

PENTAX®

AF400T

AUTOMATIC ELECTRONIC FLASH UNIT



CONTENTS

FEATURES OF THE AF-400T	1
DESCRIPTION OF PARTS	5
GRIP BATTERY PACK	8
• Test Flash	9
HOW TO USE THE BRACKET	10
SYNCH CORD HOOK-UP	12
FLASH MODE/LIGHT INTENSITY LEVERS	14
INDEXING THE ASA FILM SPEED	16
SYNCHRONIZATION SPEEDS/OPERATIONAL FEATURES	18
• Method of Synchronization	18
• Synchronization/Operational Features Chart	18
THREE-LEVEL AUTO FLASH	20
TTL AUTO OPERATION	23
TTL AUTO FLASH RANGE CHART	25
MANUAL FLASH OPERATION (M, MS Settings)	26
• Exposures at M Manual	26
• Exposures at MS Manual	29
FLASH READY/AUTO CHECK INDICATORS	31
• Flash Ready Lamp	31
• Viewfinder Flash Ready Indicators	31
• Auto Check Lamp	32
• Viewfinder Auto Check/Auto Check Switch	33
BOUNCE FLASH PHOTOGRAPHY	34
SEQUENTIAL FLASH WITH MOTOR DRIVE AND WINDER	37
WIDE-ANGLE/TELE LENS ADAPTORS	38
POWER SOURCES	40
PRECAUTIONS	41
SPECIFICATIONS	43

Your AF-400T is undoubtedly one of the most advanced electronic flash units on the market with a host of features to meet virtually all of your flash photo needs regardless of the camera you own. It's a full professional-type systems flash unit that attaches via an accessory bracket to the tripod socket at the base of the camera and features a highly versatile flash accessory system, including three DC power source options, plus an AC Adaptor, wide-angle and telephoto adaptors, multiple flash capability, sequential flash with motor drive and winder and more.

Standard operating features offered for all cameras featuring X-synchronization via flash cord or hotshoe (via adaptor cord) include Three-Level Auto Flash Control by means of a built-in auto flash sensor which permits

selection of three flash apertures, plus manual flash at four light intensity levels (FULL, 1/4, 1/16, and 1/25th output), with quick recycling offered at the 1/25th power setting.

In addition, when used with the Pentax LX, 645, Super A/Super Program, etc., the special TTL Auto Flash Mode setting may be used, whereby the flash integrates fully with the camera's IDM (Integrated Direct metering) System to effect flash output control directly at the film plane from inside the camera, thus enabling free aperture selection over the entire auto flash operating range along with unprecedented exposure accuracy. Other special features of the AF-400T with the LX as well as other late model Pentaxes include dedicated flash operation on Auto (automatic synchronization/viewfinder flash ready indication) plus

a unique MS (manual with auto synch) Mode providing automatic synchronization on charging and viewfinder flash ready indication for manual operation as well. Other dedicated flash features include viewfinder flash range confirmation following exposures in both TTL Auto and Three-Level Auto modes, plus preexposure viewfinder auto check in the Three-Level Auto mode. Additional standard features include a convenient rotating flash head that swivels 90° on each side (up to 180° to the left for backward bounce) with 45° indents and tilts vertically 90° with a -15° setting for close-ups. For difficult bounce and other complex flash situations, an auto check lamp on the back of the flash unit lights after pressing the test button to enable auto flash

range checks before exposures in the Three-Level Auto mode.

How to use this manual

Regardless of the type of camera you own, be sure to read the "Flash Preparation" section of the manual beforehand, after which, pause briefly at the "Synchronization Speeds/Operational Features" section (page 18) to examine the particular features the AF 400T has to offer when used with your camera.

Cameras without "dedicated"/TTL flash provision

All sections of the manual except "TTL Auto Flash Operation" contain information pertinent to operation of this flash unit with your camera and should be read carefully in order to take maximum advantage of the benefits the flash unit has to offer.

Cameras with "dedicated" flash provision

(Most of current Pentax models except K1000)

When operated at the Three-Level Auto mode settings, and also at the MS (dedicated) manual setting, your camera will have the added benefit of automatic flash synchronization and viewfinder flash data indication with the AF-400T. Thus, except for the "TTL Auto Flash Operation" section, carefully read all sections of the text in order to fully understand the advantages the AF-400T has to offer with your camera.

Cameras with TTL Auto Flash Provision

The TTL Auto Flash Mode section of the AF-400T is a special mode designed to offer TTL (through-the-lens) Auto Flash Control from inside the camera when used with the

Pentax LX, 645, Super A/Super Program, etc. with its IDM System of exposure control. With these cameras, the TTL Auto Flash serves as the flash unit's main operating mode offering the advantages of film plane metering and free aperture selection which overshadow those of standard auto operation with the flash unit's built-in sensor and making use of the Three-Level Auto mode virtually unnecessary. After examining the chart on pages 18 and 19, skip directly to the "TTL AUTO OPERATION" pages to check out basic flash operating features with your camera. Then, proceed to read the other sections of the manual, paying particular attention to the "Manual" section and the operational differences between "M" and "MS" Manual modes as there will be occasions when one

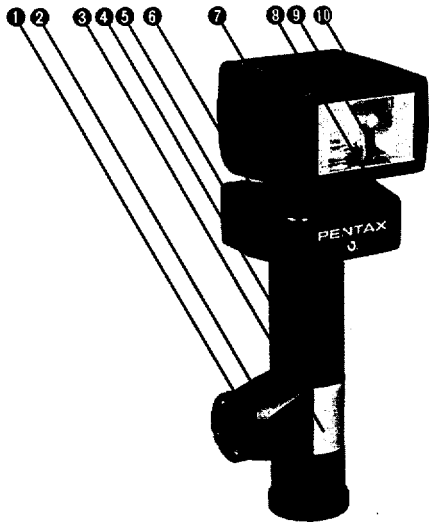
form of manual flash is more advantageous than the other.

While TTL Auto eliminates the necessity for use of Three-Level Auto with the LX, 645, Super A/Super Program, etc., it is still useful to familiarize yourself with the "Three-Level Auto" section also, as this mode can be used for approximate preflash exposure checks for TTL Auto.

NOTE: These instructions apply for Pentax cameras marketed as of the date of publication on the back cover of this booklet. For specific operating instructions with later model Pentax cameras not mentioned in this manual, refer to your camera instruction booklet.



