

**P**hotographic technology is changing so fast that it is utterly impossible to define the standard tools-of-the-trade with any degree of precision. Cameras now in use range from clumsy boxes with lots of knobs and dials to the latest high-tech whiz-bang contraptions which look like props from *Star Trek*. Photographic images can now be stored on an astonishing array of films — plus CDs, computer disks and video tape. By the time you read this, it is likely other new technologies will have appeared, promising even greater ease, efficiency and opportunities.

This is all well and good, but there is also real value in understanding the basic principles of photography — and that is much easier to do with the old fashioned, manual approach. True, it does take more time to produce a photograph in this way. And potentially great shots can be missed while you fiddle with those knobs and dials. But there is a unique satisfaction in knowing exactly what your camera is doing and why, controlling it to achieve the effect you choose rather than merely pointing and shooting.

So, it is perhaps fortunate that technological advances take some time to settle in and push aside the past. Just as there are times when



*If you choose your camera carefully and practice with it often, you'll soon learn to use it with very little effort or conscious thought. It will become simply an extension of eyes and hands—responsive, accurate and comfortable. (Student photograph by Trevor Bredenkamp.)*

writing with an antique fountain pen is infinitely preferable to tapping at a computer keyboard, there are benefits to cameras that lack the latest automation.

The essential point to all this is that there's no need to worry if you can't afford to buy a slick new camera with all the bells and whistles, a stash of fancy lenses and a suitcase

full of clever attachments and accessories. In fact, odds are that you will become a better photographer if you begin with a second-hand, second-rate old clunker that looks like an artifact from the Stone Age.

Not everyone needs the same kind of tool—whether that tool is a camera or a musical instrument. A concert violinist may require the best



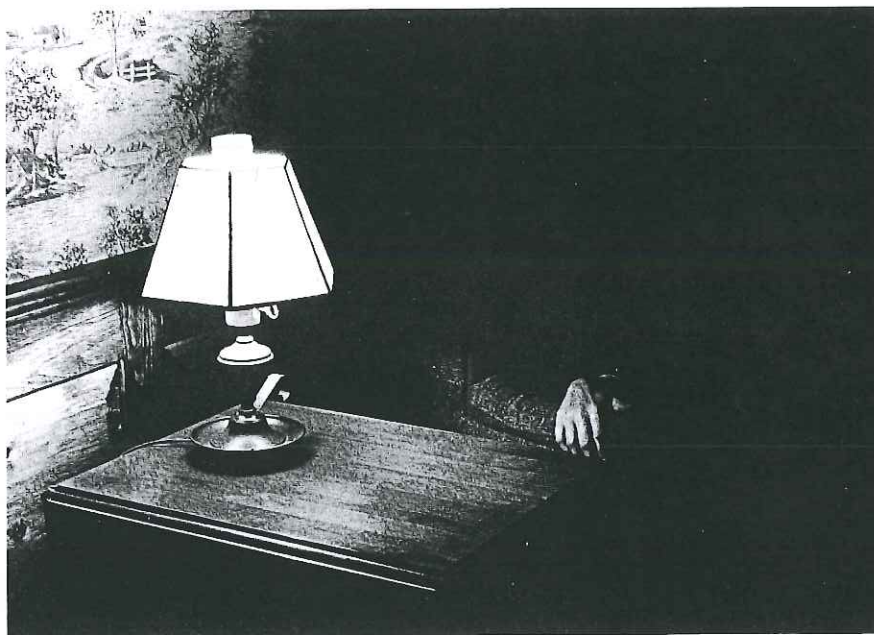
violin money can buy, but a blues singer may make fine music with an old beat-up guitar. Similarly, some of the world's best photographers use the latest "high-tech" cameras; others use antiques held together with rubber bands and tape. The right choice for most of us is somewhere between these extremes.

Like any tool, each camera has a "personality"—a mixture of opportunities and limitations that you control to express your personal vision. The goal in selecting a camera is to find one that does what you need it to do, no more and no less. In other words, the right camera for you is one with a "personality" that matches your own.

So, the first rule for choosing a camera is to make the best of what you already have or can easily afford. After you become more experienced, you'll be more able to decide exactly what features you need. That's the time to invest in your particular dream machine. For now, however, use what you have. If you don't yet own a camera, buy the least expensive one that meets your basic needs. The money you save can be spent on film and chemicals, which are far more important at this stage than the quality of your camera.

One thing that is important, no matter which camera you buy, is durability. No matter how careful you are, your camera is likely to get knocked around a bit. Get one that is strong enough to take abuse.

One of the most important differences among cameras is the lenses that can be used with them. An **interchangeable lens** can be removed from the camera body and replaced with another lens that produces a different effect. For example, a telephoto lens, which works like a telescope, may be



*Manual cameras provide a greater amount of creative control, especially with lighting. This photograph would have been virtually impossible with most purely automatic cameras, since the lighting effect is not "normal." (Student photograph.)*

used to make distant objects appear closer.

The most popular and inexpensive cameras have a **fixed lens**. A fixed lens cannot be removed and, therefore, cannot be changed. Though not essential, interchangeable lenses can be a great asset.

Some modern cameras offer a compromise between fixed and interchangeable lenses: permanently attached zooms. Others allow you to switch from a wide-angle to a telephoto lens, both of which are attached to the camera body. Generally, these kinds of lenses are too limited to be very useful, but they'll do in a pinch.

There is no need to rush out and buy a telephoto or any other non-standard lens immediately. For your first assignments, you will be using only the standard 50mm lens. Eventually, however, you will probably

want to try other lenses, so it is a good idea to use a camera that will allow you to do this. Once again, however, it is *not* essential. If your budget restricts you to a fixed-lens camera, you will still be able to take perfectly good photographs.

### **Manual or Automatic**

If you are buying a camera, you have two basic choices: manual or automatic. **Manual** cameras have been in use far longer than automatic cameras, and they are still preferred by many professionals. They require you to load and wind the film, select the shutter speed, set the aperture, and focus. **Automatic** cameras will do some or all of these things for you.

The big advantage of a manual camera is that you always control what it is doing. You make the decisions, and the camera does what you





*Automatic cameras are especially useful for "grab shots," when there's no time to fiddle with knobs and dials. By letting the camera make the technical decisions, the photographer is able to concentrate on getting the timing just right. (Student photograph by Lauren McDermott.)*

tell it to do. As a result, you will learn what works and what doesn't. You will also make mistakes (which is how you learn). The main disadvantage of a manual camera is the amount of time required to set up a shot.

