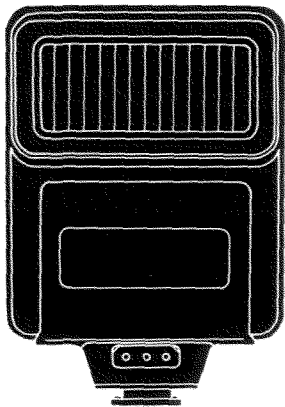


MINOLTA

# AUTO ELECTROFLASH 280PX



OWNER'S MANUAL  
BEDIENUNGSANLEITUNG  
MODE D'EMPLOI  
MANUAL DE INSTRUCCIONES

# IMPORTANT SAFEGUARDS

When using your flash unit, the specific cautionary notices in the owner's manual should always be observed and complied with, as well as basic precautions, including the following:

1. Read and understand all instructions.
2. Close supervision is necessary when the flash unit is used by or near children. Do not leave the flash unit unattended while in use.
3. Never fire the flash directly into a person's eyes at a close distance.

4. Do not operate the flash unit if it has been dropped or damaged — until it has been examined by an authorized Minolta service facility.
5. To protect against electrical shock hazards, do not immerse the unit in water or other liquids.
6. To avoid electric shock hazards, do not disassemble the unit, but take it to an authorized Minolta service facility when some service or repair work is required. Incorrect reassembly can cause electric shock hazard when the unit is used subsequently.

**SAVE THESE INSTRUCTIONS**

## MAIN FEATURES OF MINOLTA AUTOELECTROFLASH 280PX

- 2 ● Interacts with Minolta Direct Autoflash Metering SLR cameras for simple, accurate through-the-lens (TTL) off-film flash control:
  - Program TTL mode on X-700 with MD lens (camera selects aperture)
  - Any-aperture TTL mode on X-700, X-500, X-570 with almost all Minolta SLR lenses and accessories (user selects any aperture to control flash range and depth of field)
  - Simple adjustment of flash exposure by using camera's controls
  - Sufficient-exposure (FDC) signal in viewfinder and on flash
- Power-level selector with two settings:
  - "Hi" — providing flash range of 20m (65 ft.) at f/1.4 in any-aperture TTL or manual mode (guide number: 28 in meters at ASA/ISO 100, 46 in feet at ASA/ISO 25)
  - "Lo" — enabling winder or motor-drive sync at up to 2 frames per second (or up to 3.5fps with optional power grip)
  - Power level automatically switched to "Hi" in program TTL mode
- Flash mode controlled by camera's mode/shutter-speed selector
- Manual mode possible on any camera with hot shoe
- Gives flash-ready signal in viewfinder (and on flash) and automatically sets sync speed with applicable Minolta cameras
- Charge-monitoring and series-SCR (thyristor) circuitry minimizing battery drain
- Flash coverage for lenses down to 35mm focal length (28mm with included wideangle adapter)
- Versatile, easy-to-use accessories for creative flash lighting (see p. 26)

Before using your Minolta Auto Electroflash 280PX for the first time, please read this manual all the way through — or at least all the sections covering your own photographic needs — so that you will be able to operate it correctly and realize its full potential right from the start.

#### NOTE

The photographs, tables, and graphs for this four-language owner's manual have been arranged on a separate sheet for easy viewing while reading the manual and, if desired, for use as a handy reference to be taken with you when actually taking flash pictures. Designations such as "Block A" in the text refer to the lettered blocks on the sheet, and table and colored step numbers correspond to numbered tables (such as T-1) and photo sequences in respective blocks.

#### CAUTION

Before using Auto Electroflash 280PX on other manufacturers' cameras, take a series of test pictures to see whether the flash fires and synchronizes properly with the camera.

**WARNING:** Do not fire the flash directly into the eyes of people or animals at close range.

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## NAMES OF PARTS (Block A)

Flashtube .....	①
Power Grip 2 connection .....	②
Clamp .....	③
Mounting foot. ....	④
Battery-chamber cover .....	⑤
Sync contact .....	⑥
Camera/flash-control contacts .....	⑦
Film-speed slide .....	⑧
Film-speed scale .....	⑨
Distance scales .....	⑩
Aperture scale .....	⑪
Monitor light and open-flash/test button .....	⑫
Flash-distance check light .....	⑬
Power switch .....	⑭
Power-level selector .....	⑮
A-mode range indicators.....	⑯
P-mode range guide .....	⑰

## BATTERIES (Block B)

Auto Electroflash 280PX is designed to be powered by four AA-size batteries of the sealed carbon-zinc, alkaline-manganese ("AM" or "alkaline"), or rechargeable nickel-cadmium ("Ni-Cd" or "nicad") type. 5

### Installing

Correct loading of the batteries is as follows:

1. Remove the battery-chamber cover by sliding it off in the direction of the arrow towards the back of the unit.
2. After wiping the terminals with a clean, dry cloth, insert the batteries, making sure their plus (+) and minus (—) ends are positioned as indicated inside the chamber.
3. Close the chamber by aligning the cover carefully, depressing the ends of the batteries slightly with it, and sliding it towards the front of the unit until it snaps into place.

