

PHOT ARGUS

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ASAHI PENTAX SPOTMATIC

Spotmatic Motor Drive - S 1a (Honeywell Pentax H 1A)

SV (Honeywell Pentax H 3V) - SL



a full
report

by

Gérard BOUHOT

The ASAHI PENTAX SPOTMATIC, which is sold in the U.S.A. and Mexico under the name HONEYWELL PENTAX SPOTMATIC, is a single-lens, instant-return mirror, semi-automatic, reflex camera, with interchangeable lenses enabling TTL metering of the exposure at stopped-down aperture.

Metering system :

1952: The **Asahiflex I** was the first single-lens-reflex camera built in Japan. 1954: The **Asahiflex II** was the first single-lens-reflex camera in the world to feature an instant-return mirror. 1957: Introduction of the **Asahi Pentax**. 1960: Presentation at Photokina of the prototype of the **Asahi Pentax Spotmatic** was the first public appearance of a TTL metering camera (the metering was selective, hence the name *Spotmatic*). 1964: After a great deal of testing, the **Asahi Pentax Spotmatic** went into series production, with a metering method by total integration over the entire viewed field, but retained the name **Spotmatic**.

The two CdS cells are located on each side of the eyepiece and face the rear surface of the pentaprism. It is the most typical cell configuration in TTL reflex cameras with fixed focusing screens. Watching the reflections at the extreme bottom of the focusing screen, you may notice a vague reflection of the eyepiece itself, framed by vague but clearer reflections corresponding to the CdS cell elements.

This system provides total integration of the viewed field. This integration is done very evenly when using a 50 mm lens (maximum deviation $\pm 1/4$ f/stop over the whole area of the focusing screen) except for a zone covering roughly $1/5$ of the field, parallel to the longer side of the picture and at its top (factory correction to attenuate the sky influence in landscape pictures, and the vignetting mirror influence under certain conditions). It is the easiest system to use, and the best suited for amateur work. In landscape pictures, you should

nevertheless minimize the sky influence by aiming low during the metering (this is easy since the camera is semi-automatic and all settings remain unchanged when you aim at the actual subject). You should also avoid having light sources in the metering field, like the sun, street lights, bright reflections, etc. Subjects with high light contrast, such as backlights, are handled with variable success, depending on the proportion of clear and dark surfaces. In these cases, it is often useful either to take a reading at a closer distance, or to take a selective reading from the shooting point with a tele lens of much longer focal length than the lens to be used for the actual picture.

In the **Spotmatic**, the metering is done at stopped-down aperture. During the metering itself, the diaphragm is operated manually and the aperture varies the amount of light received by the CdS cells. This system requires simple linkages (no cam is necessary to transfer to the exposure meter the value of the nominal aperture of the lens in use). The metering is done by a zero method, which corresponds to the most widely used system on this type of camera (the CdS cells are part of the sides of an electric bridge, and the correct setting is reached when no current flows in the reference galvanometer, the needle being then centered on the mark: this is the so-called zero method).

This type of metering at stopped-down aperture causes the viewing to be quite dark for the extreme stopped-down diaphragm values between $f/8$ and $f/22$, particularly in the corners when using wide-angle lenses. The stray light inputs may be significant relative to the light beam measured; but the depth of field of the viewed image is directly visible; and all lenses, including those with manual diaphragm only, may be used.

Battery installation and test

The CdS cells are powered by a very tiny mercury battery, Mallory PX 400 or RM 400 R type.

The battery compartment is located on the bottom of the camera. The cover can be unscrewed with a coin in the direction indicated by an arrow marked "OPEN." Clean both sides of the battery in order to insure good contact and avoid oxydation. The polarity is not indicated in the compartment, but the battery has a shoulder; therefore, if it is inserted the wrong way, you cannot screw the cover back in place. The indication "+ terminal up," found in the instruction manual, means that the positive terminal must be oriented toward the pentaprism.

The battery test requires special operations which are not indicated on the camera body. The ASA sensitivity setting of the exposure meter must be set at 100, and the speed selector control knob at B exposure. When the meter switch is on, the needle should move down rapidly—otherwise the battery must be changed. Avoid leaving the old battery within reach of children or throwing it into a fire. Mercury batteries are toxic and will explode if exposed to heat.

