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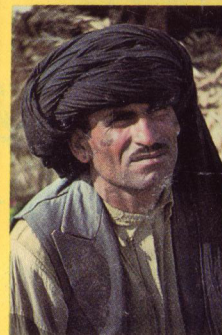
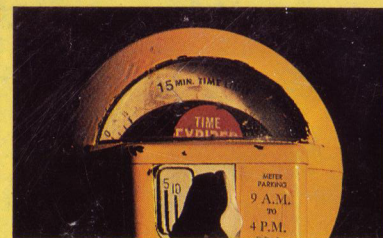
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***The Nikon EM
The most economical
way to get into
the Nikon system***

BEGINNER'S GUIDE TO THE SINGLE LENS REFLEX CAMERA



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\$2.00



Foreword

If you're new to single lens reflex photography, the name "Nikon" may be new to you. It's been old hat to professional photographers for many years now, because it's the camera almost all the top professional photographers use. Before you start thinking this is going to be a full fledged commercial for Nikon cameras, you can relax. You're not likely to see the name Nikon pitched again till you get to our equipment section at the end of this book.

Why then are we doing it? Because we feel that as the recognized leader in fine photography, we have a responsibility as well as an interest to spread the word. To spend energy and money helping *photography* to grow and prosper. This book is just one example of that responsibility. Another is The Nikon School of Photography, a travelling weekend short course held in major U.S. cities, which you might find an excellent follow-up to this book.

Photography is different things to different people. It may be a fine art, a satisfying profession, or simply a most enjoyable and exciting hobby. We sincerely hope that this book will help it find a place in your life.

—Nikon Educational Services

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Conceived, written and published by 13-30 Corporation for Nikon Inc. Special editor and photo credits for pages 6-34: Rick Smolan. Front cover: Stephen J. Wilkes (top right), Joyce Turk (center left), Alex Siodmak (bottom right). Inside front cover: K.J. Bell. Jim Sieg, pages 35, 38; Wendy Furman, page 36; Rip Noel, page 37; Skeeter Hagler, page 39; Stan Badz, pages 40-41; David Greenwald, pages 42-43; Shedrich Williams, page 43; Joshua Williams, page 44; Prentice Price, page 45. Technical Editor: Richard LoPinto.

Contents

3 Introduction

5 Introducing the 35mm SLR Camera

- 5 Getting Ready
- 6 Holding and Steadying the Camera
- 7 The Lens and Focusing
- 8 Shutter Speed
- 9 Capturing Motion
- 9 Aperture Control
- 10 Inside the Camera
- 11 Speed and Aperture = Exposure
- 11 Depth of Field
- 13 Light Meter

15 Exercises

- 16 Review of Cameraworks
- 16 Shutter Speed and Motion
- 18 Shutter Speed and Horizontal Motion
- 20 Depth of Field
- 22 Light Meter
- 24 Composition
- 26 Getting Up Closer
- 27 Framing Movement
- 28 Framing a Scene
- 29 Contact Sheets

30 Learning Review

35 Taking Better Photos: Nine Photographers Share Their Techniques

46 Building Your Personal 35mm SLR System

Introduction

Have you ever looked at a modern 35mm single lens reflex (SLR) camera? Do all those numbers, switches, dials and settings scare you? Well, you aren't alone. Many people take one glance at the assortment of controls and say to themselves: "I guess I'll stick to my Instamatic."

That's why Nikon has developed this short learning book. It's for you and others like you who want to use a 35mm single lens reflex camera but have been frightened off by its appearance of complexity.

To begin with, today there's a wide variety of SLRs available. There's the kind that's completely automatic, to make picture-taking as uncomplicated as you could imagine. Other modern SLR cameras let you choose either automatic or manual control. And, while the third popular SLR type is called "manual," it too makes excellent pictures easy, even if you're a beginner.

Fact is, you don't have to understand all the fancy dials and settings at first to take a good picture. Whatever camera you start with, if you'll give us a bit of your time for some experiments, you'll soon discover it's not really a forbidding or mysterious machine.

Instead, it's a remarkable tool that enables you to *respond visually* to what you see. You live in a world teeming with images, all vying for your visual attention. With your ordinary eyes you may focus only passively, without emotional, intellectual or physical response. But, taking a photograph requires a decision-making response about which images you want to record, and how you want others to see them.

Imagine that you're clutching your camera in the rush-hour traffic of a city street. Perhaps you see a stream of moving figures or the waving patterns of the crowded sidewalks. Perhaps your eye goes to the woman sitting wearily at a bus stop, or to the policeman frantically directing traffic. Perhaps you want to illustrate an ad for watches or supplement a

news story on urban crowding. You can freeze the action or shoot a blur of movement. You can focus from a distance to make the street a bustling colony of human ants or get a close-up portrait of a single face.

The exercises in this book are designed to introduce you to the operation of SLR cameras and to some basic photographic techniques. As you learn the basics, we hope you'll also discover some of the secrets of *making* good photographs (as opposed to simply *taking* them).

We could use up a lot of words trying to describe the versatility of the 35mm camera, but we think the best way to give you a feeling for the excitement of the photo process is to let some photographers speak for themselves. So following the learning exercises are discussions with nine young photographers whose photo images reflect some very different types of visual response. Although most of them focused their first cameras not very long ago, they're already producing imaginative photographs that range from frozen-action sports shots to sophisticated studio work. They talk about their projects, their ambitions, and their own ideas on looking through the camera's eye.

In the end, however, you have to find out for yourself what a 35mm SLR can do. All we ask is a few hours of your time and the cost of one roll of film. In return, we promise that when you have finished reading and doing the experiments in this book, you will have a good idea of how a 35mm SLR operates and whether you want to invest in one of your own.

Note: If you're using an automatic camera (either the automatic-only SLR or any automatic in 'Auto' mode), be sure to look for special operating hints throughout this book that are underlined. If you're using a manual model, or an automatic camera in its manual control mode, you can disregard such sections.

Introducing the 35mm SLR Camera

GETTING READY

1. Get a small pad for notes.
2. Buy one roll of 36 exposure Kodak TRI-X 35mm film (estimated cost, \$1.50).
3. Borrow a 35mm single lens reflex (SLR) camera from a friend or parent or rent one if none is available.
4. Be willing to spend a few hours with nothing on your mind except following the experiments in this book.
5. Ask a friend to act as a subject.

When you borrow the camera, ask someone to teach you the following steps before you start the exercises in this book. A thorough review of the camera's instruction booklet beforehand is the best way to start.

1. How to open the back of the camera.
2. How to load the film into the camera and how to rewind it.
3. How to cock the shutter and fire it.
4. How to focus and control shutter speeds.
5. How to take the lens off the camera and place it back on properly (make sure he shows you how to check that it's on right).
6. How to turn the meter on and off (make sure the battery is fresh).
7. How to set the light meter correctly.
8. How to set the ASA—have your friend set it to 400.
9. How to use the depth-of-field preview or scale.
10. If your camera is an automatic, have your friend show you how to put it on 'Auto', and then keep it there for these exercises. (Alternatively, if the camera offers full manual exposure control, you could have your friend set it on 'manual' and keep it there, to gain greater familiarity with photographic basics. For manual shooting, remember to disregard the underlined sections that follow!)

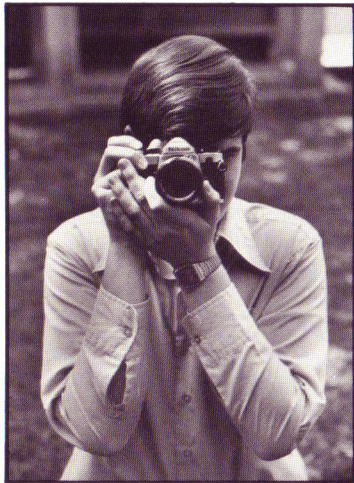
After you learn all this easy preliminary information, pick an overcast day or a time of day when the light is not *too* bright (three hours from sunset or early morning) and start the exercises in this book.

HOLDING AND STEADYING THE CAMERA

One of the most important things when taking a photograph is to keep the camera as steady as possible. Pick up the unloaded camera, put the strap around your neck and hold the camera tightly as if you were going to take a picture.

Now take a look at the photograph below and place your hands on the camera as shown in the diagram. It doesn't matter whether you are right-or left-handed, or whether you use your right or left eye, you should still hold the camera this way.

In this manner, you support the major weight of the camera



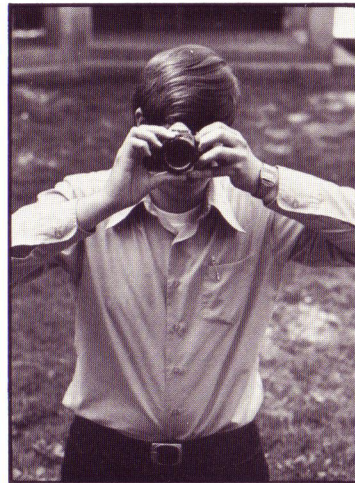
Proper way to hold a camera, supporting the weight of the camera with the palm of your left hand and pushing the shutter release button with your right hand.

with the palm of your left hand. You steady the camera and push the shutter release button with your right hand.

Pressing The Shutter Release: Hold the camera out in front of you and press the shutter release, squeezing the camera body with your right hand *but pressing the release itself with your index finger only*. Did you notice whether you moved your whole hand or just that one finger?

Practice cocking the shutter and firing the camera a few times while you hold it in front of you, concentrating on keeping the camera relatively steady as you fire it. Now, put the camera to your eye and concentrate on keeping the camera steady as you fire it.

Where are your arms in relation to your body? Out at the



Improper way to hold a camera

sides or in tight along your body? Try both ways and see which one feels the most steady. If your arms are held tight along your body, there is less room for them to move around, and this should help you stabilize the camera.

One additional way to steady the camera is to rest your chin on the top of your wrist (where your wrist meets your palm). It might feel ridiculous at first, but you'll see how much steadier this makes your hands.

THE LENS AND FOCUSING

Take a look at the lens. Numbers and markings all over the silly thing, right? Well, there are only two things on the lens that you have to use.

First, the **aperture control ring**—that series of numbers (16-11-8-5.6-4, etc.) usually near the back of the lens. These numbers are called f-stops. (Some advanced lenses have a duplicate f-stop scale closest to where the lens attaches to the camera body, enabling f-stops to appear in the viewfinder of certain camera models.)

Whenever we refer to a number preceded by an f/ it means we are talking about aperture, the size of the opening in your lens. When you turn this ring, a diaphragm in the lens opens and closes, letting in more

or less light. We will return to this in a moment.

Second, the **focusing ring**—that wide swivel ring towards the front of the lens. Most lenses have finger grooves or ridges on the focusing ring to give you a good grip. Now to practice using the focusing ring.

Focusing: Hold the camera up to your eye. As you look through the finder, you will see the image that your lens is seeing. If the subject is **fuzzy**, you need to focus the lens by rotating the focusing ring until the image appears sharp in the finder. Whatever focusing aids may be built in, when you have set the focus at the correct distance, the subject will be sharp in the finder and on the film.