## 6 NOTE

When your flash is new or has not been used for a long time, the capacitor may not be able to reach a full charge. To enable the capacitor to do so, "form" it as follows:

1. Insert fresh batteries and turn the power switch on.
2. After the monitor light comes on, fire the flash three times using the open-flash/test button, allowing 20 to 30 seconds between flashes.

The capacitor will now be "formed," and the flash will be ready for shooting.

## CAUTIONS

- When replacing batteries, be sure to change all four batteries at one time. If exhausted batteries are used with fresh ones, or if different types of batteries are used together, there is a possibility of battery leakage or bursting.
- Do not attempt to recharge carbon-zinc or alkaline-manganese batteries, as doing so could cause leakage or bursting. Nickel-cadmium batteries should only be charged in their designated chargers.
- If the flash unit is not to be used for two weeks or more, batteries should be removed.
- If batteries are inserted in reverse position, the flash will not operate.
- The terminal in the front of the attaching bracket is for use only with Power Grip 2. Connection with any other power source may damage the unit or create a fire hazard.



### Checking batteries

To check battery capacity, measure how long it takes the monitor light to come on after the flash's power switch is turned on. The following table shows when to change or recharge the batteries:

Carbon-Zinc

Alkaline-Manganese    More than 30 sec. → change

Nickel-Cadmium        More than 10 sec. → recharge

**NOTE**    Actual performance will depend on type, brand, manufacturer's lot, age of batteries, and ambient temperature.

### Cold-weather operation

Battery capacity tends to decrease as the temperature goes down. Though alkaline-manganese batteries are considerably better than carbon-zinc batteries in this respect, it is recommended that alkaline-manganese batteries be fresh if they are to be used in this unit in cold weather and that you carry fresh spares in a warm inside pocket for replacement if necessary. With nickel-cadmium batteries, no particular care is necessary in cold weather.

Battery capacity is restored as soon as batteries are returned to moderate temperature.

## ATTACHING AND REMOVING FLASH (Block C)

To attach the flash to the camera:

1. With the clamp turned fully to the right, slide the mounting foot straight forward fully into the hot shoe.
2. Turn clamp to left to secure unit.

To confirm whether the camera/flash contacts have connected properly, turn the camera's main switch and the flash's power switch on. Then touch or slightly depress the camera's operating button after the monitor light on the flash comes on, and check whether the "60" LED in the viewfinder blinks.

To remove the flash, turn the clamp to the right as far as it will go; then hold the unit's lower part and slide it straight out of the hot shoe.

## PROGRAM TTL (P-mode TTL) OPERATION WITH X-700 (Block D)

9

In program TTL mode, the X-700 automatically selects the aperture and then controls flash duration through its Direct Autoflash Metering system, freeing you to simply compose, focus, and shoot. Before taking P-mode TTL pictures, first set the camera and flash as follows.

### Basic camera and flash settings

(a) Make sure that:

- \* The correct film speed is set on the camera.
- \* The camera's main switch is on.
- \* An MD lens is being used.
- \* The camera's exposure-adjustment control is set at "0" unless desired otherwise.

NOTE When the flash is fully charged, the +/— LED in the viewfinder will not blink even if exposure adjustment is being used.

(b) Set the camera's mode selector at "P."

(c) Set and lock the lens at minimum aperture (green figure).

NOTES \* If the lens is not set at the minimum aperture, the green "P" in the viewfinder will blink as a warning.

\* Only new-type MD lenses have the locking device.

(d) Turn the flash's power switch on.

NOTE When the camera is in P mode, the flash's power level will be automatically set at "Hi."

## 10 Operation

The camera and flash are now ready for program TTL operation using the X-700's off-film metering system. All you need do before taking a picture is:

1. Focus on a subject within the P-mode range indicated in Table 1 and explained in the P-mode range section below.

**NOTE** To ensure sufficient exposure when the subject is beyond the applicable range, either reduce the flash-to-subject distance or switch to any-aperture TTL or manual mode.

2. Check that the flash is fully charged:
  - \* The red monitor light on the flash's back panel will come on.
  - \* If the viewfinder display is on, the "60" LED will start blinking.

\* The audible slow-shutter-speed warning, if on, will stop beeping.

**NOTES** \* If the shutter is released before the flash is fully charged, the photograph will be taken in regular P mode without flash.

\* When using the self-timer, check to see that the flash is fully charged before you press the operating button to start the timer.

3. Confirm that the subject is still in focus, then release the shutter.
4. If exposure was sufficient, the "60" LED in the viewfinder will blink more rapidly for about one second after exposure and the green FDC light on the flash's back panel will come on for a few seconds.

### P-mode range

In program TTL mode, the X-700 automatically sets the shutter speed at 1/60 sec. and the aperture between f/8 and the maximum aperture of the lens. When the subject brightness metered immediately before exposure is low, the camera's program selects a large aperture; when it is higher, the program selects a smaller aperture.

