Electronic Flash

Portable Light

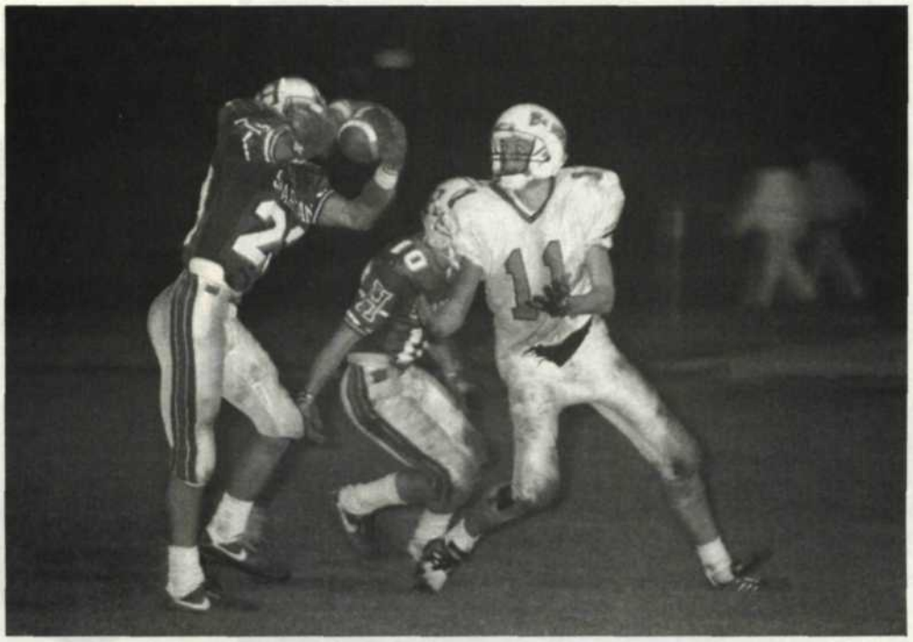
by Jack and Sue Drafahl

One of the greatest contributions to photography was Dr. Harold Edgerton's invention of the electronic flash. The first units were almost too big to carry, and not very efficient. Today's electronic flash units are extremely sophisticated, compact, very efficient, and easy to use. They come in all shapes and sizes and are found on just about every camera used today, even single-use cameras. They are color balanced for daylight exposure, so you can intermix your electronic flash with sunlight exposures and never notice the difference.

One advantage to using electronic flash is that you can use fine-grain, slow film in low-light situations and still use a small aperture. Flashes enable you to freeze the action on moving subjects. They fill in the dark shadows created by harsh sunlight. Electronic flashes even automatically balance the ambient light with strobe for more appealing portraits. You can even use electronic flash units to give that creative edge to your photography. Electronic flashes are used indoors and out in almost every aspect of photography including portraiture, nature, sports, photojournalism and weddings.

Direct flash is easy to use, but has a flat look that isn't always the best lighting.

Bouncing the flash—aiming the flash unit at a handy nearby wall or ceiling—provides a more-natural look. TTL flash automatically provides good exposure with bounce flash.



Powerful flash units are great for action work, allowing you to get sharp shots even in dim lighting.

Automatic Flash Units

You can find automatic electronic flashes in point-and-shoot cameras, one-time-use cameras, or as separate units for your 35mm and larger-format cameras. Flash units built right into the camera body usually have a sensor system that tells the flash to charge and fire when the light level is too low. It operates automatically and you usually don't even have to think about it. The output of the internal flash units is lower than portable units, but still can reach out 20 feet or more with ISO

FLASH SUPPLIERS

ACHIEVER

Achiever has more than a dozen different models of electronic flashes divided up into three groups: auto/manual, autofocus, and dedicated flash systems.

The new Z940LCD autozoom model offers TTL operation with Canon, Minolta and Nikon SLRs via dedicated modules. The unit provides manual power settings from full to 1/8, first- and second-curtain sync, a head that rotates 0–330° horizontally and 0–90° vertically for bounce versatility, and easy-to-read LCD display, and ISO 100 guide number of 115 (in feet) at the 50mm zoom setting, and a built-in AF-assist beam.