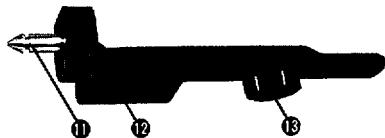
DESCRIPTION OF PARTS

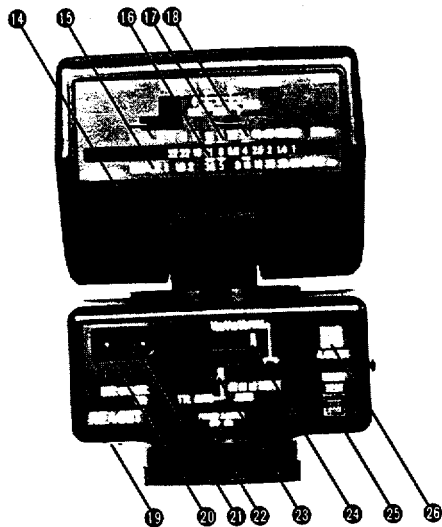


- ① base cover (removable)
- ② bracket lock release (rear)
- ③ bracket clamp
- ④ grip
- ⑤ 4 P synch terminal
- ⑥ synch cord lock button
- ⑦ auto flash sensor
- ⑧ bounce angle scale (beneath flash head)
- ⑨ flash head
- ⑩ adaptor mounting slot

BRACKET

- ⑪ bracket pin
- ⑫ tripod screw hole
- ⑬ tripod screw



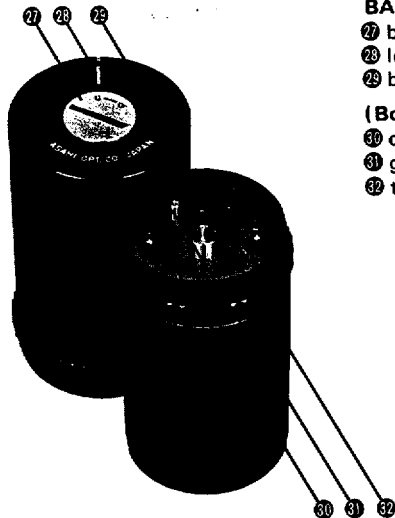


FLASH DATA PANEL

- ⑭ flash head lock lever
- ⑮ distance scale
- ⑯ aperture scale
- ⑰ color aperture indices
- ⑱ ASA/ISO film speed scale/indices
- ⑲ PC synch terminal
- ⑳ power switch
- ㉑ external power socket
- ㉒ viewfinder auto check switch (FINDER A. CHECK)
- ㉓ flash mode selector lever
- ㉔ manual light intensity selector
- ㉕ test button/flash ready lamp
- ㉖ auto check lamp (A. CHECK)

4P synch cord B





BATTERY PACK

- 27 battery compartment lock
- 28 lock index mark
- 29 battery compartment cap

(Bottom View)

- 30 contact plate
- 31 guide pin
- 32 thumb screw

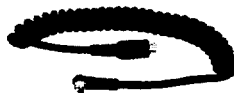
4P synch cord A (optional)



4P synch cord A-5m (optional)



4P synch cord C (optional)



4P synch cord B-5m (optional)



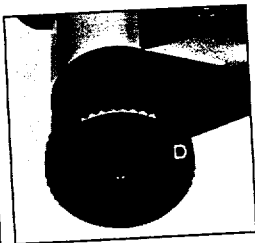
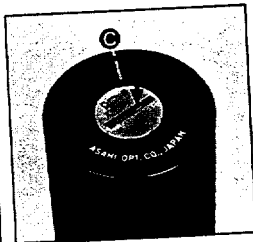
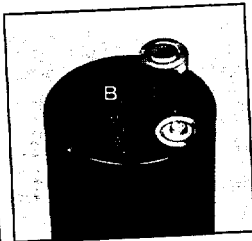
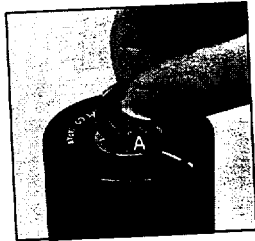
BATTERY PACK (Battery Insertion/Mounting)

NOTE: Operating instructions for power source units other than the Battery Pack are provided with the individual power unit (see page 37).

The Battery Pack attaches quickly and easily to the base of the flash unit. It is easily carried about making it ideal for light shooting sessions with flash. The Pack is powered by either six AA-size Alkaline or NiCad Cells (for NiCads a commercially available recharger unit is required).

Inserting the Batteries:

- 1) Turn the battery compartment lock dial **A** counterclockwise with a coin (to the point where "0" aligns with the index mark) and remove the battery compartment cap.
- 2) Insert the six AA-size Alkaline or NiCad cells into the compartment in accordance with the + - polarity diagrams **B** on the walls of the compartment.
- 3) Replace the battery cap by aligning the index mark with the white index dot **C**. Press down on the cap so that it fits tightly and turn the lock dial clockwise.



with a coin until "C" aligns with the index marks.

Mounting the Battery Pack:

1) Remove the grip base cover **(D)** on the bottom of the flash unit by twisting it clockwise.

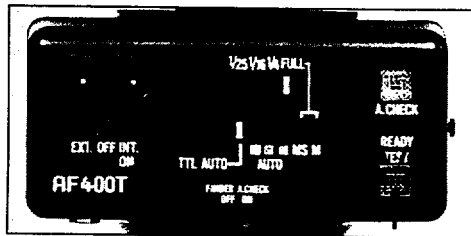
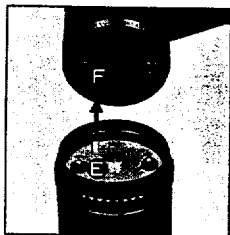
2) Align the guide pin of the Battery Pack **(E)** with the guide pin alignment hole **(F)** of the grip and mesh the two units together. Turn the Battery Pack thumbscrew **(G)** clockwise to lock in place.

To Remove the Pack: Turn thumbscrew in the opposite direction and separate. **ALWAYS COVER THE BASE OF THE FLASH WITH THE GRIP**

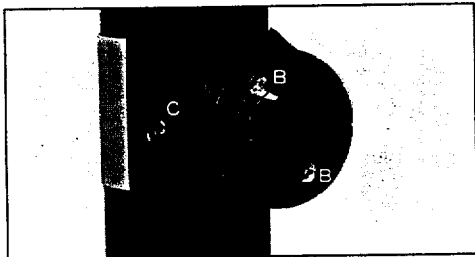
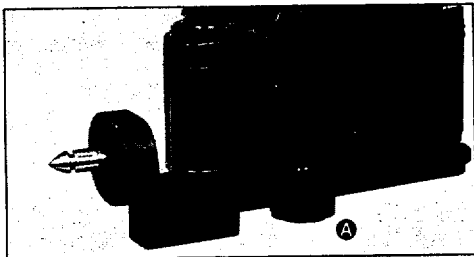
BASE COVER WHEN NOT USING THE BATTERY PACK TO PROTECT ELECTRICAL CONTACTS.

Test Flash:

Slide the power switch to INT ON; in a few seconds the flash ready lamp will light up. Press the lamp (which doubles as a test button) to discharge flash. If the lamp fails to light within 30 seconds, batteries may be inserted improperly (if new) or worn out (if old). After testing, slide the power switch back to OFF.



HOW TO USE THE BRACKET



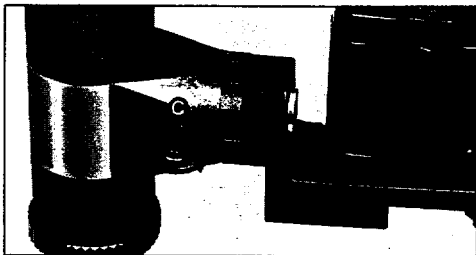
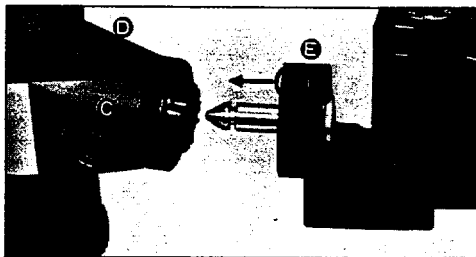
The AF-400T may be attached to all cameras featuring a tripod socket by using the mounting bracket supplied. The bracket clamp at the base of the flash grip loosens for positioning the flash on either the left or right side of the lens; flash-head-to-camera distance is also adjustable.

