made only by the camera's manufacturer, except for the Kodak Pocket Instamatic camera series, which has a Magicube socket built-in. Some, like the Minolta, offer the flash unit in two versions to accept either AG-1 flash bulbs or cubes, but Minox also makes an electronic flash available. If the use of electronic flash interests you, check the type of flash contact used on the camera under consideration. It may be possible to fit one anyway as several cameras use a standard PC flash connector.

You'll find a great deal of difference in the amount of noise in shutter operation. The Minox and Minolta shutters are barely audible but the Kodak Pocket Instamatic camera's is



## What Makes It Tick?

loud enough to startle your subject if he isn't aware that you're taking his picture. If candid photos are your primary interest, this is a definite point to consider carefully; if you can hear the shutter trip in an average room situation, so can he.

The shutter should also operate with a minimum of vibration; the pocket camera's small size and light weight make it difficult to hold steady without the shutter adding to your problem. There's also a wide difference in shutter button operation between pocket cameras, from the smooth Minox and hair-trigger Minolta MG-S to the quite stiff Pocket Instamatic camera model 60. Generally speaking, the softer the button's action, the easier it will be to take pictures without moving the camera.

### VIEWFINDERS

Practically every current pocket camera model uses a simple optical viewfinder equipped with a luminous or bright frame to indicate the limit of the picture area as seen by the lens. Several finders also include parallax correction marks to guide the user in composing close-up pictures. Because of the difference in position of the finder and lens, the picture as seen in the finder is not exactly the same as that taken by the lens. At distances beyond 3 1/2 feet parallax is of no great concern, but for head-and-shoulder or closer shots, correcting for parallax can mean the difference between a well-composed picture or one with the top of the subject's head cut off. As the tiny pocket camera negative has to be enlarged five or six times just to produce an album-size photo, it's important to carefully arrange the picture elements to appear just as you want them in the final print. The bright frame finder and parallax correction marks are both useful and highly desirable features in helping you compose your pictures correctly.

For candid photography, some pocket cameras like the Minox, Minolta and Atoron series can be fitted with an accessory right angle finder; the Minox even has a clip-on waist-level reflex finder, adding greatly to the camera's versatility in this area. The use of either allows you to point the camera away from the subject while taking his picture.

### SPECIAL FEATURES

If the pocket camera that interests you has shutter speeds slower than 1/30 second, does it also have provision for use on a tripod? Does it have a cable release socket? These are both important if you're going to

make use of the camera's potential, as hand-held pictures below this shutter speed are impractical—you can't hold the camera steady enough to get a sharp image.

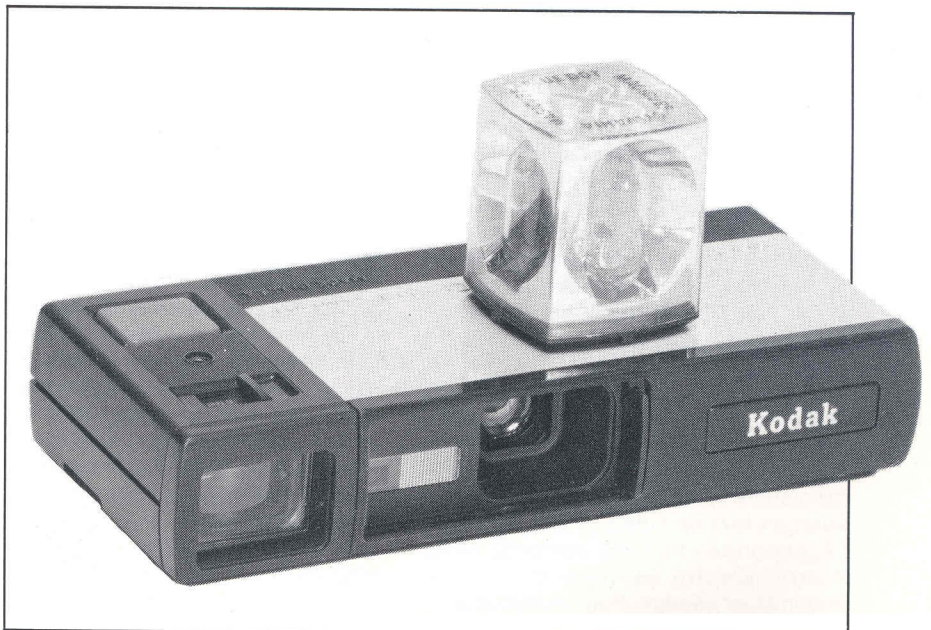
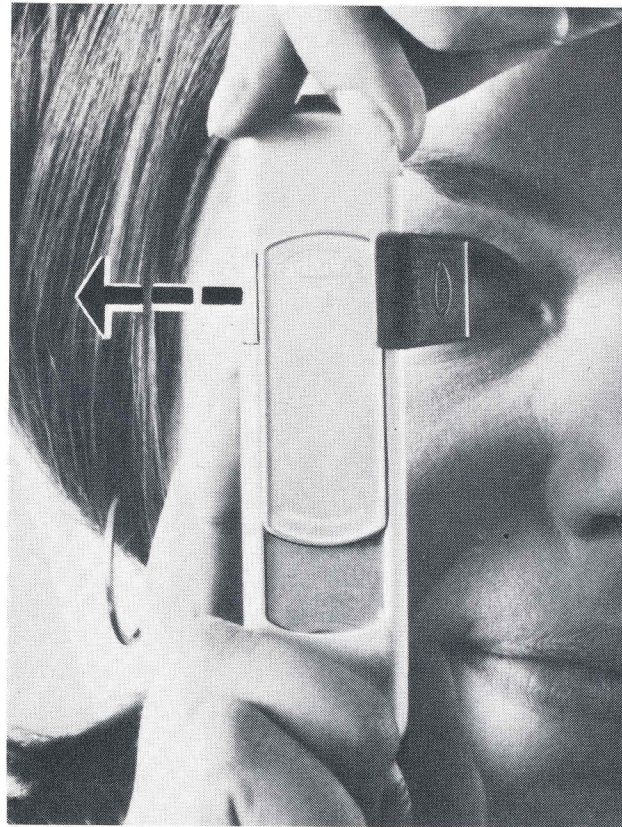
With fixed-focus lenses, does the manufacturer make close-up attachments available? Head-and-shoulder shots five to six feet from the camera are impossible and at any closer range you can't rely upon depth of field for sharpness. If you are pictorially minded, can filters be attached to

give you tonal control over your subjects? Is there a lens cover to prevent scratching as you carry the camera?

Does the shutter have a lock or signal light to indicate that the light is insufficient? Look for each of the various special features and evaluate it carefully—do you expect to need this or is it more likely to be just a frill that you won't use?

### EASE OF OPERATION

This is probably the most important



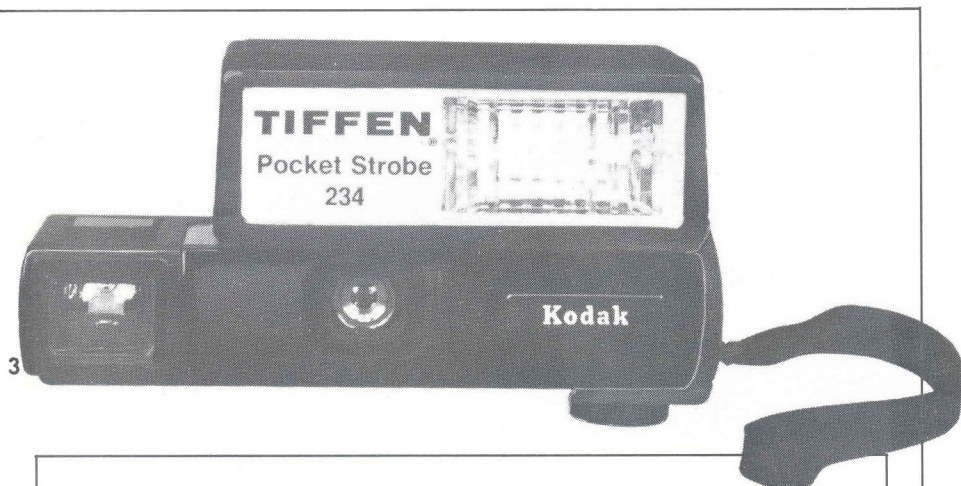


factor to consider; if you're not comfortable using your pocket camera, you'll gradually retire it to a desk drawer regardless of all the super features it has. The controls should fall naturally under your fingers, with plenty of room for their operation. They should operate smoothly and once set, stay in place. There's nothing more annoying than to focus the camera and take the picture only to discover that as you brought the camera into a picture-taking position,

you accidentally moved the focusing lever or slide to another setting.

#### IN SUMMARY

Look them all over with care and compare what each pocket camera has to offer before you buy. If you go into pocket camera photography with your eyes open, you'll be expanding your photographic horizons—make sure you take the right camera with you. With a little forethought, it's a decision you'll never regret.



3



4



5

1. Right-angle finder attached to your camera lets you look in one direction while taking a picture in another, and helps you capture those candid shots without the subject's awareness.

2. All pocket cameras use separate flash gun except new 110 models like this Kodak Pocket Instamatic 40 camera. The 110 models all have built-in Magicube flash sockets.

3. Tiffen offers Pocket Strobe 234, an accessory electronic flash unit for Kodak Pocket Instamatic 20, 30 and 40 camera flash work.

4. Once this new Minox computer unit has provided sufficient light for a correct exposure, it automatically quenches itself.

5. This is the result when close-up pictures are taken with no correction for parallax. At left is what you see in viewfinder; at right is what the camera lens sees. A bright frame in the viewfinder with parallax correction marks lets you avoid such errors in your close-up photos.



# The Kodak Pocket Instamatic Camera



Introduced in March 1972, the Kodak Pocket Instamatic camera series brought a new life to pocket camera photography with its tremendous popularity. Produced in five versions from a simple snapshot camera to a highly precise one fully capable of excellent pictures under a wide range of conditions, the Pocket Instamatic camera is very simple to use, regardless of which model you own. The first most important thing to do is to thoroughly familiarize yourself with its various parts and their capabilities. You'll find that all five have many features in common.

## MODELS 20 AND 30

These Pocket Instamatic cameras use the same three-element or triplet acrylic lens with a nonadjustable opening of  $f/9.5$ . Ultraviolet rays found in sunlight often cause deterioration in an acrylic lens but all three elements have been corrected by Kodak to prevent this from happening. As a result, the lens does not transmit the UV rays to the film; and since sunlight on hazy days contains a

great deal of these rays, this "filtering" action by the lens helps you get sharper pictures.

## MODEL 40

This is equipped with a combination acrylic-glass triplet lens with a nonadjustable opening of  $f/8$ . As it is a bit faster and better corrected than the  $f/9.5$  triplet used in the 20 and 30, this lens will give a slightly sharper picture. In addition, it has the haze penetration quality provided by the acrylic elements.

## MODELS 50 AND 60

Both use an all-glass, four-element Tessar-type lens that carries the Ektar trademark, Kodak's signature of its very best quality. This lens has a maximum speed of  $f/2.7$  and variable openings to  $f/17$ , making both cameras considerably more versatile than other Pocket Instamatic camera models. Haze penetration is afforded by the use of a recessed glass plate that also serves as protection for the lens when carrying the camera.

## LENS FOCUS

**Models 20 and 30/** The lens used in both the 20 and 30 is prefocused at the factory for a distance of 12 feet, on the assumption that both cameras would be used mainly for medium-close pictures. Because of the depth of field factor, any object from five feet to infinity will be acceptably sharp. While you can photograph distant landscapes or scenery with either camera, subjects beyond 25 feet begin to lose their apparent sharpness, so it's best to include a person or object in the foreground to give both depth and a sharp focal point on which the eye will be able to concentrate.

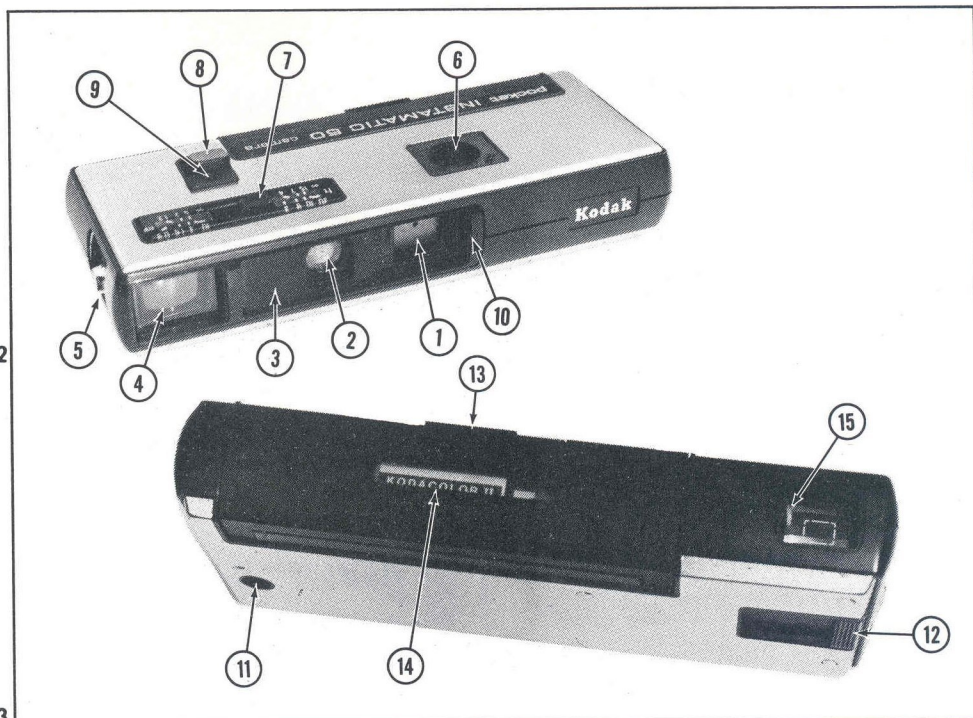
**Model 40/** Like the 20 and 30, the lens is also preset to a distance of 12 feet, but in addition it has been equipped with a limited form of zone focusing by means of an adjustment that lets you take pictures in a three- to six-foot range from the camera, giving the 40 a head-and-shoulders capability lacking in the other two. To take pictures in this closer range,



1. The Kodak Pocket Instamatic family offers a wide variety of features and capabilities to amateur photographers.

2. Kodak Pocket Instamatic features lens (1), electric eye (except 20) (2), rangefinder (60 only) (3), viewfinder (4), wrist strap eyelet (5), Magicube socket (6), focusing lever (7), shutter button (8), cable release socket (except 20) (9), sliding lens cover (20, 30 and 40 only) (10).

3. Tripod socket (11), film advance slide (12), back cover latch (13), film type/exposure indicator window (14), viewfinder indicator lights (except 20) (15).



## SPECIFICATIONS

### KODAK POCKET INSTAMATIC CAMERAS MODELS 50 and 60

<b>LENS:</b>	Kodak Ektar 26mm f/2.7 in continuous focusing mount from 3 feet to infinity. Model 50 has scale focusing, Model 60 uses rangefinder combined with viewfinder.
<b>SHUTTER:</b>	Electronic with speed range of 1/250 to 5 seconds; X flash sync; coupled to lens by electric eye
<b>FILM/FRAME SIZE:</b>	Instamatic 110 cartridge, 12 or 20 exposures; 13x17mm
<b>VIEWFINDER:</b>	Bright frame with parallax correction marks; contains used bulb and low-light, long-exposure signals
<b>EXPOSURE METER:</b>	CdS cell provides fully automatic exposure control; uses size K battery
<b>MEASURING RANGE:</b>	Accepts ASA 64 to 125 only
<b>FILM ADVANCE:</b>	Two-stroke thumb advance slide automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Cable release socket, tripod socket, battery check, focus-linked flash exposure range, wrist strap
<b>SIZE/WEIGHT:</b>	5 25/32x2 9/32x1 inch; 9.0 ounces

### KODAK POCKET INSTAMATIC CAMERA MODEL 40

<b>LENS:</b>	Kodak 25mm f/8 in two-position zone focus mount; 3 to 6 feet, 6 feet to infinity
<b>SHUTTER:</b>	Electronic with speed range of 1/225 to 5 seconds; X flash sync; coupled to lens by electric eye
<b>FILM/FRAME SIZE:</b>	Instamatic 110 cartridge, 12 or 20 exposures; 13x17mm
<b>VIEWFINDER:</b>	Bright frame with parallax correction marks; contains used bulb, closed lens cover and low-light, long-exposure signals
<b>EXPOSURE METER:</b>	CdS cell provides fully automatic exposure control; uses size K battery
<b>MEASURING RANGE:</b>	Accepts ASA 64 to 125 only
<b>FILM ADVANCE:</b>	Two-stroke thumb advance slide automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Cable release socket, tripod socket, bat-

#### SIZE/WEIGHT:

tery check, focus-linked flash exposure range, wrist strap  
5 1/8x2 7/8x1 inch; 6.3 ounces

### KODAK POCKET INSTAMATIC CAMERA MODEL 30

<b>LENS:</b>	Kodak 25mm f/9.5 in fixed focus mount; 5 feet to infinity
<b>SHUTTER:</b>	Electronic with speed range of 1/160 to 5 seconds; X flash sync; coupled to lens by electric eye
<b>FILM/FRAME SIZE:</b>	Instamatic 110 cartridge, 12 or 20 exposures; 13x17mm
<b>VIEWFINDER:</b>	Bright frame with parallax correction marks; contains used bulb, closed lens cover and low-light, long-exposure signals
<b>EXPOSURE METER:</b>	CdS cell provides fully automatic exposure control; uses size K battery
<b>MEASURING RANGE:</b>	Accepts ASA 64 to 125 only
<b>FILM ADVANCE:</b>	Two-stroke thumb advance slide automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Cable release socket, tripod socket, battery check, focus-linked flash exposure range, wrist strap
<b>SIZE/WEIGHT:</b>	5 1/8x2 3/8x1 inch; 6.2 ounces

### KODAK POCKET INSTAMATIC CAMERA MODEL 20

<b>LENS:</b>	Kodak 25mm f/9.5 in fixed focus mount; 5 feet to infinity
<b>SHUTTER:</b>	Mechanical with speeds of 1/40 and 1/100 second; X flash sync
<b>FILM/FRAME SIZE:</b>	Instamatic 110 cartridge, 12 or 20 exposures; 13x17mm
<b>VIEWFINDER:</b>	Bright frame with parallax correction marks; contains used bulb and closed lens cover signals
<b>EXPOSURE METER:</b>	None
<b>MEASURING RANGE:</b>	None
<b>FILM ADVANCE:</b>	Two-stroke thumb advance slide automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Tripod socket, wrist strap
<b>SIZE/WEIGHT:</b>	5 1/8x3 3/8x1 inch; 5.6 ounces



## Pocket Instamatic

slide the spring-loaded lever placed in front of the cable release socket to the right until it locks. When you advance the film after taking the picture, this focusing slide will return to its normal position marked "Beyond 6 feet." If you decide not to take the picture, or wish to change the focus setting before taking the picture, a slight leftward push with your fingernail will reposition it.

**Models 50 and 60/** Both have continuous scale focusing calibrated in both feet and meters from three feet to infinity. With the 50, you estimate the distance between where you're standing and the subject, then slide the distance lever, positioned in front of the shutter button, to its corresponding number—3, 4, 5, 7, 10, 15, 30 feet or infinity. For extra focusing convenience and accuracy, the 60 contains a coupled superimposed rangefinder. To set its lens at the correct distance, you simply look through the finder window. A central spot contains the rangefinder and sliding the distance lever back and forth until both images of the object on which you're focusing combine into one sets the lens for the proper distance. While it's true that the range of sharpness, or depth of field, gets larger as the camera's lens opening is reduced from  $f/2.7$  to  $f/17$ , there's no way you can control or even determine which lens setting the automatic exposure control (see following) will select; under very dim light conditions it will remain at  $f/2.7$ , or under very bright light like a beach scene it will stay closed to  $f/17$ . So you must learn to judge distances accurately to set the 50 by scale. And as the small lines indicating each distance setting are very close to each other, use care in setting the camera. With the 60, just use the rangefinder at all times. There is one problem with the slide method of focusing used on the 50. If you set it on infinity and then put the camera in your pocket, there's a reasonable probability that in handling and carrying the camera, the slide will move to another setting. This is not as likely to happen with the 60, as the rangefinder components put a slight drag on the focusing slide that the 50 doesn't have. Just to make certain that it's right on the button, *always* check your focus setting before taking a picture with the 50.

### SHUTTER AND EXPOSURE

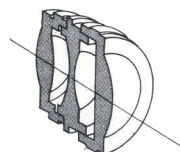
**Model 20/** The mechanical shutter in the 20 operates exactly like that of any other camera you might have owned or used. The shutter is

factory-set to provide a 1/100-second speed for daylight pictures, but inserting a Magicube in its socket automatically reduces the speed to 1/40 second for flash pictures. By taking advantage of this fact, you can increase the useful picture-taking ability of your Pocket Instamatic 20 camera. Carry a used Magicube with you on dull days and insert it before taking outdoor pictures. This lets you use the 20 on days that would otherwise be too dark to get a decent exposure. Although the negatives may still be somewhat underexposed, the automatic printing equipment used by processing labs can compensate for this to a degree. Just remember that using a slower shutter speed means that you must hold the camera very steady and cannot take pictures of rapidly moving objects without getting some blurring in the final print.

**Models 30, 40, 50, 60/** The 30 uses an electronic shutter very similar to that found in the 40, 50 and 60, but its daylight speed range is not quite as great. The top shutter speed for the 30 is 1/160 second, compared to 1/250 second for the other three

## KODAK POCKET INSTAMATIC CAMERA LENSES

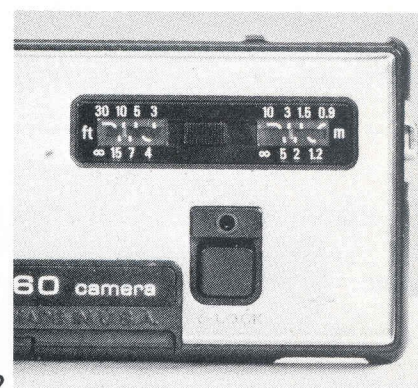
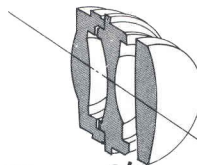
**3 ELEMENT  
25mm f9.5**



**4 ELEMENT 26mm f2.7**



**3 ELEMENT 25mm f/8**

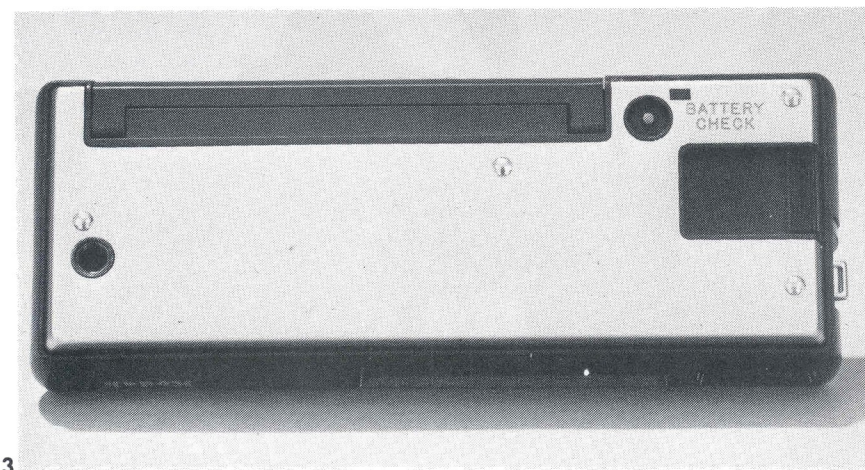
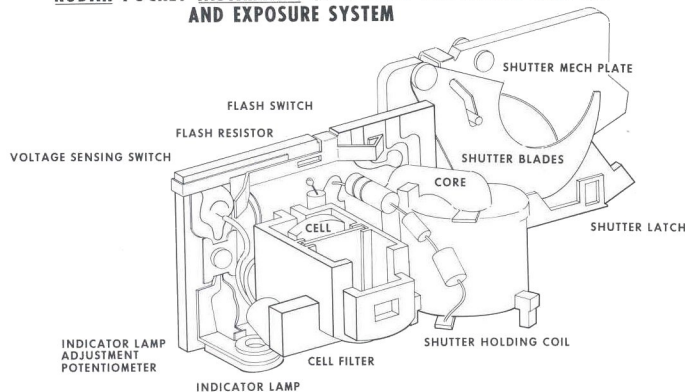


Pocket Instamatic cameras. All four of these electronic shutters will stay open up to five seconds. While this has a definite advantage in some instances, you never know exactly what shutter speed the camera's brain has selected (just as you never know exactly what lens opening the 50 and 60 will use). And as no one can hand-hold a camera for five seconds and expect to get a sharp picture (nor will very many subjects remain motionless for that long), your Pocket Instamatic camera (except the 20) has a low-level, long-exposure signal light in the viewfinder; red in the 30 and 40, amber in the 50 and 60.

As you depress the shutter button, the signal light will come on if the shutter speed selected by the camera is below 1/30 second. With the models 50 and 60, it's important to remember that the shutter speed remains at 1/250 second, with exposure compensation provided by increasing the size of the lens opening until it reaches the maximum  $f/2.7$  setting. At that time, the shutter speed is then automatically lowered accordingly to give the correct exposure combination.



### KODAK POCKET INSTAMATIC 30 CAMERA ELECTRONIC SHUTTER AND EXPOSURE SYSTEM



**1. Although its focus is preset to 12 feet, the Pocket Instamatic 40 has a two-position zone focus adjustment lever for pictures as close as 3 feet.**

**2. The more versatile models 50 and 60 use a sliding scale focus from three feet to infinity. As the adjustment is very fine between marked distances, set it carefully for sharpest results when using the non-rangefinder model 50.**

**3. Newest Pocket Instamatic 50 and 60 cameras have a battery-check button. Fully depress button, located near the film advance. If battery is live, light next to the button lights up.**

What does this all mean in terms of getting good pictures with your Pocket Instamatic camera? Simply that you *must* hold the camera as steady as possible at all times, obey the warning signal light when it comes on, stay six feet or more from your subject with the 20 and 30, and focus as accurately as possible with the 40, 50 and 60. Don't try to photograph children running or other fast-moving objects like cars, planes, boats, bicycles, etc. with the 20 or 30 on dark days or after 5:00 p.m., as the shutter speed will be far too slow to prevent blurring of the subject.

#### FLASH AND THE POCKET INSTAMATIC

Over the past few years, photographic manufacturers have made dedicated efforts toward making flash pictures as simple and foolproof as possible for the amateur. The development of the compact flashcube and more recently the Magicube have been steps in this direction, but even with the convenience offered by a small cube containing four premeasured quantities of artificial light, flash photography by most amateurs who

attempt it has continued to leave something to be desired.

Users of more advanced, adjustable cameras have had to fuss with a guide number specified by the cube manufacturer for each film, dividing this number by the distance between flash and subject to determine the correct lens opening and then setting their camera according to this calculation. While this technique is more likely to give you a correctly exposed flash picture, variations in subject placement, room lighting and an overabundance of light or dark colored objects in the picture often combine to throw this "theoretical" correct exposure off base, giving a picture as unsatisfactory as those taken with less expensive, nonadjustable cameras.

But four of the Pocket Instamatic cameras have a built-in answer to these common causes of poor flash pictures—the electric shutter. While the 20, with its mechanical shutter and single speed, has a recommended flash exposure range of 5 to 10 feet (within which you'll get adequately exposed pictures), the other Pocket Instamatic cameras, equipped with the electric eye, "read" the

amount of light from the Magicube that is reflected from the subject back to the camera and so control the length of time it stays open. This provides an exposure that's right "on the button" every time, regardless of subject or its surroundings.

