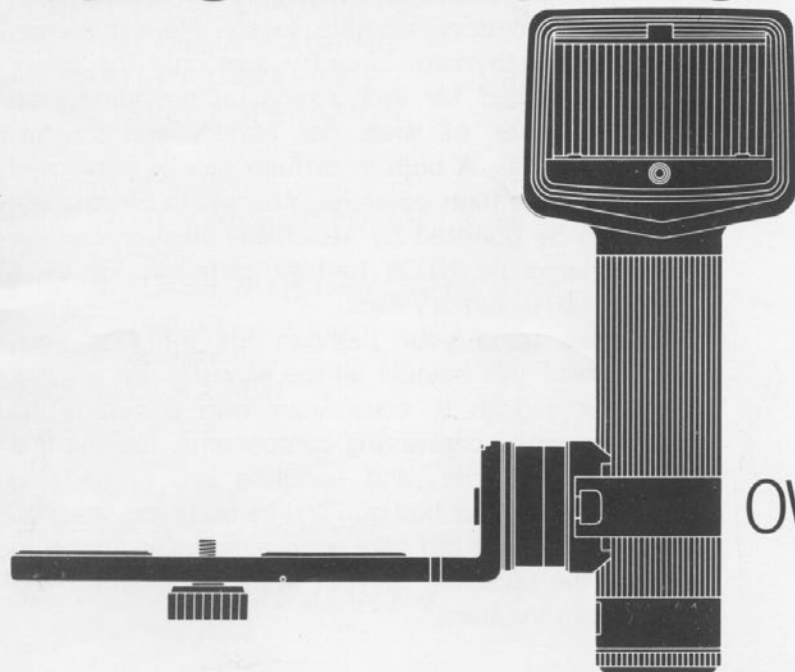


MINOLTA AUTO ELECTROFLASH 450



OWNER'S MANUAL

E

One of the world's most sophisticated flash units, your Auto Electroflash 450 will make precise flash exposures automatically at a variety of lens openings. The unit can be tilted on its bracket or removed entirely for automatic off-camera or bounce flash with the accessory separate sensor. Newest energy-saving series-thyristor circuitry uses only the power actually needed for each exposure, providing maximum number of shots per battery and shortest recycling time. A built-in diffuser can be positioned for wideangle flash coverage. Your Auto Electroflash 450 can be powered by attachable alkali-manganese or rechargeable Ni-Cd battery cartridges or by a separate 510v battery pack.

Before using your flashgun for the first time, please read this manual all the way through — or at least far enough to cover your own picture-taking needs — while connecting components, loading and attaching batteries, and handling and acquainting yourself with your flashgun and its parts and features. In this way, you can take good pictures and begin to realize the potential of your Auto Electroflash 450 right from the start.

