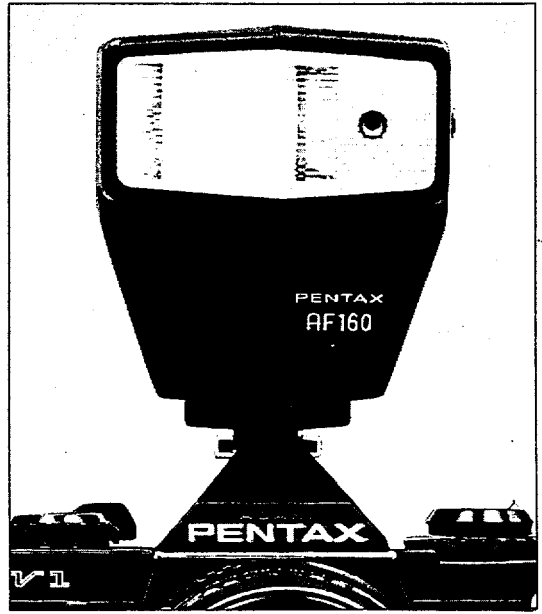
PENTAX
AF160

AUTOMATIC ELECTRONIC FLASH UNIT



FEATURES OF THE AF 160

The Pentax AF 160 is a cordless-type automatic flash unit featuring manual override. Highly compact and lightweight, it mounts quickly and easily to all cameras featuring direct flash synchronization via hotshoe. Moreover, when used in the auto modes, the unit's electronic "eye" measures the light reflected from the subject, controlling flash brilliance to allow exactly the amount of light required in relation to subject distance. Thus, it enables even beginners to obtain perfect flash exposures virtually every time. In addition, its high flash head design helps prevent "red eye" (a reddish cast resulting from the reflection of light flashing directly into the subject's eyes).

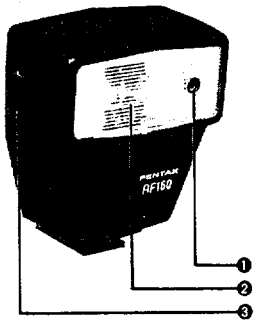
AUTOMATIC FLASH CHARACTERISTICS

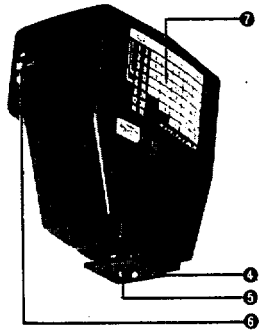
The AF 160 features two-way auto flash output selection which permits a choice of two f-numbers in its 1 ~ 4 meter operating range. Moreover, with auto flash, you may alter the distance freely between the camera and subject within the auto flash range without changing the f-number setting.

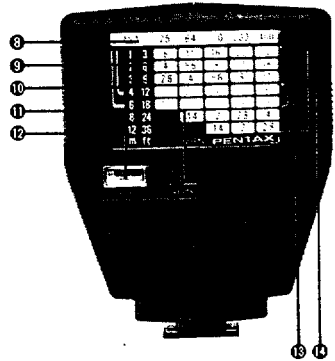
PENTAX MV, MV-1, ME SUPER: AUTOMATIC FLASH SYNCH, VIEWFINDER FLASH READY INDICATION

While the AF 160 functions equally as well with all cameras featuring hotshoe synch, Pentax MV, MV-1 and ME SUPER owners have some additional benefits. These cameras synchronize automatically with the AF 160, thus eliminating flash failures that often arise from forgetting to adjust the camera controls. With the MV or MV-1, simply leave the camera's exposure mode dial set at AUTO (in the case of the ME SUPER, either AUTO or "M") and switch the flash unit on. When the unit has charged, it synchronizes with the camera. In addition, flash ready indicators inside the viewfinders of the respective camera light when the flash unit has charged, eliminating the need to take your eye away from the viewfinder to know if the unit is ready. As viewfinder indications of the ME SUPER are different somewhat from those of the MV and MV-1, be sure to read the sections of this manual which cover your camera.

