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The Minolta SLR System of Creative Photography

Minolta makes a really complete 35mm photographic system so that you can be a really complete photographer. Now that you own one of the famous Minolta SLR cameras, you have the nucleus of the world's finest system of 35mm photography. Your potential is practically unlimited.

Judged by any standards of photographic excellence, Minolta SLR cameras are thoroughly professional instruments of uncompromising quality. With their versatile complement of specially designed Minolta lenses and many precision Minolta accessories, they are capable of mastering virtually any photographic situation imaginable.

Minolta makes more than 150 lenses, accessories, and attachments for use with Minolta SLR cameras. Encompassed are interchangeable Minolta/Celtic and Rokkor-X

Lenses, including meter-coupled zoom-type, from 16mm fisheye to 1600mm extreme telephoto plus the full range of accessories and attachments shown on the facing page. Most of these are described in this booklet.

Now that you own a Minolta SLR camera, you owe it to yourself to fit it with genuine Minolta accessories and particularly with Minolta interchangeable lenses that match it in quality. These lenses and accessories are made by Minolta expressly for your SLR. To assure best results, be sure you get these genuine products; they are the only ones that will give you maximum performance every time.

The object of the Minolta SLR system is to give every photographer, no matter what his skill, a creative choice in all areas of photography. Your Minolta dealer can demonstrate the full SLR camera, lens, and accessory line and help you choose the equipment that best suits your needs. See him for technical help, too. Your adventures in creative photography may very well begin in his store.

How Minolta Makes a Lens

Minolta is one of only two camera companies in Japan and one of a very few in the world that make their own optical glass and lenses. This little-known fact becomes very important when you consider that only in this way can a camera company ensure the precise optical and mechanical design properties so vital to advanced photography.

Before a Minolta lens is mounted on a Minolta camera, it passes through a complex series of manufacturing steps performed to the highest standards in the camera

industry. Each Minolta lens, in fact, is the end result of a long series of computations and tests aimed at eliminating the various aberrations that interfere with theoretically perfect lens performance. What kinds of glass should be used? What should the curvature and diameter of lens elements be? How should they be positioned? Minolta lens designers, aided by Minolta's own electronic computer, investigate and decide on these and many other problems long before the actual making of a lens.

The Basic Ingredients

The "recipe" of glass-making ingredients varies with the type of glass to be made. Among the materials often used are silica, sodium carbonate, alumina, barium, and lead oxide. Among many other ingredients that may be added to obtain special characteristics for quality Minolta Lenses are tho-

rium, zirconium, and rare-earth elements such as lanthanum.

The measured materials are melted and stirred in crucibles (platinum-lined ones for high-index glasses) at temperatures in the neighborhood of 1500°C for many hours, then gradually cooled over a period of days. The congealed glass is broken into easily-handled fragments which are subjected to rigid inspections for bubbles, striae, and other defects, and imperfect pieces or parts are discarded. The perfect lumps are split into weight-sized pieces, which are tumbled, heat-softened, and hydraulically pressed into blanks. From one to two further weeks of fine annealing processing relieves internal stresses and adjusts refractive index.

Grinding, Polishing, and Achromatic Coating

Diamond grinders are used for initial shaping of the disk-shaped lens blanks, which

are then further rough-ground with abrasive to approximate curvature. The rough-ground lens elements then pass through a series of mechanized abrasive and rough polishers with continual curvature gauging to produce the final high-precision finish. Optical centering and assembly in special dust- and temperature-controlled facilities precede final rigid adjustment and testing.

Conventional lens coating is done with magnesium fluoride, but Minolta, for decreased flare and improved color rendition, pioneered in developing a special technique called "Achromatic Coating" a decade and a half ago. This exclusive process provides a double coating of fluorides plus other ingredients to yield a very high rate of light transmission as well as superior color rendition. As a result, Rokkor-X Lenses give rich, true color tones—better than any other lens made today we are sure you'll agree.



Focal Length, Lens "Speed," and Angle of View

The focal length of a lens is the distance from a calculated point on the lens axis (usually at or near the lens diaphragm for medium focal lengths) to the film plane when the lens is focused at infinity.

Dividing the focal length by the diameter of the diaphragm aperture yields the F-number at the lens opening. At any constant focal length, the F-number thus becomes smaller as the aperture diameter becomes larger, but the volume of light passed by the lens increases. At usual apertures, each F-number setting in the series allows trans-

mission of twice the light volume of the next numerically smaller one and half that of the next numerically larger one. For example, when you change the lens setting from F5.6 to F4, light passing through the lens is doubled. Changing the setting from F5.6 to F8, on the other hand, cuts light transmitted in half. One such doubling or halving is one full F-stop.

The "speed" of a lens is indicated by its maximum aperture: The larger this lens opening (i.e., the smaller the F-number), the "faster" the lens. An F1.4 lens is considered one stop faster than, or twice as fast as, an F2.

Angle of view is a measurement in degrees of the amount of a scene included across the diagonal of the frame covered by the lens at a given distance. As focal length decreases, angle of view generally increases: Thus, a 50mm standard lens has an angle of view approximately double that of a 100mm telephoto, and a 28mm wideangle takes in about twice as much of a scene as does the 58mm.

Cleaning and Storage of Lenses

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If a lens becomes dusty or soiled, loose matter may be whisked off with a bellows lens brush and the glass surface wiped gently with a soft, clean cloth.