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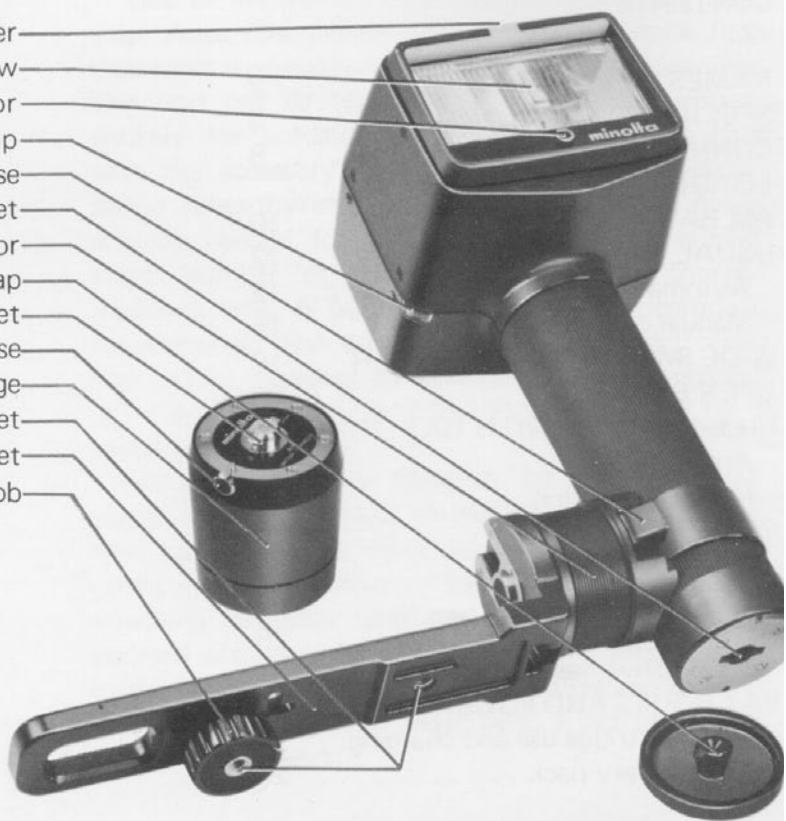
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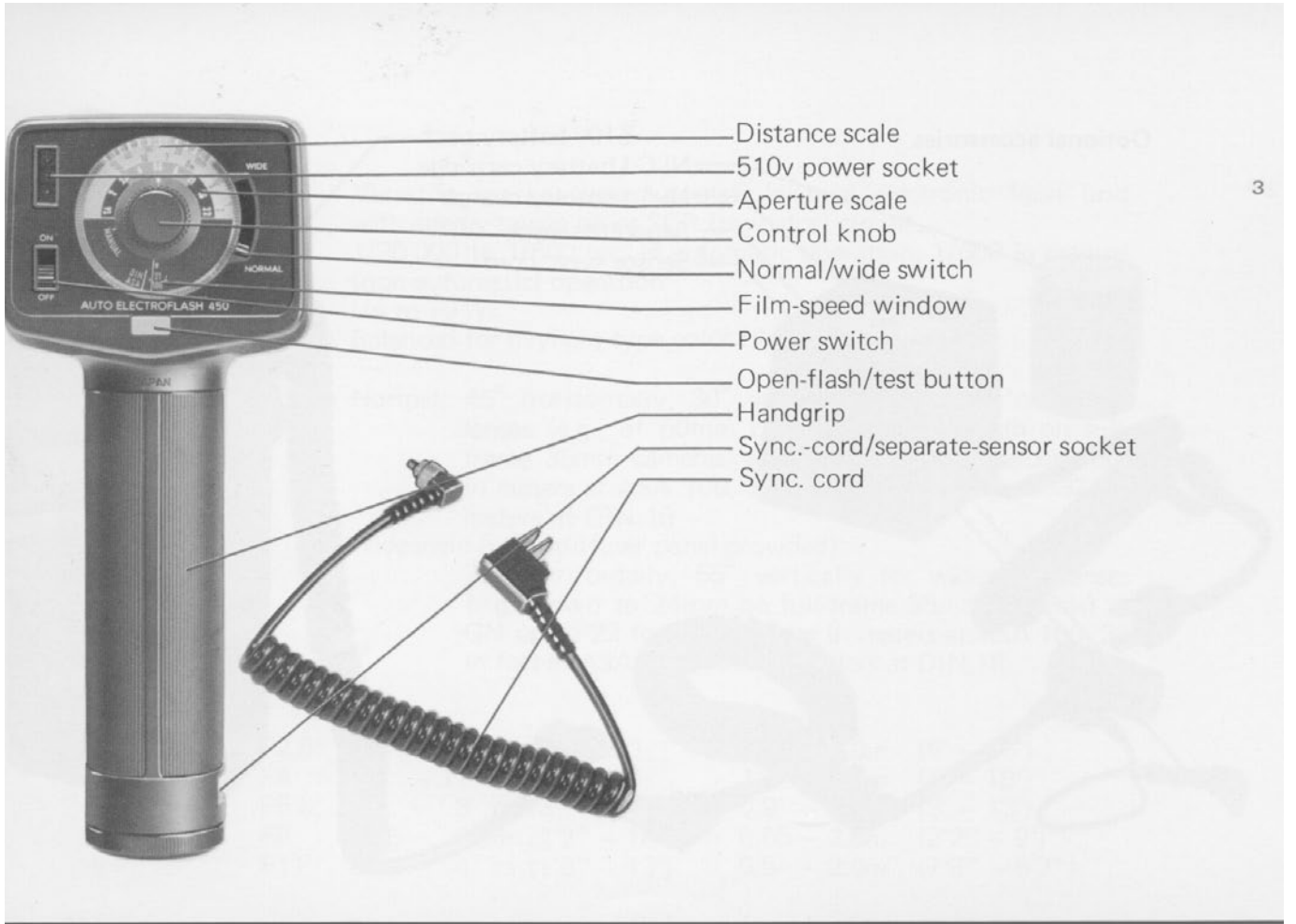
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NAMES OF PARTS

2

- Wideangle diffuser
- Flash tube and reflector with guard window
- Built-in sensor
- Monitor lamp
- Bracket release
- Cartridge socket
- Connector
- Cartridge-socket cap
- Connecting bayonet
- Cartridge release
- AM battery cartridge
- Tripod socket
- Bracket
- Attaching screw and knob





- Distance scale
- 510v power socket
- Aperture scale
- Control knob
- Normal/wide switch
- Film-speed window
- Power switch
- Open-flash/test button
- Handgrip
- Sync.-cord/separate-sensor socket
- Sync. cord



Optional accessories

- 510v battery pack
- Ni-Cd battery cartridge
- Ni-Cd battery charger
- Separate sensor
- Sensor sync. cord

minolta

SPECIFICATIONS

Type:	Versatile bracket-type automatic/manual electronic flash unit with energy-saving series-SCR (thyristor) circuit
Flash duration:	1/20,000 to 1/600 sec. in automatic operation, 1/600 in manual (non-automatic) operation
Flash power:	Up to 79 Ws
Color temperature:	Balanced for daylight-type color film
Coverage and guide number:	Normal: 45° horizontally, 30° vertically for normal or longer lenses (e.g., of 50mm or longer focal length on full-frame 35mm cameras) at GN up to 45 for calculations in meters at ASA 100, 74 in feet at ASA 25, or 32 for meters at DIN 18 Wideangle (using diffuser panel provided): 75° horizontally, 55° vertically for wideangle lenses (e.g., down to 24mm on full-frame 35mm cameras) at GN up to 22 for calculations in meters at ASA 100, 36 in feet at ASA 25, or 16 for meters at DIN 18