Table 1 in Block D gives the P-mode ranges for various film speeds, both with or without the wideangle adapter. The actual program TTL range will, of course, vary with the aperture selected by the program. When the subject brightness is low and the program selects a large aperture, the range will be greater than that indicated in the P-mode range table. When the subject brightness is higher and the program selects a smaller aperture, the range will be less than indicated in the table; however, even in this case exposure will normally be sufficient since the existing light will be added to the exposure.

In situations when you want to be certain 11  
before taking the picture that the subject will be within range for the aperture set or when you want to control the depth of field, it is recommended to use the flash in any-aperture TTL mode (see next section).

For additional information on using Auto Electroflash 280PX for program TTL photography, see the "Exposure Adjustment" section on p. 17, the "Wideangle Adapter" section on p. 23, and the general notes on p. 24.

ASA/ISO 1000 range is approximately 3 times ASA/ISO 100 range.

## ANY-APERTURE TTL (A-mode TTL) OPERATION WITH X-700, X-500, X-570 (Block E)

In A mode on an X-700, X-500, or X-570, you can use any aperture on the lens, opening it fully up if maximum flash range is desired, or closing it down for greater depth of field. Off-film Direct Autoflash Metering during exposure makes this mode ideal for auto control with almost any Minolta SLR lens or close-up accessory.

### **Basic camera and flash settings**

(a) Make sure that:

- \* The correct film speed is set on the camera.
- \* The camera's main switch is on.
- \* The camera's exposure-adjustment control is set at "0," unless desired otherwise.

**NOTE** When the flash is fully charged, the +/— LED in the viewfinder will not blink even if exposure adjustment is being used.

- (b) Set the camera's mode selector at "A."
- (c) Set the film speed on the back panel of the flash for reference in determining the aperture and flash-distance range. Intermediate stops are as shown in the ASA/ISO — DIN conversion table (T-6) in Block G.  
ASA/ISO 1000 range is approximately 3 times ASA/ISO 100 range.

- (d) Select the desired power level:  
Hi: Guide Number 28 (ASA/ISO 100, meters)  
Lo: Guide Number 7 (ASA/ISO 100, meters)

**NOTE** When using Auto Electroflash 280PX with Auto Winder G or Motor Drive 1, set the power level at "Lo" for 2fps operation (see p. 25).

- (e) Turn the flash's power switch on.

## Operation

The camera and flash are now ready for any-aperture TTL photography using the camera's Direct Autoflash Metering system. If you desire to set the aperture first in order to control the depth of field, continue reading immediately below (steps A-1, A-2, and A-3). If you desire to first determine the distance then select a suitable aperture, skip over to the next subsection (steps B-1, B-2, and B-3).

### A. Determining aperture first

A-1 Set the lens at the aperture you wish to use.

A-2 Focus on your subject and find the flash-to-subject distance, either by reading the distance from the scale on the lens or, when the flash is being used off camera, by estimating the distance light will travel to the subject.

A-3 Check the A-mode range indicators on the flash's back panel to see whether that distance is within range for the selected aperture and power level. To do so, find the flash-to-subject distance in meters or feet on the distance scales, then read directly down or up until you come to the indicator bar corresponding to the aperture set. (For apertures not shown on the scale, such as  $f/1.4$ ,  $f/2$ , and  $f/22$ , use extrapolated bars or find the range from the graph in Block I.)

If the distance falls anywhere on the indicator bar (use the beige portion for "Hi" and the blue slashed portion for "Lo"), proceed to step 4 on p. 15.

If the distance is not within the range, change the aperture, power level, or distance to obtain a combination within range.

14 **B. Determining flash-to-subject distance first**

- B-1 Focus on your subject and find the flash-to-subject distance, either by reading the distance from the scale on the lens or, when the flash is being used off camera, by estimating the distance light will travel to the subject.
- B-2 Find that distance in meters or feet on the scales on the flash's back panel. Then read directly down or up to see which aperture bars are crossed (using the beige bars for "Hi" and the blue slashed portions for "Lo").
- B-3 Set the lens at any of the apertures whose corresponding bars were crossed by the imaginary line drawn in the previous step. If the line does not cross any bar (or extrapolated bars for larger apertures, such as  $f/2$  and  $f/1.4$ , not shown on the scale), reduce the flash-to-subject distance or, if the power level

is not already at "Hi," set it at that position and select a suitable aperture.

If a distance, aperture, and power-level combination within range has been obtained, proceed to step 4 below.

When you desire to have more control over depth of field than is possible in P mode but do not want to be bothered with checking the A-mode range indicators before taking each picture, simply select an aperture that will give you sufficient depth of field and a sufficient range to cover the movement, if any, of your subject. Provided your subject does not move out of the applicable range, all you need do is focus and shoot.

**NOTE**

An alternative method for determining the A-mode range is given in Block I and explained after step 6 below.



4. Check that the flash is fully charged:
- \* The red monitor light on the back panel will come on.
  - \* If the viewfinder display is on, the "60" LED will start blinking and, with the X-700, the A-mode indicator will go out.
  - \* The audible slow-shutter-speed warning, if on, will stop beeping.