DESCRIPTION OF PARTS







❶ Flash sensor
❷ Flash head
❸ Battery compartment cover
❹ Hotshoe bracket
❺ Hotshoe contacts

❻ Auto/Manual selector
❼ Exposure chart
❽ ASA film speed scale
❾ Distance scale
❿ Auto mode indexes

⓫ Power switch
⓬ Flash ready lamp/test button
⓭ Auto f-number scale
(for Green and Red modes)
⓮ F-number scale

SPECIFICATIONS

Type	Clip-on, two-way auto flash unit w/manual.
Mounting	Direct to the camera hotshoe (cordless synch only); synchronizes automatically with the Pentax MV, MV-1 and ME SUPER 35mm SLRs; manual synch with other cameras.
Auto Modes	Two: Red (high) and Green (low); set via AUTO/MANUAL Selector.
Manual Operation	At "M" setting of AUTO/MANUAL Selector.
Usable Apertures on Auto:	With ASA 100 – f/2.8 (Red) f/4 (Green) With ASA 400 – f/5.6 (Red) f/8 (Green)
Effective Range on Auto:	Green– 0.5 – 4 meters (1.5 – 12 ft.) Red – 1m – 6m (3 – 18 ft.) with both ASA 100 and 400.
Auto Sensor Reception Angle:	18°
Manual Guide Numbers:	16 in meters (ASA 100), 32 in meters (ASA 400)
Recycling Times:	Alkaline Batteries: 8 sec. / Manganese Batteries: 10 sec.
Number of Flashes:	200 / 40

* Recycling times based on fresh batteries * Number of flashes based on the period that the flash ready lamp continues to light within 30 sec. with fresh batteries.

Flash Duration:	1/30,000 – 1/1500 sec.
Color Temperature:	Equivalent to daylight.

Flash Synch	
With Pentax MV, MV-1:	Automatically at 1/100 sec. with camera set to AUTO.
With Pentax ME SUPER:	Automatically at 1/125 sec. (at both Auto & "M")
With Pentax ME:	Manually at 1/100 sec.
With Pentax MX:	Manually at 1/60 sec.
Other Cameras:	As specified.
Angular Spread:	50° vertical; 65° horizontal (Sufficient for down to a 28mm wide-angle lens)
Flash Ready Indicators:	With Pentax MV, MV-1 & ME SUPER: Two (LED flash ready indicator in viewfinder and flash unit's ready lamp). Other cameras: flash unit's ready lamp ("125X" Flash synch indication also given with ME SUPER).
Test Flash:	By pressing Flash Ready Lamp/Test Button on back of flash unit.
Exposure Chart:	On back of flash unit; indicates correct aperture in relation to ASA film speed (ASA 25 — 400); Aperture scale: f/1.4 — f/32, Distance scale 1m — 12m (3ft. — 36ft.) Green and Red AUTO mode indexes.
Power Source:	Two 1.5 V AA size alkaline or manganese penlight batteries (rechargeable NiCad type not usable).
Size:	66mm(W) x 81mm(H) x 41mm(D); 2.59 in (W) x 3.18 in (H) x 1.61 in (D). 145 grams, (5.1 ozs.) with batteries
Standard Accessories:	Case

INSERTING BATTERIES

1. Press in slightly on the ▲ mark at the base of the battery compartment cover and slide the cover in the direction of the arrow to remove it.

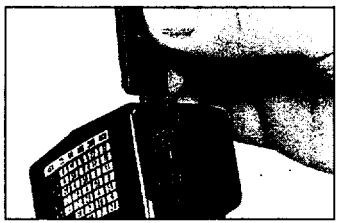
2. Insert two AA size penlight batteries into the battery compartment in accordance with the polarity diagrams on the side of the compartment. Then, replace the cover by inserting it into the slot and sliding it into place while you hold the batteries down with your finger.

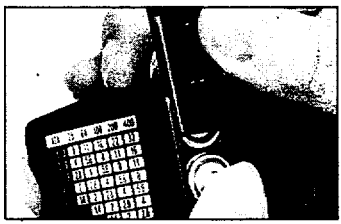
NOTE: Do not use rechargeable NiCad (nickel cadmium) batteries in this unit.

TEST FLASH

1. Before mounting the flash to the camera, it is advisable to test the unit to see if it is functioning properly. Slide the power switch on the back of the unit to ON; you will hear a faint whine. In a few seconds the flash ready lamp on the back of the flash (this also doubles as the flash test button) will light to indicate that the unit has charged. After the lamp lights, press it for test flash.

