

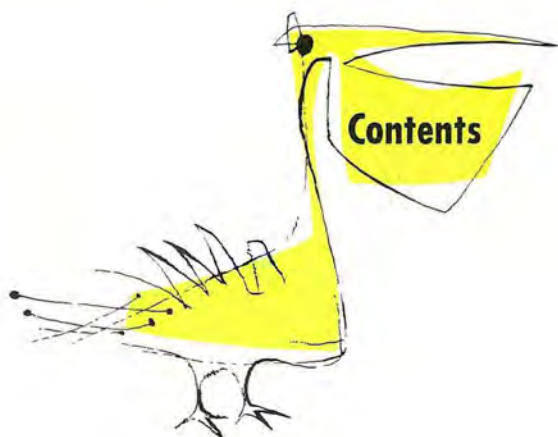
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Let's take Kodacolor Pictures





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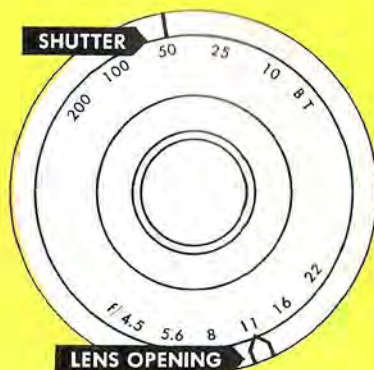
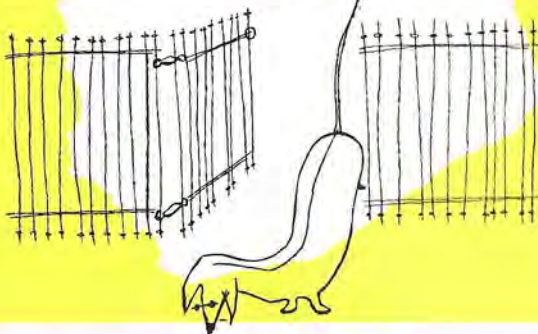
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Introduction



The Film

There are two types of Kodacolor Film. The Daylight Type is intended for use outdoors in daylight or for flash pictures with blue-coated flash lamps. Type A film is for use with regular flash lamps or with photographic flood lamps. Both types are available in roll-film sizes 828, 127, 120, 620, 116, and 616.

Lens Opening and Shutter Speed

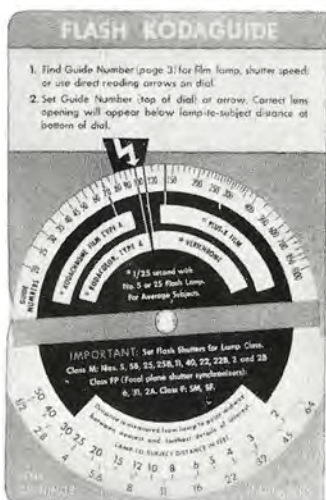
These are your exposure controls. The lens opening controls the size of the opening through which the light passes. The shutter controls the length of time that light is allowed to pass through the opening. Together they control the amount of light that reaches the film.

The same amount of light must reach Kodacolor Film for each snapshot, regardless of subject matter or type of light. A change in lighting conditions means a change in the brightness of your subject. The iris of your eye adjusts automatically to these changes; your camera depends on you to make

the adjustments. Different lighting conditions will need different lens-opening and shutter settings to let the correct amount of light reach the film each time.

What settings should you use? The handiest source of this information is an exposure guide. The three guides shown on the opposite page are part of the Kodak Master Photoguide, a booklet of complete on-the-spot picture-taking information for pictures with black-and-white and color films. The outdoor and flash guides are also available in the form of a separate guide, the Snapshot-and-Flash Kodaguide.

The most common outdoor lighting conditions can be separated into four classes: Bright Sun, Hazy Sun, Cloudy Bright, and Cloudy Dull. They are illustrated on the Kodaguide. Each of the classes, in descending order of brightness, is considered half as bright as its preceding class. This same relationship is found in the lens openings and in the shutter speeds. Each lens opening lets through half as much light as its larger neighbor. Each shutter speed keeps the shutter open half as

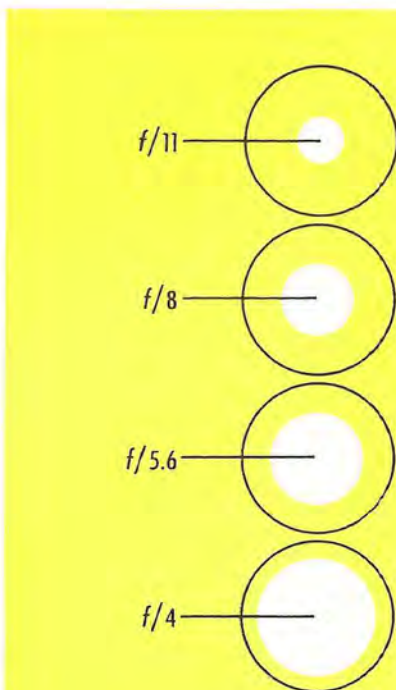


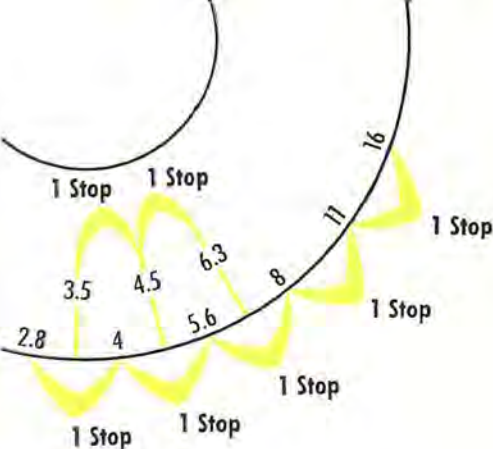
You turn the dial to place the Exposure Guide Number at the arrow. The scales at the bottom show the lens opening for whatever flashing distance you choose.



You turn the dial to place the Kodacolor Film arrow at the lamp-to-subject distance. The scales at the bottom show the lens and shutter settings.

You turn the dial to place the Subject Type pointer for Kodacolor Film at the Sky Condition. Now the two scales at the bottom are in position for reading shutter speeds and lens openings.





For Box Cameras or Similar Types

Some cameras have only one instantaneous shutter speed and two or three lens openings. These openings are usually not labeled as *f*-numbers. If you have such a camera, with little or no choice in lens opening and shutter speed, save your Kodacolor Film for *sunlit* subjects when you are outdoors. Of course, sometimes this isn't as easy to do as it sounds. The picture occasion doesn't always coincide with sunny days. When your subject isn't sunlit, and you just *have* to take that picture, here's what you can do:

long as its slower neighbor. Because of this, it's simple to double or halve either the lens opening or the shutter speed to suit the lighting conditions.

Under the same conditions of brightness, you can use any of several combinations of shutter speed and lens opening that will allow the same amount of light to reach the film; for example: 1/25 at *f*/16, 1/50 at *f*/11, 1/100 at *f*/8, 1/200 at *f*/5.6, etc. In this series, as the length of time the shutter remains open is cut in half, the size of the opening is doubled. You will make changes like this when, under the same lighting condition, one subject is posed and the next is active. Use a shutter speed of 1/50 second for most posed subjects.

