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KODAK EKTRA



— 50-mm. $f/1.9$ Kodak Ektar lens, K2 filter,
Kodak Plus-X Film, $1/500$ at $f/3.5$.

KODAK EKTRA

WITH EKTAR LENSES

The world's most distinguished camera

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The Story of Kodak Ektra

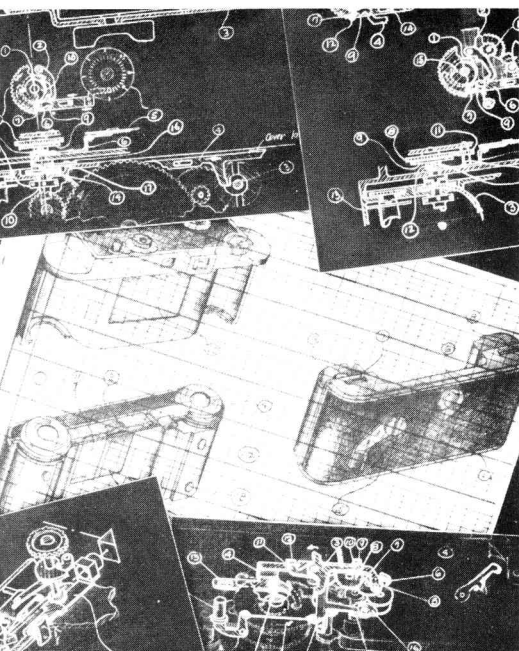
COMPARATIVELY few years ago, your interest in a new camera would almost certainly have been limited to simply the size of its pictures, the range of its lens and shutter, and its cost. Because, unless you were one of the then quite few advanced photographers, all you wanted was to be able to get what were considered good pictures of your family, travels, and other personal activities.

Today, because of the many developments in photography, it is impossible to define your own particular interest in picture making. It may be in advanced pictorial work or straight documentary photography . . . in scientific work in the laboratory or beautiful full-color transparencies . . . in microfilming or in fast action shots . . . or, in getting good pictures of personal subjects.

We do know, however, that whichever of these applications is your own photographic activity, you are interested in contemporary photography . . . and in the finest equipment available for your own picture making. We believe then that you will be interested in this story of the Kodak Ektra.

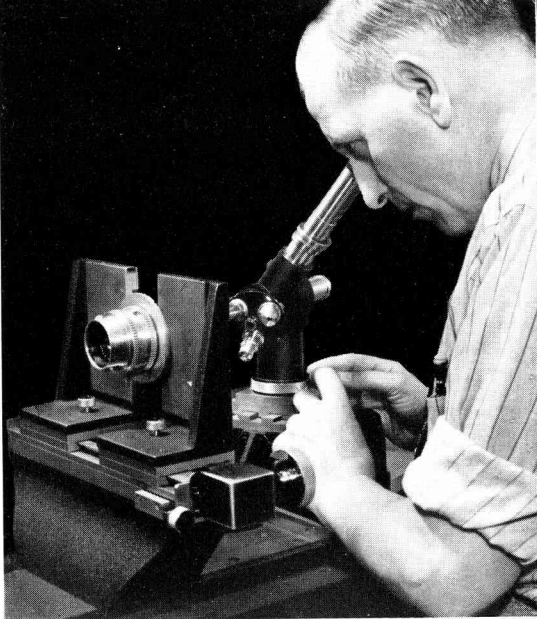
With the recent wide extensions of photography into industry, science, medicine, color, and pictorial art, there has been an increasing demand for a new camera that would match the many definite

improvements that have been made in enlarging equipment, papers, films, processing technics . . . a camera that would incorporate, integrally, a number of supplementary features and refinements which have demonstrated their importance in miniature photography . . . and a camera that would capitalize the range of specialized negative emulsions now available, with their higher speed, microscopically fine grain, sensitivity to infrared radiations, and



ability to reproduce full color.

To meet this new call for finer and finer photographic apparatus, the Kodak organization has introduced a precision production technic on a scale new to photographic manufacturing. This technic combines two complementing elements: the work of craftsmen of such caliber that their manual operations are the result of thorough knowledge of mathematics, engineering, and materials—plus the almost incredible accuracy of modern precision machines and machine tools. Eliminating both the narrower scope possible with machine production, and the variation inevitable in individual handcraftsmanship, this new technic logically combines the valuable features of both methods to produce results of a standard not previously possible. First result of this technic was the famous Ciné-Kodak Special, which set a new high standard in the amateur motion-picture camera field.



And now the Kodak Ektra . . .

You, your fellow advanced photographers, and contemporary photography generally, wrote the Ektra's specifications. Such a camera should have, first, a system of related interchangeable lenses, and an integral, accurate method of determining the field of view as it varied with the different lenses. The lenses themselves should incorporate the latest advances in optical design, materials, and processes, and be superior to any existing lenses. With such wide-aperture lenses, there was need for a coupled range finder that would be critically accurate and usable under a wide range of conditions. This interchangeability of lenses implied a focal plane shutter—if possible, more accurate and dependable in performance than earlier ones. Furthermore, interchangeable lenses

that would be practical from the standpoints of weight, size, use, and cost indicated a small negative size, as did the number of supplementary features that were desirable as integral parts of the camera rather than as accessories. Final choice rested on the 35-mm. film width and the 24 x 36-mm. format, because of the wide range of emulsions available for this size, widespread standardization on the convenient 2 x 2-inch projection slides it makes possible, similar standardization in projectors, and convenient accommodation in precision enlarging equipment.

The number of these specialized negative emulsions—in both black and white and color—as well as the different types of pictures and different conditions under which successive groups of pictures are made—indicated some practical and safe means of changing quickly from one emulsion to another.