- Choose a suitable position for the flash and attach the bracket securely to the camera body by tightening the tripod screw **A**.
- Adjustment of the bracket clamp is required when you desire to position the flash on the opposite side of the lens. Loosen the two screws of the clamp **B**, realign the clamp with the index line mark on the opposite side of the grip and tighten screws. Flash head may be made to rotate freely to right or left or backward for reflected flash by leaving screws slightly loose.

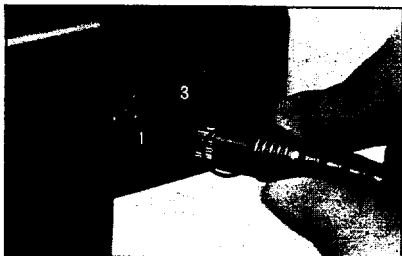
■ Turn the bracket clamp lock screw **C** counterclockwise fully. Align index mark of the bracket **D** with upright index mark of the clamp **E** and insert bracket pin into the clamp until it locks in place with an audible click. The other index marks on the bracket clamp may be used to tilt the flashhead in a number of positions for added flexibility in bounce photography. To lock the bracket securely in place turn the lock screw **C** completely clockwise; for quick release of flash, loosen the lock screw all the way by turning it counterclockwise.

To remove flash: Loosen bracket lock screw all the way, press in with thumb and separate two units.

Use with Tripod: The entire camera and flash assembly may be mounted on a tripod by screwing the tripod to the tripod hole on either end of the base of the bracket.



SYNCH CORD HOOK UP



Five types of synch cords may be used with the AF400T; usage varies in accordance with the camera in use with the flash unit.

4P Synch Cord A and 4P Synch Cord A-5m (for Pentax LX)

These cords feature special contacts for coupling with the camera's TTL/dedicated flash system. The cord attaches to the 4-pin terminal on the side of the flash head and X-synch terminal on camera body. **To attach:** Align 4P plug (horizontal groove facing you) with 4P terminal ① as shown and push plug all the way in until it locks in place. Attach plug to TTL X-synch terminal ② (lower terminal) on the camera body with TTL contacts at bottom as shown. Tighten collar screw to secure in place. The 5m Synch Cord A permits off-camera flash photography.

To remove cord from flash: Push lock button ③ at side of 4-pin terminal all the way in and remove cord.

NOTE: This cord is not specified for cameras without a TTL/dedicated flash terminal on the body. For cameras featuring dedicated flash via hotshoe use 4P Synch Cord B (below); for other cameras use 4P Synch Cord C or a standard PC Cord. **4P Synch Cord B and 4P Synch Cord B-5m (for Pentax**

cameras with dedicated flash)

These cords are essentially the same as 4P Synch Cord A, but is designed for coupling with Pentax cameras featuring dedicated flash operation via hotshoe only (ME SUPER, MG, etc.)

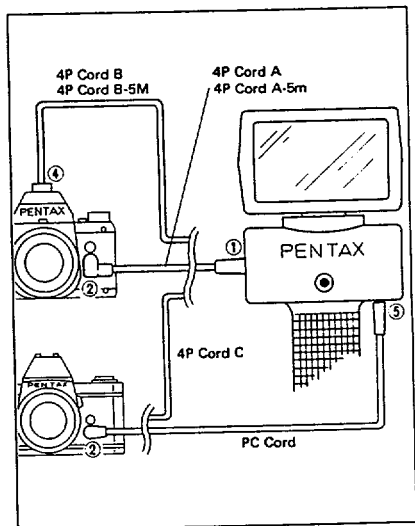
To attach: Insert 4P plug into 4P terminal ① on flash above, then slide camera side connector all the way into camera hotshoe ④ as shown.

4P Synch Cord C (for non-TTL/dedicated flash cameras)

Also available optionally, this cord enables synchronization of cameras featuring an X-terminal but without TTL/dedicated operation (ME, MX, K-2, etc) via the 4P terminal of the flash unit. **To attach:** Insert 4P plug into 4P terminal ① as with Synch Cords A and B above, then, attach the camera side connector to camera X-synch terminal ②

PC Cord (for non-TTL/dedicated flash camera)

In addition to 4P Synch Cord C, cameras without TTL/dedicated flash featuring an X-synch terminal may also be synchronized with a commercial PC Cord. **To attach:** In this instance, connect the cord plug to the PC terminal beneath the flash head ⑤ and the camera side plug to the camera X-synch terminal ②

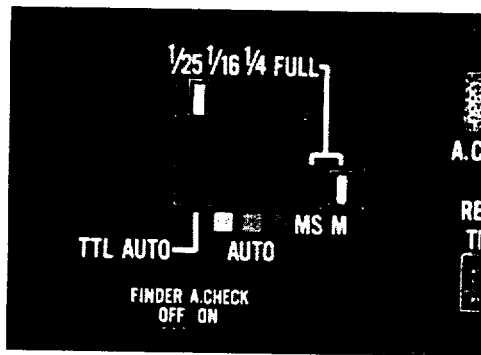


FLASH MODE/LIGHT INTENSITY CONTROL LEVERS

Flash Mode Selector:

Located on the panel beneath the flash head, the **flash mode selector** enables selection of any of six flash mode settings. The **light intensity control lever** just above it enables preselection of one of four light intensity levels when operating the flash unit in the M (Manual) or MS (manual with auto synch) modes.

To select the operating mode: Slide the mode selector lever until the white index mark on the selector corresponds with the index mark for the desired operating mode. **To select light intensity level for manual operation:** After setting the mode selector to the M or MS manual setting, set the light intensity for the required output level (see Manual Operation, page 26).





TTL Auto: This setting is used for TTL (through-the-lens) integrated flash control with Pentax cameras featuring IDM (such as the LX) or similar flash metering systems (see page 23).



M (Manual) At this setting standard manual flash operation is featured at the power output level indexed on the light intensity selector just above it. With Pentax cameras offering TTL/dedicated flash operation, the M manual setting enables you to override the dedicated flash features for free selection of synchronization speeds (see page 26).



Three-Level Auto These three color-coded settings are used for auto flash operation with all cameras not featuring TTL operation. With the selector at these settings, flash output is controlled by the built-in sensor on the flash head. YELLOW is for low output/smaller apertures, GREEN for medium output/middle apertures, RED for high output/wide apertures (see page 20).



MS (Manual with Auto Synch) This setting also offers manual operation at the output level indexed on the light intensity level. In addition, with the film-plane metering LX and Pentax cameras with dedicated flash provision, MS manual gives you the added benefit of automatic synchronization at "X" and viewfinder flash ready indication (see page 29).

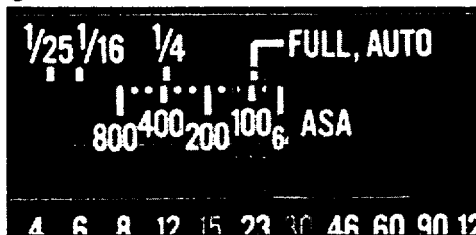
INDEXING THE ASA/ISO FILM SPEED

The ASA/ISO film speed scale on the back of the flash head is provided as a guide for selecting the correct aperture according to the ASA/ISO rating of the film in use and the mode of flash operation you've chosen. Flash ranges for each aperture are indicated on the distance scale of the flash data panel when the ASA/ISO index lever is moved to the appropriate mode.

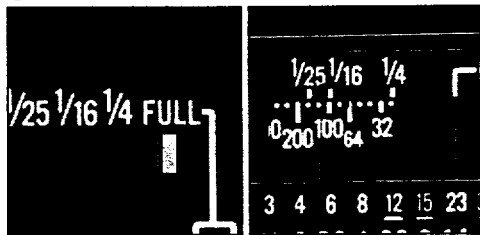
Ⓐ TTL AUTO, THREE-LEVEL AUTO OPERATION: Index the ASA/ISO number of the film being used to the FULL, AUTO setting.