Other Achiever flash units include the multi-dedicated TZ250 (ISO 100 GN 120, 260AF (with AF illuminator) and DZ260 (both GN 112), non-dedicated budget 260T (GN 88), 321AZ (GN 64) and very inexpensive 115M (compact manual), 115A (compact auto) and 115A/S (auto/slave), all GN 48.

CAMBRON

Cambridge Camera Exchange offers a complete line of Cambron flash units, both dedicated and automatic. The Camlite III is a handle-mount flash that can act as a primary flash or as a slave flash. The flash head can rotate straight up for bounce flash, and it has an auto-thyristor circuit for fast automatic exposure. A Hot Shoe Slave Eye can be used to turn your flash into a slave unit.

The Cambron Macroflash Pro Ringlite is designed with a circular flash tube that wraps around the front of your camera lens to produce very even lighting. Applications for this flash include coins, flowers, jewelry, medical, and dental photography.

CANON

Canon's newest introduction is the Speedlite 420EX, an economical alternative to their top-of-the-line Speedlite 550EX that offers many of the same features, including E-TTL, FP high-speed sync, flash-exposure lock, second-curtain sync, and zooming from 24–105mm angle of coverage (with ISO 100 guide numbers of 75.5–138, in feet).

The MR-14EX macro ring flash with full E-TTL flash compatibility. Twin circular flash tubes can fire at even power, or varied as much as six full stops. One or more 550EX flash units can be used as wireless slaves along with the MR-14EX ring flash when you want to create some very elaborate lighting effects. The control unit to the MR-14EX has full illuminated LCD info panel and can take the optional high-capacity battery packs. This new high-tech flash takes advantage of the EOS-1v, EOS-3, and other E-TTL Canon cameras. With a guide number of 46 at ISO 100, this ring flash is powerful enough for the smallest of lens apertures.

The 550EX and its companion the ST-E2 wireless transmitter were designed for the EOS-3 but can be used with

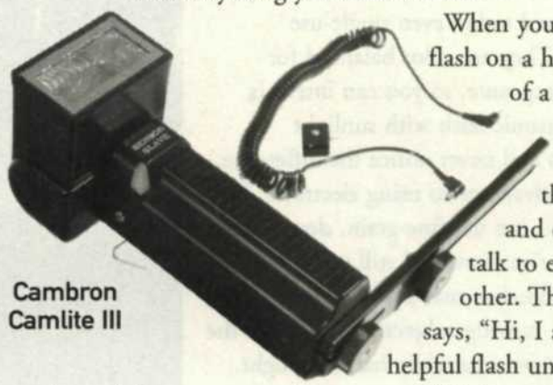
Achiever Z940LCD

400 film. Most of these internal flash units can be turned off, set to full flash, flash-fill, or used with red-eye reduction. Separate accessory flash units use rechargeable NiCd or alkaline batteries, have fast recycle times, and pack a large amount of light wallop into a small package. Some units even have adapters for AC connection.

The more complex units use a power-saving circuit that outputs only enough light to expose the scene. Once the flash is triggered, the light falling on the subject is reflected back into a sensor. When enough light for a correct exposure is achieved, the flash cuts off and the remainder of the charge is saved for the next shot. Exposure durations of an electronic flash can range from 1/1000 second to 1/50,000, and can be fired in rapid succession.

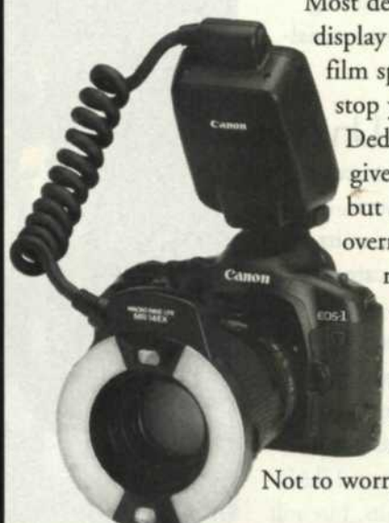
Dedicated Flash Units

Over the years the portable electronic flash units keeps becoming smarter. The dedicated flash has very complex electronics featuring dozens of functions, and can do just about anything you want it to do.