Loading, cocking, releasing

The **Spotmatic** uses standard 35 mm cartridges. Avoid loading in full sunlight.

The back is opened by lifting the rewind knob located on the top left of the camera body. During rewind, this knob is not lifted, so there is no danger of accidental opening. The opening is effected only at the extreme end of this lifting motion. A spring releases the back and the latter can then be opened 180 degrees to the right.

The film pressure plate is very wide, and the film plane ways are of the 4 rails machined type. The pressure plate bears on the two thicker outside ways, and the film is transported in the remaining corridor, while bearing on the two inner ways.

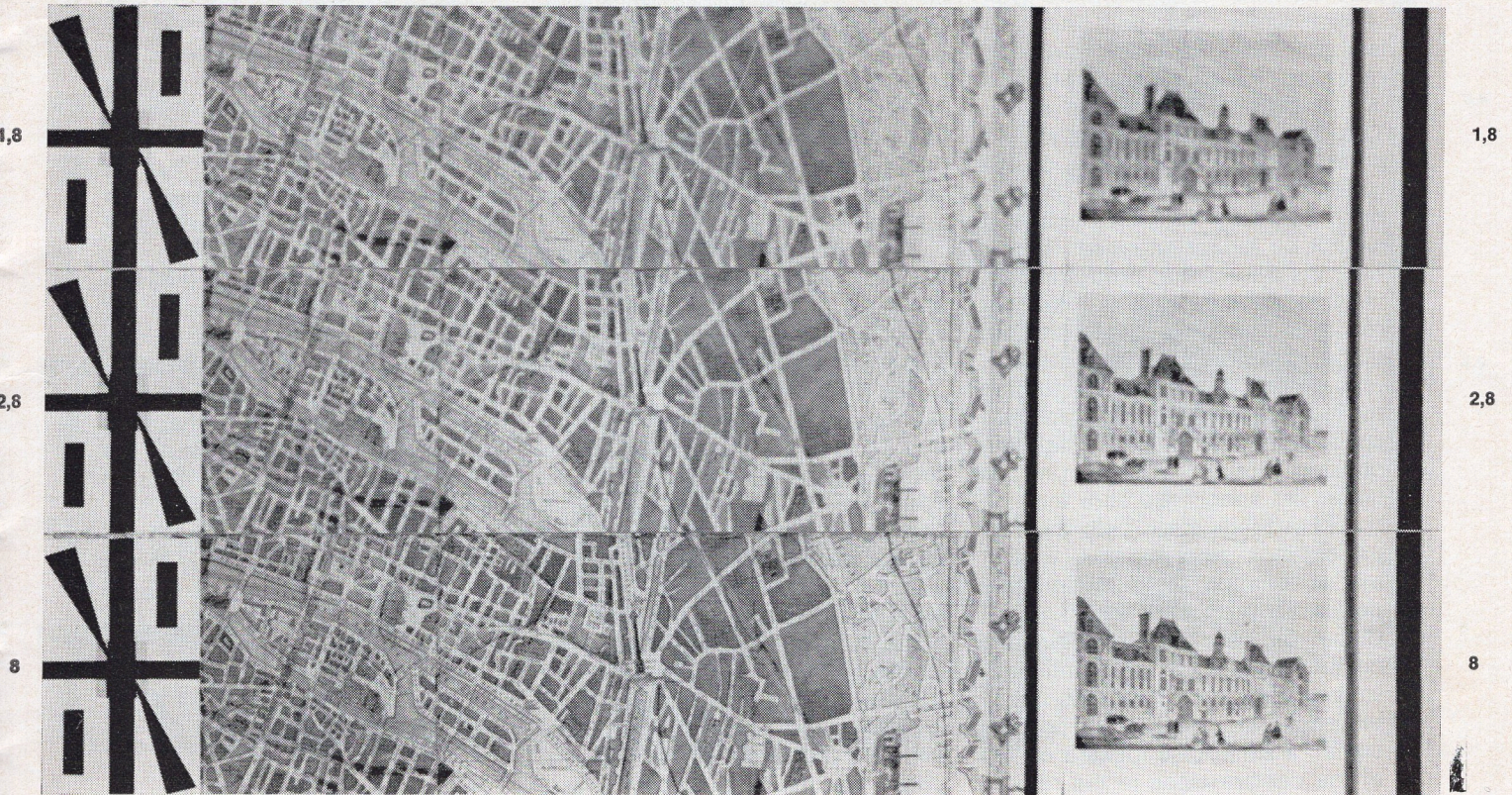
Drop the cartridge into its recess on the left and push the rewind knob fully in, by turning it slightly if necessary to mesh its fork with the cartridge shaft. The cartridge

Linear enlargments about $\times 10$.