Ⓑ M, MS MANUAL OPERATION: Index the ASA/ISO number of the film being used to the same light intensity level chosen (FULL, AUTO for full output, 1/16 for 1/16, etc.)

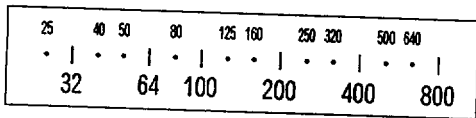
Ⓐ



Ⓑ



The chart below represents the ASA/ISO value for the in-between settings not numerically indicated on the ASA/ISO scale.



NOTE: For TTL operation, the ASA/ISO index serves only as a rough guide for aperture range. For more accurate figures, use the handy TTL Auto Flash Range Chart provided on page 25 of this manual.



SYNCHRONIZATION SPEEDS/OPERATIONAL FEATURES

The method of flash synchronization and operational features of the AF-400T vary depending upon the camera you are using it with. Generally speaking, Three-Level Auto (or standard Auto via the built-in flash sensor) and manual at M are standard features with all cameras offering X-synchronization; the TTL Auto mode is available with the Pentax LX, 645, Super A or Super Program. In addition, with the LX and also with certain other Pentax cameras, automatic flash synchronization and viewfinder flash ready indication are available for Auto and M/S manual modes as indicated in the chart.

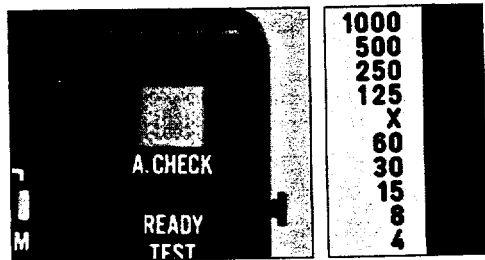
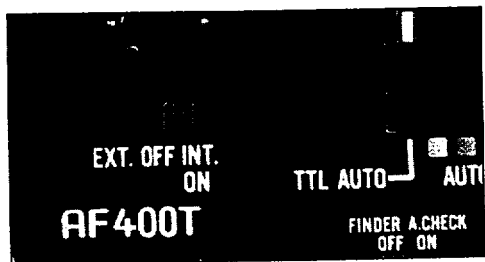
Method of Synchronization: With the Pentax cameras mentioned in the chart, the AF-400T is synchronized in the shutter modes and at the shutter speeds indicated in the column of the chart representing that camera. For cameras offering TTL/dedicated flash operation not specifically mentioned in the chart, refer to your camera instruction manual for synchronization and operational features. With older model Pentax cameras and cameras of other makes, synchronization is basically the same as indicated in the last column of the chart. However, as there are exceptions be sure to refer to your camera instruction manual for details.

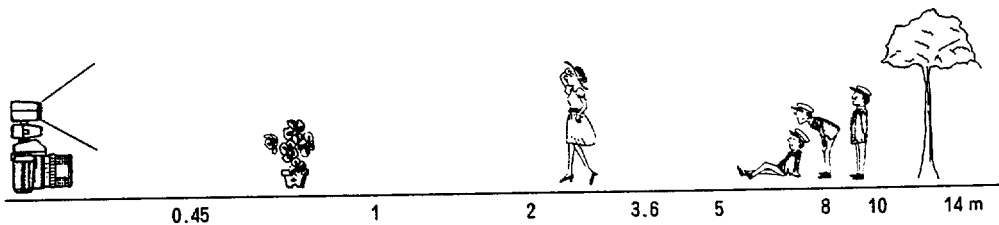
	LX	645
Flash Modes	TTL Auto, Three-level Auto, M in four steps, MS in four steps	TTL Auto, Three-level Auto, M in four steps, MS in four steps
Auto-matic Synch	At 1/50 sec. with shutter dial set at "AUTOMATIC"	At 1/60 sec. with photo mode set to Programmed AE, Aperture-priority AE or Shutter-priority AE
Manual Synch	At "X" (1/75 sec.) setting of shutter dial	By setting "60" (1/60 sec.) in LCD window
Flash Ready Indication	1) LED sign in viewfinder 2) Flash ready lamp on flash	1) LED sign in finder; LCD sign in LCD window 2) Flash ready lamp on flash
Auto Flash Check	1) Flickering LED in viewfinder 2) Auto check lamp on flash	1) Flickering LED sign in viewfinder 2) Auto check lamp on flash

SFX/SF1	Super A Super Program	A3 A3000	P3 P30	P5 P50
TTL Auto, Three-level Auto, M in four steps, MS in four steps	TTL Auto, Three-level Auto, M in four steps, MS in four steps	Three-level Auto, M in four steps, MS in four steps	Three-level Auto, M in four steps, MS in four steps	Three-level Auto, M in four steps, MS in four steps
At 1/100 sec. with photo mode set to Programmed AE, Aperture-priority AE or Shutter-priority AE	At 1/125 sec. with shutter dial set at "AUTO"	At 1/60 sec. with shutter mode selector set to PROGRAM	At 1/100 sec. with shutter dial set to PROGRAM	At 1/100 sec. with exposure mode set to Programmed AE or Aperture-priority AE
By setting "100" (1/100 sec.) in CENTIC panel	At "125X" (1/125 sec.) setting of shutter dial	At "60 1/2" (1/60 sec.) setting of shut- ter mode selector	At "100 1/2" (1/100 sec.) setting of shutter dial.	By setting "100" (1/100) in LCD window
1) LED sign inside viewfinder 2) Flash ready lamp on flash unit	1) LCD sign in viewfinder 2) Flash ready lamp on flash	1) LED lamp in viewfinder 2) Flash ready lamp on flash		
1) Flickering LED sign in viewfinder 2) Auto check lamp on flash unit	1) Flickering LCD in viewfinder 2) Auto check lamp on flash	1) Flickering LED sign in viewfinder 2) Auto check lamp on flash		

(4) Set the power switch to ON; the flash is ready for use when the ready lamp on the flash lights (flash ready indication is also given inside the viewfinder for Pentax cameras with dedicated flash provision). The flash auto check lamp (also viewfinder auto check indicator when provided) will flicker when properly exposed; auto exposure range checks are also possible before exposures (see page 32).

NOTE: When the flash is used on the Pentax camera (Super A/Super Program, Program A/Program Plus, A3/A3000, P5/P50, 645, or SFX/SF1) with the aperture ring set to A (Auto), the aperture is automatically set to the programmed f-stop upon completion of charging.





Auto Flash Ranges:

YELLOW — 0.45m ~ 3.6m (1.5 ft. ~ 11.8 ft.)

GREEN — 0.65m ~ 5m (2.1 ft. ~ 16.4 ft.)

When the distance ranges from 1.25m to 3.6m (4.1 ft. to 11.8 ft.) use of all three auto flash settings is possible. Thus, at ASA/ISO 100, apertures of f/11 (YELLOW) f/8 (GREEN) and f/4 (RED) may be used. Use of Red gives shorter recycling time and

reduces battery consumption. Yellow gives maximum depth of field, while, in this case, Green offers an intermediate choice. Flash range remains the same for all three mode settings regardless of film speed.