Lenses should be stored away from heat, high humidity, and harmful chemicals and vapors. Always keep lenses capped in their cases when they are not in use.

When attaching or removing a lens from the camera body, be careful not to touch the glass surfaces.

Minolta/Celtic and Rokkor-X Lenses

lies of genuine Minolta optics: The Minolta/Celtic line, and the incomparable Rokkor-X series.

Minolta/Celtic Lenses offer computer design and traditionally fine Minolta quality at popular prices. Minolta/Celtic Lenses are made of the finest optical glass in the most used wideangle and telephoto focal lengths to suit the usual needs of most photographers.

Rokkor-X Lenses, which offer Minolta's exclusive Achromatic Coating as well as the ultimate in computer design, are distributed through authorized Minolta Advanced System dealers. Their superb optical performance and impeccable mechanical construction reflect the precision of the Minolta XK single-lens-reflex system of photography. The Rokkor-X series ranges in focal length from 16mm fisheye to 1600mm extreme telephoto and includes specially designed macro lenses and zooms. Although an integral part of the XK system, Rokkor-X Lenses are, of course brilliant performers with Minolta SR-T cameras, too.

As the owner of a Minolta SLR, you may choose your lenses from two distinct fami-

28mm F3.5 MC Minolta/Celtic

Construction: 7 elements in 7 groups

Angle of view: 75°

Min. focus distance: 2 ft.

Filter thread diameter: 55mm

Diaphragm: Auto preset F3.5–F16



35mm F2.8 MC Minolta/Celtic

Construction: 7 elements in 6 groups

Angle of view: 63°

Min. focus distance: 1.25 ft.

Filter thread diameter: 55mm

Diaphragm: Auto preset F2.8–F16



135mm F2.8 MC Minolta/Celtic

Construction: 5 elements in 4 groups
Angle of view: 18°
Min. focus distance: 5 ft.
Filter thread diameter: 55mm
Diaphragm: Auto preset F2.8–F22

**135mm F3.5 MC Minolta/Celtic**

Construction: 4 elements in 4 groups
Angle of view: 18°
Min. focus distance: 5 ft.
Filter thread diameter: 55mm
Diaphragm: Auto preset F3.5–F22



200mm F4 MC Minolta/Celtic

Construction: 6 elements in 5 groups

Angle of view: 12°

Min. focus distance: 8 ft.

Filter thread diameter: 55mm

Diaphragm: Auto preset F4–F22

**100-200mm F5.6 MC Zoom Minolta/Celtic**

Construction: 8 elements in 5 groups

Angle of view: 24° – 12°

Min. focus distance: 8 ft.

Filter thread diameter: 55mm

Diaphragm: Auto preset F5.6–F22





Rokkor-X Wideangle Lenses

These lenses have a number of interesting and useful applications for both amateur and professional photographers. With their ability to take in a large part of a scene at short distances, they are especially useful when working at close quarters. Their exaggerated perspective suits them to use for special effects and in creative photography. Both these characteristics of wideangle lenses are employed to advantage in architectural photography.

The short focal length of wideangle lenses gives them considerable depth of field even at large apertures or short distances. This inherent extra depth of field can aid in making sharp photos at peak action without the delay needed for adjusting focus.

Naturally, each of these Rokkor-X wideangles is a meter-coupled, auto-diaphragm lens designed to permit full-aperture metering/viewing and operation as normal with no need for mirror lock-up.

16mm F2.8 MC Fisheye Rokkor-X

Construction: 11 elements in 8 groups

Angle of view: 180°

Min. focus distance: 0.3m (1 ft.)

Filters: Built-in

Diaphragm: Auto preset F2.8 — F16



21mm F2.8 MC W Rokkor-X

Construction: 12 elements in 9 groups

Angle of view: 92°

Min. focus distance: 0.25m (0.8 ft.)

Filter thread diameter: 72mm

Diaphragm: Auto preset F2.8 — F16

**24mm F2.8 MC W Rokkor-X**

Construction: 9 elements in 7 groups

Angle of view: 84°

Min. focus distance: 0.3m (1 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F2.8 — F16



28mm F3.5 MC W Rokkor-X

Construction: 7 elements in 7 groups

Angle of view: 75°

Min. focus distance: 0.6m (2 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F3.5 — F16



28mm F2.5 MC W Rokkor-X

Construction: 9 elements in 7 groups

Angle of view: 75°

Min. focus distance: 0.5m (1.75 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F2.5 — F16



35mm F2.8 MC W Rokkor-X

Construction: 7 elements in 6 groups

Angle of view: 63°

Min. focus distance: 0.4m (1.25 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F2.8 — F16

**35mm F1.8 MC W Rokkor-X**

Construction: 8 elements in 6 groups

Angle of view: 63°

Min. focus distance: 0.3m (1 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F1.8 — F16



Rokkor-X Standard Lenses

50mm F1.7 MC Rokkor-X

Construction: 6 elements in 5 groups

Angle of view: 47°

Min. focus distance: 0.5m (1.75 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F1.7 — F16

The MC Rokkor-X 50mm F1.7 and F1.4 and the 58mm F1.2 lenses are widely known as the fine "normal" or "standard" lenses for Minolta SLR cameras and are well suited for most general photographic purposes.

All are ideal for available-light photography indoors and for other low-illumination situations.