All SLR cameras have focusing devices of some type to help you know when you're in focus. Look through the viewfinder again, and you may see a circle containing what looks like small glass beads (actually they are prisms). When you are in focus these prisms seem to disappear. This "micropism ring" is one type of focusing aid found on most cameras. Another popular focusing system is called the split-image rangefinder. With this, the center circle splits the the image into two parts. To focus correctly, turn the focusing ring until the two split images come together. You are in focus when your subject is no longer split in half.

Keep in mind, too, that the

circles are just to help you focus. You don't necessarily have to keep the circle over your subject to take the photograph. Provided the distance between you and your subject remains the same, you can place the subject anywhere in the frame that you want to.

Focusing By Feel: It will be important later for you to be



The photograph above demonstrates what you might see when looking through the viewfinder of a camera that has a split-image screen for focusing. The image is out of focus in this case.



The same image now in focus. Note that the area around the boy's eye is whole whereas in the unfocused photograph the area was split.

able to feel the difference between the focusing ring and the aperture control ring without having to look at the lens each time. With your eye up to the camera viewfinder, practice focusing and changing the aperture control ring.

(Moving the aperture ring will not affect the focus; you won't see any noticeable difference.) What way do these rings feel different? The major difference is that the focusing mount turns smoothly; the aperture ring has click stops.

SHUTTER SPEED

In order to best understand shutter speed, remove the lens and look straight at the mirror inside the camera. When you take a picture, the mirror swings up and the shutter (directly behind it) opens and closes to let the image reach the film. Cock the shutter and fire the shutter release while looking at the mirror. You're seeing just what the film would see: the shutter opens and closes, at different rates of speed, depending on the speed that has been set automatically or manually.

Find the shutter speed control and take a good look at it. (With automatic cameras providing an "Auto" shutter position, look for the exposure indicator shown in the viewfinder.) The numbers you see on it refer to fractions of a

second—i.e. you should always mentally put a 1/ before the number to imagine what this speed means. A shutter speed of 1/1000 is very fast because it means you are opening and closing your shutter in one thousandth of a second. A shutter speed of 1/2 means you are keeping the shutter open one half of a second.

The longer the shutter stays open, the more light will register on the film. So, one aspect of shutter speed is that it controls the amount of light which reaches the film.

Set your shutter speed at 1/1000 and fire it. Now set the shutter speed at 1/15 and fire it. (For cameras controlling shutter speeds automatically, you can do this by turning the aperture ring while looking through the finder, until the desired speed is indicated.) What did you hear? At which shutter speed do you think more light will reach the film?

CAPTURING MOTION

There is another aspect of shutter speed that will affect the final photograph: motion. Let's say someone is running by and you want to take a photo. If you shoot the picture at, say, 1/2 second while they are running by, what kind of photograph will you get? In one-half second that person will move right by you—so on your film all you will get is a

blur.

Now, if you take the same photo at 1/1000 of a second, the shutter is speeded up to capture the action and freeze it. So there is a second aspect of shutter speed—it can be used to freeze the action (or deliberately slowed to show action, as a blur).

Professional Tip: A closely related point is how still you can hold the camera. Do you think you can remain completely motionless for one complete second? Hold your hands out in front of you and see how steady they are. With most people, every time your heart beats, your hands pulse a little. So photographers generally try to shoot their photographs at the highest shutter speed possible. (This is so important that one camera even has a built-in alarm that alerts you whenever the speed is below 1/30, the slowest speed at which you should generally handhold your camera.)

APERTURE CONTROL

Shutter speed as you have just learned can control the amount of light entering the camera. Aperture, likewise, can control light.

Take the lens off the camera. With your fingers on the aperture control ring look into the back of the lens. Starting with the aperture set at f/16, begin moving the aperture ring a click

at a time. See how the hole gets bigger? Each number on the lens corresponds to a specific sized opening.

One thing you should remember about f-stops is that they are the opposite size than their number would indicate. In other words f/16 or whatever the highest number on your lens (f/22, f/32) is the smallest opening; f/1.4 or whatever the lowest number on your lens is the largest (see Diagram A on following page). Looking at these numbers, you probably would have guessed just the opposite, right? It's important that you learn which numbers indicate a large opening and which ones are small. As long as you remember the reverse logic, it's easy.

Great, you say-so what? How does that affect the photograph? Well, recalling what you learned about how speed affects the photo, you'll remember that a faster speed lets in less light (the shutter opens and closes quickly) and a slower speed lets in more light. A lens aperture can control light in a similar way. A large opening lets in a lot of light, a small opening doesn't let in very much light at all.

INSIDE THE CAMERA

Have you ever wondered why SLR cameras make the sounds they do? A lot of people associate the sound with the shutter closing, but in fact it's just a

mirror inside the camera flipping up and down which makes that noise. These cameras have been specially designed so that the movement of the mirror will not affect your picture-taking.

To observe what we're talking about, with the lens still off the camera, look inside the camera from the front. See that mirror? (It scratches easily, so don't touch it.) Now cock the shutter and fire it while you watch the mirror—do this at a slow shutter speed so you can see what happens.

Can you guess what the mirror does? It reflects the light up to your eye as you look through the viewfinder, and when you push the shutter release, it flips up out of the way. Then that curtain opens up, lets the right amount of light hit the film, and the mirror flips back down so you can see through the camera again—ready to take your next photograph.

SPEED AND APERTURE = EXPOSURE

Speed and aperture *working together* control the amount of light reaching the film.

Imagine you have a glass you want to fill with water. There are a lot of ways you can fill it: a drop at a time for four hours or by running the faucet at full speed for a few seconds. The light meter in the camera tells us how large the glass is (how much light we need), and it is up to us

to decide how to fill it. We can let the film have exactly the same amount of light needed by taking the photograph at a very slow shutter speed (1/30) while letting in less light (aperture of f/11), or we could achieve the same effect by taking the photo at a very fast shutter speed (1/1000) while letting in a lot of light (f/2).

Look at the following combinations of shutter speed and aperture. All of these settings let exactly the same amount of light hit the film. Notice that as speed slows down, the aperture gets smaller.

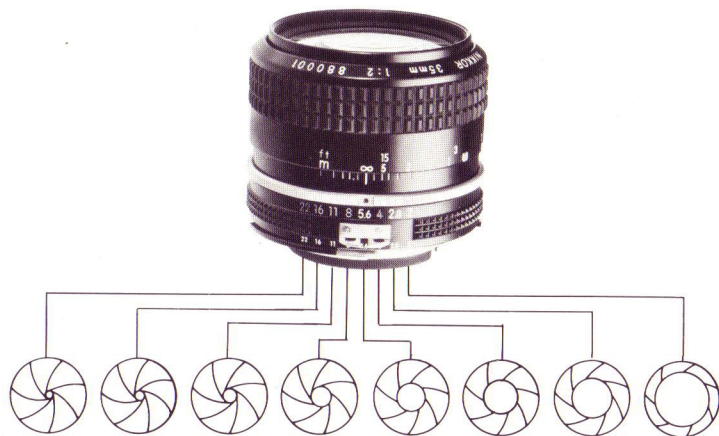
Speed—Aperture	
1/1000—f/2	1/60—f/8
1/500—f/2.8	1/30—f/11
1/250—f/4	1/15—f/16
1/125—f/5.6	

As far as exposure goes (the amount of light hitting the film), all of these photos are identical. However, there's more involved. It's something called "depth of field."

DEPTH OF FIELD

Sometimes you can improve a photograph by purposely putting the background and foreground out of focus while keeping the subject in sharp focus. Other times you may want to have everything in focus to show how the subject and the background relate to each other. *Depth of field* is the name of the process that allows you to carefully control the areas of focus

Diagram A



APERTURE SIZES

Using a 35mm f/2 Auto-Nikkor lens as a model, the illustration above demonstrates how aperture moves from the very smallest opening at f/16 to the largest at f/2.



Photo A. Shot at f/2.8.

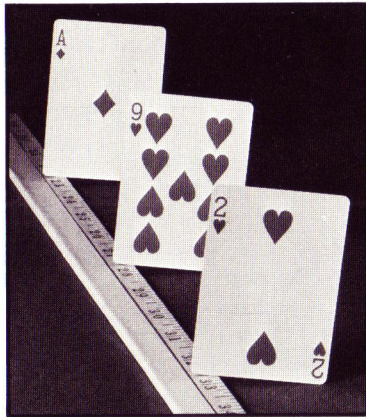


Photo C. Shot at f/22.

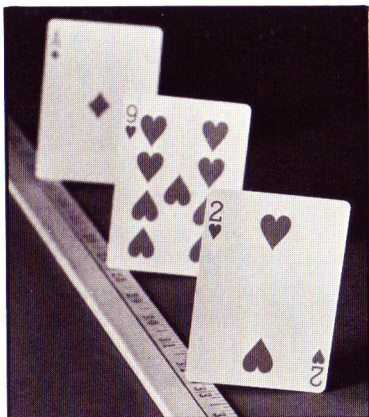


Photo B. Shot at f/8.

in your photograph. It allows you to place emphasis on your subject by selectively controlling the background and foreground focus.

Aperture, besides controlling the amount of light entering the body of the camera, also allows you to control the depth of field. The smaller your aperture, the sharper the background and foreground in your photo become. The larger the aperture

(for example, f/2.8), the less the background and foreground are sharp.

The area in which everything is sharp in your photograph is called the depth of field. At an aperture of f/16 we would say that the photograph has great depth of field. At an aperture of f/2.8 we would say that the photograph has a very shallow depth of field.

Let's look at some examples of this concept. In Photo A the lens was set at its widest aperture (we used f/2.8). We focused on the first card. Since we had a shallow depth of field, only the card we focused on is in focus. The rest of the cards are out of focus. To get Photo B, the only thing we changed was the aperture setting (with a corresponding change in shutter speed to keep the right exposure). This time our f-stop was f/8. As you can see the second card is beginning to get sharper, but the third card is still out of focus. In Photo C we closed down the lens

to the smallest aperture (on this lens it was f/22, but depending on your lens it could be f/16, f/22 or f/32). Now all of the cards are in focus.

Obviously, you can control depth-of-field with any SLR camera. If your camera's an automatic, this is much easier if it's an "aperture-priority" type (where you pre-set the desired f-stop, and the camera automatically sets the required shutter speed). Moreover, you don't have to guess how much depth-of-field a given shot will show. Practically all modern lenses have built-in indicator marks or scales showing the near and far limits of sharpness at various f-stops. With the lens shown in Diagram A (page 10), when you've focused at about seven feet, at an aperture of f/22 everything will be recorded sharply from infinity to about three feet. Check your lens (or your instruction book) for specifics. Some SLRs also have a special control called depth-of-field "preview"; this closes the lens down to the actual "shooting" f-stop, so you can see in the viewfinder what will and won't be sharp in the finished photo.