TTL AUTO OPERATION

When used with Pentax cameras with a TTL integrated flash control system, such as the Pentax LX with its IDM (Integrated Direct Metering) System, you can realize the full capabilities of the AF-400T. Not only does the TTL Auto mode permit you to use any f-stop within the flash unit's operating range (film speed indexing range of ASA/ISO 6 - 800 for LX and 25 - 800 for Super A or Super Program), most of the traditional problems of flash photography are eliminated because the flash is controlled directly at the film plane by the metering cell inside the camera. There is no need for compensation when using filters or close-up accessories; bounce flash technique is greatly simplified (see page 34). In addition, full integration with the camera's auto exposure system allows metering of both the ambient light and electronic flash during the actual exposure. And, in situations where there is enough available light, the camera's exposure system overrides the need for flash, ensuring correct exposure in all light conditions. For operation:

1) Set the flash mode selector to TTL Auto, set the camera's shutter dial to AUTOMATIC. The camera

synchronizes automatically at "X" for flash. On charging, the "X" LED inside the viewfinder lights along with the flash ready lamp on the back of the flash. The ASA film speed set on the camera automatically interlocks with flash, also. However, it's useful to index the ASA/ISO film speed on the data panel to assist in rough calculation of flash range.

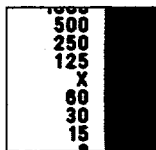
2) Any lens aperture within the TTL flash coupling range can be used. The following two methods are available for calculation of flash range.

Quick calculation with the distance scale: Glance at the flash distance scale on the back of the flash. You can see the maximum range for the chosen aperture; the minimum distance is approximately 1/8th of the maximum. For example, with ASA/ISO 100 film at f/2: $20 \div 8 = 2.5$. Thus, the total flash range at f/2 is 2.5m to 20m.

1.5	2	3	4	6	8	12	15	23	30	46	60	90	120	240 ft		
						32	22	16	11	8	5.6	4	2.8	2	1.4	1
0.45	0.8	1	1.5	2	3.6	5	8	10	20	28	40	56	80	m		

Using the TTL Flash Range Chart: The other method is to use "TTL Auto Flash Range Chart" in the back of this book. This serves as a handy pocket reference, permitting you to look up the correct working ranges for a number of film speeds and apertures, thus eliminating the need for calculation for most flash situations. Generally speaking, the wider the aperture, the greater the flash range; at medium apertures there is virtually no need to check the exposure for average flash-subject distances, while at relatively small apertures it's necessary to know the working ranges to ensure adequate exposure.

3) When you're certain that the aperture selected is within the TTL auto flash range, release the shutter to take the photo. The auto check lamp on back of the flash and the viewfinder "X" LED will flicker after the exposure to confirm that your subject received sufficient flash. Approximate pre-exposure flash range checks are also possible for certain apertures using the Three Level settings (see page 32).



NOTE: In addition to "Automatic," with the Pentax LX, 645, Super A or Super Program, the camera shutter speed dial may also be set at "X" for TTL operation. Do not use other settings, however, or proper synchronization will not be obtained. The camera's integrated TTL flash/non-flash auto exposure control system prevents flash when the metered shutter speed of the exposure being made exceeds the speed where flash is required. Generally, automatic synchronization for flash is obtained when the viewfinder LED indicates a shutter speed of 1/30th second and below (occasionally flash is obtained when the viewfinder LED indicates a shutter speed of 1/60th second due to stepless metering). The above feature also applies to the LX, 645, Super A or Super Program during Three-Level Auto Flash operation and manual flash at the MS flash mode setting.

TTL AUTO FLASH RANGE CHART

Aperture (ASA/ISO 100)	Flash-to-subject distance in meters (in feet)
f/1.2	4.2 – 33 (13.8 – 108.3)
f/1.4	3.6 – 28.5 (11.8 – 93.5)
f/2	2.5 – 20 (8.2 – 65.6)
f/2.8	1.8 – 14.2 (5.9 – 45.9)
*f/4	1.3 – 10 (4.3 – 32.8)
f/5.6	0.9 – 7 (3 – 23)
f/8	0.6 – 5 (2.1 – 16.4)
f/11	0.5 – 3.6 (1.5 – 11.5)
f/16	0.3 – 2.5 (1.2 – 8.2)
f/22	0.25 – 1.8 (0.8 – 5)

● The chart is based on ASA/ISO 100. At ASA/ISO 400, the distances are doubled, while at ASA/ISO 25, the distances halved.

● In the Aperture-priority AE or Metered Manual mode of the Super A or Super Program, the proper aperture should be selected according to the flash-to-subject distance as shown in the chart.

*In the Programmed AE or Shutter-priority AE mode of the Super A or Super Program, the aperture is automatically set to the programmed f-stop depending on the ASA/ISO rating of film in use, viz, to f/4 at ASA/ISO 100 and the TTL Auto flash ranges from 1.3m to 10m.

MANUAL FLASH OPERATION (M, MS Settings)

In addition to providing standard manual flash at M with four light intensity levels to choose from, the AF-400T also features a unique MS manual mode, whereby "dedicated manual" flash operation is possible when the flash is used with Pentax cameras having TTL/dedicated flash provision as indicated in "Exposures at MS Manual" (see page 29, also chart on page 18).

Exposures at "M" Manual

Standard manual flash at the M setting is especially useful for exposure situations where it is necessary to override the auto flash exposure system for free selection of lens aperture or shutter speed. In addition, by varying the light intensity levels (FULL 1/4, 1/16 and 1/25) increased versatility in aperture selection may be gained for given shooting distances, while the capability to reduce light intensity levels is highly useful for close-up work requiring faster recycling times.

(1) Set the mode selector to M and turn the flash unit ON.

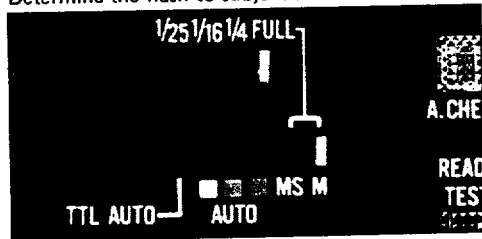
(2) Set the correct synchronization speed (or lower) as indicated in the column for manual synchronization for your camera in the chart on page 18.

(3) Set the light intensity selector to the desired light intensity (FULL, 1/4, 1/16 or 1/25) and index the ASA/ISO film speed scale on the flash data panel to the same index mark as that chosen on the selector switch.

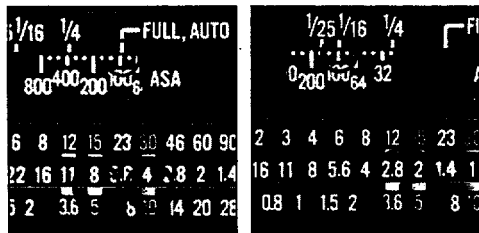
(4) Set the exposure, using either of the following methods:

Quick Calculation with Flash Data Panel:

Determine the flash-to-subject distance in feet or



meters on the distance scale of the lens or by other means of accurate measurement. Pick out the correct aperture for the given distance in the aperture window (directly below the distance in feet, directly above the distance in meters) on the flash data panel on the back of the flash. For example, at 5 meters distance using ASA/ISO 100 film at FULL output, the correct aperture is f/8; at 10 meters it's f/4; at 1/16th output, it's f/2 at 5 meters and f/2.8 at 3.6 meters.



Calculation Based on Guide Numbers:

You can also calculate the correct aperture setting based on guide numbers given in the following table and using the formula:

$$\text{Aperture} = \frac{\text{Guide Number}}{\text{Flash-to-Subject Distance}}$$

For example, with ASA/ISO GN40 at 10 meters $40 \div 10 = 4$, thus use f/4, etc.