#### FOCUS-LINKED EXPOSURE CONTROL

The 40, 50 and 60 have an additional feature to guarantee correctly exposed flash pictures—a focus-linked exposure control. For example, the flash exposure range of the 50 and 60 is between 4 and 30 feet. When you fit a Magicube into the camera's cube socket, focus-linking takes over. As you focus the lens, it automatically adjusts for the correct flash exposure at that distance. This also reduces the shutter-speed range for flash pictures to between 1/30-1/250 second (from 5 seconds to 1/250 second for outdoor use). Depending upon subject distance and lens opening, the correct shutter speed is selected by the camera's electric eye.

Although its flash exposure range is more limited (4 to 12 feet), the 40



## Pocket Instamatic

is also focus-linked, but in a slightly different way. With the camera set at "Beyond 6 feet," the shutter speeds available to the electric eye are reduced to a range between 1/10-1/225 second. But sliding the focus adjustment to the three- to six-foot position reduces this range to between 1/60-1/225 second, making it impossible for the shutter to allow too much light to reach the film. Variations in subject, lighting and room colors are read by the electric eye, which then closes the shutter when the exact amount of light necessary for a correct exposure has been received by the film. Thus, two of the most common causes of poor flash pictures by the amateur photographer have been corrected in the Pocket Instamatic camera.

If you own a 20 and are not satisfied with the results of your flash photographs, I'd suggest that you try to stay in the middle of the cube manufacturer's specified range for every shot—about 10 feet for black-and-white and 7 feet for color pictures. While this does restrict the type of pictures you can take, it also increases the possibility of getting a correctly exposed shot and will result in better pictures.

### CAMERA OPERATION FOR FLASH

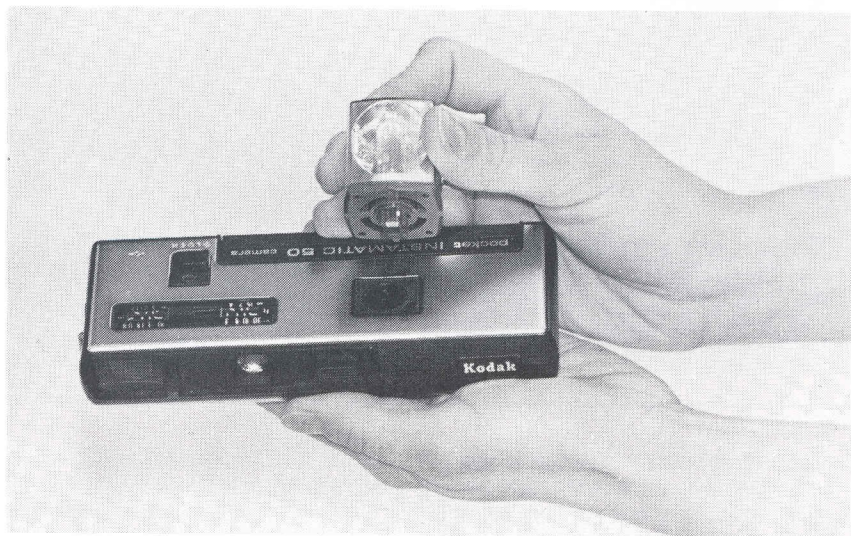
Preparing the Pocket Instamatic camera for use with flash is easy—just fit a Magicube into the socket on the top of the camera and you're all set to shoot. With the 20, this reduces the shutter speed from 1/100 second to 1/40 second; with the other four Pocket Instamatic cameras, it brings the focus-linked flash exposure control into play. The Magicube will allow you to take four pictures in sequence before it has to be replaced; advancing the film rotates the cube one-quarter turn, bringing a fresh bulb into position. All Pocket Instamatic cameras have a used flash-cube signal that appears in the viewfinder to remind you to advance the film or change the cube. In the 20, 30 and 40, it's a red line that appears diagonally across the viewfinder; the 50 and 60 have a tiny red light that illuminates a small sign inside the viewfinder reading "used bulb." Since the Magicube is ignited mechanically by the camera when you press the shutter button, there's no chance of flash failure because of poor batteries or bad battery contact.

### 110 FILM CARTRIDGE

The Pocket Instamatic camera 110 film cartridge offers easy, automatic and instant loading, and protects the film before, during and after exposure. The cartridge is so shaped that



1



2

it can only fit into the camera in the correct way. Film identification and number of pictures taken are provided by the paper sticker on its back, which remains visible through a window in the camera's back cover.

Like 126 film cartridges, the 110 film cartridge system uses a notch in the cartridge to key the electric eye to the correct film speed. The Pocket Instamatic cameras can only operate between an ASA range of 64 to 125. While current 110 film cartridges fall into this range, other manufacturers will also make their more popular emulsions available in 110 film cartridges in the future. If you should use other than Kodak films with your Pocket Instamatic camera, be certain that their speed is within this ASA range for correctly exposed pictures. While the 20 has no electric eye, it's not a good idea to use films outside this ASA range as the camera's lens and shutter are not capable of adjust-

ment for extra slow or fast emulsions.

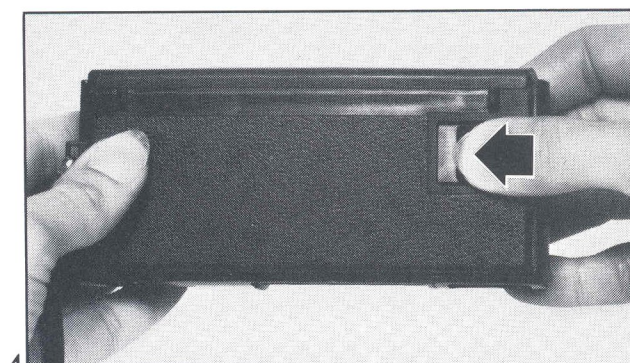
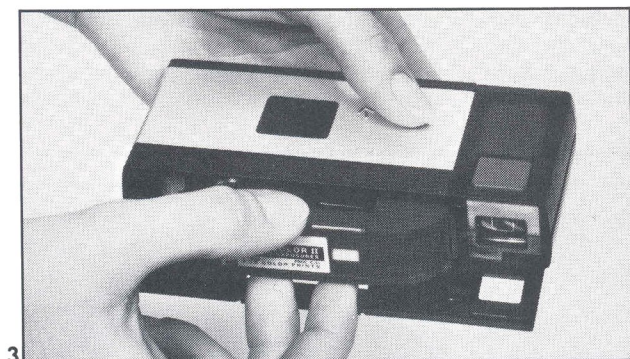
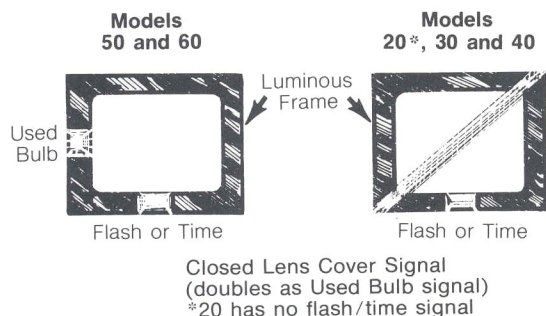
To load the Pocket Instamatic camera with a film cartridge simply pull back and down on the cover latch, then drop the cartridge in place. Close the cover and position the film for use by pushing the advance slide all the way to the left until it locks. This will take several strokes to reach the first exposure, but only 1 1/2 between each picture. When the last exposure has been taken, slide the advance lever back and forth until it locks before opening the back cover to remove the film cartridge.

### BATTERY CONDITION AND REPLACEMENT

The electronic shutter used in all but the 20 is powered by a size-K battery. This should be replaced every year. Keep an extra battery on hand and set a particular time each year for battery replacement, whether it seems to need it or not. Just before



# KODAK POCKET INSTAMATIC VIEWFINDER SIGNALS



Christmas is a good time and will insure that you don't miss those once-in-a-lifetime shots we all take over the holidays. Battery condition should be checked after periods of nonuse in the following manner:

1. Advance the film lever just as if there was a film cartridge in the camera. This cocks the shutter.

2. Close the camera's lens cover. If you have a 50 or 60, press it tightly against your left wrist to prevent light from reaching the electric eye.

3. Hold the camera's back cover open and look at the shutter as you press and hold the shutter button down for five seconds. With a good battery, the shutter will remain open until you release the button. But if the shutter opens and closes immediately (you can see *and* hear it), then it's time for a new battery.

Failure of the red or amber indicator light to come on when you are taking pictures under adverse lighting

conditions is also a sign that a new battery is needed. To change batteries with film in the camera, open the back cover and hold the film cartridge securely in place as you push the battery down and to the center of the battery retainer, you can lift the old one out and insert the new battery by snapping it in place. Then close the camera back and advance the film to the next picture just in case some light leaked around the cartridge and fogged the frame of film.

If you have recently replaced the battery but have not used the camera for some time, the failure of the indicator light to work as it should can often be traced to a dirty battery or to poor battery contact. Open the camera back and remove the battery for cleaning with a rough cloth or pencil eraser. Replace it, using the diagram stamped inside the back cover if necessary, and close the

1. The Pocket Instamatic's electronic shutter is amazingly accurate, even in backlit situations like this, but don't expect miracles every time.

2. The built-in Magicube socket does away with the necessity of the traditional separate flash gun, adding to the camera's convenience.

3. The Pocket Instamatic is loaded with film by opening the back cover and slipping the cartridge into place.

4. Film is transported by pushing the advance slide to the left until it locks.

5. Available in four different emulsions, the 110 cartridge has all the advantages of the larger 126 cartridge: instant loading, film protection at all times, one-way insertion into the camera and identification of film type and exposure number through a window in the camera's back cover.

6. Kodak Pocket Instamatic cameras with electronic shutters use a size K battery that is located inside the back cover. Replace it yearly.



## Pocket Instamatic

camera back. Again, if there's a cartridge of film in the camera at the time, be sure to hold it down while removing and replacing the battery; after closing the back, advance the film one frame to avoid the possibility of light having spoiled that picture.

### PICTURE TAKING

If you've used a regular Instamatic camera, you'll recall that its square negative allowed you to take pictures without turning the camera. While the square format has its advantages, many amateurs prefer the rectangular negative like that used in the Pocket Instamatic camera. But now you'll have to decide whether the picture is best suited to a horizontal or vertical format and then hold the camera accordingly before releasing the shutter. You can usually tell which is most appropriate just by looking at your subject, but if there's any doubt, look through the viewfinder while holding the camera both ways and use the bright frame lines in the finder window to help you decide which is best.

When using the Pocket Instamatic camera, keep in mind two important rules and you'll avoid the two most common mistakes made by pocket camera users:

1. Place your fingers only on the top and bottom of the camera. A careless finger on the front can partially obscure either the lens or electric eye and ruin your picture.

2. Hold the Pocket Instamatic camera securely and firmly when pressing the shutter button. The pressure of your "trigger finger" should not move the camera at all or you'll get blurred pictures.

Both are easy to forget unless you practice holding the camera correctly. The arrows in the photo show you a trick in holding the Pocket Instamatic camera tightly to prevent camera movement. With your left hand, combine downward pressure of the fingers with upward thumb pressure. This reduces the possibility of camera shake when you squeeze the shutter button. As you slowly depress the button, tighten the pressure with that thumb by pressing up on the bottom of the camera.

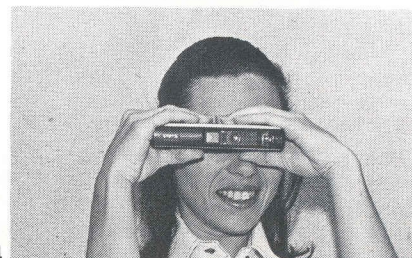
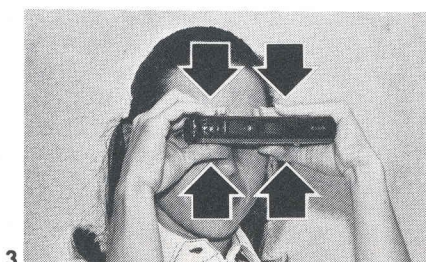
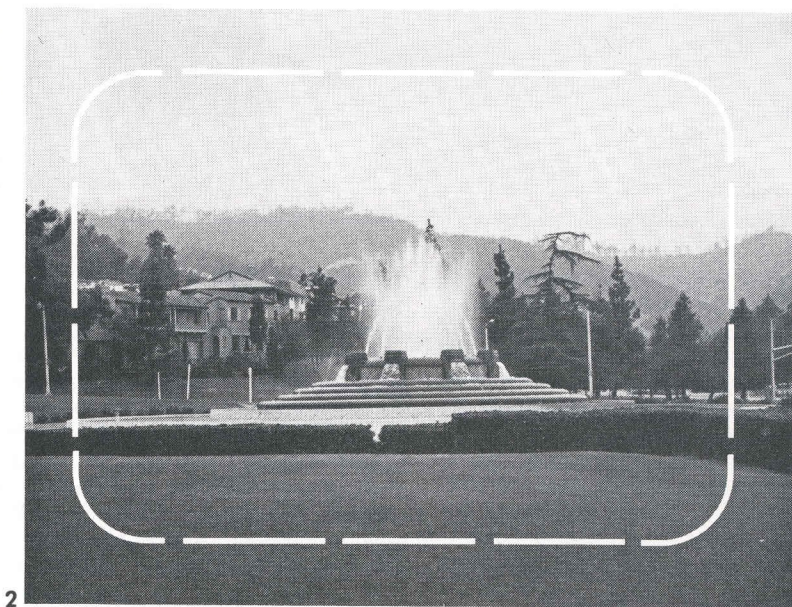
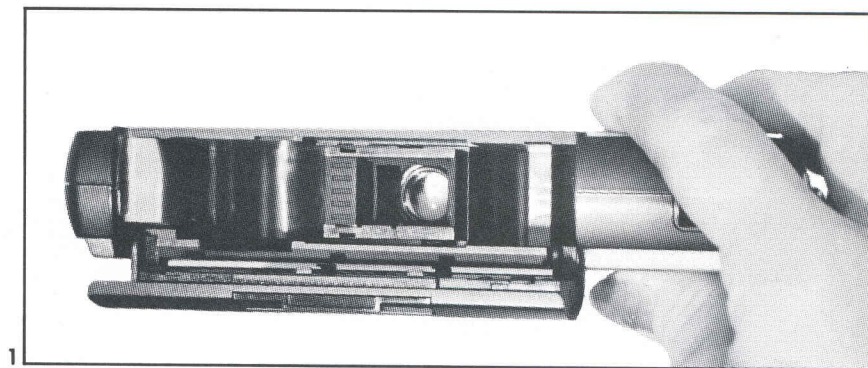
The index finger of your right hand should rest directly on top of the shutter button, not beside it. The habit of rolling your finger onto the button and down to trip the shutter is a bad one to acquire. Pocket Instamatic cameras require sufficient pressure to trip the shutter so that you need not worry about accidentally taking the picture. There are times when you might want to use the Pocket In-

stamatic camera upside down (especially if you're left-handed). Those who are more accustomed to sighting with their left eye will find this position more convenient. The same technique of holding the camera applies, except that now primary pressure is exerted with the right hand and the left thumb trips the shutter button. With a bit of practice, you'll find this as good a position as the other.

As you prepare to shoot the picture, brace your left hand and the camera's back tightly against your face and pull your elbows into your chest as shown in the photo, allowing your body to serve as a tripod. For vertical pictures, you can either hold the Pocket Instamatic camera tightly against the forehead or pressed into your cheekbone. Using the forehead

position allows you to bring both arms together and in toward the chest, and should make it easier to hold the camera steady. Breathe out slowly as you gently squeeze the shutter button and take the picture.

In all but the model 20, you'll notice a pressure point in the button's downward travel. When the light level is too low for a correct exposure while hand-holding these Pocket Instamatic cameras, a red or amber indicator light comes on in the viewfinder. If the indicator light comes on when taking indoor pictures, place the camera on the edge of a solid, flat support like a table or chair back, or use a Magicube. For outdoor photos, brace it against a tree or wall, use the optional Kodak compact camera stand or attach the camera





to a regular photographic tripod using the built-in tripod socket. Screw a cable release into its socket in front of the shutter button and hold the camera securely if you are bracing it. Then press and hold the cable release (or shutter button if you don't have the release with you) until the indicator light goes out. If you can't see the light, don't worry as shutter operation is audible enough to tell you when the exposure begins and ends. Hold everything steady until the second click is heard.

After you've taken the picture, advance the film by pushing the slide with your right thumb about 1 1/2 full strokes, or until it locks. This is important as you won't be able to trip the shutter until the film is properly positioned for the next exposure; double ex-

posures are impossible. Neglecting to fully advance the film could cause you to miss the next picture you want to take. Film can also be advanced with the camera at eye level if you want to take a series of photos, but don't hold the shutter button down while moving the film.

You've probably heard this dozens of times, but it still holds true—before you shoot your first cartridge of film with the Pocket Instamatic camera, practice holding the camera and releasing the shutter button until you can do it correctly without thinking. If you hold the camera properly, your pictures will be sharp and contain exactly what you saw in the bright frame of the finder. Once you've acquired the correct techniques of holding and using the Pocket Instamatic camera, you'll be able to get

just the pictures you want when you want them.

## ACCESSORIES

With their built-in Magicube sockets, the Pocket Instamatic cameras are self-contained units for all-weather photography. The present list of accessories offered by Kodak for these cameras is small—a carrying case, compact camera stand, Magicube extender. While it is unlikely that other accessories will be offered by Kodak at this time, it is possible that independent manufacturers will produce a set of snap-on filters and perhaps close-up lenses in the near future. Currently, the only non-Kodak accessory is an electronic flash unit for use with the 20, 30, and 40 models of the camera, and manufactured by Tiffen and Kalimar.



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**1. Check battery condition by resting the meter cell on your arm and tripping the shutter. If the shutter does not stay open, replace the battery.**

**2. The bright frame lines inside the Pocket Instamatic viewfinder indicate the picture area, but there are no parallax correction marks for close-ups.**

**3. When holding the Pocket Instamatic for horizontal pictures, combine downward pressure of the fingers with upward thumb pressure to help keep the camera steady.**

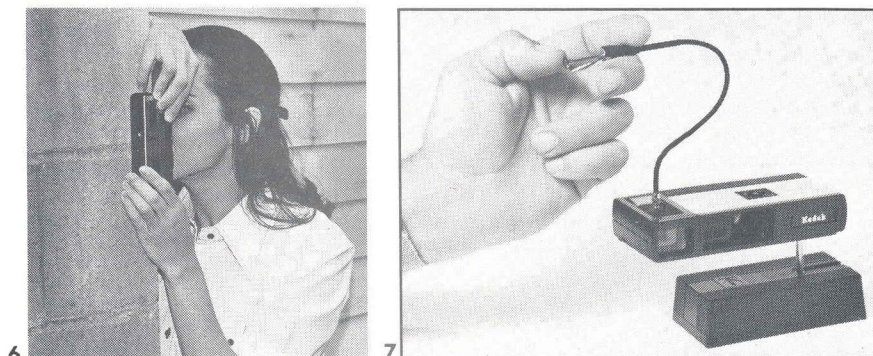
**4. Some may find it easier to view with the left eye, holding the camera upside down to allow bracing against the face.**

**5. There are two ways to hold a Pocket Instamatic for vertical pictures. One method uses the forehead as a brace (left) and the other uses the cheekbone and nose to steady the camera (right). Use whichever method feels most comfortable for you.**

**6. When the red or amber indicator light in the viewfinder comes on, brace the camera against a wall or other solid object to hold it steady.**

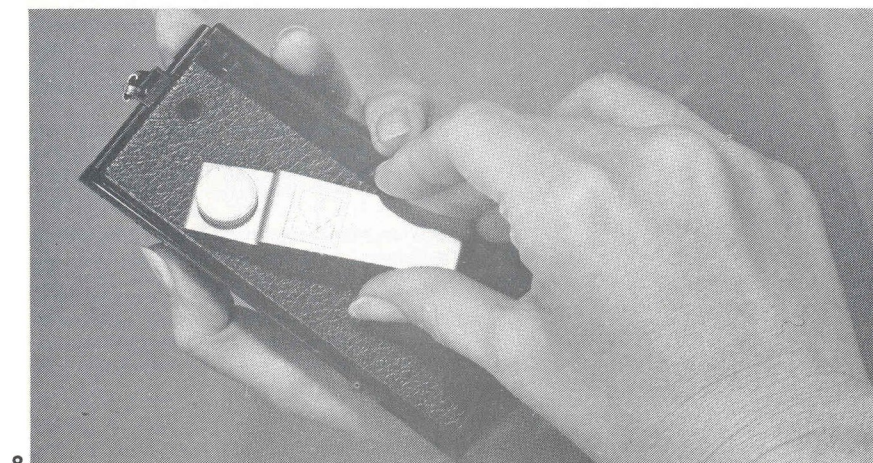
**7. Sold complete with cable release, the Kodak Compact Camera Stand is a handy and portable accessory for sharp pictures under low light conditions.**

**8. This chrome-plated brass camera clip secures all Pocket Instamatic camera models to belt, pocket or shoulder strap.**



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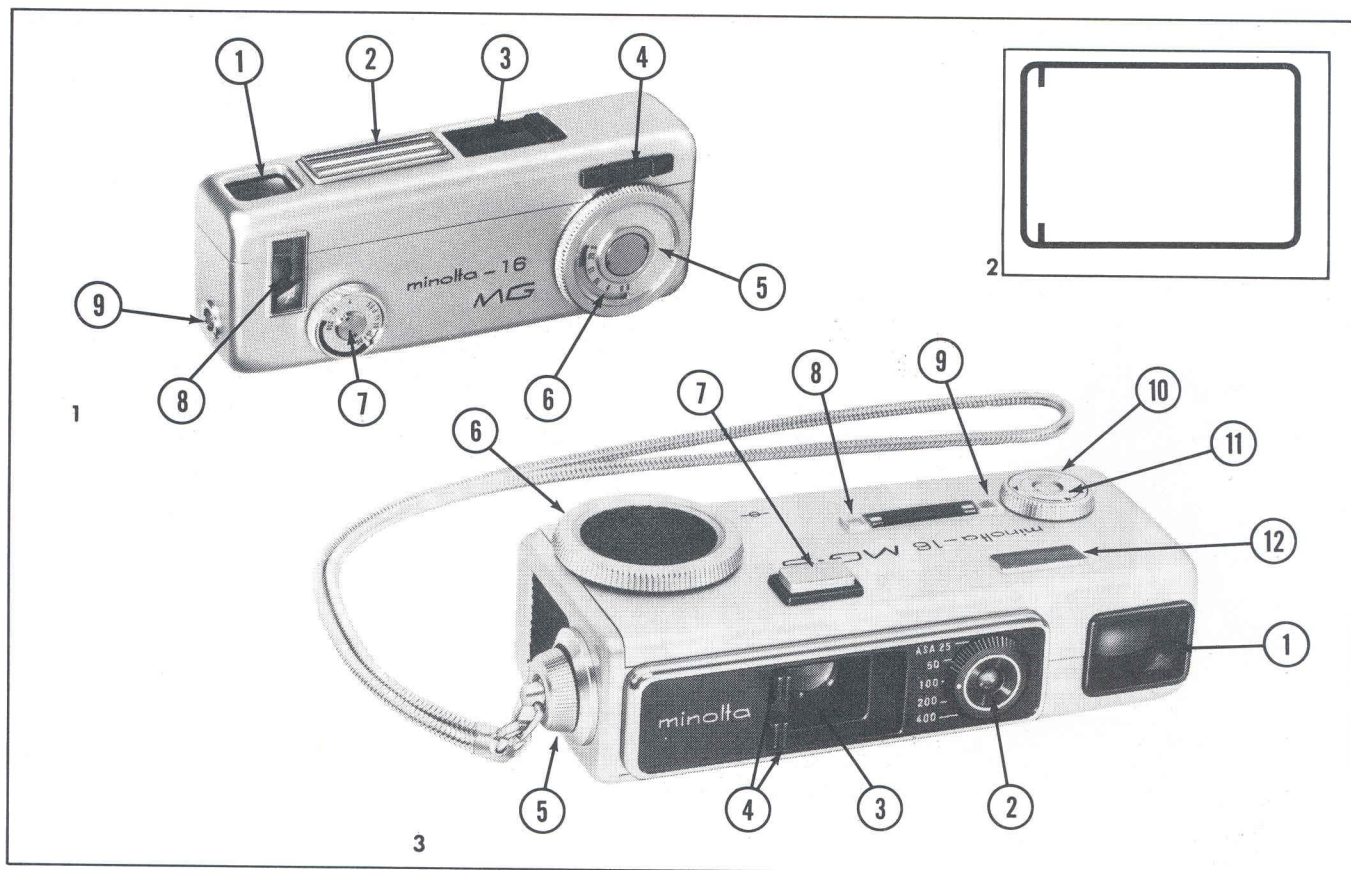
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# The Minolta Pocket Camera System



**W**ith more than two decades of experience in the manufacture of photographic equipment, Minolta qualifies as one of the outstanding names in pocket cameras. I first came across the Minolta 16 some 20 years ago while a combat photographer with the U.S. Army during the Korean Conflict. The American GIs discovered the diminutive pocket camera at about the same time David Douglas Duncan and other pros covering the war were learning of the superior quality of Japanese optics. While Duncan and company were busy covering the fighting, GIs on R and R in Japan were finding the Minolta 16 ideal for photographing nude chorus lines in Japanese burlesque theaters—but Minolta has come a long way since then.

The basic design of the original Minolta 16 was retained until 1972, a tribute to the camera's proven quality, but the company's current pocket camera line has kept pace with the

latest advances in photography. While other large Japanese manufacturers like Mamiya gave up on pocket cameras and discontinued their lines several years ago, Minolta's continuing success in the small camera business can be attributed to its forward thinking and a firm conviction that pocket cameras are not toys, but precision photographic instruments. From the outset, a full range of versatile accessories has been provided by the company to make the cameras a full-fledged photographic system.