Your lens-opening scale has part or all of the series of *f*-numbers shown in the illustration above. However, the smallest number (largest opening) on your scale may be *f*/6.3, *f*/4.5, or *f*/3.5. Each of these represents approximately a half-stop increase over the opening that precedes it (*f*/8, *f*/5.6, and *f*/4, respectively). You can make settings between the other lens openings marked on your scale, except on simple cameras having two or three openings of fixed size on a slide.

1. If your camera has a flash shutter, use a synchronized flash. The flash lamp must be a blue-coated lamp, like the No. 5B or 25B (midget) or the No. 22B or 2B (large). Use the lens opening you would ordinarily use for a sunlit subject. Flash the midget lamp with the subject of principal interest posed five to ten feet from the flash. With a No. 22B or 2B lamp, the subject should be eight to fifteen feet from the flash. These flash lamps are of little use for subjects at greater distance outdoors.

2. If you don't use a flash, you can make a time exposure. This method can be used only if the subject will hold still and if the camera is placed on a tripod or braced on some firm support like a tree trunk or fence post. Set your camera shutter at "B." To make the exposure, press the shutter release and let it up immediately. This will make an exposure somewhere between 1/5 and 1/2 second in length. The subject can be at any distance from the camera. This is a "proceed at your own risk" technique.






Indoors with a simple camera, use clear flash lamps and Kodacolor Film, Type A. You can make a snapshot by flashing the lamp at 5 to 7 feet from the subject. With flood lamps you will need to make time exposures.



The top picture was made in bright sunlight with plenty of light bouncing about to keep the shadows light. The lower picture was made in the diffuse light of a cloudy, bright day. Colors are softer in diffuse light. A good eye for proper lighting quality made both pictures successful.

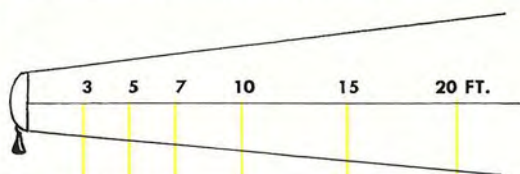
Cameras and Lighting Conditions

The table indicates the range of lighting conditions under which specific Kodak cameras can produce good Kodacolor pictures at snapshot shutter speeds. Pictures can be made under other lighting conditions by using supplementary lighting or by using a time exposure. Detailed instructions for the various lighting conditions will be found in the text of this booklet.

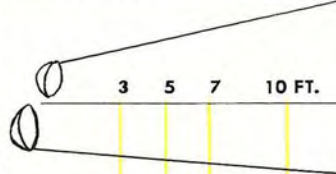
CAMERAS	DAYLIGHT				
	 BRIGHT SUN	 HAZY SUN	 CLOUDY BRIGHT	 CLOUDY DULL	 OPEN SHADE
Brownie Target	██████████				
Brownie Hawkeye	██████████				
Brownie Hawkeye, Flash Model	██████████				
Brownie Flash 620	██████████				
Brownie Reflex, Synchro Model	██████████				
Kodak Duaflex II, Kodet Lens	██████████				
Kodak Tourist, f/12.5	██████████				
Kodak Duaflex II, f/8	██████████	██████████			
Kodak Tourist, f/6.3	██████████	██████████	██████████	██████████	██████████
Kodak Tourist, f/4.5	██████████	██████████	██████████	██████████	██████████
Kodak Pony 828 and 135	██████████	██████████	██████████	██████████	██████████
Kodak Flash Bantam	██████████	██████████	██████████	██████████	██████████
Kodak Signet 35	██████████	██████████	██████████	██████████	██████████
Kodak Reflex II	██████████	██████████	██████████	██████████	██████████
Kodak Medalist II	██████████	██████████	██████████	██████████	██████████

The horizontal bars in the flash and flood tables indicate the distance range at which snapshots may be made. The flash table is based on the use of Kodacolor Film, Type A, with a No. 5 flash lamp in a 4- to 5-inch satin-finish reflector. The flood table is based on the use of two No. 2 flood lamps in Kodak Vari-Beam Lights or other high-efficiency reflectors.

FLASH WITH NO. 5 LAMP



TWO NO. 2 FLOOD LAMPS



Outdoor Pictures

IN SUNLIGHT



Sunny days can be grouped into two kinds: Bright Sunny Days and Hazy Sunny Days. You tell one from the other by looking at the sky and at the shadows that are nearby.

Bright Sunlight **1/50 f/11**

The sun is brilliant, and the sky is bright blue. Much squinting on these days! Shadows are dark and sharp in outline. They are likely to be troublesome in close-ups. We'll tell you later how to improve on this lighting.

Hazy Sunlight **1/50 f/8**

This is the best light for Kodacolor pictures. The sun's disk is bright but softened by a slight overcast and thin clouds. You can look at the sun without much discomfort. Shadows are light and soft in outline because of the diffusion and reflection of sunlight and skylight into the shadows.



AWAY FROM SUNLIGHT

If your camera has a lens opening of $f/6.3$ or larger, you can handle the two conditions below at snapshot speeds. Simple cameras will require synchronized flash or time exposures.



The sky is bright but overcast with white clouds. The sun's disk is obscured and there are no shadows. The subject must be lighted by plenty of sky overhead and in front. Remember, it's CLOUDY BRIGHT, not dull!

Cloudy Bright
 $1/50 f/5.6$

You find this type of lighting when the sun is shining but does not strike the subject. The subject is shaded from the sun but must be lighted by a wide angle of unobstructed sky overhead and in front of the subject. As this angle decreases, you will need to use larger lens openings.

Open Shade
 $1/50 f/4.5$
(or $1/25 f/6.3$)





Watch Those

Shadows!

Most dark shadows are *murder*! Keep them away from your subject whenever you can!

Why this concern about shadows? In brightest sunlight the difference between the brightest parts of your subject and the parts in shadow is often too great for a color film to handle. It can't record both satisfactorily. The result is a picture with empty blotches where the shadows were too strong.

But you can't always wait until the light is just right photographically. You have to make the most of whatever light you have, and do what you can to improve it. That's what we're after here—a number of tips on getting the best possible results without too much bother.

If your subject is in bright sunlight, it will cast a shadow—some kind of shadow no matter how you look at it. You can do one of three things to make

the shadows less troublesome: 1—You can make them small and less conspicuous in the important parts of the picture; 2—You can expose for the shadows and let the bright areas shift for themselves; or 3—You can make them less dark, less contrasty.

1—Making the Shadows Smaller

Photograph the scene with the sun lighting it flatly from the front. This puts the sun behind you, the photographer. Most of the shadows then will be behind the objects of principal interest and will be less conspicuous in the picture. This is the reason you've found picture-taking instructions for the beginner stressing front lighting: "Stand with the camera so that sunlight comes over your shoulder and falls flatly on your subject."

In close-ups of people, front lighting in bright sunlight isn't much of a solution to the shadow problem. Your subject squints, and there are usually dark shadows in the eye sockets and under the nose and chin. For close-ups of people, you'd better use side or back lighting and fill in the shadows with supplementary light. You'll find instructions for this when you reach 3—*Making the Shadows Lighter*. Side or back lighting gives your pictures more third dimension, and the modeling on the subject is more interesting.