Working ranges at ASA 100:

	Normal	Wideangle
F2.8:	1.8 – 16 m (6' – 52')	1.8 – 7.9m (6' – 26')
F4 :	1.3 – 11 m (4' – 36')	1.3 – 5.5m (4' – 18')
F5.6:	0.9 – 8 m (3' – 26')	0.9 – 3.9m (3' – 13')
F8 :	0.65 – 5.5m (2'2" – 18')	0.65 – 2.8m (2'2" – 9')
F11 :	0.5 – 4 m (1'8" – 13')	0.5 – 2.0m (7'8" – 6'7")

Built-in sensor:	Silicon photo diode with 23° angle of acceptance; inoperable when separate sensor attached		
Power sources:	6 alkaline-manganese AA cells	6 nickel-cadmium AA cells	510v battery
Number of flashes:			
At full power:	70 – 900*	50 – 420	200 – 2000
Within ½ stop under full power:	100 – 1100	50 – 420	300 – 3000
Recycling time:			
To full power:	1 – 23*	0.33 – 7	0.33 – 3
To within ½ stop under full power:	1 – 14	0.33 – 4	0.33 – 2

* Depending upon subject distance

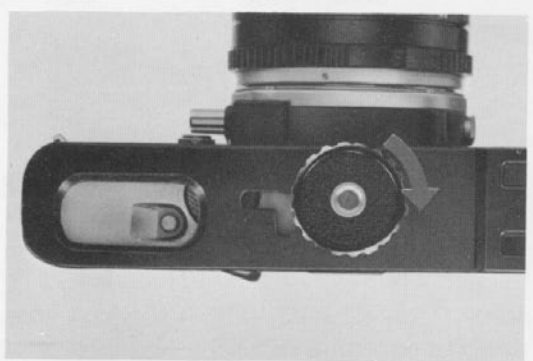
Controls: Dial for setting film speeds ASA 25 – 400 (DIN 15 – 27), knob to set computer for apertures F1.4 – F22 in auto operation, switch over to manual, normal/wide switch, power switch

- Monitor-circuit lamp: Glows steadily to indicate capacitor is charged to provide exposure within 1/2 stop of full charge and blinks when fully charged
- Accessories: Supplied with basic unit, connector, and bracket:
 - Sync. cord and AM battery cartridge
 - Optional: Separate sensor (specs same as built-in sensor), sensor sync. cord, Ni-Cd battery cartridge, 510v battery pack with cord, and Ni-Cd battery charger
- Size and weight: Width 98mm (3 7/8"), depth 103mm (4 1/8"), height 230mm (9 1/8"); 780g (27 1/8 oz.)

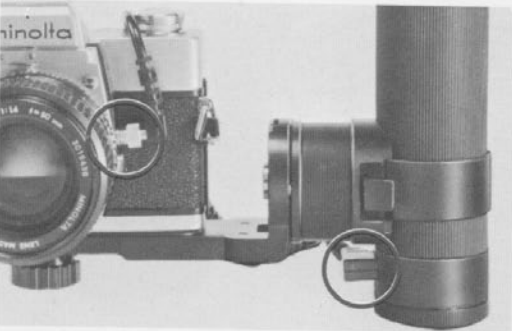
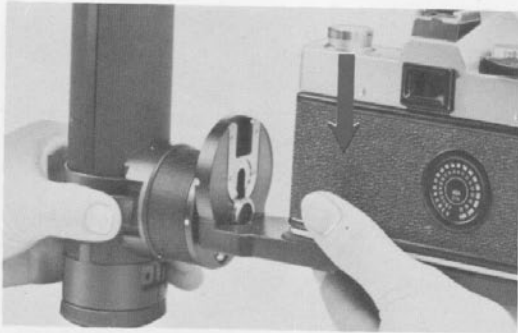
CONNECTING COMPONENTS

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1. To attach connector to handgrip, loosen the holder band by turning both screws on the opposite side of the connector counterclockwise. Then slide the band over the end of the handgrip to the desired position, make sure the connector is at the desired angle (normally 90°) to the flash lighting axis, and tighten the band in place by turning the screws clockwise.
2. To attach the bracket to the camera, begin screwing the attaching screw into the camera tripod socket, carefully align bracket at right angles to the lens axis, and tighten in place with the knob.



LOADING AND ATTACHING AM BATTERY CARTRIDGE



3. To attach the bracket to the connector, first depress both bracket release grips. While doing this, slide the connector's headed stud into the slot on the bracket as far as it will go. Align the rearmost white dot on the connector with the index on the bracket and release the grips.
4. Plug the sync. cord into the socket provided on the handgrip and connect the other end with the X sync. flash terminal of the camera.

NOTE:

When the flashgun is used attached to the bracket, it should be kept pointed straight ahead parallel to the lens axis at usual distances. For close-ups, it should be turned slightly so as to point at the center of the subject.

LOADING AND ATTACHING AM BATTERY CARTRIDGE

1. To load, remove the cover from the AM battery cartridge by turning the screw counterclockwise. Insert six AA-size (penlight) 1.5v alkali-manganese cells (Mallory MN-1500 or equivalent) with positive (+) and negative (-) ends positioned as indicated inside the cartridge. Then align the projections on the cover with the matching indentations on the cartridge and fasten the two parts firmly together again by means of the screw.