METERING

Let's figure out next how your light meter knows what the correct amount of light is to properly expose your film. First of all, look for the dial on your camera which has the letters

ASA. Here's how it works: different films have different sensitivities to light, meaning some films require more light than others to get proper exposure. The ASA is a setting you make on the camera which in turn tells the light meter how sensitive this kind of film is to light. The ASA sensitivity of all film is marked on the box.

The light meter helps us make the correct combination of speed and aperture to give us the right exposure. It's sort of a computer. You set either the shutter speed or f-stop at which you want to shoot. The meter will tell you (and with automatic cameras, automatically set) the corresponding f-stop or shutter speed for best exposure.

Now, *turn the meter on* and look through the eyepiece. With manual cameras (or automatic cameras in manual mode), somewhere in the viewing area you'll see either a needle and index marker, bright glowing lights known as LEDs (Light Emitting Diodes) or a Liquid Crystal Display (LCD). To set the exposure, you turn the aperture ring or shutter speed dial until the needle is lined up with the index mark (or until the LED or LCD that indicates correct exposure is lit). Since the markings differ from model to model, be sure to check with your friend (or the camera instructions) for specifics.

With automatic cameras that select the shutter setting, no special adjustment is necessary, provided that the meter readout

inside the finder shows a shutter speed that's neither too slow (below 1/30) nor too fast (above 1/1000, or whatever your camera's fastest shutter speed may be).

Now let's say you are outside on a very bright day, using a manual-metering camera (or automatic in manual mode). You have set the shutter to 1/125. Even with your lens all the way closed (f/16 or f/22) there will still be too much light reaching your film. Your meter freaks out and registers gross overexposure. Since your lens is set at its smallest opening, you must increase the shutter speed.

The opposite problem can occur if you set your manual speed so fast that even with the lens set all the way open (your lowest f-stop setting), still not enough light can get in. The meter registers gross underexposure. Since your lens is opened all the way, you must decrease your shutter speed.

Can you think of any other ways your light meter can get confused? What if you set your aperture at f/16 and it's a dark, dismal day outside? Well, at that setting not much light can get through your lens, and since it's dark outside to begin with, there isn't much light to get through the lens anyway. So your meter may say, "Shoot this photo at 1/2 of a second." Well, that means it's either time to grab a tripod or open your lens up some because almost no one can hold the camera steady enough

to take a sharp photo at 1/2 second. (It goes without saying that an automatic camera that signals audibly when the speed's too slow is a decided advantage in situations like this. After all, sometimes you get so wrapped up in shooting that you might forget to check the shutter speed!)

With an automatic camera, it's a good idea to pay attention to the settings chosen by the meter. Automatic exposures are fine for the vast majority of subjects and scenes, but some situations make special exposure-control features a definite plus. For example, some cameras have an "exposure compensation" button. When you press it as you take the picture, the meter automatically increases the amount of light that reaches the film (very handy when you're shooting a dark subject against a bright background). Other automatics let you "program" more or less exposure with a special control. Some even electronically "memorize" (lock in) an automatic exposure setting from one position, retaining it for the actual picture taken from another position.

Practically all 35mm SLR automatics offer one or more of these useful controls. Each helps you guide the camera through difficult lighting situations to ensure that you'll get the best possible results. A little practice will make perfect.

Exercises

We ask that you do the following exercises in the late afternoon (about three hours from sunset) or in the early morning. Before beginning, *check that you have loaded the film in the camera properly.* A way to check this is to take the rewind knob and turn it clockwise until you feel a resistance. This is taking up the slack in the film. Now as you cock the shutter watch the rewind knob—it should turn, indicating that the film is properly engaged.

You should have with you a notepad to record the speed and aperture settings you use for each photo. Also, make a note of where you are standing during these exercises, and try to stay in the same place so you can compare photos afterwards.

Each time before taking a photo you should check that you have done the following:

1. Lens properly attached
2. Lens properly set
3. Light meter properly adjusted
4. Holding the camera correctly
5. Shutter cocked
6. Camera focused

REVIEW OF CAMERAWORKS

Frame 1: Set the lens to f/16. If you're using a manual camera or an automatic set for manual operation, adjust the shutter speed while looking through the finder until the meter readout shows correct exposures. Hold the back of the camera to your ear so you can hear the sound of the shutter. Now, press the shutter release button.

Frame 2: Now open your lens all the way (and, with non-automatic cameras, set the exposure accordingly). Shoot another frame. Can you hear the difference?

Try to picture mentally what is happening inside the camera. Sit down and make a list of what happens when you push the shutter button. (Meter automatically sets correct speed in automatic cameras. . . mirror flips up. . . lens closes down. . . shutter opens, exposes the film, and closes. . . lens opens up. . . mirror flips back down.)

SHUTTER SPEED AND MOTION

Now let's try some experiments to test what we have discussed about the effect of shutter speed on your photograph. In this exercise you want to focus on a friend's hands from about three feet away.

Shoot each of the following exercises twice.

Frames 3, 4: Close the lens to f/16 to obtain a relatively slow shutter speed. (With a non-automatic camera, use the shutter speed control to make the meter readout indicate correct exposure.) Shoot two frames while your friend spins his hands.

Frames 5, 6: This time open the lens up to f/2.8, requiring a much faster speed (again, adjust the meter of non-automatic cameras by moving the shutter speed control). Now, shoot two more frames of your friend's spinning hands.

Review Questions:

1. What major difference do you expect to see in these two shots?
2. What will be the same in both photos?
3. Did you have any difficulties in shooting this photograph?



At a slow shutter speed (1/30 and f/16), motion is seen.

At a fast shutter speed (1/500 and f/2.8), motion is frozen.



SHUTTER SPEED AND HORIZONTAL MOTION

For this exercise instruct your friend to ride or run past you at a moderate speed. Each time as he comes into the frame, shoot a photo. This might be a little tricky if your friend is going too fast, so tell him to take it easy. Shoot each of these exercises twice.

Frames 7, 8: Set your speed as fast as you can while still being able to adjust the aperture to get a meter reading. (With automatic cameras, turn the control ring until the indicator shows the fastest shutter speed.) Focus on a fixed spot where your friend will cross. As he runs by, shoot the photo.

Frames 9, 10: Try it again, this time adjusting the camera for the slowest shutter speed possible at whatever f-stop gives correct exposure.

Frames 11, 12: Keeping your shutter speed at a slower speed, this time follow your friend with the camera (we mean you should keep him in the frame—not that you should actually move yourself). When he goes by that same point as before, shoot the photo, continuing to keep the camera panning with him.

The best way to pan is to imagine where your friend will end up, and point your body in that direction. Rotate the upper

part of your body to face your friend as he starts to run, following through on the pan like you would in a golf swing. Shoot at a designated point.

Frames 13, 14: Set your shutter speed high (adjusting aperture accordingly) and take this panning shot one more time (remember to face the direction you'll end your pan in).

We have just taken eight photos of a friend running by us. What can we predict will be on each frame? Keep in mind what we have discussed about shutter speed and its effect on motion.

7, 8. Your friend will be sharp—caught or frozen as you snapped the photo.

9, 10. Your friend will be blurred, but the rest of the photo will be sharp.

11, 12. Your friend will be relatively sharp, but the background will be blurred as if it were in motion.

13, 14. Your friend will be sharp, and so will the background.

Note: As you can see, automatic cameras that adjust the shutter by themselves make action photography easier. What's more, they actually increase your control of shutter speeds by providing a stepless range of in-between speeds (like 1/784 or 1/239 second). So, if you're using an aperture-priority automatic, don't feel your creativity is somehow restricted—if anything, the reverse is true!

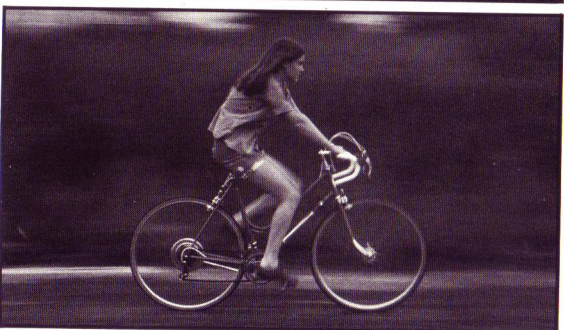
This photograph was shot at a fast shutter speed, keeping the camera pointed at a fixed spot.



This photograph was taken at a slow shutter speed, again with the camera pointed at a fixed spot.



This photograph was taken at a slow shutter speed but this time the camera was panning with the subject.



This photograph was taken at a fast shutter speed, again panning with the subject.





This photograph was shot at $f/2.8$, and because the aperture is wide open, only the thing we focused on—the subject herself—is in focus.

DEPTH OF FIELD

Have your friend stand about three feet in front of and to the side of a tree, and you should stand about three feet from him. In this exercise you'll use three different aperture settings, $f/2.8$, $f/8$ and $f/16$, and you'll have to adjust your shutter speed accordingly to get the proper exposure (of course, your automatic SLR will do this for you). If there's too much or too little light for correct exposure at these f-stops, try moving your friend into a darker or brighter area until your camera meter registers correct exposure. You should remain in the same place while shooting.

Frame 15: Set your aperture at $f/2.8$, focus on your friend, and shoot. (With non-automatic cameras, for this and subsequent shots remember to adjust the shutter speed until correct exposure is indicated. And whatever your camera, be sure to check the actual shutter speed frequently; if it's around $1/30$ or slower, make sure neither you nor your friend are moving while you shoot.)

Frame 16: Set your aperture at $f/8$, again focus on your friend, and shoot.

Frame 17: Set your aperture at $f/16$, still focusing on your friend, and shoot.

Now alter the focus a bit to demonstrate how aperture relates to depth of field.



Using a small aperture ($f/16$ in this case), everything in this photograph (background and subject) is in focus.

Frame 18: Set your aperture at $f/2.8$, keep your friend in the same place, but this time focus on the tree and shoot.

Frame 19: Set your aperture at $f/8$, still focusing on the tree, and shoot.

Frame 20: Set your aperture at $f/16$, again focusing on the tree, and shoot.

Review Question:

1. Two of the six photos you just took should look identical. Which ones will look the same and why?

In Frame 15 your friend is in focus and the tree is out of focus. Why? Because when you use a wide aperture like $f/2.8$

you have a very *shallow* depth of field, meaning only the one thing you have focused on will be in focus.

In Frame 16, your friend is in focus, the tree is much sharper (more in focus), but the background is still out of focus. Why? Because aperture $f/8$ is a smaller hole, meaning less light comes through the lens. This light is in a "narrower spray" so more of it is sharp.

In Frame 17, your friend, the tree and the background will be all pretty much in focus.

Frame 18. This time, since you focused on the tree, not on your friend, which one will be in focus? Right—just the tree.

Frame 19. This time both your friend and the tree are relatively sharp—much like Frame 16.

In Frame 20 you have the same photo as in Frame 17.