2—Exposing for the Shadows

You do this only when shadow areas form a large part of the picture area and when the shadow includes the details of principal interest. The subject that satisfies these conditions is almost always a close-up.

When the subject is flatly lighted by bright sun, the camera settings are 1/50 second at $f/11$. When the subject is turned away from the sun, the detail in the shadows is less brightly lighted. You must then increase the size of the lens opening. This increase is one-half

a stop—a shift to a setting between $f/8$ and $f/11$. If the back-lighted subject is close to the camera, increase one full stop—1/50 second at $f/8$. If the shadows are not lighted by plenty of skylight, better use an even larger opening.

3—Making the Shadows Lighter

You can lighten shadow areas by using a supplementary flash to throw more light into them. This is the best way to handle shadows. Maybe it seems odd to use flash lamps outdoors in sunlight, but when you compare the results, you'll change your mind.

Your camera must be adaptable to a synchronized flash unit, a device that automatically flashes the lamp at the instant the shutter is wide open. Most recent cameras—even the simple ones—are designed for attaching a flash unit. With this equipment, the procedure is simple.

The sun may light the subject from the front, side, or back. Nevertheless, you adjust the lens opening to $f/11$, just as though you were going to make a snapshot of a front-lighted subject without flash. On a bright, sunny day a shutter speed of 1/50 second would normally go with $f/11$. However, some camera shutters are not designed to synchronize with 5B, 25B, 22B, or 2B flash lamps at speeds faster than 1/25 second. With such a shutter, you merely make the setting 1/25 second at $f/16$. At either setting, you make the exposure using the distance range shown in the following table.

FLASH LAMP	FLASH LAMP-TO-SUBJECT DISTANCE
5B, 25B	5—10 ft
22B, 2B	8—15 ft

Best balance between daylight and the light from the flash is obtained at the farther limits of the range. At the closer limit, the flash begins to elimi-

nate the shadows entirely. This gives the subject a lighting that looks entirely different from the lighting on the objects in the background—a good picture, but slightly out of this world. To avoid this at close range, stretch a clean, white handkerchief over the front of the flash reflector.

Blue-coated lamps are preferred for exposing Kodacolor Film outdoors. They provide light that approximates the color of daylight. Clear flash lamps may give too orange a light for daylight-type color films.

Flash lamps aren't the only means of throwing added light into the shadow area. Light-colored surfaces nearby, but not necessarily in the picture area, will reflect light into the shadow side. However, make sure that the surface is white, or near-white. A definitely colored surface will throw *color* into the shadows and give the subject an odd appearance in the finished picture.

A usable surface can be the side of a building, sand, or water, or it can be a portable reflector made from a mirror, a chromium ferrotype tin, an aluminum-painted surface, a white cardboard, or some similar device. The portable reflectors above are listed in descending order of the amount of light they reflect.

The mirror or ferrotype tin reflects most of the light reaching it and can produce a pronounced fill-in effect. It is best, therefore, when the reflector must be placed at some distance from the subject. The aluminum-painted surface is best at a distance from the subject about four times the width of the reflector. White cardboard must be placed close to the subject. This limits its use to close-ups in order to keep the reflector out of the picture. See diagrams on page 14.

A trifle inconvenient, these ideas. You either have to carry a reflector or hunt out a natural reflector. It's easier to use synchronized flash.



1—Exposure: $1/50$ at $f/11$. Front lighting produces pictures with bright colors, large flatly lighted areas, and some contrasty shadows. This lighting is best where the surroundings are light enough to reflect light into shadows.



2—Side lighting gives scene more depth, needs a half-stop larger lens opening— $1/50$ at lens opening between $f/8$ and $f/11$. Shadows are best in light surroundings. Supplementary flash would pep up the shadow colors.

3—A back-lighted close-up needs a full stop larger lens opening— $1/50$ at $f/8$. It almost always needs light surroundings to contribute reflected light. Supplementary flash would have pepped up the shadow colors here, too.



4—Bright, direct sunlight on clear days produces contrasty shadows. Such shadows are not objectionable in scenics or when the principal subject is distant. See No. 5 for shadow appearance when picture is made close up.





5—In close-ups of people in bright sunlight, highlights tend to wash out, or shadows tend to block up. Fill-in lighting with reflector or flash would have improved the picture. Side or back lighting plus fill-in—still better.



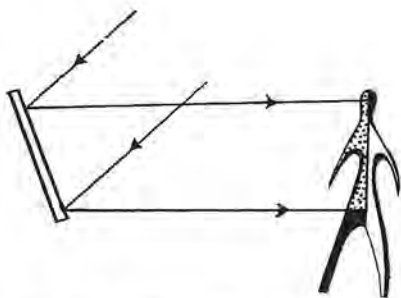
6—A No. 5B lamp was flashed at 5 ft from the subject to fill in the shadows of back lighting in bright sun. Exposure was $1/50$ at $f/11$. At 5 ft, the flash gives the subject a cut-out look against a dark background.

7—This is the same exposure setup as in No. 6, but the background is lighter. Flashing the lamp at 5 ft from the subject—exposure $1/50$ at $f/11$ —does not give the subject a cut-out appearance against the background.

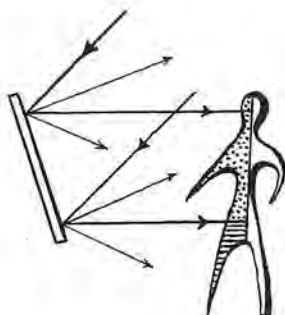


8—This is the same exposure setup as in No. 6— $1/50$ at $f/11$ —but the lamp was flashed at 10 ft instead of 5. Although background is dark, subject retains its back-lighted character and does not look cut out.

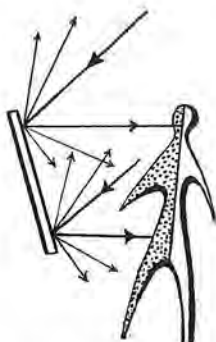




A specular reflector, like a mirror or ferro-type tin, is useful for filling in shadows from a distance.



With an aluminum-painted surface as reflector, the distance of reflector from subject should be about four times the width of the reflector.



A matte surface, like a white cardboard, must be placed close to the subject to be an effective reflector.

What It Boils Down To

Most outdoor Kodacolor picture situations can be identified as one of four lighting conditions. Looking at the sky and at the shadows will help you identify the lighting condition. If the subject is in sunlight, a look at your subject will tell you whether it is front-, side-, or back-lighted. Set your lens and shutter for these conditions. The table at right summarizes the settings.

A Refinement

In most instances you'll get satisfactory results even though you make no distinction between light, average, and dark subjects. You've learned the exposure settings for a number of lighting conditions. You can let it go at that. BUT, for really top-flight quality, there's something more you can do. You can give a little less exposure for light subjects and a little more exposure for dark subjects.

By light, average, and dark subjects we don't mean the amount of light falling on the subject. We're talking about the dark or light clothing the subject is wearing, the darkness of tree foliage and grass, the lightness of sand and light-colored buildings. Every scene contains a mixture of light, average, and dark surfaces. If the object of principal interest in the scene contains a greater amount of light surfaces, we call the subject *light*. If it contains more dark surfaces, we call it *dark*. The greatest number of scenes are average.