An achievement of coöperative planning, design, and manufacture

Once these determining factors were evaluated and interpreted into practicability, experts went to work to put them into tangible form. Lens scientists, camera designers, mechanical engineers, authorities in range-finder and view-finder optics, production engineers cognizant of the possibilities of new precision manufacturing . . . these and many others started “from scratch” to develop

the camera specified. Working in closest coöperation with one another, they also coördinated their efforts with the activities of divisions producing the films, accessories, enlargers used in contemporary advanced photography. This coördination was a prerequisite because of the extreme precision and wide scope determined upon . . . because of the intimate interrelationship of the complex mechanisms required . . . because of the interdependence necessary



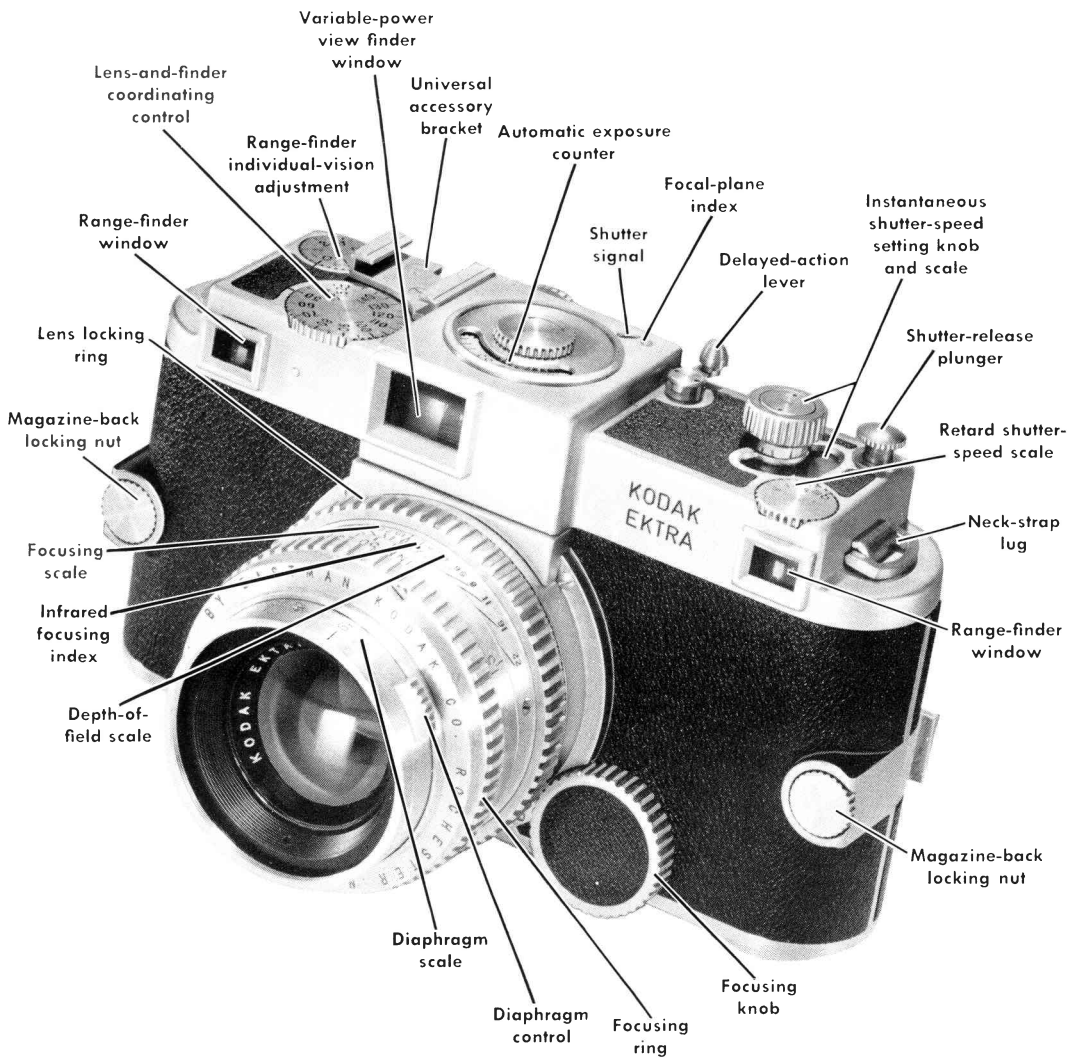


as between the camera proper and its lenses, films, and accessories, to achieve the results specified for the camera.

The Eastman Kodak Company presents Kodak Ektra in the confident belief that it is, without reservation, the world's most distinguished camera. Unequaled in the quality and scope of its lenses . . . the performance of its shutter . . . the perfection of its film system . . . the adaptability contributed by its interchangeable backs . . . the efficiency of its coupled range finder . . . the convenience and precision of its variable-power view finder, the Ektra can produce finer results, throughout a wider range, than any other existing camera. You are invited to see it, and to inspect it, at your Kodak dealer's.