Depth-of-field, then, plays a decisive part in creating the pictures you want. By selecting different apertures, you can purposely put background objects out of focus to emphasize your subject, or put everything in sharp focus to relate the subject to its surroundings. This is an important benefit of "aperture-priority" automatic cameras because they make it easier to control depth-of-field.

LIGHT METER

At one time a light meter was something a photographer carried on a cord around his neck. Before taking a photograph he would have to walk up to the subject, measure the light, walk back to where he wanted to shoot from, set the aperture and shutter speed, and THEN take the photograph.

With the advent of the built-in, through-the-lens meters and automatic-exposure cameras, photography became much, much easier. Still, whether your camera sets exposures automatically or not, the creative photographer will always remember that you'll get the best possible pictures when you add your own, personal input to the camera's exposure controls.

There are three basic lighting situations you should know something about when you start photographing—front lighting, side lighting and back

lighting. Front lighting is the way most people have been taught to take photos. The rule here is to keep the sunlight to your back when shooting a photo. While this approach is fine for many scenes, it does have two disadvantages. First, your subject will be looking into the sun, and it might be hard for him not to squint. Second, front lighting tends to make a photograph look flat, without a feeling of depth.

One very effective way to add depth to a photograph is to use light coming from the side of the scene (side lighting) as your principal source of light. The resulting shadows can create an impression of three-dimensional depth in your photograph.

Sometimes light seems to come from all directions as on cloudy or foggy days. Don't be afraid to shoot on these days. As a matter of fact many photographers prefer to shoot portraits on cloudy days because there are no harsh shadows. You can even shoot in the rain or in thick fog as long as you take care not to get your camera wet.

Back lighting, another way to employ light in an interesting way, can pose some problems for your camera's meter. To some extent, most built-in meters respond to all of the light that enters the camera—and a very bright background behind a very dark subject can cause exposure errors. Fortunately, they're easy to overcome.

Frame 21: To demonstrate

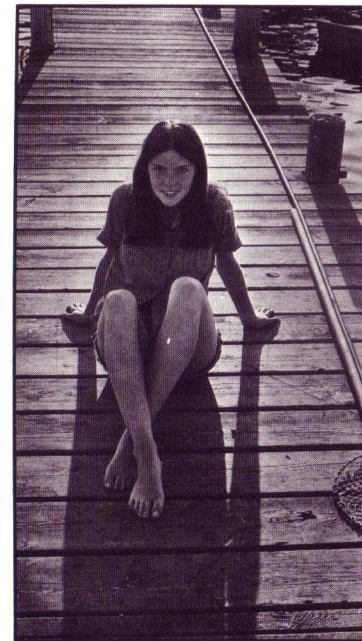
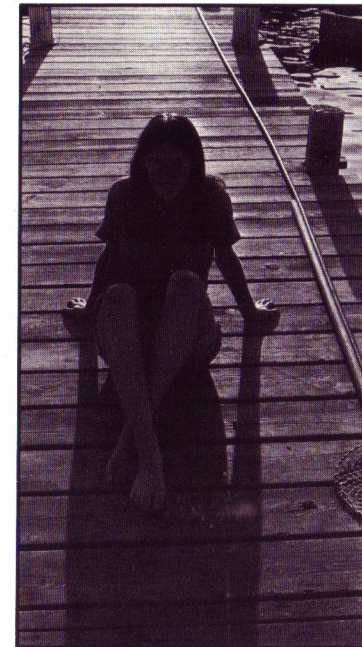
how back lighting would affect the light meter, let's have your subject stand in the shadows under a tree, where there is a lot of sunlight falling on the grass behind him. Keep in mind that with the exception of the center-weighted systems the meter will probably give just as much "weight" to the bright background, as to the much darker but more important subject. Such meters read all of the light coming into the lens and give you an average exposure. And in a back lighting situation like this one where the light from behind your friend is much stronger than the light on him, the exposure your light meter computes for you may not let enough light in to get a good photo of your friend.

So if your friend is in the shade, go into the shade, point your camera at your friend and adjust the meter. Now walk back to wherever you want to take the photo and shoot. Don't worry if the meter now says there is too much light.

Many automatic cameras offer such refinements as back-light controls, exposure compensator, or "memory lock" to achieve the same end result even more quickly.

The illustrations on this page demonstrate how back lighting can fool a light meter. When the photographer shot the girl in the first photo, he simply adjusted the camera meter from shooting position and took the photo.

In the second photograph, however, the photographer



compensated for the strong light coming from behind the girl. He did this by walking up to the girl, taking a light reading off her face and then returning to where he took the first shot to take this second photograph.

With an automatic camera, he could have used the exposure compensation control (which instantly lets in about four times as much light) or exposure compensator (which can be programmed for almost any desired exposure increase or decrease by modifying the film speed setting). Or, he could walk up to the girl, "memorize" a light reading from her face, and return to shoot the picture, if his camera offers this facility. The method of correction is not critical as long as it's done correctly.

COMPOSITION

Before we ask you to finish shooting this roll of film we'd



The angle shot from above can enhance a photograph's effectiveness. Here, the photographer shot down on the boys to emphasize their youth.

like to ask you to think a little bit about the elements that go into making a good photograph. While your subject is, of course, very important, the background and the way you position your subject in the frame are also important.

Put your camera up to your eye and analyze what you see. Remember that everything you see through that viewfinder will be in your final photograph. Pick a person or an object you want to photograph. Make believe you are actually going to take that photograph and ask yourself these questions:

*How does your subject relate to the background?

*Is the background distracting or does it tell us more about the subject?

*How can we eliminate a background (review what you've learned about aperture)?

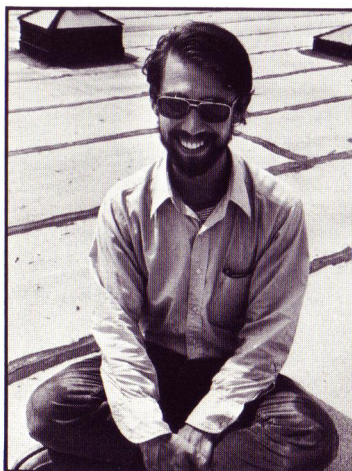
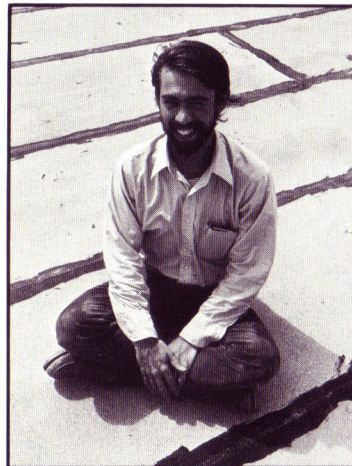
*What effect do camera angles have on the photo?

*Can you add or eliminate

anything to the way you have framed your photo?

Frame 22: Take a friend and have him sit on the grass while you stand above him, framing him in your camera from above. Now analyze that photo. What does this angle do to the background? Shoot the photograph.

Frame 23: Try kneeling so you are still looking down on

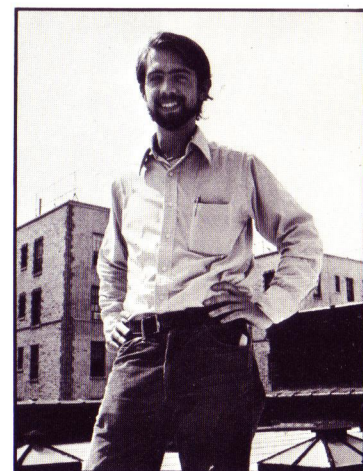
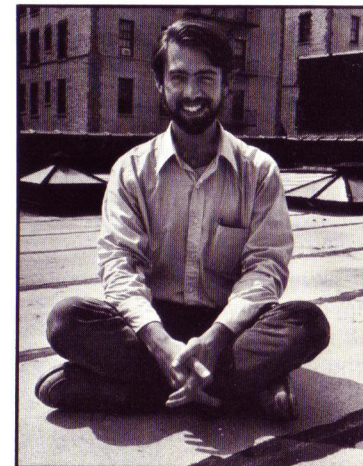


your friend but not from such a great angle. Does seeing more background look better? Shoot this angle.

Frame 24: Now sit in front of your friend and take a third shot. How does this work?

Frame 25: Have your friend stand up while you shoot him from below.

Each of these approaches gives the photo a different feel-



ing. Very often the whole feeling of a photograph can be enhanced by merely changing the angle from which you photograph.

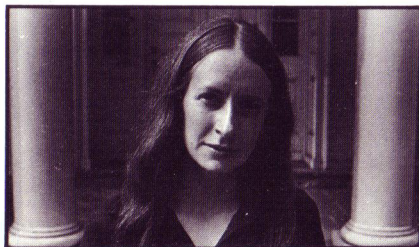
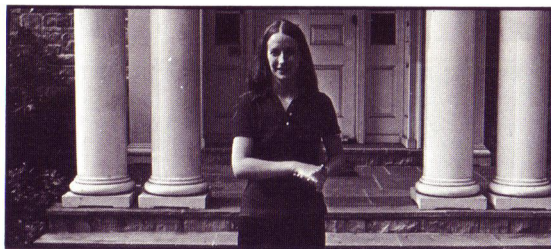
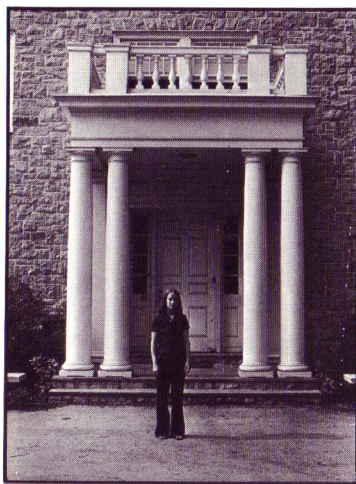
GETTING UP CLOSER

Most people, when they start photographing, tend to shoot too far from their subject. In this exercise you want to take three separate shots of the same person—one at a moderate distance, another closer to the subject, and a third as close as you can get (see illustrations). You want to see how close you can actually get to the person while still saying what you want about them in the photograph.

Frame 26: Position your friend about 10 feet from you in a background setting that tells

something about your friend (next to a tree, sitting inside a car with the door open, anywhere). Now, from a distance of 10 feet, shoot the photograph, capturing your friend and the background.

Frame 27: With your friend in the same position, move to



The three photographs here demonstrate the different perspectives which can be achieved by one factor: how close (or far away) the photographer stands to his subject.

within four feet of the scene and shoot another photo, again capturing as much as you can about both the person and the background.

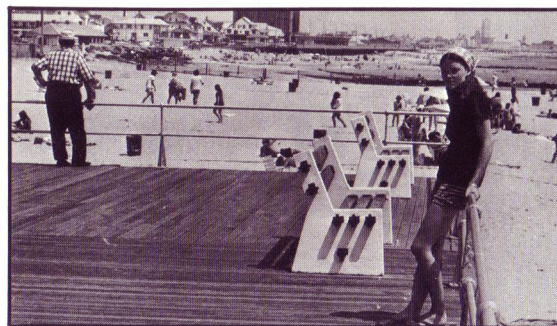
Frame 28: Now move to within two feet of your subject and take another photo.