## THE 16 MG SERIES

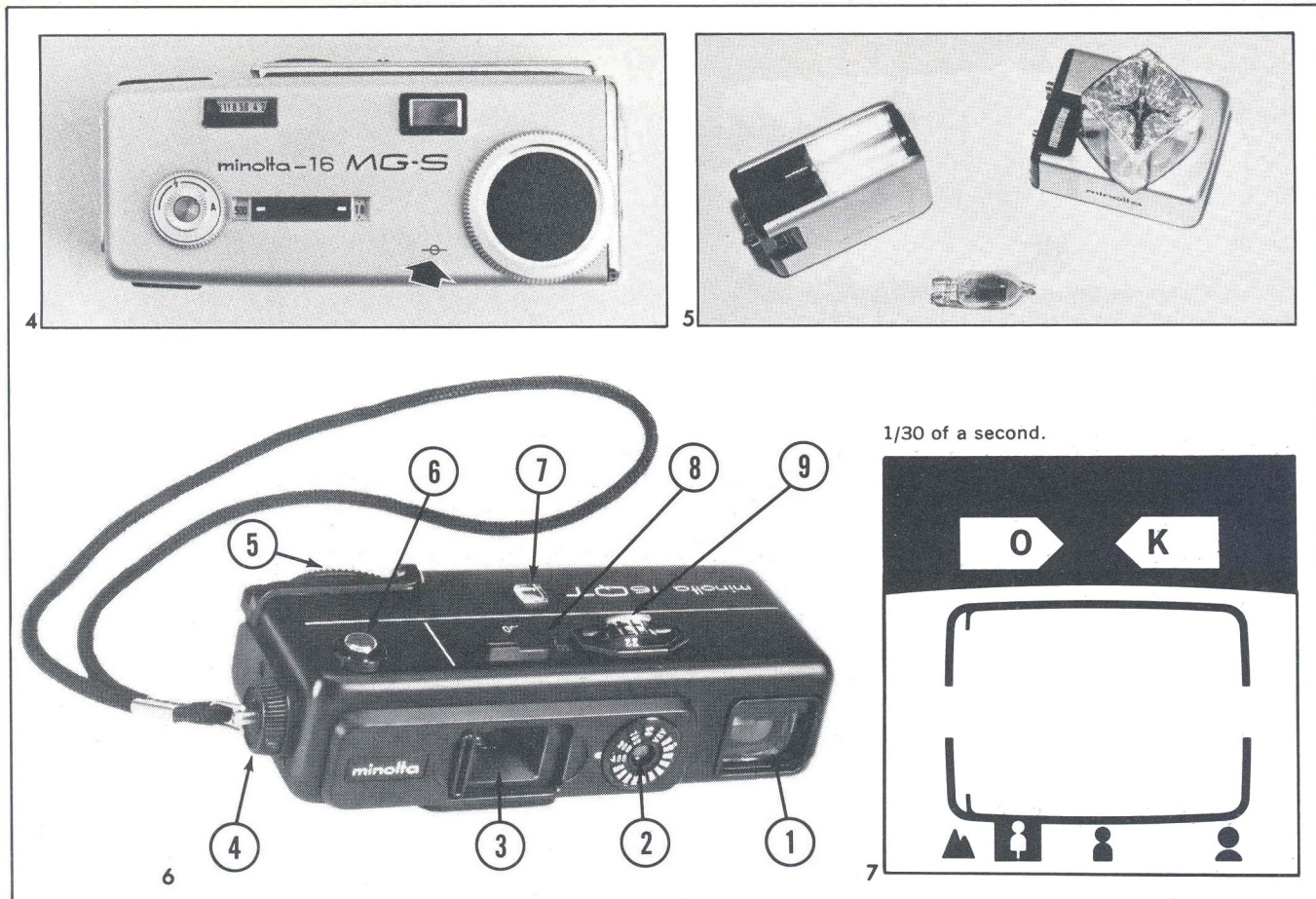
While there have been several different pocket cameras in the Minolta family, the MG series has remained its top-of-the-line in recent years. Only one model is currently manufactured—the 16 MG-S—but as the 16 QT is also based extensively on the same body design and the recently discontinued 16 MG is still to be found in ample quantities on dealer shelves, it

is appropriate to consider all three cameras here.

## MINOLTA POCKET CAMERA LENSES

Minolta fits its pocket camera line with modern Rokkor lenses of the same optical glass as those used in the more expensive Minolta 35mm cameras. These lenses are designed to provide corner-to-corner brightness, superb color reproduction and sharp contrast. The 16 MG uses a 20mm f/2.8 Rokkor, the 16 MG-S a 23mm f/2.8 Rokkor and the 16 QT a 23mm f/3.5 Rokkor. The f/2.8 lenses use four elements in three groups while the f/3.5 in the 16 QT contains three elements in three groups. The 16 MG's shorter focal length is explained by the camera's smaller picture area, 10x14mm as compared to the now-standard 12x17mm frame size of the 16 QT and MG-S. The f/2.8 Rokkors are prefocused at a distance of 11 1/2 feet for maximum





**1. Minolta 16 MG features viewfinder (1), selenium meter cell (2), lens and lens cover (3), shutter button (4), film advance wheel (5), exposure counter (6), exposure control ring (7), match needle window (8), flash contact (9).**

**2. The 16 MG and MG-S use bright frame viewfinder complete with parallax correction marks.**

**3. Minolta 16 MG-S features viewfinder (1), CdS cell window and ASA index dial (2), lens (3), lens cover and close-up lens (4), tripod/wrist strap socket (5), film advance wheel (6), shutter button (7), exposure counter (8), shutter speed window (9), shutter speed ring (10), auto/flash selection dial (11), lens opening scale (12).**

**4. With all controls visible from above, operation of MG-S is quick and certain. Small circle with line through it to left of film advance wheel indicates exact plane of the film.**

**5. Flash capability for Minolta is provided in the form of two flash guns, one using regular AG-1 flash bulbs and one using flashcubes.**

**6. Minolta 16 QT features viewfinder (1), CdS cell window and ASA index dial (2), lens and lens cover (3), tripod/wrist strap socket (4), film advance wheel (5), shutter button (6), exposure counter (7), shutter speed selector index (8), meter switch, f/stop dial (9).**

**7. The QT "Control Center" viewfinder contains a bright frame with parallax marks, four zone focusing symbols and two orange arrows that flash O.K. when the correct exposure is set.**

sharpness at any lens opening, while the f/3.5 in the QT uses a four-position zone focus.

#### THE 16 MG

Now discontinued but still available new in photo stores, the 16 MG uses a programmed mechanical shutter with a four-speed range of 1/30 to 1/250 second, cross-coupled to a built-in selenium meter for correct exposures with no calculation by the user. Precise exposure measurement is determined by turning the exposure control ring (which contains the ASA film-speed window, lens and shutter-speed index) located beside the meter window. When the red match needle is aligned in the center of the silver indicator, the MG is set for a correct exposure. For flash photos, a synchro contact select button lets you disconnect the exposure meter from operation. A cordless X-sync flash contact accepts the Minolta MG flash gun and flash bulbs at 1/30 second. By aligning the lens opening number on the exposure control ring with a red index dot on the camera body, you can select any desired lens opening from f/3.5 to f/16.

A sliding close-up lens that lets you take pictures as close as 26 inches is provided in the camera body, as well as a sliding lens cover and a built-in signal that warns when one or both are in front of the recessed lens. The

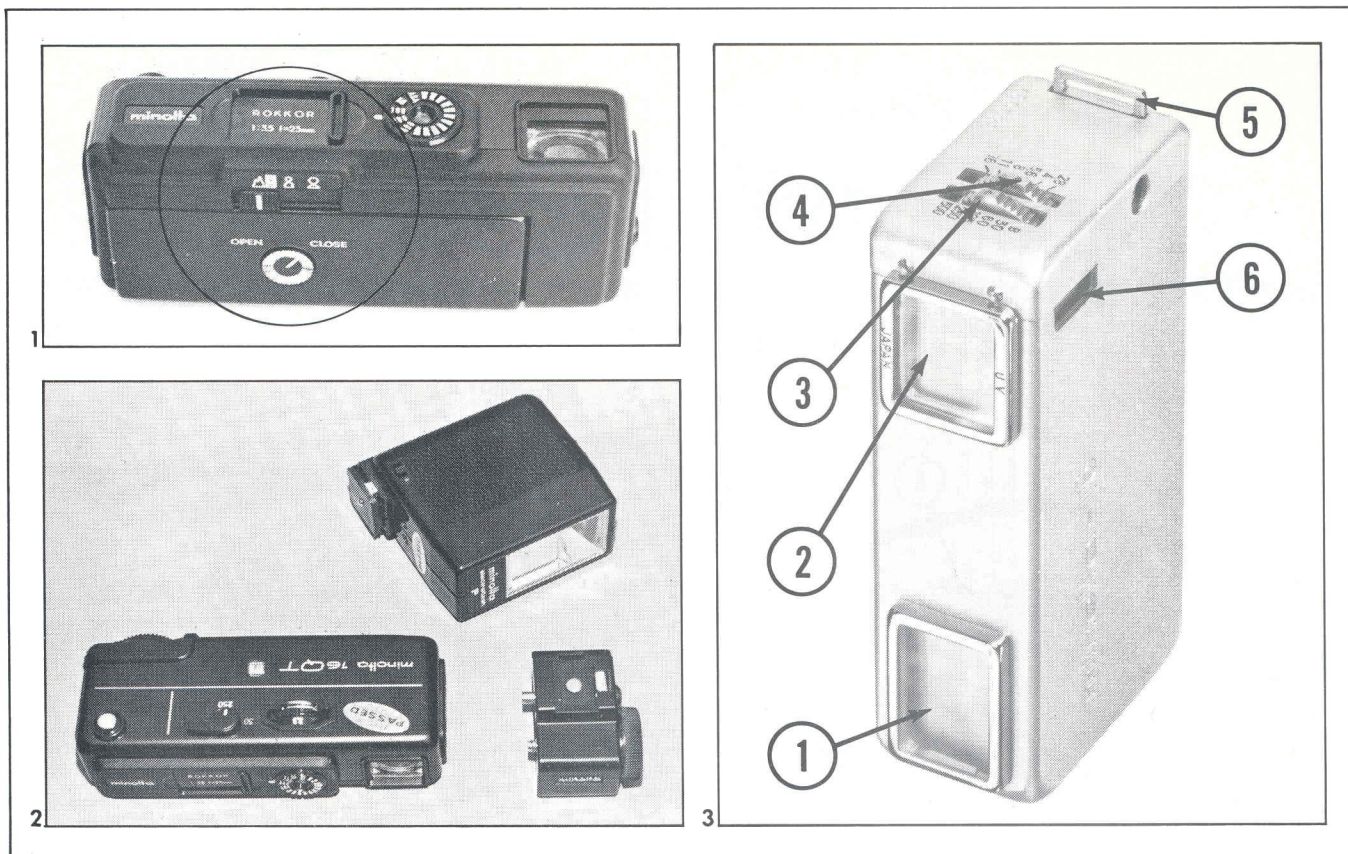
bright frame viewfinder also contains parallax correction marks.

#### THE 16 MG-S

This semiautomatic model recently superseded the 16 MG and is equipped with a CdS cell coupled to the shutter and film-speed index. After setting the ASA index dial positioned beside the lens to the film speed you're using, select the desired shutter speed by turning the ring around the outside of the Auto/Flash selection dial. For automatic diaphragm control with the CdS electric eye, the A on the inner selection dial should line up with the shutter speed window. When using flash, press down on the milled center of the inner dial and turn until the red line is opposite the window. This returns control of the lens opening to the user. Revolving the inner dial in the direction of the line allows you to set the lens at any desired opening between f/2.8 and f/16; these are visible in the lens opening scale.

The scale is contained in a horizontal window placed on the camera top just above the viewfinder. The scale also contains a red zone at each end. If the exposure needle stays in the red zone at the right end of the scale when the camera is set on automatic and pointed at the subject, there's insufficient light for a





## Minolta Camera System

correct exposure and the shutter button automatically locks, bringing a red warning signal into the viewfinder at its bottom. Set the camera to a lower shutter speed or use flash. When the needle stays in the red zone at the left, there's too much light for a correct exposure and you'll need a higher shutter speed.

### OTHER MG-S FEATURES

A built-in close-up lens is located behind the lens cover for use at the four-foot range. This auxiliary lens is positioned by sliding the bottom half of the split knob all the way across the recessed lens mount. When the close-up lens is in use, a red signal appears at the left in the viewfinder, reminding the user not to take pictures beyond four feet from the camera. For parallax correction with the auxiliary lens in place, frame the subject within the area marked off by the two partial vertical lines at the left side of the bright frame. If you're holding the MG-S correctly, this corresponds with the edge of the red warning signal. When the close-up lens is not completely in or out of position, the shutter locks and will not work until correct positioning is achieved.

Sliding the lens cover in place across the lens serves three purposes; it protects the lens from dam-

age, automatically shuts off the meter circuit to conserve battery energy, and locks the shutter button to prevent accidental release of the shutter that would waste a picture. Like the close-up lens, if the lens cover is not completely open, the shutter will stay locked and unusable.

Flash synchronization is provided at 1/30 second with flash bulbs or flashcubes, or at any speed with electronic flash and the accessory Minolta Strobe Adaptor. The MG-S flash gun is available in either AG-1 or flashcube models and attaches to the camera end by matching the male plug and screw on the gun to the camera's two receptacles, then securing them tightly by turning the screw on the gun.

### THE 16 QT

This impressive looking little performer is the newest Minolta 16 and features a unique "Flashing OK" exposure system that's not only ingenious but quite up-to-date. With only two speeds, shutter selection is simplified: for outdoor daylight photos, the shutter is set at 1/250 second; for overcast days or flash, use the 1/30 second position.

To operate the 16 QT, you must first set the film-speed selector on the camera's face for the ASA rating of your film. Then turn the shutter speed selector index on the camera's top to its correct position (30 or 250) and look through the viewfinder where

**1. QT's focusing lever is underneath the lens on the camera bottom. Moving lever also moves a red indicator in the "Control Center" viewfinder that shows you the exact focus setting without the need of removing your eye from the finder window.**

**2. Minolta Electroflash-P makes an ideal companion for the QT when used with the Strobe Adaptor. This electronic flash unit also fits MG-S and provides a GN of 45 with ASA 100 film. Power is two replaceable AA batteries.**

**3. Minolta 16 II features viewfinder (1), lens (2), shutter speed wheel (3), lens opening wheel (4), wrist strap eyelet (5), shutter button (6).**

**4. MG-S filters also fit QT model. Circular window fits over CdS cell, so exposure compensation for filter is automatic operation.**

**5. Close-up lenses for MG-S and QT are shown with measuring chain.**



same flash guns and same method of attachment.

## THE SYSTEMS APPROACH

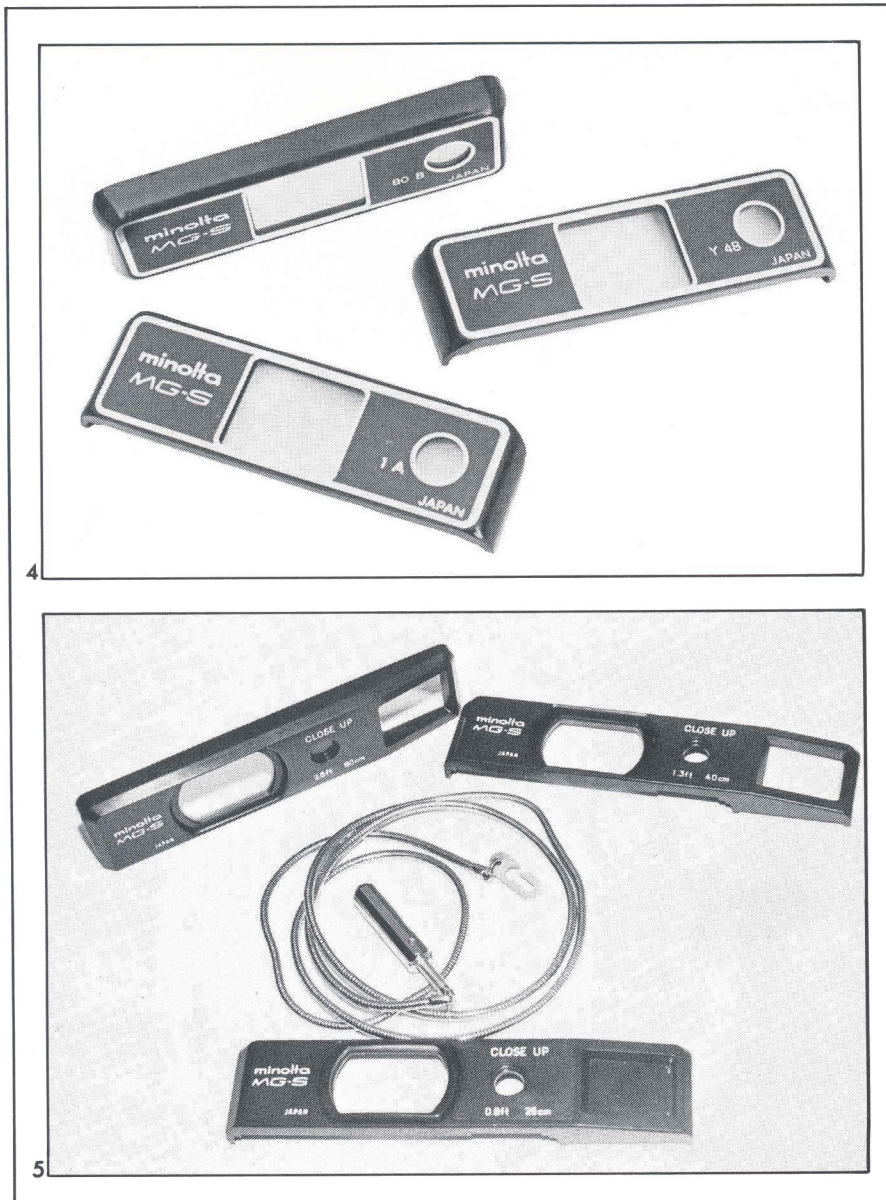
The Minolta pocket camera system is enhanced by the availability of filters and additional close-up lenses beyond those built into the camera. For the 16 MG, Ultraviolet (UV) and Y48 filters are available but exposure correction must be made manually by halving the ASA setting when using the Y48. Although these filters do not fit other Minolta pocket cameras, three others are provided for the MG-S and QT. Each attaches by slide-locking over the camera face and each contains a special filter window to cover the electric eye. As this window filters the light reaching the CdS cell, no exposure compensation or correction is necessary when using a filter.

The clear 1A skylight filter reduces haze and is recommended for use with either color or black-and-white film, especially when photographing distant landscapes, seaside or beach scenes where there's a high percentage of UV rays in the light. The blue 80B filter lets you use outdoor color film inside under artificial lighting while the Y48 yellow filter increases contrast and brightens natural skin tones when used with black-and-white films.

Two accessory close-up lenses, which allow camera use at 2.6 and 1.3 feet, are also provided in addition to the MG-S and QT close-focusing position; there are none for the MG. Both lenses slide-lock over the camera face in the same manner as do the filters, and a corresponding scale chain is used for correct distance measurement from lens to subject. When used on the 16 QT, the camera must be focused at the click-stop medium distance setting.

Two other close-up lenses are available for use with the 16 MG-S and the Minolta copy stand. These let you photograph documents and other small objects at distances of 16 and 10 inches. The two-position copy stand extends automatically to the proper distance for use with each accessory lens—no measurement is necessary when copying. The copy stand has a special head containing a tripod screw to hold the camera and a cable release unit that slips over the shutter button. The versatility of the Minolta pocket camera system is greatly extended by the practical reality of close-up and extreme close-up photography, and other accessories, such as the unique Spy Finder attachment that permits candid shooting from a variety of positions.

Manufactured with a sturdy metal body that fits easily and comfortably in hand, this Minolta 16 series comes



you'll find the control center in operation. There's the bright frame that outlines the lens's field of view, a pair of parallax correction marks at the left side of the bright frame for use when taking portraits and close-ups, four zone focusing symbols, the two "Flashing OK" exposure pointers, and a red slow-shutter warning mark that appears when the 1/30 second speed is in use, reminding you that you must hold the camera steady.

Controlled by an integrated circuit, the "Flashing OK" system uses two pointers that glow a bright orange to show you the correct direction in which to turn the lens setting dial on the camera's top. Push the metal circuit switch on the camera top down and revolve the plastic lens setting dial in front of it. Once the CdS cell determines that a proper exposure has been found, the integrated circuit activates both pointers which then begin to blink, flashing a signal that reads "OK."

Unlike the more expensive MG-S, the 16 QT has a four-position zone focus: infinity (33 feet), medium distance (11 1/2 feet), portrait (6 1/2 feet) and close-up (4 feet). The focusing slide on the bottom of the QT body click-stops at the medium distance setting, but slides continuously between this and the other three positions. As a coupled indicator needle moves to the zone symbol you select at the bottom of the bright frame, you can focus the QT while looking through the viewfinder.

Because of the close-up position in the zone focus range, there's no need for a built-in supplementary lens, as used with the 16 MG-S for head-and-shoulder shots. But the QT does have a sliding lens cover, similar to that of the MG-S, that locks the shutter and shuts off the meter circuit. Like the MG-S, the QT is fully equipped for flash photography, with standard flash bulbs, four-shot flash-cubes or electronic flash, using the



## Minolta Camera System

in a choice of attractive and durable finishes: soft-luster chrome or gold for the MG, a soft-luster silver or a professional-looking all-black exterior for both the MG-S and QT. Until 1972, Minolta also offered two other pocket cameras, the 16 Ps and 16 II. We'll discuss both models here, as the recently discontinued 16 II is still available new in many camera stores, often at an attractive price.

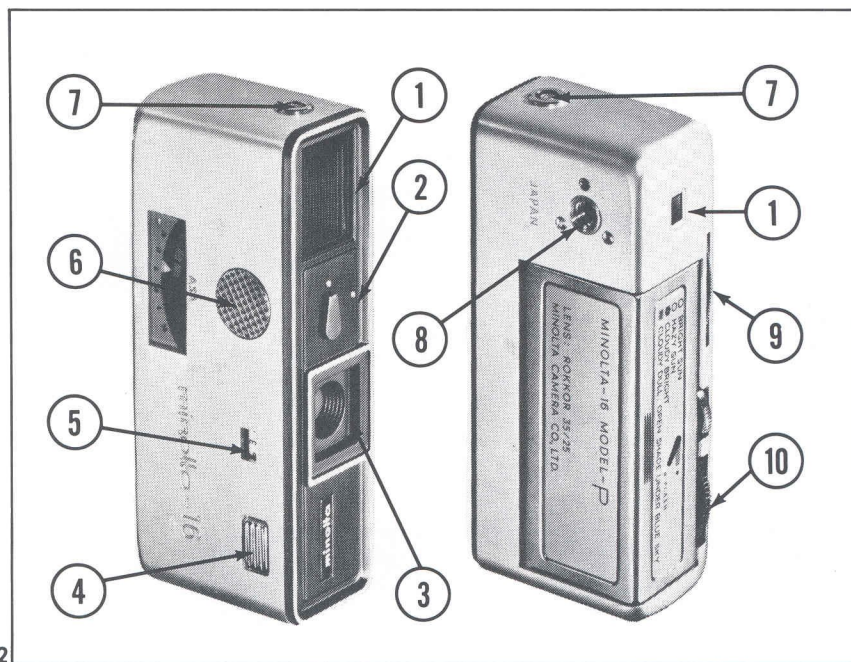
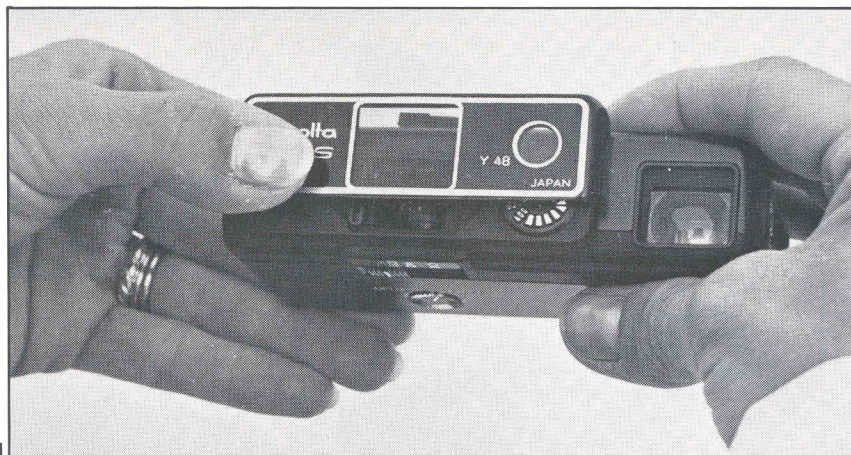
### THE 16 II

The most compact pocket camera Minolta has ever produced, this is the original Minolta 16 design. Completely manual in operation, the 16 II is equipped with a fixed-focus 22mm f/2.8 Rokkor lens and five-speed shutter, with a B setting for long exposures. Negative size is the older 10x14mm format. For carrying, the 16 II telescopes into its own metal case somewhat as does the Minox series. To use, you must first pull the camera out of its case as far as it will go. This extends the body length to a comfortable size for easy handling and exposes both the viewfinder and shutter button. After estimating the correct exposure, the lens and shutter are set by revolving the two milled wheels at the camera's right end. The viewfinder is a standard optical type, lacking the bright frame of the M series. After taking the picture, the film is advanced by pushing the camera back into its case as far as it will go and pulling it out again. This push-pull action also cocks the shutter for the next picture and moves the film counter one notch.

Synchronized for flash at 1/30 second, the 16 II uses the tiny Duofit-S flash gun. A wraparound flash/tripod adapter clamp is provided as an accessory. This carries a shoe on top for the flash and a tripod socket on the bottom. Three color filters (80A, 81B, 1A), two black-and-white filters (UV and Y48) and two close-up lenses complete the basic 16 II outfit.

### THE 16 PS

Minolta's aim-and-shoot pocket camera is an excellent choice for those new to pocket camera photography. Like the 16 II and MG, the Ps takes 10x14mm pictures with its 25mm f/3.5 lens and two-speed (1/30, 1/100) shutter. The longer focal length of the Ps lens will give you a larger image than the other Minolta pocket cameras. Operation of the Ps is also completely manual, but the unique Weather Mark exposure system simplifies pocket camera photography for the user. After loading the camera and positioning the film for the first picture via the knurled wind dial at the back (similar to that of the



M series), the user sets the film-speed-indicator dial to the ASA rating of the film.

The lens is then adjusted according to one of four symbols that represent lighting conditions—bright sun, hazy sun, cloudy bright or cloudy dull—or if a separate light meter is used, at any lens opening between f/3.5 and f/16. Compose the picture in the life-sized enclosed optical finder and depress the shutter button. The shutter speed is then selected by positioning the flash-switch lever at the white dot (1/100 second) for daylight or red dot (1/30 second) for flash photography. All accessories for the 16 II are provided to fit the 16 Ps.

### TAKING FLASH PICTURES

Designed for the novice as well as advanced amateurs, the Minolta pocket camera line offers something for everyone and sufficient accessories are available to extend its versatility beyond the camera's basic capa-

bility. If you've used other adjustable cameras before, you'll find nothing different about flash with the Minolta pocket cameras. All are equipped for flash photography and are used in essentially the same way. Those models with built-in meters are disconnected from the electric eye for flash photography and the user then selects the correct lens opening for a proper exposure. This is accomplished by a series of "guide numbers" (GN) assigned to each film for use with flash bulbs or flashcubes. You'll find this number on the instruction sheet packaged with the film or on the bulb/cube carton.

To find the correct exposure, divide the GN by the distance in feet between flash and subject. Thus if you're taking a picture 10 feet from the subject and the film has a GN of 80, the lens must be set at f/8. While not as convenient as the electronic shutter and focus-linked exposure control on the Kodak Pocket In-





**1. Fitting a filter or close-up lens to Minolta pocket cameras is quick and simple — just slide into place as shown.**

**2. Minolta 16 Ps features viewfinder (1), flash switch lever (2), lens (3), shutter button (4), exposure counter (5), ASA index dial (6), flash contact (7), tripod socket (8), weather mark exposure dial (9), film advance (10).**

**3. Ideal for medium-close photos, the 16 QT with Electroflash-P was used here. Note even light distribution throughout picture area.**

**4. Available in five emulsions, Minolta film cartridges are packaged in plastic boxes for protection. Load and unload in subdued light to prevent fogging.**



stamatic cameras, this system does allow the user a degree of creative control lacking in the fully automatic flash system.

In addition to the use of bulbs and cubes, Minolta offers a Strobe Adaptor to mount its tiny Electroflash-P to the MG-S and QT cameras. Ideal for pocket camera use because of its small size, this inexpensive electronic flash delivers about one-half the amount of light provided by a flash-cube and lets you take head-and-shoulder pictures without overexposing the subject. Using the Minolta color print film (ASA 80) with a flash-cube at a distance of four feet, the correct lens opening is  $f/25$ , but as the camera lens only stops down to  $f/16$  this means a gross overexposure—too much light will reach the film and wash out highlights. But with the handy Electroflash-P instead of the cube, the proper lens opening is  $f/11$ , well within the camera's capability.