Cambron Camlite III

When you place a flash on a hot shoe of a newer 35mm camera, the flash and camera talk to each other. The flash says, "Hi, I am your helpful flash unit, and I am ready to light your scene. I am set to TTL, have a full charge and I'm ready to go." The camera responds with, "Hi, I am your friendly camera, and I have ISO 100 film loaded and a zoom lens set to f/8 at 65mm focal length. Let's go to work." All this happens in a micro second where they work together as a team to make your pictures look good.



Canon MR-14EX ring flash

Most dedicated flash units will display a flash range for a specific film speed, and indicates what f-stop you should set on the lens. Dedicated flash units are set to give perfect flash-fill exposures, but they still give you manual override so you can change the ratio with a +/- exposure control.

These flashes are so smart that they even know when you're not taking pictures so they go into a standby mode. Not to worry though, because they will be back ready to work on a moments notice.

Direct sunlight is very harsh (left). Using flash to fill the shadows (right) creates a more pleasant effect.

Non-TTL Automatic Flash Units

The non-TTL auto flash is a more independent flash system, and does not translate electronic information from the camera. It has its own sensor system on the front that tells it when enough light is reflected from the scene. After you set the film ISO speed on the flash, select one or more different f-stops on your camera lens. With each of these f-stop settings, you will be shown a range in which the auto function will give a correct exposure. Select the f-stop that will provide a correct exposure in the range you need, set it on the camera and take the picture. If all goes well you will get a great shot, but since the flash is not looking at exactly what your camera sees, there may be a slight discrepancy in exposure. Bracket your exposures if you are really worried about getting the shot.

When all else fails, you can set the flash to manual and calculate the exposure the hard way. Take the guide number for the flash and a specific film ISO. You will find the information either printed on the back of the flash or in the instruction manual. Divide the guide number by the distance of the flash to subject. For example, a flash has a guide number of 110 for ISO 200 film. If the subject distance is 10 feet, divide 10 into the guide number of 110 and you get f/11 as the f-stop to use for a correct exposure.

Additional Flash Options

Manufacturers include a variety of optional controls on each of their flash units, and unfortunately they vary from flash to flash. When you are looking to buy a camera-mount

the rest of the Canon EOS line. The 550EX has a guide number of 180 with ISO 100, AF-assist beam, FE lock (flash version of AF lock), high-speed flash sync, and a flash exposure bracket system. It includes a built-in wireless transmitter, which can control other 550EX flash units.

If you want a lot of flash power, you might consider the 480EG grip-style flash with a hefty guide number of 223 with ISO 100. This flash has a wide range of flash controls, and a clamp-and-bracket system for mounting the flash. Smaller Canon flash units include the 540EZ, 380EX, 220EX, and the very compact 200E.

CONTAX

The TLA 280 (ISO 100 guide number 92) incorporates two flash heads in one unit. The main head at the top can swivel for bounce flash, while the smaller flash at the base of the unit serves as a fill-flash. The main flash head has a zoom feature that links up with the focal length of the camera lens.

The TLA 360 has a guide number of 118 and can deliver TTL, auto, and manual flash control. The power-zoom head can handle six different focal lengths from 24mm to 85mm.

The TLA 480 is a bracket-mounted flash that can deliver a guide number up to 158. The three flash modes are TTL, auto, and manual control. Second-curtain control is possible with this flash and RTS III, RX and the G1/G2 cameras. The flash head can be tilted 90° up, 180° to the left and 115° to the right for optimum bounce control.

Contax also has additional power packs that reduce the recycle time to 1/3 and increase the number of full-power flashes by 3.5 times.

METZ

The Metz collection, distributed by Bogen Photo Corporation, has more than a dozen electronic flashes, divided into shoe-mount and handle-mount flash units. The most recent shoe-mount flash is the Metz 40AF fully dedicated flash series. It has a maximum guide number of 131 and power zooms to 28mm, 35mm, 50mm and 80mm. Focus assist is accomplished with an autofocus measuring beam, and rear-curtain flash exposure is possible with the Canon and Nikon versions of the flash.