Light in weight and styled with "human-engineered" waffle-pattern rubber focusing grips, these standard lenses, like all MC Rokkor-X's, are fitted with automatic iris diaphragms and meter-coupling lug rings. They thus provide for full-aperture light measuring or focusing with the diaphragm always open to maximum aperture except at the instant of exposure.



50mm F1.4 MC Rokkor-X

Construction: 7 elements in 5 groups

Angle of view: 47°

Min. focus distance: 0.5m (1.75 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F1.4 — F16

**58mm F1.2 MC Rokkor-X**

Construction: 7 elements in 5 groups

Angle of view: 41°

Min. focus distance: 0.6m (2 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F1.2 — F16





Rokkor-X Telephoto and Zoom Lenses

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Tele Rokkor-X Lenses are available in a wide range of fixed or continuously variable focal lengths that start with 80mm and extend through 1600mm. Like the wideangle and standard, all are fully meter- and auto-diaphragm-coupled for full-aperture metering/viewing, except for the RF type, with which the stop-down method is used.

The 85mm, 100mm, and 135mm Tele Rokkor-X Lenses are popular among working professionals. All are ideal for candid or portrait photography, allowing greater working distances from subjects and preventing distortion of features (nose, ears, chin) nearest the lens.

The 200mm and 300mm telephotos offer even more optical "reach" for the sports, nature, or human-interest photographer yet

are lightweight and compact enough to be hand-held. The 300mm F4.5 MC Tele Rokkor-X is also equipped with a tripod socket for midsection support and perfect balance. It is invaluable for photographing unapproachable subjects such as distant landmarks or to keep you a safe distance from dangerous objects and situations.

Each of the MC Zoom Rokkor-X Lenses allows the photographer to select the exact focal length he wants from an infinite number within a particularly useful range. The 80–200mm model thus provides in only one lens the collective telescopic advantages of short and medium fixed telephotos and more. The extraordinary 100–500mm is light and compact despite its great focal-length range, which is especially effective in sports and nature photography. Each of these lenses is a light, compact new design equipped for full-aperture metering/focusing and automatic diaphragm operation. And each can be zoomed and focused with one hand on the positive, comfortable grip of waffle-textured rubber—another instance of

the easy handling Minolta is famous for.

The catadioptric-type 800mm and 1600mm RF Rokkor-X's, utilize precision ground-and-polished mirrors in combination with conventional refractive lens elements in their designs. Light travels the length of the barrel three times in an overlapping reflex path, resulting in relatively small bulk for such enormous focal lengths.

This compactness is particularly striking in the 800mm RF Rokkor-X, which yields some 16 times the magnification of a standard lens yet can even be used hand-held—rare with optics of this great focal length. Similarly, the actual length of the 1600mm RF Rokkor-X measures only one fifth of its extraordinary focal length, which produces images 32 times larger than a standard lens.

Both of these mirror lenses are suited for sports, landscape, and nature photography at extreme distances. Lens-stop settings for them are achieved with neutral-density filters, which, like the special "sharp-cut" filters provided constitute integral elements of the optical system.

85mm F1.7 MC Rokkor-X

Construction: 6 elements in 5 groups

Angle of view: 29°

Min. focus distance: 1m (3.3 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F1.7 — F22



100mm F2.5 MC Tele Rokkor-X

Construction: 6 elements in 5 groups

Angle of view: 24°

Min. focus distance: 1.2m (4 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F2.5 — F22



135mm F3.5 MC Tele Rokkor-X

Construction: 4 elements in 4 groups

Angle of view: 18°

Min. focus distance: 1.5m (5 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F3.5 — F22

**135mm F2.8 MC Tele Rokkor-X**

Construction: 6 elements in 5 groups

Angle of view: 18°

Min. focus distance: 1.5m (5 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F2.8 — F22



200mm F4.5 MC Tele Rokkor-X

Construction: 5 elements in 5 groups

Angle of view: 12°

Min. focus distance: 2.5m (8 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F4.5 — F22



200mm F3.5 MC Tele Rokkor-X

Construction: 6 elements in 4 groups

Angle of view: 12°

Min. focus distance: 2.5m (8 ft.)

Filter thread diameter: 62mm

Diaphragm: Auto preset F3.5 — F22



300mm F5.6 MC Tele Rokkor-X

Construction: 5 elements in 5 groups

Angle of view: 8°

Min. focus distance: 4.5m (15 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F5.6 — F22

**300mm F4.5 MC Tele Rokkor-X**

Construction: 6 elements in 6 groups

Angle of view: 8°

Min. focus distance: 4.5m (15 ft.)

Filter thread diameter: 72mm

Diaphragm: Auto preset F4.5 — F22



800mm F8 RF Rokkor-X

Construction: 2 mirrors,

8 lens elements in 7 groups

Angle of view: 3°

Min. focus distance: 8m (26 ft.)

Filters: Integral lens-element type

Lens stops: F8 and F16 by ND filters

**1600mm F11 RF Rokkor-X**

Construction: 2 mirrors,

7 lens elements in 6 groups

Angle of view: 1° 30'

Min. focus distance: 20m (70 ft.)

Filters: Integral lens-element type

F-stop control: F11-F22 by ND filters



80-200mm F4.5 MC Zoom Rokkor-X

Construction: 14 elements in 10 groups

Angle of view: 30°-12°

Min. focus distance: 1.8m (6 ft.)