Adjusting for subject type will mean a shift to one-half a lens opening larger for dark subjects or one-half a lens opening smaller for light subjects. The Snapshot-and-Flash Kodaguide takes care of the subject type in one setting of the dial.

IN SUNLIGHT

Bright Sun

Hazy Sun



1/50 f/11
Front-lighted



1/50 f/8
Front-lighted

1/50 f/8-11
Side-lighted or
Back-lighted

1/50 f/6.3
Side-lighted or
Back-lighted

1/50 f/8
Back-lighted
Close-ups

1/50 f/5.6
Back-lighted
Close-ups

AWAY FROM SUNLIGHT

Cloudy Bright

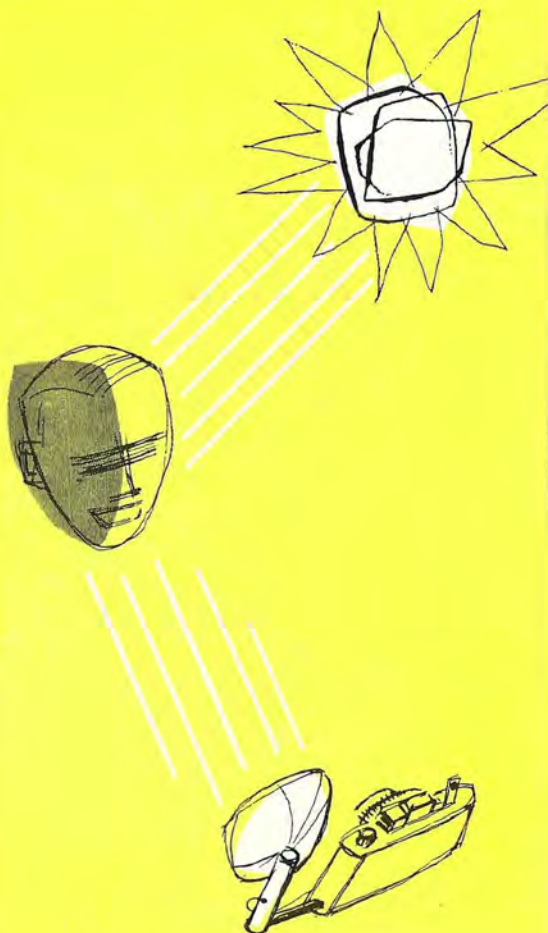
Open Shade



1/50 f/5.6



1/50 f/4.5



Exposures for Simple Cameras

Snapshots without
supplementary flash

Subjects in
Bright Sun

Snapshots with
supplementary flash
or reflectors

Close-ups of Side- or
Back-lighted Subjects
in Bright or
Hazy Sunlight

Close-ups of Subjects
on Cloudy Bright Days,
or in Open Shade.

Time Exposure
(No flash)

All conditions except
Bright Sun.

Beware!

Subjects that are posed partly in shade and partly in bright, direct sunlight do not make good color pictures. Re-pose them or change your camera position so that the objects of principal interest are all in one kind of light.

If your own shadow, which will be between you and your subject, intrudes in the picture area, you can move away from the direct sun-to-subject axis. At 45°, your shadow usually will not appear in the picture.



Average Subjects

This class includes scenes in which the picture area of principal interest contains about equal amounts of light and dark objects or surfaces: gardens, houses, and nearby people in the more common surroundings. Use this class when in doubt.



Light Subjects

This class includes scenes in which the picture area of principal interest is dominated by light objects or surfaces. Distant scenery, and nearby people in marine, beach, and snow scenes are typical of this class.



Dark Subjects

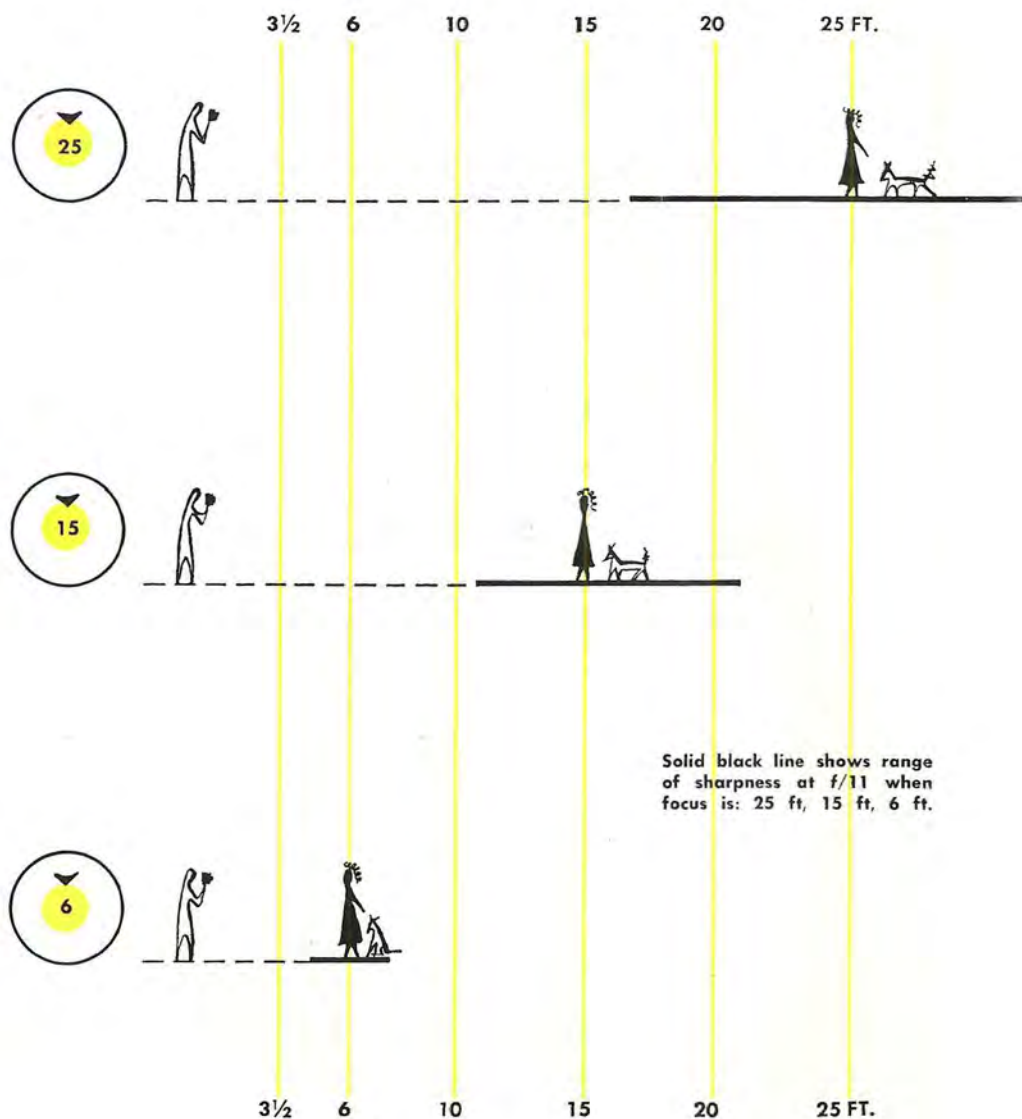
This class includes scenes in which the picture area of principal interest is dominated by dark objects or surfaces: people in dark clothing, dark flowers, foliage, animals, and buildings. Subjects usually must be close to camera to qualify in this class.