Most manual cameras now available in the 35mm format have a built-in light meter. The meter informs you of the lighting conditions, and you set the speed and aperture accordingly. Older cameras, and many studio models, require you to use a hand-held light meter to "read" the light, before you set the camera.

Cameras with automatic light metering also fall into two categories: full automatic and manual-override. A **full automatic** chooses the aperture or shutter speed, or both, according to a built-in computer that is programmed to make the decision you would *probably* make anyway. While

this may sound very appealing, there is a problem—and that problem is the "probably."

As you become a more experienced photographer, you will sometimes disagree with your camera's choice. You may want a picture to be a bit darker or lighter for effect, or the camera may be "confused" by a complex lighting situation. With full automatic, there's not much you can do to change the camera's decision. This is a poor choice for anyone who really wants to learn about photography.

**Manual-override** offers a solution. When you're sure the camera will make the right decisions (i.e. when you want a normal photograph in a normal lighting situation), you let the camera decide. When you disagree, you set the camera manually. If you make an effort to pay attention to

what the camera is doing, you can use the automatic light meter most of the time and still learn how to use light effectively. If you don't make that effort you won't learn much, and you'll end up taking a lot of "normal" and probably boring pictures.

If you are shooting a lot of "candid" (quick, unposed photographs), like most photojournalists, the automatic option can be a big help—since you won't miss a good shot or annoy your subject while you fumble with knobs and dials. If you're doing a lot of still-life or nature photography, or if you prefer to take your time, as most art photographers do, a manual camera will do just as well, and will teach you more.

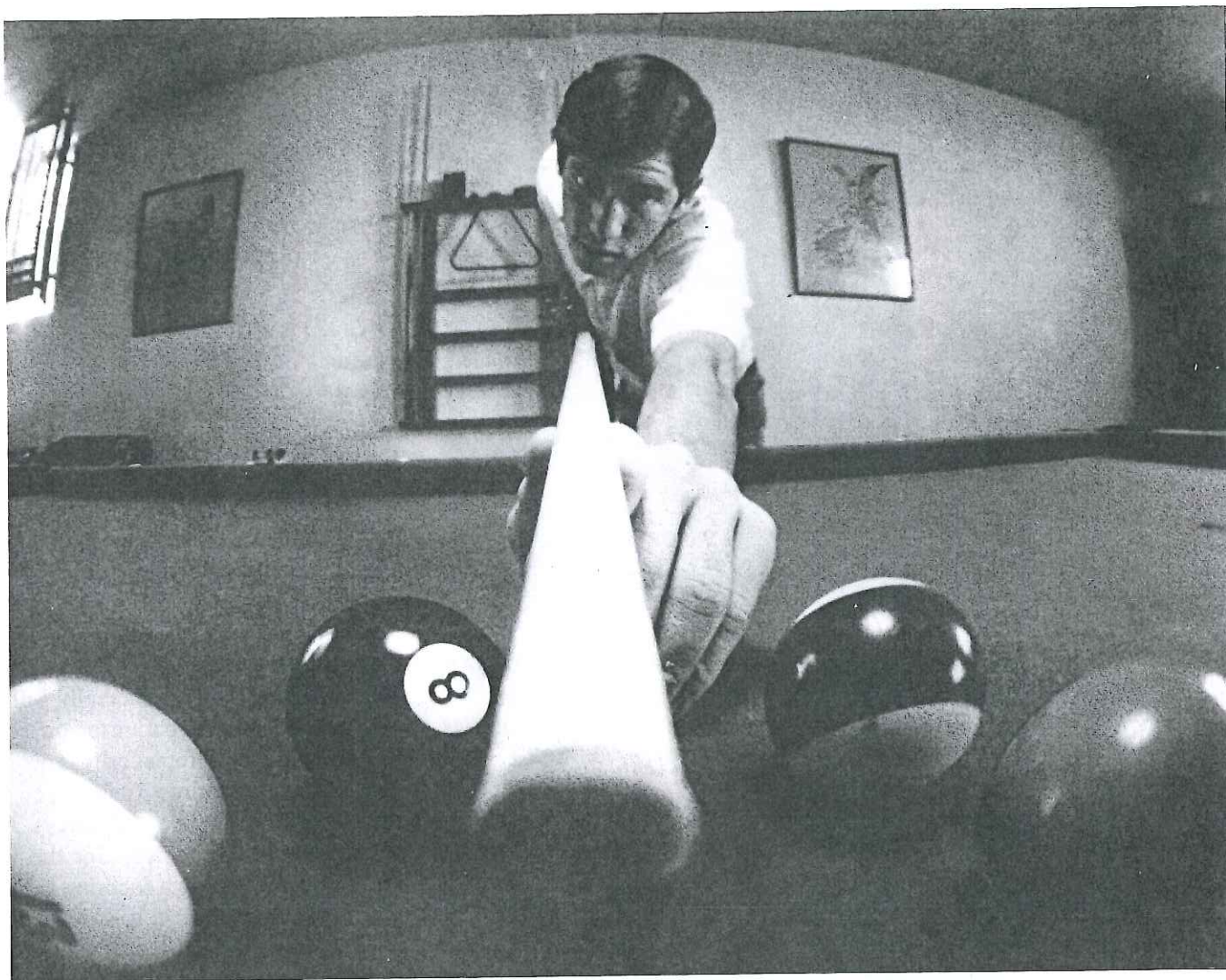
All the other automatic features are far less important. Loading and winding the film manually will soon become second nature to you, so having it done automatically is not much of an advantage (unless you have reason to be in a real hurry). Autofocus is another asset for the "grab-shooter," though focusing shouldn't take more than a split second once you get the hang of it.

### **What Format?**

Most modern cameras use 35mm film. This is a relatively small format that allows many frames to fit on a single roll. As a result, it costs less per shot than larger formats. In addition, the smaller format means the camera can be smaller and lighter, so it's easier to carry and use.

There is one advantage to larger formats: the grain of the film. All film stores images in tiny dots. When the film is enlarged, the dots begin to show. This is grain. If you are making a large print (such as for an exhibit or a full page in a magazine), grain can be a problem. Too much





*Each kind of lens has its own characteristics and uses. The wide-angle lens used for this photograph produced a slightly surreal effect. Much of the photograph's impact would have been lost with either a normal or a telephoto lens. (Student photograph by John Berringer.)*

grain reduces the image quality. It begins to look "grainy."

For most uses, including most exhibit formats, the ease of using 35mm outweighs the drawbacks of grain. And, as films continue to improve, grain is becoming less and less of a problem. After you've developed your skill and style, you may want to move up to larger formats, but you can decide that later.