Filter thread diameter: 55mm

Diaphragm: Auto preset F4.5 — F32

**100-500mm F8 MC Zoom Rokkor-X**

Construction: 16 elements in 10 groups

Angle of view: 24°-5°

Min. focus distance: 2.6m (8 ft.)

Filter thread diameter: 72mm

Diaphragm: Auto preset F8-32



Close-ups and Photomacrography: Striking New Views of Ordinary Objects

Of all the kinds of photography possible with the Minolta SLR system, the two that probably yield that most consistently unusual pictures are close-up photography and photomacrography.

For even the beginning photographer the possibilities in these fields are practically unlimited, and the results are almost always uncommonly exciting. Everyday objects such as stamps or coins, mechanical subjects such as the movements or gears of a wrist watch, insects, plants and myriads

more take on aspects missed by the human eye. The commonplace becomes extraordinary through magnification.

The world of close-ups and photomacrography—i.e., close pictures at up to a dozen or so times life size—provides a stimulating challenge for any photographer to test his techniques and imagination. But today, particularly using a TTL-metering Minolta SLR with special attachments makes these kinds of photography easier, faster, and more practical than ever before.

The main advantage of using these cameras with accessories for close-ups or photomacrography is that the through-the-lens metering system eliminates the need to calculate exposure factor or effective aperture. It thus does away with the most complicated and troublesome factor involved with longer-than-normal extension: Since light is measured through the lens and any other Minolta close-up or extension devices being used, all adjustment for exposure is completely automatic, regardless of magnification ratio.

50mm F3.5 MC Macro Rokkor-X

Construction: 6 elements in 4 groups
Angle of view: 47°
Min. focus distance: 0.23m (9 in.)
Filter thread diameter: 55mm
Diaphragm: Auto preset F3.5 — F22
Accessories: Life-Size Adapter,
Reverse Ring

**100mm F3.5 MC Macro Rokkor-X**

Construction: 5 elements in 4 groups
Angle of view: 24°
Min. focus distance: 0.45m (1.5 ft.)
Filter thread diameter: 55mm
Diaphragm: Auto preset F3.5 — F22
Accessory: Life-Size Adapter



Used with a Minolta SLR, the 50mm and 100mm MC Macro Rokkor-X's make photomacrography easier than ever before. All information required to determine magnification ratio and adjust exposure with non-TTL cameras is engraved on the lens barrel. With our TTL SR-T series cameras, the lens is set for correct exposure simply by turning its aperture ring until the two needles are aligned in the viewfinder. With our new electronic-shutter models, exposure control can be completely automatic. Either of these lenses attaches to any Minolta SLR camera and focuses all the way from infinity to half life-size in its regular mount without attachments. Using the life-size adapter, magnification ratios from half life-size to 1:1 (life size) can be obtained. Each of these lenses may also be used for ordinary photography with excellent results.



100mm F4 Auto Bellows Rokkor-X

Construction: 3 elements in 3 groups

Angle of view: 24°

Filter thread diameter: 55mm

Diaphragm: Auto preset F4 — F32



This lens is designed with a short mount and no focusing ring for use with the Auto Bellows I (see page 35). The focusing range with this bellows is all the way from infinity to 1:1 magnification (life size) on the film. This lens' relatively great focal length enables greater lens-to-subject distance, with resulting greater freedom in placement of lighting equipment. Its automatic diaphragm operation facilitates focusing and viewing up to and after the moment of exposure. Like many other Minolta lenses, it has a built-in depth-of-field preview button.



LENS	ELEMENTS	GROUPS	METER-COUPLED AUTO-DIAPHRAGM	ANGLE OF VIEW	MINIMUM FOCUS	MINIMUM F-STOP	FILTER-MOUNT DIAMETER	DIMENSIONS	WEIGHT
28mm F3.5 MC MINOLTA/CELTIC	7	7	Yes	75°	0.6m/2 ft.	F16	55mm	φ63×45mm	260g/9½ oz.
35mm F2.8 MC MINOLTA/CELTIC	7	6	Yes	63°	0.4m/1.25 ft.	F16	55mm	φ63×45.3mm	240g/8½ oz.
135mm F2.8 MC MINOLTA/CELTIC	5	4	Yes	18°	1.5m/5 ft.	F22	55mm	φ64.2×100.5mm	610g/1 lb. 8 oz.
135mm F3.5 MC MINOLTA/CELTIC	4	4	Yes	18°	1.5m/5 ft.	F22	55mm	φ62.8×88.5mm	415g/14¼ oz.
200mm F4 MC MINOLTA/CELTIC	6	5	Yes	12°	2.5m/8 ft.	F22	55mm	φ65.6×130.5mm	595g/1 lb. 7¼ oz.
100-200mm F5.6 MC ZOOM MINOLTA/CELTIC	8	5	Yes	24°—12°	2.5m/8 ft.	F22	55mm	φ63.9×173mm	630g/1 lb. 6¼ oz.
16mm F2.8 MC FISHEYE ROKKOR-X	11	8	Yes	180°	0.3m/1 ft.	F16	Built-in	φ70.6×63.5mm	440g/15½ oz.
21mm F2.8 MC W ROKKOR-X	12	9	Yes	92°	0.25m/0.8 ft.	F16	72mm	φ75×66.9mm	515g/1 lb. 2½ oz.
24mm F2.8 MC W ROKKOR-X	9	7	Yes	84°	0.3m/1 ft.	F16	55mm	φ65.2×50mm	410g/14½ oz.
28mm F3.5 MC W ROKKOR-X	7	7	Yes	75°	0.6m/2 ft.	F16	55mm	φ63.4×45mm	260g/9¼ oz.
28mm F2.5 MC W ROKKOR-X	9	7	Yes	75°	0.5m/1.75 ft.	F16	55mm	φ65.8×61.5mm	350g/12¾ oz.
35mm F2.8 MC W ROKKOR-X	7	6	Yes	63°	0.4m/1.25 ft.	F16	55mm	φ63.4×45mm	240g/8½ oz.
35mm F1.8 MC W ROKKOR-X	8	6	Yes	63°	0.3m/1 ft.	F16	55mm	φ65.8×67.6mm	415g/14¾ oz.
50mm F1.7 MC ROKKOR-X	6	5	Yes	47°	0.5m/1.75 ft.	F16	55mm	φ64.6×41mm	240g/8½ oz.
50mm F1.4 MC ROKKOR-X	7	5	Yes	47°	0.5m/1.75 ft.	F16	55mm	φ65.2×46mm	305g/10¼ oz.
58mm F1.2 MC ROKKOR-X	7	5	Yes	41°	0.6m/2 ft.	F16	55mm	φ70.8×54mm	478g/1 lb. ¾ oz.

