

35 mm Aperture Priority 35mm cameras

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35mm SLR EE

Selection Guide

Aperture-Priority

[INTRODUCTION 2](#)

[THE APERTURE-PRIORITY SYSTEM](#)

[PROS AND CONS](#)

[The Future](#)

[MINOLTA XK](#)

[NIKKORMAT EL](#)

[PENTAX ES](#)

[YASHICA ELECTRO AX](#)

[MORE ON THE WAY](#)

[What Does It All Mean?](#)

[Should You Buy One?](#)

INTRODUCTION

Progress towards exposure automation has been slow, but since the original Konica Autoreflex appeared in 1968, the pace has accelerated and there are now 10 35mm SLR cameras so equipped. Under normal circumstances, there would be little difficulty in choosing the one that seems "best" for your photographic needs, but the introduction of the electronically governed shutter and the aperture-priority exposure system by Pentax in 1971 has thrown the consumer into a quandary - which system is best for him, the shutter priority or aperture-priority?

It's not a decision to be made lightly, as a substantial sum of money is involved in purchasing an SLR EE camera, and you should be certain that you've made the right decision when you tell the clerk to "wrap it up." So Photographic magazine decided to provide sufficient comparative data to help you decide if automated exposure is the right path for you and if so, which camera will best suit your particular needs. As a careful evaluation of all 10 cameras currently available proved to be beyond the scope of a single volume in the Mini Manual series, the topic was sliced in half - you'll find the Aperture-Priority cameras in this volume and those using the Shutter-Priority system in Volume I. If you've already decided which system to go with, this book will be sufficient; if not, you'll want both for the complete picture. Now, let's take a look at what makes the "electronic" cameras tick.

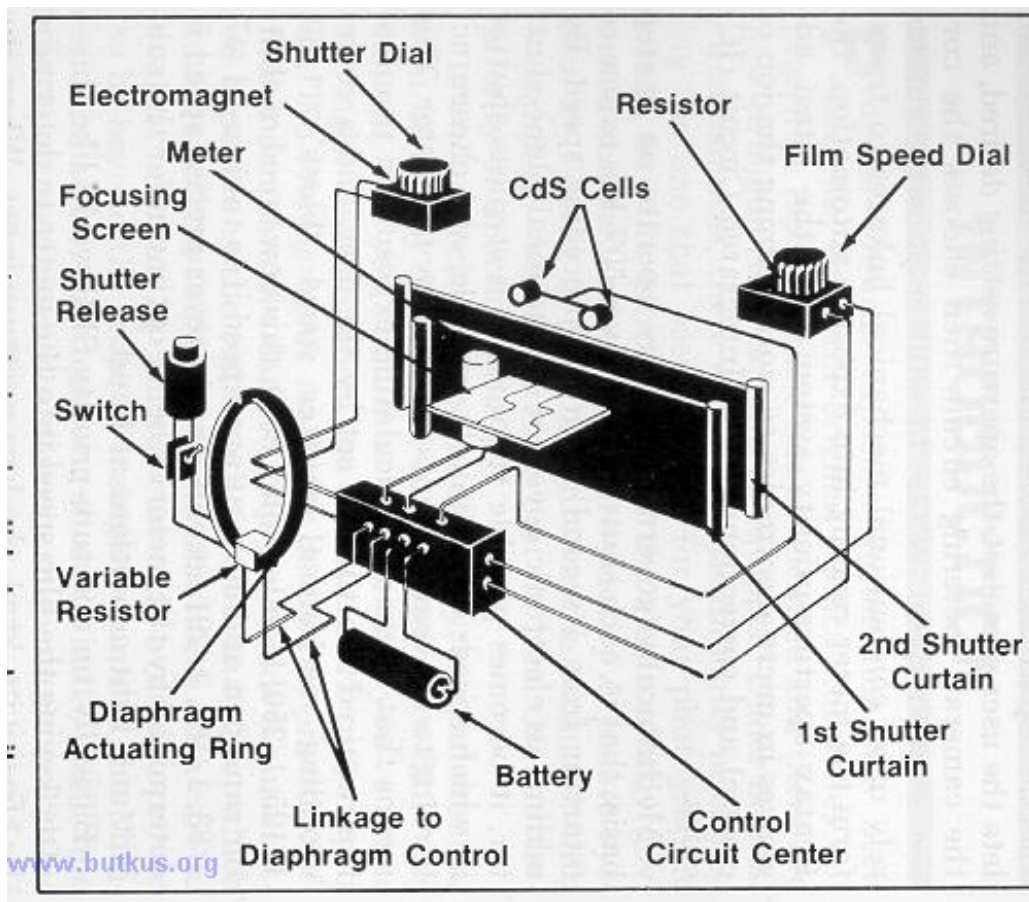
THE APERTURE-PRIORITY SYSTEM

This approach to automated exposure appeared in late 1971 when Asahi announced its new Pentax Electro Spotmatic (ES) camera. The Asahi system lets the user preselect the aperture setting desired, and the camera's metering circuit then chooses the correct shutter speed. While the shutter-priority cameras rely upon conventional mechanical linkages to transform the meter reading into exposure automation, the Pentax aperture-priority system puts the latest advances in micro-electronics to work, turning the job of control and correction over to Integrated Circuit (IC) chips.

Mechanically governed shutters operate on a step basis; that is, each shutter speed gives 50% less exposure (starting from 1 second) than the preceding speed. By adding an electronic governor to the focal plane shutter, it becomes possible to produce a stepless shutter in which speeds are infinitely variable, and chosen according to the requirements specified by the meter. This means that instead of calculating exposure in terms of the required aperture, as set by the user, and a corresponding mechanical shutter speed "block" (1/60, 1/125, 1/250, 1/500-second, etc.), this new breed of shutter can open and close at any speed it is told to - 1/47, 1/83, 1/166, 1/291-second, or whatever precise speed is determined by the meter as being optimum for the subject and light conditions at hand.

Basically, an aperture-priority SLR works like this-- after keying the film speed into the meter to determine its sensitivity level, the lens aperture is set. When the meter is turned on, information about the preselected aperture is sent to the primary electronic center through a variable resistor attached to the aperture stop-down ring. This information is joined by data about the film speed, which is transmitted by a multifunction resistor. At the same time, the CdS cells begin measuring subject light intensity and sending this data to the electronic center, where it's stored in a capacitor which acts as a memory bank.

When the shutter is activated by pressing the release in completely, the lens stops down to the preselected aperture as the mirror flips out of the way and the first shutter curtain begins its travel.



When the camera's metering circuit is turned on, its control center receives information about film speed, lens aperture, and light intensity. Depressing the shutter release closes a switch to the control center, which then energizes the electromagnet that will hold the second curtain.

The lens stops down to its preselected aperture as the mirror rises and the first shutter curtain begins its travel. The CdS cells are now disconnected and the control center's memory capacitor takes over. The timing capacitor draws battery energy until its load equals that of the memory capacitor.

When equality is reached between the two the electromagnet is de-energized and releases the second curtain to end the exposure. The mirror returns, diaphragm opens up to full aperture and CdS cells begin monitoring the light level once more.

The CdS cells are temporarily disconnected from the control circuit, turning over their function to the memory bank. Battery power is diverted to an electromagnet, which restrains the second curtain, and to a timing capacitor. When the capacitor and electromagnet charges become equal, the control center de-energizes the latter, which then releases the second curtain to complete the exposure.

Thus, what we really have is a mechanically operated, electronically governed shutter, not an "electronic" shutter as some manufacturers might lead you to believe. By energizing the electromagnet, the shutter is trapped open until battery and capacitor resistance is equal - the so-called trigger level - at which time the electromagnet is de-energized to close the shutter. The length of time needed by the timing capacitor to reach the trigger level is dependent upon the resistance value used in shutter speed selection. In elementary applications, this could be a variable resistor, but it usually takes the form of a complicated network of resistors for film speed, aperture control, and for light level responses.

While it's possible to provide the user with a visual readout in the viewfinder as to the shutter speed chosen by simply attaching a needle to a moving coil meter, not all aperture-priority systems are designed to do so. The Pentax ES does, but in an effort to be the first with the most, the trend seems to be in the direction of light-emitting diodes. These require far less space and are also less

fragile than a moving coil, but are currently limited to performing the function of indicating over/underexposure. But as fast as this field is moving these days, it's dangerous to make statements like the above - the next AP SLR EE to appear might well feature a full array of such diodes.

As you might imagine, the aperture-priority system requires more battery power than the shutter-priority cameras - 3.0 to 6.0 volts as opposed to 1.35 to 1.5 volts. If the battery voltage level drops below a predetermined level, the meter stops functioning, and you must resort to manual operation until the battery can be replaced. With some designs, you're limited to a single speed (usually 1/1000-second under such conditions) while others allow you the luxury of a variety of speeds.

This brings us to the manual override built into the aperture-priority cameras. Each has a range of speeds at which the focal plane shutter will operate mechanically on a step basis, allowing you to use the camera manually or in a match-needle mode. Some designs also have an exposure compensation subsystem that programs the main system to provide over/underexposure as much as two f/stops for use under special lighting conditions.

PROS AND CONS

As mentioned in Volume I, the shutter-priority system is a proven one whose mechanical linkages derive from those used in countless match-needle SLR's. All is not lost should the meter battery fail, as you can use the camera manually by selecting your own aperture until a new battery can be obtained and installed.

But the system's disadvantages are threefold. Each lens used with a shutter-priority camera must incorporate a coupling device to function with the manufacturer's design; thus, a lens used with a Konica Autoreflex will not work on a Miranda Auto Sensorex EE body. Lenses, extension tubes, extenders, etc., will not work automatically with camera bodies other than the one for which they were designed. And as all manufacturers do not provide the same flexibility in terms of number and types of lenses available for their body design, this can be a limiting factor in your choice of camera.

Although the diaphragm stopping device controls the aperture selection with only a limited amount of movement, mechanical wear leading to a loss of adjustment can throw off the aperture by a full f/stop or more without the meter or you ever knowing it. But the shortcoming most discussed by amateurs and the photographic press is the point at which the shutter priority camera is locked into a selected exposure. Once the needle is trapped, the aperture selected by the meter can be changed only by freeing the needle and remetering. This means that pressure on the shutter release must be removed, the linkage configuration returned to its original position, and the process started all over again.

What does this process mean in practical terms for most of us? Well, if you trap the needle and complete the exposure, it means very little. Despite what self styled authorities claim as a valid criticism of the shutter-priority system, that brief time between the point of no return and the opening of the shutter is inconsequential. The possibilities of lighting conditions changing sufficiently to spoil your shot in that split-second are so slight as to be nonexistent with all but the most unusual of subjects. What you must remember with this type of exposure automation is to not trap the needle, and then to wait several seconds before completing the shutter release travel. If you trap the needle and do not continue through with the exposure, release the pressure on the shutter button until you're ready again to expose, and then do so with a smooth motion.