EASTMAN KODAK COMPANY

ROCHESTER, NEW YORK

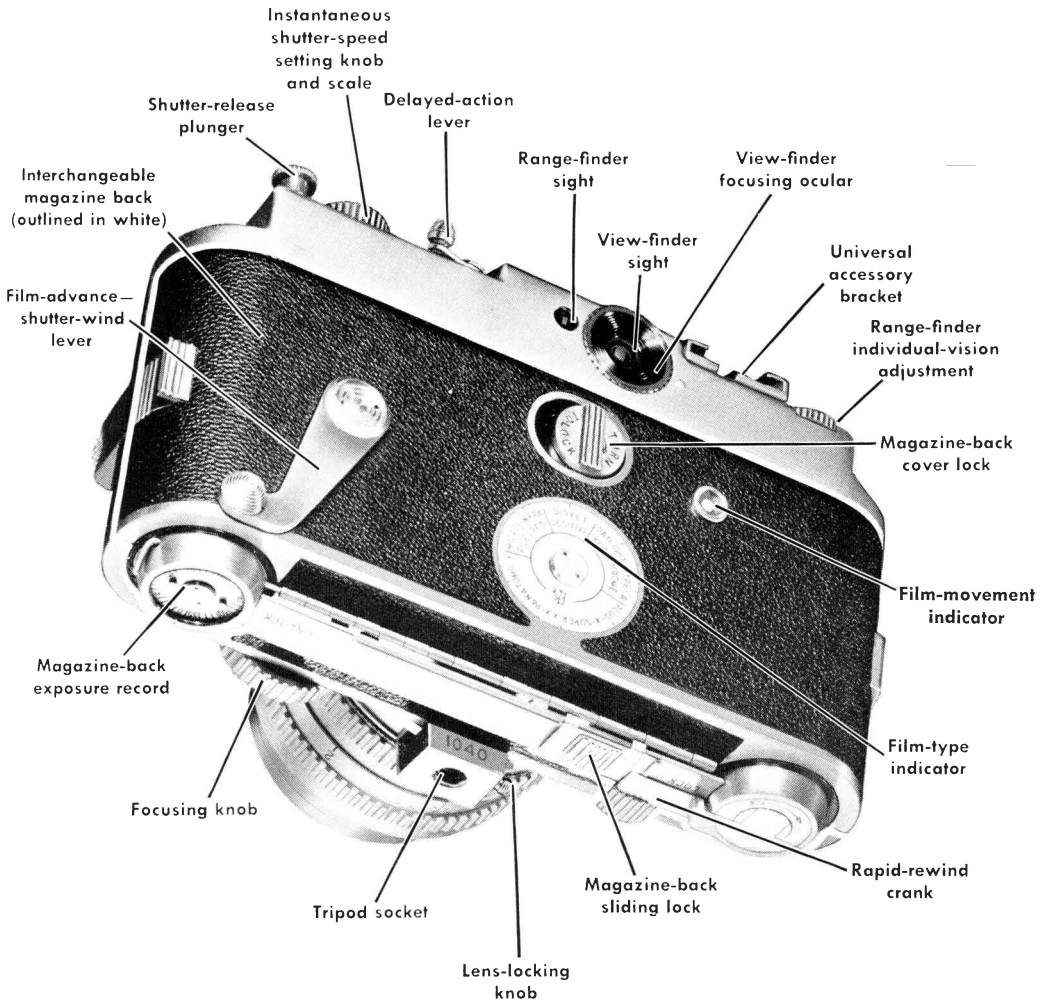


Features Which Distinguish Kodak Ektra

IN the following pages of this book, there are detailed descriptions of the Ektra's component parts and their functions. Here, in these two diagrams of the front and back of the Ektra, most of the visible features are indicated and identified—an over-all guide to the camera's sights, scales, knobs, rings, locks, and dials. These

diagrams may make the Ektra seem complicated to those unfamiliar with precision cameras, but the advanced photographer will realize at once that it is this combination of features and controls that makes the Ektra the world's most distinguished camera.

However, in general picture making, the Ektra user simply checks his focus with the range finder, sets his shutter speed and lens aperture, and shoots. Two strokes of the dual-purpose lever automatically advance the film and wind the shutter, and the Ektra is ready for the next picture. The many other features are available for use as required.



Lenses for Kodak Ektra

SINCE the scope of any camera and the quality of the pictures it makes depend in the last analysis upon its lens equipment, no feature of the Kodak Ektra is of greater importance than its special group of Ektars. Aside from the high over-all quality indicated by their name, these lenses provide great optical adaptability, precision interchangeability, unique structural and operating advantages, and, in the case of the $f/1.0$, ultra-speed.

A range of superb new lenses

As is true of the rest of the camera, the lenses are entirely new—in formula, in mounting, and in many aspects of their focusing and general use. All were computed and designed specifically as component parts of the Ektra, and as members of a group of lenses whose combined ranges would complement each other in a wide, related series of magnifications. Kodak lens scientists, working with the designers of the camera proper, took into account not only the negative size and other specifications, but also the means for effectively coordinating the lenses with both the range-finder and view-finder systems. And these lens designers, and the craftsmen who executed their designs, had constantly before them the standards of accuracy, workmanship, and performance specified for the camera as a whole.

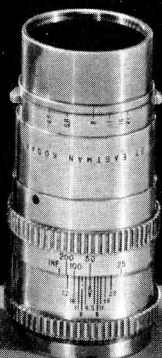
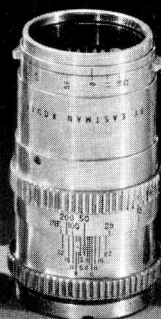
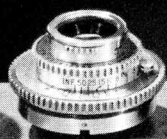
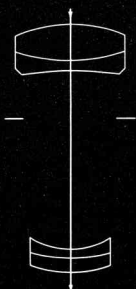
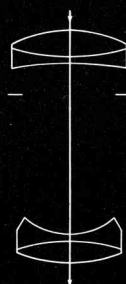
The resulting family of Kodak Ektars challenges comparison with any other group of lenses. Their design embodies to a high degree all of the corrections essential for fine photography, and especially important for precision miniature work. Because of the growing importance of full-color photography, particular attention has been given to both lateral and longitudinal color correction.*

Surface treatment

The inner surfaces of the lenses are treated by a coating process that improves the clarity and brilliance of the negatives obtained. This surface-coating process, forms of which have been widely publicized, reduces reflections from the sur-

*The fault known as "lateral color," or chromatic difference of magnification, results in objectionable color fringes along the edges of a color picture. "Longitudinal color," caused by the registering of different colors in planes other than the true focal plane, results in fuzziness. Lenses for the Ektra have excellent correction for both of these faults.