The upper picture was exposed for the bright, distant landscape. This underexposed the shadowed foreground but made an attractive frame for the scene. The lower picture was exposed for the shadowed foreground. This overexposed the distant landscape. When a scene includes very bright and very dark areas, expose for the areas most important to the picture.



Sharp Pictures



Focusing

When your subject is *more than ten feet* from the camera and when you can use small lens openings like $f/8$, $f/11$, $f/16$, you can focus your camera for *ranges* instead of specific distances. This will be the case with most outdoor pictures.

When your subject is *less than ten feet* from the camera, or when the lens opening is larger than $f/8$, you must focus the camera for specific distances—frequently, measured distances. This will be the case with most indoor pictures.

Distant Subjects—20 ft. or farther:

Set focus at 25 ft.

Nearby Subjects—10 to 25 ft. away:

Set focus at 15 ft.

Close-Ups— $3\frac{1}{2}$ to 10 ft. away:

Set focus for the measured distance.

Closer Than Close-Up—Supplementary lenses placed over the camera lens will permit you to work even closer to your subject and thus get a larger image. This is a definite advantage in photographing small objects with important or interesting detail. Instructions for the use of supplementary lenses are packaged with the lens.

Camera Steadiness

Movement of the camera while the shutter is open makes fuzzy pictures. Here are some tips which will help you avoid this fault:

1—Use a shutter speed of $1/50$ second in preference to $1/25$.

2—Stand firmly with feet separated.

3—Hold the camera with both hands and place it against the body: against the waist when using a waist-level finder, and against the cheekbone when using an eye-level finder.

4—Press the shutter release slowly and evenly. You can't hurry the shutter by the speed with which you press it.

It releases at a certain point in the thrust of the exposure button; the speed at which it opens and closes is fixed by the shutter setting.

Action Pictures

Nearly all the specimen exposures on the preceding pages recommend a shutter speed of $1/50$ second. Most people can hold a camera steady enough at this shutter speed to avoid blurring the picture. If you have a steady hand, you can sometimes use a shutter speed of $1/25$ when you need the slower speed. For still longer exposures, you must use a tripod or some other firm camera support.

So far, these exposures are all for a subject that stays put. But all life is not vegetable or mineral—our energetic youngsters, active friends, and frisky pets aren't always rooted to the ground. Sometimes we have to catch them "on the wing." Yet they must be sharp in the picture and, at the same time, properly exposed.

Every movement of the subject means a movement of the image on the film. To get a sharp picture we have to keep the image movement so slight that it is not apparent in the print. We do this by using a shutter speed to fit the action of our subject. The shutter speed depends on:

1—How far away the subject is.

2—In what direction the subject is moving with respect to the camera.

3—How fast the subject is moving.

Distant movement means less image movement on the film than when the object is close.

Movement directly toward or away from the camera means less image movement on the film than movement across the camera axis.

This means that you can photograph fast movement most easily when it is distant and when it is moving toward or away from the camera.



Diagonal motion at 1/50 second



Diagonal motion at 1/100 second



Diagonal motion at 1/200 second

If you use 1/50 second for a distant subject moving in the "Easy" zone, you'll need 1/100 when the angle is that of the "Possible" zone, and 1/200 in the "Danger" zone. In addition, at 10 to 15 feet, you'll need a shutter speed twice as fast as at 25 feet—1/100 instead of 1/50 in the "Easy" zone. The diagram and table on the opposite page illustrate this.

Uniform movement is easiest to record sharply. Parades, races, street traffic, boats, and similar subjects are in this class. In some activities, movement is erratic. Body, arms, and legs may be moving in different directions, and may change direction suddenly. However, there are usually moments of pause, at the beginning or end of the movement, during which you have the best chance for sharpness. Try to anticipate these pauses, and play safe by using as fast a shutter speed as conditions permit.

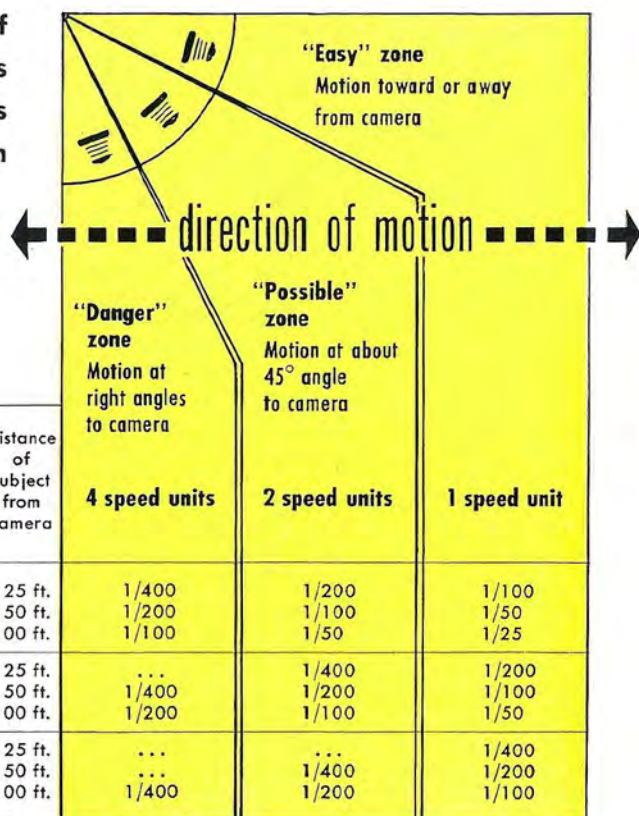
Lens Openings for Action

The exposure in bright sun is 1/50 at $f/11$. Suppose you speed up the shutter to 1/100 second to catch an action picture. At 1/100 second, the shutter stays open only half as long as at 1/50 second. Consequently, the light that reaches the film is only half as much as it needs. So you must increase the size of the lens opening. If the new lens opening lets through twice as much light as $f/11$, the exposure will again be correct. The opening that will do this is $f/8$.

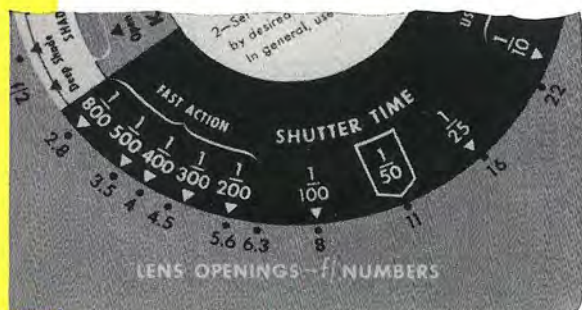
When you halve the length of time the shutter is open, you must double the area of the lens opening to keep the same exposure. You increase the opening in the same proportion as you shorten the time.

The Snapshot-and-Flash Kodaguide is most helpful when camera settings must be changed while maintaining the same film exposure.