Proponents of the aperture-priority system maintain that exposure is more precise with this system because of the memory bank which stores exposure data right to the moment of mirror rise. They also maintain that shutter speed increments can be more minutely divided and controlled by an electronically governed shutter than can the differences between apertures operating via a trapped needle system. For all but the professional, these are academic arguments. However, one very solid fact about the aperture-priority cameras remains hard reality to be considered carefully before reaching a decision as to which camera to buy: You can obtain exposure automation with any lens that fits the camera because no special lens mount is required as in the shutter-priority system.

Although the so-called "electronic" camera is less subject to temperature and humidity factors, there remains to be answered the all-important question of gradual changes in the components that make up the electronic system. Over a long period of time, there may be alterations in the capability of the memory bank and timing capacitor, or resistors may experience a value change. In either case, incorrect data would operate the system without the user or the control center being aware of what had happened, resulting in incorrect exposures. These are questions to be answered over the next few years, but you can rest assured that as soon as they appear (if they do), manufacturers will correct any problems.

Those who worry about selecting an aperture that will result in such a slow shutter speed as to capture subject movement as a blur, can look upon the aperture ring as a means of controlling the shutter speed, not the F-Stops. This bit of mental double-

thinking will work fine with aperture-priority cameras like the Pentax ES, which gives a visual indication of the shutter speed chosen, but will not work so well with the Yashica Electro AX, which does not. Users of such "blind" aperture-priority cameras can double-think themselves into working with near-maximum apertures (except where depth of field is critical) to assure a high shutter speed.

THE FUTURE

Will the electronically governed cameras eventually "do in" the mechanical competition? Probably not; the electronics that go into an aperture-priority camera are currently considerably more expensive, and you pay for this high degree of sophistication with hard cash. While the market for such cameras is a potential 1/2 to 1/4 million annually, it will never expand sufficiently to bring about widespread price reductions as a benefit of mass production.

Even if electronics sweep the photographic market in the next few years, the economics of producing a mechanical-linkage, shutter-priority camera will probably assure this system of retaining at least the lower half of the market. Since every one of these cameras is manufactured abroad, the precarious position of the dollar, the threat of unfavorable trade balances, and a possible further devaluation of currency in the future is almost certain to drive the price of both systems upward--the list price of an Electro AX equipped with the f/1.2 is already \$600.

In the coming months, you'll be reading a lot of arguments concerning which system is the best--shutter or aperture-priority. Actually, there is no "best," and your consideration of the cameras included in this selection guide should be based, as always, on what purpose you intend to use the camera for, and how much money you can afford to spend.

One last word--all cameras included within these pages are the manufacturers' top-of-the-line and of professional caliber. You'll find no optical comparisons of lens tests included; each camera's lens will deliver a professional quality picture and the mumbo-jumbo of such tests means very little to the average reader.

For all but the most demanding professionals, the primary difference between the lenses offered for the cameras discussed within these pages is one of construction, not of optical quality. The Nikon lenses *are* better than those provided for use with the Petri FT EE or Ricoh Auto TLS, BE, but not enough so that it's apparent to the average eye. And if you demand that type of optical perfection, you won't be of a mind to consider the less-expensive alternatives anyway.

Let's now evaluate each of the aperture-priority camera systems. The cameras are treated alphabetically and the order of their appearance is in no way to be construed as a rating system. It's up to you to make the final decision. And when you drop by your local dealer for a demonstration of those which interest you, be sure to take this book with you--you'll find it most helpful.

[CLICK HERE TO SEE CHART OF TYPICAL 1973 CAMERAS](#)

COMPARISON CHART

Camera	List Price (Lens as Listed)	Focal Length	Maximum Aperture	Lens Mount	Shutter Speed Range	X Sync Speed
KONICA AUTO-REFLEX T3	\$600	52mm	f/1.2	Konica bayonet	1-1/1000	1/125
KONICA AUTO-REFLEX A-1000	\$374.95	57mm	f/1.4	Konica bayonet	1-1/1000	1/125
MAMIYA/SEKOR AUTO XTL	\$469.95	55mm	f/1.4	Mamiya bayonet	1-1/1000	1/60
MAMIYA/SEKOR 528TL	\$169.95	48mm	f/2.8	Nonint.	1/15-1/500	All
MINOLTA XK	N/A	58mm	f/1.2	Minolta bayonet	16-1/2000	1/100
MIRANDA AUTO SENSOREX EE	\$379.95	50mm	f/1.4	Miranda bayonet	1-1/1000	1/60
NIKKORMAT EL	\$674	55mm	f/1.2	Nikon bayonet	4-1/1000	1/125
PENTAX ES	\$624.50	50mm	f/1.4	Pentax screw	8-1/1000	1/60
PETRI FT EE	\$239.50	55mm	f/1.8	Petri bayonet	1/2-1/500	1/60
RICOH AUTO TLS EE	\$389.95	50mm	f/1.4	Pentax screw	1-1/1000	1/60
YASHICA ELECTRO AX	\$600	55mm	f/1.2	Pentax screw	8-1/1000	1/125

Other Sync	Priority	Metering System	ASA Range	EV Range	Quantity of Mfgr.'s Lenses for Auto Mode
M	Shutter	Variable Center-weighted	12-3200	1.5-18	16
M	Shutter	Variable Center-weighted	25-1600	1.5-18	16
FPM	Shutter	Spot and Averaging	25-3200	3-18	10
MF	Shutter	Spot	10-400	7-17	None
FP	Aperture	Averaging	12-6400	1-17	All MC Rokkors
FP	Shutter	Spot and Averaging	25-1600	3-18	8
FP	Aperture	Center-weighted Averaging	25-1600	1-18	All Nikon
FP	Aperture	Averaging	20-1600	1-18	20
FPM	Shutter	Averaging	25-800	3-17	5
FP	Shutter	Bottom-weighted Averaging	25-1600	3.7-18	4
FP	Aperture	Spot	25-1600	2-18	11

MINOLTA XK

(APERTURE-PRIORITY) SPECIFICATIONS



[CLICK ABOVE LIKE TO SEE MODEL](#)

LENS/50mm f/1.7, f/1.4, or 58mm f/1.2 MC Rokkor in interchangeable Minolta bayonet mount, stops to f/16, focuses to 21 inches, accepts 55mm lens accessories (f/1.7 uses 52mm).

SHUTTER/Electronically governed focal plane with titanium curtains; speeds from 16 to 1/2000-second steps, 4 to 1/2000-second continuously variable; two mechanically controlled settings (X&B); X & FP sync with single terminal and switch; optional hot shoe on accessory mount. Self-timer with 10-second delay.

VIEWFINDER/Interchangeable pentaprism; choice of five finders from plain to Auto Electro with each offering a different degree of sophistication in camera application. Aperture, shutter speed/function scale, meter readout needle, speed/function bar, LED exposure warning signal visible in Auto Electro finder. Choice of nine focusing screens available.....

EXPOSURE CONTROL/Automatically selects correct shutter speed when speed/function dial is set to Auto position. Two CdS cells in Auto Electro finder provide Minolta CLC metering at full aperture with MC Rokkor lenses, stop-down metering with other Rokkors. Auto Exposure stepless override from + 2 EV to -2 EV; meter compensation scale in half-step graduations from - 0.5 EV to + 3.5 TV. Adjusts for film speeds between ASA 12 and 6400 and provides exposure range (ASA 100) of EV 1 to 17 with f/1.2 lens. Powered by two 1.5-volt, S-76 silver oxide batteries or equivalent.

FILM ADVANCE/110° ratchet-type after 20° unengaged movement of plastic-tipped lever.

OTHER FEATURES/Auto-Senswitch turns on Auto Electro finder, auxiliary finder power switch, battery checker, film reminder, multiple exposure provision, long exposure selector, eyepiece shutter control, mirror lockup/depth-of-field preview button, progressive exposure counter resets when camera back is opened.

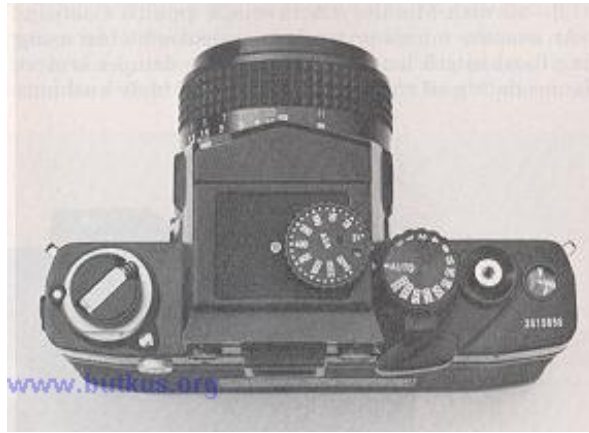
PHYSICAL DIMENSIONS/6 inches long, 4-5/16 inches high, 33/4 inches deep; weighs 1 lb. 15~2 oz. (without lens).

MANUFACTURER/Minolta Camera Co., Ltd., Osaka, Japan.

IMPORTER/Minolta Corp., 200 Park Avenue South, New York, N.Y. 10003.

LIST PRICE/To be announced.

[CLICK HERE TO SEE TOP PHOTO OF MINOLTA XK](#)



Reversing the position of the film advance lever and exposure counter on the XK top plate would have made it a better fast-action camera, but all controls shown are large and functional.

Minolta avoided the engineering difficulties of devising its own memory system by licensing the same one Asahi uses in the Pentax ES, and with the lead time thus saved, Minolta has produced what amounts to the most elaborate EE camera system you can expect to see for some time to come--the Minolta XK. At the same time, the XK turns out to be one of the most over-engineered cameras in recent times. Let's take an inside look at what makes Minolta's bold challenge to Nikon and Canon work.

The basic XK unit is the body. The standard Minolta bayonet lens mount is used, and a 54° clockwise motion seats any MC Rokkor lens for full aperture through the-lens viewing and metering. Other non-meter coupled lenses (including earlier Rokkors) in Minolta mounts can be used for stop-down metering and viewing. Three newly-designed Rokkor standard lenses with a rubberized waffle pattern focusing grip are provided for XK use - the 50mm f/1.7, 50mm f/1.4 and 58mm f/1.2 - all with Minolta's Achromatic (multi) Coating.