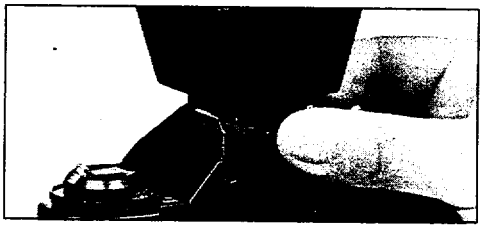
• If the ready light fails to light within 30 seconds, batteries may be inserted improperly (if new) or worn down (if old).





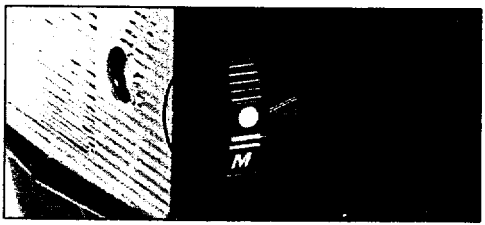
MOUNTING

1. Slide the flash unit's hotshoe bracket into the camera's hotshoe (this is easier if you grasp the flash unit at the bottom near the bracket). Make sure the bracket slides all the way into the hotshoe to insure proper contact.



THE AUTO/MANUAL SELECTOR

This small dial on the side of the flash unit enables you to select either of two auto operating modes and the manual mode. The red dot or red setting is for the high output auto mode, while the green dot or green setting is for the low output auto mode. This dual-mode auto output feature of the AF 160 permits the option of using either of two f-numbers over most of the auto flash range. For manual operation, set the mode selector to "M."



Pentax MV, MV-1

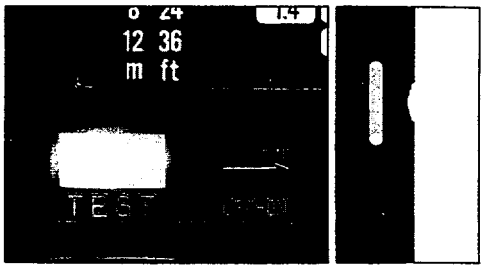
The Pentax MV and MV-1 cameras feature a special hotshoe contact that enables direct synchronization with the AF 160 at 1/100 second while the camera remains set for the Auto mode.

1. Determine the flash unit's operating mode as indicated on pages 10 ~ 13 and set the lens aperture accordingly.
2. Switch the flash unit on. Compose the picture and focus while the flash unit is charging. Depress the shutter button slightly to check if the "X" LED flash ready indicator inside the viewfinder comes on. When the indicator lights, depress the shutter button all the way to take the picture.
3. After you trip the shutter the flash ready indicator will go out and come on again when the unit recharges. Be sure to turn the flash unit off to save batteries when you do not plan to make any more exposures.

• If you trip the shutter before the flash ready lamp comes on, normal non-flash auto exposures will be made as the flash unit will not flash (most likely underexposure or blur will result).

• Once you slide the power switch to OFF, the flash unit no longer interlocks with the camera's auto exposure system. Thus, it may conveniently left mounted on the camera until needed.

• When the "X" LED indicator lights, other viewfinder indications should be disregarded (the automatic flash synch system overrides these).

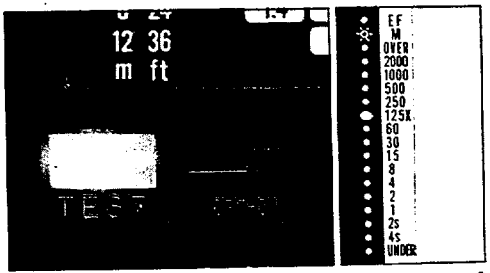


Pentax ME SUPER

As with the MV and MV-1 cameras, the Pentax ME SUPER also features a special hotshoe contact for direct synchronization with the AF 160. In this instance, however, flash synchronization is automatic at 1/125 second whether the cameras exposure mode dial is set at the AUTO or "M" (Manual) mode.

1. Choose the flash unit's operating mode as indicated on pages 10 ~ 13 and set the lens aperture.
2. Switch the flash unit on. Compose the picture and focus while the flash unit is charging. When the unit has charged, the "M" LED indicator inside the viewfinder will flash to signal flash readiness. Unlike the MV and MV-1, there's no need to partially depress the shutter to obtain the viewfinder flash indication. It's given automatically when the flash unit charges with the camera dial set either to AUTO or "M." The "125X" LED also flashes to indicate flash synch.

