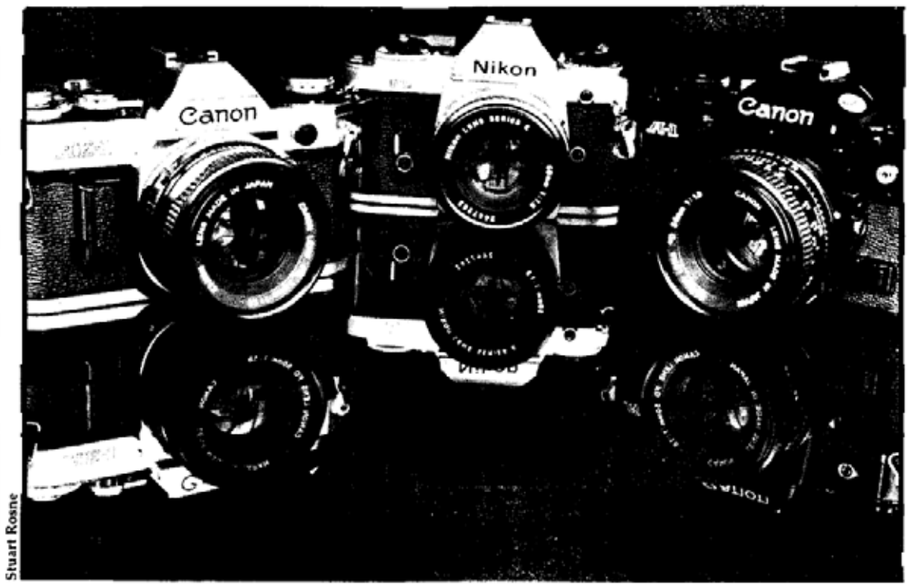
Hands off

Programmed cameras: All you do is focus



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by Peter Bates

Programmed cameras — "decision-free" models so advanced that all the photographer has to do is set the ASA, turn on one or two switches, and thereafter let the camera choose most of the correct shutter speeds and aperture settings under any light conditions — are the Japanese manufacturers' most recent attempt at exterminating the Instamatic menace once and for all. Their first bugle blast sounded in the mid- '70s, with the introduction of aperture- and shutter-priority cameras. Instamatic sales dipped slightly as amateur photographers rushed to buy cameras that, if used properly, would not overexpose or underexpose too many prints and would not blur Jamie as he pole-vaulted through the regional championships. Some models, like the Olympus OM-10, came "aperture-preferred"; that is, if you selected the aperture, the camera selected the appropriate shutter speed. Others, like Canon's AE-1, came "shutter-preferred," and did the same thing, only reversed. In 1978, two cameras, the Minolta XD-11 and the Canon A-1, introduced *both* options. Stealing a step on everyone else, Canon's A-1 introduced a third feature, the "hexa-cybernetic exposure mode." Things would never be the same again.

To understand how programmed cameras work, it's useful to know something about exposure values. EVs are simply geometric values assigned to various light conditions, ranging from one (Transylvanian nights) to 18 (Malibu surf). Each number represents a shutter speed and f-stop combination producing equivalent exposures. For example, with ASA 100 film, EV12 (average scenes with dark shadows) can be achieved with any number of f-stop/shutter speed combinations: f-11 at 1/30 sec., f-8 at 1/60 sec., f-5.6 at 1/125 sec., all the way down the line. It's up a p, down a eed, and /ice vers

What the Canon A-1 does in its programmed mode is to choose a set shutter speed and f-stop combination for each EV. Thus at EV 18 it picks f-16 and 1/1000 sec. At EV 17 (half the amount of light), it does something quite remarkable: it invents its own shutter speed and f-stop (1/667 sec. and f-14 respectively). As the sun goes down, it keeps chipping away at aperture and shutter speed in this geometric fashion until it reaches EV 4 (a moonlit room). There it is at maximum aperture (f-1.4) and thus cannot open any further, so if the environment gets any darker, it simply doubles the shutter speed for the remaining three EVs.

If you, as a serious amateur, are a little sheepish about owning a camera that does everything for you, the A-1 will soothe your guilt by offering the old shutter- or aperture-priority modes, giving you *some* control over the situation. If you feel secure, even adventurous, in handling lighting conditions, you can always switch back to the manual mode. Canon also offers the model AE-1, programmed similarly to the A-1 but without the aperture-preferred mode. The Canon A-1 is priced between $275 and $300.