2. To attach, with the flashgun power switch in the OFF position insert the connecting bayonet of the cartridge into the cartridge socket at the end of the handgrip, push the two parts together slightly and turn the cartridge clockwise or counterclockwise until it locks in place.



3. The cartridge is removed by sliding the cartridge release away from the handgrip and turning the cartridge in either direction until its bayonet can be lifted out of the socket.



USUAL DIRECT OPERATION

Automatic

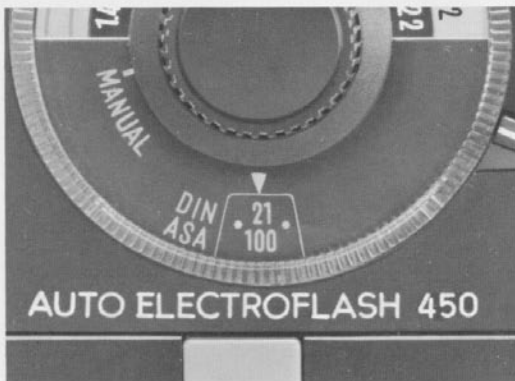
1. For normal or telephoto lenses*, the wide/normal switch on the back of the flashgun should be snapped all the way into the NORMAL position and the clear guard window in front of the flash tube and sensor should not be covered or obstructed by anything.



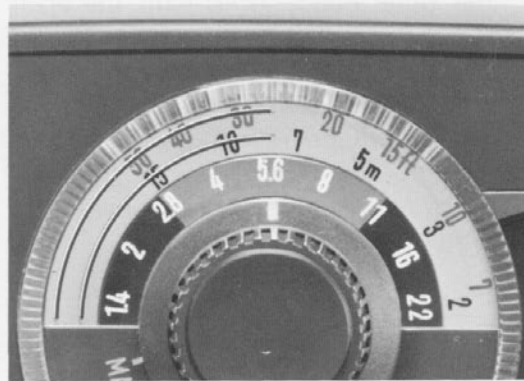
2. Make sure that the camera is set for X-synchronization and/or that the flashgun is properly connected with the X-sync. terminal of the camera.
3. Also make sure that the camera is not set for a shutter speed faster than the manufacturer's recommendation for electronic flash in the instruction manual. (Between-the-lens blade shutters can often be set at speeds up to 1/500 sec., while 1/60 is often the maximum safe speed for full-frame 35mm cameras with focal-plane shutters; if in doubt, use 1/30 sec. with the latter.)

* of 50mm focal length or longer on full-frame 35mm cameras

4. By means of the grooved rim of the flashgun's control dial, turn it until the index is aligned with the speed rating of the film in use. (Dots on the film-speed scale represent ASA ratings of 32, 40, 64, 80, 125, 160, 250, and 320 or DIN indexes of 16, 17, 19, 20, 22, 23, 25, and 26, respectively from left to right.)



5. The computer will vary flash duration from 1/600 to 1/20,000 sec. to provide auto-flash exposure at the range of five F-numbers appearing in the green area visible through the aperture scale. Turn the control knob to set the white index at the desired aperture within this range.* (The index may be

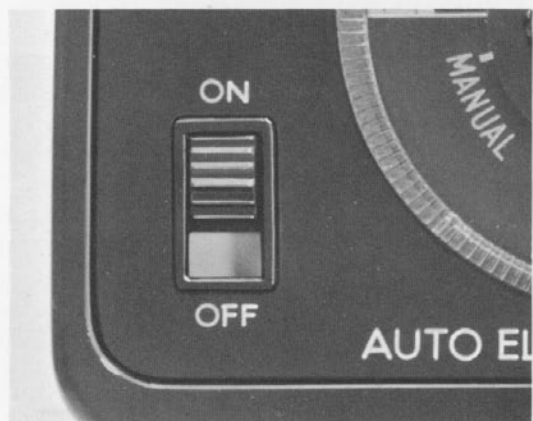


set between click-stops if desired.) The ends of the two circular red lines on the distance scale indicate the maximum range of the flash at the aperture set. Note this carefully, since average subjects will be underexposed at distances falling within the red lines on the scale.

Minimum flash-to-subject distance, on the other hand, varies with the aperture set from 0.5 to 1.8m (1 ft. 8 in. to 6 ft.); see the specifications (p. 6) for details. At distances shorter than these, subjects will be overexposed.

6. For normal exposure, set the lens aperture to the same F-number as set on the flashgun.

7. With a properly loaded AM battery cartridge attached, slide the power switch to ON. (For operating instructions when using an Ni-Cd, cartridge or the 510v battery pack, see p. 27 or p. 29, respectively.) With fresh batteries, the monitor lamp will come on within about ten seconds and will



begin to blink on and off within about 23 seconds. For full power, the monitor must be flashing before the flash is fired. If necessary or desirable, however, it may be fired while only lighted before starting to flash, but in this case, to assure adequate exposure, maximum flash range should be considered to be the distance appearing at a point halfway between the F-number at which the index is set and the next F-number to the right of it. Further, in this case the manual guide number is 38 for calculations in meters at ASA 100, 62 in feet at ASA 25, or 27 in meters at DIN 18.