Another advantage of the electronic flash is its short ( $1/2000$  second) duration that will stop any action in the picture where use of a cube at  $1/30$  second might result in a blurred subject. If you shoot many flash pictures, this diminutive electronic unit can save you considerable money in a short time, since its total cost is less than that of 24 packages of cubes.

#### MINOLTA 16 FILM CARTRIDGES

Cartridges of Minolta film are conveniently packaged in small plastic containers for easy carrying and are used in all Minolta pocket cameras regardless of whether they take the older  $10 \times 14$ mm or the now-universal  $12 \times 17$ mm pictures. The boxes in which the film is sold are color-coded according to film type and contain an exposure recommendation sheet.

To load all Minoltas, open the film chamber cover and simply drop the cartridge in place. Like the 100 Pocket Instamatic cartridge, one end of

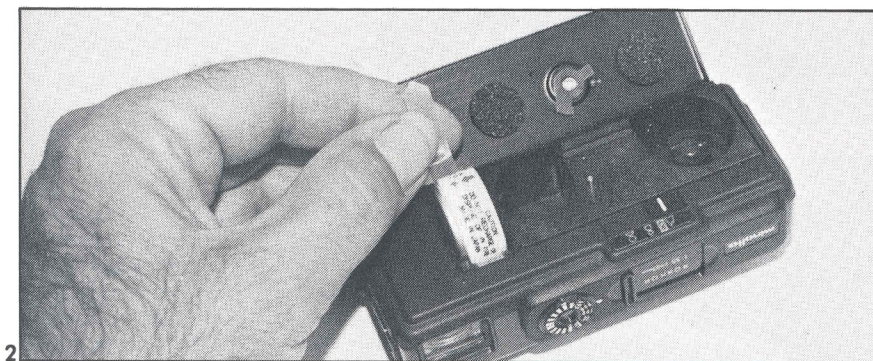
the Minolta cartridge is oversize so there can be no mistake in loading—it will only fit in one way. If the cartridge does not slip completely into place, press it down while turning the film advance slightly to let the advance mechanism engage the cartridge. It will then drop the rest of the way into place. Close or replace the film chamber door (depending upon camera model) and set the camera's film speed dial to correctly program the meter (not necessary with the 16 II). Advance the film and release the shutter three times or until the exposure counter reads 18 (20 with the 16 II and Ps). Each time you take a picture and wind the film, the counter will decrease by one number, indicating the remaining number of pictures to be taken.

One word of caution here: all Minolta loads customarily make no provision for a trailer after the final exposure. If the processing lab splices your film to another for developing in

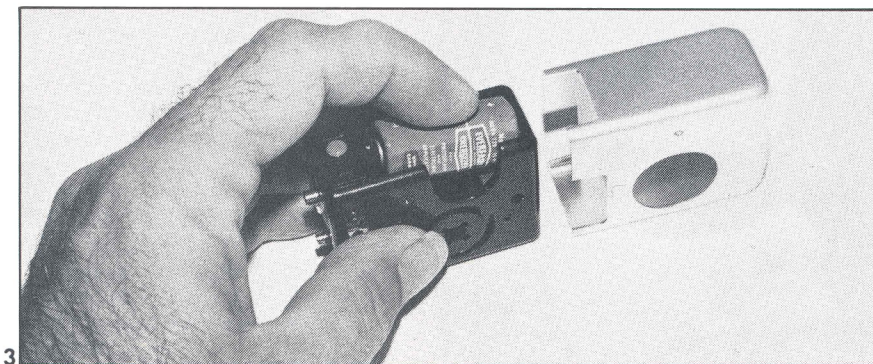




1



2



3



4



5

## Minolta Camera System

a continuous processing machine, it will spoil that last picture. I've found that you can safely take pictures after advancing the film only two frames. This places the exposure counter at one dot beyond 18. When the counter reads 1, you will have taken 18 pictures; don't take that 19th and you'll have almost a full inch of film at the end to protect the final picture against that happening, while still getting the full number of pictures.

Easily reloaded with single-perforated 16mm film, Minolta cartridges give their owners the option of using a number of more exotic emulsions, such as infrared for special effects (you'll have to improvise a red filter), high-contrast copy film or color emulsions not generally available to the pocket camera user. Investigate the various film possibilities with your

dealer and in another section, I'll show you how to reload your own.

### BATTERY CONDITION AND REPLACEMENT

As the MG is equipped with a selenium meter, it needs no battery power to operate the exposure control system. The QT requires a 3-volt Mallory alkaline PX-30 or equivalent; the MG-S uses a much smaller 1.3-volt PX-675 mercury battery. Both are positioned inside and to the right of the film chamber and, since there is no provision for checking battery strength, should be replaced every year. If you remember to slide the lens cover into position each time you finish taking pictures, either battery will easily last a year. If you do not use the camera for extended periods, such as a month or more, remove the battery and store it in a cool dry place to prevent corrosion from injuring the terminal contacts. As these batteries generally exude an

**1. Cartridge drops in place for instant loading. Like 110 cartridge, it cannot be inserted incorrectly.**

**2. Battery replacement for 16 QT should be done once a year as standard practice as there is no battery check on camera.**

**3. AG-1 and cube flash guns both use 15-volt battery. Replace as shown when you renew the camera battery.**

**4. MG-S (top) must be held differently than QT, as shown. Brace against nose bridge and sight with left eye. Pull elbows into your side to further steady the camera. Looks awkward, but you'll find it's really quite comfortable.**

**5. For vertical pictures, brace camera against nose and press in on cheekbone. Adopt a position that is comfortable for you, but make certain that the lens and CdS cell for meter are not covered by your fingers.**



ashlike coating when in use, it's a good idea to periodically remove them for cleaning with a soft dry cloth to restore perfect contact when in operation.

All Minolta flash guns use the standard 15-volt Mallory M-504 battery or equivalent. While it's a good idea to replace it at the same time as the camera's battery, this really depends upon how much you use the flash. To check its battery condition, connect the unit to the camera and insert a bulb or cube. Press the flash test button on the back of the gun; if bulb and battery are O.K., the orange test lamp will light up. If you encounter problems with the flash, check to make sure you've inserted the battery properly, with the + side of the battery against the + contact of the gun. Like the meter battery, it's a good idea to remove and store the flash gun battery if you're not going to use the unit for a month or more.

## PICTURE TAKING

Taking sharp pictures with your Minolta is easy, provided you hold the camera correctly. For horizontal pictures, I've found that sighting through the viewfinder with the left eye and bracing the camera across the bridge of the nose offers the most support in holding the camera steady. It's also considerably more convenient than the method suggested in the Minolta owner's manual supplied with each camera. For vertical pictures, the left eye is again used. Hold your camera as shown and push it firmly against the nose with the left hand.

Regardless of how you choose to hold the Minolta, remember these important points. As the camera is very compact, you must be careful not to cover the lens or CdS cell with your fingers while taking a picture. Unlike the Kodak Pocket Instamatics, the shutter button on all Minoltas requires only a light touch to release; squeeze

it very gently with your index finger, particularly when the camera is set at the 1/30 second speed. Using ASA 320 film, you can take pictures under available light without flash. But to do so, you'll have to use a camera setting of 1/30 or 1/60 second at f/2.8, so pick your subjects carefully, as depth of field is limited when the lens is opened to its maximum speed.

To get the best results with your Minolta pocket camera, I suggest that you practice holding the camera, manipulating the controls and releasing the shutter button until you feel completely comfortable with it before loading that first film cartridge. This first and most important step on the path to good pocket camera photography gives you an opportunity to correct bad habits that would otherwise ruin your pictures, and it helps to insure many enjoyable years with a faithful, constant companion that's always by your side



## SPECIFICATIONS

### MINOLTA 16 QT

<b>LENS:</b>	Minolta Rokkor 23mm f/3.5 in 4-position zone focus mount; 4 feet to infinity
<b>SHUTTER:</b>	Mechanical with speeds of 1/30 and 1/250 second; X flash sync; semi-automatic diaphragm control by CdS electric eye
<b>FILM/FRAME SIZE:</b>	Minolta 16 cartridge, 18 exposures; 12x17mm
<b>VIEWFINDER:</b>	Bright frame with parallax correction marks; IC over-/underexposure lamps; "Flashing OK" exposure signal; focus setting and red slow-shutter warning are all visible in viewfinder
<b>EXPOSURE METER:</b>	CdS cell coupled to shutter and film-speed setting
<b>MEASURING RANGE:</b>	EV8.5 to EV17 with films speeds ASA 25 to 400
<b>FILM ADVANCE:</b>	Knurled wheel automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Built-in lens cap turns off meter switch; automatic resetting film counter; 4-zone focusing symbols from 4 feet to infinity; click-stop for fixed focus at 11 1/2 feet; tripod socket; wrist strap
<b>SIZE/WEIGHT:</b>	4 1/4x1 1/8x1 3/4 inch; 5.25 ounces

### MINOLTA 16 MG

<b>LENS:</b>	Minolta Rokkor 20mm f/2.8 in fixed focus mount; 5 feet to infinity
<b>SHUTTER:</b>	Mechanical with speed range of 1/30 to 1/250 second; X flash sync; built-in exposure meter cross-coupled to lens diaphragm by match needle
<b>FILM/FRAME SIZE:</b>	Minolta 16 cartridge, 20 exposures; 10x14mm
<b>VIEWFINDER:</b>	Bright frame with parallax correction marks
<b>EXPOSURE METER:</b>	Selenium cell cross-coupled to programmed shutter
<b>MEASURING RANGE:</b>	EV8 to EV16 with film speeds ASA 25 to 400
<b>FILM ADVANCE:</b>	Knurled wheel automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Built-in lens cap and close-up lens with warning signal; automatic resetting film counter; cordless flash gun contact; tripod socket; wrist chain
<b>SIZE/WEIGHT:</b>	4 1/8x1 1/8x2 5/8 inch; 5.6 ounces

### MINOLTA 16 II

<b>LENS:</b>	Minolta Rokkor 22mm f/2.8 in fixed focus mount; 6.6 feet to infinity
<b>SHUTTER:</b>	Mechanical with speed range of 1/30 to 1/500 second; X flash sync
<b>FILM/FRAME SIZE:</b>	Minolta 16 cartridge, 20 exposures; 10x14mm
<b>VIEWFINDER:</b>	Enclosed optical glass
<b>EXPOSURE METER:</b>	None
<b>MEASURING RANGE:</b>	None
<b>FILM ADVANCE:</b>	Push-pull action automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Self-contained in metal carrying case; automatic film counter; wrist-strap eyelet
<b>SIZE/WEIGHT:</b>	3 1/8x15/16x1 3/8 inch; 5.3 ounces

### MINOLTA 16 Ps

<b>LENS:</b>	Minolta Rokkor 25mm f/3.5 in fixed focus mount; 4.7 feet to infinity
<b>SHUTTER:</b>	Mechanical with speeds of 1/30 and 1/100 second; M flash sync
<b>FILM/FRAME SIZE:</b>	Minolta 16 cartridge, 20 exposures; 10x14mm
<b>VIEWFINDER:</b>	Enclosed optical glass
<b>EXPOSURE METER:</b>	None
<b>MEASURING RANGE:</b>	None
<b>FILM ADVANCE:</b>	Knurled dial automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Automatic film counter; tripod socket; wrist-strap eyelet
<b>SIZE/WEIGHT:</b>	4 1/16x1 1/16x1 5/8 inch; 4.2 ounces

### MINOLTA 16 MG-S

<b>LENS:</b>	Minolta Rokkor 23mm f/2.8 in fixed focus mount; 5 feet to infinity
<b>SHUTTER:</b>	Mechanical with speed range of 1/30 to 1/500 second; X-flash sync; locks automatically at over- or underexposure
<b>FILM/FRAME SIZE:</b>	Minolta 16 cartridge, 18 exposures; 12x17mm
<b>VIEWFINDER:</b>	Bright frame with parallax correction marks; over- or underexposure warning signal visible in finder
<b>EXPOSURE METER:</b>	CdS cell coupled to shutter and film-speed setting
<b>MEASURING RANGE:</b>	EV8 to EV17 with film speeds ASA 25 to 400
<b>FILM ADVANCE:</b>	Knurled wheel automatically cocks shutter; double exposure prevention
<b>OTHER FEATURES:</b>	Built-in lens cap turns off meter switch; automatic resetting film counter; f-number scale on top of camera; tripod socket; wrist strap
<b>SIZE/WEIGHT:</b>	4 1/4x1 1/16x1 3/4 inch; 7.4 ounces



# The Mighty Mite

## THE MINOX SYSTEM

No discussion of pocket camera photography would be complete without consideration of the Minox; after all, this is the granddaddy of the modern pocket camera and dates back some three and one-half decades to its origin in Riga, Latvia. Unlike other cameras with such a lengthy lineage, the present Minox cameras retain virtually all those features that made their predecessors a favorite of such diverse interests as businessmen, scientists and sports fans, as well as camera buffs. Currently, there are two models in production, the electronic automatic Minox C and the semiautomatic match-needle Minox BL, which recently replaced the older Minox B.

### MINOX C

The first transistorized pocket camera with electronic exposure automation, the Minox C is fitted with the same critically corrected focusing four-element 15mm f/3.5 Minox Complan lens used on other recent Minox cameras, and like them, the Complan on the Minox C is permanently set at its f/3.5 opening. The camera's only exposure variable is the choice of shutter speed. While its very short focal length has a great depth of field, the Complan can be accurately focused down to eight inches, making the camera suitable for a wide variety of photographic situations, including microcopy work.

The Complan is unique in that absolute overall sharpness is obtained by the use of a concave film plane. While most other cameras try to reproduce the image on a flat surface, the Minox film lies in a curved plane where the sharpest image is formed. By only partially correcting the "curvature error" in the lens itself, other problems in lens design have been solved by Minox with a high degree of success. Obviously, trying to enlarge Minox negatives with a conventional enlarger lens will not be completely successful; for best results, you'll need the Minox Enlarger Model II, whose negative carrier duplicates the concave film plane for maximum sharpness in the projected image.

### AUTOMATIC EXPOSURE CONTROL

Equipped with a tiny solid state computer, guided by an ultrasensitive

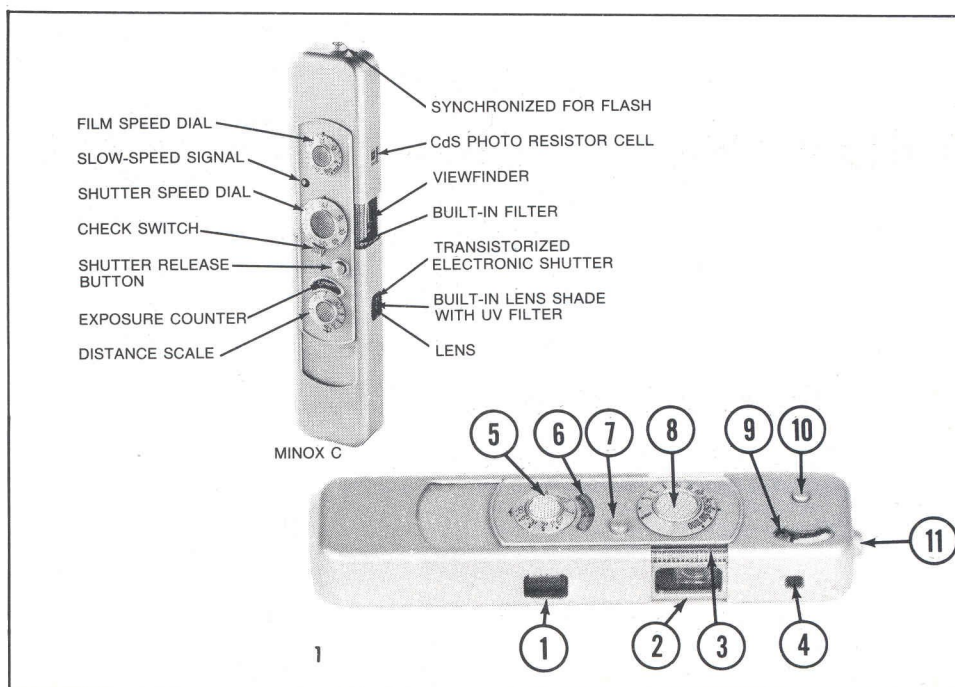
CdS photo resistor cell and aided by diodes, minute electromagnets and condensers, the metallic sliding blade shutter mechanism automatically times correct exposures from 1/1000 to seven seconds. After setting the ASA index dial for the speed of film in use, you need only aim the Minox C at the subject—electronics do the rest. When the shutter button is depressed, the shutter opens and the computer goes to work instantaneously; the CdS cell measures the brightness of the scene and as soon as sufficient light has reached the film, the solid state circuitry closes the shutter.

For flash pictures and other unusual situations (such as back-lighted subjects), you can override the automation system and manually set your own shutter speeds between 1/15 and 1/1000 second. When the camera is used on the A or automatic position, the shutter has an infinite speed range—the speed selected by the camera may be 1/67, 1/278 or 1/365 second—but no intermediate speeds are available when used on manual. You can only choose one of the seven marked speeds.

A slow speed check switch should be used before taking pictures under

poor light conditions since the Minox C gives no indication of the shutter speed selected. If the light signal goes on when you activate the switch, use a tripod or other firm support before taking the picture, as the required shutter speed is 1/30 second or less.

Under extremely bright lighting conditions (like beach or snow scenes) or when using faster films, the top speed of 1/1000 second may not be great enough to give a correct exposure with the f/3.5 lens. In such cases, a built-in neutral density (ND) filter can be positioned in front of the lens. By increasing the required exposure four to six times, the ND filter brings the scene within control of the automatic exposure range of the electronic shutter. In addition to the sliding ND filter, the Minox C also contains a built-in ultraviolet (UV) filter that serves as a protective lens window. Three slip-on filters are provided as accessories for use with the Minox C—Green for black-and-white work, Skylight (R3) for taking color pictures under a blue noonday sun and Color Correcting (R6) for taking color pictures in the shade. Each automatically corrects the electronic exposure system to compensate for its respective factors.





## FILM ADVANCE

The Minox film advance is a telescopic push-pull action. Grasp the camera at each end and pull it open to expose the lens and viewfinder. This action cocks the shutter and advances the film one frame. With earlier Minox models, if you decided not to take a picture and closed the camera by pushing both ends toward the center, that picture was wasted, as reopening the camera transported a new frame of film into position. But a freewheeling clutch has been incorporated into the push-pull film advance of the Minox C. This disengages the advance gear train unless the shutter button has been depressed. With the Minox C, it is now possible to open the camera and close it without taking a picture and losing that frame of film. Those who are familiar with Minox cameras will especially appreciate this feature—no more running a whole cartridge of film through the camera without taking a picture, and no more taking pictures just to prevent wasting film.

Previous Minox cameras used an additive exposure counter numbered to 50 and films were packaged in both 36 and 50-exposure loads. If you switched back and forth between the two lengths, there was always the possibility of forgetting whether you should stop at 36 or go on to 50, but a new exposure counter on the Minox C eliminates any uncertainty about the film length or the number of unexposed frames still left in the camera. The redesigned subtractive counter is preset for 15 or 36 exposures when loading the film and as each picture is taken, the counter

subtracts until it reaches 0, indicating that the final exposure has been taken. By using the 36-exposure cartridges only, the counter remains automatically set for the new cartridge when the exposed load is removed.

## FILM LOADING

Film loading is much the same as with previous models, but it has been simplified in the Minox C. With older Minox cameras, it was necessary to open the camera film chamber and then push the two ends of the camera together about 1/8-inch to manually open the film gate before inserting or removing a film cartridge. But once the Minox C is opened all the way for loading, the film gate opens automatically to release the exposed cartridge and accept the fresh one. If the new cartridge doesn't drop flush into the camera, the take-up core of the cartridge is probably resting on the film transport teeth. Just lift the cartridge out and turn the three-toothed wheel in the film compartment slightly, then reinsert the film.

## THE MINOX VIEWFINDER

The bright frame inside the viewfinder window shows you the exact picture area and automatically corrects for parallax at all distances. When working extremely close-up (8-10 inches), the film image in the camera is smaller than that shown by the viewfinder image by about one frame line on all four sides.

## BATTERY CHECK AND REPLACEMENT

To operate the automatic exposure control system, the Minox C uses a Mallory PX-27 (or equivalent) battery. This is housed inside the top of the

camera above the ASA index dial. To check battery condition, set the shutter speed dial manually to 1/1000 second and press the shutter button. If the small circle in the lens window does not disappear, the shutter is not working and the battery must be replaced. Be sure to use the 1/1000 second setting, as a nearly exhausted battery may be sufficiently strong to operate the camera at slower speeds. To replace the battery, open the camera as for film loading and pull up on the flexible strip in the battery chamber. Make sure that the + and - poles of the fresh battery match up with the positions indicated on the flexible strip.

## MINOX BL

Essentially the same as the older Minox B, the Minox BL uses a built-in CdS cell coupled to an infinitely variable shutter instead of the selenium meter and mechanical shutter of the Minox B. As the Minox BL is similar to the Minox C in all respects other than the exposure control system, I'll avoid duplication by describing only those operations that differ from the Minox C or the earlier models.

The ASA index dial is positioned on the underside of the camera and should be set to correspond with the speed of the film in use. To use the Minox BL, sight through the viewfinder and hold the meter button down for two or three seconds, taking care not to cover the meter window. As the meter is of the center-weighted variety, aim the center of the viewfinder at the most important portion of the subject to take the reading, even if you plan on composing the picture differently when actually making the exposure.

Release the button to lock the meter needle in its position, then lower the camera from your eye. Turn the shutter speed dial until the red pincer in the meter window brackets the black meter needle. This sets the shutter speed for correct exposure.

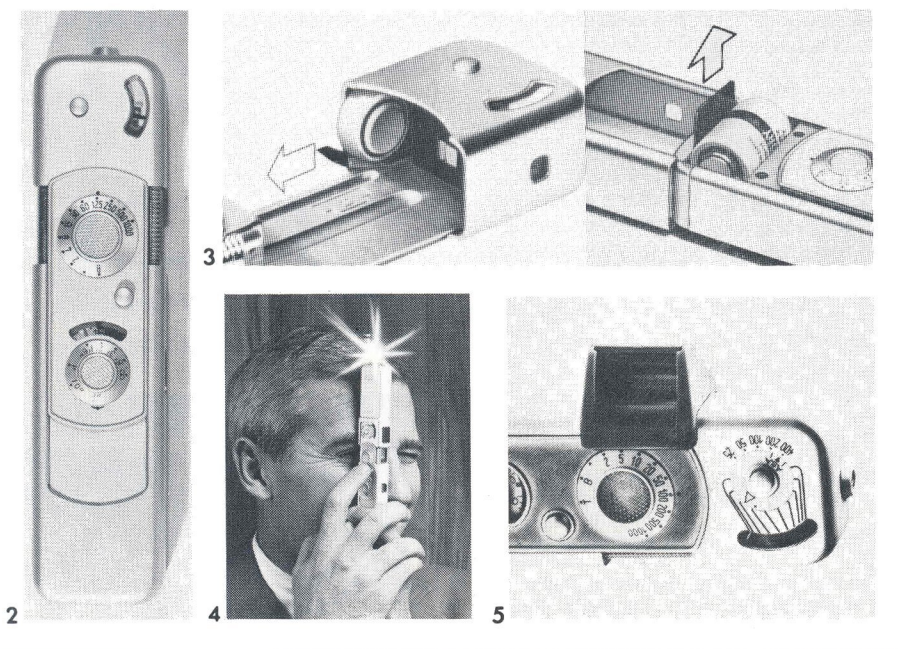
**1. Minox BL features CdS meter cell window (1), viewfinder (2), filter/battery test lever (3), lens (4), distance scale (5), exposure counter (6), shutter button (7), speed dial (8), meter field and button (9 & 10), flash post (11).**

**2. Top view of Minox BL shows slim lines of pocket camera.**

**3. Minox BL battery chamber is behind meter (left); Minox C battery chamber is much more accessible (right).**

**4. Minox B/C flash gun fits older Minox B (left) as well as newer BL and C models. Similar Cube Flasher C4 is also available.**

**5. Right-angle finder attaches to Minox for candid photos "around the corner." Mirrors for the older B (shown here) and IIS do not fit BL and C cameras.**





## The Mighty Mite Minox

As the Minox BL has an infinite speed range from 1/2 to 1/1000 second, the shutter speed dial will often come to rest between the engraved numbers. The speed being selected by the camera will be somewhere between the two numbers and while you won't be able to tell exactly what it is, it'll be precise for the subject at hand.

When the black needle is in the meter's gray zone at the right side of the window, the Minox BL is telling you that the light is too intense for even the 1/1000-second speed—the ND filter must be positioned in front of the lens and a new reading taken. If bracketing the needle results in a marked shutter speed of 1/30 second or less, use a tripod or other firm support to avoid blurring the picture; when indoors, use flash. If the pincer and needle intersect at the dot between 1/2 and B on the speed dial, the required exposure is one full second. Use the B setting and hold the shutter button down for one second. When the needle reaches B before the pincer brackets it, the exposure required is longer than one second and cannot be read by the meter.

The CdS meter in the Minox BL is powered by a Mallory PX-675 (or equivalent) battery with a normal life span of one year. To check battery condition, turn the shutter speed dial until a small black check mark can be seen at the edge of the meter field. Then push the ridged sliding lever that positions the ND filter toward the meter cell while holding the meter button down. If the black indicator needle does not move into or to the right of the check mark, the battery needs to be replaced.

This is done by opening the camera as you would for film loading. Pull up the red end of the flexible strip in the battery chamber to remove the old battery. When sliding the new one into place onto the red strip, make sure that the position of the + and - poles corresponds to the symbols on the inside of the camera cover.

### FLASH PICTURES

The Minox C and Minox BL are both synchronized for use with flash bulbs or cubes at 1/30 second and below, or with electronic flash at speeds of 1/250 second and slower. As the Minox flash contact is a standard PC terminal positioned at the left end of the camera (or top, depending upon how the camera is held), you can use any flash unit with a PC connector; but Minox provides a variety of highly efficient, compact units that match the cameras in styling while connecting automatically.

A B/C (battery capacitor) unit is available for use with AG-1 bulbs and the Cube Flasher C 4 accommodates four-shot flashcubes, but the cube must be positioned manually after each picture. The ME-1 electronic flash consists of a tiny flash head and a small power pack with built-in nicad batteries that hold up to 160 flashes on one charging. A thin flexible power cable connects the two.

An even more compact unit, the ME-2 is a self-contained computerized unit that adjusts the flash duration to the brightness and distance of the subject. Just match the ASA dial of the ME-2 to that of the film in use and the flash does the rest. By switching off the ME-2's automation system, the unit then operates as a normal electronic flash with a guide number of 36 (ASA 25).

Unlike cameras with a variable diaphragm, you cannot control flash exposure with the Minox by adjusting the lens opening. With the B/C or C 4 units, Minox users are restricted to a flash "zone" as shown in Table 1. Good results can be obtained if you follow the zone recommendations. If you are using a Minox C for flash pictures, be certain to move the shutter speed dial off the A position and to a speed of 1/250 or below.

Both Minox electronic flash units offer more control over exposure than do flashcubes. With its flash range switch that controls both light output and intensity, the ME-1 lets you reduce power to move closer to the subject. A scale connected to the switch reads the proper distance in feet from flash to camera. The newest and most convenient, the ME-2's computer control lets you flash away without worrying whether or not you're in the right "zone" by automatically varying the duration of the flash according to the subject and its distance from the camera.