The key to the Metz system is the SCA (Special Camera Adaption) adapter system. Located in the foot at the base of the flash, this system can be changed out with a different adapter for a new camera brand name. More than 15 camera manufacturers are supported, which makes Metz flash units compatible with just about every SLR made.

One of the more powerful flash units is the 60CT. It has an ISO 100 guide number of 197 and exposure durations from 1/200 to 1/20,000. With a recycle time of 0.2 to 4 seconds, this powerful flash can shoot from 160 to 4500 images on one charge.

At the other end of the scale we have the 20BC series, six flash units so small they can fit in your coat pocket, but with enough power for most shooting situations, and they can be used as an auto flash.

In addition to many potential variations of flash units and camera bodies, Metz makes some unique accessories as well. Tele-attachments concentrate the beam, doubling the range of the flash, which makes it popular with sports and long lens nature photographers.

MINOLTA

Minolta's new 5600HS (D) flash not only delivers power, but a lot of intelligence as well. Most impressive is the 1/8000 flash sync when used with the new Maxxum 7, and the Maxxum 800si and 9 cameras. The flash also uses ADI (Advanced Distance Integration) to eliminate the effect of background conditions, and/or the subject's reflectance. The flash can also be operated as a wireless TTL flash, and has an ISO 100 guide number of 56 with an 85mm len. The flash head can tilt down 10° for close-ups, and turn 90° up or to the side. It even includes a modeling flash function that sends out a short burst of light to check shadows before taking the actual shot.

Smaller flash units include the 3600HS (D), 3500xi, 2000xi, and the macro ring flash 1200 AF. Additional support for these flash units includes off-camera cables, off-camera hot-shoe, and a radio control system. In addition to the TTL, auto, and manual functions these flash units also have slow shutter sync, which allows for an even blend of flash and long exposures.

NIKON

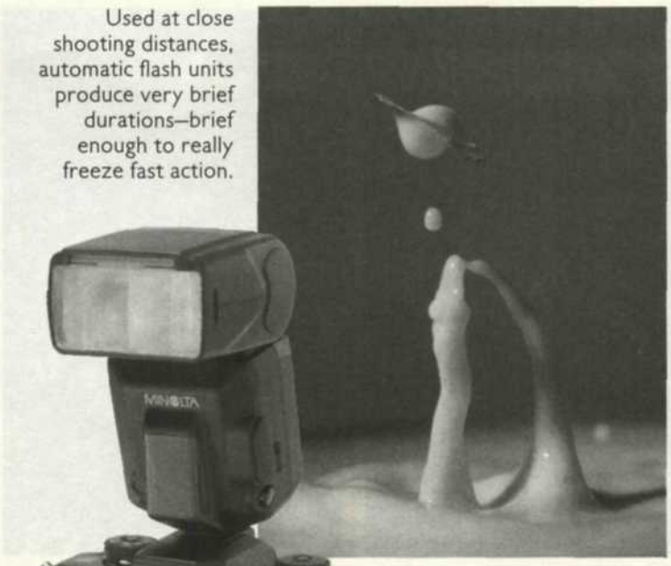
Nikon has a full line of flash units providing optimum performance when matched with the various camera bodies and lenses. The SB-28, SB28DX, and SB-27 use the 3D Multi-Sensor Balanced Fill-Flash system for extremely accurate exposures. Distance information from the Nikon D-type lenses is incorporated into the exposure calculation. The SB-28DX is designed to accommodate some of the unusual features of the new D1 digital camera, but also works on the F5, F100, N90S, and N80 cameras. For the macro photographer, the new TTL Macro Speedlight SB-29 is the latest in ring flash technology. For even lighting on extreme close-ups, this is a gem.

In addition, Nikon offers updated versions of their older flash units that match up to some of the older Nikon camera systems. The SB23, SB16A, and SB- 16B all work with a variety of new and old camera systems.

Flash accessories include a full line of SC sync cords, the SU-4 wireless slave flash controller, the SD-8A high-performance battery pack, and adapters that fire all multiple flash units at one time.