Center

Super-Takumar $f=55\text{ mm } f/1.8$ No. 3040780

Edge



Center

Super-Takumar $f=35\text{ mm } f/2$ No. 3111341

Edge



settles in easily, its shaft fitting into a corresponding recess in the case bottom. It is therefore well seated when you pull the film leader. Take the leader over the rails and thread its end into one of the slots of the take-up spool. This is achieved easily, and two perforations is the amount of engagement. Whether the film is held vertically or horizontally, it cannot be further engaged. In this way, the film cannot protrude back through another slot and thereby create an unwanted bulge. Any one of the four slots can be positioned, one way or the other, by turning the lower flange of the take-up spool with your thumb. Start the cocking motion. The film winds under the spool. Be sure that the sprocket teeth mesh with the film perforations (the manual recommends winding the film until the perforations on both sides mesh). Close the back. Complete the cocking motion. The counter advances from the large white dot to the small white dot. The cocking signal, a small disc located on top of the camera close to the release button, goes from black to red, showing that the camera is cocked. This signal will operate even when there is no film in the camera; it does not indicate film transport, but only cocking. When you release, the signal returns to black.

Extend the rewind crank. It features a rotating metal handle. Wind it slowly in the direction of the white arrow (its function is indicated by a letter R engraved in green, for "Rewind") in order to remove the slack from the film. Fold the crank back. Cock. The counter moves to the zero mark indicated in red (the back rotation of the rewind knob is the only sign of correct film transport). Release. Cock for frame No. 1.

The counter has white markings, and figures are placed every 5 frames. The figure 20 is marked in red, and the line for the 36th frame is scribed in red. Beyond 36, the counter will slip on the 37 mark.

The sleek film advance lever is easy to grasp even when flush with the camera case. It has a starting position at a 10 degree angle from rest, after which the

cocking stroke is 160 degrees. This necessitates moving your hand to perform the entire stroke, but the same result can be achieved in several shorter strokes, which is quite convenient. The friction is strong enough so that the lever remains sufficiently open even if you let it go inadvertently. This cocking motion is relatively smooth and quiet.

The stroke of the release button is short, 2 mm, and smooth, without any hard point. The camera itself is rather quiet. The return of the mirror is the only noisy factor.

Set the film sensitivity by lifting the outer ring of the speed selector control knob, in order to bring the red line located close to the 1 second mark in front of the ASA film sensitivity, from 20 to 1600. The figures appear in a window on the knob. This setting can be performed without having to rotate the speed selector control knob. The values are only given in ASA - no ASA/DIN conversion table is given on the camera body or in the manual. Do not forget to set the sensitivity as this is an essential prerequisite for the setting of the exposure meter.

Film reminder disc

One of the symbols of the disc concentric with the rewind knob can be turned to the black triangle mark on the body. The following words are visible, engraved white: "empty," "panchro" (meaning B and W), and "color" meaning color film, without distinction between positive or negative film (therefore serving as symbol for universal negative films). For positive films, a "lamp" engraved green and a "sun" engraved red permit the selective dialing of artificial or daylight-type films. The manual accurately states that you can verify whether the camera is loaded by rotating the rewind knob. If it turns freely, the camera is empty.

Film unloading

At the end of the film, if you wind beyond 20 or 36, the film ad-

vance lever is blocked somewhere during its stroke. Do not force the film advance lever or you will tear the perforations.

Push the rewind release button located on the right of the camera bottom. Extend and turn the rewind crank. During rewind, the red dot located at the edge of the rewind release button shows by its rotation that the film is being transported.