An oversize mirror prevents image cut-off when using long focal length lenses and a movable damper arm at the inside top of the lens mount in the body cushions the mirror's upward motion, reducing vibration and noise. A small chrome button beneath the self-timer lever at the base of the body's lens mount serves as a combination depth-of-field preview and mirror lockup device. When pushed in, it locks for full aperture metering/viewing. To check depth-of-field, depress the button and it pops out about 'A'-inch. This position is also used for stop-down metering. Twisting the chrome button to line up the red dots locks the mirror up; if you wish to unlock it without taking a picture, just push the button in toward the lens. In theory, it all sounds delightfully easy, but operating that small milled button takes a bit of practice, especially when twisting it for mirror lockup.

[CLICK HERE TO SEE FRONT VIEW](#)



On the opposite side of the mount, you'll find a PC terminal for flash and another very small selector switch below it for sync adjustment - X sync in the upper position, FP in the lower; it seems that it would have been just as practical to provide separate terminals. The self-timer lever operates exactly as you'd expect it to, but placed beside it is a vertical waffle-patterned strip which Minolta calls its Auto-Senswitch. This is actually a microswitch that turns on the XK's metering system whenever it's depressed, and this switch is placed on the camera body precisely where the designers think the fingers of your right hand should rest when holding the camera. Thus, picking it up in a shooting grip will activate the meter with no other effort on your part.

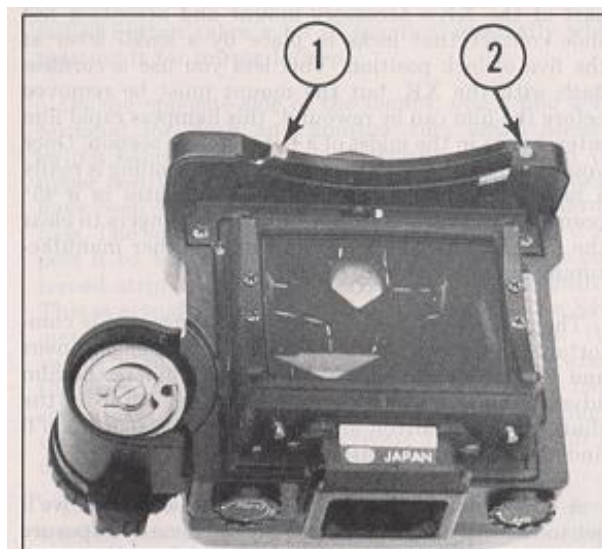
But here's where one of the XK's delightful eccentricities comes into play. Suppose the camera is set for auto operation (we'll come to that shortly) and just as you depress the shutter release button, your grasp changes slightly, breaking the microswitch contact-- what happens? Zing, the titanium shutter curtain zips across the film plane and locks open! To close it, you must flip the XK body upside down, insert a coin in the battery chamber cover and turn from C to O to break the circuit. This can be a pain in the neck, especially to the casual user of the camera. And breaking the microswitch contact is quite easy to do since the switch is hinged at the top, traveling but a minute distance to make or break contact. There is a way to avoid this when using the Auto Electro finder, which we'll look at in a moment.

With no finder on the body, you have no way of setting the shutter speeds, since the function dial. is an integral part of each of the five different finders available, but before considering the viewing choice, let's look at the rest of the top plate. The rewind crank is part of the XK's accessory mount and accepts a hot shoe contact that locks in place by a small lever at the five o'clock position. This lets you use a cordless flash with the XK, but the mount must be removed before the film can be rewound; this hampers rapid film interchange in the midst of a hot shooting session. Once you've removed the accessory mount, rewinding is really a breeze because the crank handle operates in a 45° position and provides plenty of room for fingers to clear the finder while giving a good grasp. (Other manufacturers should take note of this feature!)

The film advance lever rides on bearings and is comfortably cushioned, swinging out 20° before engagement and requiring another 110° stroke to complete the film advance and shutter cocking. The lever's hub is the shutter release button and to the extreme right, you'll find the exposure counter.

A quick look at the XK's baseplate and then we'll get to the heart of the camera - its automatic exposure system. A neat touch that others would do well to emulate comes to light when you unlock the battery chamber cover by turning it 90°. Attached to the inside of the cover is a small metal holder into which two S-76 silver oxide batteries are positioned - no more fumbling with batteries to drop them into the chamber correctly. You simply insert them in the holder and lock it in place. A film type/exposure number indicator is located beside the battery chamber cover, and following the trend toward easier rewind operation, Minolta has provided a large cutout around the film advance release button. This also serves a dual function in that it can be depressed (while you're operating the film advance) to cock the shutter without advancing the film for multiple exposures. Other SLR's use this same technique for intentional double exposures, but with some it doesn't always work precisely - the film may move ever so slightly, but with the XK, you needn't worry because it works perfectly.

[CLICK HERE TO SEE VIEWFINDER SHOT](#)



Auto Electro finder has meter coupling arm (1) that must be locked against the red dot (2) before mounting to camera

body. When fitted in place, the arm rides against a lug on MC Rokkor lenses to program the system for the aperture you've chosen.

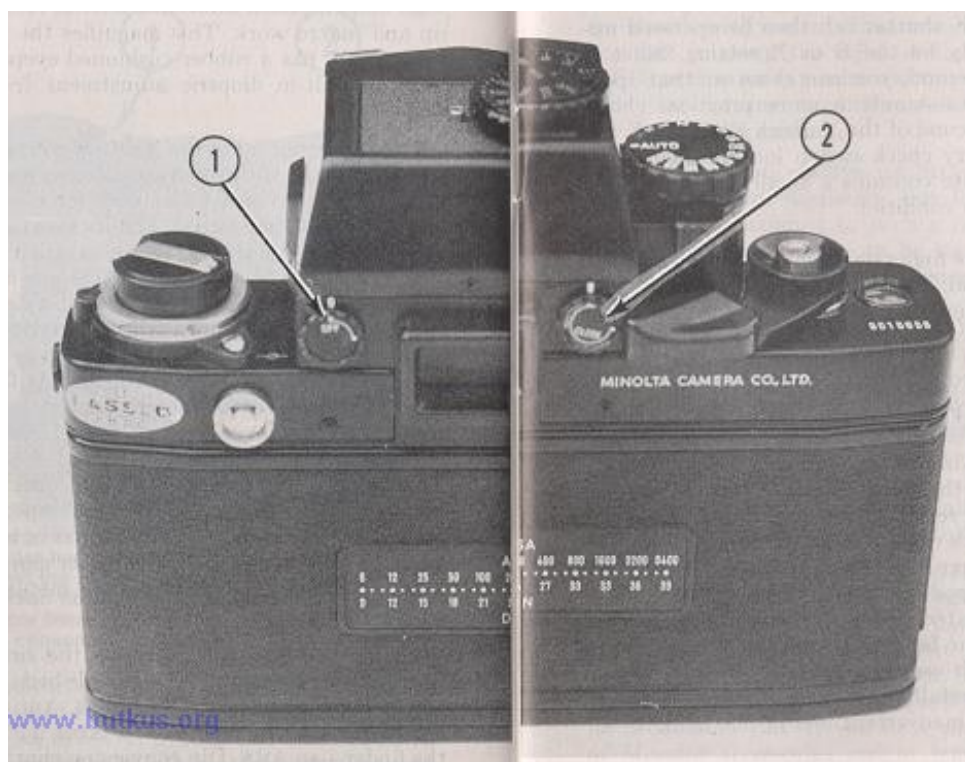
As mentioned earlier, a choice of five interchangeable finders are provided for use with the XK. The meterless Plain finder is an eye-level pentaprism with 0.8X magnification, and it displays both shutter speed and aperture in the finder. A Match-Needle finder contains two CdS cells in the pentaprism, measures light at full aperture using Minolta's Contrast Light Compensator (CLC) system, and is used as any conventional match needle equipped camera - the follower bar and meter indicator needle are aligned to provide the correct exposure in an EV range of 3 to 17 (ASA 100).....

A waist-level finder with folding hood and swing-out magnifier (1X magnification, -1.2 diopters) is available for low- or right-angle viewing. Or you can select a high-magnification finder for critical focusing in closeup and macro work. This magnifies the entire field of view 6.20X, has a rubber cushioned eyepiece, and contains a built-in dioptic adjustment from + 3 to -5 diopters.

The full potential of the XK however, is utilized only when equipped with the Auto Electro finder. This contains all the necessary circuitry for electronic timing and release of the shutter, and its measuring range extends from EV 1 to EV 17, an excellent performance that lives up to Minolta's specifications in actual practice. Various special circuits combine data about film speed and lens aperture with information provided by the twin CdS cells of the CLC system to electronically govern the XK's shutter. When locking the Auto Electro finder in place, the meter coupling arm beneath its front must be moved across the finder bottom until it clicks into place beside a fixed red dot (see picture). This is very important, as the arm operates against a lug on the rear of the MC Rokkor's aperture ring and is the only way the finder's meter has of knowing which aperture you've selected. The finder can be positioned without latching the arm, but all meter readings will be erroneous.

Fitting the finder in place via the single front and two rear locking pins is accomplished by pushing it straight down until the pins click. You set ASA film speeds from 12 to 6400 with a large milled knob atop the finder - an ASA/Din conversion chart is an integral part of the camera back and is useful when foreign emulsions not rated in the ASA system are used. A compensation factor selector on the film speed dial alters the meter's sensitivity to compensate when using certain focusing screens and/or lenses. Positioning the finder couples the shutter speed dial to the camera, and now you'll see shutter speeds ranging from 1 to 1/2000-second, a B setting for time exposures, an X setting for flash sync, and the word "Auto." When Auto is aligned with the dot on the finder, the XK is set in automatic mode and the shutter is governed electronically through a continuously variable or stepless range of 4 to 1/2000-second.

[CLICK HERE TO SEE BACK OF CAMERA](#)



Small milled knobs on either side of the finder eyepiece operate the auxiliary meter switch (1) and viewfinder shutter blind (2), but the knob faces are not well affixed; remove and re-cement to prevent their loss.

A long-exposure selector lever at the base of the shutter speed coupling dial on the camera top plate provides manual selection of electronically governed speeds from 2 to 16 seconds. There's also a thumb-controlled auto exposure override device protruding from the back of the shutter speed dial. This manually adjusts the automatic exposure in a stepless range from 2 EV *under* to 2 EV over the metered value, but it must be held in position as the shutter release button is depressed. The marked speeds of 1 to 1/2000-second are used whenever the XK is working in a match-needle mode.

The film advance locks when battery voltage is insufficient, and the XK shutter can then be operated mechanically but only on the B or X setting. Since X represents 1/100-second, you can shoot at that speed with dead batteries - surely a more practical choice than the 1/1000-second of the Yashica ElectroAX. Incidentally, a battery check switch located on the left side of the top plate contains a small red signal light to indicate battery condition.