**Table of
shutter speeds
to record subjects
in motion**



**The Snapshot-and-Flash
Kodaguide shows the
lens opening
to use with any
shutter speed.**



Flash Pictures

There is a correct type of flash lamp for use with each type of Kodacolor Film: clear lamps for Type A, blue-coated lamps for Daylight Type. The blue-coated lamps bear the suffix letter, B. See Table No. 2, page 30.

Flash Shutters and Synchronization

Cameras of most recent design have flash shutters. This type of shutter needs only a flash unit comprised of reflector and batteries—it's ready for synchronized flash pictures. The synchronizing mechanism—the "dingus" that flashes the lamp at the right instant—is built into the shutter.

Regardless of what type of shutter you have, check your camera and flash unit manuals for lamp and shutter speed recommendations. This is important because synchronization needs split-second teamwork between shutter and lamp. You can't assume that you have a picture just because the lamp and shutter *seem* to go off together. The peak, or brightest portion, of the flash must occur at the precise instant the shutter is wide open. Some lamps peak more slowly than others. With some shutters, maximum opening is reached later than with others. Consequently, some lamps will not synchronize with all shutters at all speeds. Therecommendationswill specify lamp type, shutter speed, and any special shutter adjustment that may be necessary.

The lamp must receive an adequate electrical discharge from the batteries in order to flash at the correct instant. Old batteries should be suspect, even though they may have had little use.

These paragraphs may give the impression that backing a long shot at a horse race is a surer thing than flash synchronization. To the contrary, the point we're making is: Use the correct lamp, the correct shutter speed, and good batteries; then, you can't miss. If you can set your shutter for 1/25 second exposure, use that setting whenever you are in doubt about lamp type or shutter manipulation. That always works.

An SM or SF lamp has a special advantage for some cameras. Its flash is very short and gives the effect of a shutter time of 1/200 second even though the shutter is set at a slower speed. With these lamps, you can use the slower shutter speeds and thus make allowance for possible faulty synchronization from poor battery conditions or contacts.

Open Flash

This is the alternative to having synchronizing flash equipment. You just get a flash unit—reflector and batteries. There is no connection between the unit and the shutter. It is up to you to flash the lamp when the shutter is open. This means setting your shutter for a time exposure. Most shutters are marked with a "T" or "B" or both. At "T" you press the shutter release once to open the shutter and a second time to close it. At "B" you press the release and hold it down to keep the shutter open; when you let go, the shutter closes. In both cases it is safest to place the camera on a tripod or other firm support.

You can hold some cameras securely in one hand while operating the flash unit with the other. When you attempt this, however, don't include lighted lamps or daylight windows in the *picture* area. Otherwise, movement of the camera will give you an image from the dimmer light which will blur the image made with the light of the flash.

An SM or SF flash lamp is usually best for open flash pictures; its flash is short, minimizing both subject and camera movement. A sharp image on the film is very important because all Kodacolor Prints are enlargements. Any lack of sharpness becomes more noticeable through enlargement.

Flash Exposure Guide Numbers

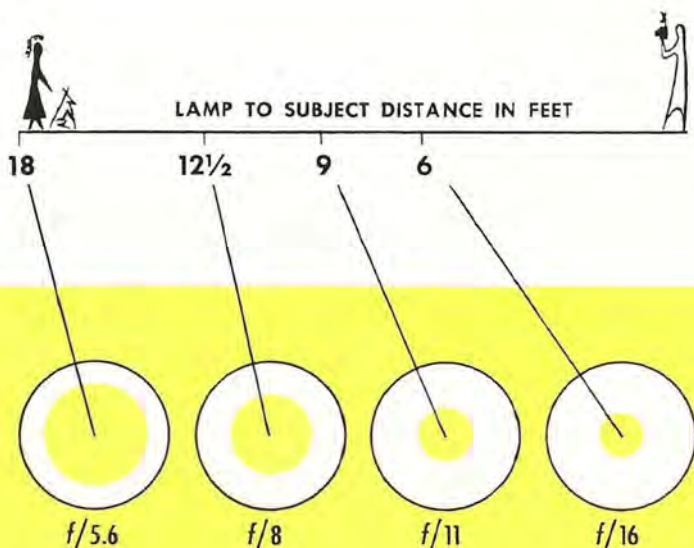
These numbers help you adjust your lens and shutter correctly. Each flash lamp has a Guide Number for each shutter speed. See page 30. To find the lens opening that goes with the shutter speed, you merely divide the Guide Number by the lamp-to-sub-

ject distance. For example: the Guide Number for Kodacolor Film, Type A, with a No. 5 or 25 lamp at a shutter speed of 1/25 second is 100. When the distance from flash lamp to subject is 12 feet, the lens opening is: 100 divided by 12, that is, $f/8$.

The Guide Number works the other way around, too. Divide it by an f -number and the answer is the lamp-to-subject distance.

The flash dial on the Snapshot-and-Flash Kodaguide will do this figuring for you. You set the Guide Number on the dial opposite the arrow. The lower scales then give you the proper lens opening for any distance.

No. 5 or 25 lamp at 1/25 second—Guide Number 100



$$\frac{\text{Guide Number}}{\text{Distance}} = f/\text{number}$$

How You Go About It

You have the correct flash unit and lamp for your type of camera and shutter. The picture-taking steps are then:

1—Insert the flash lamp into the reflector.

2—Pick the camera-to-subject distance that will give you the picture you want.

3—Focus for that distance.

4—Set the lens opening—Guide Number divided by distance.

5—Snap the picture.

If you have a simple camera with openings that aren't labeled with f -numbers, flash the lamp at the distances given in Table No. 3, page 31.

More Than One Flash Lamp

Some camera flash units have an extension cord. With this you can hold the single flash unit away from the camera and still retain synchronization. At close range, the resultant lighting is similar to side lighting by the sun. To lighten the shadows produced by this setup, you should pose the

subject near light-colored surfaces that will reflect part of the light from the flash into the shadows.

Some flash units have provision for attaching a second, or extension, flash unit. With this equipment you can place the extension out to the side of the subject to produce a side lighting. The flash on the camera provides fill-in light for the shadows. Both flashes synchronize with the shutter.

Flash Exposure with Two Lamps

Suppose you plan to light your subject with two flashes aimed at the same part of the scene. This will increase the light on the subject. To keep the exposure correct, you must use a smaller lens opening than you would use for one lamp.

With a No. 5 or 25 lamp and Type A film, the Guide Number at 1/25 second is 100. At 12 feet from the subject you use $f/8$ with one flash lamp. If the two lamps are practically side by side and illuminate the same picture area, use a lens opening one stop smaller— $f/11$.

If you move the second lamp out to form an angle with the subject-to-camera axis, but at the same distance from the subject as the first lamp, use a lens opening one-half stop smaller—between $f/8$ and $f/11$.

If the angle exceeds 45° , use the lens opening you obtained for one lamp— $f/8$.