LENS	ELEMENTS	GROUPS	METER-COUPLED AUTO-DIAPHRAGM	ANGLE OF VIEW	MINIMUM FOCUS	MINIMUM F-STOP	FILTER-MOUNT DIAMETER	DIMENSIONS	WEIGHT
85mm F1.7 MC ROKKOR-X	6	5	Yes	29°	1m/3.3 ft.	F22	55mm	φ71.2×62mm	460g/1 lb. ¼ oz.
100mm F2.5 MC TELE ROKKOR-X	6	5	Yes	24°	1.2m/4 ft.	F22	55mm	φ65.8×68.5mm	430g/15½ oz.
135mm F3.5 MC TELE ROKKOR-X	4	4	Yes	18°	1.5m/5 ft.	F22	55mm	φ64.5×88.5mm	415g/14½ oz.
135mm F2.8 MC TELE ROKKOR-X	6	5	Yes	18°	1.5m/5 ft.	F22	55mm	φ67×93.5mm	518g/1 lb. 2¼ oz.
200mm F4.5 MC TELE ROKKOR-X	5	5	Yes	12°	2.5m/8 ft.	F22	55mm	φ64.5×130mm	545g/1 lb. 3¼ oz.
200mm F3.5 MC TELE ROKKOR-X	6	4	Yes	12°	2.5m/8 ft.	F22	62mm	φ75.4×137.5mm	775g/1 lb. 11½ oz.
300mm F5.6 MC TELE ROKKOR-X	5	5	Yes	8°	4.5m/15 ft.	F22	55mm	φ65.2×186mm	720g/1 lb. 9½ oz.
300mm F4.5 MC TELE ROKKOR-X	6	6	Yes	8°	4.5m/15 ft.	F22	72mm	φ80×199.5mm	1155g/2 lb. 8½ oz.
800mm F8 RF ROKKOR-X	8 2 Mirrors	7	No; manual	3°	8m/26 ft.	F16	Built-in	φ125×166.5mm	1800g/3 lb. 15½ oz.
1600mm F11 RF ROKKOR-X	7 2 Mirrors	6	No; manual	1°30'	20m/70 ft.	F22	Built-in	φ178×322.5mm	6500g/14 lb. 5 oz.
80-200mm F4.5 MC ZOOM ROKKOR-X	14	10	Yes	30°—12°	1.8m/6 ft.	F32	55mm	φ74.4×156mm	700g/1 lb. 8½ oz.
100-500mm F8 MC ZOOM ROKKOR-X	16	10	Yes	24°— 5°	2.5m/8 ft.	F32	72mm	φ91×330mm	2000g/4 lb. 6½ oz.
50mm F3.5 MC MACRO ROKKOR-X	6	4	Yes	47°	0.23m/9 in.	F22	55mm	φ67.2×55.5mm	345g/12½ oz.
100mm F3.5 MC MACRO ROKKOR-X	5	4	Yes	24°	0.45m/1.5 ft.	F22	55mm	φ75×88.5mm	600g/1 lb. 5½ oz.
100mm F4 AUTO BELLOWS ROKKOR-X	3	3	Autodiaph'm	24°	—	F32	55mm	φ63.5×35mm	165g/5½ oz.

The Tools of Close-up Photography and Photomacrography

Even without accessories or attachments, the standard lenses on Minolta SLR cameras permit a considerable variety of close-up photography. The MC Rokkor-X 58mm F1.2 Lens can be focused for pictures as close as 60cm (2 ft.) in its standard mounting on the camera. The 50mm F1.4 focuses down to 55cm (1.75 ft.) just as it is. But to get closer to your subject for even more dramatic results, use Minolta's special equipment designed to provide photographs much larger than life size.

The simple combination of a Minolta SLR camera with 50mm lens and a supplementary screw-on close-up lens is sufficient, at modest cost, to do many close-ups and copying. For more specialized work, you can select from a range of Minolta extension tubes and bellows, special Minolta lenses, and so on for the performance and flexibility needed.