At the back of the finder on either side of the eyepiece is a small milled dial. The right one is an eyepiece shutter control and when it's turned in the direction of the arrow, it moves two pieces of metal together that are positioned in front of the eyepiece lens, shutting off external light from entering the finder to disrupt meter readings during lengthy exposures. The other dial is an auxiliary meter off/on switch that can be used instead of relying on the Auto-Senswitch. Using this auxiliary switch will prevent the aforementioned shutter problem if the Senswitch is released accidentally while making the exposure, but it's easy to forget that it's on. Minolta intends its use primarily for long exposure control when the camera is tripod-mounted, since the Auto-Senswitch is not activated under such conditions. A word of caution here the faces of these dials are poorly secured in place with only a small dab of glue, so you might want to carefully pry each out and re-cement them to avoid the inadvertent loss of one or both.

A chrome finder release button to the left of the eyepiece on the back of the top plate is depressed to remove the finder and/or focusing screen. Minolta has made nine different screens available, although the camera is normally equipped with a split image rangefinder center (Type P) screen that shows 98% of what will appear on the film. The finder contains a display of the information Minolta considers essential for using the XK. The lens aperture selected appears at the top of the viewfinder frame in white and is also enclosed in a white rectangle for easy recognition. The shutter speed scale with meter indicator needle and speed/function bar is along the right. A Light Emitting Diode (LED) acts as an exposure warning signal and pulsates whenever lighting conditions fall below the meter's lower operating limits.

As long as you observe its little eccentricities, the XK will perform flawlessly, but for many photographers not accustomed to such a complicated looking device, this might prove to be its downfall. Minolta clearly intends the XK to challenge the Nikon F2 and Canon F1 as a professional system camera and lists 107 accessories, including 30 lenses. Whether the XK will lure Nikon and Canon users to its fold is debatable, as both have their own SLR EE model that's completely compatible with their present lens and accessory listing, and how well the XK will fare with non-professionals in view of its price, is still to be determined. For readers presently equipped with a Minolta SR 101 or 102, it's a natural upgrade, especially if you've already invested a healthy sum in MC Rokkor lenses.

How did we like the camera? Well, opinion was split among *Photographic* magazine's editors concerning the ease of using it, but there's no doubt that the XK is an extremely capable instrument. Obviously a lot of thought went into the XK design, but an on-going program of modifications will probably take place during its production run. If you have an extensive number of Minolta accessories and/or lenses, can afford the tariff, and are willing to be tolerant of its small quirks, as well as some undersize but overmilled knobs and buttons, this should prove to be more camera than you'll ever use. But it's also one camera you're going to have to play with a bit before you can decide whether or not you want to part with the money. Minolta originally scheduled the XK for U.S. introduction in early 1973; it now appears that you won't be able to purchase one until at least April 1974 - that should give you a head start in saving your money for this one!

[MINOLTA MI ROKKOR LENSES CONSTRUCTION](#)

MINOLTA MC ROKKOR LENSES							
LENS (Focal Length/Speed)	Angle of View	CONSTRUCTION		Minimum f/stop	Mode of Operation	Minimum Focus (FL)	Filter Size (mm)
		Groups	Elements				
16mm f/2.8	180°	8	11	1/16	Auto	1.0	—
21mm f/2.8	92°	9	12	1/16	Auto	.8	72
28mm f/2.5	76°	7	9	1/16	Auto	1.75	55
28mm f/3.5	76°	7	7	1/16	Auto	2.0	55
35mm f/1.8	84°	6	8	1/16	Auto	1.0	55
35mm f/2.8	64°	6	7	1/16	Auto	1.4	52
55mm f/1.7	43°	5	6	1/16	Auto	1.75	52
58mm f/1.4	41°	5	6	1/16	Auto	2.0	55
55mm f/1.2	41°	5	7	1/16	Auto	2.0	55
85mm f/1.7	29°	5	6	1/16	Auto	3.3	55
100mm f/2.5	24°	5	6	1/22	Auto	4.0	55
135mm f/2.8	18°	5	6	1/22	Auto	5.0	55
135mm f/3.5	18°	4	4	1/22	Auto	5.0	52
200mm f/3.5	12°	4	6	1/22	Auto	8.0	62
200mm f/4.5	12°	5	5	1/22	Auto	8.0	52
300mm f/4.5	8°	6	6	1/22	Auto	15.0	72
800mm f/8 ¹	3°2'	7	8	1/16 ¹	Man.	26.0	—
50mm f/3.5 Macro	45°	4	6	1/22	Auto	.75	55
100mm f/4.0 Auto-Bellows	24°	3	3	1/32	Auto		55
100mm f/3.5 Tele-Macro	24°	4	5	1/22	Auto	1.25	55
100-200mm f/5.6 Zoom	24-12°				Auto		
80-200mm f/4.5 Zoom	30-12°				Auto		

¹ Catadioptric construction with 2 mirror elements, light transmission change.
² Bellows focusing range only.

controlled by ND filters equivalent to f/8 and f/16—depth of field does not

NIKKORMAT EL
(APERTURE-PRIORITY)



CLICK ABOVE TO SEE PHOTO

SPECIFICATIONS

LENS/50mm f/2 or f/1.4, 55mm f/1.2 Auto-Nikkor in interchangeable Nikon bayonet mount, stops to f/16, focuses to 24 inches, accepts 52mm lens accessories.

SHUTTER/Electronically governed metal blade Copal Square ES with speeds from- 4 to 1/1000-second and B. Has MX sync with side terminal and hot shoe. Self timer with 9-second delay.

VIEWFINDER/Fixed pentaprism with central microprism, fine focusing collar, and full focusing screen. Shutter speed scale, over/underexposure indicators, meter readout needle, exposure mode indicator, match needle bar visible.

EXPOSURE CONTROL/Automatically selects correct shutter speed when shutter speed/function dial is set to "A" position. Two vertically mounted CdS cells in pentaprism read center-weighted area of viewing screen at full aperture. Manual override. Automatic exposure hold lever. Adjusts for film speeds between ASA 25 and 1600 and provides an exposure range (ASA 100) of EV 1 to 18. Powered by 6-volt #544 silver oxide battery or equivalent. .

FILM ADVANCE/140° ratchet-type after 30° unengaged movement of plastic-tipped lever which activates meter.

OTHER FEATURES/Battery check button and light, sync switch, depth-of-field preview button, mirror lockup provision, dual safety latch on camera back, progressive exposure counter returns when back is opened.

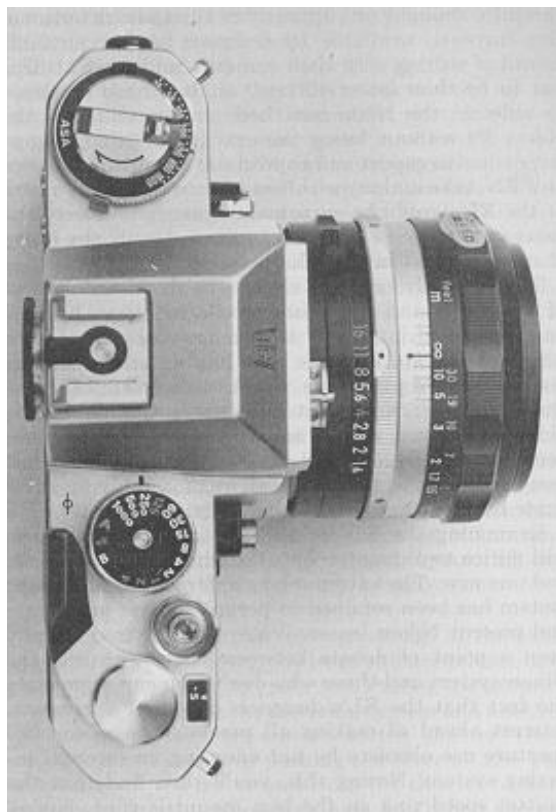
PHYSICAL DIMENSIONS/5 3/4 inches long, 3 3/4 inches high, 3 7/8 inches deep; weighs 1 lb. 13 oz. (without lens).

MANUFACTURER/Nippon Kogaku, Japan.

IMPORTER/Ehrenreich Photo-Optical Industries, Inc., 623 Stewart Avenue, Garden City, N.Y. 11530.

LIST PRICE/\$540 with f/2 lens, \$624 with f/1.4 lens, \$674 with f/1.2 lens. Add \$18 for black body. (Prices approximate at publication.1972)

[CLICK HERE TO SEE TOP OF CAMERA](#)



Smooth, clean lines of EL make this the choice Nikkormat model to date; shutter speed dial is now conventionally located on top plate and everything falls easily In hand - you won't find any 35mm SLR EE camera that tops the silky operation of this one.

Nippon Kogaku's new EL model is one of the most carefully thought out approaches to exposure automation currently available. Its designers have an enviable record of scoring with their cameras, and the EL turns out to be their latest success, as they have managed to redesign the Nikkormat body in the image of the Nikon F2 without losing the exact "feel" that owners have come to expect and appreciate. If you already own an FTN, take it along with you to your dealer for a look at the EL - you'll be surprised at just how closely the two cameras are in handling and feel, despite the many changes evident in the EL.

The EL body redesign eliminates the sharp corners of the FTN, and the prism profile has been lowered and reinforced internally to accommodate a hot shoe for flash. The film advance lever has been reshaped and given a molded plastic tip, which should fit nicely into that groove worn in most FTN users' thumbs by the older style lever. At the same time, body weight has been reduced by one full ounce, no mean feat when you consider the size and weight of the 6-volt silver oxide battery that powers the meter and shutter.

Examining the EL for the first time, FTN owners will notice two distinct features immediately - one old and one new. The external lens indexing pin and prong system has been retained to permit the use of all past and present Nikon lenses. While this has traditionally been a point of debate between those who like the Nikon system and those who don't, you can appreciate the fact that the EL's designers put their customers' interest ahead of making all previous lenses for full aperture use obsolete by not adopting an internal indexing system. Noting this, you'll then find that the shutter speed ring on the lens mount is gone, having been replaced by a conventional dial located in the traditional spot on the top plate.

There are several other small touches that have been added a white battery check button placed next to an amber check light on the back of the top plate, moving of the depth-of-field preview button to the camera's front, a redesign of the mirror lockup lever to make it more functional, and the addition of steel inserts in the strap lugs to reduce wear.