FRAMING MOVEMENT

While no rule in photography has to be observed, it is helpful to know what the rules are. A person moving out of the frame (illustration 1) makes us uncomfortable because we have no



illus. 1



illus. 2



illus. 3

indication of where she is heading and the space behind her doesn't really help us to know anything about this person.

Frame 29: Duplicate the scene in illustration 1 by having your friend stand to the far right of the scene.

In illustration 2 the person seems to be just moving into the frame. The space ahead of her helps us to imagine the space she is about to enter. In this photo, however, the person is moving from right to left, and since most of us read from left to right, a photograph indicating motion in the opposite direction sets up a tension in the viewer. If your intention is to make the viewer aware of a tension, this is a good way to shoot your photo.



Tunnels and overhanging arches are natural frames that can add to the composition as in the photograph shown here.

Frame 30: Duplicate this illustration, having your friend enter the frame from the right.

If you are trying to create a natural flow of action, it is generally best to have the action moving from left to right, as in illustration three.

Frame 31: Duplicate the situation in illustration 3.

Some of the best photos ever taken have been by people who purposely disregard all these rules. We would by NO means insist that you strictly follow any rule in photography, just that you be aware of them.

FRAMING A SCENE

A frame is used to create a feeling of depth in the photo

and also to keep the viewer's attention on the action in the photo. You can use any foreground element, such as overhanging branches or a gate, to help contain the action in the frame as was done in the accompanying illustration.

Frame 32: Position your friend slightly to the side of a low-hanging branch with full foliage. As you look at the scene through the viewfinder, try to structure the frame so that the foliage to the side of your friend's face acts as a motif surrounding the face. Shoot this photo.

CONTACT SHEETS

You probably find all these new terms, and all the decisions you have to make each time you want to take a photograph a bit confusing. You have to remember that all these things are tools. You are in control, not they.

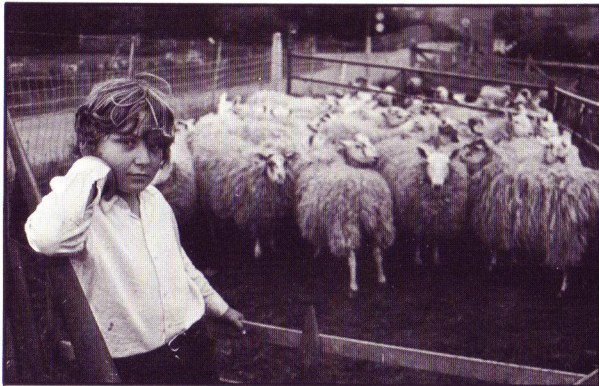
An additional tool that can be extremely useful is something called the *contact sheet*. This is a proof sheet showing each photograph you took, numbered in the order taken. Each photo on the contact sheet is the same size as the negative. A contact sheet is made by laying your negatives down on a sheet of sensitized photo paper and placing a sheet of glass over them to hold them flat. These are exposed briefly to light and developed.

We recommend that when you take your first roll of film to be developed, you ask your photo dealer to "develop and contact *only*." When you look at the contact sheets you can then decide which photos are worth printing up. Most professional photographers are very pleased if there are three good photographs on a roll of 36.



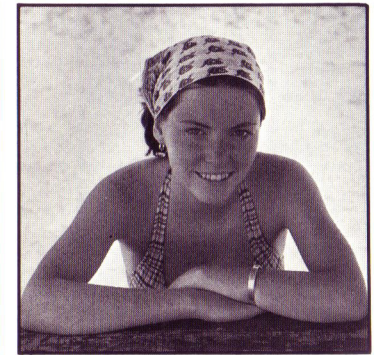
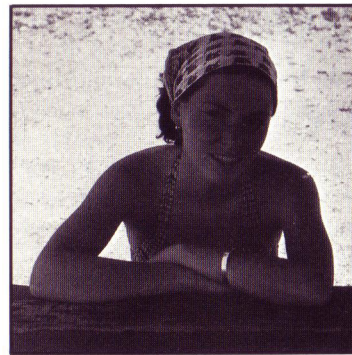
Learning Review

We are going to ask you several questions about some of the material you've been reading. Answers are given at the end so you can see how well you understood everything.



1. Which of the two photographs above creates a feeling of tension in the viewer because of the way action moves through the frame? Why?

2. What did the photographer do to freeze the motion of this scene?



3. The photograph on the left is too dark to see the subject. This means that not enough light reached the film. The photographer is sure that when he took the photograph the meter indicated correct exposure. What could be one thing he forgot? How did he get the photograph on the right? (The answer could vary, depending on whether an automatic or non-automatic camera was used. Answer it for the camera you are using.)

4. Name two ways a photograph can be made to be unsharp.

5. What is the slowest shutter speed that usually assures blur-free pictures?

6. Say you are taking a photo for your local newspaper. They have asked you to photograph the mayor, who is in a huge crowd of people. Assuming you can get close enough to him, what technique could you use to make him stand out from all the people behind him?

7. You are outside in bright sunlight trying to photograph your grandmother. But no matter how you change the f-stops on your lens, your meter indicates over-exposure. What's wrong? How can you adjust the camera for correct exposure? (Answer is different for automatic cameras.)

8. Place these f-stop settings in order from smallest to largest. f/5.6—f/11—f/2.8—f/16—f/8—f/4



9. What would be the result of setting the ASA incorrectly?

10. Why does your viewfinder go dark during the instant that the camera is taking the photograph?

11. Why is the series of pho-

tos above called a contact sheet?

12. If your light meter wasn't working how else could you figure and set exposure? (Answer may vary for automatics.)

13. You see a friend walking down the street and you want to take a photograph of her without her knowing. The problem is that you aren't sure where to take a light reading since you don't want her to notice you. Assuming the light falling on you is the same as the light falling on her, how can you get the proper light reading? (Answer may vary for automatics.)

LEARNING REVIEW ANSWERS

1. The photograph on the top, because in this photo the subject is moving from right to left.

2. The photographer was able to freeze the motion by using a fast shutter speed.

3. In the case of the photo on the left, the photographer was shooting into the sun and thus the light meter in his camera thought there was more light on the subject than there actually was. The way he got the photo on the right was to take a light reading off his subject's face and adjust his aperture—or shutter—accordingly.

(With an automatic camera, he could have obtained the same improvement by using the camera's exposure compensation

button or film speed exposure compensator to let in more light; or, by "memorizing" the reading from the subject's face, according to his camera's specific capabilities.)

4. Two ways to make a photograph unsharp are to shoot motion at a slow shutter speed (thus causing the subject to appear blurred) and to simply be out of focus.

5. 1/30th second is the slowest speed at which most photographers can hold a camera steady. Shooting at a slower speed raises the risk of blur, caused by movement of either camera or subject, or both.

6. If you wanted the mayor to be in focus and the rest of the crowd blurred so as to make the mayor appear to stand out from the crowd, you can get this effect by opening your aperture to f/2.8 and focusing on the mayor only.

7. With manual metering, you're probably trying to shoot at too slow a shutter speed, thus too much light will hit the film. The solution is to use a faster shutter speed. (If that doesn't do it, move the subject into a darker location.)

(With automatic metering, if the indicator in the finder indicates your fastest speed and your lens is set to the smallest aperture, there's just too much light. Move your subject into a shady area for the picture.)

8. F-stop settings in order of smallest to largest would be f/16, f/11, f/8, f/5.6, f/4 and

f/2.8.

9. If you set the ASA incorrectly you will either get underexposed or overexposed photographs.

10. The viewfinder goes dark while the camera is taking a photograph because the mirror inside the camera flips up.

11. A contact sheet is thus called because the negatives are in contact with photosensitive paper when the print is made.

12. With non-automatic cameras, just check the instruction sheet supplied with your film for recommended settings under various lighting conditions. (With automatic and other cameras with battery-powered shutters, there should be one or more "mechanical" speeds (not dependent on batteries) provided for just such emergencies. You should definitely check this feature out before investing in your own camera, automatic or not.)

13. If you're relatively sure the light falling on you is the same as the light falling on your friend, then you can take a light reading from a patch of grass near you and then shoot the photo of your friend. (With automatic cameras, using the special backlight or compensation controls is one answer; "memorizing" the light reading from that nearby patch of grass is another.)

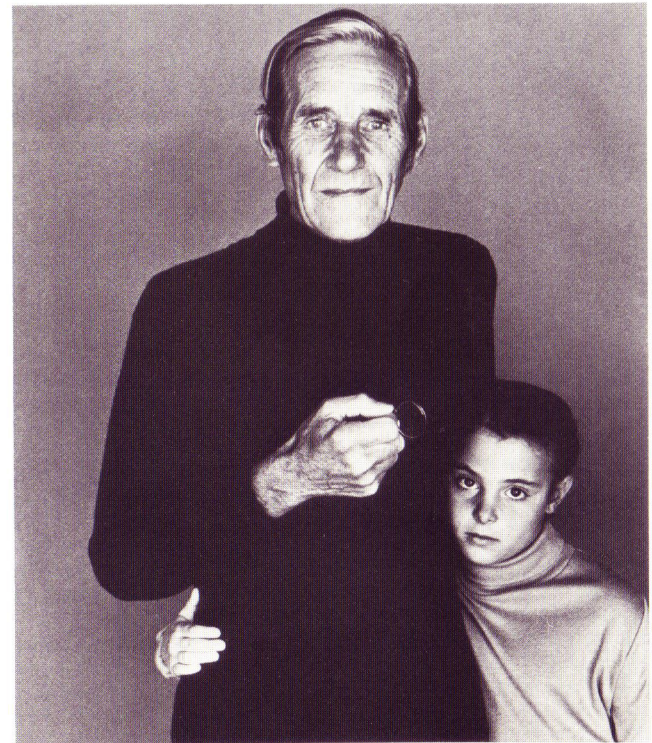
IN SUMMARY

So far in this book we've tried to give you a brief taste of how easy SLR photography can be. Of course these exercises are only the beginning. "When I first started, I was very, very bad," says one young photographer, "so I just made lots and lots of pictures."

You'll find that photography is a very forgiving medium. You can make a lot of mistakes and still create good photographs while you learn. Moreover—as you will see in the following interviews with nine young photographers—when your technical skill increases, the urge to frame your vision in the camera's eye soon changes from a hobby to a habit.

TAKING BETTER PHOTOS

Nine Photographers Share Their Techniques



COMPOSITION

It was the spreading arc of flags which initially prompted Wendy Furman to shoot the photo shown here. "I just liked the symmetry of it," she says. "Then I waited until the skateboarder was at the top of his turn before I shot. It gave the picture a good balance."

Balance is important to Wendy, a Los Angeles-based photographer who believes in composing "full frame" as she shoots. "In other words, the whole negative should serve a purpose," she explains. "There shouldn't be any wasted images."