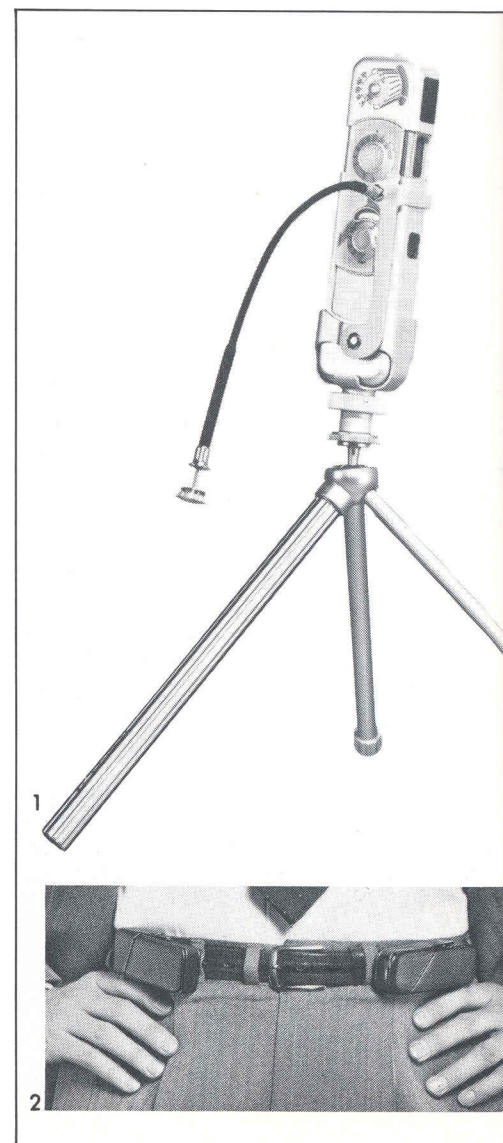
### PICTURE TAKING

Like any other pocket camera, you must hold the Minox firmly and very steady when taking pictures. Place both thumbs on the bottom of the camera and your fingers on its top. This assures that the lens, viewfinder and meter cell remain unobstructed. Inadvertently covering the lens results

in a partial or complete shadow across the picture area, while obstructing the meter cell leads to an incorrect exposure. Sighting through the viewfinder with your left eye, steady the camera across the bridge of your nose and press inward to brace the camera firmly while taking the picture. This brings your hands against the cheek and forehead, adding to the stability of the camera during exposure.

A normal tendency when using any pocket camera is to spread your arms and elbows outward. Because of its very small size, this is especially true of the Minox. But practice holding your arms so that the elbows are braced against your chest. While this position may seem a bit awkward at first, you'll soon find it both natural and a great help in holding the camera steady. Remember, camera movement is bad enough with a 12x17mm negative, but you can't afford even a tiny jiggle with the 8x11mm Minox negative.

Once you've brought the Minox



**1. Minox pocket tripod with adapter unit can be used for close-up photography or simply to hold camera steady under low-light conditions.**

**2. Minox belt case protects little camera while carrying.**

**3. Film speed dial is on bottom of BL.**

**4. Versatility of Minox accessory system is demonstrated by telephoto/binocular clamp, giving Minox owners the capability of long-distance photography.**



into position correctly, frame your picture in the viewfinder's bright frame rectangle and gently squeeze the shutter button downward. As the button requires a very light pressure to trip the shutter, it's best to place your index finger close to the button while composing the picture. Then when you're ready to shoot, take a deep breath and hold it while you roll your finger onto the shutter button. Keep the camera to your eye until you've heard the soft click of the shutter, indicating that the exposure has been completed.

## THE MINOX SYSTEM

Just as "clothes make the man," so accessories make the camera, and no pocket camera has a greater number available for its use than the Minox, making it a true pocket camera system instead of just another small camera. If you want to do copy work, there's the Minox pocket tripod, camera clamp and copy stand. Distant subjects can be brought right into your backyard with the Minox binocu-

lar attachment and a good pair of glasses. Candid photos are easy with the right-angle mirror attachment.

For color photography, Minox provides 30x30mm slide mounts, slide files, slide magazines for use with its Minotact and HP24 projectors and a transparency viewer/magnifier with film cutter. Home darkroom fans will appreciate the Model II enlarger, daylight developing tank, premeasured vials of ultrafine grain developer concentrate and negative wallets.

While my consideration of the Mi-

nox line has been restricted to the current models and is greatly condensed because of space requirements, there are several good books available dealing solely with the Minox and its applications. For further information in greater depth, I suggest you refer to *Small Minox—Big Pictures* by Rolf Kasemeier, or to the current edition of Joseph D. Cooper's *The Minox Manual*. Both are highly readable and practical in their approach to fully utilizing the potential of the Mighty Mite.

TABLE 1

MINOX ZONE FLASH TABLE  
(Set camera at 1/30 second shutter speed)

	ASA 25	ASA 50	B&W PLUS-X	ASA 20	COLOR ASA 80
Number of feet Without filter	3-15	4-17	20-26	5-10	7-12
Number of feet With ND filter	1-3	2-6	10-15	2-4	4-7

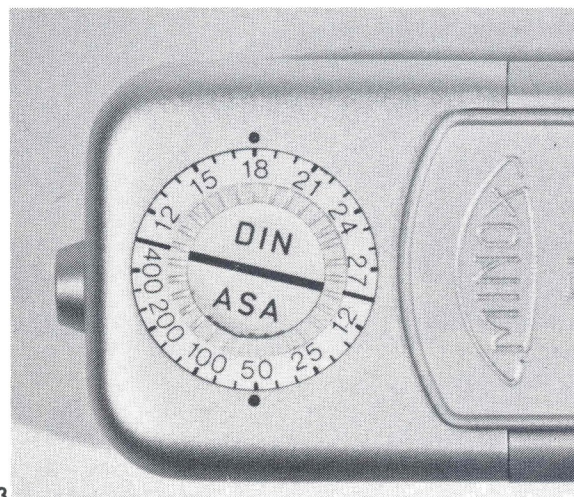
## SPECIFICATIONS

### MINOX C

- LENS:** Minox Complan 15mm f/3.5 in continuous focusing mount from eight inches to infinity
- SHUTTER:** Electronic with speed range of 1/1000 to seven seconds; X flash sync; coupled to lens by electric eye
- FILM/FRAME SIZE:** Minox cartridge, 15 or 36 exposures; 8x11mm
- VIEWFINDER:** Bright frame with automatic parallax correction
- EXPOSURE METER:** CdS cell provides fully automatic exposure control; uses PX-27 battery
- MEASURING RANGE:** ASA 6 to 400
- FILM ADVANCE:** Telescopic body action cocks shutter and transports film; double exposure prevention
- OTHER FEATURES:** Manual override of CdS cell, slow speed check switch, built-in neutral density and UV filters, subtractive exposure counter

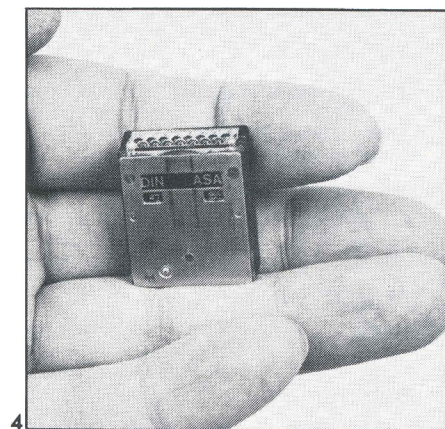
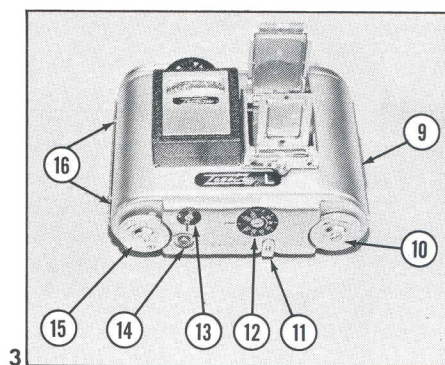
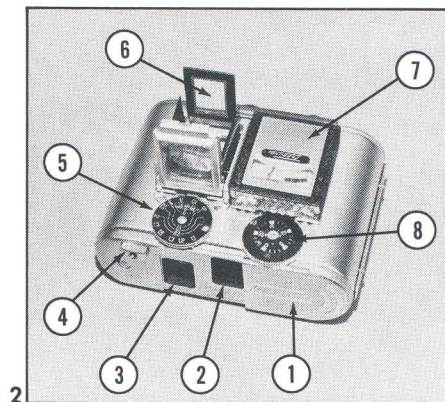
### MINOX BL

- LENS:** Minox Complan 15mm f/3.5 in continuous focusing mount from eight inches to infinity
- SHUTTER:** Infinitely variable with speed range of 1/1000 to 1/2 second; X flash sync; coupled to CdS meter
- FILM/FRAME SIZE:** Minox cartridge, 15 or 36 exposures; 8x11mm
- VIEWFINDER:** Bright frame with automatic parallax correction
- EXPOSURE METER:** CdS cell match-needle meter for semiautomatic exposure control; uses PX-675 battery
- MEASURING RANGE:** ASA 12 to 400
- FILM ADVANCE:** Telescopic body action cocks shutter and transports film; double exposure prevention
- OTHER FEATURES:** Battery test circuit, built-in neutral density and UV filters, full manual shutter control possible, subtractive exposure counter
- SIZE/WEIGHT:** Minox C—1 1/8x4 3/4x5/8 inches; 4 ounces Minox BL—1 1/8x3 15/16x5/8 inches; 2 3/4 ounces.





# 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



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).**

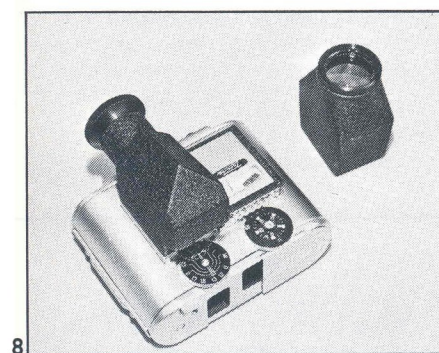
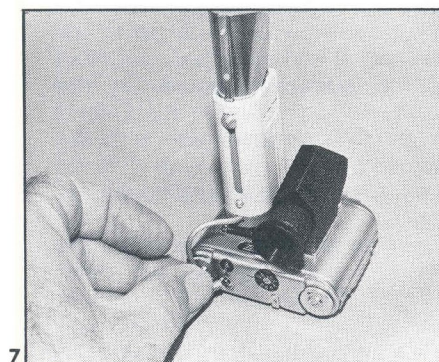
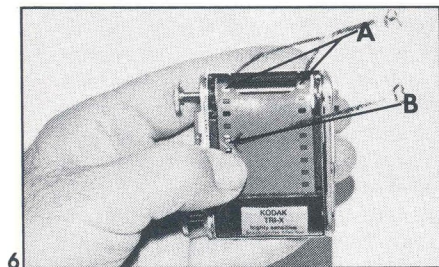
**4. Before using the Tessina in its cross-coupled mode, turn the milled dial below the meter cell until the ASA index of the film can be seen in the ASA window. Then set the lens opening dial to f/4 and slide the meter in place until it locks.**

**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 in to 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.**



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,



## 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-spoiled 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

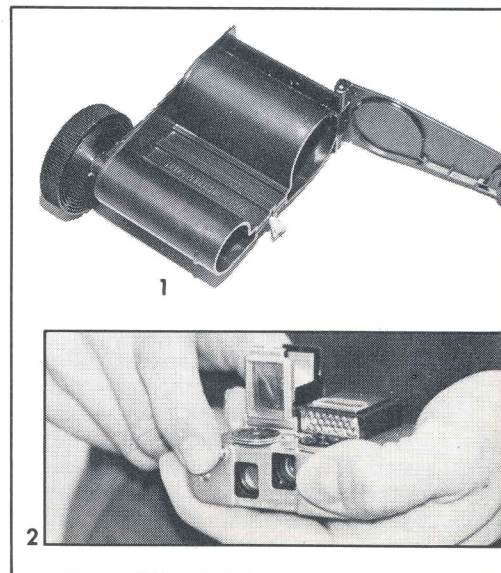
the flash. Be sure to plug the short connector cord into the PC receptacle. With its tiny reflector that slides into the unit when not in use, the Emolux is an ideal choice for pocket camera use with the Tessina; it accepts AG-1B bulbs and is powered by a standard 15-volt Mallory M-504 (or equivalent)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





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.

## SPECIFICATIONS

### TESSINA 35L

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

## 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.

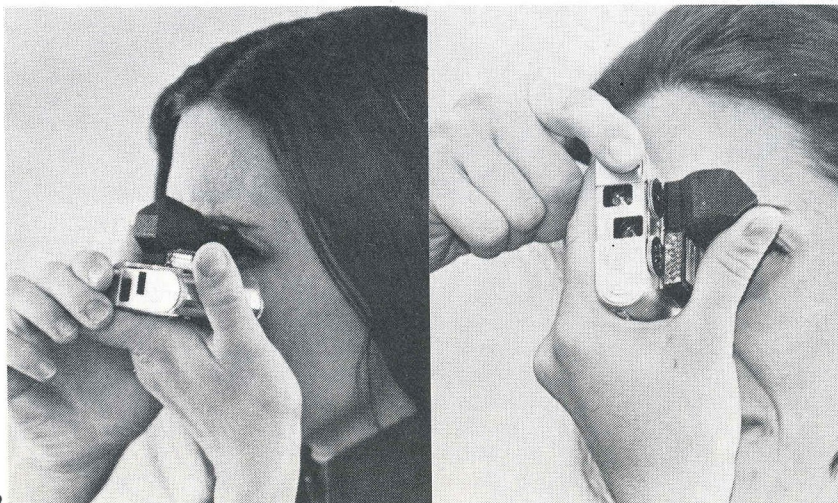
Horizontal pictures are easiest with the prismfinder. Cup your hand as if you were going to hold the camera for a waist-level shot, then turn the camera on its side with the thumb resting on the prism roof and the fingers along the camera bottom. Sighting with the left eye, press the Tessina against 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.

**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.**





# The Yashica Atoron

**Y**ashica has been in the pocket camera business for some two decades now and while several of its designs are no longer current, the company still packages film for them. The present Yashica pocket camera offering consists of two rather sophisticated models: the Atoron and the Atoron Electro. Both have enjoyed success wherever they're sold but as Yashica's marketing effort seems to be concentrated mainly in the Eastern United States, the cameras are not as widely available as they should be. Although few photo dealers stock the films packaged by Yashica, both Atoron models accept the Minox cartridge. This interchangeability gives Atoron owners the same wide selection of emulsions developed for the Minox. Negative size is the same 8x11mm format as the Minox and any Minox processing laboratory can develop and print the Atoron negatives. As Minox labs have offered the most consistent quality of pocket camera darkroom work over the years, this is also an asset for Atoron users.

## YASHICA ATORON

The Atoron is comparable to and competitive with the now-discontinued Minox B in many respects. A match-needle selenium exposure meter is coupled to a programmed shutter-diaphragm. Aligning the meter's indicator needle with the exposure follow-pointer selects a shutter speed/lens opening combination for correct exposure. Shutter speeds range from 1/45 to 1/250 second and Bulb; the fixed-focus 18mm Yashinon f/2.8 lens closes down to f/16.

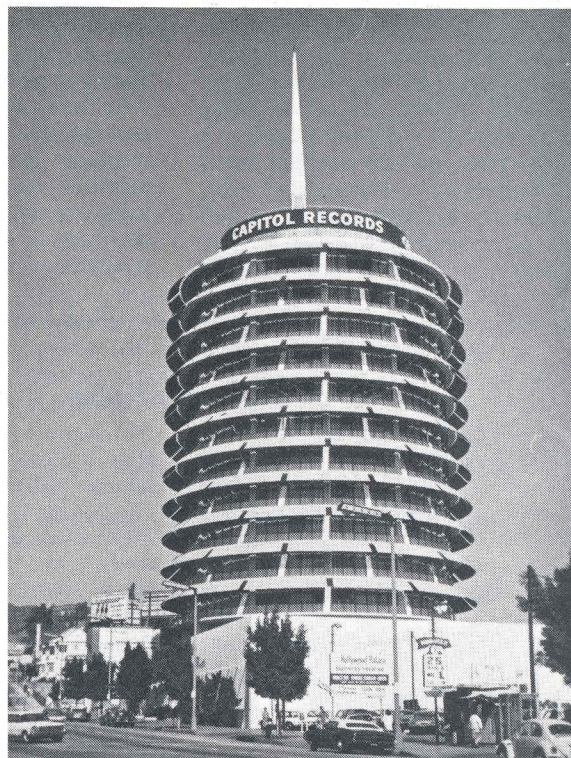
The heart of the Atoron's exposure control system is a revolving dial slightly larger than a nickel and placed at the left top of the camera housing. The raised pin or follow-pointer that is lined up with the meter indicator needle also sets the meter for the ASA index of the film in use. The pin is rotated within its slot until the correct ASA rating appears in the tiny window on the opposite side of the dial. The Atoron's ASA scale is marked 25, 50, 100, 200, 400 but intermediate film speeds can be set by splitting the numbers—for ASA 320, for example, set the scale between 200 and 400.

Between the pin and window, you'll find numbers from 8.5 to 16. These are Exposure Value (EV) designa-

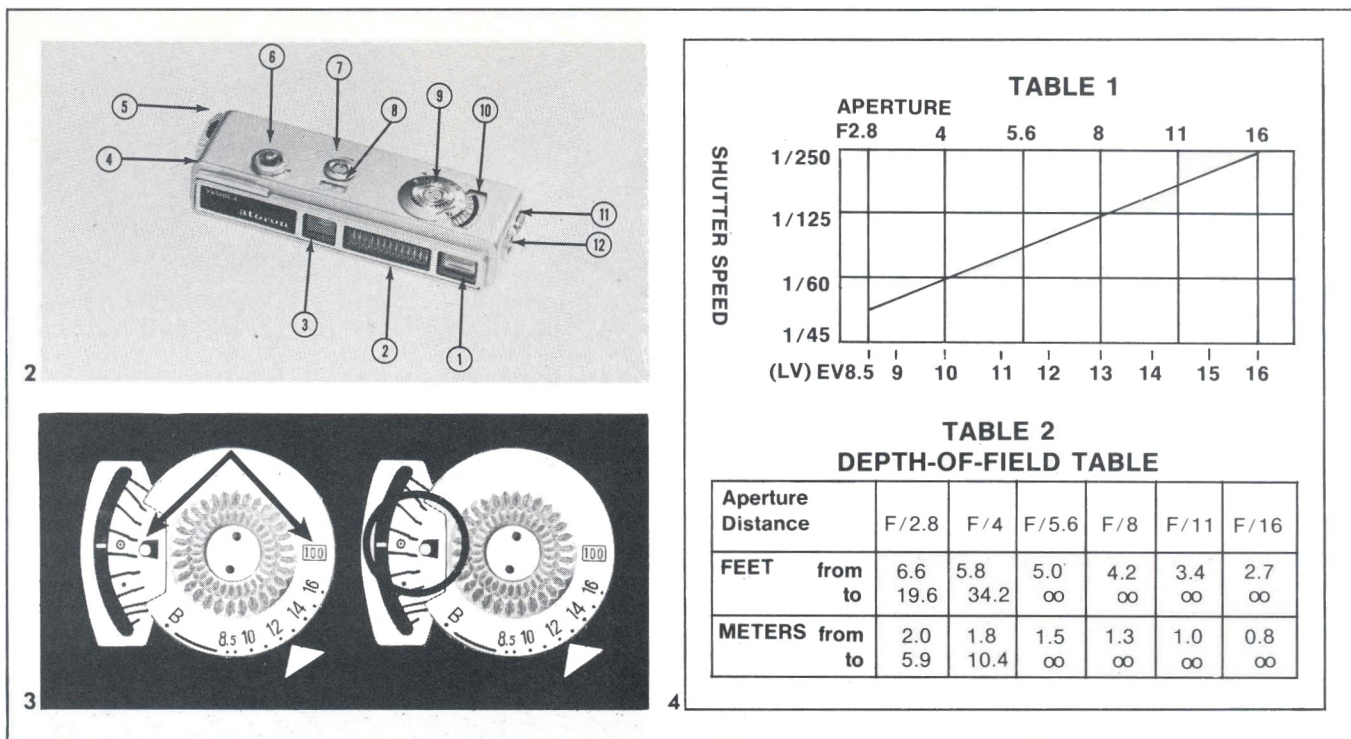
tions, a numerical method of indicating the shutter speed/lens opening combinations chosen by the camera and they have absolutely no meaning to most amateurs without reference to a chart such as Table 1. The EV system never really caught on with amateurs when it was in vogue during the sixties and few can correctly interpret the system today by memo-

ry. If you're not content to simply point-and-shoot, you may not be happy with the Atoron's method of exposure determination, but the use of Table 1 will help you to better understand the camera's method of selection and Table 2 will do the same for the Yashinon's depth of field.

The tiny engraved triangle on the camera housing beside the dial indi-







1. With its sophisticated programmed exposure system, Atonor is capable of producing high-quality photographs.

2. Yashica Atonor features viewfinder (1), selenium meter (2), lens (3), filter setting lever (4), film advance lever (5), shutter button and lock ring (6), exposure counter setting knob (7), exposure counter (8), EV dial (9), exposure meter scale (10), back cover plate lock (11), flash socket (12).

3. Exposure follow-pointer has a dual function. It's used to set ASA index of film in tiny window on opposite side (left) and is lined up with meter indicator needle to find correct EV setting for exposure (right). The B position is used to make time exposures of one second or longer.

4. Table 1: Exposure Value Settings. By referring to this table, you can determine shutter speed/lens opening in use at any EV setting. Once lens opening in use is established, refer to Table 2 to find range of apparent sharpness or depth of field.

cates exactly which EV number has been chosen. Look closely at the meter scale and you'll also see a line, a dot and a dot within a circle, all marked in red. The red line on the lower end of the scale is the bottom or zero limit of the meter's ability to measure light and the red indicator needle should align itself with this line whenever the meter face is completely covered. If it doesn't, the meter needs adjustment and should be returned to a Yashica service center. I'll come back to the dots shortly.

To load the Atonor with film, set the exposure counter on "S" by revolving the milled dial in the direction of the arrow behind it. Turn the cam-

era upside down with the lens facing away from you, push the back cover lock knob (marked open) in the direction of the engraved arrow and hold with the right thumb. With the left thumb, press the back cover plate downward and to the right to expose the film chamber. Then unfold the film transport lever from the opposite side and pull it out slightly beyond the green mark. This opens the film plane to allow insertion of a film cartridge. After loading, slide the back cover plate in until it snaps shut and then pull the film transport lever all the way out. Release the shutter button and repeat until "I" appears in the exposure counter window—you're ready to take pictures.

As the film cannot be advanced until the shutter has been released, double exposures are impossible with the Atonor. If you should decide not to take the picture after all, revolve the ring around the shutter button until its red dot lines up with the black triangle. This locks the button and prevents the accidental release of the shutter while carrying the camera. You have to remember to unlock the shutter by returning the ring to its black dot/triangle position before using the camera again. If you try to take a picture and neither the shutter button or film transport lever operates, the problem is simple—you've forgotten to unlock the shutter.

Like the Minox, a built-in haze filter permanently covers the lens and a self-contained yellow (Y2) filter is positioned in front of the lens by sliding the lever above the face plate until it locks. Exposure compensation for the

filter factor is taken care of internally and the filter remains in place until you slide it back. Yashica also includes a neutral density (ND4) and 80B snap-on filter that fit over both lens and meter cell. The ND4 is used whenever light conditions are so intense that the indicator needle and follow-pointer cannot be aligned, as when shooting snow or beach scenes on a bright day with a fast film cartridge in the camera. By filtering out the excess red rays, the 80B lets you use color film under artificial lighting. Either can be snapped in place by engaging a notch on the filter with a tiny knob in the bottom front groove of the camera's face.

The Atonor is synchronized for use with the tiny Atonor B/C flash gun and AG-1B bulbs. The unit secures to the camera in the same manner as with the Minolta pocket cameras; the flash plug is inserted in the receptacle on the camera's side and locked in place with the milled setting wheel. Depressing a tiny lever in front of the wheel lets the reflector spring open and as the AG-1B bulb is pressed into place in the socket, a white plastic lever appears underneath the flash gun. This serves as the used bulb ejector and once the picture is taken, pushing up on the lever frees the bulb from the socket.

Because of the programmed shutter, flash exposure is calculated on a zone basis using the red dot and dot-in-circle on the meter scale mentioned earlier. When using black-and-white or color negative film, set the follow-pointer opposite the solid red dot for 12 feet and opposite the



## The Yashica Atoron

dot-in-circle for 6 feet and take the picture from that particular distance for correct exposure. With color slide film in the camera, use the solid dot for 8 feet and the dot-in-circle for 4 feet. As this formula is not the easiest thing to remember offhand, Yashica has thoughtfully attached a legend plate bearing this data to the back of the gun.

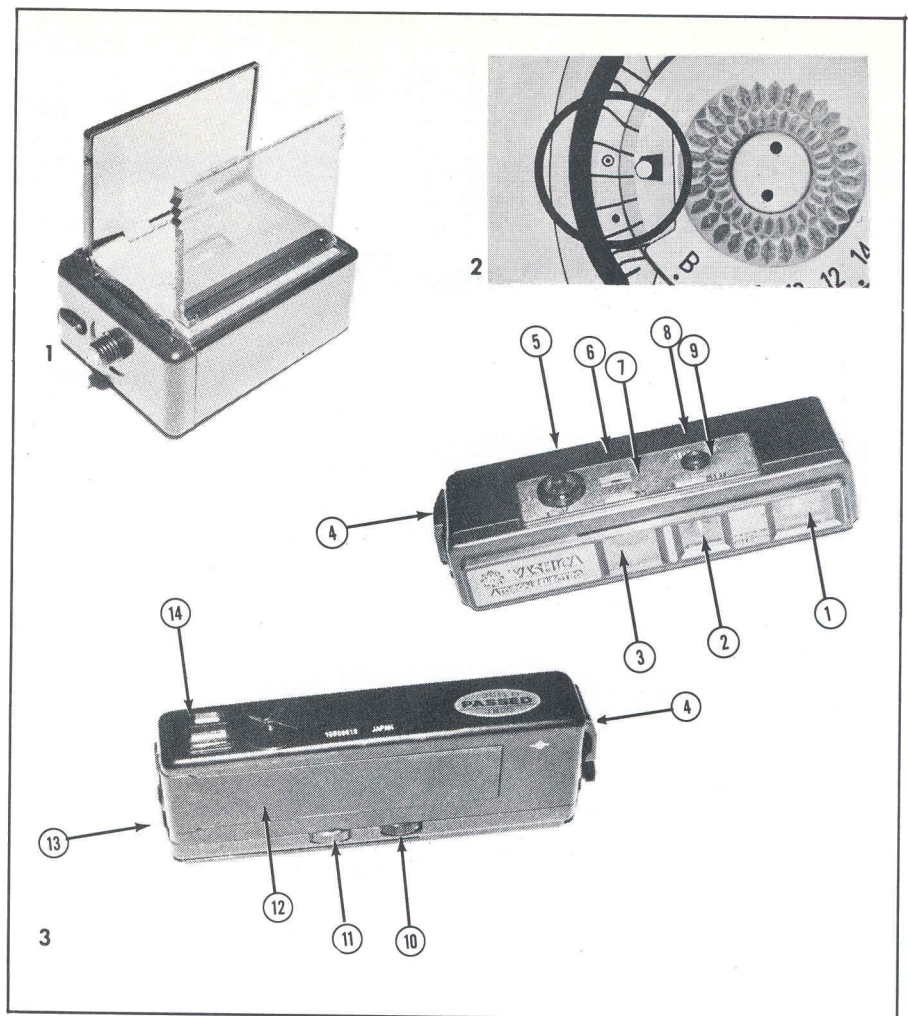
Once the Atoron has been loaded with film and the meter set for the film speed, taking pictures is a simple procedure. Aim the camera at the subject and match the follow-pointer to the exposure indicator needle. For pictures in which there's a large expanse of sky, you should point the camera slightly downward or the meter will over-read the scene, giving you an EV combination that is insufficient to properly expose the main points of interest. If you're photographing a back-lighted subject, the only way to minimize the strong lighting from behind and obtain a workable reading is to approach the subject at close range and take a meter reading. Then set the camera and return to the position from which the exposure will be made.