NOTES


- \* If the shutter is released before the flash is fully charged, the photograph will be taken in regular A mode without flash.
- \* When using the self-timer, check to see that the flash is fully charged before you press the operating button to start the timer.

5. Confirm that the subject is still in focus, then 15  
release the shutter.
6. If exposure was sufficient, the "60" LED in the viewfinder will blink more rapidly for about one second after exposure and the green FDC light on the flash's back panel will come on for a few seconds.

## 16 Explanation of A-mode range graph (Block I)

The graph in Block I can be used to find the A-mode range for any combination of film speed, aperture, and power level ("Lo" or "Hi"), both with or without the wideangle adapter. The example explained below and shown in red on the graph illustrates how to find the minimum and maximum distance (for ASA/ISO 100) when the aperture is set at f/1.4 and the power level is at "Hi" without the adapter. (Directions are given with graph viewed so that aperture lines are on left.)

1. Find the ASA/ISO at lower left, then read directly up until you reach the sloping line corresponding to the aperture set (f/1.4). Now read across to the right.
2. To find the minimum distance, read to the right until you reach the sloping line marked " MIN," then read down: 70cm or approx. 2 ft. 4 in.

3. To find the maximum distance, keep reading to the right on the horizontal line until you reach the sloping line marked "Hi  MAX," then read down: 20m or approx. 65 ft.

Use a similar procedure to find the minimum and maximum distances at other settings. If your subject is closer than 70cm, use the flash off camera.

For additional information on using Auto Electroflash 280PX for any-aperture TTL photography, see the next section ("Exposure Adjustment"), the "Wideangle Adapter" section on p. 23, and the general notes on p. 24.

## EXPOSURE ADJUSTMENT (Block F)

The exposure-adjustment control of the X-700 or film-speed ring of the X-500 or X-570 can be used to increase or decrease autoflash exposure in the same way as normal exposure adjustment without flash (see camera manual). However, use of exposure adjustment causes a respective decrease or increase in the autoflash ranges. Any of the following ways can be used to determine the adjusted range:

- \* In P mode, the range increases by about 40% for -2 stops adjustment and by about 20% for -1 stop adjustment. For +1 stop adjustment the decrease in range is about 15%, and for +2 stops adjustment, about 30%. (See Table 2 in Block F.)
- \* In A mode, find the adjusted film speed as follows (see Table 3 in Block F): For -2 stops adjustment, multiply the film speed by 4, and for -1 stop multiply by 2; for +1 stop adjustment, divide the film speed by 2, and for

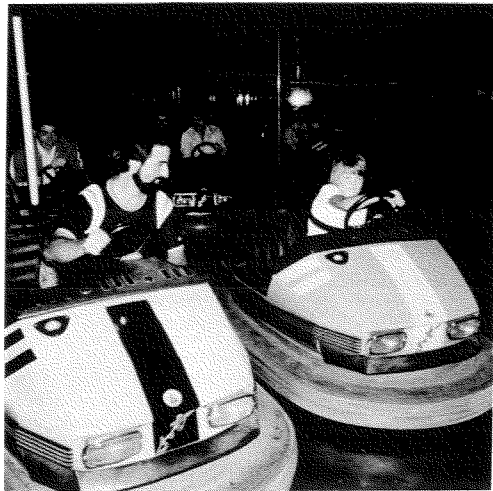
+2 stops divide by 4. Then set the adjusted film speed on the flash's back panel and determine the flash-distance range as usual. (Be sure to reset film speed on flash as soon as exposure adjustment is no longer being used.)

- \* In A mode, find the adjusted film speed from Table 3 in Block F, then use it to determine the range from the graph in Block I.
- \* In A mode, use a flash-distance range indicator above or below the one for the lens aperture set. For example, if your lens is set at f/8 you would use the f/5.6 indicator bar for -1 stop of exposure adjustment and the f/4 bar for -2 stops of adjustment. For +1 stop exposure adjustment, you would use the f/11 indicator bar, and the f/16 bar for +2 stops adjustment.
- \* If initial or adjusted film speed (or film speed equivalent when using X-700's +/- control) is beyond ASA/ISO 400, results of exposure adjustment may not be as expected.

## 18 NOTES

- \* With the X-500 or X-570, set the camera's film speed 3 click-stops lower (e.g., 100  $\rightarrow$  50) for + 1 stop, 3 click-stops higher (e.g., 100  $\rightarrow$  200) for -1 stop, etc. The film speed should remain within ASA/ISO 25 to 400.
- \* When the flash is fully charged, the X-700's +/- LED in the viewfinder will not blink even if the exposure-adjustment control is set at a position other than "0."
- \* Be sure to reset the exposure-adjustment control to "0" or film-speed ring to normal as soon as you no longer wish to adjust exposure.

Suggestions on when to use exposure adjustment are given in the general notes on p. 24.