8. Fire the flash by releasing the camera shutter. At full power with monitor flashing, number of flashes per AM battery cartridge will be between about 70 and 900, and recycling time will

be between one and 23 seconds, depending upon subject distance. At partial power with monitor glowing steadily, number of flashes will be from about 100 to 1100; recycling time, from about one to 14 seconds. For more flashes or shorter recycling times, use an Ni-Cd cartridge or 510v battery pack (see p. 27).

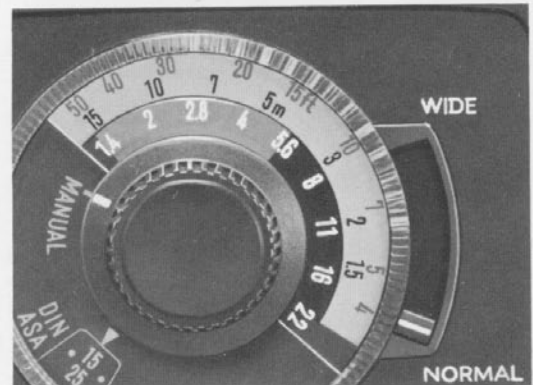
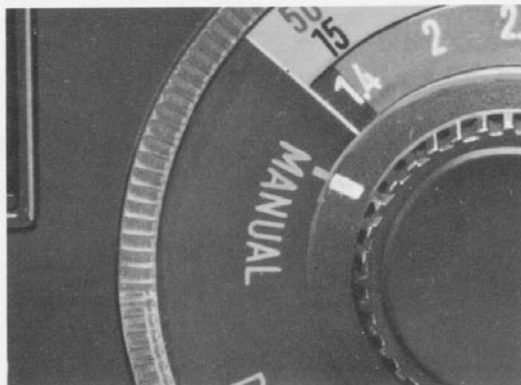
***CAUTION:**

At settings to the left of the 5-aperture green area on the dial, adjustment of flash duration is not automatic and will be at full power at a fixed 1/600 sec.

Manual operation

For non-automatic exposures at the maximum flash duration of 1/600 sec.:

1. Make film-speed and other camera and flash adjustments as indicated in instructions 1 through 4 on pp.12 and 13.
2. Turn the control knob index to the MANUAL setting.
3. Note the F-number appearing opposite the applicable flash-to-subject distance at any point on the flash dial (green-area range limits are not applicable in manual operation). Then set the lens aperture on the camera to this F-number for normal exposure.



4. Further operation is as described in instructions 7 and 8 on pp. 14 and 15. Because the flash operates at fixed maximum duration on manual, however, the number of flashes at full power would be about 70, with a 23-sec. recycling time; at partial power, about 100 with 14 sec. Further, at partial power, the lens aperture should be opened one-half stop more than indicated by the dial.

(With ASA 25 or DIN 15 film, for example, the flash dial indicates an aperture of between F4 and F5.6 for a subject 5m or 16 ft. from the flash. Set the camera lens aperture to the F-number opposite the applicable distance — say, between F4 and F5.6 for a distance of 5m or 16 ft., or one-half stop farther open, i.e., at F4 for partial power — and proceed to shoot.)

NOTE:

Exposure at apertures indicated should be correct for subjects and surrounding conditions of average reflectivity. With very light-colored subjects and/or in small, bright rooms, etc., exposure may need to be reduced by closing the lens aperture down somewhat. Dark-colored subjects and/or large, high rooms; outdoors at night; and comparable conditions generally require increasing exposure somewhat by opening the lens aperture. The exact number of stops' increase or decrease in exposure will of course vary with individual conditions. It is generally recommendable in non-average conditions to take "bracketed" exposures at several different apertures.

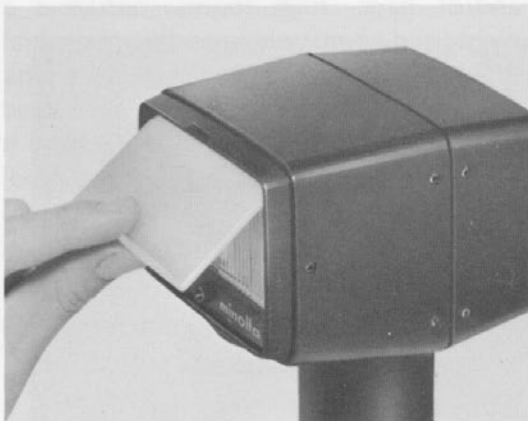
WIDE SWITCH AND DIFFUSER

18

The clear guard window with the NORMAL switch setting will provide proper flash coverage and exposure for lenses of normal or longer focal length.* For wider-angle lenses having a diagonal angle of view of up to about 85°:**

1. Grasp the tab and pull the opal plastic wideangle diffuser plate out of its

storage slot, push the non-tabbed longer edge of it against the spring tension into the retaining groove above the slot, and secure it in place over the flash tube with the lower edge behind the two small tabs at the bottom of the guard window.