50-millimeter
f/1.9

50-millimeter
f/3.5

35-millimeter
f/3.3

90-millimeter
f/3.5

135-millimeter
f/3.8

153-millimeter
f/4.5

faces of the lens elements, thereby increasing the efficiency with which light is transmitted to the negative material. The chief advantages are the superior contrast obtained in black-and-white negatives, greater color purity in full-color pictures, lessened danger of flare in pictures taken against the light, and reduction of the intensity of the "ghost" images sometimes apparent when strong lights are included in the picture.

Precision mounting

Contributing extensively to the quality of these Kodak Ektar lenses is the excellence of their mounting. After the lens elements are accurately assembled, the complete assemblies are critically positioned in the mounts, and the lenses are prefocused by what is probably the most precise and scientific method to be found anywhere in lens manufacture. Inside the mounts are carefully calculated corrugations or "baffle rings" which, by trapping non-image-forming light entering the lens, give added contrast and prevent flare spots. The elements of the mounts themselves are held to extremely close manufacturing tolerances, and all bearings are especially designed for smooth, positive operation of focusing and

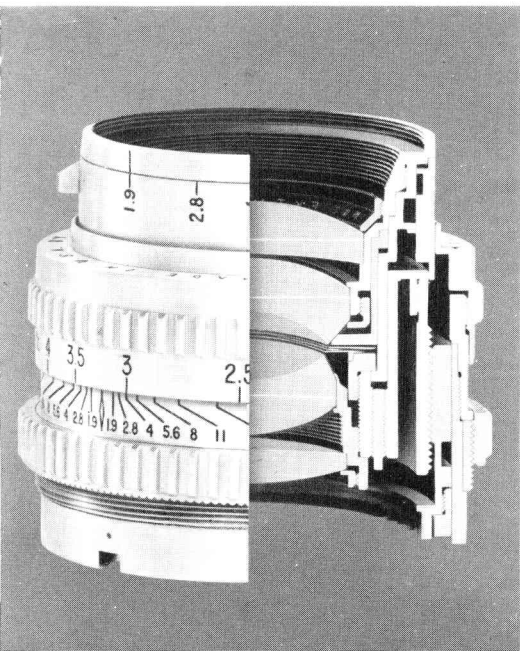
diaphragm controls. The precision of the mounts assures optimum performance of the functions for which each Ektar lens was designed.

Interchangeability and operation

The design of the lens mounts is such as to permit quick, precise interchangeability and positive coupling with the range-finder system. A red dot at the top of the lens-seat sleeve, and a wide key slot at the bottom, serve as quick guides to accurate positioning on the camera. When one of the lenses is fully screwed into place, an automatic lock grips it and holds it immovable. It can then be unscrewed only by first disengaging the lock plunger. Once in position, the lens automatically interlocks with the driving member of the range finder mechanism for critical automatic focusing. A large, milled ring on the mount facilitates rapid preliminary focusing, and the final precise adjustment is made by means of the small focusing knob. Located on the front of the camera, and convenient to the left hand, this knob permits using the same finger movements in focusing any of the lenses except those of the greatest focal lengths.

The $f/3.3$ 35-mm., $f/3.5$ 50-mm., and $f/1.9$ 50-mm. lenses have two-phase focusing scales—a de luxe feature found elsewhere only on the accessory lenses for 16-mm. Ciné-Kodaks. Normal focusing extends from infinity to $3\frac{1}{2}$ feet. But drawing out a latch at the side of the mount releases the focusing sleeve for movement beyond the limit of the normal scale, and into a secondary scale engraved in red. This scale extends the ranges to distances as short as one foot. The range finder does not operate at short distances, but correct focus can be rapidly and accurately determined by measurement from a red focal-plane index mark atop the camera, or with the aid of the accessory ground-glass back. The 135-mm. lens focuses down to 4 feet, the 153-mm. lens to 5 feet.

All lens barrels carry the usual diaphragm scale, and also a depth-of-field scale. The latter adjoins the distance markings, and when the camera has been focused the depth of the field at the selected diaphragm opening is immediately apparent to left and right of the distance index mark. Near this mark is a small red dot. Positioned to take into account the plane in which infrared rays come to a focus, it is used instead of the regular index mark when making pictures on infrared film. All of the scales, and the infrared index as well, are visible from above the camera, so that any of them can be seen at a glance.