• The flash system remains in command of the camera only for as long as the "M" indicator flashes and "125X" LED lights simultaneously. After the flash discharges the camera reverts back to the non-flash AUTO or "M" mode.
• Always keep the flash unit power switch set to OFF when not using the flash. In this manner, it may be left mounted on the camera and switched on when needed.



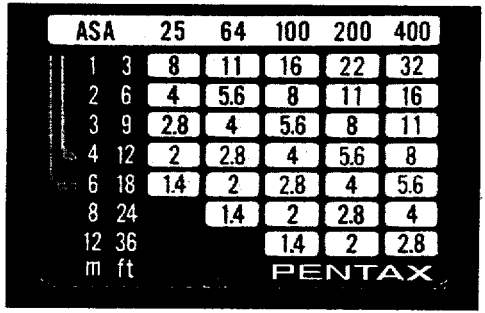
SHOOTING ON AUTO

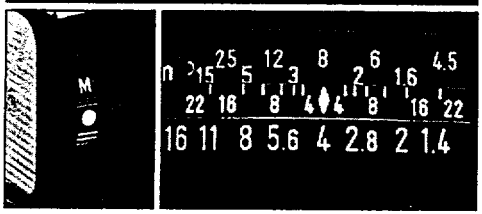
The AF 160 features two auto output modes: Red (high) and Green (low). If your chief interest is obtaining flash photos with the least possible effort, simply set the auto mode as indicated in ① and ② below; there's no need for you to read page 12. On the other hand, photographers who wish to take advantage of the availability of two f-numbers for the 1 - 4 meter range should set the f-number as indicated on page 12.

① Use the GREEN AUTO MODE for all subjects between 0.5m and 4m (1.5ft - 12ft).

Use the RED AUTO MODE for all subjects between 4m and 6m (12ft - 18 ft).

② **F-Number Setting:** After setting the flash unit's mode selector to either the Green or Red auto setting, the lens aperture must be set according to the f-number indicated by the exposure guide on the back of the flash unit. F-numbers are indicated in relation to ASA film speed. If ASA 100 film is loaded in your camera and you are shooting in the Green auto mode, for example, pick out the f-number in the ASA 100 column which corresponds to the green index line on the chart. With ASA 100 film in the Green mode, the correct f-number is f/4; in the Red mode with ASA 100 film, it's f/2.8. If your are using ASA 400 other films with other ASA ratings, pick the f-number in the appropriate column and adjust the lens aperture ring accordingly.





Note on Distance Scale: Although the distance scale of the exposure chart is provided mainly as a guide for choosing f-numbers for manual flash, it is also designed to help you remember the maximum distances of the auto flash range: the green index line stops at 4 meters indicating that this is the maximum range of the Green auto mode; the red index line stops at 6 meters, the maximum range of the Red auto mode. For subjects beyond 6 meters use manual flash. (See page 13.)

- As distances for the auto flash range are easily determined, usually it is sufficient to make only a rough mental estimate of them. When in doubt, however, focus on the subject with the lens first, and then, check your estimation against the lens' distance scale.

Choice of f-numbers:

Photographers who wish to take advantage of the availability of two-f-numbers for the 1 to 4 meter range, should choose the auto output mode in accordance with the following.

From 1m—4m: GREEN or RED

This simplest and also saves batteries to use the low output Green auto mode for all objects up to 4 meters distance. However, the Red mode may also be used for subjects in the 1 meter to 4 meters (3 ft.—12 ft.) range. Because the f-number used differs depending on the mode you select for this range, you have the option of selecting the auto mode based on which f-number is more desirable for the particular shot.

When you wish to use a smaller lens aperture (i.e., higher f-number, which offers greater depth of field), use the Green setting. On the other hand for shots where you wish to accentuate your subject a little more by reducing focal sharpness in the background and foreground, use the Red auto setting. This requires a wider lens aperture (i.e., lower f-number) which reduces the overall sharpness of the depth of field.

For Subjects 0.5m—1m: GREEN ONLY

For subjects between the distances of 0.5m to 1m (1.5ft.—3ft.), use the Green auto mode only. Overexposure results if the high output Red mode is used for subjects closer than 1 meter.