If you wish to rewind the film before all frames are exposed, the fact that this red dot stops turning (together with the noise of the film disengaging from the take-up spool) is an indication that you should stop rewinding while the leader is still accessible outside the cartridge.

When the back is opened, the counter resets automatically to the starting mark. The rewind release button springs back at the first cocking.

How to hold the camera

The left hand, under the camera, can control the exposure meter switch, the focusing ring, the diaphragm ring and, if necessary, the "automatic/manual" control of the diaphragm.

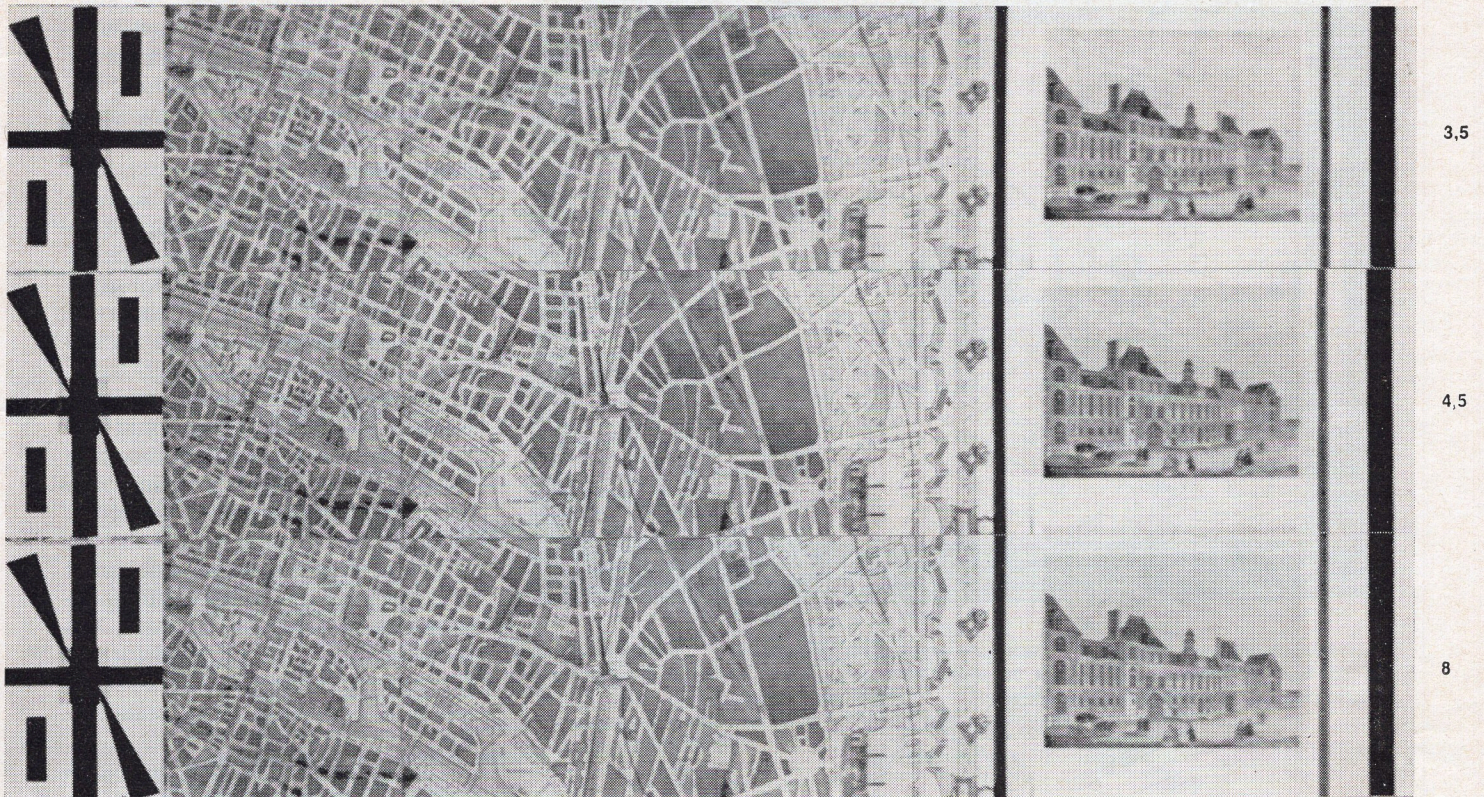
The right hand holds the right side of the body and performs the cocking and releasing actions.