NISSIN

Nissin flash units are distributed by R.T.S. Inc., and are designed for use with most SLR camera brands. The sleek Auto 6000AF Thyristor is Nissin's top-of-the line handle-mount flash. It features a powerful bounce and swivel head and auto-shut-off energy-saving circuitry. This flash offers five auto f-stop ranges of f/2.8, f/4, f/5.6, f/8 and f/11. It also features five variable power ratios and has a maximum auto range of 70 feet.



Used at close shooting distances, automatic flash units produce very brief durations—brief enough to really freeze fast action.

Minolta 5600HS (D)

flash, look carefully at the options and features section of the brochures. Make sure the features offered match your camera model. The following is a list of additional options to consider when making your flash purchase and a brief description of how they work.

Manual Flash: With the flash setting in this position, you can select full power, half power, quarter power or less. Settings on the back of the flash tell you what f-stop to use with a particular film ISO speed at different distances to the subject.

Nikon Speedlight SB-28

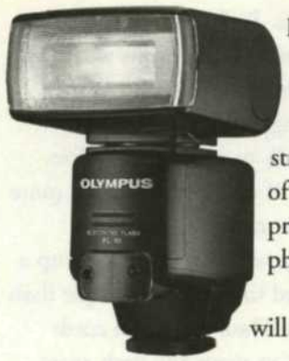
Ring Flash: Several flash manufacturers offer a different flash variation called a ring flash. Most commonly used for macro and medical photography, the flash tube forms a ring around the lens to light the subject evenly.

Red-Eye Reduction: The aperture of the human eye is large when in a darkened room, to facilitate low-light viewing. When a flash is positioned close to the lens, or on the camera as in compact cameras, the light travels through the large eye aperture and bounces off the back of the eye resulting in "red-eye." Many of the flashes today feature red-eye reduction, which sends a pre-flash so the eye has a chance to contract before the actual photo is taken.

Nissin Auto 5200G

Stroboscopic Flash: This control can vary the number of times the flash fires during an exposure and the power setting for each flash. The shutter is held open for the entire duration, so the background should be dark so not to overpower the scene with too much available light. As a subject moves through the scene, multiple images are formed on one film frame.

You can also use this function to



Olympus F140

paint with light. With the camera mounted on a tripod, pan the flash around your subject and depress the test fire button to start the stroboscope sequence. Several groups of stroboscope flash sequences provides very soft lighting when photographing large objects.

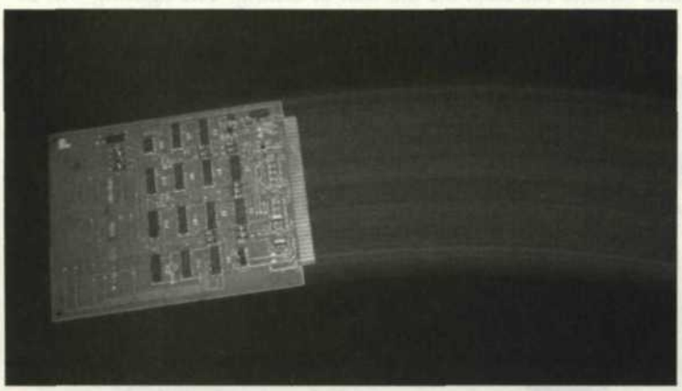
Slow Sync: Most automatic cameras will not let you make long available-light exposures using flash. It normally forces the camera to a flash sync speed that enables you to hand-hold the camera. This causes the background to be very dark, but the subject is correctly exposed. If you use slow sync in a low-light situation, the camera will automatically balance the low-light exposure with the flash. You may have to use a tripod to avoid camera movement and have the subjects limit their movement for the exposure. On the other hand, you may want to be creative and have the subjects move throughout the exposure, resulting in burred movement.

Pentax AF-330FTZ

Rear-Curtain Sync: Normally a flash fires at the beginning of the exposure. If the subject moves during the exposure, the blur of available light follows the flash exposure. The rear-curtain feature moves the flash burst to the end of the exposure. This allows the subject to blur first and then be frozen by the flash exposure.