For subjects 4m—6m: RED ONLY

For subjects beyond 4 meters (12ft.) to the maximum auto flash range of 6 meters (18ft.), use the Red mode only. Underexposure results if the Green setting is used for this range.

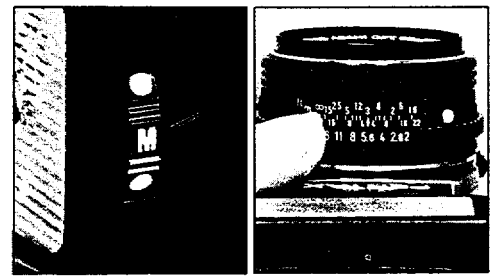
SHOOTING ON MANUAL

The AF 160 also features manual flash for special shooting situations when it is necessary to override the auto flash sensor. Moreover, because full flash output is always used for manual flash, it permits use of a smaller lens aperture when the subject is near, which is especially useful for close-up shooting requiring maximum depth of field.

1. Set the AUTO/MANUAL Selector to the "M" (manual) setting.

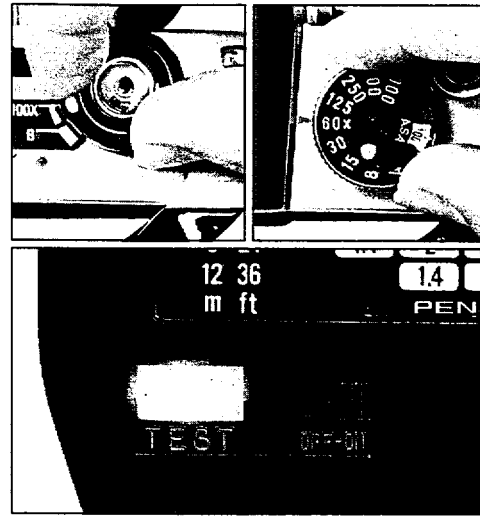
2. After focusing on your subject, read off the subject distance on the distance scale of your lens. Then select the f-number in the appropriate ASA column of the exposure chart on the back of the flash unit which corresponds with the subject distance (with ASA 100 film at 3 meters, for example, the correct f-number is f/5.6, etc.). When the actual subject distance lies between the figures indicate on the distance scale of the exposure chart, use an in-between f-number setting.

3. Set the lens aperture ring to agree with the f-number indicated by the exposure guide. Then, switch the flash unit on and take the picture after the flash ready lamp lights.



FLASH PHOTOGRAPHY WITH OTHER CAMERAS

The AF 160 works equally as well with other cameras featuring cordless-type, hotshoe flash synch and functions fully in both auto and manual flash modes. In this instance, however, the flash unit is synchronized manually via the camera's shutter speed dial. Flash charge is indicated by the flash ready lamp on the back of the flash unit only.



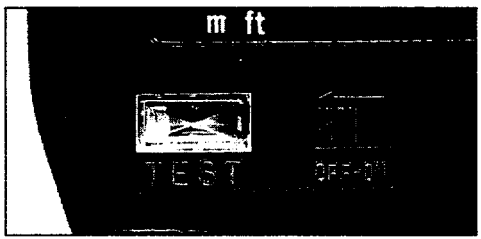
Flash Synch:

With Pentax ME: Set the shutter dial to "100X."
With Pentax MX: Set the shutter dial to 60X."
Other cameras: Set as specified by the camera's instruction manual.
Auto Flash: Choose the auto mode (Red or Green) in accordance with the subject distances indicated on Pages 10 ~ 12 and set the lens aperture accordingly. Then, switch the flash unit to ON. After the flash ready lamp on the back of the flash lights, compose and take the picture. Switch the flash unit OFF when no longer needed.
Manual Flash: See proceeding page.

POWER SWITCH

When not using the AF 160 for long intervals, turn off the power switch to save batteries. If the power switch is left on, battery energy will be used constantly to restore the flash charge to its peak.

Moreover, batteries will drain if you forget to turn the switch to OFF after putting the flash unit away. Always make it a point to turn the switch off when storing the unit; remove batteries when you do not intend to use the unit again within a few days.