In the vertical position, it is more convenient to cock with the film advance lever down. The release is then done by the thumb.

The manual warns that the camera must be held firmly. An insecure grip can produce vibrations upon release which might cause a loss of sharpness in the picture, even when one does not notice an obvious blurring.

Viewing, focusing

Before taking an exposure reading, you should view and focus. The lens diaphragm is then fully open (we shall see that it reopens automatically after each release). The clear viewing and the limited depth of field speed up the operation.



The picture is viewed in actual size with the standard 55 mm lens (magnification 0.88 with the 50 mm). The center of the focusing screen is taken by a 3 mm diameter disc of 4-sided microprisms which break horizontal and vertical lines, and usable with the standard lens up to roughly f/6.3. An 11 mm diameter ring, very finely frosted, not backed by a Fresnel lens, surrounds the microprisms (with the standard lens, this ring gets dark from f/6.3 up).

The rest of the screen is very finely ground and backed by a Fresnel lens. The pitch of this lens is so slight that it is almost unnoticeable at full aperture, as well as with the diaphragm completely closed (it is then the ground structure which becomes visible). For outside shots, focusing can be done up to f/6.3 or f/8, particularly on the edges of the focusing screen. This viewing system is very efficient.

At full aperture, the viewing is very bright and free from aberrations,

even in the corners. A few reflections are visible on the edges of the viewed image, principally the bottom edge.

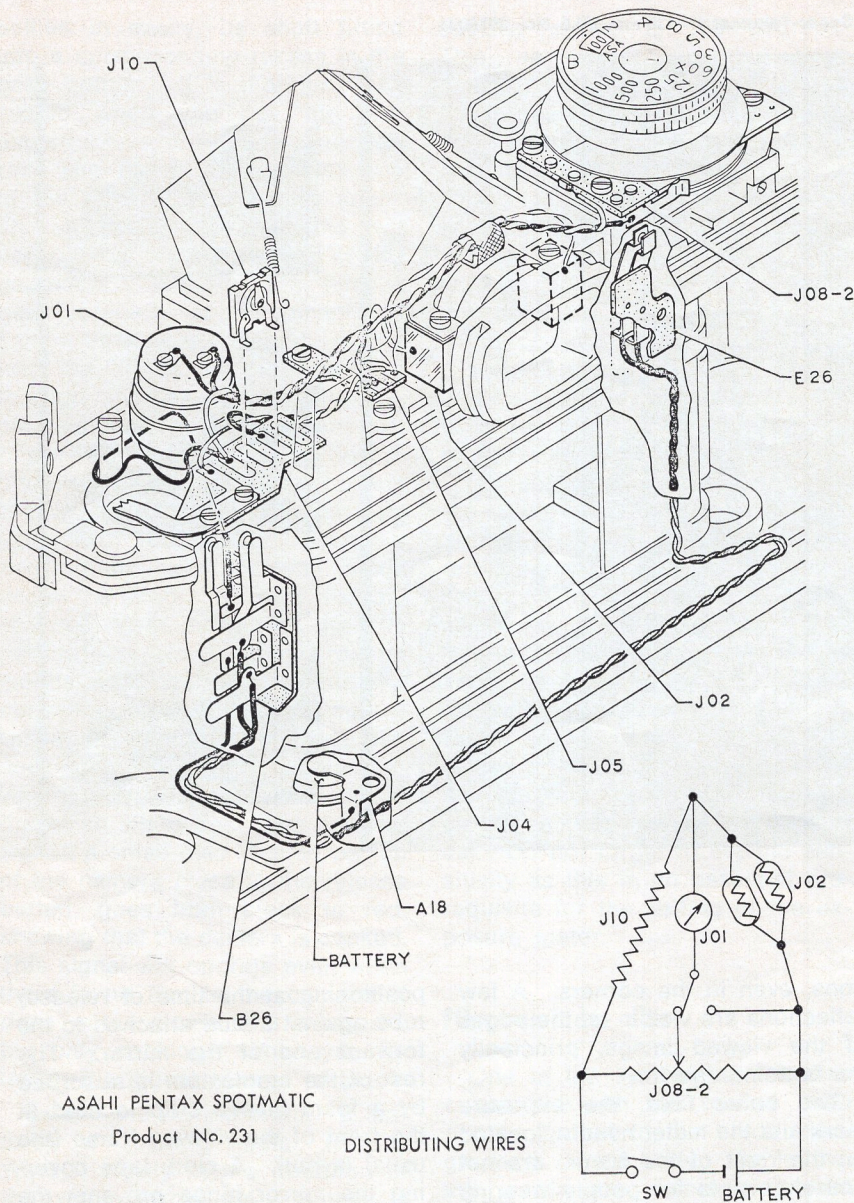
The entire field, the exposure mark and the meter needle, located on the right of the frame, are not entirely visible for people wearing glasses. A round rubber eyecup, also serving as correcting lens holder, is available (the correcting lenses are not supplied by ASAHI). This cup fits closely over the edge of the eyepiece. It may be left in place when closing the eveready case, but must be partially removed to allow opening the back for loading.