## MANUAL (M-mode) OPERATION WITH X-700, X-500, X-570 (Block G)

### Basic camera and flash settings

To set the camera and Auto Electroflash 280PX for manual flash photography, proceed as follows:

- (a) Make sure that the camera's main switch is on.
- (b) Set the camera's shutter-speed selector at any position between 1 and 1000. As soon as the flash is fully charged and the operating button is pressed, the shutter will be automatically switched over to the flash-sync speed, 1/60 sec.

**NOTE** If the selector is set at "B," the flash will fire as soon as the shutter is released, but the shutter will remain open until you remove your finger from the operating button (although the "60" LED will blink).

- (c) Set the film speed on the back panel of the flash for reference in determining the aperture

and distance. Intermediate stops are as shown in the ASA/ISO — DIN conversion table (T-6) in the lower right corner of Block G.

- (d) Select the desired power level:

Hi: Guide Number 28 (ASA/ISO 100, meters)

Lo: Guide Number 7 (ASA/ISO 100, meters)

**NOTE** When using Auto Electroflash 280PX with Auto Winder G or Motor Drive 1, set the power level at "Lo" for 2fps operation (see p. 25).

- (e) Turn the flash's power switch on.

### Operation

To determine the correct combination of aperture, flash-to-subject distance, and power level for manual flash photography, use one of the methods explained on pp. 20 to 22 and illustrated in the photo sequences (A 1-3, B 1-3, and C 1-3) in Block G, then proceed to step 4 below.

- 20 4. Check that the flash is fully charged:
- \* The red monitor light on the flash's back panel will come on.
  - \* If the viewfinder display is on, the "60" LED will start blinking and the M mode indicator will go out.
  - \* The X-700's audible slow-shutter-speed warning, if on, will stop beeping.

NOTES \* If the shutter is released before the flash is fully charged, the photograph will be taken without flash at the speed and aperture set on the camera and lens.

- \* When using the self-timer, check to see that the flash is fully charged before you press the operating button to start the timer.

5. Confirm that the subject is still in focus, then release the shutter.

## NOTE

The Flash Distance Checker does not operate in M mode.

For additional information on using Auto Electroflash 280PX for manual flash photography, see the next section, the "Wideangle Adapter" section on p. 23, and the general notes on p. 24.

## DETERMINING APERTURE AND FLASH-TO-SUBJECT DISTANCE IN MANUAL FLASH PHOTOGRAPHY

The methods explained below can be used for setting the aperture and flash-to-subject distance in M mode. Step numbers correspond to pictures in Block G.

### Using scales on back panel of flash

First make sure the proper film speed is set on the panel, then follow either procedure A or B below.

## A. Determining aperture first

- A-1 Set the lens at the aperture you want to use.
- A-2 Find the corresponding figure on the flash's aperture scale and read across to the right end of the indicator bar (using the beige bars for "Hi" and the blue slashed portions for "Lo"). Now read straight up or down to find the suitable flash-to-subject distance in meters or feet. (For apertures not shown on the scale, such as  $f/1.4$ ,  $f/2$ , and  $f/22$ , use extrapolated bars.)
- A-3 Position the camera, flash, and subject so as to obtain that flash-to-subject distance. If impossible, choose a different aperture and/or power level.

## B. Determining flash-to-subject distance first

- B-1 Focus on your subject and find the flash-to-subject distance, either by reading the dis-

tance from the scale on the lens or, when the flash is being used off camera, by estimating the distance light will travel to the subject.

- B-2 Find that distance in meters or feet on the scales on the flash's back panel. Then read straight down or up until you reach the right-hand end of one of the flash-distance indicator bars (using the beige bars for "Hi" and the blue slashed portions for "Lo"). If you do not come to the exact end of a bar, pick the one whose end comes closest. Now read directly to the left to find that bar's aperture.

- B-3 Set the lens at the aperture determined in the preceding step. If the distance did not fall exactly on the end of the indicator bar, but to the left of it, close down the lens  $1/2$  stop. If it fell just to the right of the bar's end, open up the lens  $1/2$  stop.

If the distance did not come near the end of any bar (or extrapolated bars for larger apertures, such as  $f/2$  and  $f/1.4$ , not shown on the scale), reduce the flash-to-subject distance or, if the power level is not already at "Hi," set it at that position and determine the appropriate aperture.

### Using guide numbers

From Table 4 in Block G (or from Table 5 when using the wideangle adapter), find the guide number corresponding to the film speed and power level in use, then:

**C-1** Focus on your subject and find the flash-to-subject distance, either by reading the distance from the scale on the lens or, when the flash is being used off camera, by estimating the distance light will travel to the subject.

**C-2** Divide the guide number by that distance to obtain the proper f-number, according to the formula:

$$\text{Aperture (f-number)} = \frac{\text{guide number}}{\text{flash-to-subject distance}}$$

**C-3** Set the lens at that aperture. If the calculated f-number does not correspond exactly with any standard f-number on the aperture ring, set the ring at an intermediate position, as indicated in Table 7 in the lower right corner of Block G.

### NOTE

The formula can also be used to find the appropriate flash-to-subject distance to use if you wish to select a certain aperture.

For ASA/ISO 1000 print film, close lens down 2 stops from aperture indicated for ASA/ISO 250.