Uses of the Ektar lenses

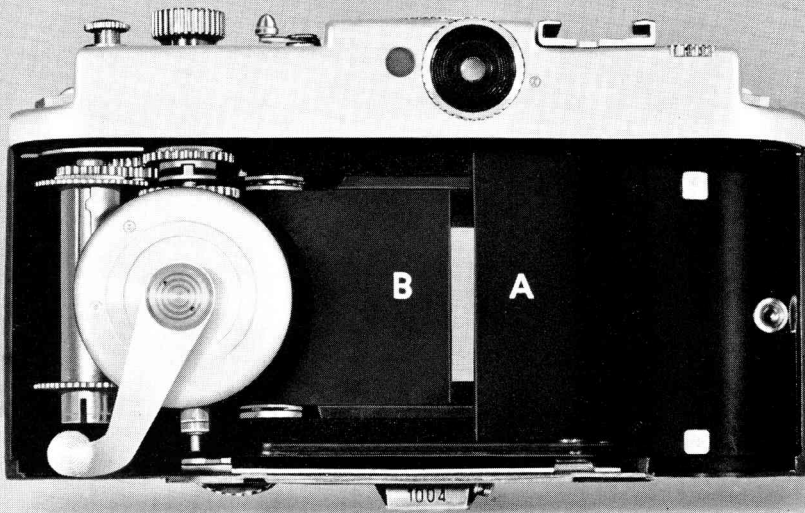
Of the six lenses now ready, the 50-mm. Ektar $f/1.9$ and 50-mm. Ektar $f/3.5$ will no doubt find the widest use, since their normal focal length and large apertures meet the requirements of a great range of photography. In the matter of speed the $f/1.9$ naturally has a tremendous advantage, being about $3\frac{1}{2}$ times as fast as the $f/3.5$. The 35-mm. Ektar $f/3.3$ is a fine, fast lens that serves outstandingly when a wide angle of view is desired. The 90-mm. Ektar $f/3.5$, with its moderately long focus, gives large, sharply detailed images of semidistant subjects, and is also especially adapted to informal portraiture. The 135-mm. Ektar $f/3.8$ and 153-mm. Ektar $f/4.5$ give successively more pronounced "telephoto" effects. Of these two lenses, the $f/3.8$, with its 40 per cent advantage in speed, is more easily adaptable to difficult light conditions. On the other hand, the $f/4.5$ yields a 15 per cent larger image, and, though not as fast as the $f/3.8$, is a highly versatile lens.

In a word, these special Ektars include lenses for every photographic requirement—normal, wide-angle, telephoto, ultra-speed—all designed and constructed for superior performance as integral parts of the Kodak Ektra. Their combination of exhaustive correction, surface treatment, permanently accurate mounts, and simple, precise controls enables them to reach a level of photographic effectiveness and convenience that will more than satisfy even the most critical of users. With this group of lenses at his command, the Ektra owner need not give ground, on the points of optical equipment, and the photographic quality of his results, to any miniature camerist in the world.

The Ektra Shutter

WHILE a fine lens, or family of lenses, carries promise of outstanding camera performance, the realization of this promise depends largely upon the quality of the shutter. For it is the mechanical adjustments and movements of the shutter that either provide or fail to provide that exact control of the optical equipment that is so important in modern precision picture making. This is particularly true of miniature photography with its necessarily minute tolerances . . . and applies most emphatically of all to miniature full-color work.

These facts were made guiding principles in designing the shutter for Kodak Ektra. The latter's system of interchangeable lenses presupposed a shutter of the focal-plane type. Furthermore, full capitalization of these splendid lenses, and general adherence to the Ektra concept of superlative results and unlimited scope, were contingent upon the designing of a high-speed focal plane shutter that could be made more accurate throughout a wide range of speeds, and that would stay more accurate under varying operating conditions, than any other previously devised.



Cutaway rear view of the Ektra's shutter, showing how the aperture is formed by the leading curtain (A) and the follower curtain (B); and, at left, the couplings between the dual-purpose lever and the shutter-winding and film-advancing mechanisms.

A shutter of new design

The design selected employs a slit which passes across the longer dimension of the focal-plane aperture. The slit is formed by an opening between two separate curtains, and its width—which, of course, governs the extent of exposure—is established, not as the shutter is tripped, but before exposure is started. The shafts on which the curtains operate are linked with the shutter-speed controls atop the camera in such a way that when the setting is made for the desired speed the curtains are automatically adjusted to positions that establish a slit of precisely proper width. Furthermore, the curtain shafts are immediately and positively interlocked, so that the relation between the curtains is maintained throughout their passage across the focal plane. This relation compensates for acceleration at high speed to give uniform exposure over the entire field—a factor that looms large in every picture situation, and that is especially important in color photography.

The Ektra shutter provides ten speeds—1, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/250, 1/500, and 1/1000 second—plus “bulb” (time exposures are made with the T.B.I. Cable Release No. 1). As an aid to attaining, and maintaining, the high accuracy, the main curtain shafts operate in oilless bronze bearings, and the diame-

ters of both shafts and bearings are held to extremely close tolerances. By means of quantitative light measurement the slits of various widths are checked against data representing the corresponding speeds, and are minutely adjusted. Final testing operations utilize a scientifically precise photoelectric "scanning" system. From the beginning of construction to the last of the tests, no precision method that modern science can devise is overlooked. The result is highest accuracy, under wide ranges of operating conditions.

Operating features

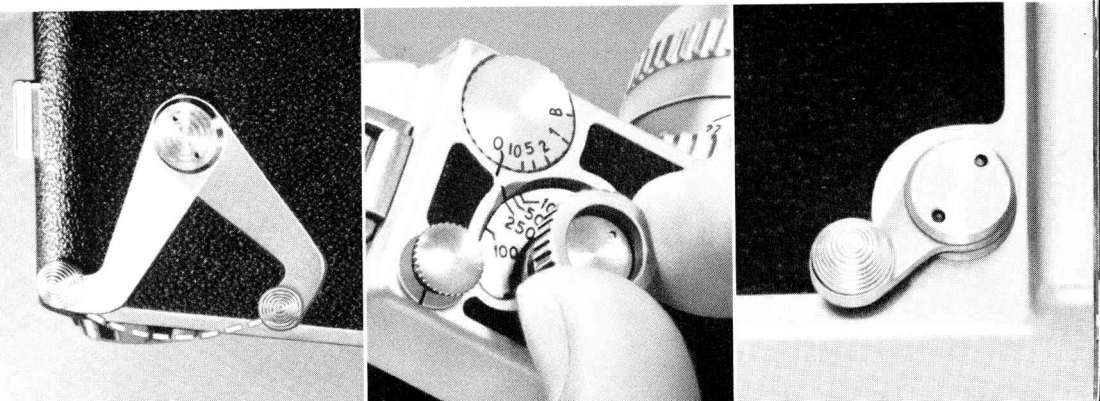
This preciseness is combined with convenient, simple operation. For settings of $1/25$ second or faster, the knurled top of a handy telescoping knob is raised and turned until the selected speed, appearing on a recessed dial, is opposite an index mark. Settings for $1/10$, $1/5$, $1/2$, 1 second, and "bulb" are made by turning an adjoining auxiliary slow-speed scale. Once the setting has been made, the shutter continues to operate at the selected speed until a change is desired. In other words, when a series of pictures is to be made at the same speed, there is no need of reestablishing the desired setting for the succeeding exposures.