Unlike many photographers who shoot rolls of film with the hope that something will come out, Wendy prefers to be selective at the time she shoots. "I try to think of all four corners of the picture, so the frame will be well composed before I click the shutter," she explains.

Admittedly, Wendy's art background (she has a bachelor's degree in sculpture) helps her in selecting the elements for a picture. But she says her technique is one anyone can use.

"Having a strong central element is important," she says. "It should be strong enough to draw the viewer's eye to it." For example, a picture of a single flower centered in the middle of the frame is usually boring, explains Wendy. "The viewer says, 'so what?' Other elements should be used to draw the viewer into the middle." In this instance, smaller flowers could be arranged in a pattern which would lead the viewer's eye to the larger, centrally placed flower.

Wendy's best advice, however, is simply to think before you shoot. "Don't just take pictures for the sake of shooting," she says. "Think about every frame, and you'll find that each shot you make will be better."



The symmetry of the waving flags and an off-center subject make for an interesting-yet balanced-composition.



Two strategically placed flash units gave this photo a stark realism.

USING A FLASH

"It doesn't matter what kind of flash you have or how expensive it is—light is light," says Rip Noel, a freelance photographer from Knoxville, Tennessee. "You just have to know how to use it."

Rip used two flash units to obtain this photo of a boxer and his manager. First he set one flash on a tripod behind the boxer, then placed the other on a tripod to the left of his camera. "I arranged the strobes like that because I wanted the picture to reflect the place they were in—a sweaty gym. The flash gave the shot that stark look."

Most beginning photographers are hesitant to use a flash creatively because they are afraid of "messing up" the picture. "You shouldn't be

discouraged by mistakes," says Rip. "It sounds crazy, but the more you shoot and the more mistakes you make, the better photographer you'll be."

Flash can even be a great help to amateurs, because it freezes action, he adds. "Some photographers think they can hand-hold at very slow shutter speeds, but even the pros can't do that," he says. "With flash, the exposure is instantaneous. There isn't any movement."

Rip suggests the beginner shoot an entire roll of film with a flash just to experiment. Some of his ideas: Bounce the flash off the ceiling for a softer effect. Or borrow a second flash to mount behind the subject for a "halo" look. And try mounting the flash on a tripod to one side of the camera, so the light won't be so harsh.

PORTRAITS

The last thing Jim Sieg wants his models to do is flash a big toothy grin. "It's too false," he says. "Instead, I suggest they try smiling with their eyes. It makes for a less artificial picture."

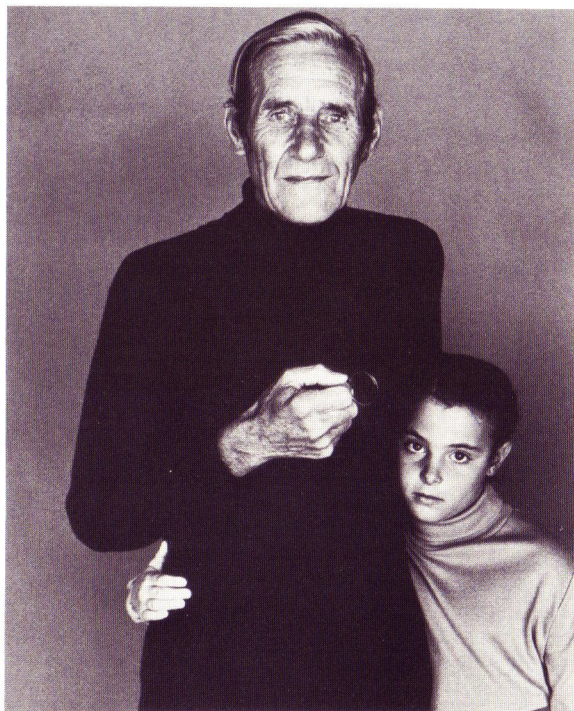
Jim, of Laguna Beach, California, shoots portraits like the one shown here in his combination studio-garage. He doesn't use a flash since "I don't like the harshness." Instead, he stretches a piece of gauze across the doorway to let the sun filter through. "You get sunlight, but it's a simple, softened light."

Simplicity is the key to Jim's por-

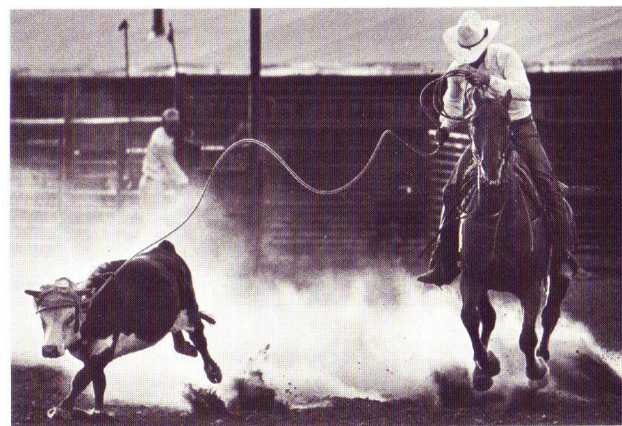
traits. He uses a plain background—either gray no-seam paper or a dark velvet cloth. He also prefers to keep his models' clothes to the basics: turtle-necks or plain pastel blouses.

"My main rule is that if it doesn't enhance the photograph, then get rid of it," he says. In the picture shown here, Jim initially found the young girl's unbrushed hair too distracting ("so I had her pull it back").

Jim has found that sincere flattery is the best tactic for getting a subject to relax. "I just say, 'I've selected you to model because you have a really interesting face,' and then I just kind of keep up the banter from there. The more I talk, the less they think about the camera, and the more natural the shot."



Soft, natural lighting and simple backgrounds focus attention on the subjects' individual personalities.



The key to action photography is to anticipate the right moment and shoot quickly.

CAPTURING THE ACTION

The main consideration in taking action photos is shutter speed, says Skeeter Hagler, a newspaper photographer from Dallas. "You have to shoot quickly enough to stop the action," he says. "Otherwise, all you'll end up with is a blur."

In the picture shown here, Skeeter froze the crucial moment in a bull-roping contest by setting his shutter at 1/500th of a second. The fast shutter speed was necessary to obtain the fine detail, and it took some maneuvering to obtain. Because of the low amount of available light (it was dusk), an initial metering indicated that a setting of f/5.6 at 1/125th of a second was called for.

"I knew that wouldn't work," explains Skeeter. "And I didn't really want to drop my f-stop any, because I needed the depth of field."

To achieve the faster shutter speed, Skeeter made the decision to "push" his film, a common practice in sports photography. At the time,

he was shooting Kodak Tri-X film, which has a normal ASA (film speed) rating of 400. By resetting his camera's ASA meter to 1600, he obtained the 1/500th shutter speed. (However, since the ASA rating cannot be changed in the middle of a roll of film, he had to expose and develop the entire roll at the 1600 rating.)

Anticipation is another important factor in making good action shots. "You have to be aware of what's going on, so you can at least predict where the action will be going," explains Skeeter. Predicting action flow is perhaps easiest in baseball, he adds. "If a guy is on first, he's obviously going to second. Just focus there and let him run into the frame."

Football, however, is more difficult to predict. Skeeter's rule of thumb there is "where the ball goes, the camera goes." Unfortunately, this technique makes the photographer oblivious to everything except what is seen through the camera lens. "It's easy to get blind-sided by an errant tackle," he laughs. "It's just one of the hazards of the trade."



SILHOUETTING

There are instances when less is more. This striking photo taken at sunrise on a serene Florida lake is one such example.

"I knew that if I set my exposure to get all the detail in the bird that I would have 'lost' the sunrise," says Stan Badz, a photojournalism student at the University of Florida at Gainesville. "I liked the idea of capturing just its outline."

Sunrise on a Florida lake provided an ideal opportunity for using the silhouetting technique.

To get the picture, Stan waded into the marsh (he believes in getting as close as possible to his subjects), pointed his camera, and shot an entire roll of film—36 exposures' worth. "I bracketed my shots (experimented with different f-stop settings) because I wasn't certain of the correct exposure," he explains.

The silhouette effect was achieved by deliberately underexposing the

subject. Though Stan's camera meter indicated a light reading of $f/4$ for the bird, he tried shooting at $f/11$. With the smaller aperture, the film didn't receive enough light to record details of the bird or the fence line—thus, they became silhouettes.

"It was just one of those lucky photos where everything goes right," Stan says. "Even the bird was patient through it all."

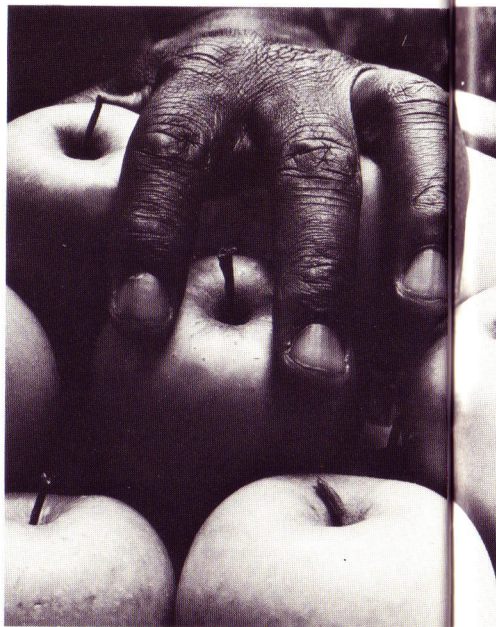
SHOOTING AT NIGHT

David Greenwald had gone by the Olympia Diner several times in daylight without giving the upstate New York establishment a second thought. "But I passed it at night, and it was fantastic—like a whole different place," he recalls. "I just got my camera and started shooting."

To get the nighttime exposure shown here, David set his camera shutter speed at 1/15th of a second. He braced the camera on the door of his car to steady it during the lengthy exposure time called for because of the low amount of available light. "Of course, it's better to use a tripod for a long exposure like that," he says. "And a cable release helps, since even depressing the shutter can create a blur."

The most difficult aspect of night photography is getting a correct light reading, David adds. "I usually go in close to the source of light for the reading. Then I back off, and bracket several stops on each side of the suggested setting."

Shooting at night has its advantages, though. "There aren't as many people around," explains David. "It's a nice block of time to work without distractions."



Nighttime exposures without a flash (left) demand an accurate light reading and a steady hand. Below, focusing on contrasts in textures between simple objects can lead to an arresting photo.

TONES AND TEXTURES

"I create an idea in my mind and then set it up on film," says Shedrich Williams, of Portland, Oregon. "I like to come up with an idea that not everybody else has had—not the cliché rusty-lock-on-the-old-barn-door shot."

Shedrich created the photo shown here because he was interested in capturing the contrast in texture between the gnarled hand and the stack of smooth-skinned apples. "Most of the time in pictures, all the textures tend to blend together as one," he says. "Here, I was trying to achieve

the realism in the hand and in the fruit."