### **Choosing a Lens**

In many ways, choosing the right lens or lenses is even more important than choosing the right camera.

Once you've selected some brand names you trust and can afford, you face another choice: which lenses to buy. Most cameras come equipped with a 50mm lens. This is the standard lens for 35mm photography, because it is closest to normal vision. What you see through the camera will

look the same as what you see with your own eyes. Whatever lenses you eventually buy, you will want to include the 50mm range. (By the way, if you find 50mm lenses and 35mm film confusing, don't worry. These and other terms will gradually become familiar to you as you use them.)

If you have a choice (and you often won't) you might consider buying the camera body and lens separately.



This will enable you to choose a **variable focal-length**, or “**zoom**,” lens instead of a “**fixed focal-length**” lens.

As explained in Chapter 11, the focal-length of a lens determines how wide an area you can see through it. In effect, the 50mm lens draws a box within which objects are normal in size and proportion. A shorter lens, such as a 35mm, draws a larger box, and makes objects appear smaller and somewhat “bent” or distorted. A longer lens, such as a 135mm, draws a smaller box, making objects appear larger and more compressed (with less space between them). With each fixed focal-length lens you have only one choice.

With a zoom (variable focal-length) lens, you have many choices. A zoom lens is essentially several lenses in one. For example, if a zoom lens ranges from 35mm to 135mm, you will have the same choices as you would if you bought the three focal-lengths just mentioned (35mm, 50mm and 135mm), plus all the focal-lengths in between.

Any good modern zoom lens will match the image quality of a typical fixed focal-length lens. (Early zooms produced poor image quality at “in-between” focal-lengths, such as 42mm. This problem has been corrected on most modern models.) You will, however, almost certainly lose some of the lower (larger) apertures offered by fixed focal-length lenses. Since a large aperture lets in more light than a small one, a zoom lens may limit your ability to photograph in low-light situations or at high shutter speeds.

If your budget permits, it is useful to have the three basic lens ranges: wide-angle, “normal” (50mm), and telephoto. However, the normal lens is the most important. Do not start

your photo career with only a wide-angle or only a telephoto. It’s perfectly all right to start it with only a 50mm. Once again, the best procedure is probably to start simply, with just a standard lens, and add others as you decide you need them. If you are thinking of investing in more than one lens, review Chapter 11 before making any decisions.

### **What Price?**

How much should you pay for a camera? Well, it really depends on what you can easily afford. Good cameras are available for as little as \$50. Top professional models can cost several thousand dollars.

If your budget limits you to under \$100, buy the best manual camera you can find—perhaps a good second-hand model. If you can afford more, take a careful look at the \$100 to \$500 range, keeping in mind the features you care most about (automatic features, manual features, durability, lenses), and buy the one that best suits you. A fully professional camera system—which you absolutely do not *need* at this stage—is likely to cost over \$1,000, depending on your choice of lenses.

Before buying any camera, read reviews of several in camera magazines (see the Bibliography for names of some good ones). Ask someone you know who does a lot of photography to give you some recommendations. Then make an informed decision.

Selecting a lens may be more difficult. The quality of the glass and construction varies considerably. A cheap lens may result in photographs that are always out of focus, blurry around the edges or grainy.

A good rule of thumb is to stick with the brand names you know. All

camera manufacturers make lenses for their cameras that you can trust to be as well-made as the cameras. In addition, cameras with automatic features may require that you stay with the same brand when buying lenses. However, many companies produce lenses designed for use with a variety of cameras. These may be as good as or better than the camera manufacturer’s own lenses and often cost less. Read the reviews in camera magazines and ask for the advice of experienced photographers before you decide.

One final note on lenses: Buy a UV (ultraviolet) or a “skylight” filter for each lens, attach it and leave it on at all times. Either of these filters will help a little to reduce haze under some lighting conditions, but their real use is to protect the lens itself from damage. Should you accidentally scratch the filter, it can be inexpensively replaced. Replacing the lens would of course be far more costly.

### **Summary**

There are only three key points you need to understand at this point: First, start with the basics—a simple, relatively inexpensive camera with a 50mm lens. Ideally, your camera will permit you to use other (“interchangeable”) lenses as well. You should have at least one lens that opens up to  $f/2.8$ , and all lenses should have UV or skylight filters attached. Second, choose a camera that includes manual controls for aperture and shutter-speed. Full manual is fine; automatic features are nice extras, but they are not necessary. Third, make sure that both your camera and lens are manufactured by a reliable company. If you begin with these essentials, you’ll be well equipped to learn photography.



## Additional Tools

Once you've selected a camera and lens (or lenses), you have taken care of the big decisions. Later, you may want to add other tools, such as a tripod and flash, but they can wait. Refer to Appendix 4 for more information on them when the time comes. There are, however, a few other inexpensive tools you'll need in order to get started.

As soon as you begin producing photographs, you'll want to store your negatives and prints, to keep them clean and organized. Plastic sheets specially designed for storing negatives are available that fit into a standard three-ring binder. Buy a box of these and a binder to file them in.

Immediately after developing and drying each roll of film, you will cut the roll into shorter lengths (five frames each) and slip them into the negative file. The next step is to place the film directly onto a piece of photographic paper to make a **contact print** (see Appendix 1 for explanation). With a plastic negative file, this can be done directly. Paper files are also available. They require you to remove the film to make a contact print, however, so are not as easy to use as plastic sheets.

Similar sheets are available for storing prints. If your photo store doesn't carry them, you can probably find them in an office supply store. Any plastic sheet that will hold  $8\frac{1}{2} \times 11$  paper, with holes for a three-ring binder, will do fine.

You will also want an ordinary grease pencil (yellow or white) to mark your contacts when you're deciding which frames to print. Grease pencil marks show up well in the darkroom, and they can be rubbed off if you change your mind.

Finally, be sure to have the instruc-

tions for your camera available at all times. If you are buying a new camera, this will be easy. If not, you may have to search a bit, or buy one of the many books available describing different camera models. If you can't locate instructions, have someone who knows the camera well show you how it works—and be sure to take notes.