The shutter mechanism itself is coupled with the film system of the magazine back in such a manner that advancing the film automatically winds the shutter. The shutter cannot be released until the film is fully advanced. This arrangement provides positive protection against double exposures. Moreover, until the advancing-winding operation is completed, a red signal on the top of the camera warns the user that his camera is not prepared for the next picture.

In the making of sequence pictures, the thumb rapidly performs the advancing-winding operation and a finger of the same hand presses the shutter-release button—all without moving the camera from the picture-taking position at eye level. Contributing to this smoothness of operation is the absence of shutter shock, and of noise that might disturb either subject or operator.

Setting a separate lever on the camera top provides for delayed action with any speed. When this is used, actual exposure takes place after an interval of approximately twelve seconds. The shutter release can easily be locked against

At left: The short stroke of the dual-purpose lever, two strokes of which advance the film and wind the shutter. **Center:** Close-up of the high-speed shutter setting knob, high-speed and retard scales. **Right:** The delayed-action lever atop the camera.



accidental exposure by a partial turn of the plunger, and when the cap is unscrewed from the top of the plunger, a threaded socket is available for attaching the T.B.I. Cable Release or the accessory Flash Synchronizer.

Universal accuracy

Easy selection from the wide range of speeds . . . automatic winding . . . smooth, quiet exposure . . . a carefully worked-out general operating ease . . . all these characteristics of the Ektra shutter are highly gratifying to the discriminating photographer. Yet all are subordinate to its accuracy. Precision exposure at every speed over every part of the negative . . . that is the chief aim, and accomplishment, of the Ektra shutter. In the final analysis it is this factor that brings the shutter into line with the concept of the world's most distinguished camera.

View Finder

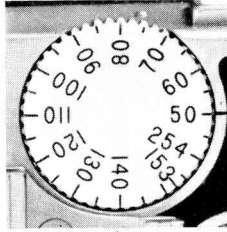
AN ABSOLUTE requirement with interchangeable lenses of various focal lengths is some positive method of ascertaining the field which each one covers as a result of its particular angle of view. In copying work, and also when a tripod is used, this can be done with the aid of a ground glass—and such an accessory is available for Kodak Ektra. In general picture taking, however, the use of a ground glass is not practicable—hence the Ektra's variable-power view finder.

A unique finder system

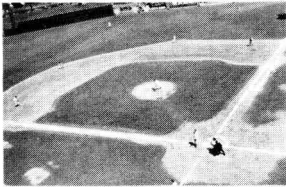
In several respects this view finder is without parallel. It is the only parallax-correcting, variable-power system built into a camera as an integrally operating mechanism. It can be set instantly for the focal length of each of the lenses now available and to be offered later, requiring only the addition of minor accessories for wide-angle and extreme telephoto work. As the setting of the control dial atop the camera is changed for a lens of greater or smaller focal length, objects in the field of view change in size accordingly, but in every case the entire view finder frame is utilized. When, for instance, the finder is adjusted for a lens of longer focus, the finder frame is not reduced by mechanical masking to indicate the more restricted field; on the contrary, the image is magnified optically to fill the full original frame. This feature, especially valuable in telephoto work, is illustrated on the opposite page. The view-determining lenses which govern the action are shown in the detailed illustration of the system on page 16.

When the camera is in use, this action is accompanied by another. As the lens is focused, the cam which controls the range-finder system also actuates a second cam—a part of the view-finder assembly and the connecting link between the two systems. This cam controls a movable lens which, operating in a vertical plane, compensates for the separation between the axes of the view finder and

KODAK EKTRA'S VARIABLE-POWER VIEW FINDER is controlled by this dial on the top of the camera. As the dial is turned to the figure representing the focal length of the lens used—in the illustration a 50-mm. lens—the optical system of the finder

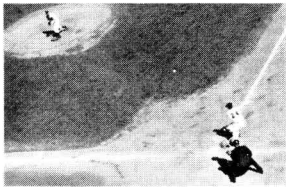
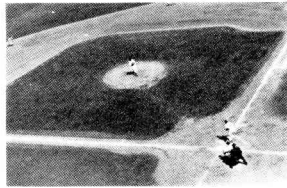


changes the angle it covers, and its magnification, to correspond with the angle and magnification of the lens itself. The illustrations below show how a typical scene appears, from the same point, as the finder is adjusted for the various lenses for the Ektra.