Besides precision lenses or attachments and a measure of patience, the great majority of close-ups and macrophotography will require a sturdy tripod or other base from which to shoot, as the slightest movement of camera or support will be greatly exaggerated. The Minolta Copy Stand, described on page 35, was designed to provide the maximum stability essential in these kinds of photography.

Lighting techniques for photomacrography and close-ups in many ways resemble those for other types of photography. You may wish to experiment with such basic lighting types as back lighting to show edge details, front lighting for standard effects, side lighting to bring out texture, diffuse shadowless lighting for subjects of sufficient color contrast, or transmitted illumination for translucent or transparent subjects. Keep in mind that the considerable heat generated by most lamps will rapidly affect heat-sensitive objects at close range, while living things may wilt or die if kept under the lamps too long.

Close-up Lenses

These lenses screw into the filter mount of normal Minolta lenses to permit focusing at close-up distances. Lenses 1 and 2 may be used in combination to allow work as close as 23cm (9 in.) from the subject. Lens 0 allows closer focusing with short telephoto lenses. With any of these close-up lenses, aperture is set as it would be for normal photography.



Extension Tube Set II

This set of five separate rings and tubes can be used in various combinations for close-up photography with Minolta lenses. Function of the parts is to increase magnification by lengthening the lens-to-film distance. Selection of the proper extension part or combination depends on the area to be covered or the image size required. When used with TTL Minolta SLR cameras, no compensation for exposure is necessary since exposure readings may be taken directly through the extended lens.



MC Auto Extension Tubes

The purpose of this set of three tubes is the same as for the Extension Tube Set II, but it offers refinements that provide greater ease of use. Full meter and automatic-diaphragm coupling enables full-aperture metering/focusing, with the diaphragm closing down to the preset aperture only at the moment of exposure with Minolta SLR's and meter coupled Minolta lenses. Each of the three tubes has a Minolta SLR bayonet on one end and a matching receptacle on the other; this all-bayonet system makes for fast, easy attaching and changing.



Bellows III

Modest in price, compact, and lightweight, this quality bellows attaches to the camera in the same way as a lens and provides calibrated extension between lens and film by means of a scale engraved on the track. Magnifications between 0.75X and 2.96X can be obtained with this unit and a 50mm lens. Among the optional accessories common to this unit and the Auto Bellows I is a slide copier attachment for duplicating transparencies shown attached to the latter unit on the next page.



Auto Bellows I

This deluxe, double-track bellows performs all of the functions of the Bellows III on page 34 and further features an automatic-diaphragm coupling device. With MC lenses, this coupler allows focusing and viewing at full-aperture brightness, with the lens closing down to the preset aperture only at the moment of exposure. Used with a standard 50mm lens, the Auto Bellows I permits a continuous range of magnifications from 0.7X to 3X. The focusing rail (shown attached below) can also be used separately for focusing or positioning a camera equipped with lens only, extension tubes, or a close-up lens.



Copy Stand II

A rigid camera support that assures maximum stability in all photomacrography, this unit is highly recommended when photographing either flat or three-dimensional objects. Unusually sturdy, the stand features a heavy-duty 39.4x45cm (15½ x 17¼ in.) baseboard and a 61cm (24 in.)-high chrome tube 5cm (2 in.) in diameter to provide secure support for camera and macro equipment.



Magnifier V

This is a useful tool for precise focusing when making photomicrographs, copying, and taking distant telephoto pictures. It features an adjustable eyepiece and 2.5X magnifying power. It slides on over the camera eyepiece and can be adjusted for individual eyesight.

**Angle Finder V**

This device permits viewing with the camera held below the eye. It can be adjusted for individual eyesight, and is ideal for microscopic photography and many other applications. It slides on over the camera eyepiece.



Photography Through the Microscope

Microscope Adapter

This two-piece device is used to connect an SLR camera to a microscope. One section bayonets into the camera body in place of the lens, while the other end fits into the ocular adapter tube section of the microscope. Taking photomicrographs is convenient with this adapter because you can follow moving specimens up to the precise moment of exposure. The adapter fits ocular tubes from 23mm to 29mm in diameter.

Going from several diameters' magnification with photomacrography to tens or hundreds of diameters, we descend into an even stranger and more fascinating microcosm. Using your Minolta SLR in combination with the Minolta microscope adapter, you can capture on film the beauties and mysteries of the normally invisible world of photomicrography. This simple and inexpensive unit is suitable for scientific work as well as in shooting for sheer illustrative or abstract effects.





Minolta Flash Units

No matter which of the major types of photo-flash you prefer, it is available from Minolta. There is a unit for your Minolta SLR, whether you use conventional flashbulbs for occasional shooting with maximum light output or choose regular electronic flash (sometimes also called "strobe") for greater action-stopping power, convenience, and economy. Further, with an automatic electronic flash, which figures its own exposure exactly, you'll never have to think of guide-number calculations again. With auto-flash, a sensor receives light reflected from the subject and turns the flash off the micro-second that proper exposure is reached. Minolta's Auto Electroflash units represent the vanguard of the industry in offering the very latest thyristor series circuitry for maximum flashes per battery and shortest recycling time.

Deluxe Flash Unit III

This compact and powerful flash unit has a folding-type reflector whose bowl adjusts for regular and wideangle lenses and swivels to any of 5 click-stop positions to allow bounce flash, etc. It takes regular-base, pinless-base, and AG-type flash bulbs and can be used either with or without the cord. The unit unfolds and installs on the camera body in seconds.