## Basic Tools Checklist

The following tools are all you will need to get started. Check to see that you have them, and that your camera and lens meet the key requirements listed here:

### Camera Requirements

- \_\_\_ Durability
- \_\_\_ Manual Aperture & Shutter-Speed Controls
- \_\_\_ Reliable Manufacturer
- \_\_\_ Interchangeable Lens Capability

### Lens Requirements

- \_\_\_ Standard Focal-Length (50mm)
- \_\_\_ f/2.8
- \_\_\_ Reliable Manufacturer
- \_\_\_ UV Filter

### Additional Tools

- \_\_\_ Plastic Negative Files
- \_\_\_ Plastic Print Sheets
- \_\_\_ Grease Pencil
- \_\_\_ Operations Manual or Other Instructions for Camera

## THE CAMERA, INSIDE & OUT

Most 35mm cameras are fairly similar in the design and placement of key controls. For example, the film advance lever (the "winder") is generally on the top right, next to the shutter release. Advances in electronics, however, are turning cameras into

mini-computers. Many are utterly unlike the traditional models. Some new ones, for example, come with a built-in auto-winder and don't have a film advance lever at all.

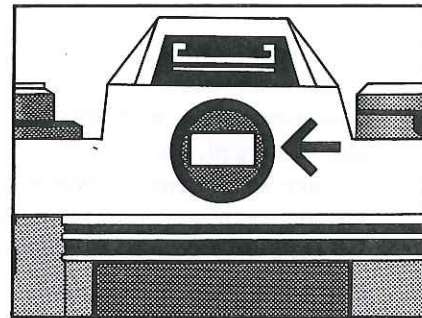
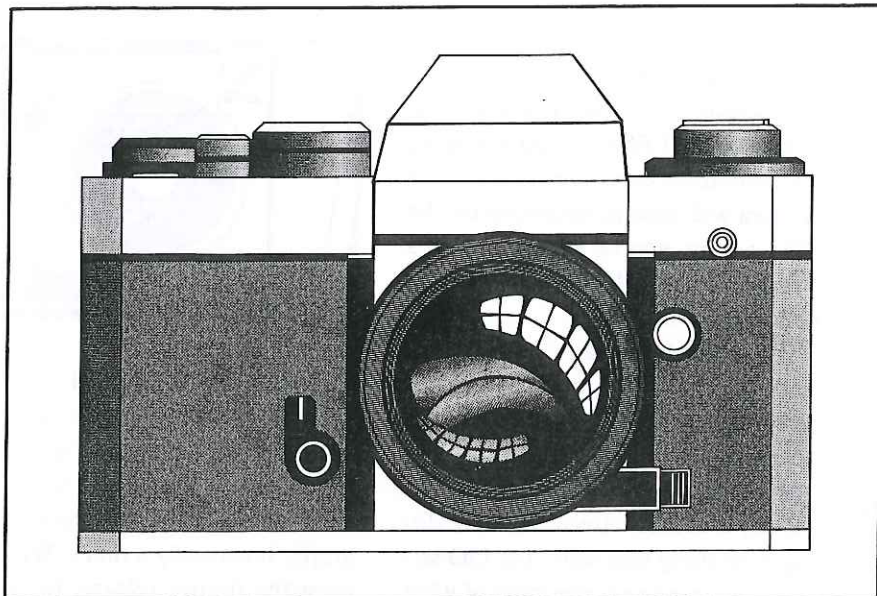
So, the following pages are not intended as a substitute for your camera's manual. No one list can be correct and complete for all camera brands and models. You may have to hunt a bit to locate some of the components on your camera, since each model tends to have its little quirks. Check your own manual to be sure that you know where each component is located on your camera and how it works.

The following pages *are* intended as a summary of the basic components of a typical, traditional camera. This will give you an idea of how your camera compares to most others.

You may not find all of the components that are listed here, either because they are not included in your camera or because they have been replaced by an automatic feature. It is still a good idea to become familiar with all of them. Understanding each component of a traditional camera will help you understand how even the simplest or most automatic camera works. And knowing how a camera works is vital to using it well.

As you read this section, compare each description with your own camera. Be sure to have your own camera's manual on hand to clarify any questions. Look for each component as it is described, and try it out. Do not put film into the camera until instructed to do so.





## The Camera Body: Outside

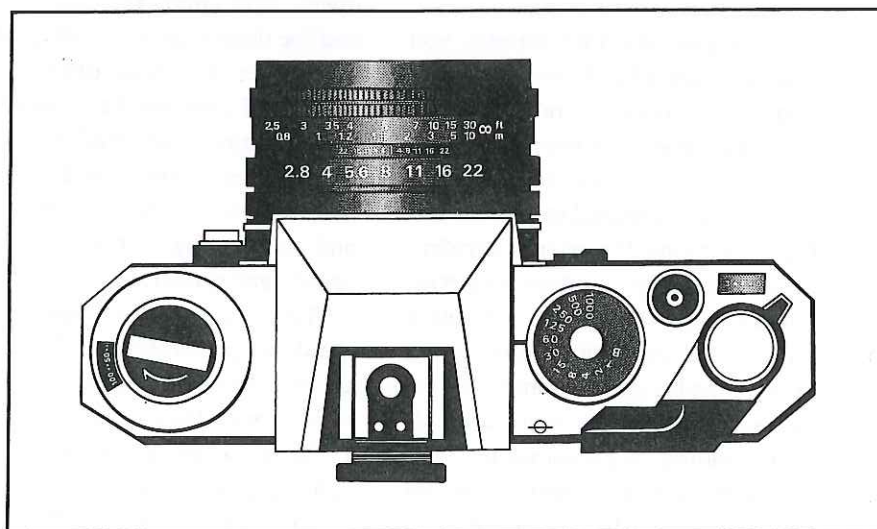
### • Viewfinder

The first thing to look at on your camera is the part that allows you to look *through* it. The viewfinder, in simplest terms, is just a rectangular window that shows you what will be in your photograph when you click the shutter. (Actually, viewfinders generally show you a bit less than you'll actually get. This is usually an advantage, as it gives you a little "slack" when you're making a print.)

Your viewfinder is probably quite a bit more than just a window, however. It certainly will include some kind of focusing aid. One common focusing aid is a split circle (called a split-image focusing screen) in which out-of-focus objects do not line up correctly. Another common kind is a series of circles (called a ground-glass focusing screen) that go in and out of focus as you turn the focusing ring on the lens.

The split-image screen is especially helpful if you're at all nearsighted. To use it, you simply adjust the focusing ring until both sides of the circle line up. It works best when the split is placed across a line of some kind, such as an eyelid or a branch, so you can see what you're lining up.