Look into the viewfinder and compose the picture within the bright frame. Hold the Atoron firmly with thumbs on the bottom, fingers on the top of side, much as you'd hold a Kodak Pocket Instamatic camera. Take care not to cover the lens or meter cell and squeeze the shutter button gently. The Atoron shutter button is quite stiff and has a rather long way to go before it trips the shutter and if you are not familiar with this type of release, you'd better practice before actually loading the camera to take pictures. Whenever you're within 3 1/2 feet of the subject, use the parallax correction marks at the left side of the bright frame as your margin to avoid cutting off a portion of the subject.

As the Atoron exposure system is programmed, accessories are somewhat limited. A close-up lens set, right angle finder and mini-pod are available, but the lack of slow shutter speeds and the inability to combine them manually with large lens openings make the camera difficult to use for specialized photography. If the Atoron appeals to you but you want capabilities beyond its limited point-and-shoot range, consider the Atoron Electro.

### ATORON ELECTRO

Considerably more sophisticated in design and more versatile in use than the standard Atoron, the all-black Electro model uses a four-element



Yashinon 18mm f/2.8 lens in a focusing mount adjustable from two feet to infinity. An electronic shutter with speeds from 1/350 to eight full seconds is coupled to the lens via a CdS meter and integrated circuit, which Yashica refers to as the camera's "IC brain." The integrated circuit acts as a tiny computer that analyzes the light conditions read by the CdS cell and chooses the correct EV combination from f/2.8 at eight seconds to f/13 at 1/350 second.

To set the ASA index and focus the lens, the Electro uses two milled wheels that protrude from underneath the camera. The settings appear in small windows on the camera's top housing. As its exposure determination system is completely automatic (no manual control is provided), simply load the camera with a film cartridge (loading is the same as with the standard Atoron), set its ASA speed, focus, and you're ready to take pictures.

While the Electro functions in much the same manner as the standard Atoron, there are a few other differences. To power the CdS cell, a Mallory Px 28 N (or equivalent) silver oxide battery must be inserted in the camera. The battery compartment is

positioned on the camera back beside the viewfinder window. The battery cover is removed by placing a coin in the grooved slot and turning the cover counterclockwise. Insert the battery with its positive (+) end first and then replace the cover, tightening it with the coin. The shutter button uses a single red dot, which must be lined up with the AUTO position as marked on the camera housing; the "L" position locks the shutter when the Electro is not in use.

When using the camera under adverse lighting conditions, depress the slow check button behind the ASA window. If the tiny lamp above the viewfinder window lights up, the shutter speed will be below 1/30 second and the Electro should be braced against a solid object or used on a tripod. This button can also be used to check the battery condition. The viewfinder is an Albada-type with bright frame, .63X magnification and automatic parallax compensation.

Flash photography with the Electro is more versatile because of its electronic shutter. Secure the flash gun in position, pop a bulb in place and shoot the picture. The CdS cell senses the flash and closes the shutter automatically for a correct expo-



sure, if the subject is between 6 1/2 and 16 feet from the flash.

Where the Electro really scores is in its accessory system. Three snap-on filters (Y2, 80B, ND4) and an ingenious close-up lens kit extend the camera's photographic range, as do a self-timer and copy stand. The flash gun, right angle finder, grip/tripod and enlarging lens unit can be used with either Atoron model. All accessories made solely for the Electro are finished in black to match the camera, while those provided specifically for the standard Atoron are finished in brushed chrome.

A daylight-loading plastic developing tank similar to the Minox tank will

soon be made available, as will a stainless steel tank—and other accessories are sure to follow. But perhaps the most unusual aspect of the Yashica pocket camera line is its limited production of the Electro T model. This conversation piece is a regular Atoron Electro, but it has a transparent top that enables the user to watch the mechanical components in operation. Early models of the T leaked light into the CdS and IC circuits, giving an erroneous exposure combination, but this has now been corrected by a baffle system—and makes the Electro T the perfect pocket camera for the photographer who thinks he has everything.

**1. Atoron Electro flash gun has plexi-glas shield in front of bulb; it can also be used with standard Atoron. AG-3N bulbs are recommended.**

**2. Zone flash exposure with Atoron is set by lining up follow-pointer with red dot or dot-in-circle. Data plate on bottom of gun explains distances according to type of film in use.**

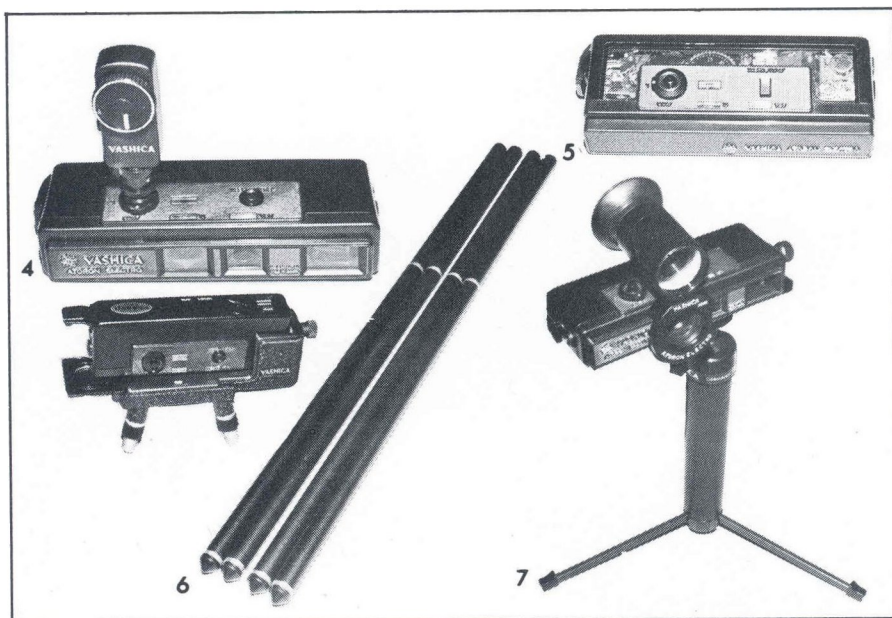
**3. Atoron Electro features viewfinder (1), CdS cell (2), lens (3), film advance lever (4), shutter button, lock ring (5), exposure counter (6), distance scale (7), slow speed check button (8), ASA index scale (9), distance scale thumb knob (10), ASA index scale thumb knob (11), back cover plate (12), flash socket (13), and slow speed check lamp (14).**

**4. Self-timer screws onto Electro's shutter button for vibrationless slow-speed exposures.**

**5. Yashica Atoron Electro T with lens cap in place. Transparent top housing lets you watch mechanical action and makes the camera an unusual conversation piece as well.**

**6. Yashica copy stand is similar to that of Minolta. Camera locks in adapter unit with two sliding close-up lenses at bottom. Legs unscrew in middle and automatically position camera at correct distance for copy work.**

**7. Close-up lens kit for Electro is unusual, turning camera into TLR. Viewfinder unit has bright frame with parallax correction marks. Camera is shown on grip/tripod adapter. Tiny legs collapse and slide into the unit for compact carrying.**



## SPECIFICATIONS

### YASHICA ATORON

<b>LENS:</b>	Yashinon 18mm f/2.8 in fixed-focus mount
<b>SHUTTER:</b>	Programmed mechanical with speed range of 1/250 to 1/45 second and Bulb; sensitivity range—EV 8.5 to 16; X flash synchronization
<b>FILM/FRAME SIZE:</b>	Minox or Yashica cartridge, 15, 20 or 36 exposures 8x11mm
<b>VIEWFINDER:</b>	Optical with bright frame; parallax correction marks
<b>EXPOSURE METER:</b>	Selenium cell for match-needle type exposure determination
<b>MEASURING RANGE:</b>	ASA 25 to 400
<b>FILM ADVANCE:</b>	Single-stroke pull lever advances film, cocks shutter and counts exposures; double exposure prevention
<b>OTHER FEATURES:</b>	Built-in haze and Y2 filters, wrist strap socket, shutter lock
<b>SIZE/WEIGHT:</b>	4x4/5x1 1/2 inches; 4.5 ounces

### YASHICA ATORON ELECTRO AND ELECTRO T

<b>LENS:</b>	Yashinon DX 18mm f/2.8 in continuous focusing mount from two feet to infinity; four elements in three groups
<b>SHUTTER:</b>	Electronically programmed for full automatic exposure control with speed range of 1/350 to 8 seconds; sensitivity range—EV 0 to 16; X flash synchronization
<b>FILM/FRAME SIZE:</b>	Minox or Yashica cartridge, 15, 20 or 36 exposures 8x11mm
<b>VIEWFINDER:</b>	Albada-type with bright frame; automatic parallax compensation
<b>EXPOSURE METER:</b>	CdS cell coupled to IC brain and electronic shutter; uses Mallory Px 28 N battery
<b>MEASURING RANGE:</b>	ASA 16 to 200
<b>FILM ADVANCE:</b>	Single-stroke pull lever advances film, cocks shutter and counts exposures; double exposure prevention
<b>OTHER FEATURES:</b>	Slow speed check button doubles as battery condition check, self resetting exposure counter, wrist strap socket, shutter lock
<b>SIZE/WEIGHT:</b>	4x4/5x1 1/2 inches; 4.9 ounces



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

POCKET CAMERA FILMS



1



2



3



**F**or 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



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.



## 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

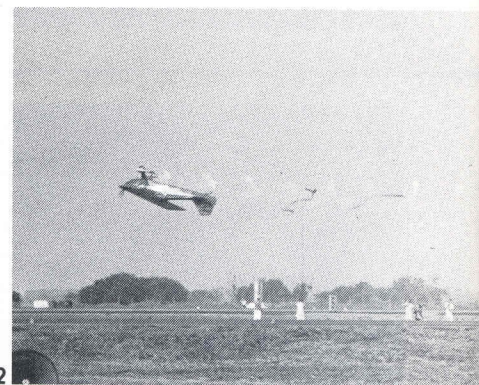
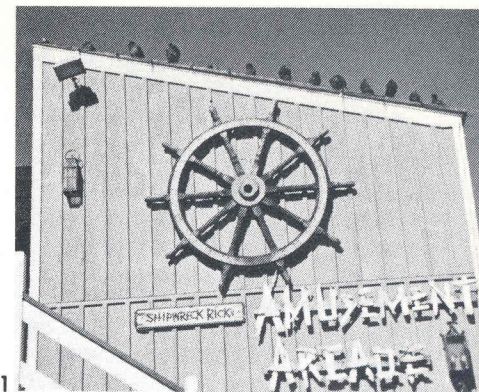
Some pocket camera systems like the Minox or Atoron allow the use of several different black-and-white emulsions; others like the Kodak Pocket Instamatic camera and Rollei 16 have only one or two black-and-white films packaged for their use. If yours uses a reloadable cartridge, we'll examine other unusual 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 Adox 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





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, Atoron, 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.**



## 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.**

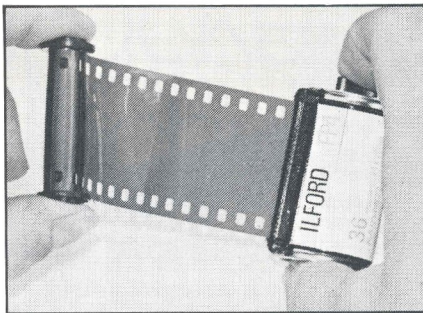
**3. Minolta 16 MG-S camera — ASA 320 (Double-X) film, available light.**



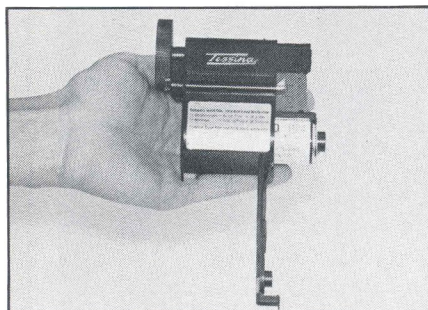




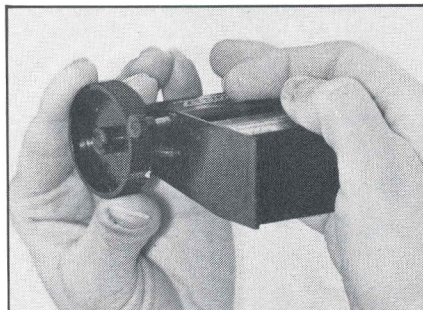
**1. Tessina self-loader is used to transfer film from standard 35mm cartridge to special Tessina cartridge.**



**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



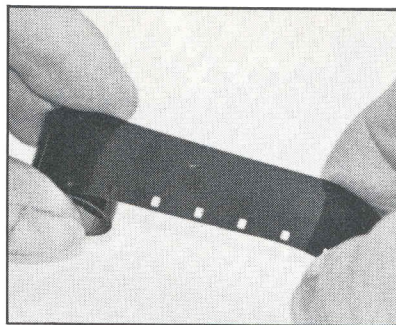
## Silver, Silver, on the Film

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.

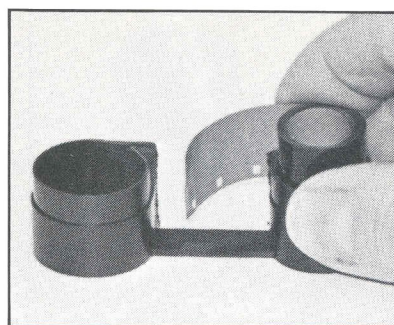
To reload Minolta cartridges, you'll need a completely dark work area. While a closet probably comes to mind first, it's a poor choice because of the close quarters in which you'll have to work and the omnipresent dust problem. Like pockets, closets seem to collect more dust and dirt than any other part 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.

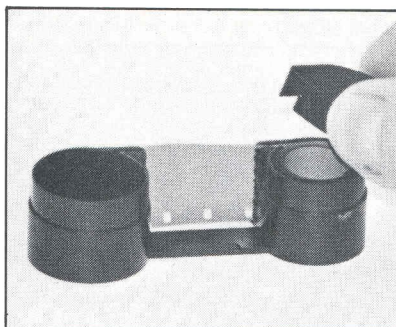
A yardstick makes a good measuring rod; if you want a full 18-exposure load, you'll need 18 inches of film, so cut the stick in half. Fewer exposures can be loaded if you desire; allow 7/8 inch for each frame and add four more inches to the total for leader—a 10-exposure load would thus require 13 inches 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.



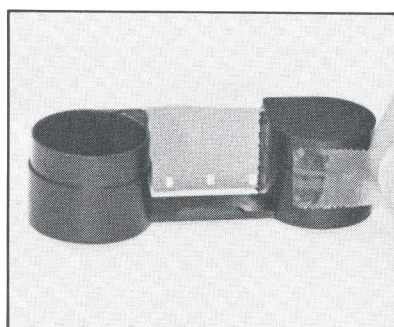
**1. To reload Minolta cartridges, cut 18-inch strip of film and wind into small roll with emulsion side in. Steps 1-3 must be done in dark.**



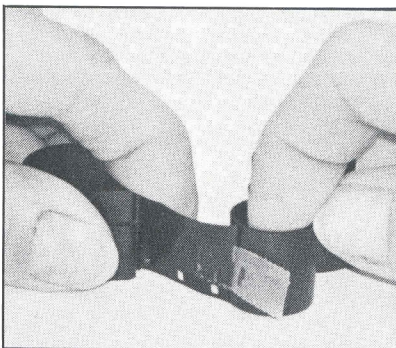
**2. Place film roll in smaller cartridge chamber, threading about an inch through the light trap.**



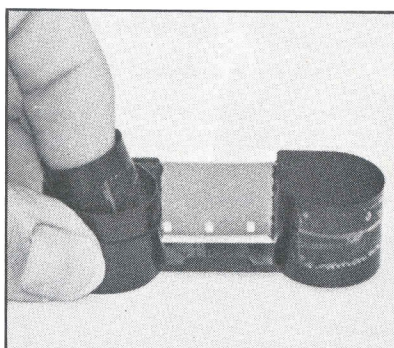
**3. Put chamber cover on tightly.**



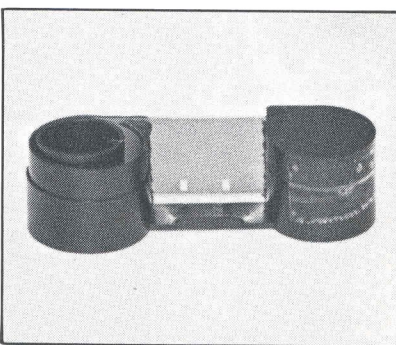
**4. Tape cover securely with a piece of pressure-sensitive tape as shown.**



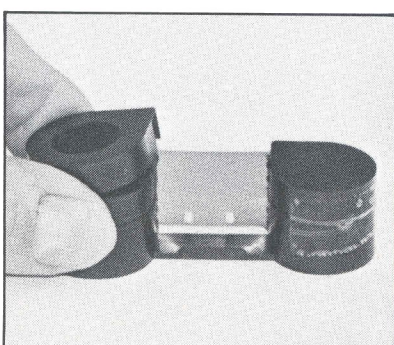
**5. Attach a piece of tape to end of film and hold film winding drum on forefinger like thimble. Line up drum with film, attach tape with right thumb.**



**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.**



# 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

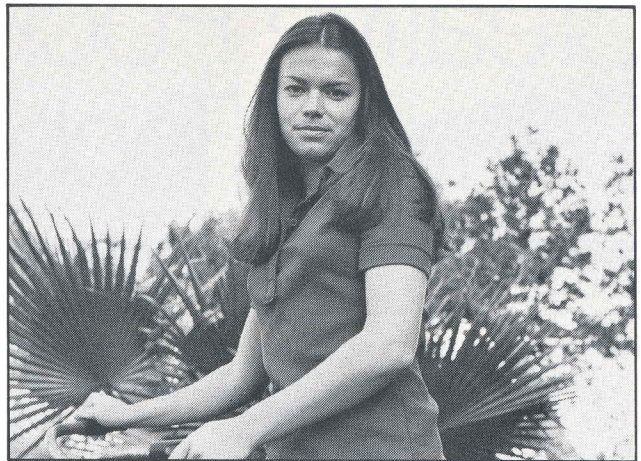
of a typical amateur picture. It has that essential ingredient which makes life so enjoyable for the male of the species and to many who look at it, it is considered to be a good "snapshot." But as you and I know that it's really not very good, let's see what can be done to elevate it step-by-step from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





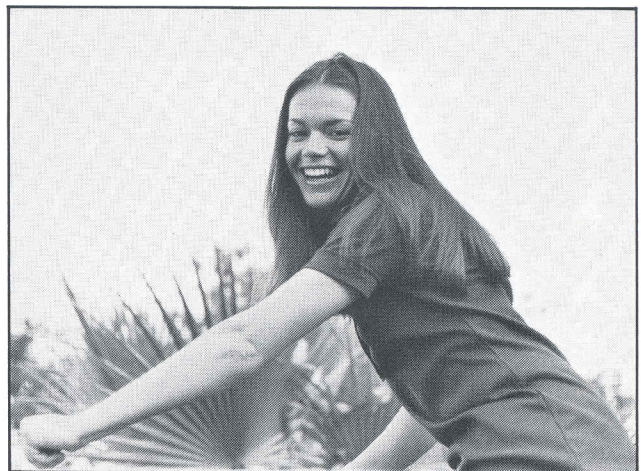
**Photo 2**



**Photo 3**



**Photo 4**

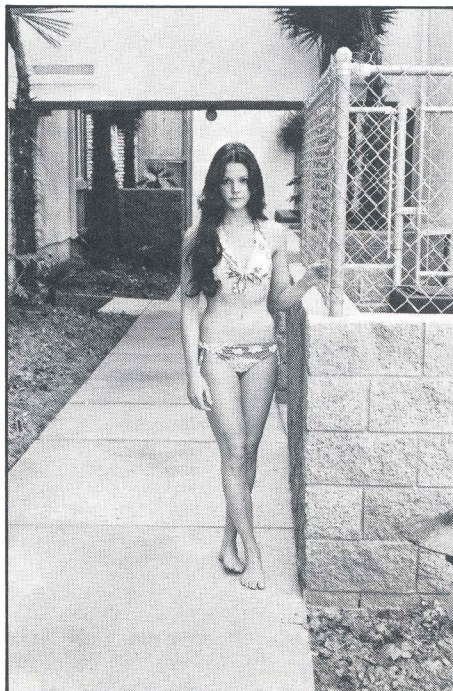


**Photo 5**

## 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 ( $1/30$

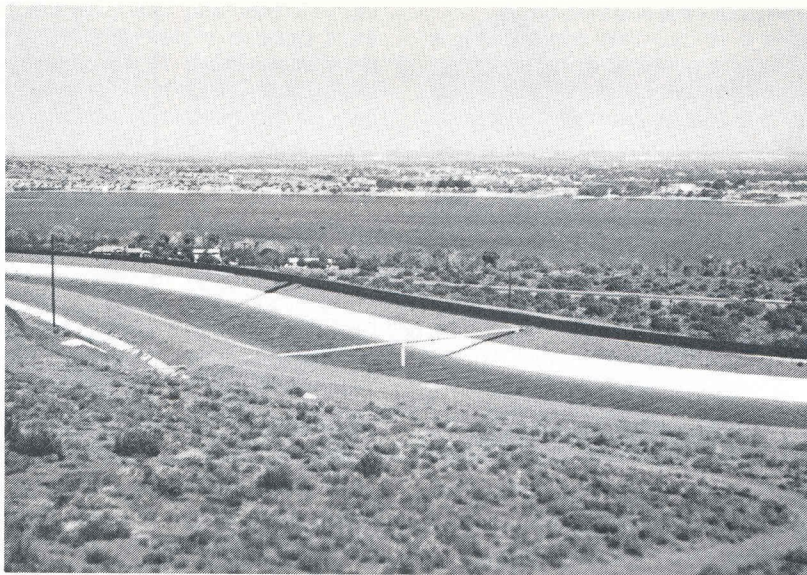


Photo 9

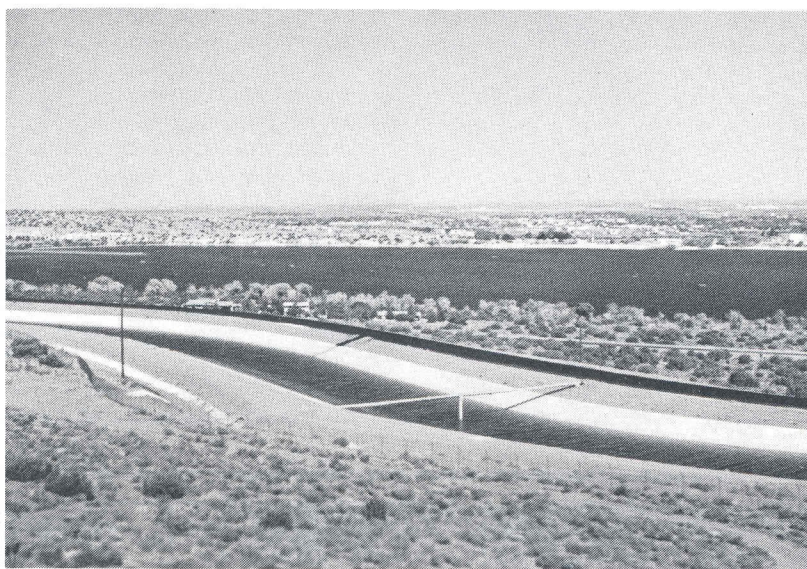


Photo 10

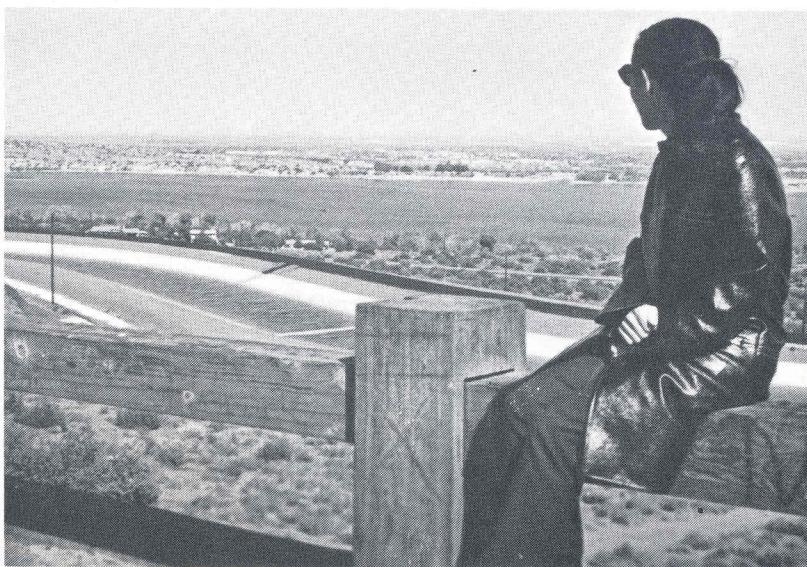


Photo 11





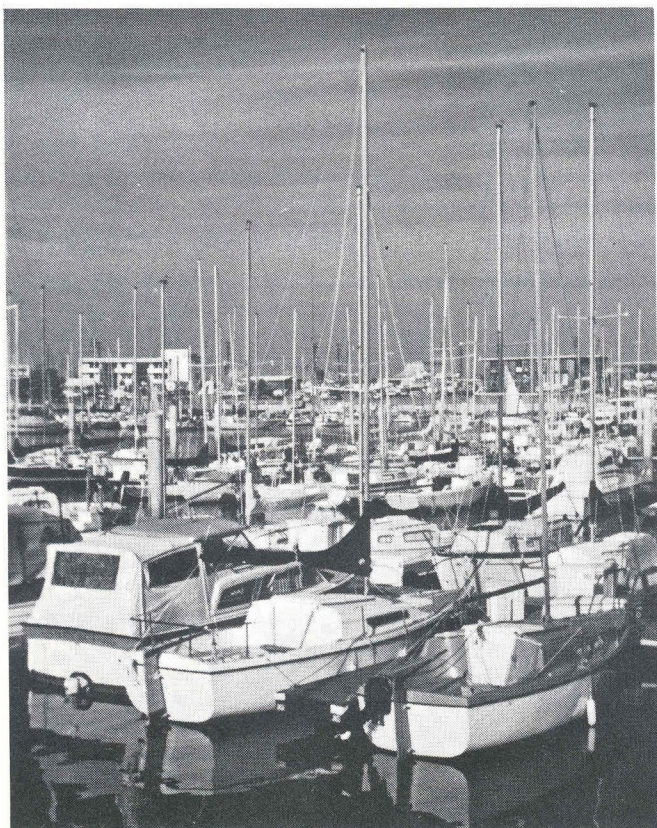
**Photo 12**



**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 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 15-25 30+	1/500 1/250 1/125 1/250 1/125 1/60 1/125 1/60 1/30
Fast action like football, horse racing, autos traveling at speeds up to 35 mph.	10-15 15-25 30+	* * 1/500 * 1/500 1/250 1/500 1/250 1/125
Very fast action like planes, trains and autos traveling at 50 mph and faster.	20-40 50-75 100+	* * 1/500 * 1/500 1/250 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