To obtain the rich spread of tones, Shedrich used a fine-grain film (Kodak Plus-X) and set his camera on a tripod to assure steadiness in the 1/125th exposure. He took the shot at 7 a.m., a time of day when he knew the sunlight would not be harsh.

Shedrich uses only natural light because he believes that "no flash can substitute for the soft light of nature." When shooting outdoors, he prefers open shade (a shady place open to the sky; not covered, as under a tree). "With direct sun, you get terrible shadows," he says. "I'm probably one of the few people who really appreciates a cloudy day."

WORKING WITH THE GRAIN

Joshua Williams doesn't believe a lot of fancy camera equipment is necessary to make a good picture. "I believe in making the photographer work, instead of the camera," he says. "It's a lot more challenging."

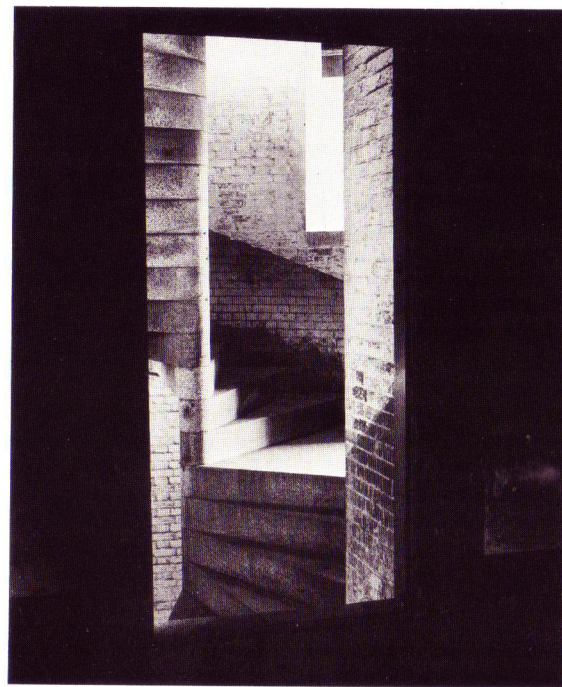
This moody rendering of the Manhattan skyline embodies the New York photographer's preference for simplicity. He took the photo with a standard 50mm lens, shunning special-effects filters or unusual developing techniques.

"I was trying to capture the mood of a wet, gray day in New York," he recalls. "There was a natural 'grain' in the air, and the fast film (Kodak Tri-X) helped bring that out." (Another way to achieve the grainy look is to "push" film by resetting the ASA.)

Joshua suggests the beginning photographer visualize how a scene will look on film before clicking the shutter. "And shoot from a lot of different angles so you can compare the results," he adds. "Taking pictures is like learning to play the guitar: the more you practice, the better you'll get."



The "feel" of this rainy-day Manhattan skyline is captured by fast film.



Capturing the play of light on this twisting stone stairway meant hunting for the right camera angle.

PUTTING THINGS IN PERSPECTIVE

While vacationing in San Francisco, Prentice Price happened to pass the stairway shown here. "The way the light struck the white plaster really caught my attention," he remembers. "It was a nice, diffused light. It lit everything with a very soft effect."

The lighting also caused a problem: Prentice had to find a perspective in which the glare of sunlight passing through the window would not detract from the "softness" of the rest of the picture.

He began by setting his camera

on a tripod in what he thought was the best position for a picture. "I used the tripod for a reference point," he explains. "I walked around it, looking at the stairway from all different angles—from standing on tiptoe to squatting down on the floor. I even went up the stairs to see if that wasn't a better angle."

Prentice finally decided his first selection was his best. He shot a single frame: the one shown here.

"A lot of times, you pick your shot from a 'gut' feeling of what you think will make the best picture," he says. "But it's a good idea to examine your subject from all sides, just to make sure you don't miss the best angle."

Building your personal system

When you've mastered the basics of photography, you'll begin to have more and more ambitious ideas. Some of them will probably require a better camera than you may have now. And, possibly additional pieces of equipment, such as lenses and closeup accessories. We earnestly hope you'll decide to choose your lenses and accessories from the Nikon System.

Why Nikon? Ask some of the toughest customers a camera maker ever had: the photojournalists of the world. The overwhelming majority of them use Nikon. They'll tell you that Nikon has proven its ruggedness and versatility as no other 35mm slr camera. You'll get the same response from NASA who have used Nikon on every manned space mission since Apollo 15. And from people who have made expeditions to the highest and lowest spots in the world.

But, which Nikon camera is right for you, for your specific needs and ambitions? This section is designed to help you make the right choice and then begin building your personal Nikon system in a logical way.



THE CAMERA

Among the cameras in the Nikon system, there's certain to be one that's just right for you. All are built on a rugged metal body and are engineered with matchless Nikon precision and have many advantages in common: Reliable, Nikon-designed "center-weighted" exposure metering. Accurate metal shutter. "Hot shoe" for cordless electronic flash, and self-timer. Plus, matchless image quality with quickly interchangeable Nikon lenses. Each accepts a Nikon motor drive for high-performance action photography. And, no matter which you choose, you can look to the all-encompassing Nikon system for virtually unlimited photographic potential.

Nikon EM Ultra-Compact Automatic

The low-priced EM is the handiest, easiest to use, and easiest to afford of all cameras in the Nikon system. Together with its special, equally convenient and low-priced accessories, it lets you enjoy the excitement and satisfaction of Nikon photography at far less cost than ever before possible.

The Nikon EM gives you superbly sharp, true-color pictures with convenient focus-and-shoot simplicity. When you press the shutter button, the Nikon-designed EM electronic meter automatically sets the shutter for the best possible exposure at the lens opening you've selected. (This "aperture-priority" system allows you important control over the creative aspect of your photography). Auto-set shutter speeds range from 1 second to 1/1000th; there are also two special settings—M/90 and B—that enable you to shoot without battery power.

For the most convenient operation, the EM viewfinder with its amazing SONIC™ (Sound & Optical Nikon Indicator Circuits) system gives you unmistakable audible and visual warning; you *hear* a pulsing "beep" from a micro-electronic speaker, and you *see* a needle swing into a red "alert" zone to alert you to a bad exposure condition.

After dark, indoors or out, slip on the matching ultra-compact Nikon SB-E electronic flash, which "programs" both the camera and itself for automatically correct flash exposures. What's more, it activates a visual, electronic "go/no-go" signal in the viewfinder. The SB-E is an energy-saving thyristor unit that makes fine flash photography as easy as 1-2-3.

You'll also want to try the Nikon EM with its matched MD-E motor drive. It advances the film automatically for action sequences at up to about 2 frames per second or for single shots. The combination of Nikon EM and motor drive is a marvel of compact efficiency that handles like a dream. Another advantage no other low-cost slr offers is the acknowledged excellence of Nikon optics. These include a wide range of compact, low-priced Nikon Series E lenses along with dozens of world famous AI-Nikkors. The combination of Nikon EM and Nikon lenses adds up to superior image quality that even a professional can be proud of!

Nikon FM Compact

Remarkably small, light, easy handling, moderately priced, and every inch a Nikon. Its meter system uses Gallium Photo Diodes for wide sensitivity and fast response, with an always-bright 5-stage LED readout in the viewfinder. The ruggedly reliable, vertical metal shutter offers speeds from 1 second to

1/1000th, with electronic flash synch to 1/125th. Multiple-exposure facility offers exciting creative possibilities. Add the optional, low-cost MD-12 cordless motor drive for high-performance photography at up to 3.5 shots per second, including multi-exposures. The FM is in a class of its own, with its smooth Nikon precision and endless Nikon system versatility—at a low price that makes it a super buy!

Nikon FE Automatic Compact

The combination of Nikon quality and modest cost makes this the top value among all automatic “compacts.” Just aim, focus and shoot—the FE with its Nikon-designed electronics gives you automatically correct exposures every time. And, because the FE uses versatile aperture-priority automation, you can enjoy automatic exposure control with any lens, even with closeup accessories. You select the lens aperture—the electronically-controlled shutter sets itself to the correct speed, from 8 seconds to 1/1000th. Or, use one of the ingenious override controls to add your own creative touch to your exposures. Other special Nikon FE features include dual Silicon Photo Diode sensors for super-accurate, center-weighted metering, multiple-exposure control, interchangeable viewfinder screens, and a brilliant total-control viewfinder. For automatic flash photography, slip on a Nikon SB-10 or SB-E electronic unit (they actually “program” the camera for the correct shutter speed and activate a flash ready-light in the viewfinder). The FE uses the same Nikon MD-12 motor drive and accessories as the FM.

New Nikon F3

This newest, finest and most advanced Nikon ever sets the professional standards for the 1980s. Its new, built-in meter assures precise exposures with all its interchangeable viewfinders, screens and lenses, in automatic and manual modes. Shutter speeds, from 1/2000th to 8 seconds, are controlled with incredible accuracy by electronic microprocessors and quartz-crystal technology. Add the MD-4 motor drive, and you can fire at the unprecedented rate of up to 6 frames per second. The Nikon F3 is so rugged, reliable and versatile, it was chosen by NASA for operational use aboard the Space Shuttle.

LENSES

Nikon optics are acknowledged to be the finest made for 35mm photography, famous for surpassing sharpness, image clarity and color rendition. They also offer the greatest variety. Nearly 70 are available, from 6mm Fisheye that actually “sees” behind the camera to 2000mm super telephoto (plus 3 teleconverters for extra versatility). All are made by Nikon specifically for use with Nikon slrs; no others can match the precise fit of lens and camera that's essential for the best possible picture quality. Nikon, by the way, is one of the very few camera and lens makers who produce their own optical glass, a major reason Nikon keeps coming up with new and better lens designs.

Nikon Series E Lenses

A select group of ultra-compact lenses offering Nikon optical quality at surprisingly low cost. Because of their modest prices, they're the easiest way to build a complete lens system without compromising on Nikon quality. All feature Nikon optical coating for superior clarity and color fidelity. The Nikon Series E “normal” 50mm f1.8 is best for all-round picture-taking because it provides about the same perspective as the human eye. And, its high speed gives you great available-light shots, both indoors and out.

When shooting at close quarters, you'll get much more into the picture with the Series E 28mm f2.8 wide angle lens. Use it also to emphasize the broad sweep of landscapes and for its great depth-of-field, which can also give you sharp pictures when there isn't time for critical focusing. Or, choose the 35mm f2.5 for the same basic advantages with slightly less wide coverage.

The Nikon Series E 100mm f2.8 telephoto produces twice the image size of the 50mm. It's excellent for portraits, sports and other semi-distant action, with plenty of speed—and small enough to carry in your pocket!

A lens you'll find irresistible is the Series E 75-150mm f3.5 zoom. It gives you all the most popular medium-to-tele focal lengths in one light, compact lens—and it's tack-sharp through the entire zoom range. Fast-handling, too, actually lets you zoom-while-shooting for striking professional effects.

AI-Nikkor Lenses

These world famous optics are designed and built to meet the most exacting needs of professionals and other demanding Nikon photographers. They span the widest range of any 35mm system, from 6mm to 2000mm focal length, including many exclusive optical formulas and technological innovations. All feature Nikon multi-layer Integrated Coating as an important element in their extraordinary performance.