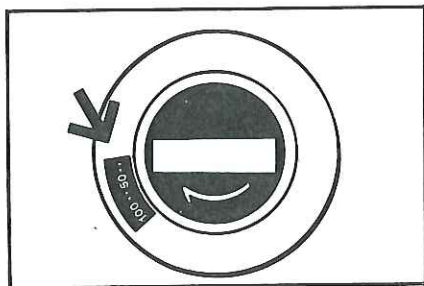
In addition, most modern cameras use the sides of the viewfinder to show you important information. This may include the aperture of your lens, the camera's shutter-speed,





whether the camera is in manual or automatic mode, whether your flash has recharged, etc.

Take some time to explore your viewfinder. If you aren't certain what everything in it means, consult the user's manual for your camera or ask an experienced photographer.



#### • ASA/ISO

The first step of any photo assignment is to set the correct **film speed**. This will be listed on the **film carton**, or box, (and also on the **canister**, the metal container holding the film) as **ASA** or **ISO**. These two terms are used to describe the same thing: the film's sensitivity to light. In fact they often appear together, as ASA/ISO. ISO is becoming the more common term, however, so we'll be using it throughout this book. (Both "ASA" and "ISO" are the initials of organizations—the American Standards Association and the International Standards Organization—that establish scientific measurements.)

The ISO indicator is generally built into the rewind knob, on the left side of the top of the camera. The ISO numbers are usually visible through a little window in the rewind knob. Each number is usually double the preceding number: 25, 50, 100, 200, 400, 800, etc. Dots between the numbers indicate settings in between these numbers. So, for example, ISO 125 is one dot above ISO 100.

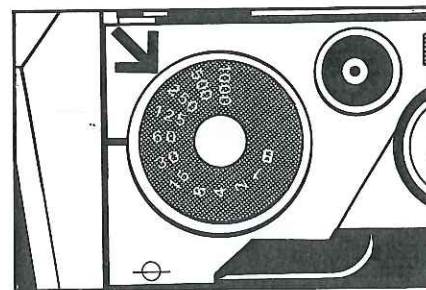
You *must* remember to change the ISO setting every time you use a different kind of film. If you are using any automatic exposure system, your camera will base its decisions on the ISO setting you've selected. If it's wrong, all your photos will be incorrectly exposed.

The same holds true for the camera's internal light meter. If you're setting the shutter speed or aperture according to the meter, your exposures will only be correct if the ISO setting is correct. Even if you're doing everything manually, the ISO setting is an important reminder of what kind of film you're using.

To change the ISO setting, you generally turn a knob that moves the numbers through the indicator window. You may first need to press a button, lift the knob or otherwise release a lock designed to prevent you from changing the setting accidentally. On many modern cameras, you'll change the ISO by pressing a button until the right number comes up in a display panel. Some cameras will set the ISO for you automatically, reading the proper setting from a code on the film canister. (Film that has been coded for this purpose is labeled "DX.")

Locate the ISO indicator on your camera. Adjust the setting to see how low and high it goes. Professional cameras will provide ISO settings as low as 6 and as high as 6400. Many popular models have a range of 12 to 3200. Don't worry if yours doesn't go as high or as low as that. Most films fall between ISO 25 and 1200.

Once you've checked out the limits of your camera's ISO indicator, set it to ISO 125. This is the speed for Kodak's Plus-X film, which you will be using in your first assignment.



#### • Shutter-Speed Control

The shutter-speed control is almost always on the top right of the camera. It determines how long the shutter will remain open for each photograph. It is simply a timer. When you press the shutter release, the shutter opens, light enters through the lens, and the timer begins counting. When the shutter has been open for the amount of time you have selected, it closes again. The numbers on the shutter-speed control indicate fractions of a second (60 = 1/60 of a second, and so on), so the timer has to count very quickly.

The most commonly used shutter speeds are probably 60 and 125. Both are fast enough to stop most action with a 50mm lens, while allowing for a fairly small aperture in most lighting conditions.

Notice that 125 (or 1/125 of a second) is almost exactly twice as fast as 60 (or 1/60 of a second). The next speed above 125 is 250—twice as fast again. Depending on your camera, the highest speed may be 1000 or even higher, fast enough to "freeze" a bird in flight or a race car at the Indy 500.

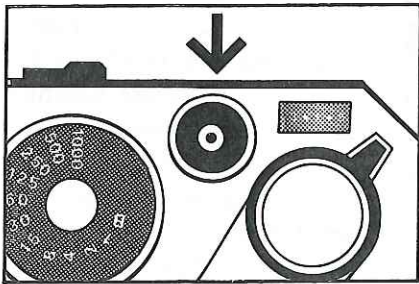
Moving down from 60, the next speed is 30. Again depending on your camera, the shutter speeds may go as low as 1, for 1 second. Some cameras provide even longer automatically timed exposures, even as long as a minute or more.

The last indicator on the shutter-speed control should be a "B." This



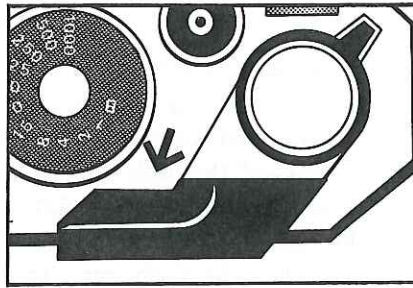
stands for “bulb.” In the early days of photography, the shutter was released by squeezing a rubber bulb, and it stayed open as long as the bulb was squeezed. The photographer had to decide when enough light had entered the camera, and then let go of the bulb to close the shutter. Since film was very slow in those days, that wasn’t as hard as it sounds.

Today, although everything about the cameras we use is far more complex, this term remains the same. The “B” simply means that the shutter will remain open as long as the release is held down. This is useful for very long exposures, primarily at night. To use the “B” setting, you will almost certainly need to use a tripod and a **cable release**, which (like the old-fashioned bulbs) is used to avoid shaking the camera.



#### • Shutter Release

Next to the shutter-speed control (top right of the camera) you should find the shutter release. It is simply a button which, when pressed, triggers the shutter mechanism. (Note: On some cameras, the shutter release is pressed part-way down to measure the light or “freeze” the aperture setting.)



#### • Film Advance Lever

The film-advance lever (or winder) is generally located directly behind the shutter release, making it easy to click-and-wind quickly.

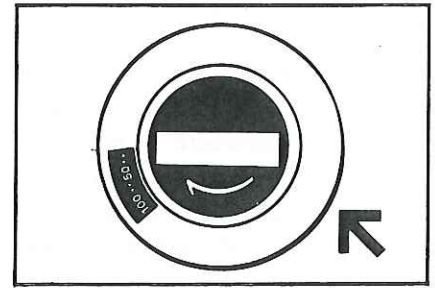
Try turning the winder (counter-clockwise). If it doesn’t move more than an inch, press the shutter release. You should hear a sharp click. Then try the winder again. It should swing easily out to the side of the camera and snap back into place when you let go of it. If you had film in the camera, you would have just taken a photograph and advanced the film to the next frame.