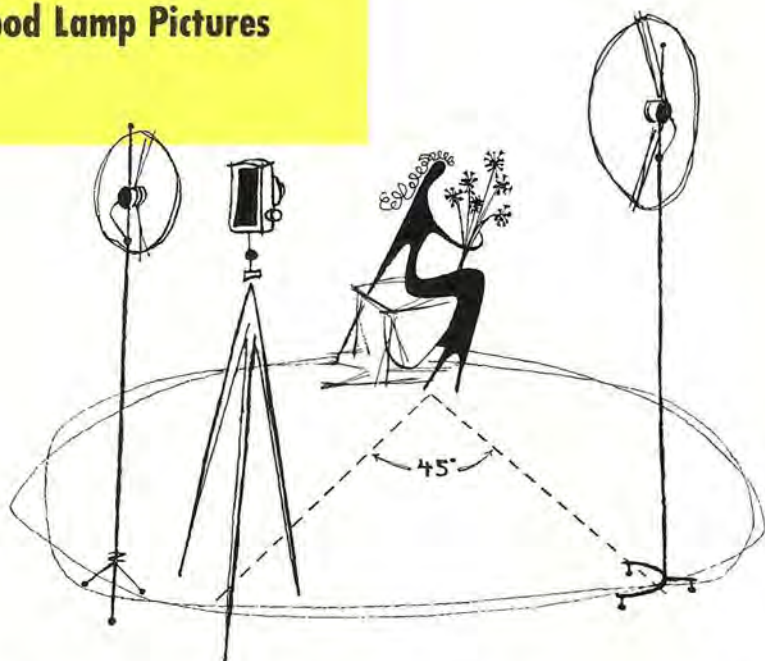
When the second lamp is out at an angle of approximately 45° , it can be placed a little closer to the subject than the lamp at the camera if you want more contrast in lighting. Proceed cautiously, however; too much contrast will not print satisfactorily. When the distance from subject to side light is $7/10$ the distance from subject to camera light, you have reached the end of the safe limit. Use a lens opening one stop smaller than for one lamp— $f/11$.





A single flash mounted on the camera produces a flat lighting and a shadow outline, as in the top picture. Still, it's a good picture, easily made. In the lower picture, made with two flash lamps, the shadow outline is gone, colors are livelier, and the picture appears to have more depth.

Flood Lamp Pictures



Use only Kodacolor Film, Type A, with flood lamps. Daylight-type film used with floods produces pictures that are often too orange to be satisfying. If your camera is loaded with daylight-type film when you want to take indoor pictures, switch to flash lamps.

Lamp Arrangement

Use two No. 2 flood lamps in Kodak Vari-Beam lights or in other high-efficiency reflectors, or use two reflector-type flood lamps. The latter have a built-in reflecting surface.

Arrange the lights as shown in the diagram. Both lamps are at the same distance from the subject, one lamp near the camera-to-subject axis, the other out at about a 45° angle to the axis. This unbalanced lighting is usually more desirable than flat lighting. The picture gives a better representation of volume and depth in the subject.

The Main Light controls the location of the highlights that produce modeling. The Fill-In Light lightens the shadows caused by the Main Light. You can see the effect clearly if you switch on first one light by itself and then the other.

Exposure

An exposure table based on this lighting arrangement is given on page 31.

More Than Two Lamps

One of the simplest variations is the introduction of a third lamp. The basic setup is retained for the first two lamps. The third is used to highlight the hair in portraits, to introduce a touch of crosslighting, or to light the background. These effects are shown on page 28. As long as the third lamp is not used to heighten the effect of either of the other two lamps, no change in exposure setting is needed.



Background Shadows and Reflections

Both flash and flood lamps cast strong shadows. If the subject is close to the background, these shadows will show on the background in the picture. You can avoid them by posing your subject away from walls or upright surfaces. However, as you move the subject away from the background, the background becomes darker in the finished picture. If this is objectionable, you can hide a flood lamp behind your subject with its light directed onto the background. This can be done even though you are using flash for lighting the subject.

Watch out for shiny surfaces that will reflect light into the lens. They include windowpanes, mirrors, spectacles, and highly polished surfaces that are perpendicular to the flash-to-subject axis. With flood-lamp illumination, you can check for them by looking at the scene with your eye close to the camera lens. With flash lamps, you get no forewarning. You have to anticipate them by examining the location of shiny surfaces. Make sure they are at an angle to the flash-to-subject axis.



Picture at top left shows the typical shadow cast when the subject is lighted by a single flash.

At top right, a flood lamp placed behind the chair lights the wall and eliminates the shadow.

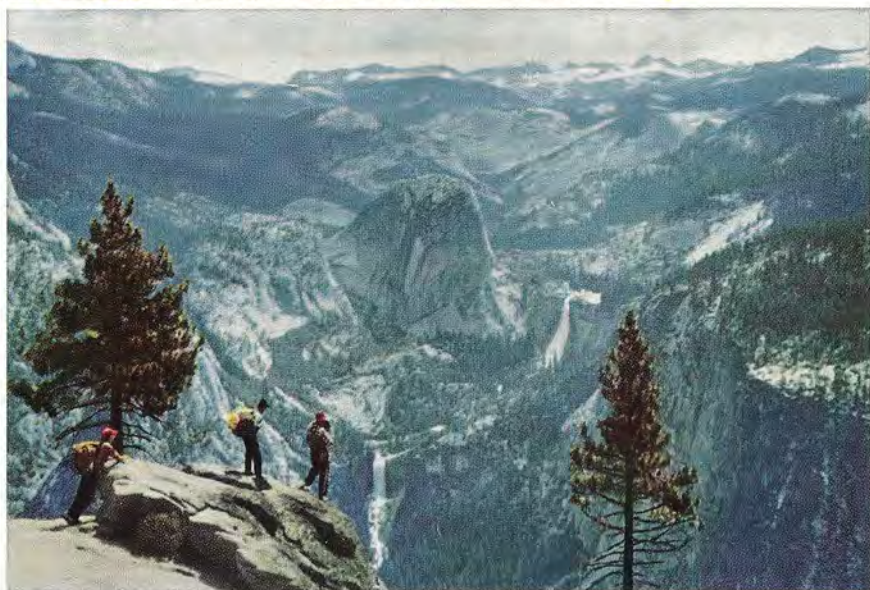
Picture at bottom shows reflection of lamp in glass. Moving camera slightly to right would have avoided it.



The top picture was made with the basic two-lamp setup. In the lower picture, a third lamp was placed above and behind the subject to light the hair. It has also lighted several top edges and thrown more light into the background. The scene appears to have more depth with three lamps than with two.



This booklet has said little about landscapes because landscape snapshotting has few problems in lighting and exposure. In sunlight, $1/50$ at $f/11$ will capture most scenes.



Lighting a subject in deep shade with flash—as in the top picture—takes a little figuring and a little guessing. One way is to compute exposure as though there were no other light on the subject. In the example above, the larger lamp, No. 22B, was used to get a lens opening small enough to properly expose the sunlit background also. With a dark background, a larger lens opening would be a better choice, when coupled with the correct flashing distance.

Exposure Tables

TABLE NO. 1—OUTDOOR EXPOSURE AT 1/50 SECOND

	Bright Sun	Hazy Sun	Cloudy Bright	Open Shade
Front Lighted	f/11	f/8	f/5.6	f/4.5
Side or Back Lighted	between f/8 and f/11	f/6.3		
Back-lighted Close-Ups	f/8	f/5.6		

Fill-In Flash: In bright sunlight, adjust the camera to 1/25 at f/16 and flash the lamp at the following lamp-to-subject distances:

No. 5B, 25B 5-10 ft No. 2B, 22B 8-15 ft

When outdoor lighting conditions are poor, as in deep shade or on cloudy dull days, flash can be used as the principal light source. Ignore the daylight and base your exposure on the Flash Exposure Guide Number alone.