## WIDEANGLE ADAPTER (Block H)

Auto Electroflash 280PX provides sufficient coverage for lenses of 35mm or greater focal length. To extend coverage down to 28mm lenses, snap the wideangle adapter into place over the flashtube's guard window. When removing the adapter, pull off one side first.

Since the adapter spreads the light output of the flash over a wider angle, autoflash ranges and manual-flash guide numbers and flash-to-subject distances will be reduced. Any of the following methods can be used to determine the corrected values:

- P mode \* Find the applicable range from the P-mode range table in Block D.
- A mode \* Determine the range from the A mode range graph in Block I by using the sloping lines marked with an adapter symbol.
  - \* Use the A-mode range indicators on the flash's back panel in the usual manner, except: (1) in step A-3, look

A mode  
&  
M mode

M mode

- \* at the bar immediately below the one for the aperture you selected, and (2) in step B-2, disregard the lowest bar which is crossed by the distance line.
- \* Divide the ASA film speed by two, then set that value in the film-speed scale on the flash's back panel. Determine the aperture, flash-to-subject distance, or flash-distance range as usual. (Be sure to reset the film-speed scale as soon as the wideangle adapter is removed. Do not change film-speed setting on camera.)
- \* Calculate the aperture or flash-to-subject distance from the formula, using the guide number from Table 5 in Block G.
- \* Find the appropriate aperture for a given flash-to-subject distance in the usual manner, but then open up the lens one stop.

## GENERAL NOTES ON FLASH OPERATION (All modes)

- The table gives typical situations where exposure adjustment is recommended (especially for color slide film due to its narrower latitude). For manual mode, open the lens 1/2 to 1 stop for the second, third, and fourth situations, or if the room has a high ceiling.
- When taking pictures at close-up range (less than 0.7m) with the flash mounted on the camera's hot shoe, it will be difficult to obtain correct exposure since the subject may be outside the flash's angle of light emission. To avoid this problem, use the optional Off-Camera Shoe and Cable OC to position the flash away from the camera.
- For "open flash" photography, remove the flash from the camera and press the open-flash/test button while the shutter is open at "B."

Situation	P-mode TTL	A-mode TTL
Subject against bright, reflective background	set camera for up to +1 stop adjustment *	
Subject against dark, nonreflective background (e.g., black curtain, or outdoors at night)	set camera for up to -1 stop adjustment	
handkerchief, tracing paper, etc. placed over flash to soften light	decrease subject distance	open lens 1/2 to 1 stop or decrease subject distance
long recycle time, or flash fired as soon as charged		

\*If subject is near limit of flash range, also decrease subject distance if possible.

## WINDER/MOTOR-DRIVE SYNC

When used in A mode or M mode with Minolta Ni-Cd batteries fully charged in Ni-Cd Charger NC-2 and with the power level set at "Lo," Auto Electroflash 280PX synchronizes with Auto Winder G or Motor Drive 1 for multi-frame sequences (at least 40 per charge) at up to two frames per second. For 3.5fps motorized flash photography with Motor Drive 1, use the optional Power Grip 2 Set.

## USE OF AUTO ELECTROFLASH 280PX WITH OTHER CAMERAS

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Auto Electroflash 280PX can be used for manual flash photography with any camera equipped with a hot shoe. If it is used with a Minolta XD, XG, or 110 Zoom SLR Mark II camera at any setting (except "B"), the flash will start the camera's flash-ready signal in the viewfinder blinking when the unit is fully charged and will set the camera for proper X sync when the operating button is pressed. For all other cameras, check that the camera is not set for a shutter speed faster than the manufacturer's recommendation for flash sync.

Set the power level, aperture, and flash-to-subject distance in accordance with the instructions for manual flash operation on pp. 19 to 22.

## OPTIONAL ACCESSORIES

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The precise exposure control and ease of use made possible by Direct Autoflash Metering are maintained even when using the 280PX with the following accessories for creative flash lighting.

### Off-camera flash

Placing the flash unit off camera and connecting it by Cable OC (plus one to five Cable EXs for greater distances if desired) and the Off-Camera Shoe provides accurate and easy operation for:

- flash close-up and macrophotography
- bounce flash — to give your subject softer, more natural lighting
- directional flash — to creatively control shadows by lighting your subject from the desired angle
- placing flash at angle to glass, mirror, or other reflective surfaces to avoid unwanted flash reflections
- avoiding "red eye" in people and animal pictures by placing flash away from lens axis

### Multi-flash

Using several flash units gives you control over modeling of your subject by illuminating it from more than one angle. Up to three 280PXs with Off-Camera Shoe (or other PX flash units) can be fired simultaneously by using the Triple Connector, Cable OC, and Cable EXs.

### Power sources

Power Grip 2 operates on six AA-size batteries, or Ni-Cd Battery Pack NP-2 charged in Ni-Cd Charger QC-1. It provides:

- up to 3.5fps firing with motor drive
- well-balanced handling on right or left
- camera control from power grip (with Cable MD or AW)
- bounce flash at wide range of angles
- auto charge control (with Multi-Function Back and Cable FB) in flash time-lapse photography
- more flashes per charge or battery set

Ni-Cd Charger NC-2 recharges two or four Minolta Ni-Cd batteries in eight hours for use in the flash itself or power grip.