#### • Rewind Release

As you wind film through the camera, it travels from its canister (on the left) to the “take-up reel” below the advance lever (on the right). When you reach the end of a roll, the lever will jam. You will no longer be able to turn it easily. The next step is to rewind the film back into the canister.

Before you can do that, you’ll need to release the lock that keeps the film from slipping backwards by accident. Remove the camera from its case and look on the bottom of the camera body. You should find a small button directly below the film advance lever.

Pressing this button will release the lock, so you can rewind the film. (Until there is film in the camera, however, it won’t have any effect, so don’t bother testing it yet.)



#### • Rewinder

Once you’ve released the film lock, you’ll need to crank the film back into its canister, using the rewind knob on the left side of the camera’s top. Generally, a small crank is lifted out of the rewind knob for this purpose. There should be an arrow indicating that the crank turns clockwise, in case you get confused. As you rewind the film, it is a good idea to keep your finger on the rewind release button so it doesn’t lock again and tear the film’s sprocket holes.

#### • Battery Compartment

Another important component is generally located on the bottom of the camera: the battery compartment. If yours is there, it will probably have a round metal cover with a slit in it. To open the compartment, you place the edge of a coin (a penny works well) into the slit and turn it counter-clockwise. When the cover is removed, a small packet with one or two coin-shaped batteries should slide out. These batteries are very sensitive and may not work if you get dust or fingerprints on them. So treat them carefully. Fortunately, your batteries rarely need changing.

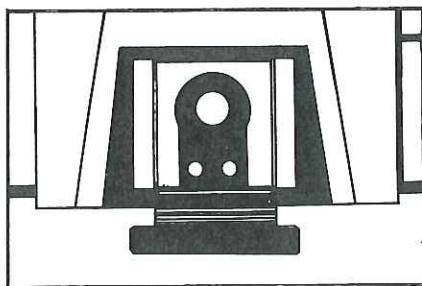
If you found a round metal cover with a slit in it, but did not find any batteries under it, then you’ve probably just discovered your camera’s motor-drive connector. This is a gear that connects a separate motor-drive unit to your camera’s film advance mechanism. (To learn more about



motor-drives, see Appendix 4.) In this case, your camera's battery is located elsewhere. Most likely it's in a compartment on the front of the camera body, on the right side. If so, it's likely that your camera uses batteries to run both the light meter and a variety of automatic features. The more automatic features your camera has, the more power it requires, and the more frequently you'll need fresh batteries. Check your manual to find out how to change them.

#### • Battery Check

The placement and operation of the battery check varies considerably from one camera model to the next. It may be activated by a button on the top or on the front of the body. It may cause a needle in the viewfinder to move to an assigned spot, or light up an indicator lamp. Or it may be fully automatic, activating an indicator only when the battery is low. Take a moment to locate the battery-check function on your camera, using the manual, and be sure you know how it works. Few things are more depressing in photography than discovering too late that your camera has dead batteries.



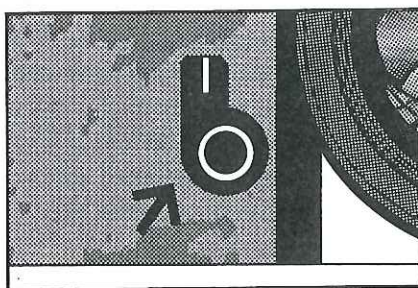
#### • Hot Shoe

Nearly all modern cameras come equipped with a "hot shoe." This is a small clamp right above the eyepiece, onto which a flash can be

mounted. It establishes an electronic link between the flash and the camera. This link enables the camera to "trigger" the flash while the shutter is fully open. It may also enable the flash and camera to "communicate," so the flash can "tell" the camera what aperture to use, or the camera can "tell" the flash when it has received enough light. (See Appendix 4 for more information on flashes.)

#### • Accessories

The next three components are not essential and are not included in all models. If your camera has them, however, they can be useful.



**Self-Timer** The primary purpose of the self-timer is to permit you to take a picture of yourself. It usually consists of a lever that you turn before pressing the shutter release. The timer starts counting as soon as the shutter release is pressed, generally giving you a few seconds to position yourself in front of the camera and work on your smile. Most self-timers also include a little light that blinks to tell you it's working.

**Multiple-Exposure Control** This feature stops the film advance mechanism from working, so you can move the lever without moving the film. This enables you to cock the shutter for a new shot, while the film stays where it is. You can then put more than a single shot onto a single

frame of film. If you want to play with multiple images, "ghosts" and related special effects, this mechanism will allow you to do so.

#### **Depth of Field Preview Button**

Normally, your lens will stay open to the largest aperture available until you click the shutter. This gives you as much light in the viewfinder as possible to help you focus precisely. The depth of field preview button temporarily closes the lens down to the aperture you've selected, so you see exactly what the film will see. As explained in Chapter 9, the smaller the aperture, the greater the range of distance that will be in focus. This range is known as depth of field.

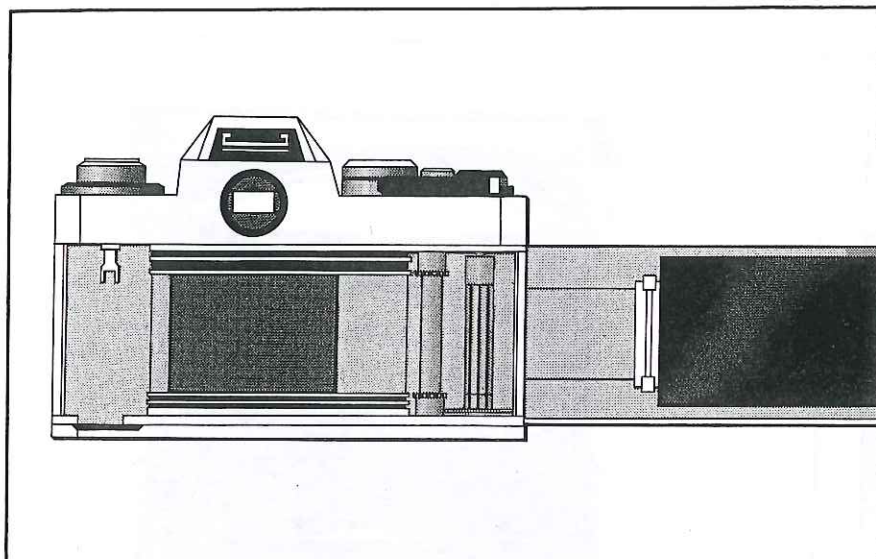
If you have selected a small aperture (say,  $f/16$ ) pressing the depth of field preview button will cause the viewfinder to become dark (due to the small aperture). If you look carefully, you'll see that nearly everything is in crisp focus. If you've selected a moderate aperture (say,  $f/5.6$ ), the background will be out of focus when the foreground is in focus, and vice versa. If you've selected your largest aperture, the depth of field preview button won't have any effect at all, since the depth of field stays the same.