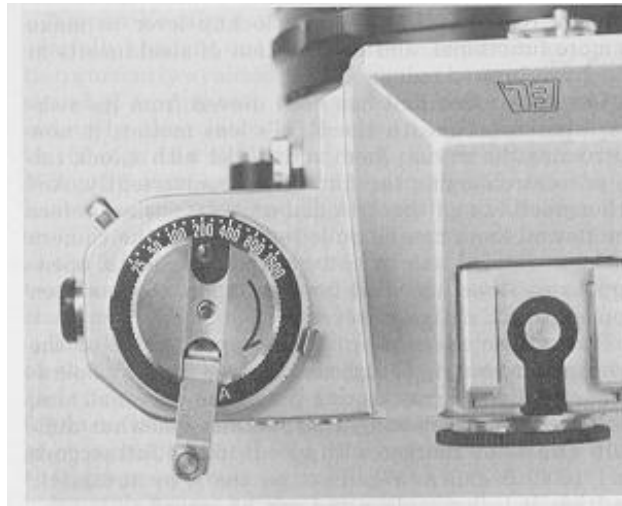
The ASA index dial has been moved from its awkward position beneath the FTN's lens mount; it now surrounds the rewind knob and works with a lock tab to prevent changing the film speed inadvertently. Another small lug on the ASA dial must be pushed before the rewind knob can be pulled up to open the camera back, providing a safety factor against accidental opening. As we'll see, the dual function approach has been applied to EL design in several ways.

The shutter speed dial on the opposite side of the pentaprism housing is sufficiently large for easy operation, although the numbering is a bit on the small size, making its use in low light situations somewhat difficult. The dial is marked with speeds from 4 full seconds to 1/1000, B and A. When set on the A or automatic position, it locks in place and can be moved to a manual mode only by depressing the small chrome hub. A lift-up outer collar is used to switch flash sync from X to M and controls both hot shoe and PC terminal, which is now threaded to use the screw-on Nikon sync cord. With a dead battery, the Copal Square ES can be used mechanically at 1/90-second only.

Positioned just right to take advantage of the redesigned film advance lever, the large shutter release button is silky smooth in its operation. Pulling the advance lever out 30° turns on the metering system and another 140° advances the film and cocks the shutter. Once you've finished shooting, pushing the lever all the way back turns off the meter and locks the shutter button. Directly in front of the lever's hub, you'll find the exposure counter set beneath a small rectangular window.....

Now back to the dual function controls. Push the self-timer lever to the right and it fires the shutter after the center release button is depressed; push to the left and you can lock the metering system for up to 10 minutes. This is handy for close-up readings of unusually lighted subjects, but don't let that moving meter needle fool you; as long as the locked reading is held, the meter is disconnected from the exposure circuit.

[CLICK HERE TO SEE ASA INDEX](#)



The ASA index dial is now placed beneath the rewind knob and actuated by small lever; the other lever acts as a safety lock for the camera back to prevent it from opening if the rewind knob is accidentally pulled up.

Nikkormat FTN owners will find little change in the metering system; twin CdS cells provide a center weighted reading of the entire picture area, just as in previous Nikon cameras. The difference here is that the cells have been positioned vertically near the eyepiece instead of horizontally. This reduces the possibility of stray light entering the eyepiece and affecting the meter's performance. The metering circuit governs the Copal Square ES focal plane shutter, offering fully automatic and electronically governed speeds through a stepless range from 1/1000 down to 4 full seconds.

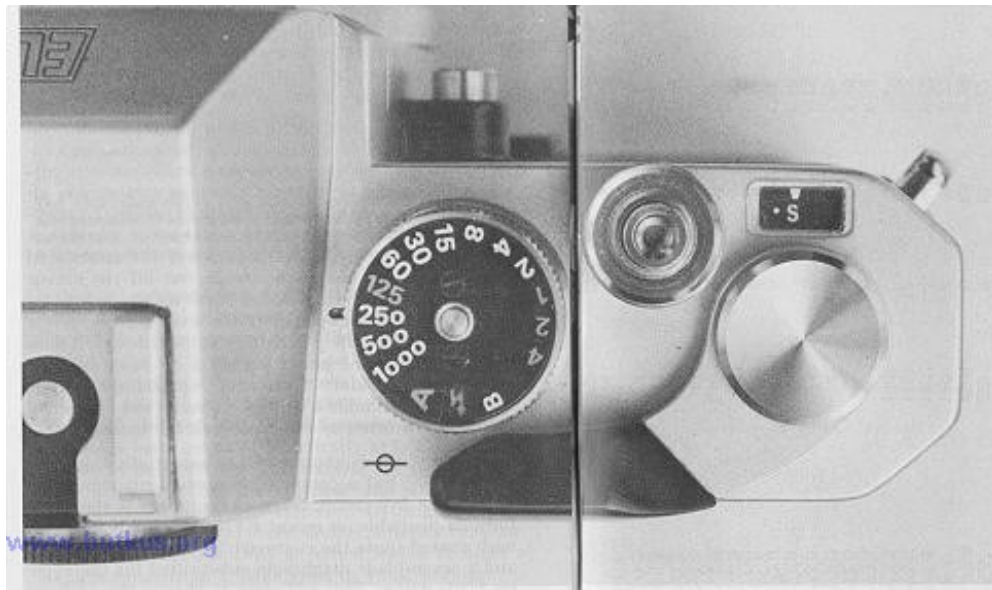
The EL comes equipped with a 4mm central micropism in the focusing screen but a split-image rangefinder is available on request. You'll see 92% of the picture area but not the Fresnel lines seen on the FTN's screen; screen redesign lets you use the entire area for focusing if desired, and those who wear glasses will have little trouble seeing the entire area. Unlike other SLR EE cameras, the viewfinder's data display is on the left side and consists of a shutter speed scale, meter readout needle, and transparent red over/underexposure warnings marked A and B. A transparent green needle covers the A when the EL is used in automatic mode, doubling as a part of the match-needle system when the camera is operated on manual. The B indicates that an exposure of more than 4 seconds is necessary and that the shutter will remain open as on a Bulb setting. In such cases, close the shutter by turning the speed dial from its A position to one of the marked speeds.

The instant-return mirror is now longer, an improvement made possible by redesigning the mechanism's rotational axis, and lets you use long lenses without cutoff. At the same time, the dampening system was altered to minimize vibration during exposure. Examining the well baffled mirror box would never reveal that the huge 6-volt battery used to power the automated exposure system was stored inside, but lift the mirror and you'll find a spring-loaded cover on the bottom of the chamber. Pop it open and there's the battery. While this solves the problem of battery storage neatly, it does make changing the power supply a bit more difficult than the usual slotted external compartment cover. But users shouldn't worry about the inconvenience - how often do you fuss with the battery?

Optically, the Nikkormat EL is essentially the same as the FTN, but a couple of improvements should be noted. The five-group, seven-element lens is the same formula available on recent FTN models but it's been multicoated (note the engraved "C" on the front ring) and a seven-blade diaphragm substituted for the older six-blade design. This will serve to change the configuration of sun images as well as to soften out-of-focus highlights. Multicoating considerably reduces ghost images and flare, and should be welcomed by all serious EL users.

How does the camera compare with its competition? Very favorably. Nippon Kogaku has had a great deal of experience producing superb quality cameras, and considering that the EL is really a new design, despite its remarkable retention of the Nikkormat image, it's a considerable achievement in design evolution and refinement. That soft, silky shutter button movement is much improved over the FTN release, and will be appreciated by all who use it.

[CLICK HERE TO SEE SHUTTER SPEED DIAL](#)



The large shutter speed dial is easy to operate but legibility of the numbers could be improved for use under low light level conditions.

The camera's finish and workmanship are superior to those of previous Nikkormat models and reaches into the level of the Nikon F series. If you presently own an FTN, you'll be pleased at the favorable comparison between the two cameras and delighted at the improvements; if owning a Nikkormat has been your ambition, this is the model to aim for now.

[CLICK HERE TO SEE LISTING OF AVAILABLE NIKKOR LENSES](#)

NIKKOR LENSES							
LENS (Focal Length/Speed)	Angle of View	CONSTRUCTION		Minimum f/stop	Mode of Operation	Minimum Focus (Ft.)	Filter Size (mm)
		Groups	Elements				
6mm f/5.6	220°	9	12	f/22	Man.	—	—
6.3mm f/2.8	220°	9	12	f/22	Auto	.9	—
8mm f/8	180°	5	9	f/22	Man.	Fixed	—
10mm f/5.6	180°	—	—	f/22	Man.	Fixed	—
15mm f/5.6	110°	12	15	f/22	Auto	.9	—
16mm f/3.5	170°	—	—	—	Auto	—	—
20mm f/3.5	90°	—	11	f/22	Auto	1.0	72
24mm f/2.8	77°	—	9	f/16	Auto	1.0	52
28mm f/2.0	74°	8	9	f/22	Auto	1.0	52
28mm f/3.5	74°	6	6	f/16	Auto	2.0	52
35mm f/2.8 Pc ²	62°	—	8	f/16	Preset	1.0	52
35mm f/2.8	62°	6	7	f/16	Auto	1.0	52
35mm f/2.0	62°	6	8	f/16	Auto	1.0	52
45mm f/2.8	50°	3	4	f/32	Auto	3.0	52
50mm f/2.0	46°	4	6	f/16	Auto	2.0	52
50mm f/1.4	46°	5	7	f/16	Auto	2.0	52
55mm f/1.2	43°	5	7	f/16	Auto	2.0	52
80mm f/4.5	30°	9	15	—	Auto	3.3	—
85mm f/1.8	28°	4	6	f/22	Auto	3.5	52
105mm f/4	—	—	—	—	—	—	—
Bellows	23°	3	4	f/22	Preset	—	43
105mm f/2.5	23°	3	5	f/22	Auto	4.0	52
135mm f/3.5	18°	3	4	f/22	Auto	5.0	52
135mm f/2.8	18°	4	5	f/22	Auto	5.0	52
180mm f/2.8	13°	4	5	f/32	Auto	6.0	82
200mm f/4	12°	3	4	f/22	Auto	10.0	52
300mm f/4.5	8°	4	5	f/22	Auto	13.0	72
400mm f/5.6 ⁺	6°	3	5	f/32	Auto	16.0	122
500mm f/8 ⁺	5°	—	—	—	Man.	13.0	—
600mm f/5.6 ⁺	4°	4	4	f/22	Auto	35.0	122
800mm f/8	3°	4	5	f/22	Auto	60.0	122
1000mm f/11 ⁺	2°	—	—	—	Man.	25.0	—
1200mm f/11 ⁺	2°	3	5	f/64	Man.	130.0	122
2000mm f/11 ⁺	1°	5	5	—	Man.	200.0	—

500mm f/8 ¹	5°	—	—	—	Man.	13.0	122
600mm f/5.6 ⁴	4°	4	4	f/22	Auto	35.0	122
800mm f/8	3°	4	5	f/22	Auto	60.0	122
1000mm f/11 ⁵	2°	—	—	—	Man.	25.0	
1200mm f/11 ⁴	2°	3	5	f/64	Man.	130.0	122
2000mm f/11	1°	5	5	—	Man.	60.0	
43-86mm							
f/4.5 Zoom	53-28°	6	9	f/22	Auto	4.0	52
50-300mm							
f/4.5 Zoom	45-8°	—	14	f/22	Auto	8.5	95
80-200mm							
f/4.5 Zoom	29-12°	—	15	f/32	Auto	6.0	52
200-600mm							
f/9.5 Zoom	12-4°	12	19	f/32	Auto	13.0	82
200mm f/5.6							
Medical Nikkor	12°	3	4	f/45	Auto	Fixed	38

1 Built-in
 2 Perspective Control
 3 Bellows Focusing Range only
 4 Requires Nikkor Focusing Unit
 5 Catadioptric Construction consisting of mirror and lenses

PENTAX ES (APERTURE-PRIORITY)



SPECIFICATIONS:

LENS/55mm f/1.8 or 50mm f/1.4 Super-Multi-Coated Takumar in interchangeable Pentax screw thread mount, stops to f/16, focuses to 18 inches, accepts 49mm lens accessories.