Table of guide numbers (m)

ASA/ISO Light intensity	50	100	200	400
Full	28	40	57	80
1/4	14	20	28	40
1/16	7	10	14	20
1/25	6	8	11	16

- 5) Set the correct f-stop on the lens aperture ring. Take photo after flash ready lamp on back of flash

lights. Be sure to turn the flash and/or power pack power sources to OFF immediately after exposure when no longer needed.

IMPORTANT: Correct exposures on manual depend upon 1) proper setting of the lens aperture in relation to flash-to-subject distance and guide number, 2) proper indexing of the ASA/ISO film speed in relation to light intensity, and 3) proper shutter speed synchronization. Neglect of any of these steps will result in flash failures.

***Using the Auto Shutter Mode on M:** While not recommended for normal photography when mechanical shutter speeds are available, with the LX and for all other aperture-priority automatic cameras having viewfinder shutter speed readouts (those with "Auto only" operation in particular), the AUTO setting of the shutter dial may be used for manual flash. In this instance, generally full exposures will be obtained at speeds of 1/30 sec. or slower (depending upon the individual synchronization features of the camera). Be sure that shutter speeds do not exceed required synchronization or only partial exposures will be obtained; at very slow speeds, use a tripod and make sure that subject is stationary to avoid double images.

Exposures at MS Manual

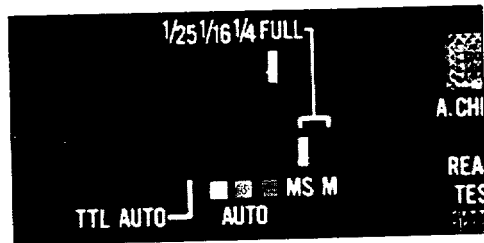
The MS manual setting is a special setting for "dedicated manual" flash operation with Pentax cameras featuring TTL/dedicated flash provision. When these cameras are used at this setting, synchronization at "X" is automatically obtained on charging and flash ready indication is given in the viewfinder in addition to standard manual flash at four light intensity levels.

When cameras without dedicated flash provision are used at this setting, only non-dedicated manual operation is obtained. Similarly, in the Programmed AE or Shutter-priority AE mode of the Super A or Super Program, or in the Programmed AE mode of the Program A or Program Plus, just the ordinary manual flash operation is obtained even when the flash is set at this MS setting (as at the M setting described on page 26).

For "dedicated manual" flash operation:

- 1) Set the mode selector lever to MS and set the power switch to ON.
- 2) Set the camera shutter dial to "Auto" (also M in the case of the ME SUPER).

NOTE: Dedicated flash can also be obtained using the LX at the mechanical "X" shutter speed setting. (see note on next page). When other cameras are used at the mechanical "X" setting, standard non-dedicated manual operation will be obtained (see page 26).



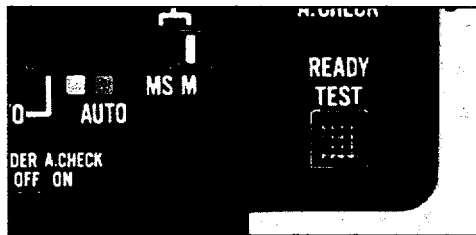
3) Determine the exposure as indicated in steps 3 – 5 for manual operation at M (see page 26~28). Camera synchronizes automatically for flash on charging; the viewfinder flash ready indicator also lights in addition to the flash ready lamp on the back of the flash. Turn the flash unit/power pack switches to OFF when no longer needed. To synchronize at speeds other than "X" for cameras offering dedicated flash operation, switch to the M manual mode.

NOTE: Although automatic synchronization at "X" is obtained with the LX with the shutter dial set at either "Automatic" or the mechanical "X" speed, do not use other speeds for the MS manual mode as proper exposure will not be obtained. Moreover, the camera's automatic exposure system will still override flash when shutter speed readings exceed the required synchronization speed. For manual flash without override, switch to manual flash at M.

FLASH READY/AUTO CHECK INDICATORS

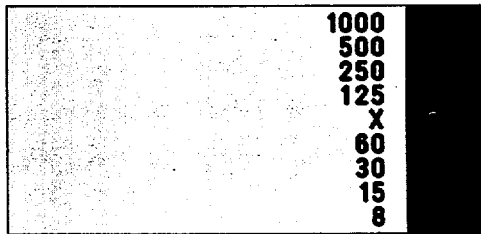
Flash Ready Lamp

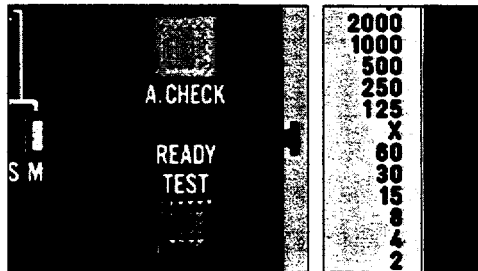
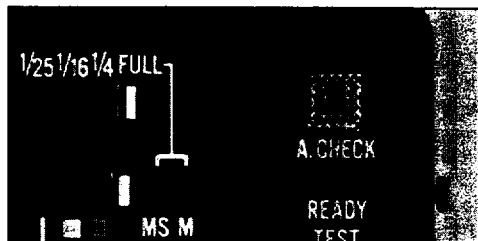
The flash ready lamp on the back of the flash comes on when the flash unit reaches 80 – 90% of its charge; light intensity stabilizes a few seconds after the lamp lights. With flash at low intensity, the ready lamp comes on instantaneously when power supply is adequate, permitting several flashes in succession. Following high intensity flash, however, longer intervals are required before the unit is ready to flash again (recycling times depend upon the power source being used).



Viewfinder Flash Ready Indicators

These are standard features on Pentax cameras with TTL/Dedicated flash capacity and give you the added convenience of telling you when the flash is ready to fire without moving your eye from the viewfinder. The proper auto flash synch cord must be used before the ready lamp will light (see page 12). Method of indication also varies slightly from camera to camera (refer to the individual camera instruction manual for details).





Auto Check Lamp

The auto check lamp on the back of the flash serves two basic functions:

Proper Exposure Confirmation: Following exposures for the Three-Level Auto mode settings and the TTL Auto mode as well, the auto check lamp will flicker as confirmation that your subject received sufficient exposure (CAUTION: be careful not to allow the sensor to be fooled by foreground objects).

Pre-exposure Flash Range Check: For the Three-Level Auto mode settings only, the auto check lamp also permits you to check that the subject is within correct flash exposure range before making the actual exposure, highly convenient for bounce flash and other difficult flash situations. After making flash preparations and making sure to index the film speed properly on the back of the flash, turn the flash on and press the test button after the ready lamp comes on; if exposure is sufficient, the green auto check lamp on the back of the flash will flicker (if it fails to flicker, additional exposure adjustments are required).

Approximate Checks for TTL Auto:

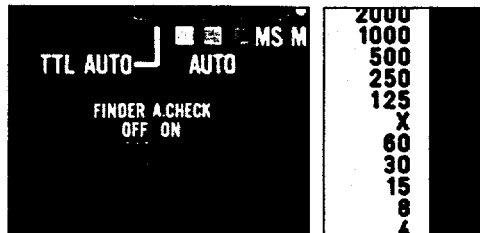
While pre-exposure flash range checks cannot be made in the TTL Auto Mode because the sensor in the camera is used, approximate checks can be made using one of the Three-Level Auto mode settings when the aperture used approximates those indicated for the three non-TTL settings. After flash preparations, set the mode selector to the Yellow, Green or Red setting, whichever is appropriate for the aperture being used, and press the TEST button. Be sure to set the selector back to TTL Auto before making the actual exposure.