The primary function of the depth of field preview button is to help you select the correct aperture when depth of field is of critical importance. You'll find it especially useful when shooting close-ups.

#### • Camera Back Release

Now comes the tricky part. Because you don't want your camera to open itself accidentally, the latch that keeps the back shut is often cleverly hidden. In addition, releasing it tends to require several steps. Generally, the release is connected in some way to pulling up the rewind knob (which

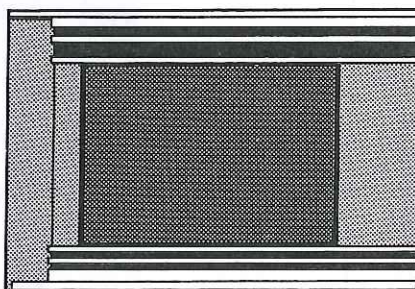




also frees the film canister from its sprocket). If in doubt, once again, consult your manual.

### The Camera Body: Inside

Before we explore the internal workings of your camera, a few general words of caution are in order. Though the outside of most cameras can stand a fair amount of abuse, the inside can't. Once you've opened the camera back, you have exposed some very delicate machinery. This is one time that strict rules *do* apply: Don't poke around with your fingers until you know what you're poking. Don't try to "fix" things, even if they appear to be broken. If you think something's wrong, take the camera to an authorized repair shop. Open the camera back only when absolutely necessary (to change film), and close it again as quickly as possible. Protect the interior from dust and moisture. If you're shooting in dusty or wet conditions, aim your back into the wind and cover the camera as much as possible. In short, *be careful!*



#### • Shutter

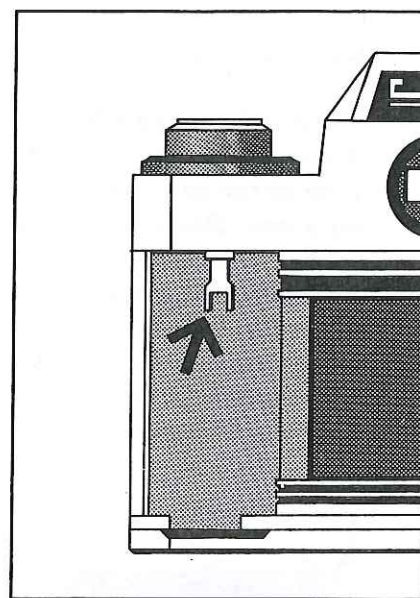
The first thing you're likely to notice once you open the camera back is also the most fragile and important: the shutter. This is a piece of cloth or a series of small metal plates covering the rectangular space directly below the viewfinder. It is as delicate as it looks, so do not touch it.

When you click the shutter, three things happen. The lens closes down to the aperture you've selected. A mirror between the lens and the shutter (which you'll see a little later) lifts up out of the way. Then the shutter slides open, stays open for the duration of the shutter speed you've selected, and slides shut.

Sound simple? In a sense it is, except that all this has to happen with absolute precision in a fraction of a

second.

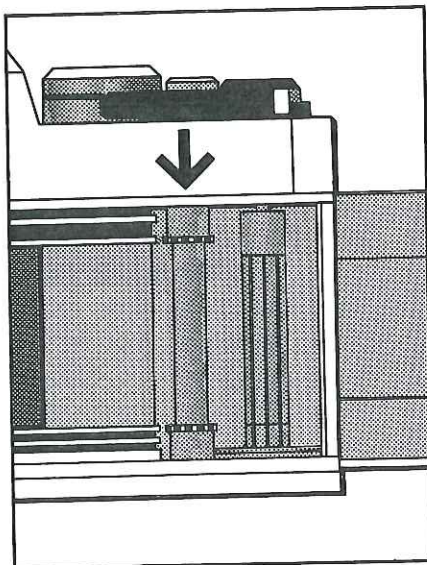
The metal plate attached to the camera back (see it?) presses the film flat. (This is another of the camera's "don't touch" parts.) The shutter opens and closes, letting a very precise amount of light in through the lens. The light exposes one piece (or **frame**) of film, initiating the chemical reaction that produces a negative image. The film is advanced to a fresh (unexposed) frame and the process is repeated until the film has all been exposed. That, in very simplified form, is how a camera works.



#### • Film Spool

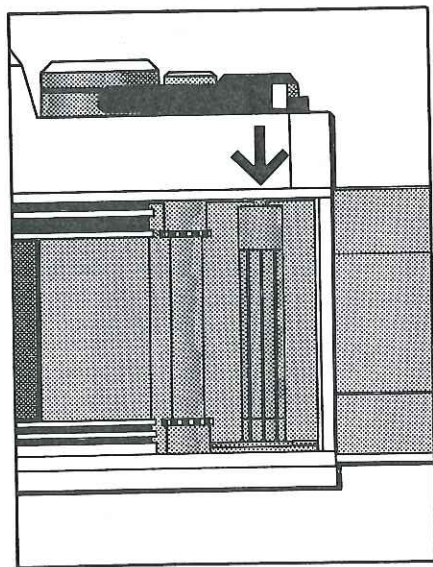
To the left of the shutter screen is the film spool. This is where you'll insert a film canister. Notice the prongs that protrude from the end of the spool. These must be fitted to matching openings in the film canister. Notice also that the entire spool slides up out of the way when you pull the rewind knob. This provides just enough space for you to slip in the canister. You then push the knob back down, fiddling with it, as needed, to slip the prongs into their respective openings.