Electroflash S

Perfect for both black-and-white and color photography, this well-designed, high-performance electronic flash unit can be used either on cordless direct-contact "hot-shoe" cameras or with attachable cord and conventional brackets and terminals. It gives up to 250 flashes per set of alkaline batteries, up to 80 with sealed carbon-zinc batteries.

**Auto Electroflash 200**

This compact unit makes completely automatic electronic-flash exposure by means of a built-in sensor. A variety of apertures can be selected with a dial; those usable at ASA 100 are F4, F5.6, F8, and F11. The unit attaches cordlessly to cameras having direct-contact hot shoes or via an attachable sync. cord to others. Color balanced for daylight-type film, the Auto-Electroflash 200 covers the field of a 35mm lens. It accepts alkali-manganese or rechargeable nickel-cadmium batteries and features a monitor circuit, constant guide number up to 20 (for meters at ASA 100, 33 for feet at ASA 25), and manual (non-auto) operation at 1/1000 sec. flash duration. A Ni-Cd battery charger is also available for the unit.



Auto Electroflash 450

An unusually versatile bracket-type unit, this professional flashgun incorporates the newest energy-saving thyristor-series circuitry for fastest recycling and maximum number of flashes per battery. Simply turning a dial sets its computer to yield perfect exposure automatically at a selection of five apertures—the widest range on any unit today. At ASA 100 (DIN 21), lens openings usable are F2.8, F4, F5.6, F8, and F11. The Auto Electroflash 450 has a built-in sensor near the flash tube that receives light reflected from the subject for usual direct auto exposure. The optional accessory sensor, however, will remain pointed at the subject while the flash head and grip are rotated toward the back of the camera or completely removed from the bracket for bounce or off-camera flash. This unit provides coverage for a standard lens (i.e., 50mm on full-frame 35mm cameras) at a full-power guide number of up to 45 for calculations in meters at ASA 100, 72 for feet at ASA 25, or 31 in meters at DIN 18. Simply positioning the built-in diffuser changes this to coverage for wideangle lenses of focal lengths down to 24mm at GN up to 22, 37, and 16, respectively. The Auto Electroflash 450 operates on attachable alkaline or Ni-Cd battery cartridges or from a separate high-voltage battery pack. Other features include a monitor-lamp circuit and non-automatic operation at 1/600 of a second. A unit is available for recharging Ni-Cd battery cartridges in only three and one half hours.





Minolta Light Meters

Besides world-renowned cameras, lenses, and other products, Minolta makes and markets a full line of meters for every major photo-exposure purpose. And at Minolta we produce our own CdS (cadmium-sulfide) and silicon-blue cells for these and the meters built into our cameras.

At the request of NASA, the U.S.A.'s National Aeronautics and Space Administration, Minolta developed and produced the Space Meter, which was used for critical exposure measurement on epoch-making Apollo missions to the moon. This feat gives some indication of the distinguished state of the photometric art at Minolta.

You put this same superior technology to work for you whichever of the remarkable Minolta light meters you may choose.

Autometer Professional

This sophisticated meter features effortless one-hand operation with a battery-powered, moving scale that gives instant direct readings completely automatically—no needle reading or manual dial alignment is necessary. A sensitive CdS cell and high-grade integrated circuit give both incident- and reflected-light readings with high accuracy over an unusually wide range. The light, sturdy unit features automatic over- and under-exposure warning lamps that flash when light is above or below acceptable levels. Accessories are available that permit a wide range of uses including light measurement on groundglass, illuminance determination, and enlarger exposure.



Auto-Spot 1°

This remarkable instrument is the world's only power-scale exposure meter with a 1° angle of acceptance for critical spot measurement. It works automatically as rapidly as you sight your subject, with motor-driven scales reacting instantly in response to light changes. Total viewing area is 8°, and exposure readings are taken through the lens as you view and focus your subject. ASA range: 3 to 25,000. DIN range: 8 to 45. EV range: 2 to 18. Aperture range: F1 to F45. Shutter speed range: 1/2000th second to 30 seconds. Cine range: 8 to 128 frames per second. A hard-leather carrying case and leather wrist strap supplied.



Flash Meter

Remarkably accurate thanks to ideal combination of a high-response silicon blue cell with high-stability electronic components, this meter gives incident or reflected readings of bulb or electronic flash, as well as of continuous illumination. Readings are registered directly in F-numbers; no calculations or conversions are needed. The Minolta Flash Meter offers a selection of measuring times (shutter speeds) for convenient measurement of fill-in flash in combination with ambient light. Compact and lightweight, this unit incorporates hermetically sealed printed circuits with silicon transistors in a diecast aluminum body. A scale illuminator makes for easy reading under dim conditions. Optional accessories available for increased versatility include a pinpoint receptor, two micro-disk receptors, separate sync. cord, 10" reflected-light receptor, and soft case.



Color Meter

Minolta's very compact all-new 3-color measuring Color Meter, designed for precise professional measurement of light color temperature from any source and rapid, direct determination of proper light-balancing and color-correction filters, provides particularly high accuracy by dividing its broad measuring capability into four ranges. The Minolta Color Meter reads a wider range of color temperatures—from 2,500°K to 12,500°K—than any other color meter and gives consistently accurate readings regardless of variations in illumination level within an extremely broad range of from 10 to 128,000 lucas. Red, blue, and green detectors incorporated in the light receptor feature spectral response similar to that of color films. A fourth detector measures incident light for the built-in illumination-intensity meter, permitting use as an ordinary photographic exposure meter or for determining illumination levels for other purposes. Sturdy diecast aluminum body contains a hermetically-sealed transistor circuit that needs no warm-up. Needle locks automatically to "remember" reading.