## TECHNICAL DETAILS

Type: Program/any-aperture/manual clip-on Minolta Program System electronic flash unit with provisions for TTL off-film autoflash control by Minolta Direct Autoflash Metering with Minolta X-700, X-500, X-570 cameras 27

Guide number: Adjustable at "Hi" or "Lo" levels

Wideangle adapter	Without		With	
Power level	Hi	Lo	Hi	Lo
Meters, ASA 100	28	7	20	5
Feet, ASA 25	46	11	33	8
Meters, DIN 18	20	5	14	3.5

Autoflash control: By Direct Autoflash Metering (TTL off-the-film) system with X-700, X-500, X-570 cameras

Flash duration: Approx. 1/50,000 to 1/1,000 sec. in auto operation; approx. 1/1,000 sec. at "Hi" and 1/10,000 at "Lo" in manual operation

# Aperture/distance ranges at ASA 100:

P mode	0.7 to 7m (2.3 to 23 ft.) (without adapter) 0.7 to 5m (2.3 to 16 ft.) (with adapter)		Actual range varies with aperture set by program	
A mode	without adapter		with adapter	
f No.	Hi m (ft.)	Lo m (ft.)	Hi m (ft.)	Lo m (ft.)
1.4	0.7 ~ 20 (2.3 ~ 65)	0.7 ~ 5 (2.3 ~ 16)	0.7 ~ 14 (2.3 ~ 46)	0.7 ~ 3.5 (2.3 ~ 2)
2	0.7 ~ 14 (2.3 ~ 46)	0.7 ~ 3.5 (2.3 ~ 12)	0.7 ~ 10 (2.3 ~ 33)	0.7 ~ 2.5 (2.3 ~ 8.2)
2.8	0.7 ~ 10 (2.3 ~ 32)	0.2 ~ 2.5 (2.3 ~ 8.1)	0.7 ~ 7 (2.3 ~ 23)	0.7 ~ 1.8 (2.3 ~ 5.8)
4	0.7 ~ 7 (2.3 ~ 23)	0.7 ~ 1.8 (2.3 ~ 5.7)	0.7 ~ 5 (2.3 ~ 16)	0.7 ~ 1.3 (2.3 ~ 4.1)
5.6	0.7 ~ 5 (2.3 ~ 16)	0.7 ~ 1.3 (2.3 ~ 4.1)	0.7 ~ 3.5 (2.3 ~ 12)	0.7 ~ 0.9 (2.3 ~ 2.9)
8	0.7 ~ 3.5 (2.3 ~ 12)	0.7 ~ 0.9 (2.3 ~ 2.9)	0.7 ~ 2.5 (2.3 ~ 8.2)	
11	0.7 ~ 2.5 (2.3 ~ 8.2)		0.7 ~ 1.8 (2.3 ~ 5.8)	
16	0.7 ~ 1.8 (2.3 ~ 5.8)		0.7 ~ 1.3 (2.3 ~ 4.1)	
22	0.7 ~ 1.3 (2.3 ~ 4.1)		0.7 ~ 0.9 (2.3 ~ 2.9)	

Color temperature: Balanced for daylight-type color film

Flash coverage: For lenses down to 35mm focal length on full-frame 35mm cameras, down to 28mm with wideangle adapter

Wideangle adapter	Angle of light emission		Applicable lenses
	Vertical	Horizontal	
Without	45°	60°	Down to 35mm
With	53°	70°	Down to 28mm

Power sources: Four self-contained AA-size (penlight) 1.5V sealed carbon-zinc, alkaline-manganese, or rechargeable 1.2V nickel-cadmium batteries; optional Power Grip 2

Number of flashes/  
recycle time\*:

	Hi	Lo
Sealed C-Zn cells	70/9	1000/1
AM cells	200/6	2000/0.5
Ni-Cd cells	100/3.5	600/0.3

\* As determined by Minolta's standard testing method. Actual performance will depend on type, brand, manufacturer's lot, age of batteries, and ambient temperature.

- 30 Camera/flash contacts: Direct contact for hot shoe; two spring-loaded contacts, one for signal from flash to set camera shutter speed and finder flash-ready indication, second for signal from Direct Autoflash Metering system in camera to control flash duration
- Flash-distance check: FDC (Flash Distance Checker) light on back panel and rapid blinking of "60" LED in viewfinder after exposure indicate exposure was sufficient
- Controls and other: Special circuit that minimizes battery drain when capacitor charged; A-mode range indicators with sliding film-speed (ASA 25 to 400) scale; combination monitor light and open-flash/test button
- Standard accessory: Snap-on wideangle adapter, flash case
- Optional accessories: Cable OC, Off-Camera Shoe, Cable EX (for off-camera flash); Triple Connector, Cable OC, Cable EX, Off-Camera Shoe (for multi-flash); Power Grip 2 Set; Ni-Cd Charger NC-2 with batteries
- Dimensions: Width: 70mm (2-3/4 in.)  
Height: 102mm (4-1/16 in.)  
Depth: 60mm (2-5/16 in.)
- Weight: 220g (7-3/4 oz.) without batteries