Phoenix RL-59

Flash Accessories: Flash manufacturers often include several flash accessories to enhance the flash operation. Many have special flash-head diffusers, colored filters, softbox attachments, or bounce card attachments. Some of the diffusers are designed to expand the flash to cover wide-angle lenses, while others narrow the light beam for greater range with telephoto lenses. Softbox attachments provide soft lighting, perfect for portraits and small



Rear sync keeps ambient-light "speed streaks" behind a moving subject, rather than in front of it.

The Auto 5200G Thyristor is also a handle-grip flash, but it only features three auto f-stop ranges. Both flashes feature a wide assortment of pro accessories to make your picture taking days easier.

OLYMPUS

The Olympus flash systems are designed primarily for the OM cameras. The Full-Synchro flash F280 uses off-the-film readings during flash photography. The F280 has full-synchro capability and uses long flash emission time in the Super FP mode. Flash power is demonstrated in the G40 flash with its GN of 132, swivel head, multi-flash mode, and rear-curtain mode which fires the flash at the end of the exposure. If you want slim and light, the S20 is an ultracompact flash with a guide number of 20, offering auto flash exposures at f/2.8 and f/5.6.

PENTAX

Pentax offers more than a half-dozen AF flash units with guide numbers ranging from 65 to 164 at ISO 100. The AF-330FTZ has a zoom flash head with an autofocus spot beam, and contrast control. At 7.4 ounces, this small flash has a healthy 108 guide number.

The AF-220T is a very compact little flash with bounce head, automatic X-sync speed, auto aperture settings, and an auto check lamp.

If you want more power and features, the AF-500FTX increases the guide number to 164 and has a 24mm lens coverage, trailing-shutter sync, swivel head for bounce flash, multiple burst, autofocus spot beam, and contrast control.

Pentax offers various flash hot-shoe adapters for the PZ and ZX cameras. Off-camera hot-shoes, and extension cords allow for remote flash photography with the various Pentax flash units.

PHOENIX

The Phoenix Corporation makes more than a dozen manual, auto, and TTL flashes for the most popular camera brands. The most recent manual flash introduction is the HMS-98T twin flash. The bracket mount flash has a guide number of 98, slave function with a large flash head at the top, and a small fill flash below. The large swivel head can be turned up for bounce as the lower unit fills in the shadows.

In the TTL group we have four new flash introductions. The BIF82N is a fully dedicated TTL automatic flash with a guide number of 82, and focus assist-thyristor bounce. The ZBIF92 is designed for Nikon, Canon, Minolta, and Pentax cameras. It has manual, auto, and TTL exposure control, swivel head, and infrared focus assist.

The APZ99 features focus assist, power zoom, and a bounce-swivel head. For the macro crowd, a new RL-59 ring flash has a guide number of 59 allowing small apertures and greater depth of field.

For macro work, Phoenix offers the RL-59 TTL Ring Light, which fits around the lens and provides very even lighting.

PHOTOGRAPHER'S WAREHOUSE

This is a mail-order company offering their own line of MEDALight strobes, mainly for studio photography. The PG3001MLB Pro Strobe has a 40-watt modeling light with a switch that is independent of the power control so you can view the modeling effect. It has a built-in slave and adjustable power output with a guide number of 105.

The Macrolite is an automatic ring flash unit designed for close-up photography. It has an automatic ISO range from 20–400 and 80° angle of coverage. They also feature several mini slave lights and slave triggers.

Photographer's Warehouse also features studio strobes like the PG4001ML MonoLight for lightweight, yet powerful studio and location photography.

QUANTUM

Quantum is well known for its different battery packs for electronic flash systems. In addition to batteries, Quantum makes studio-quality portable flash units. The Qflash model T2 produces a guide number of 160, while the Qflash Model X2 has a guide number of 220. This means that at 10 feet from the subject you are still at f/22. The Qflash system has a TTL mode or auto for any camera system, and saves out your favorite settings in the program mode of the flash. The Qflash has a flexible flash head that takes a variety of flash diffusers, or bare bulb. In manual mode you have 19 different settings from f/1.4 to f/32. An LCD display on the back provides you information about f-stop, flash range, power settings, and the selected program mode.