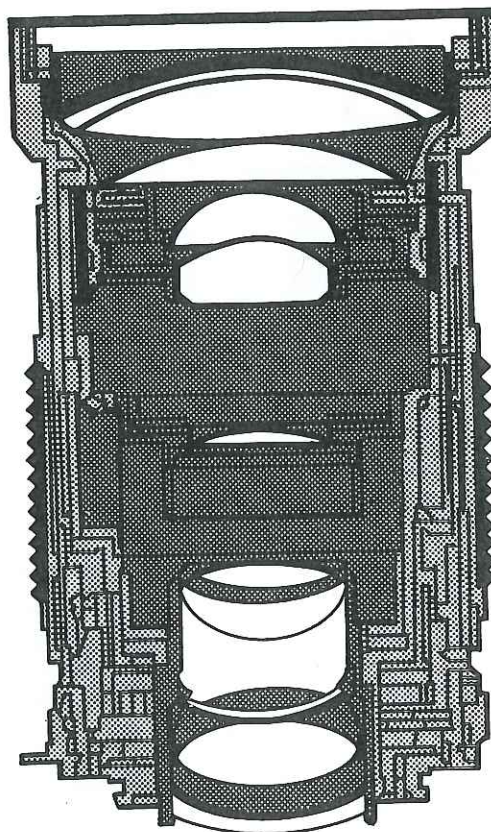
#### • Film-Advance Sprocket

Just to the right of the shutter screen there are two sets of sprockets (gears) on a reel. This is the next step in loading film. The small rectangular holes along the upper and lower edges of the film must be positioned over these sprockets. Each knob of the sprocket should slide easily into a hole in the film as they turn together.



#### • Take-Up Reel

The final step in loading film occurs



at the far right, just past the film-advance sprocket. This is the take-up reel. In most cameras, this reel is simply a tube with slits in it. Your job is to insert the end of the film in one of the slits and then wind the reel until the film catches and holds tight.

On some newer cameras, the take-up reel is equipped with a special mechanism to make it easier to insert the film. Some even load the film automatically. Once again, if you have any questions, consult your manual.

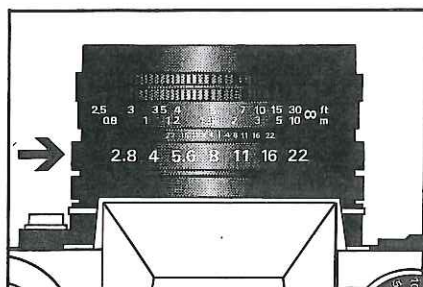
#### The Lens

The lens is a camera's eye. Like a human eye, its opening expands and contracts (opens and closes) as the

amount of light it is "seeing" decreases and increases. Also like a human eye, it focuses on some things and not on others. Unlike the human eye, however, a camera lens requires help to do these things. With most cameras, that help must come from you, the photographer.

You expand and contract the opening of the lens by adjusting the **aperture ring**. You use the **focusing ring** to select what is in and out of focus. The aperture and focusing rings are used together to determine how *much* is in focus. By decreasing the aperture, you increase the depth of field. In other words, a smaller lens opening means that more of your photograph will be in focus.





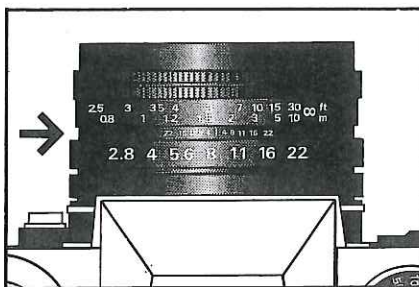
### • Aperture Ring

Let's start with the ring that is usually closest to the camera body and move outwards. On most cameras, this will be the aperture ring.

The aperture ring consists of a series of numbers—4, 5.6, 8, 11, etc.—that can be turned to line up with a marker. The lowest number will probably be 1.8, 2.8, or 3.5, depending on your lens. The highest is likely to be 16 or 22.

Each of these numbers stands for an **aperture** or **f-stop**, a different size lens opening. The lower numbers represent larger openings; the higher numbers represent smaller ones.

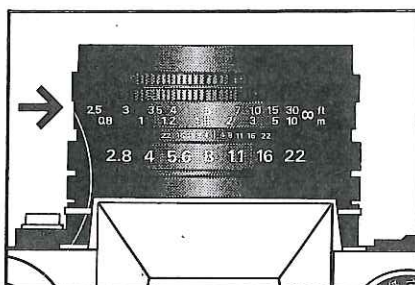
On cameras with automatic metering, you're likely to see an "A" or some other symbol indicating "automatic." If so, you may need to press a button to release the ring so you can turn it. In this case, the ring locks itself on automatic, so you don't accidentally bump it into manual mode (which can result in a lot of ruined photos.)



### • Depth of Field Scale

Generally, there is another ring with the same numbers (usually smaller and sometimes colored) right next to the aperture ring. This one does not turn. It is the depth of field scale, and is there only to give information. The scale tells you what range of distance will be in focus at each f-stop. For example, at f/16 everything from 7 to 30 feet away from you will be in focus. At f/4, the depth of field is much smaller: from 7 to about 9 feet.

Basically, the depth of field scale gives you the same information as the depth of field preview button. The difference is that one tells and the other shows you.

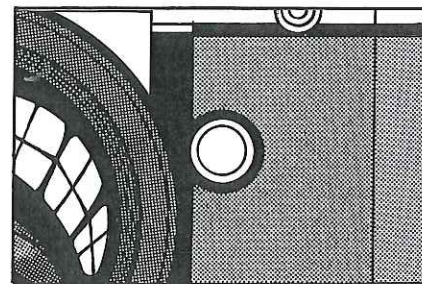


### • Focusing Ring

If you've been checking out the depth of field scale, you've probably already figured out the focusing ring. The focusing ring is marked with distances, virtually always in both feet ("ft") and meters ("m"). You turn the ring to adjust the focus.

Normally, of course, you won't see the numbers, since you'll be looking

through the lens. The main use of the numbers is to give you the option of guessing at the correct focal distance. This can come in very handy if you want to sneak a shot of someone without being noticed.



### • Lens Release & Mount

Now that you know how the lens works, let's take it off. On most cameras, you'll find a button somewhere that you must press as you turn the lens (and some turn one way, some the other). Absolutely, positively, with no exceptions, do *not* attempt to remove a lens from any camera until you're sure you know how. This goes double for trying to put the lens back on. (One of the best ways to ruin a camera, outside of dropping it on concrete, is to force a lens on the wrong way—and there are *lots* of wrong ways.) Always check the manual first.

Once you have studied the manual carefully, practice removing the lens and putting it back on again until you can do it quickly and effortlessly. Before you do, make sure you have everything correctly lined up, and that you have a clean, safe place to put the lens when you take it off. Finally, never leave a lens lying around off the camera and out of its case, or a camera lying around with no lens on it. Either way, you're just asking for trouble.