The Minolta X-700 differs slightly in its program from the Canon A-1. At EV 14, where the A-1 would choose 1/250 sec. at f-8, the X-700 chooses 1/375 sec. at f-6.3 (higher shutter speed, wider aperture). This means that the Minolta program is more useful in situations where stopping action is more important than maximizing depth of field. Thus if you were at a football game and wanted to catch the great reception on film, not caring if the background was blurred, the Minolta X-700 would be your camera of choice. Unlike the A-1, the Minolta has no shutter-priority program, but it has the next best thing. If the cumulus clouds rolled over that stadium and you didn't want your camera to pick a slower shutter speed, you might use an "abbreviated F-5.6 program." On the X-700, the f-stop at which you set the lens defines the upper limit of the camera's automatic aperture control. In most cases, you would set the lens at its smallest aperture (f-16 or f-22) and let the camera select all the way down to the wide-open setting. If you need to keep the shutter speeds high, however, setting the lens at a lower f-stop will prevent the X-700 from automatically selecting a small aperture and consequently a long shutter speed.

Minolta's X-700 also has an intriguing accessory that no other camera maker yet offers — the Multi-Function back, which doubles as a data-imprinting device (it stamps each negative with the date and time when it was taken) and an intervalometer (read interval-o-meter).

The intervalometer lets you program the camera to take pictures at regular intervals, ranging from one second to 99 hours, 59 minutes, 59 seconds, and over a specified period of time (again, up to one second short of 100 hours). You could, for example, take a photograph every 10 minutes for three days, or every seven seconds for 23 hours. This device wil probably be a big hit with the surveillance photographers.

Fujica's AX-5's ($290) differs from the abovementioned cameras by offering a program that is biased toward maximizing depth of field (small aperture) at the expense of shutter speed. This is most useful in dimly lit situations where it's often difficult to focus correctly, such as the office party at which they turn the lights out before igniting the cake. At EV 10 (ASA 100) it offers f-5.6 at 1/30 sec., as opposed to Canon's A-1 program of 1/60 sec. at f-4. Like the A-1, it has backup aperture- and shutter-priority modes.

In its programmed mode, the Nikon FG ($250) follows decreasing EVs by the same route as Canon's A-1 (and AE-1) program. It also has no shutter-priority mode. But its aperture-priority mode is notable. If, through some mechanical defect, the shutter leaves are sluggish and, say f-5.6 is really f-5, the camera will read the light level at the moment of exposure and adjust its shutter speed accordingly. The camera, like most Nikons, also incorporates a spare-tire feature that confronts the nagging problem of battery failure. If you should discover your batteries are dead and you're miles from the nearest camera store, you can switch on its 1/90 sec. shutter speed, guess the aperture (or have a friend's camera do it for you), and take your picture. No other brand lets you do this.

Tricky lighting conditions are the bane of all automatic-exposure systems. If you're photographing snow or composing a backlit portrait, it's easy to underexpose your subject in both priorities and in the programmed modes. Nikon has partially solved that problem by supplying a backlight-compensation button that, when pressed, will supply an added two stops of exposure. Not to be outdone, both Canon automatic cameras, the Fujica AX-5 and the Minolta S-700, overleap this feature with their memory-lock buttons. With memory lock, you approach your backlit person, stick the camera

in his face (being careful to shield all extraneous light), take a light reading, and press the memory-lock button. While holding the button down, step back and take the picture. The two Canon models further refine this feature by locking the button in place, making two-fingered gymnastics unnecessary.

As you can see, automatic-exposure systems have been refined to such a degree that basic snapshooting is quite anxiety-free. Photography instructors are thrown into the curious position of owning less-sophisticated cameras than their students. Amateurs buying their first 35mm cameras are faced with 100-page instruction manuals encouraging them to try dazzling super-effects. As stunning as the new technology is, however, there's room for improvement.

"To make a programmed camera that would really do the proper job," says Sheldon Brown, sales manager at S.K. Grimes camera repair in Boston, "requires something that hasn't been done yet. You would have to have different programs for different focal-length lenses." It's no secret that a hand-held, 200mm telephoto lens must be used at least with a 1/250 sec. shutter speed to minimize camera shake. But the Fujica AX-5, for example, won't use that shutter speed until the light reaches EV 16, (clear sky on a sunny day). Thus if you use that lens on an overcast day, your shutter speed will be inappropriately fast. Similarly, common very-wide-angle lenses (24mm and 28mm) take in a larger scene than do normal lenses and as a result include more background and sky areas in the light that the auto-exposure system is reading. This can lead to underexposed subjects. Also, since an auto-exposure circuit treats all focal-length lenses as equal, it is likely to choose a faster shutter speed than you actually need for hand-held wide-angle work (a little camera shake doesn't hurt as much with wide lenses because each element in the frame will move an insignificantly small percentage of the frame's dimensions), and you may end up unnecessarily sacrificing some depth of field.