SHUTTER/Electronically governed rubberized focal plane with speeds from 8 to 1/1000-second on Auto setting or 1/60- to 1/1000-second (5 speeds), and B on Manual setting. FPX sync with hot shoe contact and front terminals.

VIEWFINDER/Fixed pentaprism with central microprism, fine focusing collar and full focusing screen. Magnification at infinity: 0.89X. Shutter speed scale, battery check signal, over/underexposure indicators visible.

EXPOSURE CONTROL/Automatically selects correct shutter speed from infinitely variable range when selector is set to Auto. CdS cells on each side of finder eyepiece read entire picture area at full aperture with SMC Takumar lenses; at stopped-down aperture with any Pentax thread lens. Manual override. Adjusts for film speeds between ASA 20 and 1600 and provides exposure range (ASA 100) of EV 1 to 18. Powered by 6-volt, #544 silver oxide battery or equivalent.

FILM ADVANCE/170° ratchet type.

OTHER FEATURES/Depth-of-field preview lever, battery test button, exposure factor control dial, progressive exposure counter resets to "0" when camera back is opened, film reminder indicator.

PHYSICAL DIMENSIONS/5/2 inches long, 4 inches high, 3 1/2 inches deep; weighs 2 lbs. 1 oz.

MANUFACTURER/Asahi Optical Co., Ltd., Tokyo, Japan.

IMPORTER/Honeywell Photographic Products, Littleton, Colo. 80120.

LIST PRICE/\$574.50 with f/1.8 lens, \$624.50 with f/1.4 lens. Black body is standard but chrome body is available at \$318.17 (minus lens).

[CLICK HERE TO SEE TOP OF CAMERA](#)



As slight pressure on the shutter button turns on the meter when SHUTTER dial is set to Automatic position, ES should be set on a marked speed when carrying in a foam-padded case to prevent rapid battery discharge.

As the first of the new SLR EE cameras equipped with an electronically governed focal plane shutter, the Pentax ES sent a host of the competition's designers scurrying back to the drawing board, and thus reaped the benefits of being first with the most. Impressive as the achievement was, packaging this bold new approach to automatic exposure control in a body virtually identical in size and weight with previous Pentax cameras is also quite a feat. While other manufacturers have found it necessary to produce what amounts to entirely new body configurations for their EE models, those accustomed to the handling and operation of the traditional Pentax design will feel right at home with the new ES.

There have been a few changes, but all are minor and none detracts from the basic ease of use that has characterized the Pentax for over a decade. The self-timer is gone, replaced by a battery housing that protrudes about 1/2-inch from the front of the camera body. Unscrewing the front of the housing allows access to the #544 silver oxide battery, and a tiny button on the top plate left of the pentaprism housing serves as a battery check switch. But don't look for any bright lights to blink the battery's condition; such a gaudy display is totally out of keeping with the camera's basic conservatism. A deflection of the meter readout needle accomplishes the same thing--and you don't even have to remove the camera from your eye.

Just to confuse the issue, Honeywell announced, that a Pentax ES II will be available shortly. Designers have restored the self-timer to the ES II in its traditional position presently occupied by the battery chamber on the original ES. The ES II has a blind built into the viewfinder to prevent extraneous light from entering the finder eyepiece during long exposures and uses four 1.5 volt batteries relocated to the camera's base. Its price will be somewhat higher than that of the ES presently, but by how much is not

known at this writing.

The ASA index control has been moved from the shutter speed dial to a collar surrounding the rewind knob. The collar also serves as a limited override on the metering system to adjust exposure for unusual lighting conditions and can be used to provide AX, 2X or 4X, the exposure determined by the meter. The collar is left in the 1X position under normal lighting conditions. The shutter speed dial is marked with five mechanical speeds from 1/60- to 1/1000-second and B. and an Automatic position.

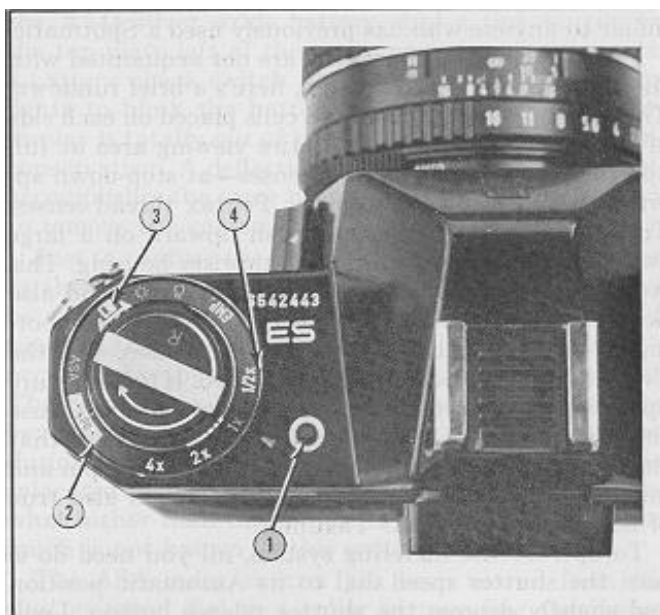
The ES shutter has the virtue of not requiring battery power when set on a marked speed, and so it's possible to use the camera manually with all five shutter speeds even if the battery is dead. This is certainly more useful than being locked into the use of a single speed as with the Yashica Electro AX or Minolta XK. But the meter is disconnected when you use mechanical speeds, and it will not give a reading--there's no match-needle capability (nor is one necessary) with the ES. Everything else about the camera is strictly Pentax--handling, controls, metering system, etc.--and familiar to anyone who has previously used a Spotmatic.

For the benefit of those who are not acquainted with the time-proven Pentax design, here's a brief rundown. The metering system uses CdS cells placed on each side of the eyepiece to read the entire viewing area at full aperture with SMC Takumar lenses--at stop-down aperture with all other automatic Pentax thread lenses. To use the latter, you must push upward on a large switch at the left side of the pentaprism housing. This stops the lens down to the shooting aperture and also serves as the depth-of-field preview switch when shooting at open-aperture with automatic lenses, but the shutter remains electronically governed. If full aperture operation is important to you and you intend to use the camera primarily with a zoom lens, be advised that the Pentax SMCT zoom lacks the full aperture pin and must be used in a stop-down mode. This is also true of the 85mm f/1.9 SMC Takumar.

To operate the metering system, all you need do is turn the shutter speed dial to its Automatic position and slightly depress the shutter release button. Look through the viewfinder and you'll see a full focusing Fresnel screen with the usual central microprism surrounded by a fine focusing collar. The ES can be ordered with one of four other screen types (including a split-image), or you can have your choice installed at a later date by factory service centers at a nominal cost of \$25. (A lock-up mirror modification is also available at \$40, or \$30 if done when a screen is installed.)

Along the right side of the screen, you'll find a shutter speed scale marked from 1/1000- to 1-second (the ES will govern speeds down to 8 full seconds with accuracy) and meter readout needle. This is the least complex "control center" used by any SLR EE manufacturer-- no colored areas or blinking lights. At the extreme right side of the shutter speed scale, there are three cutout areas. The top and bottom cutouts indicate over/underexposure, while the central one is a deflection area in which the readout needle will indicate battery condition when you depress the check button.

[CLICK HERE TO SEE ASA CONTROLS](#)



Left side OF ES top plate is a busy affair, with battery check button (1), ASA film speed window (2), film type indicator (3) and exposure override (4) surrounding the rewind knob.

The metering circuit turns off automatically once the shutter has been tripped, and will not be reactivated until the release button is slightly depressed for the next exposure, a handy feature that prevents accidental battery drain. Those accustomed to winding the film immediately after taking a picture will not have to readjust their technique as they would with cameras like the Mamiya Auto XTL, whose film advance lever turns on the meter. There is, however, one precaution to be taken, especially when carrying the ES in a gadget bag or foam-padded case. If the shutter release button is depressed slightly either by pressure of the foam or an accessory that might shift its position in the bag, the metering circuit will be turned on and a fresh battery will die completely within 24 hours. To prevent this, always turn the shutter speed dial from Auto to 1/1000 when shooting is finished, and remember to return it to the Auto setting when preparing to take pictures at a later time.

The SMC Takumar lens provided with the ES uses a new rubberized focusing ring with a waffle pattern, and the milling on the aperture ring has been coarsened for a better grasp, but other than these two changes, the lens remains the same design as used by other current Spotmatic models. However, you cannot use a standard lens from other Pentax models on the ES because of slight differences in mechanical design. When mounted to the ES, the Auto/Manual selector lever of the SMC Takumar lenses must remain in the Auto position and cannot be moved; the depth-of-field preview switch is used to provide the stop-down aperture instead.

The slim and compact Pentax profile will appeal to many who have not previously worked with the camera, especially when it's compared to other and more bulky SLR EE cameras. Like the Nikkormat EL, Asahi has managed to retain the flavor of past Pentax design in the ES and, despite the apparent simplicity of the camera in appearance and operation, it has already proven extremely popular with those looking for exposure automation in a top-quality 35mm camera. I specifically mention the "apparent simplicity," as the Pentax has never been adorned with flashing lights, multi-colored viewfinder signals, etc., and those seeking such touches might consider the ES as somewhat stark by comparison to other SLR EE cameras.

But in this case, appearance is deceiving, and as the first of the aperture-priority SLR's to be marketed, it has been the standard by which others are compared. From the aspects of quality, workmanship, capability, and ease of operation, the ES with its proven and accurate metering system may be equalled by the competition, but it is doubtful that any of the first generation electronically governed cameras will exceed it in these respects.