When it comes to power, Quantum is able to give power packs that recycle flash units at the speed of light. The Turbo and Turbo Z can reduce your recycle time on a shoe-mount flash to one second for up to 300 full-power flashes.

If you need power in a small package, Quantum's answer is the Bantam battery. This small, lightweight battery can reduce your recycle time by half and double the amount of full power flashes. The popular Quantum Battery 1+ allows you to power dual-mount flashes, while the 2, 4, and 5 are designed for handle-mount flash systems.

SIGMA

Sigma's solution to electronic flash is the EF430 Super. This powerhouse flash, with a guide number of 142, is designed to work with Sigma, Canon, Minolta, and Nikon(D) camera systems. The flash supports TTL exposure, bounce, and automatic flash-fill. The zoom flash head automatically adjusts for the focal length of a lens from 28mm to 80mm. It also has a wide panel attachment that lets you use lenses as wide as 18mm with the EF430 Super. Since the flash fires continuously while the focal-plane shutter is open, it can synchronize at much higher shutter speeds than normal.

The EF430 also supports wireless off-camera TTL exposure when a second slave unit is set. Rear-curtain

Photographer's Warehouse PG3001MLB Pro

product shots. Built-in bounce cards work great in situations where you want softer lighting using a single flash, but have no walls or ceilings to utilize.

If you plan on using more than one flash with your camera, you will need to pick up a TTL flash cord to connect multiple flash units together. Flash extension cords allow you to move the flash away from the camera to provide more directional lighting. Some flash units have cordless triggering devices which makes multiple-flash photography a dream.

Both manual and auto flash units can be fired in multiple groups using a device called a slave. This small electronic device attaches to one flash and it triggers the flash to fire when the on-camera unit fires. If you have to photograph a large room, using slave units and multiple flashes is a great solution.

The electronic flash is a great photographic tool, but only if you know how to use it properly. Once you feel accomplished

Quantum T2 and X2

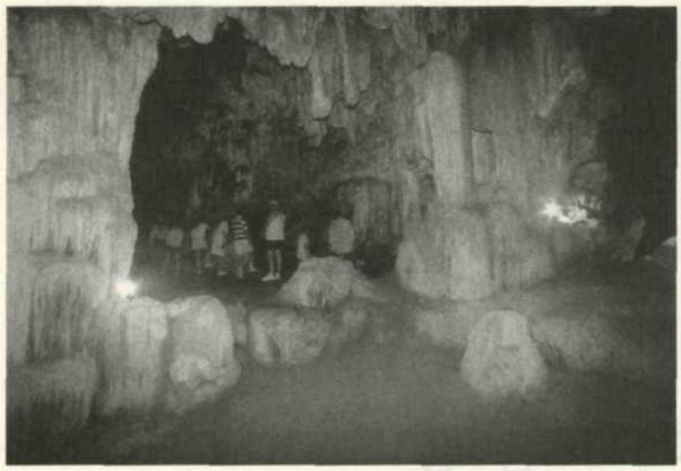
in a flash technique, experiment and try some different variations. Here is a brief overview of the more common methods for using flash.

Single Flash: When you place the flash directly over the camera, the flash beam will cast a shadow slightly to one side of the subject. This provides unattractive portrait lighting. One solution, if inside, is to rotate the flash head up or to the side and bounce the flash off the wall or ceiling. The lighting will be much softer, and the harsh shadow will be gone. A white wall or ceiling works best, because if your bounce source is colored, the reflected illumination will take on that hue.

Sigma EF430 Super

Another great single-flash technique involves attaching the single flash to an extension sync cord. Hold the flash off-camera at a 45° angle to the subject and the resulting shadow will fall out of the picture.