Viewfinder Auto Check/Auto Check Switch

Flash range confirmation inside the viewfinder is also available with all Pentax cameras with TTL/Dedicated flash provision (except the ME SUPER). In both Three-Level Auto and TTL Auto modes, the flash ready indicator (by LED with LX and 645, and $\frac{1}{2}$ mark with Super A, Super Program, Program A or Program Plus) will flicker after releasing the shutter to confirm your subject is properly exposed (refer to camera instruction manual for details). Pre-

exposure flash range check using the TEST button is also given inside the viewfinder for the Three-Level Auto mode only (see "Auto Check Lamp").

Auto Check Switch: For fast action photography with flash, the viewfinder exposure check ON/OFF switch (marked FINDER A. CHECK) on the back of the flash allows you to turn the viewfinder auto exposure check OFF. Be sure the switch is set at ON when you desire viewfinder auto check indication.



BOUNCE FLASH PHOTOGRAPHY

To avoid the flat lighting or harsh shadows which are often characteristic of direct flash (A), the AF-400T may be tilted to reflect light from a ceiling or a wall, card, etc. (B). Indirect use of flash in this manner is referred to as "bounce flash," which gives softer lighting and a greater sense of depth with most photographs.

The AF-400T's highly mobile flash head and the availability of auto flash via the built-in sensor make it relatively easy to obtain good results for bounce flash; it's even easier in the TTL auto mode.

Since the light intensity depends upon the nature of the reflective surface, however, it's a good idea to test the flash with the auto check lamp before shooting to find the correct aperture.

In the manual mode, the aperture must be wider than the calculated value (the number of stops again depending upon the reflecting surface). Because of this, it's helpful to refer to a photo guide book for a more detailed explanation of bounce techniques for manual flash.

(A)



(B)



Vertical Bounce Flash: The flash head can be positioned vertically at fixed 45° , 65° and 90° angles, simply by lifting it with your hand and tilting it to the desired click-stop setting. Angles are marked on the scale beneath the flash head. Use of angles less than 45° is not recommended as lighting will be uneven. For bounce flash at additional upright angles, the entire grip may also be tilted by releasing the bracket lock and aligning the unit to the appropriate index mark on the bracket.

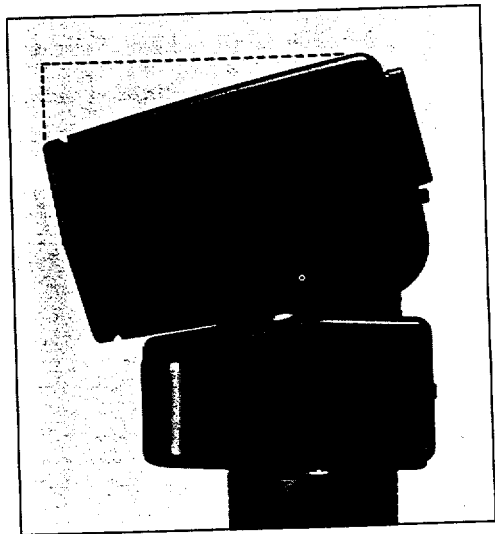
Horizontal Bounce Flash: To bounce from walls or other horizontal surfaces, you can rotate the grip horizontally 45° , 90° , 180° (for backward bounce) to the left, and 45° and 90° to the right, with click-stop settings provided at respective angles (for additional angles, the entire grip may also be rotated—see section on mounting grip and bracket, page 10).

NOTE: For both vertical or horizontal bounce flash at intermediate angles where the sensor does not face the subject use only the TTL Auto or manual modes (use of auto with the built-in sensor for these positions will not give correct exposures).



Close-ups: For close-up work at distances from 0.5m – 1m, the flash head may be tilted downward to a -15° setting by sliding the lock lever on the back of the flash head all the way in the direction of the arrow on the back of the flash head and lowering the head. As the sensor doesn't face the subject in this instance also, use either the TTL Auto or manual modes (to use auto with the built-in sensor for close-ups, the grip must also be tilted forward so that the sensor covers the subject as well (see "Vertical Bounce Flash").

CAUTION: Do not attempt to lower the flash head without first releasing the lock or breakage could result.



SEQUENTIAL FLASH WITH MOTOR DRIVE AND WINDER

When operating the flash at relatively close and medium ranges, recycling times are fast enough to permit sequential flash in conjunction with motor drive or winder units for the TTL Auto and Three-Level Auto modes. To obtain best results, set the viewfinder auto check switch (FINDER A. CHECK) on the back of the flash to OFF so that exposure checks do not slow recycling times. Wait an additional 10 seconds after the flash ready lamp comes on to allow sufficient time for the capacitor to charge completely before beginning the sequence.

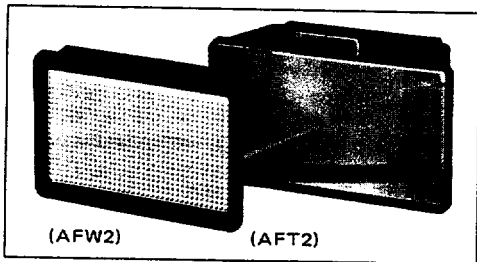
- In the TTL Auto mode, approximately 10 flashes are obtainable in a sequence using high performance alkaline batteries in good condition at $f/1.4$ with ASA/ISO 100 film; approximately 10 in the red Auto mode at $f/4$.

- When used on Super A/Super Program, Program A/Program Plus, or P5/P50 for sequential flash by powered winding operation, select either Aperture-priority AE or Metered Manual mode. Maximum speed of sequential flash is about 3.5 fps.

- In addition to battery condition, recycling times depend upon the subject matter and flash-to-subject distances. Minimum recycling times are obtained in the TTL Auto mode by using the largest aperture available.

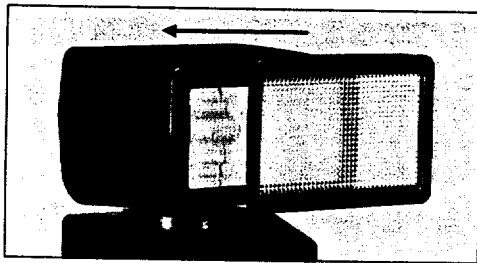
Manual Flash: Fast recycle times for sequential flash with motor drive or winder are also available in the manual mode at the 1/25 and 1/16 light intensity settings. Sequential flash on manual, however, requires that the subject remain at a fixed distance; best results and minimum recycling times are obtained at large apertures.

WIDE ANGLE/TELE LENS ADAPTORS



(AFW2)

(AFT2)



The Pentax AFW 2 Wide-Angle Adaptor and AFT 2 Telephoto Adaptor offer greater flash beam control when used in conjunction with the AF-400T in both auto and manual flash modes. The Wide-Angle Adaptor extends flash coverage for use with wide-angle lenses down to 24mm, and improves results with 28mm and 30mm wide-angle lenses. The Telephoto Adaptor offers greater concentration of the flash for use with telephoto lenses in the 85mm–200mm range.

How to Attach the Adaptors:

Fit either adaptor into the slots at the top and bottom of the flash head, and slide it all the way until it is centered over the flash head.