Minolta Solid Glass Filters

Minolta's filters are invaluable for correcting or obtaining various photographic effects. They are made of solid glass ground optically flat in Minolta's own factories to prevent distortion and mounted in satin-finish metal rings.

Refer to the following brief explanations to determine which filters best suit your photographic purposes, or consult your Minolta dealer for further information. The table on page 48 indicates the mount diameters in which the various Minolta filters are available.



For Black-and-White Photography

- UV: This filter absorbs excessive ultraviolet rays when shooting mountain, snow, and other distant scenes. Exposure is the same as without a filter, and it may be kept attached to protect the lens.
- Green: For correct monochromatic rendition of colored subjects as they appear to the eye, this filter is used with panchromatic film.
- Yellow: Red and yellow subjects are rendered lighter than the eye sees them by this filter. It tends to increase over-all contrast somewhat and is often used to darken blue skies and emphasize white clouds.
- Orange: Use of this filter with panchromatic films produces effects similar to but more pronounced than those with a yellow filter.
- Red: This filter used with panchromatic materials greatly lightens red, produces strong contrast, and can be used for exaggerated cloud effects. Used in combination with infrared film, it eliminates atmospheric haze and produces spectacular, high-contrast effects.

For Color Photography

- 1A: Use this filter to improve bluish rendition of subjects in shade illuminated by blue sky, on overcast or rainy days, or obscured by atmospheric haze. It requires no increase in exposure and is often used with color or monochromatic materials to protect the lens.
- 80B: This filter is used for shooting with daylight-type color film indoors with artificial light of 3400°K color temperature (as of photoflood lamps).
- 85: Type A color films (balanced for exposure with light of 3400°K color temperature) can be used in daylight by exposing through this filter.

For Black-and-White and Color Photography

- Polarizing Filter: This filter is ideal for reducing or eliminating specular reflections as from glass or water to provide clearer views or richer tones or textures; it can also be used to darken skies in either color or monochrome.
- ND X4: Used to adjust light volume from a scene or subject, this neutral density filter can be employed to avoid over-exposure (as when shooting beach or brilliant snow scenes, especially with fast films). It is also useful for depth-of-field control under certain condition to emphasize a subject against an out-of-focus background.

Filter Sizes

L39 (UV)	46mm	52mm	55mm	62mm	67mm	72mm	77mm	126mm
Y48 (Yellow)	46mm	52mm	55mm	62mm	67mm	72mm	77mm	126mm
R60 (Red)		52mm	55mm					126mm
O56 (Orange)		52mm	55mm					
GO (Green)		52mm	55mm					
Polarizing		52mm	55mm					
80B		52mm	55mm					
85A		52mm	55mm					
1A		52mm	55mm					
ND	46mm	52mm	55mm					

With Polarizing Filter**No Filter**

Eyepiece Correction Lenses

Focusing aid for far- and near-sighted photographers is provided by these special lenses which snap into grooves provided in the camera eyepiece. Minolta makes nine different diopter strengths, from -4 to $+3$.



Panorama Head

Installed between a Minolta SLR camera and tripod, the panorama head allows shooting up to 360° panoramic views in overlapping sections without misjudging the camera's coverage of any section. Its rotation scale is marked in 12° graduations, with click stops every 24° . A built-in spirit level aids proper camera positioning. A chart provided with the panorama head shows the number of sectional pictures required when using various Minolta interchangeable lenses, as well as the overlap between sections.





Oscilloscope Photo Unit II

Designed principally for academic and industrial research, this instrument enables accurately recording the images from Braun tubes and oscilloscopes. Incorporated in the adapter are an over-size finder for ease of observation and a date-recording device.



Lens Mount Adapters

Minolta makes Leica and Praktica lens adapters, both of which lock securely on Minolta SLR camera bodies with the use of the special key provided. Any Praktica-mount lens can be used with Minolta SRT cameras and can be focused throughout its full range. Leica-mount lenses can be used only for close-ups and copying, since their back focus is different from Minolta Lenses.



Cable Release

This very flexible metal release threads directly into the shutter release button on Minolta SLR's and is essential for steady tripod exposures, photomicrography, photomacrography, and telephotography. It features a screw-type lock, which facilitates making time exposures.



This booklet has briefly described many of the Minolta/Celtic and Rokkor-X Lenses and the accessories of Minolta's extensive SLR system. You can use them either with a standard Minolta SLR or on one of our new electronic shutter models offering interchangeable finders and fully automatic exposure control. Either way, you'll enjoy genuine Minolta quality, precision, and the handling and operating ease we are famous for.

Be sure to talk with your Minolta dealer; he can help you learn more about all the fine Minolta products and what they can do for you. Or contact the Minolta distributor or branch office in your area.

Minolta Camera Co., Ltd., 30, 2-Chome,
Azuchi-Machi, Higashi-Ku, Osaka 541, Japan

Minolta Corporation, 101 Williams Drive,
Ramsey, New Jersey 07446, U.S.A.



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