2. To adjust the computer and dial for proper exposure, snap the wide/normal switch all the way to the WIDE position.



3. Proceed as for usual operation (p.12).

In wide as in normal operation, if the flash is to be fired while the monitor lamp is only lighted but not blinking, the maximum range is the distance that appears at a point halfway between the F-number at which the index is set and the next F-number to the right of it. The manual guide number in wide operation in this case is 18 for calculations in meters at ASA 100, 30 in feet at ASA 25, or 13 in meters at DIN 18.

* (i.e., 50mm or more on full-frame 35mm cameras)

** (i.e., down to 24mm focal length on full-frame 35mm cameras)

OPEN FLASH

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This technique may be useful to illuminate large, dark subjects or obtain special effects such as "stroboscopic"-type multiple exposures. It can of course also be used under dark or dim conditions to make single exposures with non-synchronized cameras.



For open flash, disconnect the flash and camera and use them independently: With the camera stationary on a tripod or other firm support, open the shutter and fire the flash as many times as desired by means of the open-flash/test button.

The button merely acts to trigger the flash in place of the camera shutter's sync. switch. Flash duration is still controlled by the sensor in automatic operation and remains fixed at maximum power on manual. Flash-dial settings and indications and exposure produced will thus be the same with open flash as in usual auto or manual operation. That is, auto dial settings will generally produce correct one-shot exposure with the camera lens set at the same aperture (see p.14), while the manual setting will yield proper exposure at corresponding apertures and subject distances (see p.16).

FLASH WITH DAYLIGHT

oper balance between fill-in and illumination is a matter of personal and the effect desired. Particularly auto flash, it involves a fairly complex set of interacting variables and can be accomplished in a number of ways. Instructions given here are intended to serve as a generally workable basis for experiment toward obtaining the specific effect you want with direct fill-in. (Remember that the wideangle diffuser and lens cap can be used to decrease effective brightness for closer shooting where desired.)

Operation

Using your camera's built-in exposure meter or a separate one, determine the aperture/shutter-speed combinations for proper exposure with the available light.

2. From these select a suitable combination in accordance with electronic-flash synchronization range of the camera and the available F-stops on the flash unit control dial.
3. Set the flash dial index to the metered aperture, but close the camera aperture down one F-stop from that aperture for making the exposure.

(Say, for example, that metered combinations for proper exposure include 1/15 sec. at F16, 1/30 at F11, 1/60 at F8, 1/125 at F5.6, 1/250 at F4, etc. Camera electro-flash sync. is through 1/60 sec., and apertures available on the flash dial at ASA 100 or DIN 21: F2.8, 4, 5.6, 8 and 11. Suitable combination chosen: 1/60 at F8. The flash-dial index is set to 8; but camera aperture, to F11. Flash-to-subject distance for the effect sought: Up to 5.6m or 18 ft.).

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Manual operation

1. Set the control knob index to MANUAL. Proper F-number for usual exposure will appear on the scale opposite the figure indicating the distance from flash to subject.
2. Use a built-in or separate exposure meter to determine proper shutter speed for the daylight illumination present. Set this speed on the camera if it is within the X-sync. range. If not, exposure conditions must be adjusted as needed by changing the subject-to-flash distance (perhaps using a lens of different focal length), using the WIDE switch and panel, or otherwise.
3. Close the lens aperture on the camera down one stop from the indicated aperture, and proceed to shoot.

(If, for example, with ASA 160 or DIN 23 film, the flash dial indicates an aperture of F11 for a subject 5m or 16 ft. from the flash, and the meter reading

indicates F11 at the maximum usable shutter speed of 1/100, this speed is set on the camera, but the lens aperture is set at F16 for exposure.)

The auto or manual procedures outlined above should under usual conditions produce noticeable fill-in with subject emphasis that will perhaps be most acceptable to a majority of people.

Another method that will tend to lighten and emphasize existing light and subordinate fill-in light is to set the camera aperture at the metered or indicated aperture (rather than closing it down one stop) but set the control-knob index one or preferably two stops left of it. (Example: Suitable metered or indicated combination: 1/60 at F11; camera aperture set to F11, but flash dial set to F8 or F5.6, the latter of which will produce the least fill-in and most detail in highlights.)

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OTHER OPERATION

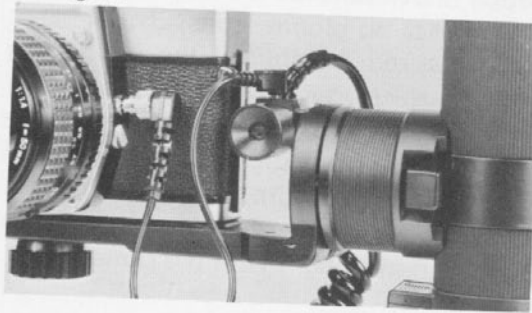
Separate sensor

For auto-exposure off-camera or bounce flash, the optional-accessory separate sensor is used.

To attach this, first slide its bracket into the accessory shoe of the camera or into the shoe provided on the bracket so that the sensor "eye" is pointing toward the most important part of the subject. Next insert the single-prong plug of the sensor sync. cord into the socket on the side of the sensor and plug the PC connection on the other end of the cord into the X-sync. terminal socket on the

camera. (The sensor sync. cord is not necessary if your camera is provided with a hot-shoe and the sensor is attached there. For proper contact in this case, however, be sure sensor-sync.-cord plug is disconnected from the sensor if the other end is not plugged into camera sync. terminal.) Then insert the three-prong plug on the cord of the sensor into the sync.-cord/separate-sensor socket on the flashgun.