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Flash manufacturers have also joined in the fray against all possible variables. Here the latest buzz word is "dedicated."

In the '70s, most consumer-grade strobes incorporated auto-exposure systems like those once available only on some professional models. Automatic flash was invented in the mid-'60s by Honeywell, and that company's were the first popular-priced electronic-flash units to offer the system. Auto-flash involves a sensor that reads light (from the strobe or any other source) reflected from a subject at the instant the flash is fired. Miniaturized circuitry behind said sensor then cuts short the duration of the flash when enough light has reached the sensor (and the film) to make a correct exposure. The early models were programmed to measure and control only one consistent exposure. The photographer compensated with f-stops depending on film speed. By the late '70s, consumer-grade electronic-flash units like the Vivitar 285 and the Sunpack 422 came with several automatic modes, giving the user a choice of several apertures for any given film speed. That consideration aside, auto-flash made it possible for the photographer to set his lens at a single f-stop and fire away at anything near or far.

All exposures are fine, providing the photographer doesn't venture outside the prescribed distance range of a particular mode. For example, at ASA 100, the outer limit of f-11 on the Vivitar 285 is 10 feet. Should Marnie and her new husband disco outside that range, they'd be woefully underexposed.

What the newer dedicated flash units do to correct this problem is to incorporate through-the-lens (TTL) metering for their exposures. These flash units are electronically matched (dedicated) to specific camera models at the connection between the unit and the camera's hot-shoe mounts. Thus the Canon Speedlite only works on Canon cameras and could severely fry the circuitry of another model. What these flash units can do is remarkable: they measure the amount of light they dish out to a subject and communicate the information to the camera, which then adjusts its own aperture to the specific light output. Thus, however far afield Marnie dances, she will be properly exposed. As she dances off into the distance, the system will open the aperture, so there will be a loss of depth of field. Of course, the photographer will simultaneously be focusing closer and closer to infinity, so with luck she might keep looking sharp. There's a point at which the lens can't open any wider, and another point that defeats the flash unit's maximum power.

What have the independent flash manufacturers done about the problem of adapting their products to specific cameras? It would be fiscal suicide to develop and manufacture five flash systems to accommodate the market gains, so they have done the next best thing: they have designed interchangeable shoe-mount modules, "feet" to fit into each camera's shoe.

The Sunpack Auto 422D (under $100) is one of the more impressive dedicated flashes. It gives you a choice of three f-stops if you're not using it in a dedicated mode. Its head tilts upward for automatic-exposure-controlled bounce-flash work, and if used in the dedicated mode, can alleviate most fears of underexposure due to medium-height ceilings. It can also swivel horizontally a full 90 degrees, in case you wish to bounce a shot while holding the camera vertically. It is capable of auto-exposure up to 50 feet and, with an accessory "telekit," up to 70 feet.

Vivitar's 3500 flash (under $100), the 422D's main competitor, talks to you (chirps, actually), once to tell you it's fully charged, and again after you shoot, to assure you that you (and it) did the right thing. Its head swivels upward for bouncing, but only for horizontal shots. In order to compose vertical bounce and perform side-lighting feats, the flash has to come off the camera shoe. But through Vivitar's optional (and unique) remote sensor cord, you can accomplish these off-camera tasks in the dedicated mode.

Between the auto-exposure cameras and the automatic dedicated strobes, there really isn't much left for us humans to do but focus; and auto-focus is, of course, the next challenge for the manufacturers. When they beat that one, we can go back to concentrating on *what* we're shooting instead of how. That's when we find out who the really great photographers are. □

Artists

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just as good, and it's less expensive. But if I want to manipulate the image, then it's the SX-70."

Laurie Dietz, a Cambridge-based painter, borrowed an SX-70 camera a year ago to take pictures of her large abstract paintings. "The photographs of the paintings didn't turn out that well," she recalls. Dietz quickly found other uses for the camera, however, beginning with a series of nude self-portraits taken with