With very long tele lenses and in photomacrography the instant-return mirror, which is long, introduces little vignetting at the top of the viewed picture. A finger, retaining the mirror, then projects in the middle of the bottom of the focusing screen. During its upswing, the mirror is slowed down at the end of its stroke. An articulated lever (spring loaded for proper

positioning at the time of release) rubs against a stud attached to the forward end of the mirror. The rest of the momentum is absorbed by a foam plastic strip located at the front of the viewing frame (the usual layout). A cloth tape covering the mirror hinge prevents the leaking of any stray light from the viewing system to the film during shooting.

Shutter

Since this camera is semi-automatic, the shutter speed is usually selected first. The speed is dialed in front of the black triangle on the body by rotation of the speed selector control knob either way. The motion is continuous (there is no stop between B exposure and 1/1000) which is practical. Nevertheless, this knob is very low and not very easy to grasp, being located between the film advance lever and the release button. The speed selector control knob does



Circuit diagram of the exposure meter (the various elements have the same references on both drawings). J01. Galvanometer. - J02. CdS cells. - J08-2. Speed and sensitivity setting potentiometer. - J10. Adjustable setting resistor. - SW. Exposure meter control switch (B 26). - Battery. Power element.

not turn upon release. The speed range is the normal series of 11 values: 1 - 1/2 - 1/4 - 1/8 - 1/15 - 1/30 - 1/60 - 1/125 - 1/250 - 1/500 - 1/1000, engraved white. B exposure is also available and engraved green. T exposures can be made with a locking cable release screwed into the release button threads. A small pitch threaded hole, located under the bottom and close to the center of gravity, provides for attachment to a tripod.

The shutter curtains are very finely woven and are made of rubberized silk. When the camera is to be stored for a long period of time, it is advisable to leave the shutter uncocked and to remove the battery.

Exposure metering

When the speed has been selected and focusing completed, measure the exposure.

Push up, in the arrow direction, the switch marked "SW" located on the top left of the lens mounting plate. This switch locks in the up position. The small indicator located under the arrow (visible when you look at the camera from the side) goes from black to red. The exposure meter is now working and the lens diaphragm goes from automatic to manual operation. Turning the diaphragm ring brings the meter needle to the center of the mark located on the right side of the picture frame. This operation can also be performed by rotating the speed selector control knob after choosing a given f/stop, as both settings are interconnected. If centering of the needle cannot be achieved for the speed or diaphragm value selected first, change the initial setting. Intermediate positions between the indexed ones can be used for the diaphragm, but not for the speeds, which is good reason for preselecting a speed initially.

During the metering, the depth of field of the composed image is directly visible, as the diaphragm is used manually and therefore closed at the correct exposure value. When you release, the diaphragm reopens completely after the exposure and the switch moves back to rest, shutting off the meter circuit.

You may, after the metering and before shooting, move the switch back by hand. The meter is then off and the indicator goes black; but, at the time of release, the diaphragm will close to the preselected value and will reopen immediately after exposure.

You may also use the lens manually. Swing the lever located at the rear of the lens mount to the left, from AUTO to MAN. The viewing is then done at closed diaphragm, and the depth of field can be permanently assessed. Operating the switch turns the meter ON. It is automatically shut off after the exposure; the switch returns to rest, but in this case the diaphragm remains closed.