23



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Bounce flash

This technique provides lighting that is considerably softer than with direct flash.

The four white dots on the connector denote flashgun positions of vertical and 30°, 60°, and 90° from it. With both bracket release grips depressed, the gun can be tilted back so as to reflect light from an overhead surface. There are stops to fix the gun at all but the 30° position; simply align the desired dot with the white index on the bracket and release the grips.

If desired to bounce the light from other surfaces, such as a wall or reflecting umbrella, the release grips may be depressed, the connector stud lifted out of the slot in the bracket, and the gun detached leaving only the cord of the sensor connecting it with the camera.

Effective subject illumination with bounce flash is of course considerably lower than that from direct flash. (Flash bounced from a white ceiling in a medium-sized room for example, may require some two stops more exposure than if direct to the subject.) For this reason, it is advisable to set the dial and lens to assure adequate exposure, i.e., at the largest practicable aperture of the green range. (The specific setting will vary widely with the subject and bounce-lighting conditions, but in the case of the example mentioned above, setting the index at least one or two F-numbers to the left of the one you might normally use — say, F4 rather than F8 with ASA 100 or DIN 21 film — could be a recommendable starting point.) Naturally, the indication of the maximum-range lines on the dial does not apply to bounce-flash operation.

Off-camera flash

With the flashgun removed from the bracket as above, it can be directed toward the subject from any angle within range of the sensor's coiled cord to provide better modeling than with the flat lighting of direct flash. The flashgun should generally be pointed toward the center of the subject. Since the off-camera flash technique provides direct light on the subject, special care in selecting the F-number for use with it is generally not necessary.

Both of these techniques can of course be employed at maximum flash duration in manual operation without the separate sensor.

CAUTION:

The flash should never be fired when pointed directly at the sensor.

Motor-drive flash sequences

Under suitable conditions, your Auto Electroflash 450 can be used for auto-exposure sequences with motor-drive cameras at speeds up to three frames per second.

For best results in this kind of operation, a fully charged Ni-Cd or preferably a fresh 510v battery pack should be used, with a replacement at hand if needed for extended operation. A medium to large lens aperture should be chosen, and flash-to-subject distances should be as short as practicable.

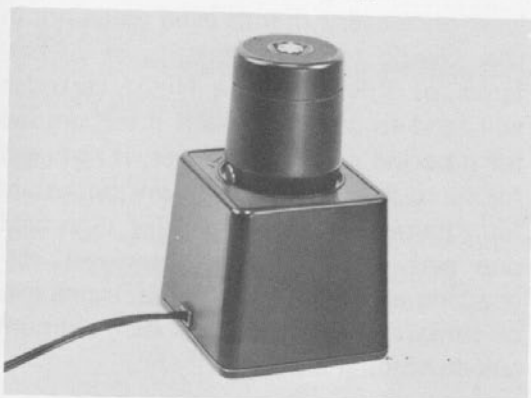
A short test sequence will determine whether conditions are allowing proper operation or must be adjusted.



Bounce flash

BATTERIES AND POWER

Besides the AM battery cartridge dealt with on pp. 10 and 11, your Auto Electroflash 450 can be powered by an optional-accessory Ni-Cd battery cartridge or separate 510v battery pack. The former is rechargeable and provides faster recycling than the AM cartridge, while the latter permits fastest recycling and maximum number of flashes.



Ni-Cd cartridge use and charging

The Ni-Cd battery cartridge is attached to the flashgun in the same way as the AM battery cartridge (see p.11).

With this cartridge fully charged, recycling time to partial power, i.e., with monitor lamp lighted but not blinking, is between 0.33 and 4 sec. depending upon subject distance; to full power, i.e., with monitor lamp blinking, between 0.33 and 7 sec. Number of flashes at either full or partial power per full charge over a relatively short period of time is 50 to 420.

The cartridge should always be recharged before use and when recycling to full power requires more than 30 sec. To do this, insert the connecting bayonet of the cartridge into the socket in the optional-accessory Ni-Cd battery charger

2

BATTERIES AND POWER

Besides the AM battery cartridge dealt with on pp. 10 and 11, your Auto Electroflash 450 can be powered by an optional-accessory Ni-Cd battery cartridge or separate 510v battery pack. The former is rechargeable and provides faster recycling than the AM cartridge, while the latter permits fastest recycling and maximum number of flashes.