Specifications subject to change without notice



## CARE AND STORAGE

- When the flash has not been used for a long time, recycle time may increase. However, if you fire the unit several times, it will return to normal. Firing the flash several times a month will keep it in good condition even if it is unused for a long period.
- Auto Electroflash 280PX is designed for use at temperatures between  $-10^{\circ}\text{C}$  and  $50^{\circ}\text{C}$ . If the unit becomes hotter or colder than this, operation may be unsatisfactory.
- Keep the flash away from water, and dry.
- Never attempt to disassemble the unit. Any repairs necessary should be done by an authorized Minolta service facility.
- Because of its energy-saving circuit, this flash consumes less current than conventional units. However, it should be turned off when not used for a long period.
- The flash may be wiped with a silicone-treated cloth to clean it. Do not allow alcohol or other chemicals to touch its surface.
- If the flash is not to be used for two weeks or more, its batteries should be removed.
- The flash unit should never be placed or left in the glove compartment or other places in motor vehicles or elsewhere in which it may be subject to temperatures higher than  $60^{\circ}\text{C}$  ( $140^{\circ}\text{F}$ ). Further, do not store it in humid places, near corrosive chemicals, or where it would be subjected to dust or dirt. Store in a cool, well ventilated place.

## WICHTIGE EIGENSCHAFTEN DES AUTO-ELECTROFLASH 280PX

- 12 • Ermöglicht an Minolta Spiegelreflexkameras mit Blitz-Direktmessung auf dem Film die exakte und einfache TTL-Blitzautomatik:
  - TTL-Blitz-Programmautomatik an X-700 mit MD-Objektiven (Kamera stellt auch Blende automatisch ein)
  - TTL-Blitz-Zeitautomatik mit jeder Blende an X-700, X-500 und X-570 mit praktisch allen Objektiven und Zubehörteilen (Benutzer wählt beliebige Blende vor und kann damit Blitzbereich und Schärfentiefe steuern)
  - Einfache Belichtungskorrekturen von der Kamera her
  - FDC-Signal im Kamerasucher und am Blitzgerät bestätigt ausreichende Belichtung
- Zweistufige Blitzleistungs-Einstellung:
  - „Hi“ für Blitzreichweiten bis 20 m mit Blende 1,4 und TTL-Zeitautomatik oder Manuellfunktion (Leitzahl: 28 für ISO 100/21°)
  - „Lo“ für winder- und motor-synchrones Blitzen bis 2 Bilder/Sekunde (bis 3,5 B/s mit zusätzlichem Power-Grip-2)
  - Bei TTL-Programmautomatik (Funktion P) wird die Blitzleistung automatisch auf „Hi“ umgeschaltet
- Blitzfunktion folgt den Einstellungen des Verschuß- und Funktionswählers an der Kamera
- Manueller Betrieb an jeder Kamera mit Mittenkontaktschuh möglich
- Signalisiert im Sucher (und am Blitzgerät) die Blitzbereitschaft und schaltet die entsprechenden Minolta-Kameras automatisch auf die X-Synchronzeit um
- Ladekontrollschaltung und Serien-Thyristor-Schaltung (SCR) verringern Batteriestromverbrauch
- Leuchtet ohne Vorsatz das Bildfeld eines 35 mm-Kleinbildobjektivs aus (bis 28 mm mit mitgeliefertem Weitwinkel-Vorsatz)

- Vielseitiges, leicht anwendbares Zubehör für kreative Blitzbeleuchtung (Seite 56)
- Bevor Sie den Minolta Auto-Electroflash 280PX zum erstenmal benutzen, lesen Sie bitte diese Bedienungsanleitung sorgfältig und vollständig durch (oder zumindest die Seiten, die Ihre fotografischen Ambitionen betreffen), damit Sie das volle Leistungspotential von Anfang an erkennen und ausschöpfen.

#### ANMERKUNG

Zur leichteren Orientierung beim Lesen der Bedienungsanleitung (oder auch zum Mitnehmen bei Foto-Exkursionen) sind die Abbildungen, Tabellen und Diagramme dieser Anleitung auf einem separaten Blatt zusammengefaßt. Hinweise wie „Block A“ beziehen sich auf die entsprechend gekennzeichneten Blöcke auf dem separaten Blatt;

Angaben wie „T-1“ verweisen auf die zugehörigen 33 Abbildungen oder Tabellen innerhalb des betreffenden Blocks.

#### ACHTUNG

Bevor Sie den Auto-Electroflash 280PX an Kameras von anderen Herstellern verwenden, ist es ratsam, einige Testaufnahmen durchzuführen, um festzustellen, ob das Blitzgerät an diesen Kameras einwandfrei funktioniert.

**WARNUNG:** Personen oder Tieren nicht aus kurzem Abstand direkt in die Augen blitzen.