Lens Systems

1. The Basic 3-Lens System: 28mm, 50mm, 135mm

If you want to be prepared for the maximum number of photo opportunities with the minimum number of lenses, this is an excellent choice. It also ranks high in portability—ideal for travel!

A 28mm wide angle gives you a far wider angle of view than your normal lens but without the tricky perspective problems extreme wide angle lenses can present. Great for large groups in small rooms, for creative wide angle perspectives. According to the lens speed you need and price you want to pay, choose the Nikkor 28mm f3.5, f2.8 or f2, or Series E f2.8.

Nikkor 50mm f1.2, f1.4 and f1.8 ‘normal’ lenses give high speed and great versatility, indoors or out... as does the matching Series E 50mm f1.8.

A 135mm telephoto is an ideal multi-purpose medium-long lens. It gives pleasing perspectives in portraiture, also has enough “reach-out ability” for sports and travel applications. Choose the compact, economical 135mm f3.5, the faster 135mm f2.8, or the incredibly fast 135mm f2.

2. The Travel System: 24mm, 55mm Micro, 75-150mm or 80-200mm Zoom

Many combinations of wide, normal and long lenses make ideal travel packages, but here is an especially versatile version.

The 24mm f2.8 combines an extremely wide angle of view with superb sharpness near and far, a result of Nikon Close Range Correction (CRC) design. It can be used for general scenes, and the possibilities for creative perspectives are marvelous! Here again, a faster f2 version is also available.

The 55mm f2.8 Micro Nikkor does double duty as a super-sharp normal lens and a closeup lens. One lens equips you for closeups of ornate doorknobs and long shots of the entire building! One caution: if you expect to be in low-light situations, a faster normal such as the 50mm f1.8, f1.4, or f1.2 may also be needed.

If you had to make do with just one lens on a trip, the 80-200mm f4.5 Nikkor or 75-150mm f3.5 Series E Zoom may be your best choice. Each gives fantastically sharp images over the entire, enormously useful range. If, for example, you're photographing a cathedral from across a river, the 150mm or 200mm focal lengths permits you to frame the scene perfectly.

3. The Low-Light System: 35mm f1.4, 50mm f1.2, 85mm f2, 135mm f2

The natural charm of available light is one of the nicest capabilities you gain with a fine 35mm camera—and here is a system for the dimmest of dim illumination. Soft, flattering window light, the romance of a dimly-lit cafe... if much of your photography will be under such conditions, this is an unbeatable choice!

Combine a wide picture angle with f1.4 speed and the extra closeup sharpness of Nikon Close Range Correction design, and you have the great 35mm f1.4. An excellent general purpose lens. (For a slightly wider angle, consider the 28mm f2 as an alternate choice).

Fastest of all Nikkor lenses, the 50mm f1.2 adds this breath-taking speed to traditional Nikkor sharpness.

The 85mm f2 is designed for portraiture by window light, and many other medium-tele applications in light both bright and dim. If your low-light work includes sports or candid, consider the spectacular 135mm f2.

4. The Zoom System: 25-50mm, 43-86mm, 80-200mm

It is now possible to cover the entire wide-to-tele range, every millimeter of the way, with just three lenses! Nikkor Zooms can actually compete with regular optics for sharpness, and all remain in perfect focus as you zoom. If you normally shoot in ample illumination, this all-zoom system is a superb choice. You'll spend far less time changing lenses and also have the unique "zooming-while-shooting" effects at your command. Altogether, there are ten Nikkor Zooms, including such other popular focal-length ranges as 35-70mm, 50-300mm and the economical Series E 75-150mm.

When you're ready to grow...

Naturally, these lens systems—or your personal adaption—are just the beginning. You're almost sure to want something additional that's longer, or wider, or that fills a gap in the middle. Or, a Fisheye-Nikkor for spectacular visual impact—or a perspective-correcting PC Nikkor that turns your Nikon into a 35mm view camera. You'll always find exactly the right lens—and the finest available—in the Nikon system!

Nikon Teleconverters

They offer a simple way to increase the image size produced by many Nikkor lenses. A Nikon 2x converter transforms a 135mm f2.8, for example, into a 270mm f5.6, while maintaining excellent image quality. Nikon offers two 2x models: TC-200, for lenses up to 200mm focal length, and TC-300, for 300mm and longer. The Nikon TC-14 converter provides 1.4x magnification and requires only 1-stop exposure compensation.

FILTERS

A popular use for filters in black & white photography is to darken skies, so that clouds stand out white and fluffy. But, that is far from the only talent offered by these inexpensive accessories. They are often used to make people's complexions look their best, to make a cloudy day look sunnier, to subdue an unwanted reflection—and to simply protect the lens surface—among many other applications.

One of the great advantages of Nikon lenses is that so many of them—almost every one from 20mm through 200mm, including the 80-200 mm Zoom—use the same 52mm filter size. So you can have a full selection of filter types, and you'll probably need only one size of each.

CLOSEUP ACCESSORIES

Closeup and macro photography are literally a whole new world of photographic potential. You'll find the widest variety of closeup equipment within the Nikon system. And with Nikon automatic slrs, your closeup exposures are always automatically accurate.

There are two basic ways to make a lens focus closer than its own, built-in mechanism permits: (1) increase the power of the lens by adding a supplementary closeup lens, and (2) extend the lens-to-film distance by means of extension tubes or bellows.

Closeup Lenses

These supplementary lenses screw into any of the regular Nikon lenses with 52mm accessory mounts. However, the 50mm f1.8 Nikkor is best suited for closeup work. There are three strengths—#0, #1 and #2. The #1 and #2 may be used together. These lenses are quite inexpensive and ideal for general closeup photography. But, they cannot get you as close as other devices. The minimum distance with both #1 and #2 on a 50mm lens is just over 10 inches. Nikon also offers two additional types, #3T and #4T, specifically for use with tele lenses from 85mm to 200mm.

Automatic Extension Rings PK-11, 12 and 13

Use any or all of these three extension rings with any AI-Nikkor or Nikon Series E lens from 24mm through 200mm, and enjoy closeup photography with full aperture metering and automatic diaphragm control. PK-11 is 8mm in depth, PK-12 is 14mm and PK-13, 27.5mm.

Extension Tube Set Model K

A set of five rings that can be combined in nine different ways for varying magnifications, using stop-down metering with any Nikon lens (meter-coupled or not). Distance with 50mm lens can vary from 22 inches to less than 8 inches—and 1:1, or life size reproduction. Provides an advantage of variable magnification, at a very moderate cost.

Bellows Attachments

The versatile Nikon PB-6 unit offers continuously variable magnification from about life-size (1:1) to almost 4X larger-than-life (4:1) with 50mm lenses, and extensive capabilities with other Nikon system lenses from 20mm to 200mm. Its modular 'system' design lets you add a precision slide copying adapter, macro stand—even a second extension bellows for truly impressive flexibility.

Micro Lenses

For greatest convenience and extraordinary image quality at anything from infinity to 1:1 (life-size), the Micro Nikkor lenses—55mm f2.8, 105mm f4 and 200mm f4—can't be beat. All focus down to 1:2 just as they come. To go down to 1:1, simply add optional auto extension tubes to the 55 and 105mm or the TC-200 teleconverter to the 55mm micro or the TC-300 to the 200mm (which lets you stay farther away from your subject). The micros can also be used with bellows for still greater magnification.

Other Closeup Accessories

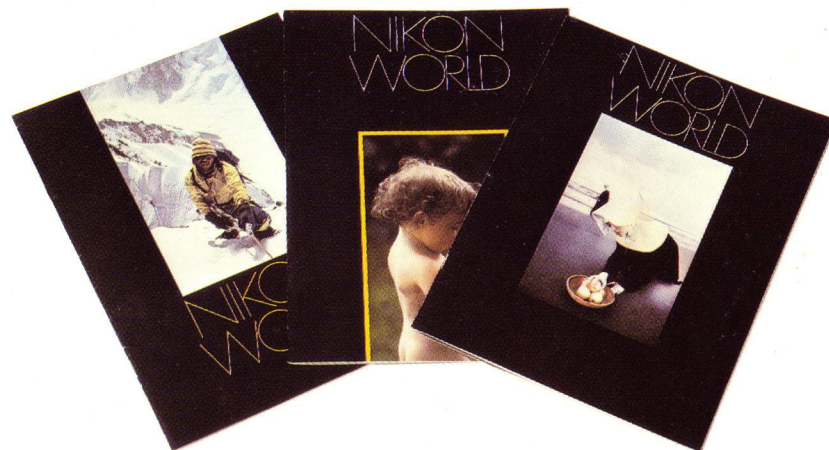
At magnifications of greater than 1:1 (life-size), many lenses produce better results if reversed. The BR-2 Lens Reversing Ring lets you do this. The BR-3 Ring permits use of a Slide Copying Attachment or Nikon 52mm filters on the reversed lens. For extremely precise copying work, Nikon Reprocopy Outfits offers great convenience. A special ring light flash with AC or DC power supply rounds out the Nikon closeup photography system. As one of the world's major microscope manufacturers, Nikon also provides a complete line of photomicrographic accessories.

CARRYING CASES

You'll want to protect your Nikon from the elements and also from accidental bumps. A Nikon eveready case does it beautifully, while keeping the camera action-ready. And, when you add another lens or two and some accessories, you can carry and store your entire outfit in a smartly-styled, sturdily-built Nikon compartment case. There's a wide range to choose from—the finest protection for the finest of cameras.

Your Nikon dealer can suggest many other possibilities for building your own Nikon system. See him for complete details.

We sincerely hope that this booklet has increased your interest in and understanding of good photography. Many millions of people around the world have found it to be the most rewarding of avocations, vocations, or both! The first step towards getting better pictures is, of course, a good camera. And the best, whatever your needs and your budget, can be found in the Nikon System!



Explore the world of Nikon photography with **NIKON WORLD MAGAZINE**

The overwhelming majority of professional photographers shoot with Nikon cameras. And, Nikon World is the showcase for their photography, exclusively.

Every issue displays examples of the finest in current camera art in spectacular color portfolios. More than beautiful to look at, they vividly demonstrate Nikon capabilities and inspire your imagination as you pursue your own photographic visions. In addition, Nikon World features practical, easy to follow tips and technical information to help you expand and improve your picture-taking. You also learn about new equipment that is constantly developed to make the Nikon System ever more comprehensive and keep it in the forefront of 35mm photography.

Obviously, Nikon World is produced with the Nikon user in mind. But, its stunning images as well as much of the information it provides are just as enjoyable and valuable for any other serious photographer.

Nikon World is published four times a year: three regular issues plus a calendar issue containing especially outstanding, full-page photographs for each month. Their total value is \$7.45 a year, but you can subscribe at these money-saving rates: 1 year, \$6.00; 2 years, \$11.00; 3 years \$15.00.

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