**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**



## 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.

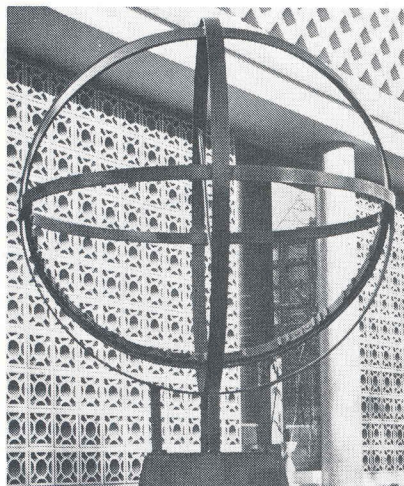


Photo 25

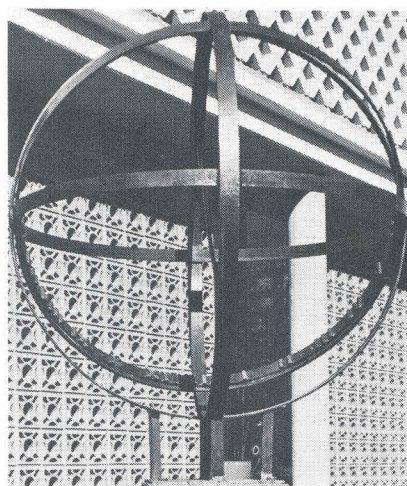


Photo 26

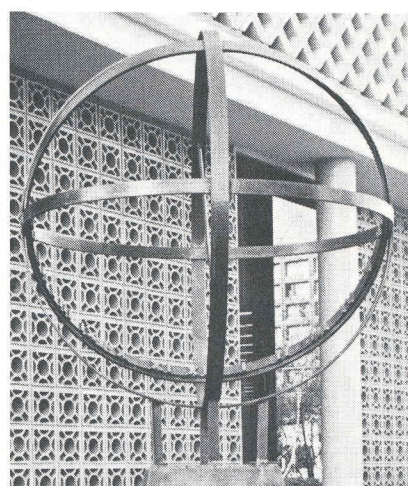


Photo 27



Photo 28



Photo 29





Photo 30



Photo 31



Photo 32

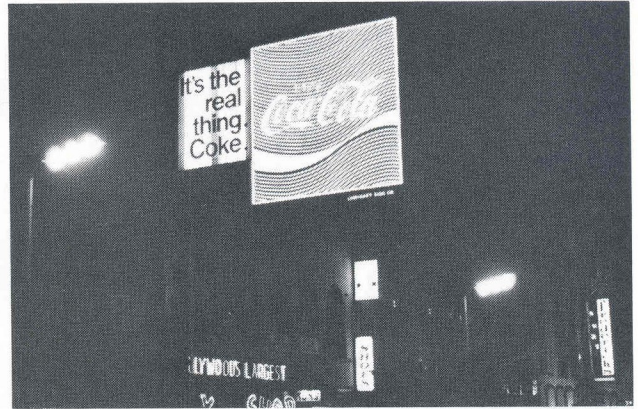


Photo 33

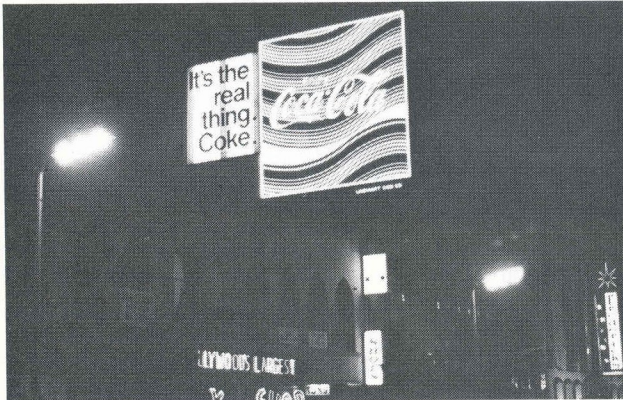


Photo 34

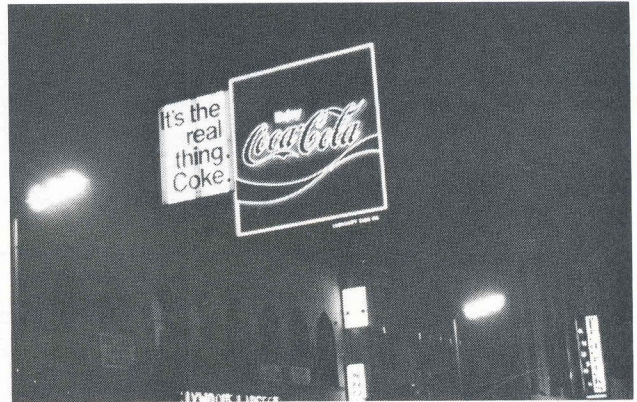


Photo 35

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

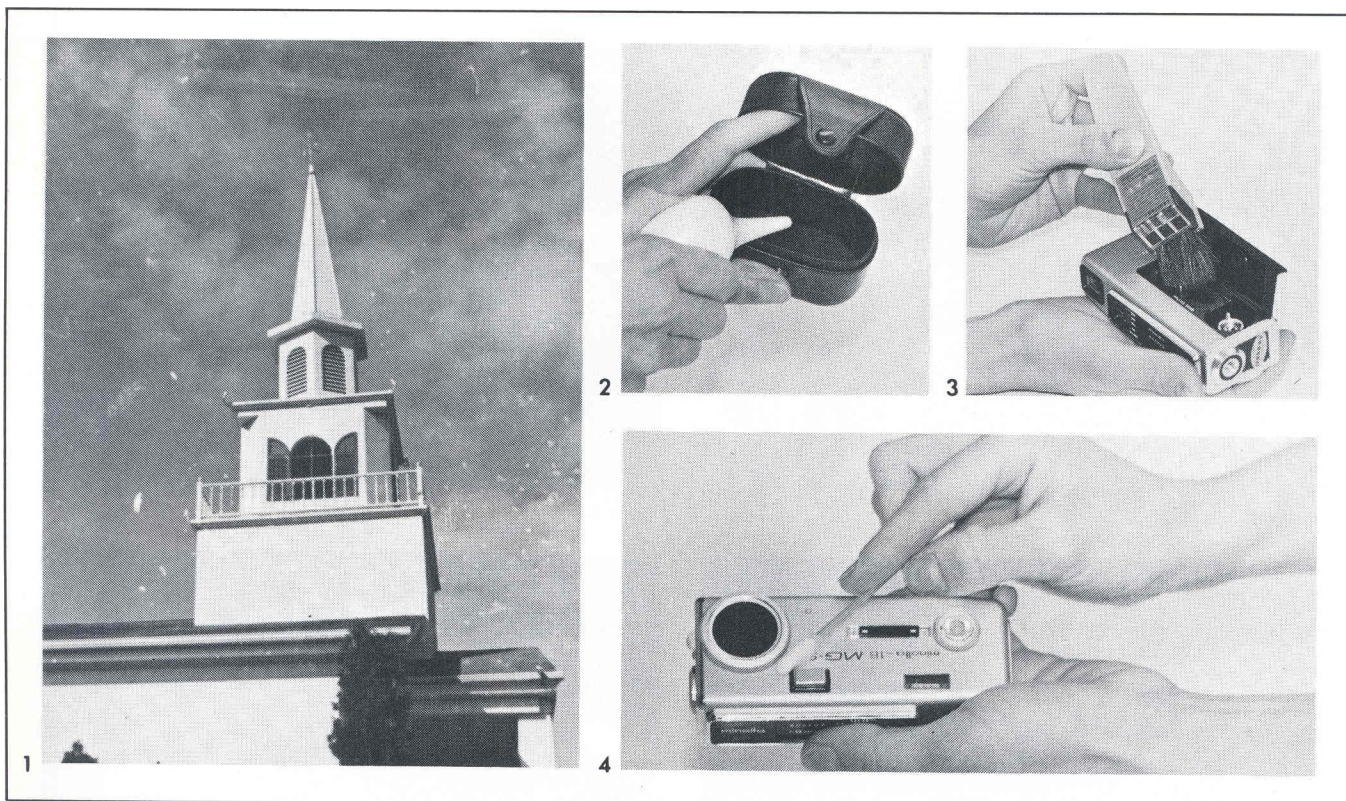
Grauman's Chinese Theatre in Hollywood, I'd be so busy carrying deposits to the bank across the street that I wouldn't have any time at all to write books like this one.

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 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.

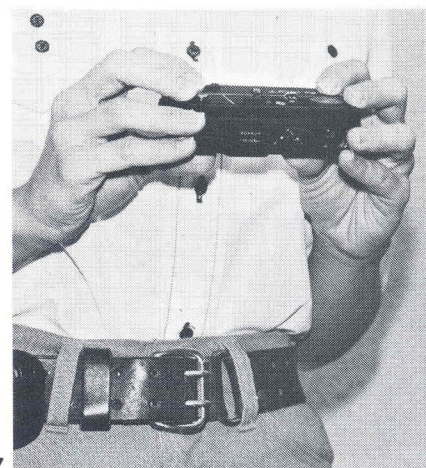
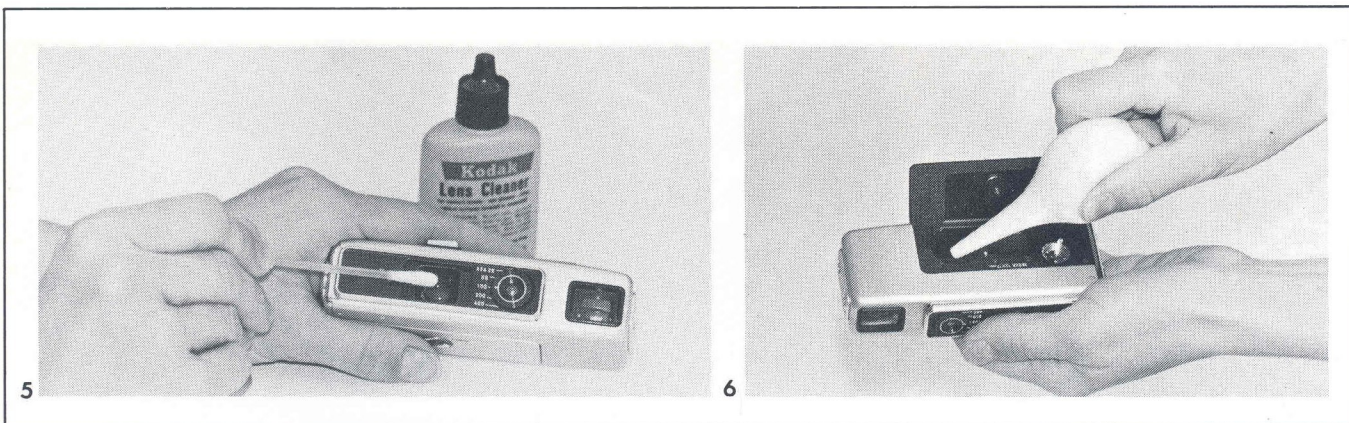
While cleanliness should be of concern to any photographer, it's a way of life for those of us with pocket cameras. Since the degree of magnification necessary to produce even a 3 1/2 x 4 1/2-inch print is so great that although a dust speck on a 2 1/4-inch negative will go almost unnoticed (comparatively 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.





**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



## Avoiding Pitfalls

precautions that should be followed for the best results:

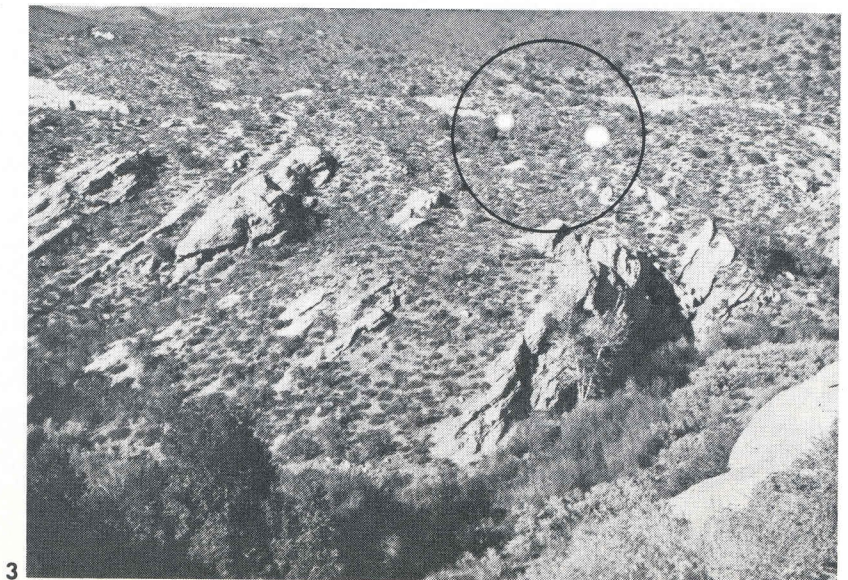
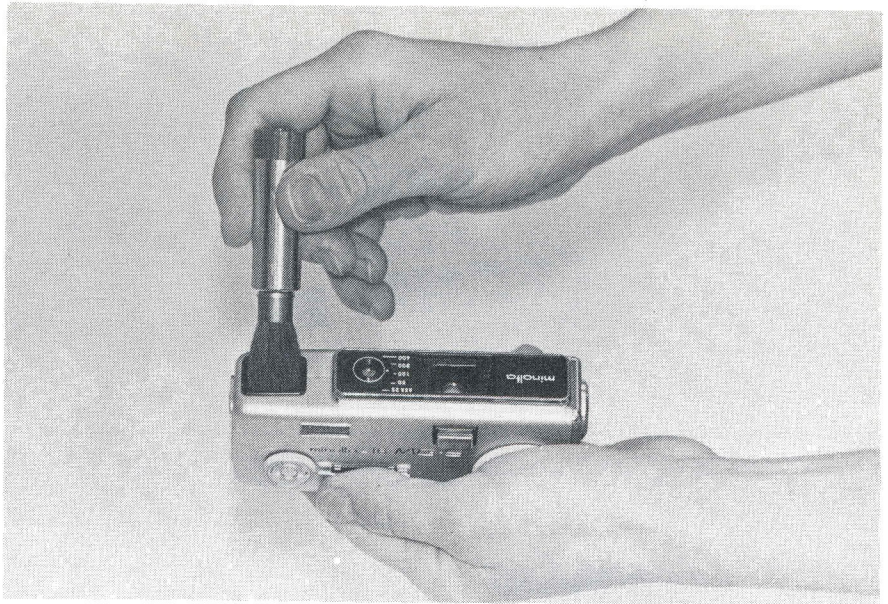
Use fresh developer each time you process film, and then throw it away; don't run the risk of chemical exhaustion or contamination. If you live in an area where water has a high mineral content (hard water), filter the chemicals and wash water thoroughly. Keep your negatives free from scratches and abrasions 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.

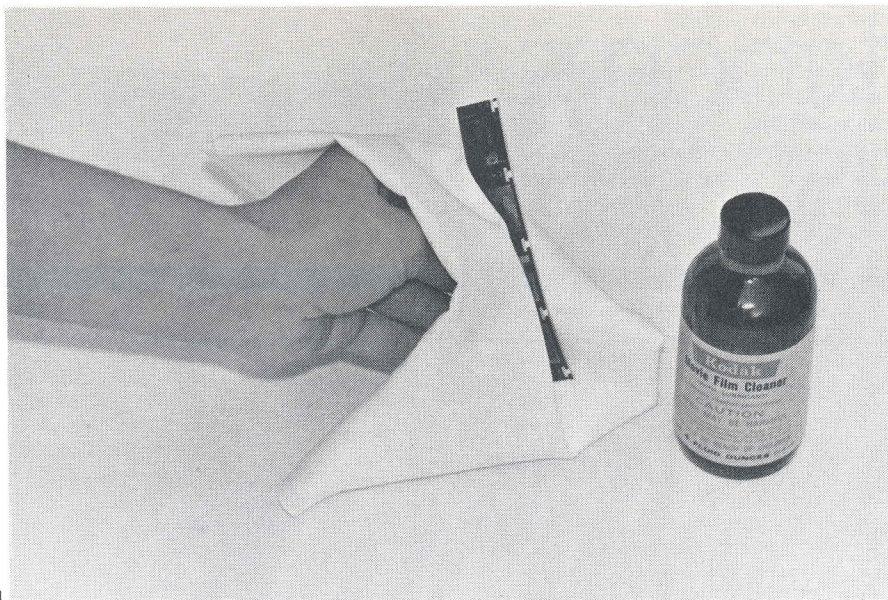
Unlike the other pocket camera films that use a pressure plate to hold the film flat during exposure, Kodak 110 cartridge film with its paper backing is designed to prevent negative scratches both from dirt in the camera and faulty cartridges. But if your camera is kept clean, you should have little 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.

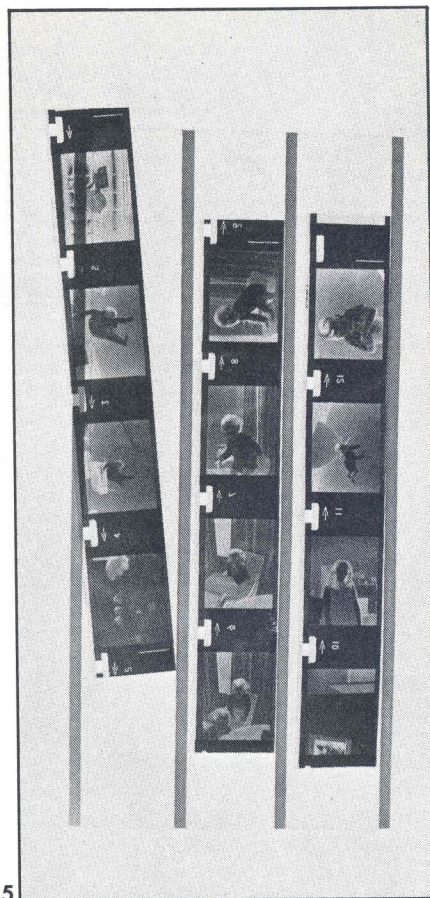
If you make cleanliness a part of pocket camera photography from the outset, you'll find that it all comes very naturally and really isn't a headache after all. Accept it as a part of your hobby and you'll turn out good pictures with amazing consistency. 📷



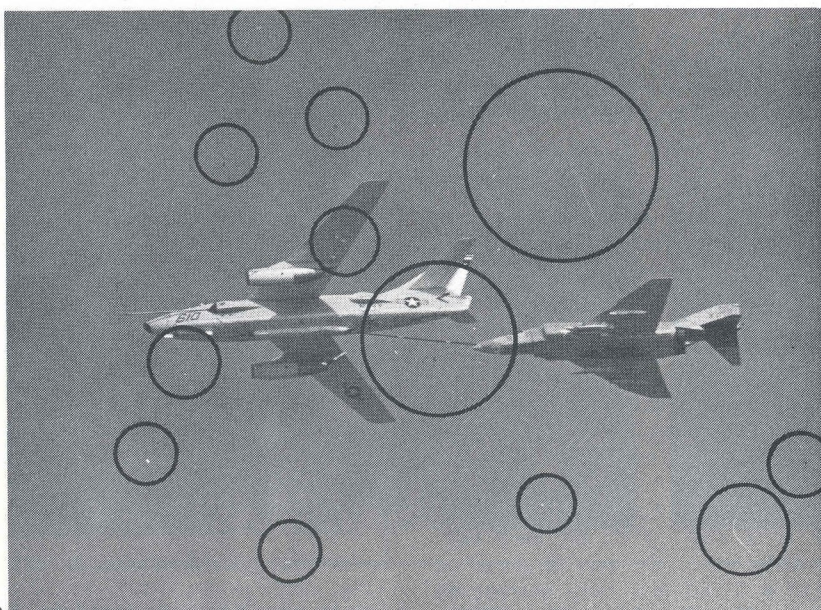




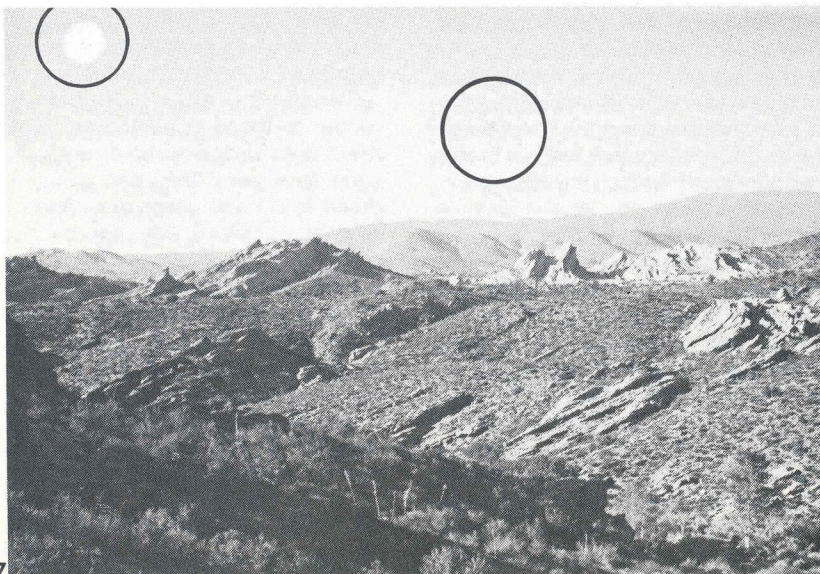
4



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.

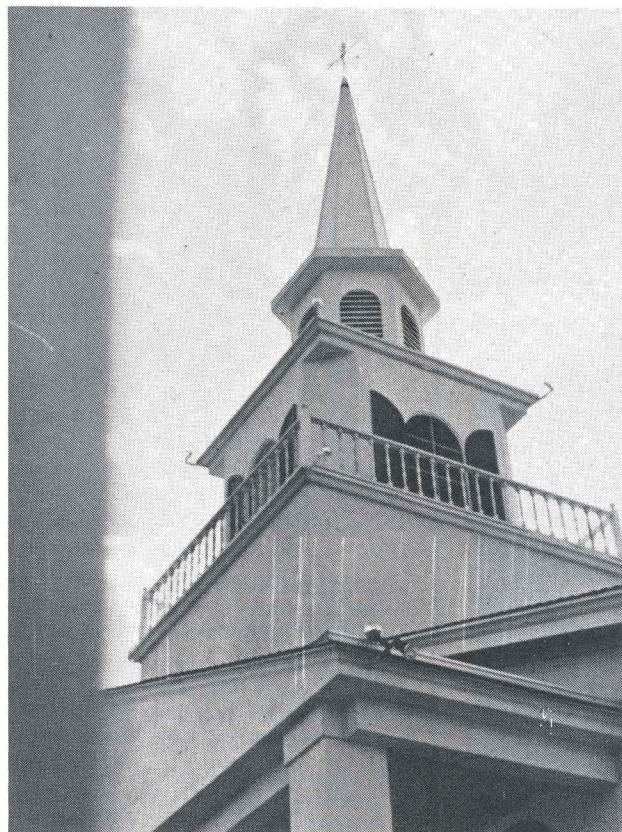
5. Pocket camera negatives should be kept in acetate sleeves to prevent scratching and dirt accumulation.

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.



# 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



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

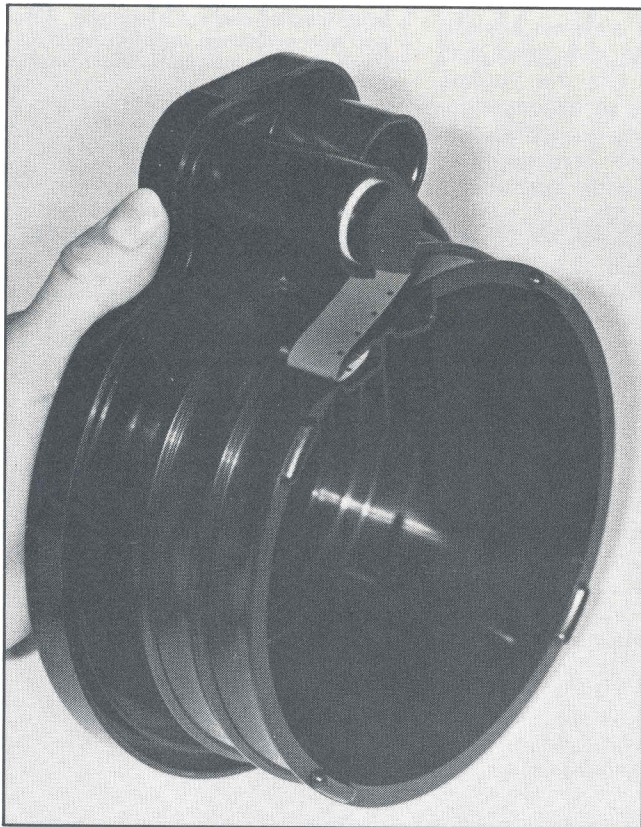
you have to use a closet, run a vacuum cleaner over the floor periodically to keep the dust level down. I find a shower stall or cabinet to be most ideal; the moisture of its frequent use makes it the dampest but most dust-free room in any house or apartment.

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

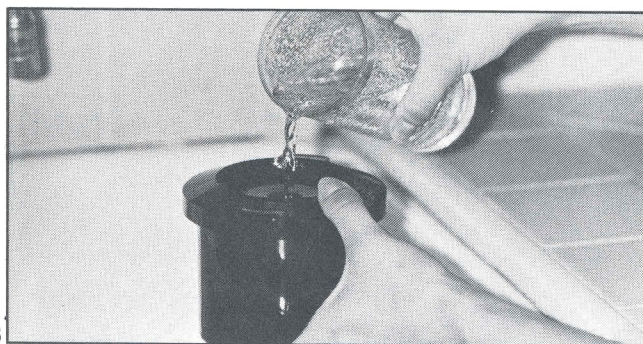




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## Darkroom Procedures

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-





**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-



## 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.

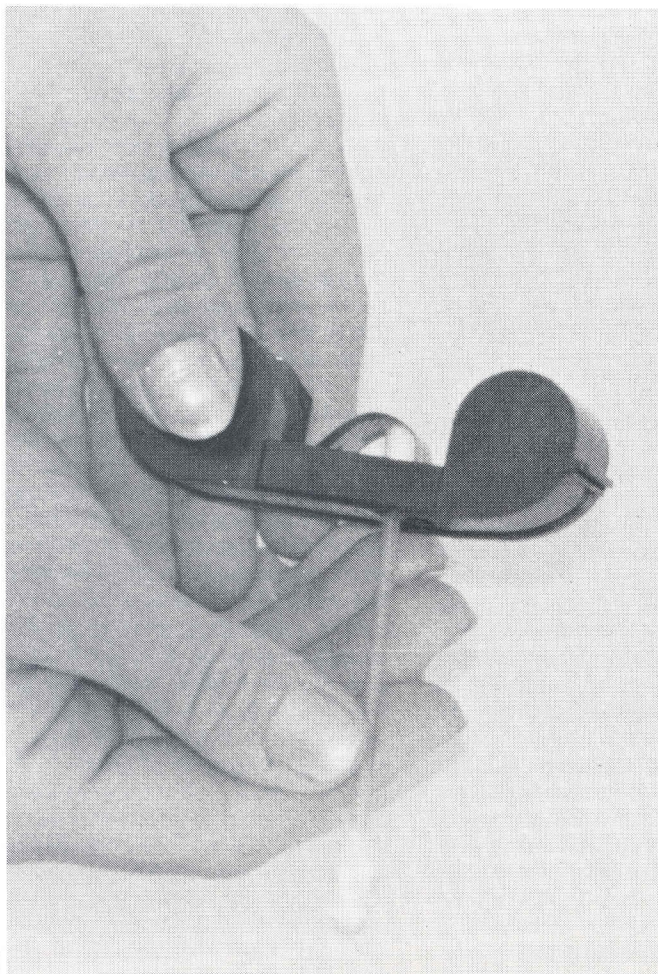
### ABOUT THOSE NEGATIVES

The best pocket camera negative

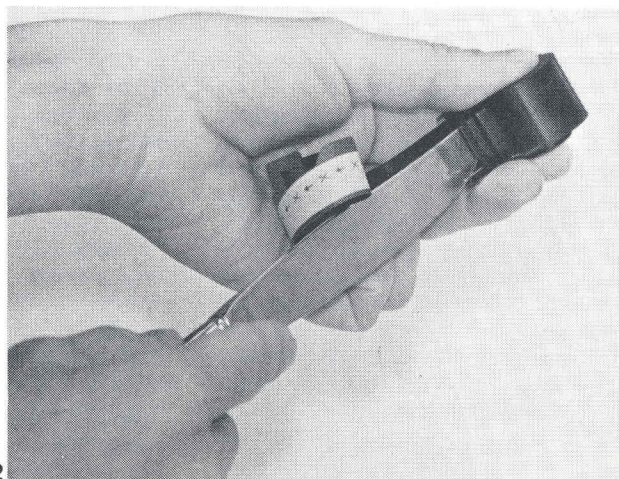
will have three distinct qualities: its density is on the thin side, there's ample detail in both shadow and highlight areas and the negative contains a full tonal range from light to dark. When a pocket camera negative has been overexposed or overdeveloped, it will be overly dense (dark) and contain 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?