[CLICK HERE TO SEE PENTAX ES LENSES](#)

PENTAX ES CONSTRUCTION			LENSES			
LENS (Focal Length/Speed)	Angle of View	(Elements)	Minimum f/stop	Mode of Operation	Minimum Focus (Ft.)	Filter Size (mm)
17mm f/4	180°	11	f/22	Auto	.66	B1
20mm f/4.5	93°	11	f/16	Auto	.65	77
24mm f/3.5	84°	9	f/16	Auto	.80	58
28mm f/3.5	75°	7	f/16	Auto	1.3	49
35mm f/2	62°	8	f/16	Auto	1.25	49
35mm f/3.5	62°	5	f/16	Auto	1.5	49
50mm f/1.4	46°	7	f/16	Auto	1.5	49
55mm f/1.8	43°	6	f/16	Auto	1.5	49
85mm f/1.8**	29°	6	f/16	Auto	2.75	58
85mm f/4.5*	29°	5	f/22	Auto	2.0	49
105mm f/2.8	23°	5	f/22	Auto	4.0	49
120mm f/2.8	20°	5	f/22	Auto	4.0	49
135mm f/3.5	18°	4	f/22	Auto	5.0	49
135mm f/2.5	18°	5	f/22	Auto	5.0	58
150mm f/4	16.5°	5	f/22	Auto	6.0	49
200mm f/4	12.5°	5	f/22	Auto	8.2	58
300mm f/4	8°	5	f/22	Auto	18.0	77
300mm f/5.6*	8°	5	f/22	Auto	16.0	58
400mm f/5.6	6°	5	f/45	Man.	27.0	77
500mm f/4.5	5°	4	f/45	Man.	32.8	122.5
1000mm f/8	2.5°	5	f/45	Man.	98.0	192.5
85-210mm f/4.5 Zoom	11.5-28.5°	11	f/22	Auto	11.5	58
50mm f/4 Macro	46°	4	f/22	Auto	.77	49
100mm f/4 Bellows	23°	5	f/22	Pre-set	—	49

* Ultra-Achromatic Takumar, corrected for chromatic aberration from ultraviolet to infrared wavelength bands.
** Replaces previous f/1.9 lens mentioned in text.

YASHICA ELECTRO AX
(APERTURE-PRIORITY)



SPECIFICATIONS

LENS/50mm f/1.7, f/1.4 or 55mm f/1.2 Multicoated Auto Yashinon-DS in interchangeable Pentax screw thread mount, stops to f/16, focuses to 20 inches, accents 55mm lens accessories.

SHUTTER/Metal Copal Square (vertical travel) electronically governed focal plane with speeds from LT (approximately 8 seconds) to 1/1000-second on Auto setting or 1 to 1/1000-second (11 speeds) and B on Manual setting. FPX sync with hot shoe contact and lens mount terminals. Self-timer with 8-second delay.

VIEWFINDER/Fixed pentaprism with central microprism, fine focusing collar, and full focusing screen. Magnification at infinity: 0.87X. Overexposure and slow speed warning arrows visible. Eyepiece light shield.

EXPOSURE CONTROL/Automatically selects correct shutter speed from infinitely variable range when selector knob is set to *Auto*. CdS cell fitted to swing-away arm behind mirror center and immediately in front of film plane reads center spot through lens at stop-down aperture. Metering system works with any Pentax thread lens in stop-down mode. Manual override. Adjusts for film speeds between ASA 25 and 1600 and provides exposure range (ASA 100) of EV 2 to 18 with f/1.4 lens. Powered by 5.6-volt, PX32, E164 or equivalent mercury battery.

FILM ADVANCE/180° single-stroke, plastic-tipped lever.

OTHER FEATURES/Dual-lock back cover, battery check lamp incorporated in progressive exposure counter that returns to *Start* when camera base is opened, shutter indicator lamp on camera top, aperture activator button to open lens to full aperture, shutter release lock.

PHYSICAL DIMENSIONS/5-15/16 inches long, As inches high, 37/s inches deep; weighs 2 lbs. 4 oz.

MANUFACTURER/Yashica Camera Co., Ltd., Tokyo, Japan.

IMPORTER/Yashica Inc., 50-17 Queens Blvd., Woodside, N.Y. 11377.

LIST PRICE/\$460 with f/1.7 lens, \$510 with f/1.4 lens, \$600 with f/1.2 lens.

[CLICK HERE TO SEE TOP OF CAMERA](#)



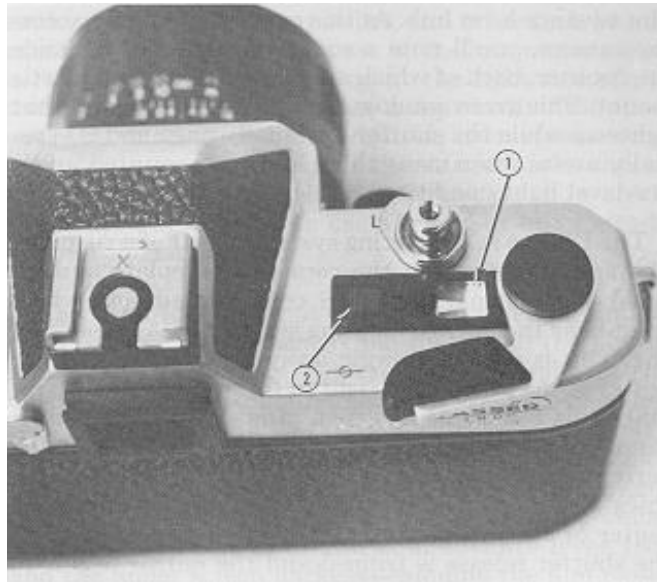
Electra AX top plate controls are massive In tradition of Mamiya/Sekor Auto XTL, making the camera easy to use; there's plenty of room to operate everything.

Unlike other Japanese camera lines which have achieved a good market penetration across the United States, Yashica has never really made an impact west of the Mississippi with its 35mm line and consequently, the brand has suffered in popularity and sales. A halfhearted effort was made a couple of years ago when Yashica hired its first factory representative for the West Coast, but nothing much came of this, and if you live in a western state, you may have to search to find a dealer who stocks Yashica 35mm cameras. This is unfortunate, because a potential best-seller has arrived in the form of the Electro AX, an aperture-priority SLR that could conceivably give the competition a run for its money if Yashica marketing would just move into the second half of the 20th century with its new camera.

To begin with, the Electro AX has the look and feel of quality, fulfilling the visual impression that it's a rugged piece of equipment. Like the Mamiya XTL, the squarish body is heavy but falls into hand naturally and once there, you don't notice the weight. Controls are logically placed and seem a genuine step in the direction of human engineering applied to camera design. As a whole, this most sophisticated of an innovative line of 35mm SLR's is less cluttered than previous Yashica designs, almost to the point that you wonder why they're asking \$600 list for it.

Truthfully, the price is somewhat inflated, as the Electro AX has its shortcomings, a couple of which you might consider as serious if you're caught up in the craze to be first with the latest, but the dollar devaluation is partially responsible for the hefty price. By EE SLR standards, the top plate of the Electro AX is relatively empty, although it does contain a couple of interesting innovations that should appeal to the gadget conscious reader. At the left side beneath the film rewind crank, there's a large milled knob with Auto in red letters and 11 shutter speed markings plus B (all click-stopped) in silver. When set in the Auto position, the AX shutter is electronically governed from 8 full seconds to 1/1000-second.

[CLICK HERE TO SEE TOP OF CAMERA](#)



Depressing the battery check button illuminates the exposure counter window (1), a helpful feature when shooting under low light conditions. The green window beside the counter (2) lights up for the duration of shutter operation to provide visual indication when long exposures are completed.

By depressing the small button beside the knob, the shutter can be switched over to manual mode to deliver the stated 11-speed range. As the shutter is a vertical-travel Copal Square, flash sync is at 1/125- instead of 1/60-second, which is common to horizontal cloth focal planes.

On the rear surface of the top plate just below the shutter mode button, there's a slightly larger black button and a brushed chrome switch. The latter activates a shield inside the viewfinder to shut out light that might otherwise detract the meter when the self-timer is being used. The black button marked C is a battery check which also illuminates the large and easy-to-read green and white exposure counter positioned beside the film advance lever hub. As this carries us visually across the camera, you'll note a square green window beside the counter, both of which are framed in a black plastic mount. This green window is an operational signal that lights up while the shutter is actually open, and is especially useful when using the AX tripod-mounted under low-level light conditions.

The Electro AX metering system is a bit of a surprise; film speeds are set on the camera's baseplate and instead of the usual twin CdS cells located somewhere on or near the mirror/focusing screen, the AX uses just one. This is part of a swing-away arm just behind the center of the mirror and right in front of the film plane. Since this technique has been around for some time-- from Bolex movie cameras of some years back to the current Leica M5--it's not new by any means, but Yashica has added a different twist by semi-silvering the center of the mirror to let light strike the cell. When the shutter release is tripped and the mirror begins to rise, the meter cell or sensor arm drops into a recess at the floor of the mirror box to clear the film plane for exposure. A spring-loaded flap attached behind the mirror at the bottom folds back during exposure to cover the semi-silvered part of the mirror and prevent any stray light from finding its way through the viewfinder eyepiece and pentaprism to the film's surface. Incidentally, the mirror box is neatly blackened with a felt-flock material that keeps stray light and glare to a minimum; a most effective touch, but don't let it get too dirty because the flock is hard to keep clean.

Once you've pressed the shutter release button, the exposure data provided by the CdS sensor cell is transferred to the IC brain which computes the precise exposure required. Yashica uses a flexible printed circuit draped over the pentaprism to transmit the information, which should lower the cost of repairs if they should become necessary.

In keeping with Yashica's previous designs, the view finder is devoid of scales, needles, and other such adornments. When the camera is set in the automatic mode a red warning arrow lights up at the right side of the finder when the shutter release is depressed; if the aperture you've selected will result in an overexposure, simply select a smaller f/stop. If the shutter speed chosen by the camera is 1/30-second or below, a yellow arrow lights up, warning you to use a tripod or other steady support during

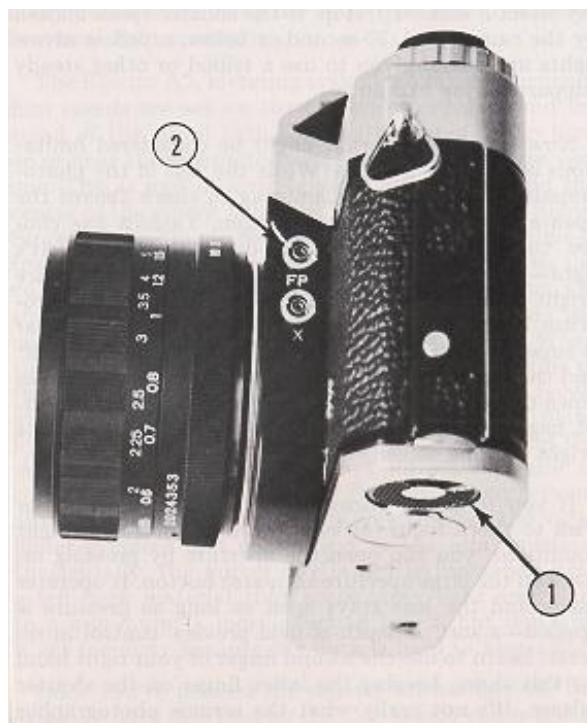
exposure.