TABLE NO. 2—FLASH GUIDE NUMBERS FOR KODACOLOR FILM

Lamp	Film Type	Shutter Speeds			
		1/25, Open Flash B or T Settings	1/50	1/100	1/200
SM, SF*	Type A	50	50	45	—
5B, 25B*	Daylight	70	60	50	40
5, 25*	Type A	100	80	75	60
22B, 2B**	Daylight	120	100	85	60
11, 40**	Type A	130	110	100	75
2, 22**	Type A	150	130	110	85
*In Kodak Flashholder or similar 4- to 5-inch satin-finished reflector.					
**In 6- to 7-inch polished reflector.					

TABLE NO. 3—FLASH-LAMP DISTANCES FOR SIMPLE CAMERAS

Camera	Film Type	Flash Lamp	Shutter Set At	Distance to Subject (in ft)
Brownie Flash Six-20	Daylight Type A	22B, 2B	I	5
		11, 40	I	5-6
		2, 22	I	5-8
Brownie Reflex, Synchro Model	Daylight Type A	5B, 25B	B	5
		SM, SF	I	5
		5, 25	B	5-7
Kodak Duaflex II Kodet Lens	Daylight Type A	5B, 25B	B	5
		SM, SF	I	5
		5, 25	B	5-7
Kodak Duaflex II, Kodar Lens (at f/8 opening)	Daylight Type A	5B, 25B	B	7-10
		SM, SF	I	5-7
		5, 25	B	9-13
Kodak Tourist, Kodet Lens (at f/12.5 opening)	Daylight Type A	5B, 25B	B	5
		SM, SF	I	5
		5, 25	B	5-7

TABLE NO. 4—KODACOLOR FILM, TYPE A, AND FLOOD LAMPS

Shutter Speed	Lamp-to-Subject Distance in Feet							
	f/3.5	f/4	f/4.5	f/5.6	f/6.3	f/8	f/11	f/16
1/25	5½	4½	4					
1/10	9	8	7	5½	4½			
1/5	13	11	10	8	7	5½		
1/2	20	18	16	13	11	8½	6	
1	28	25	23	18	16	12	8½	6

This table is based on the use of No. 2 flood lamps in Kodak Vari-Beam lights. If reflector flood lamps are used, place the lamps at the distance shown in the table, but use a lens opening a half stop larger. *Simple Cameras with Unmarked Lens Openings:* Use the largest lens opening and make a 1-second exposure with the lamps at 7 feet from the subject. With these cameras, flash lamps provide a more practical picture-taking method.

Developing and Printing

Ordering Procedure

Kodacolor Prints are at their best when the film is returned to your Kodak dealer immediately after exposure. You'll find detailed instructions for returning exposed Kodacolor Film packed with each roll.

Your dealer sends the film to a processing station, operated by the Eastman Kodak Company, where the film is developed to a negative, free of charge. No prints will be made unless prints are ordered.

The best procedure is to enter a "Develop and Print" order with your dealer when you turn in your exposed Kodacolor Film. Prints will then be made only from those negatives which are of suitable printing quality.

There is a second type of order which you can enter after you have seen the negatives. This is the "Prints Only" order. On this order, prints will be made from all negatives submitted, except in unusual cases when the quality of the results would be so unsatisfactory as to be unacceptable.

Print Sizes

All prints made on a "Develop and Print" or a "Prints Only" order are made to a standard width of about 3½ inches, including margins. The lengths depend on the proportions of the original negative.

You can order prints from selected areas of the negatives. This is a special order and an extra charge is made for the first print from each masked negative. The masked areas must conform to a smaller standard negative size:

2¼ x 3¼	1½ x 2¼
2¼ x 2¼	1½ x 1½
	1¾ x 1¾

The masked area should be indicated by attaching opaque Scotch Tape to the base (shiny) side of the negative. *Do not trim the negative.* The narrower dimension of the masked area will be enlarged to the standard width of approximately 3½ inches.

Enlargements

Standard-size Kodacolor Enlargements are 5 x 7 and 8 x 10 inches. When these proportions will result in cutting off important parts of the picture, enlargements are made as follows:

From 616 or 116 negatives:

4 x 7, 6 x 10

From 620, 120, or 127:

7 x 10

From square negatives:

5 x 5, 8 x 8

If you want only a portion of a negative enlarged, you may mask it off by surrounding it with opaque Scotch Tape placed on the shiny base side of the negative. The dimensions of the portion must be those of one of the standard negative sizes:

2¼ x 3¼ 1½ x 2¼

2¼ x 2¼ 1½ x 1½

1¾ x 1¾

Care of Film, Negatives, Prints, and Enlargements

The film, negatives, prints, and enlargements should be kept in a cool, dry place. The prints, enlargements, and negatives must be protected from prolonged exposure to bright daylight, especially direct sunlight.

The dyes used in Kodacolor materials, like other dyes, may, in time, change. Prints or negatives will not be replaced or otherwise warranted against any change in color.

Kodacolor Film should not be left in cameras for long periods of time.

Kodacolor materials will not keep well in the tropics without special protection from heat and humidity.

Mounting of Kodacolor Prints and Enlargements

The prints can be mounted satisfactorily with Kodak Rapid Mounting Cement. Rubber cement or pastes containing water or penetrating solvents should not be used.

Kodak Thermount Tissue, which can be used at a lower temperature than regular mounting tissue, is also recommended for mounting Kodacolor Prints. Kodacolor Enlargements, however, should not be mounted by any process involving heat, because the dyes may be affected.

A Good Kodacolor Picture Deserves a Good Setting

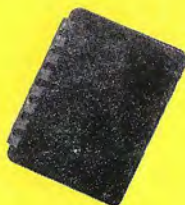
Albums, folders, and mounts will protect your prints and show them to best advantage. Here are a few—



Kodak Protecto Pocket Albums—You can slip a maximum of 16 prints into the 8 Kodapak folders. One size album accepts 3½x5-inch prints; the other size accepts 3½x3½-inch prints. Leaves are provided for mounting. The cover is a flexible, maroon leatherette with gold design. The binding is spiral Tenite.

Kodak Color Print Mounts—These are folder mounts for individual pictures. They are available for either horizontal or vertical Kodacolor Prints and Enlargements in sizes 3½x5, 5x7 and 8x10.

See your Kodak Dealer.



An abstract geometric diagram on a yellow background. It features a red rectangle with a white circle inside at the top left. A red square is positioned below it. A red triangle is to the right. A vertical red line with a green dot at the top and a red dot at the bottom runs down the right side. Several black lines originate from the red square and the red triangle, extending downwards and crossing each other. Some lines end in colored dots: a white dot, a red dot, and a green dot. A black horizontal bar at the bottom contains the text 'EASTMAN KODAK COMPANY • Rochester 4, N. Y.'.

Kodak Master Photoguide

This handy pocket-size information book contains all the guides mentioned in this booklet, plus many more. It is crammed with on-the-spot picture-taking information—information that you will find useful both with and without an exposure meter.

At Kodak dealers, \$1.75



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