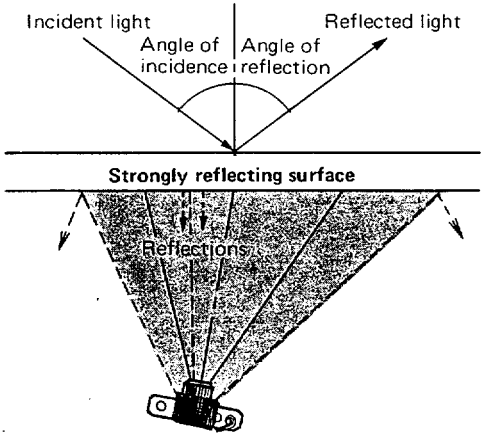


FLASH READY LAMP

The flash ready lamp on the back of the unit comes on when the capacitor has reached 80% of its charge. This presents no problem in the Green mode up to 3 meters or the Red mode up to 4.5 meters. However, in the manual mode, and portions of the Green and Red modes beyond 3 and 4.5 meters, respectively, it is best to wait an addition 4 – 5 seconds after the ready lamp lights to take the picture (with low batteries, wait longer). When you wish to take the picture immediately after the ready lamp comes on, expose 1 additional f-stop.

BATTERY PRECAUTIONS

- Remove batteries when not using the flash unit for long periods of time. Batteries tend to leak if left too long in the unit and may cause serious damage.
- When the ready lamp no longer lights within 60 sec. after a test flash on Manual, it is time to replace batteries. Replace batteries earlier when shorter recycling is desired. Although the ready lamp will still light after 60 sec., flash is usually insufficient for correct exposure.
- Battery performance tends to deteriorate when batteries are used that have been left lying around for long periods of time. Make it a point to use batteries that are fairly new.
- Batteries are very sensitive to cold and performance tends to deteriorate at temperatures near freezing. Performance is restored to normal as soon as batteries are subjected to room temperatures. Keep a set of warm spare batteries in your pocket when shooting in freezing weather to substitute when the others become cold.
- Battery performance tends to differ depending upon brand and type. Best results are obtained when high-performance alkaline batteries are used.



GUARD AGAINST UNEXPECTED REFLECTIONS

The direction in which light is reflected off an object is shown in the illustration. It is not always possible to actually see these reflections, but precautions can be taken against them. Do not shoot directly into highly reflective surfaces as the reflections will be picked up by the lens. Even when shooting at an angle, care should be taken to reduce reflections. Non-white and non-glare backgrounds are suitable for direct flash, while backgrounds such as glass windows and white walls will produce a high-glare. For beautiful prints without glare, angle your camera so that the flash doesn't rebound into the lens.

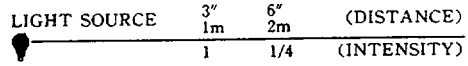
LIGHT QUALITY (COLOR TEMPERATURE)

The color 'cast' or temperature of the AF 200S is 5,800°K (Kelvin) which is compatible with that of normal daylight. Tungsten light bulbs have a temperature of 2,800° and the evening sun is 3,200°K. Thus, electronic flash has a higher

temperature than tungsten bulbs and can be used freely with daylight films in rooms lit by tungsten bulbs without producing a reddish cast.

DISTANCE/LIGHT INTENSITY

Brightness (light intensity) drops of as distance from the lighting source increases. As brightness drops off with the square of the distance from the light source to the subject, light intensity at a distance of 2 meters from the camera will only be 1/4 of the value it is 1 meter. Thus, all else being equal, objects two meters from the camera will require four times the exposure as those 1 meter from the camera.



ASA		25	32	64	100	125	160	200	400	800	1600	3200
G. No.	m	8	9	13	16	18	20	22	32	44	64	87
	ft	24	27	39	48	54	60	66	96	132	192	264

GUIDE NUMBERS: The guide number is the measure of the brightness of the flash in relation to the subject distance. Guide numbers vary depending upon the ASA rating of the film being used. To calculate the guide number in meters, multiply the distance in meters by the f-number. For the guide number in feet, multiply the distance in feet by the f-number. Although all the practical exposure data needed for operating the AF 160 is provided on the control panel, manual guide numbers as well as some additional ASA speeds are listed above.

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Asahi Optical Europe N.V. Weiveldlaan 3-5, 1930 Zaventem Zuid-7, BELGIUM
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