Multiple Flashes: When you use two or more flash units, the light from each unit fills in the other's shadows, thus



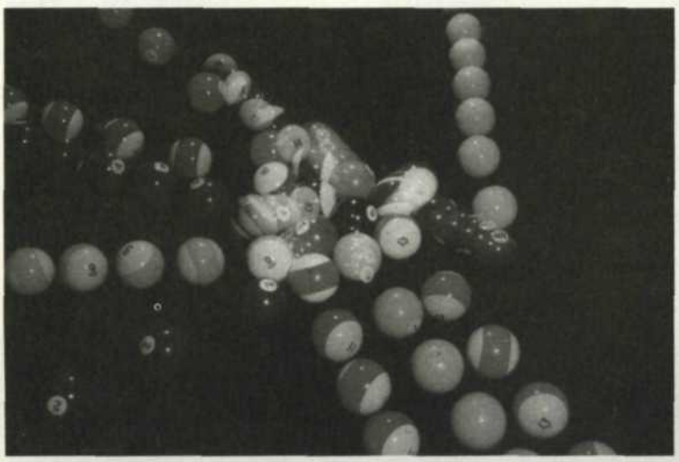
Slave units fire when they "see" the burst from an on-camera flash unit, thus allowing you to fire several flash units at once to light a large area.

creating softer lighting. One flash should be mounted on the camera hot-shoe and the other flash held by another person or mounted on a flash bar to the side of the camera. The additional flashes can be connected by a flash extension cord or a slave unit. Creative lighting effects can be accomplished by putting colored filters over the different flash heads.

With multiple flash units, you can create your own studio lighting by varying the flash output. The flash on the camera can be the fill, the second flash at 45° can be the main, and a third can be used to light the background. You can experiment with lighting ratios by placing the flashes at different distances from the subject. ■

Sunpak PZ5000AF

Vivitar 840AF



Strobe mode causes the flash to fire rapidly, freezing a moving subject as several points in a single image.

flash fires the flash just before the shutter closes and stroboscopic flash is also possible at various intervals up to 18 times per firing. When the light level is low, a special focus-assist light helps the camera's autofocus system lock in on the subject.

SUNPAK

When it comes to selection, Sunpak is loaded with flash variations. With almost two dozen different models of flashes for every band name camera, you should easily be able to find a flash for any purpose. To make your choice easier, Sunpak has created four distinct groups: professional series, shoe-mount autofocus, dedicated flash with fixed mounts, and shoe-mount flash units. You will find small flashes, powerful flashes, ring flashes, underwater flashes, bracket-mount flashes, slave units and flashes with parabolic reflectors.

One of the most impressive handle-mount units is the 622 Super Pro with a whopping guide number of 200. It has seven interchangeable flash heads, as well as a wide range of dedicated modules for different camera systems. Seven aperture settings and an impressive manual control down to 1/128 power make this one of the most versatile handle-mount flash units on the market.

The PZ5000AF shoe-mounted flash features a motorized zoom head that automatically adjusts the flash to match the focal length of lenses from 28mm to 135mm. This TTL flash features exposure compensation, fill flash, bounce flash capability and a guide number of 139.

The DX-8R and DX-12R ring flashes are designed for medical, industrial, or creative applications. They accept the full range of Sunpak dedicated modules and offer ratio lighting that can be controlled over a five stop range.

VIVITAR

For years, Vivitar has been manufacturing a wide selection of flash units to work on just about every camera system available. It is hard to believe that Vivitar's 283 flash will celebrate its 25th anniversary in 2001 and it is still going strong. This workhorse has a guide number of 120, bounce head, auto-thyristor circuitry and four auto f-stop settings.

Vivitar also makes the 285HV and the 840AF with the same guide number. The 840AF automatically changes its illumination angle to match the focal length of your zoom lens from 28 to 80mm. It provides complete TTL auto exposure flash operation.

Smaller units include the 730AF, 728AF, 560D, 2800, 2000, and the very small 16A/16M flash units. Most of the units have flash heads that can swivel left or right and point up for bounce flash. If you want a ring flash, Vivitar has the 5000 and the 6000AF macro ring flash systems.

To make the system versatile Vivitar has a variety of flash accessories that allow you to use the flash off-camera, remotely trigger strobes, or vary the power from full down to 1/64 in half power steps.