Ni-Cd cartridge use and charging

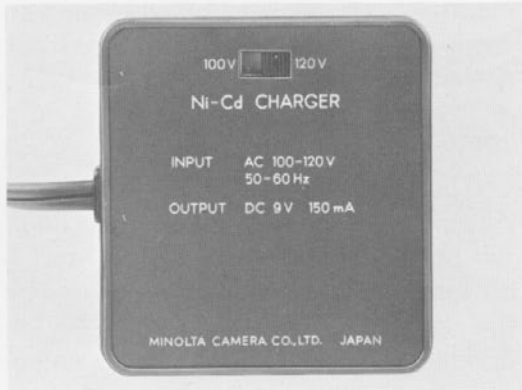
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The cartridge should always be recharged before use and when recycling to full power requires more than 30 sec. To do this, insert the connecting bayonet of the cartridge into the socket in the optional-accessory Ni-Cd battery charger

2

and turn it as far as it will go in the direction of the arrow to secure it in place. The charger has a switch for 100v or 120v alternating current of 50 or 60 Hz (cycles) only. First make sure that your charger is set for your power source. Then insert the charger plug into an electric outlet and allow the battery to charge for three and one half hours.



Lighting of the pilot lamp on the charger indicates when power is flowing to the charger.

Charging the cartridge for a reasonable time in excess of three and one half hours will not damage the battery, though it may become warm and power will be wasted.

The cartridge should be charged at least once every month even when not in use. Owing to characteristics of all batteries of this kind, the Ni-Cd cartridge will tend to discharge itself if left unused for a period of time. Further, if not used for more than a month, it will not attain full charge even if charged for three and one half hours or more. However, discharging and recharging the cartridge two or three times will restore its maximum charge-holding capacity.

If time does not permit charging the cartridge fully, approximately 14 to 120 flashes can be obtained from a battery in normal-capacity condition that has been charged for only one hour. Two hours' charging will yield 29 to 240 flashes; and three hours, 42 to 360. Repeated partial charging of Ni-Cd batteries, however, may reduce their charge-holding capacity at least temporarily.

CAUTION:

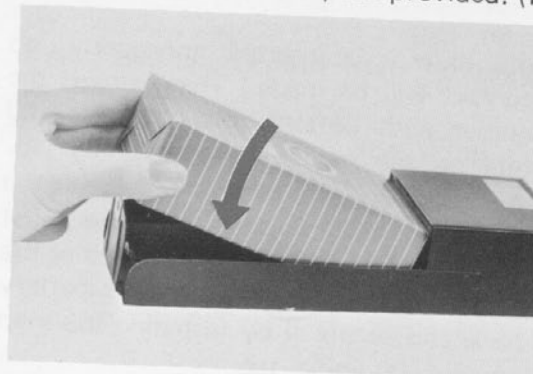
Do not remove the cover of the Ni-Cd battery cartridge.

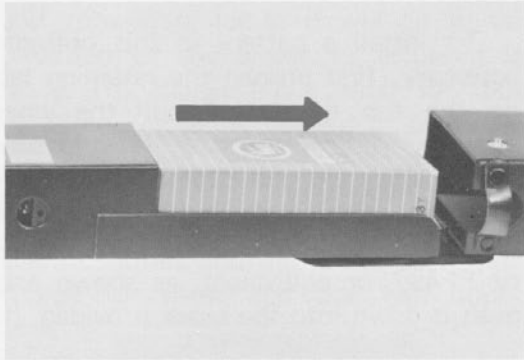
NOTE:

The Ni-Cd battery cartridge and charger are not available in areas where voltages other than 100 to 120 are prevalent.

510v battery pack

To install a battery in this optional accessory, first unsnap the retaining tab on the top of it and pull the inner assembly out of the case. Making sure that positive (+) and negative (-) terminals are oriented as indicated by the diagram, angle a 510v dry battery, Mallory PF497 or equivalent, as shown and push it down into the space provided. (If





the battery is inserted improperly, no contact will be made.) Then reinsert the holder with battery into the case and refasten the snap on the retaining tab.

Connecting the battery pack with the flashgun is accomplished as follows: First insert the rounded plug on one end of the cord into the receptacle on the battery pack and secure it by fastening the snap on the retaining tab.

With the power switch at OFF, insert the three-hole plug on the other end of the cord into the 510v power socket on the flashgun. (There is a stop to prevent insertion of the plug if the switch is in the ON position; power to the gun in this case is turned on and off with the switch located on the power pack.)

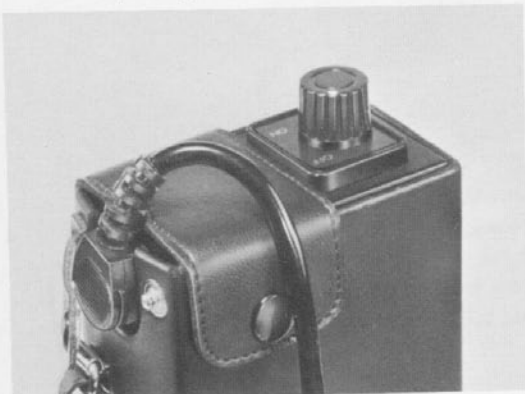


To operate, turn the battery-pack switch to ON. With a fresh battery, the monitor lamp should come on within two seconds, indicating partial power. Within one more second at most, it should begin to blink, accompanied by an audible clicking sound from the battery pack, indicating full power. These are maximum recycling times with this high-vol-

tage pack, and recycling time to full power may be as short as 0.33 sec., depending upon subject distance. Number of flashes per battery over a relatively short time at full power will vary from 200 to 2000, while 300 to 3000 at partial power can be obtained.

CAUTION:

Because of the 510v battery pack's high voltage, be careful to keep metal objects and fingers away from the terminal.



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