Auto/TTL Auto Flash with Adaptors:

For Auto and TTL Auto photography with either adaptor there is no need to adjust the aperture, but the maximum shooting distance for each aperture is altered. With the AFW 2, the maximum distance is halved, while with the AFT 2 it is increased 1.4 times. For example, referring to the flash range chart, at $f/11$ with ASA/ISO 100 film, 0.5–3.6m becomes 0.5–1.8m with the AFW2; and 0.5–5m with the AFT2.

Manual Flash with Adaptors

For manual photography, light output is decreased two stops with the AFW2 and increased 1 stop with the AFT2. For example, to find the correct aperture with ASA/ISO 100 film, change the ASA/ISO index setting to ASA/ISO 25 with AFW2 and ASA/ISO 200 with AFT2. When using the guide for calculations, it must be halved with the AFW2 and multiplied by 1.4 with the AFT2. For example, at ASA/ISO 100, GN40 becomes GN20, with the AFW2 and GN56 with the AFT2.



POWER SOURCES

AF-400T in addition to the Battery Pack supplied with the unit. Each power source unit has a variety of uses and features, permitting you the option of selecting the most appropriate for your individual photographic needs.

TR Power Pack

The TR Power Pack is a transistorized portable power unit which utilizes six "C" cell batteries and transistor circuitry to reserve unused power allowing fast recycling and successive shooting with the convenience of standard battery operation.

Power Pack 510V

The Power Pack 510V is a high performance portable power unit using a 510V high-voltage laminated battery and offering a greater number of flashes and faster recycling times than the other portable power sources.

AC Adaptor II

This adaptor unit allows the AF-400T to be operated from regular household current. It offers an unlimited number of flashes along with fast recycling times and can be used anywhere an AC outlet is provided (voltage switchable for AC100V, 120V, 220V and 240V current).

PRECAUTIONS

- As both flash unit and auxiliary power packs utilize high voltage circuitry, never disassemble either. If repair is required obtain proper service.
 - Do not use solvent cleaners such as thinner, alcohol, gasoline, ether, etc. to clean the flash unit.
 - Do not expose the unit to high temperatures and humidity for long periods of time. To ensure maximum performance always, store in a cool, dry well-ventilated place. Also, test fire the unit every month or two when storing for long periods of time to maintain the capacitor at peak performance levels.
- Power Sources:**

- When using the Grip Battery Pack, be sure to turn the flash unit power switch to OFF after use. With other DC power source units, the switch on the power pack itself must be turned off to avoid battery drain. Take care that power switches are set to OFF when storing flash equipment; batteries will soon drain if the switch is left ON.

Batteries:

- When not using the power source for long periods of time, remove batteries to avoid corrosion.

- Use batteries with a fairly short shelf life. Batteries that have exceeded the expiration date marked near the contact terminals (or elsewhere) do not perform consistently. Performance also varies with brand and type and neither should be mixed. Best results are obtained with high performance alkaline cells. Rechargeable NiCad batteries (where specified) offer the advantage of shorter recycling times but give less total flashes per charge. Manganese batteries may be used but total number of flashes is less.
- Due to use of high voltage parts in the flash and auxiliary power source units, always make sure that batteries are inserted properly; as improper insertion is hazardous and could damage flash equipment.
- Batteries are sensitive to cold and performance deteriorates temporarily at temperatures below freezing. Carry spares in a warm pocket for working in extreme cold.

Always keep batteries out of the reach of children and never throw used batteries into a fire or expose to excessive heat to guard against explosion.



SPECIFICATIONS

- Type** Multi-mode, grip-mount thyristor electronic flash with TTL Auto, built-in sensor Auto, M (manual) and MS (manual with auto synch).
- Mounting** Via accessory bracket to base of camera; bracket clamp permits forward/backward tilt of flash head 360° at 30° angles.
- Operating Modes** **TTL Auto:** measures light at film plane with Pentax cameras having TTL flash provision; offers integrated flash/non-flash exposure systems (IDM) with Pentax LX, 645, Super A and Super Program. **Three-Level Auto:** three aperture/flash range settings via built-in sensor **M (Manual):** standard manual at four light intensity levels **MS:** "dedicated manual" at four light intensity levels.
- TTL Auto/Auto Flash Distance** **TTL Auto:** 0.25–33mm (at ASA/ISO 100, f/22–f/1.2) **Auto at Yellow:** 0.45m–3.6m, at green: 0.65m–5m, at Red: 1.25m–10m.
- Auto Apertures at ASA/ISO 100** f/11(Y), f/8(G), f/4(R); at ASA/ISO400: f/22(Y), f/16(G), f/8(R)
- Auto Sensor Angle** 20°
- Power Sources** **Standard:** Battery Pack; attaches to base of grip, utilizes six AA-size alkaline or NiCad cells. **Optional:** (1) TR Power Pack, transistorized utilizing six C-cells (2) Power Pack 510V utilizing 510V laminated battery (3) AC Adaptor II for household current, four adjustable voltage settings.
- Guide Numbers** (manual at four light intensity levels)

Output	FULL	1/4	1/6	1/125
ASA/ISO100, m	40	20	10	8
ASA/ISO400, m	80	40	20	16

Power Source	Battery Pack		TR Power Pack		Power Pack 510V	AC Adaptor II
	Alkaline AA-size	NiCad	Alkaline C-size	NiCad	510V Laminated	AC current
Power Supply						
Number of Flashes	70	45	210	150	300	Indefinite
Recycling times	11 sec.	9 sec.	7 sec.	6 sec.	2 sec.	—

* At FULL output manual. Faster recycle on auto depending upon flash distance and f-number used. Recycling times and number of flashes also depend upon power source used and condition of batteries (data based on new batteries only).

Flash Duration 1/1500 sec. at FULL Manual; 1/30,000 (shortest at Auto/TTL Auto)

Color Temperature Balanced for daylight

Flash Data/Switches ASA/ISO film speed scale with four settings, distance scale in feet and meters with color-coded maximum indications for auto, six-way flash mode selector, auto check lamp, ready lamp/test button, flash ON/OFF switch with EXT./INT. power settings, auto check ON/OFF switch, Ext. power socket, 5-Pin synch terminal with lock, -15° angle lock release, PC synch terminal.

Synchronization/Dedicated Flash Features Automatic synch at "X" with shutter dial set at "Automatic" for Pentax cameras with TTL/dedicated flash provision, plus viewfinder flash ready/auto check indication (auto check not provided for ME SUPER), Auto synch also with shutter dial at "X" for Pentax LX and "M" for ME SUPER; synch with cameras without TTL dedicated flash provision as specified for camera.

Bounce Flash

Flash head tilts vertically at 45°, 65° and 90° click-stop settings (additional angles available by tilting grip); rotates horizontally to right and left with 45° and 90° click-stop settings (grip also rotates freely by loosening clamp. -15° vertical setting with lock release provided for close-ups.

Size

86mm(W) x 260mm(H) x 92mm(D); 3.4" x 10" x 3.6"

Weight

770g (27 ozs.) without batteries.

Standard Accessories

Battery Pack, Bracket, 4P Synch Cord B, Grip Bottom Cover, Case.

Optional Accessories

AFW-2 Wide-Angle Adaptor for lenses down to 24mm; AFT-2 Tele Adaptor for lenses from 80mm—200mm, TR Power Pack, Power Pack 510V, AC Adaptor II, , 4P Synch Cord A, 4P Synch Cord A-5m, 4P Synch Cord B-5m, 4P Synch Cord C.



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