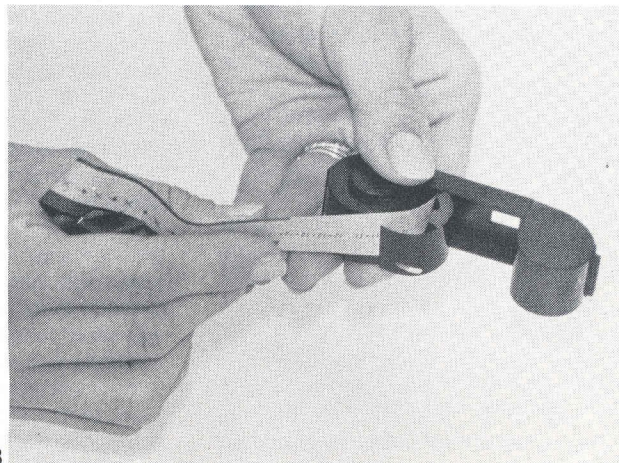
Enlargers specifically designed for pocket camera negatives give the best results, as their optical system and controls were all designed with the small negative in mind. It is possible to adapt most regular enlargers to accept the smaller film and if you already own one, or plan on using more than one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



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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-

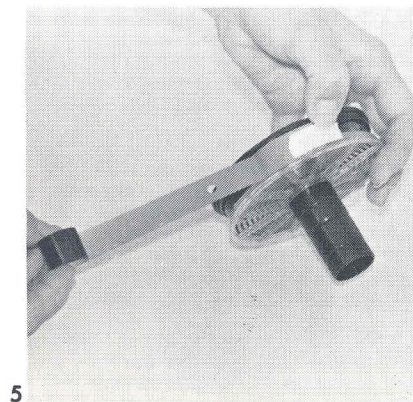
**1. The 110 cartridge is unloaded by pushing a pen or swab through the cartridge window to poke the backing out.**

**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.**

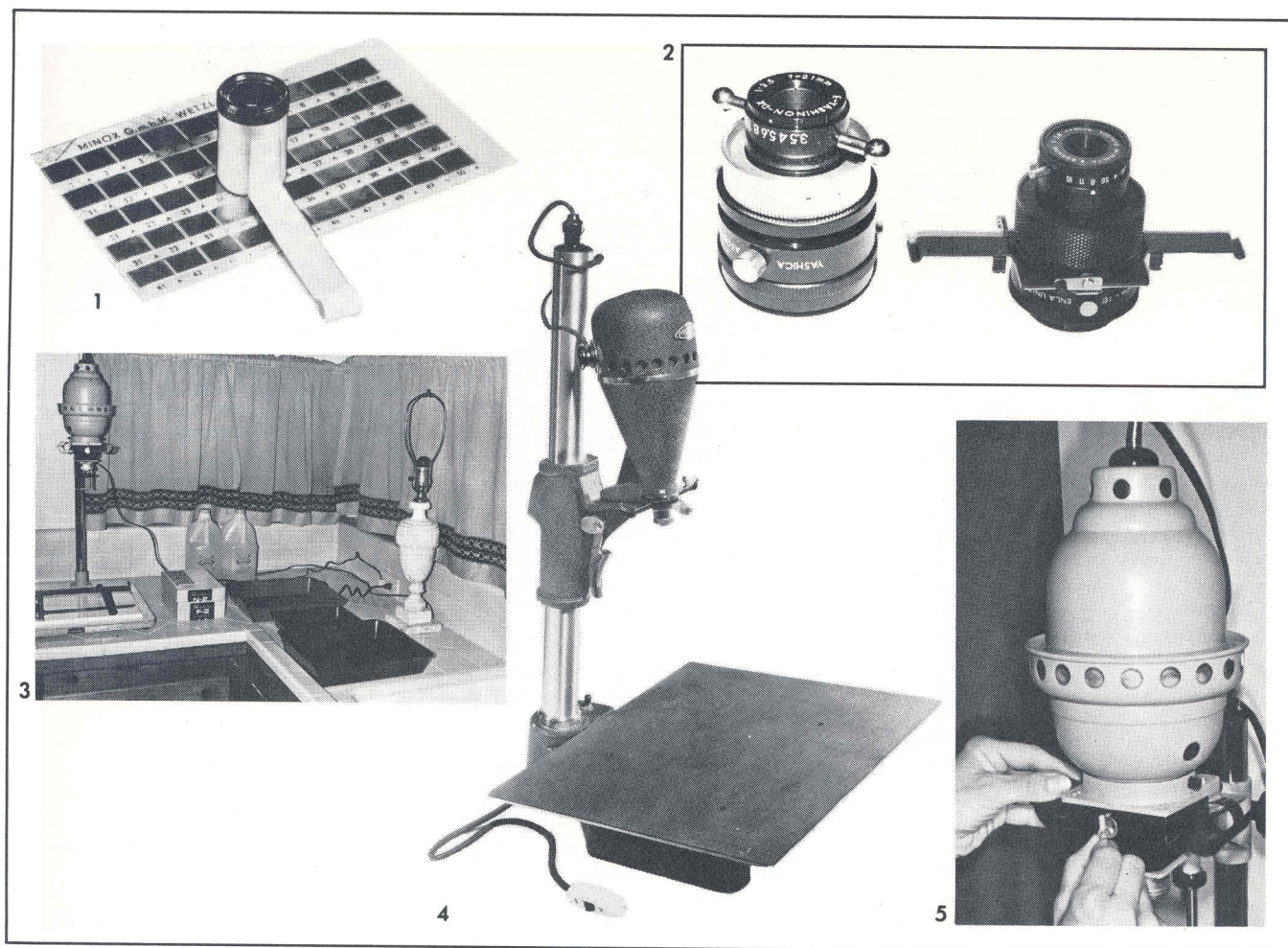
**3. Pulling the paper backing then brings the film out with it.**

**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.**







## 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 compliment 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.**



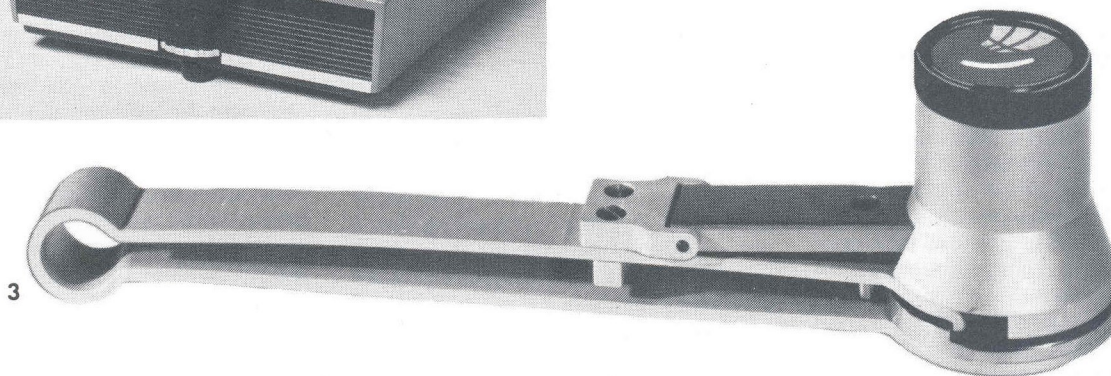
# Pocket Camera Color Photography



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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 respoiled 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

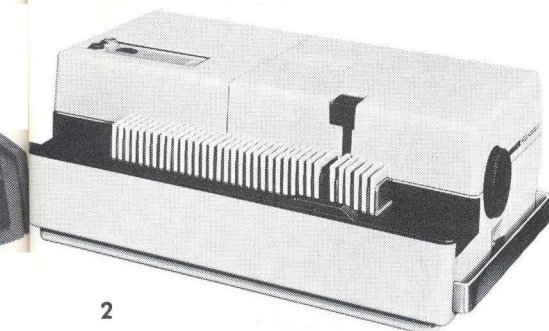


hold in color pictures. Side or back lighting causes harsh, dense and dramatic shadows that are undesirable in color work, especially when working with people as subjects in bright sunlight. It's always a good idea to use fill flash to control such shadows when shooting outdoors.

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-





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**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 Magicube 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.

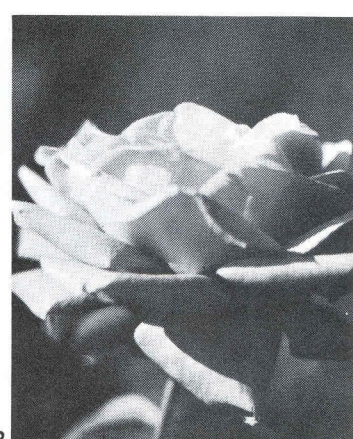
For the majority of color pictures you'll take, hazy sunlight is ideal. It's bright enough for short exposures and diffused enough to cast soft shadows. If you confine your picture taking activity to that period between two hours after sunrise and two hours before sunset, you'll get a "normal" color 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-



# Explore Macrophotography: Come Closer, Closer, Closer!



These four lines extending from camera are copy stand legs.

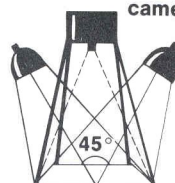


FIGURE 1

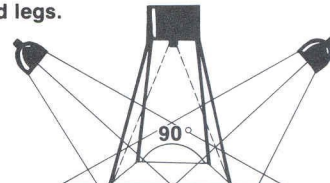


FIGURE 2

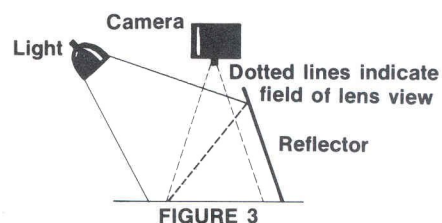


FIGURE 3

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 as 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.



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.

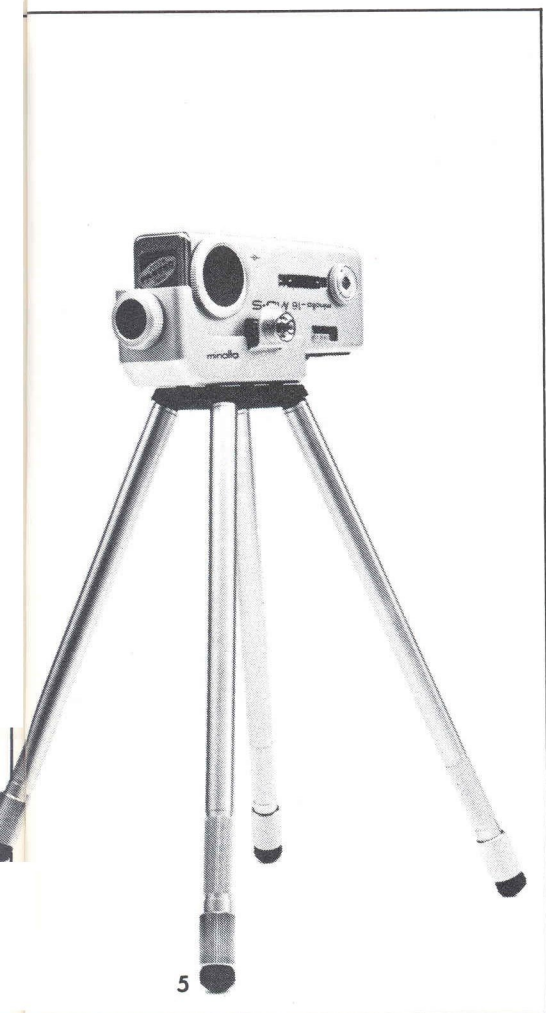
**1. Capable of focusing down to 8 inches and equipped with a beaded measuring chain (shown in use here) that indicates distances of 8, 10, 12, 18 and 24 inches, the Minox is ideal for hand-held close-up photography.**

**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.**

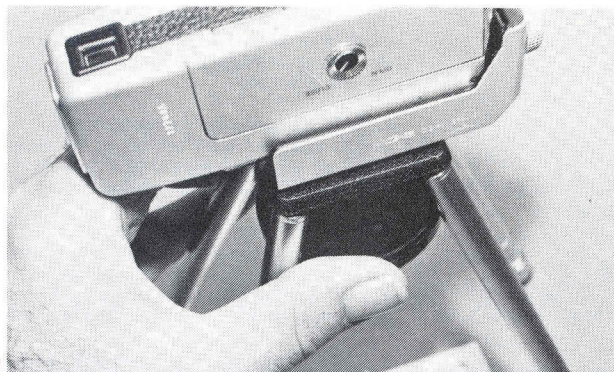
**4. You'll find close-up work with the Minolta 16 MG-S easier on tripod. Measuring chain is used with close-up lens.**

**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.**

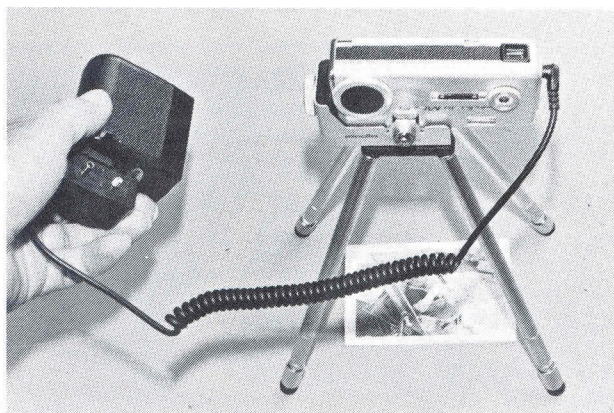


Because of its ultraclose focusing ability (to eight inches), the Minox is especially well-suited for both close-up and copy work, but with the variety of auxiliary lenses made available for the Minolta system, you can get much the same results with the less-expensive MG-S. When working at such close 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

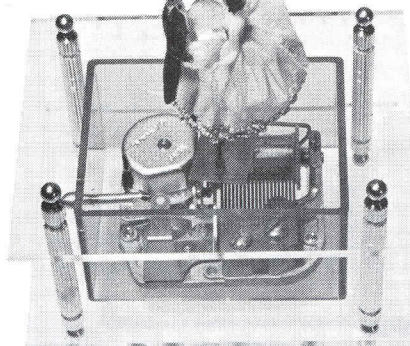




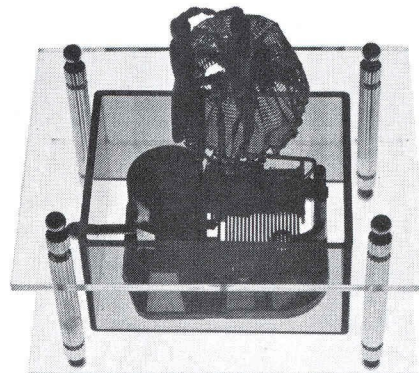
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## Macrophotography

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

**W**hen 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.

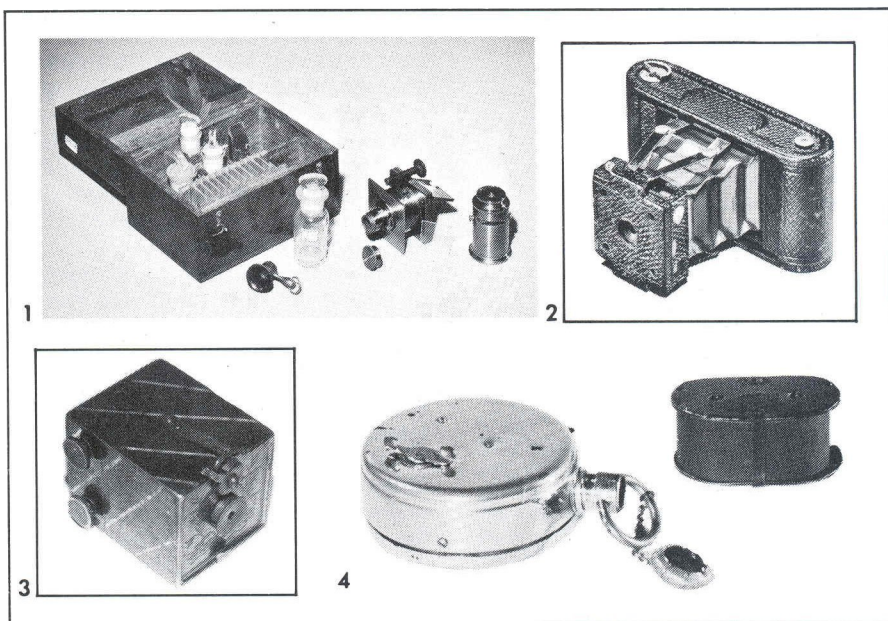
The pocket camera actually dates back at least to 1839, when Professor Carl Von Steinheil, a Bavarian scientist who founded the famed German optical works bearing his name, produced a small daguerreotype camera. Its 20mm two-element achromatic lens took 8x11mm pictures on highly polished, silver-plated 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, Steinneck 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-

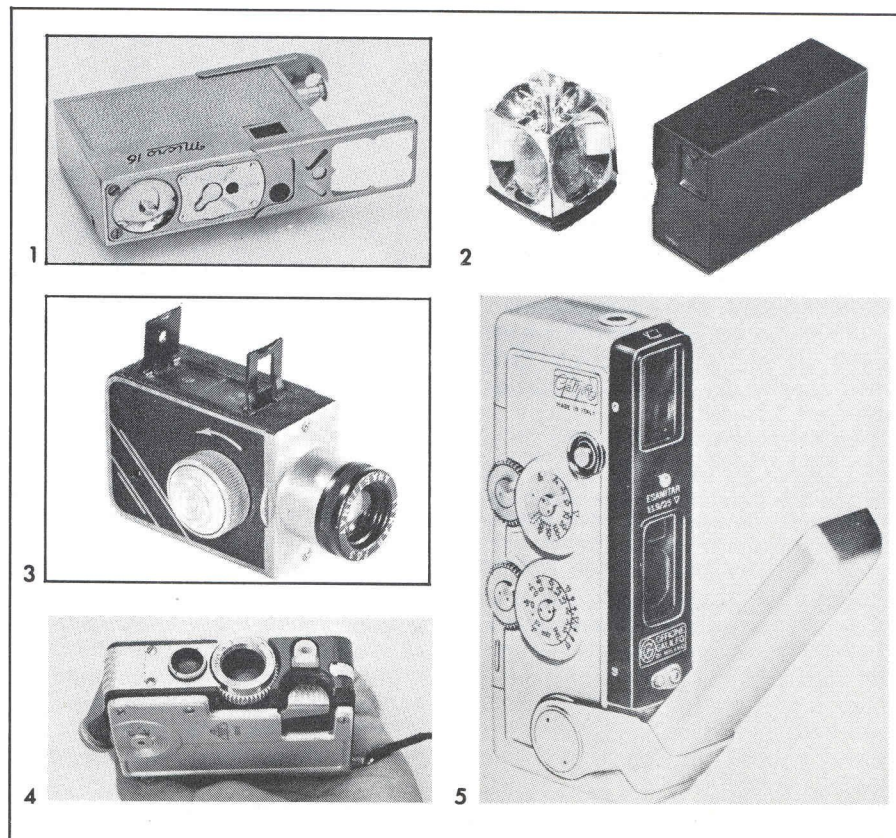
**1. The postwar American pocket camera boom began with the Whittaker Micro 16. Although it had a simple spring shutter (1/50 second) and an f/8 lens that closed to f/16, the Micro was very popular at \$29.50. Normal viewing was reflex-type, but an accessory open frame finder (shown on camera here) simplified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





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

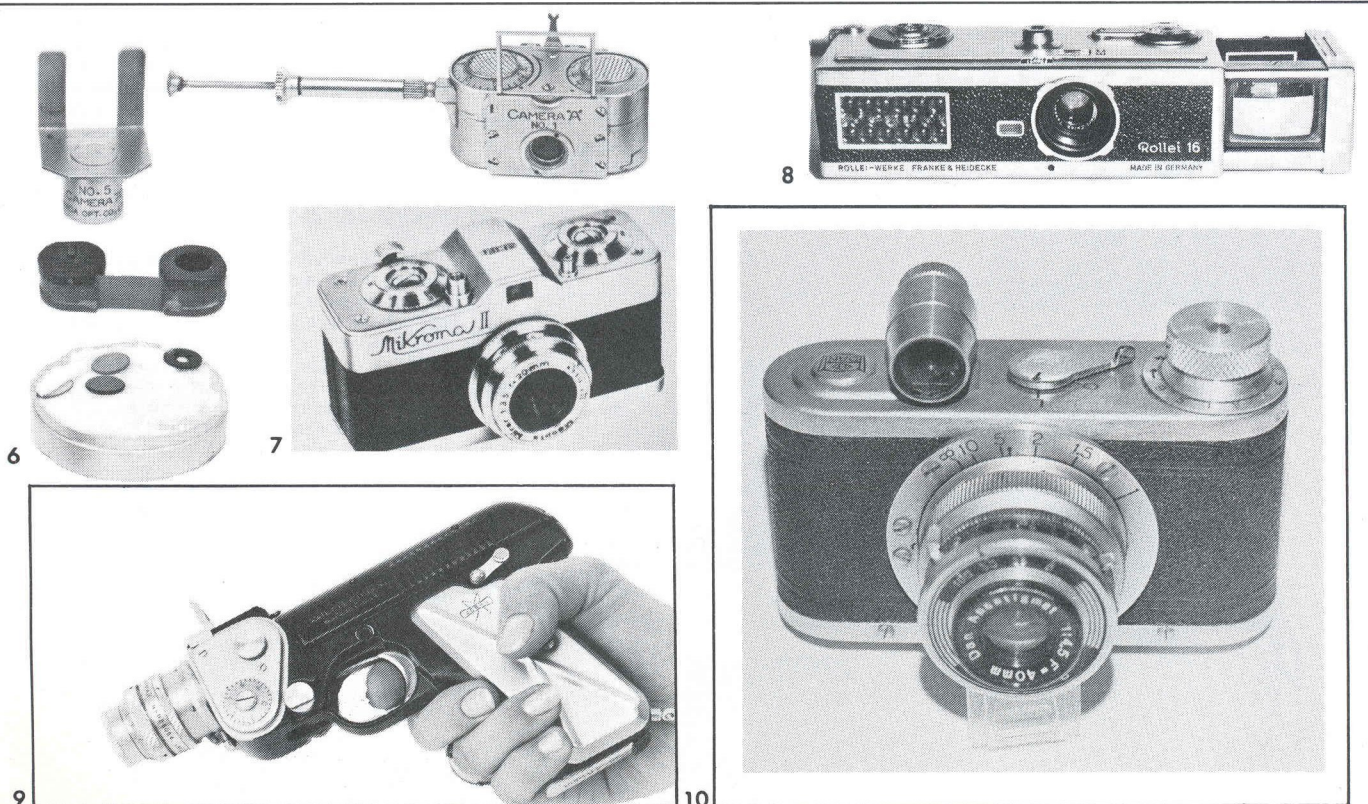
**6. Perhaps the most fascinating of the Japanese pocket cameras, the Camera "A" No. 1 was a product of Tokyo's Okada Optical Company. Designed around 1950, the camera used a cassette load of 8mm film and came in a lined presentation case complete with tripod adapter, glass filters, close-up lens (all 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.**





## 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.

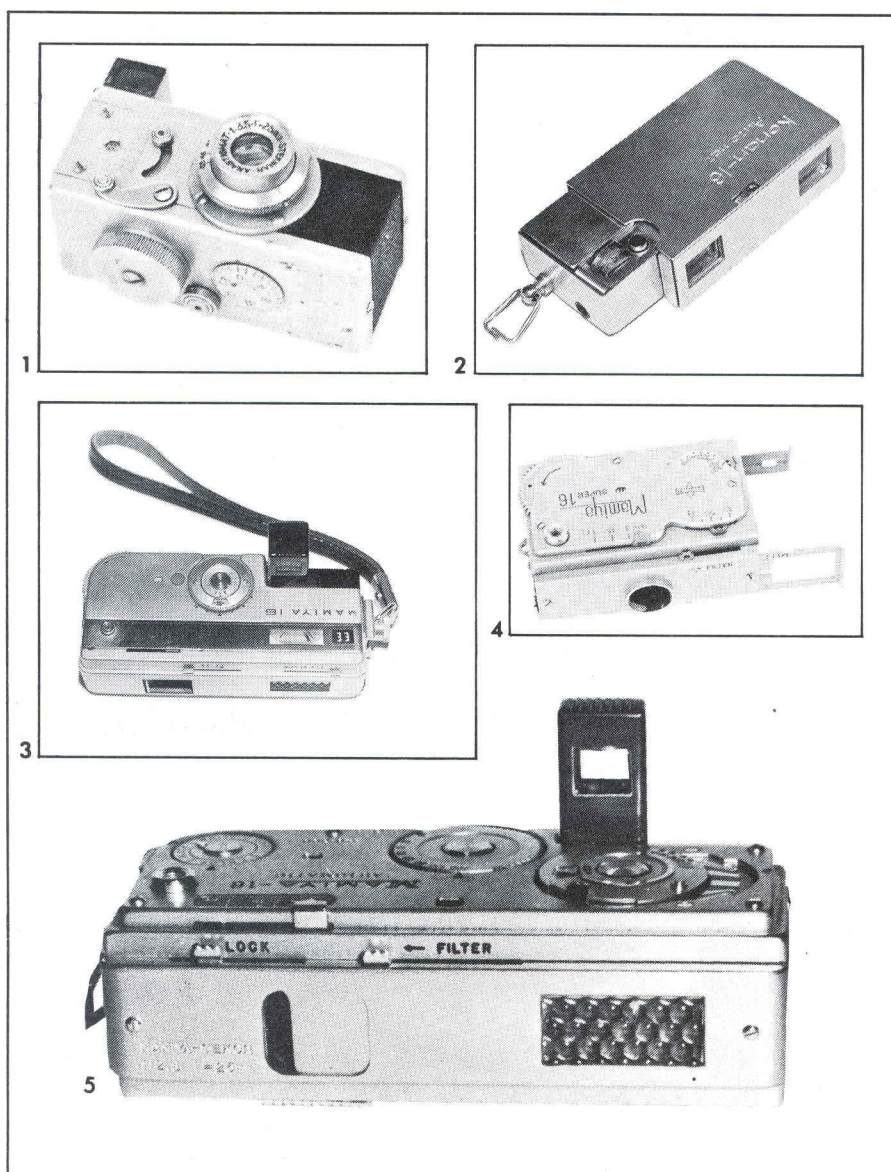
Several color emulsions were loaded for pocket camera use at the time, but only the old Kodachrome was really suitable. The lack of fine grain in other color films of that era contributed to a seemingly unsharp image when blown up. Processors customarily returned the tiny transparencies either in strips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