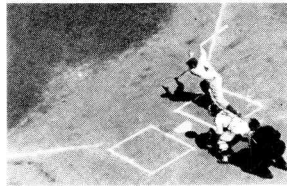
35-mm. Wide-Angle Lens
(adjustment with aid of wide-angle finder lens)

50-mm. Lens



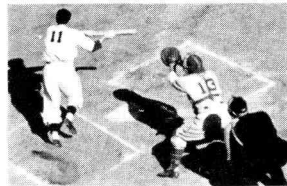
90-mm. Lens

135-mm. Lens



153-mm. Lens

254-mm. $f/4.5$ Lens
(not yet available)



PARALLAX CORRECTION is accomplished automatically—at all the various magnifications and angles—and the subject as seen

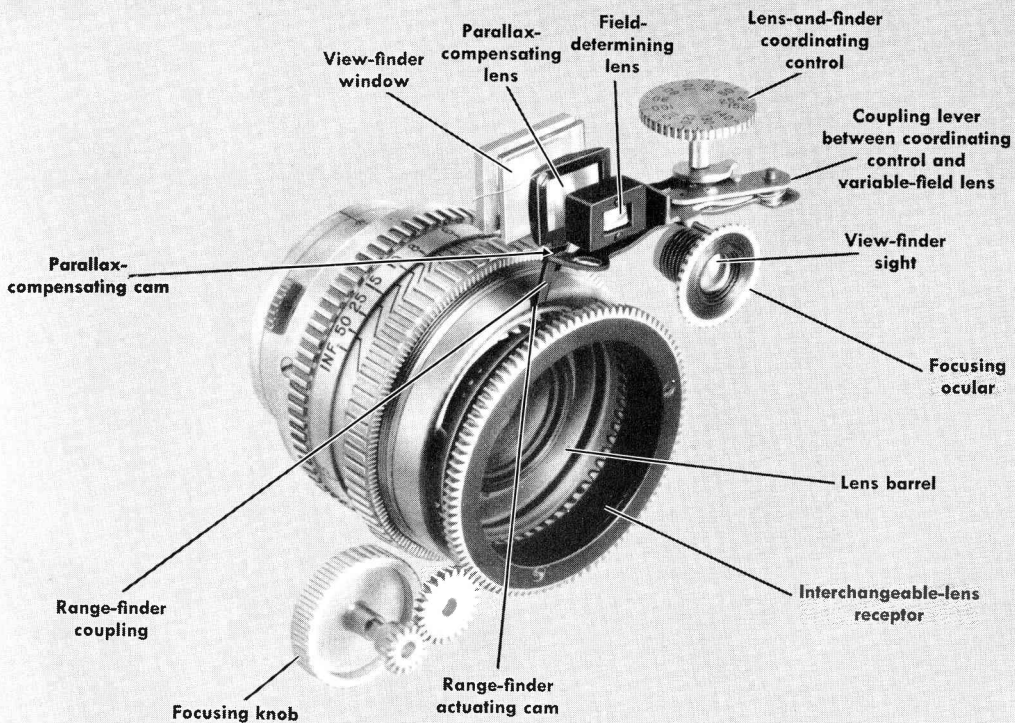
through the finder presents the field covered by the taking lens with respect to displacement, as well as to area and scale.



Left: The Ektra's parallax-corrected finder shows the subject as it will be photographed.

Right: If the finder were not corrected for parallax the subject would be photographed with approximately this vertical displacement.





the taking lens. The result is accurate automatic parallax correction for all distances within the normal focusing ranges of the various lenses.

Exceptional sighting efficiency

This double coupling of the two systems delineates with great precision the field being covered with any of the lenses at any normal picture-making distance . . . a field established in scope by the view-determining lenses, and corrected for parallax by the special compensating device just described. But still another element is introduced as an aid to the Ektra user. By means of a milled ring he can quickly adjust the view-finder eyepiece to his individual vision, to get the clearest possible image. The view-finder system has large "eye relief," so that neither this adjustment nor the wearing of spectacles changes the view.

With the finder control properly set, and the eyepiece adjusted to his vision, the user does not need to make allowances, or use masks, or follow guide lines in the finder field, or content himself with a tiny image of a distant subject. He can see clearly, instantly, certainly, what his picture will include, regardless of the

lens in use and the distance. Kodak Ektra makes this possible for the first time outside the reflex-camera field. A camera with all of the essential "extras" built in, it has none of greater interest or importance than this remarkable finder system.