Now let's look at what might be considered limitations built in by Yashica. While the rest of the photographic world is madly clamoring to climb aboard the open-aperture metering bandwagon, Yashica has chosen to remain with the stop-down method. That's right--look through the viewfinder and you'll see a nice bright image on its Fresnel screen. The central microprism is one of the best, and the fine focusing collar is super large. But throw the film advance lever 180° and the finder screen darkens--winding the film closes down the lens diaphragm to the f/stop you've preselected, negating the prime advantage of a modern SLR--its bright viewing screen.

If you forgot to focus before winding the film, or wish to check focus (or even framing) under dim light conditions, you can open the aperture by pressing inward on the large aperture activator button. It operates easily and the lens stays open as long as pressure is applied--a sort of depth-of-field preview control in reverse. Learn to use the second finger of your right hand for this chore, keeping the index finger on the shutter release. It's not really what the serious photographer would consider an asset, especially since it's an approach 180° from that to which we've become accustomed, but you do become used to it after awhile.

This also affects lens interchange. If you've already wound the film and then wish to switch to another lens, you should hold the activator button in while unscrewing one and mounting the other - it's best to switch before winding the film because you can do so without worrying about the activator switch. The question, of course, is just why Yashica chose to buck the current trend toward open aperture metering. The only answer that makes sense is that the entire range of Yashinon lenses can be used with the Electro AX without modification - certainly a boon to those who already own a number of them, as well as a boon to Yashica from a production standpoint.

[CLICK HERE TO SEE SIDE OF CAMERA](#)



ASA Speeds are set with this base plate dial (1) beside the battery chamber cover. Flash terminals (2) are body mounted beneath the pentaprism.

Any auto diaphragm Pentax thread lens will work with the AX exactly as would a Yashinon DS lens, although you won't be able to open its diaphragm to full aperture with the activator switch. Even non-auto lenses can be used with the stop-down metering system of the AX. Like the Ricoh Auto TLS EE, the Electro AX possesses nearly unlimited optical capabilities with the ubiquitous 42mm screw thread lenses.

Should battery power fail, the camera can be operated in a mechanical mode, but only at 1/1000-second, which is hardly a practical shutter speed for most situations. Setting the camera to manual operation disconnects the meter, but the shutter still requires battery power to function through the range - a limitation not shared by other aperture-priority cameras, like the Pentax

ES and Nikkormat EL. Incidentally, the 5.6-volt PX32 mercury battery cell is one of the largest power cells used to date in EE cameras.

So there you have it - a beautifully finished, excellent handling and expensive SLR that shows considerable imagination in its design. If you can live with the stopdown metering, and to a lesser extent, the prospect of a dead battery, this one will deliver the goods and you'll enjoy every minute of it. And if you already happen to own a couple of Yashinon lenses, the money you'll save by not having to swap them in to get into the EE game will go a long way toward paying for the AX.

[CLICK HERE TO SEE AVAILABLE YAHSINON DS LENSES](#)

YASHINON DS LENSES							
Lens (Focal Length/Speed)	Angle of View	CONSTRUCTION		Minimum f/stop	Mode of Operation	Minimum Focus (Ft.)	Filter Size (mm)
		Groups	Elements				
20mm 1/3.3	94°	9	11	1/22	Auto	1.0	72
21mm 1/3.3	92°	5	8	1/16	Man.	2.5	55
28mm 1/2.8	76°	7	8	1/16	Auto	1.0	52
35mm 1/2.8	63°	5	6	1/16	Auto	1.25	52
50mm 1/1.7	46°	5	6	1/16	Auto	1.75	52
50mm 1/1.4	46°	6	7	1/16	Auto	1.75	55
55mm 1/1.2	45°	6	7	1/16	Auto	1.75	55
60mm 1/2.8							
Macro	40°	4	5	1/22	Preset	.75	58
135mm 1/2.8	18°	4	5	1/22	Auto	5.0	55
200mm 1/4	12°	4	5	1/22	Auto	8.0	55
300mm 1/5.6	8°	4	5	1/22	Auto	12.0	58
500mm 1/8	5°	5	6	—	—	12.0	—
600mm 1/8	4°	1	2	1/32	Preset	40.0	37
800mm 1/8	3°	1	2	1/32	Preset	75.0	37
1000mm 1/11	2°	5	6	—	—	25.0	—
45-135mm f/3.5 Zoom	18-51°	10	15	1/16	Auto	6.0	77
75-230mm f/4.5 Zoom	10-32°	8	13	1/22	Auto	8.0	67

MORE ON THE WAY

As you might expect, there are more EE SLR s on the way; no manufacturer of a major camera line can hope to compete today without one. The next model to appear should be the EF from Canon sometime in 1974, an interesting hybrid that will use the complete series of Canon FD lenses and seems to offer the best of both worlds to potential customers - its shutter is mechanically controlled at speeds between 1/8 and 1/1000-second, but electronically governed at slower speeds ranging from 1/4 -second down to 30 full seconds.

The designers at Canon believe that the accuracy of an electronically governed shutter is most useful during longer exposures, and by arbitrarily shutting off the control above 1/4 -second, the EF possesses two distinct advantages of interest. Since its energy requirements are less, smaller and less powerful batteries are used. However, if they should fail, the shutter will continue to operate within the full 1/8 to 1/1000-second speed range. Despite its part-time electronic system, the Canon EF is considered to be a shutter-priority camera. The contest between it and the Nikkormat EL is not likely to result in any major changes in either s share of the SLR market.

Argus is presently prevented from distributing its Cosina EC-2000 in the United States because of patent difficulties, but readers who live in Canada or travel abroad may well run into this aperture-priority SLR. Purchase of one for use in the U.S. would not prove a wise idea due to service and warranty problems that would arise should the camera develop problems. But you can look for other manufacturers to jump into the race in the coming months.

You can also look for a variety of minor improvements to make their appearance, either on new cameras or second-generation models of those already available.

Industry observers already feel the CdS cell to be on its way out because the silicon blue cell used by Fujica has a faster response to extreme changes in light levels and does not go temporarily "blind" when exposed to a brilliant light source.

It's also reasonable to anticipate that the LED concept as used in the Yashica AX will find greater favor, both in the name of

simplicity and lower manufacturing costs. This will result in less cluttered viewfinders, which may or may not be of benefit, depending upon how much you rely on the "control center" approach favored by some cameras.

WHAT DOES IT ALL MEAN?

Primarily, the sophistication in camera design that's appearing now means a higher initial cost, more expensive repairs when one system conks out, and a greater likelihood that such system failure will occur. As each succeeding generation of cameras becomes more complicated internally, repairmen find themselves going "back to school" periodically just to keep up with the fundamentals. Today's SLR models are packed with subsystems that often have an intricate interdependence upon each other, and to locate and repair one that has failed may require disassembly and removal of two or three other subsystems just to reach the faulty one. Modular construction is bound to come, and the manufacturer who can figure out how to pack everything necessary in a camera body, yet make repairs a simple and inexpensive matter of replacement, is going to have a very strong advertising point.

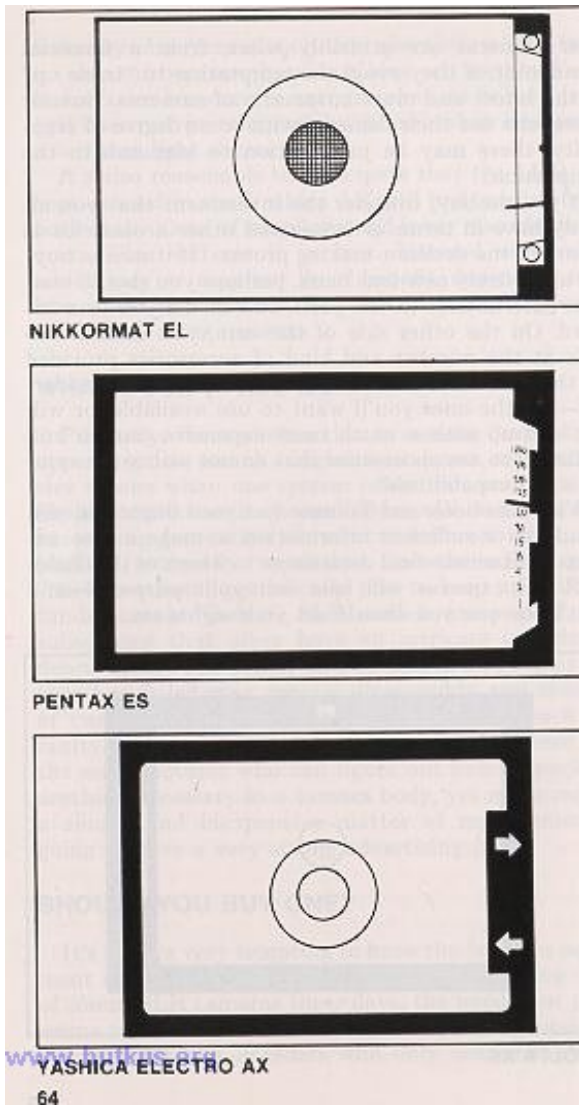
SHOULD YOU BUY ONE?

It's always very tempting to have the latest in equipment at your fingertips, but with the increasing costs of 35mm SLR cameras these days, the important point seems to be whether having the latest is economically practical for you. Readers who only occasionally use their cameras are probably wiser, from a financial standpoint, if they avoid the temptation to "trade up" to the latest and most automatic of cameras. But for those who use their cameras with some degree of regularity, there may be justification to succumb to the temptation.

If you do buy, consider the investment that you already have in terms of lenses and other accessories as a part of the decision-making process. If it means buying an entirely new lens bank, perhaps you should consider alternatives in the particular model you lean toward. On the other side of the coin, you should also look at the number and kind of accessories provided by the manufacturer of the camera you are considering - are the ones you'll want to use available, or will you end up with a much more expensive camera and be forced to use accessories that do not utilize the camera's full capabilities?

- [CLICK HERE TO SEE VIEWFIND INFORMATION FOR DIFFERENT MODELS](#)





- [FOR NIKKORMAT EL, PENTAX ES, YASHICA ELECTRO AX](#) -