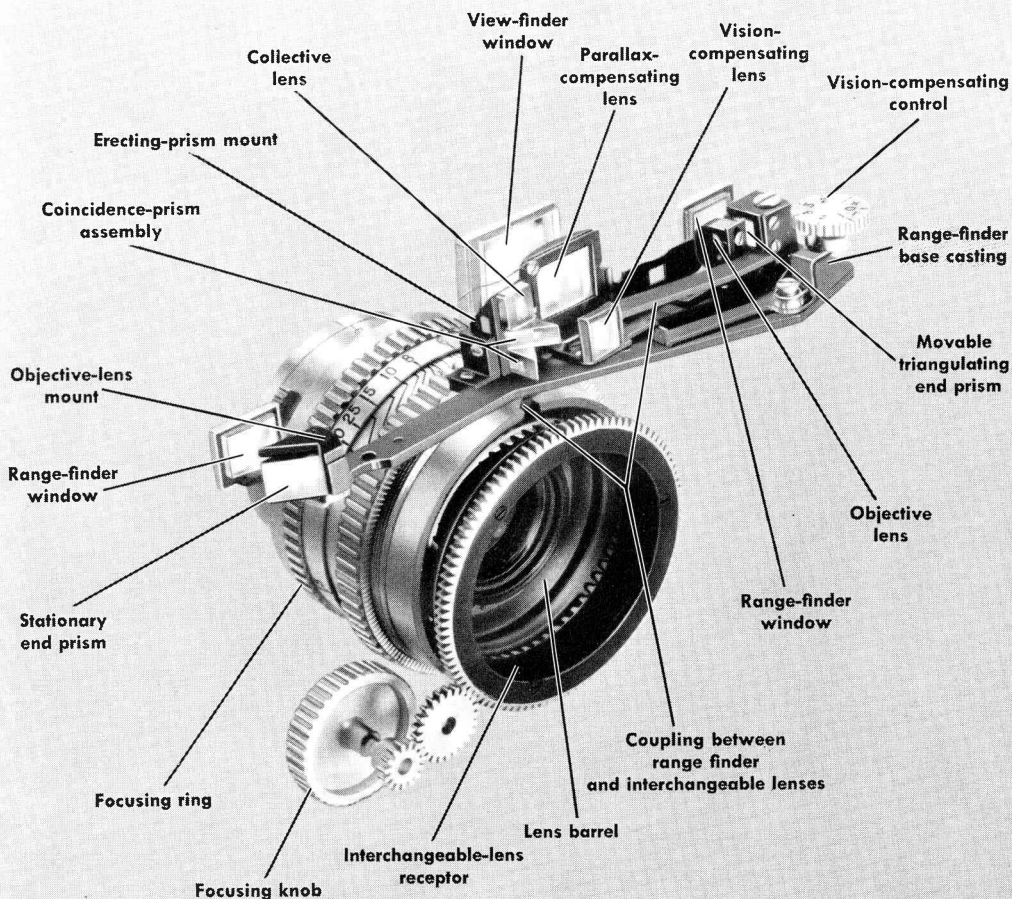
Range Finder

IT IS impossible to derive full benefit from a camera engineered for high precision unless that precision extends to such operating equipment as its range finder. This fact was not lost sight of in designing the coupled range finder for Kodak Ektra. As finally evolved, it functions more easily, more positively, and under more widely varying conditions than any other built-in range finder.

A highly advanced range finder

The design is based on the well-known split-field principle. The optical system splits the image horizontally into halves, and these half-images are obtained through separate windows at either end of the camera. When the Ektra is aimed

17



at a subject not in focus, the halves, as seen through the range-finder eyepiece, are laterally offset . . . the corresponding parts of the subject image out of alignment. As the range finder is operated, the upper half of the image, reflected by a stationary end prism at the left end of the camera, remains in fixed position. The lower half, however, moves to right or left as the mechanism actuates a movable triangulating prism at the other end of the camera. When the halves have been brought into alignment, the subject is in focus.

One advantage of this design is that the sharply split halves of the image can be seen in almost any light, permitting accurate focusing in many cases where other types of range finders fail. This is the same costly but highly efficient design, which, because of its accuracy, is used on surveying instruments and on military range-finding equipment. Furthermore, the accuracy of any range finder involving triangulation depends upon the length of its base, and the base of the Ektra finder— $4\frac{1}{8}$ inches—is longer than any heretofore attained in built-in miniature-camera focusing equipment

When you inspect Kodak Ektra, you will find that the range finder has an eyepiece, or sight, of its own, located only one-fourth inch from the view finder. This separate eyepiece permits the use of a magnified image. Viewed through the Ektra range finder, the subject is 1.6 times as large as the naked eye sees it . . . an important additional step toward hairline focusing.

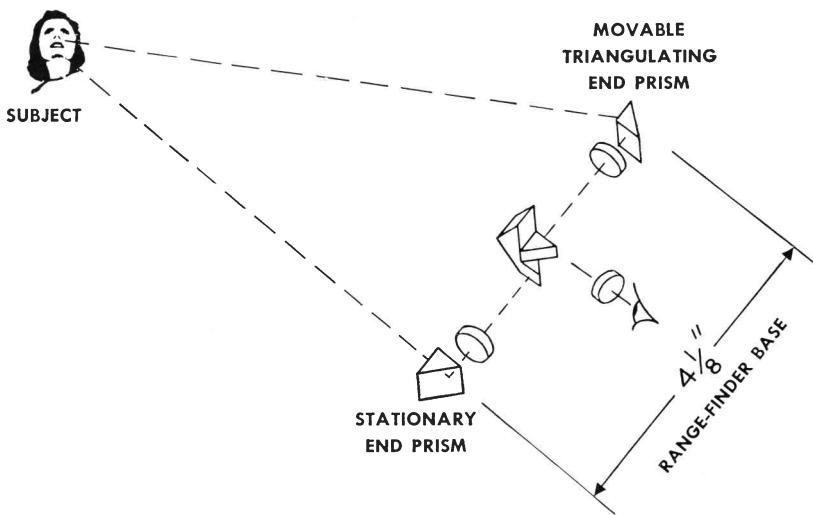
One other feature aids in the same direction. By turning a simple control dial on the camera top, the user can quickly adjust the range finder to his individual vision to get the sharpest possible image. This de luxe accessory function, like so many other Ektra features, is built directly into the camera.

Automatic focusing of unmatched accuracy

Combining the critical registering characteristics of the military-type split-field triangulation principle, an unprecedentedly long base, separate eyepiece with an image magnified more than one and one-half times, accommodation for the individual user's vision, and usability in poor light, the Kodak Ektra range finder affords the most precise automatic focusing available on any camera. Coupling automatically with any of the interchangeable lenses available for the Ektra, without fitting or adjustment, it likewise does its share toward capitalizing those lenses to the full. Thus it contributes brilliantly to the exceptional capability maintained throughout the Kodak Ektra.



MILITARY-TYPE DESIGN OF THE EKTRA RANGE FINDER



The small rectangle outlined in white represents the part of the field covered by taking lens and view finder that is chosen for critical focusing with the range finder.



The halves of the image, as seen through the range finder, are split and out of alignment here as the lens is focused for a distance shorter than that from camera to subject.



Here the halves are out of alignment because the lens is focused for a distance greater than that from the camera to the subject.



When the halves of the image have been brought into register, as they appear here, the lens is in exact focus for the subject.