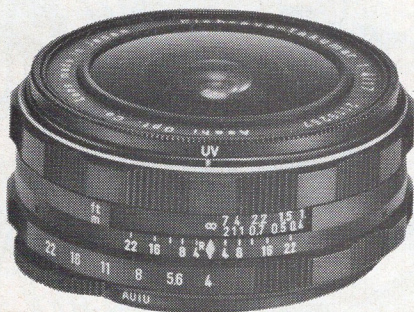
If you do not release the shutter after the metering, the meter circuit should be turned off by moving the switch back to rest manually

in order to avoid early deterioration of the battery.

Whatever metering method is used, the operator should be careful about the possible input of stray light through the eyepiece. The **Spotmatic** system seems well protected, however, particularly when the eyepiece is used.

At rest, the needle stands half way between the center mark and the minus sign. Upon switching on, it usually moves toward + or — and must be centered by turning the diaphragm ring (or the speed selector control knob). The + and — signs indicate which direction to move the needle in order to achieve voluntary over or under-exposure. The limits for ± 1 f/stop cannot be given. The reason is that for a given sensitivity setting, say 100 ASA:

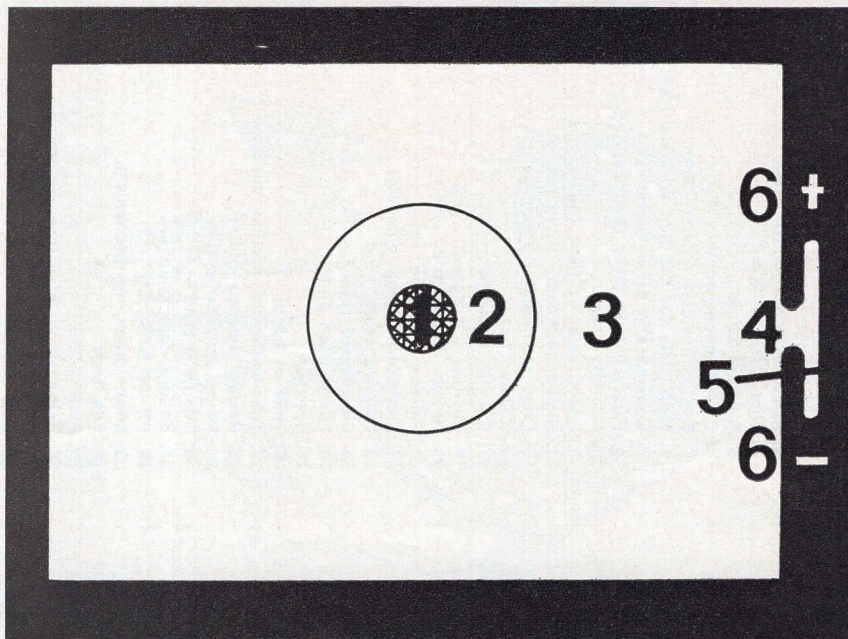
A. in bright light, the needle displacement for a given variation of the opening is slightly



Super-Takumar 17 mm Fish-Eye f/4, enabling the viewing and exposure metering in reflex operation.



Super Macro-Takumar 50 mm f/4 lens, focusing directly from infinity to the ratio $\times 1/2$.



Focusing screen: 1. Microprism disc, 3 mm diameter. - 2. Frosted ring without Fresnel lens, outside diameter 11 mm. - 3. Remainder of the focusing screen backed by a Fresnel lens. - 4. Exposure metering slot. - 5. Galvanometer needle at rest (exposure meter switched off). - 6. Voluntary over and under exposure marks.

smaller at 1/1000 second (the open slot in the window corresponds to 1.25 f/stop) than at 1/30 second (open slot corresponding to 1 f/stop).

B. in dim light, around 1 second at f/3.5, the needle displacement is again reduced (open slot corresponding to 2 f/stops) and does not occur until after 3 to 6 seconds.

C. these factors remain generally constant from 20 to 1600 ASA; at 1600 ASA, the needle displacements are noticeably slower, particularly around f/1.8 at 1/15 second.

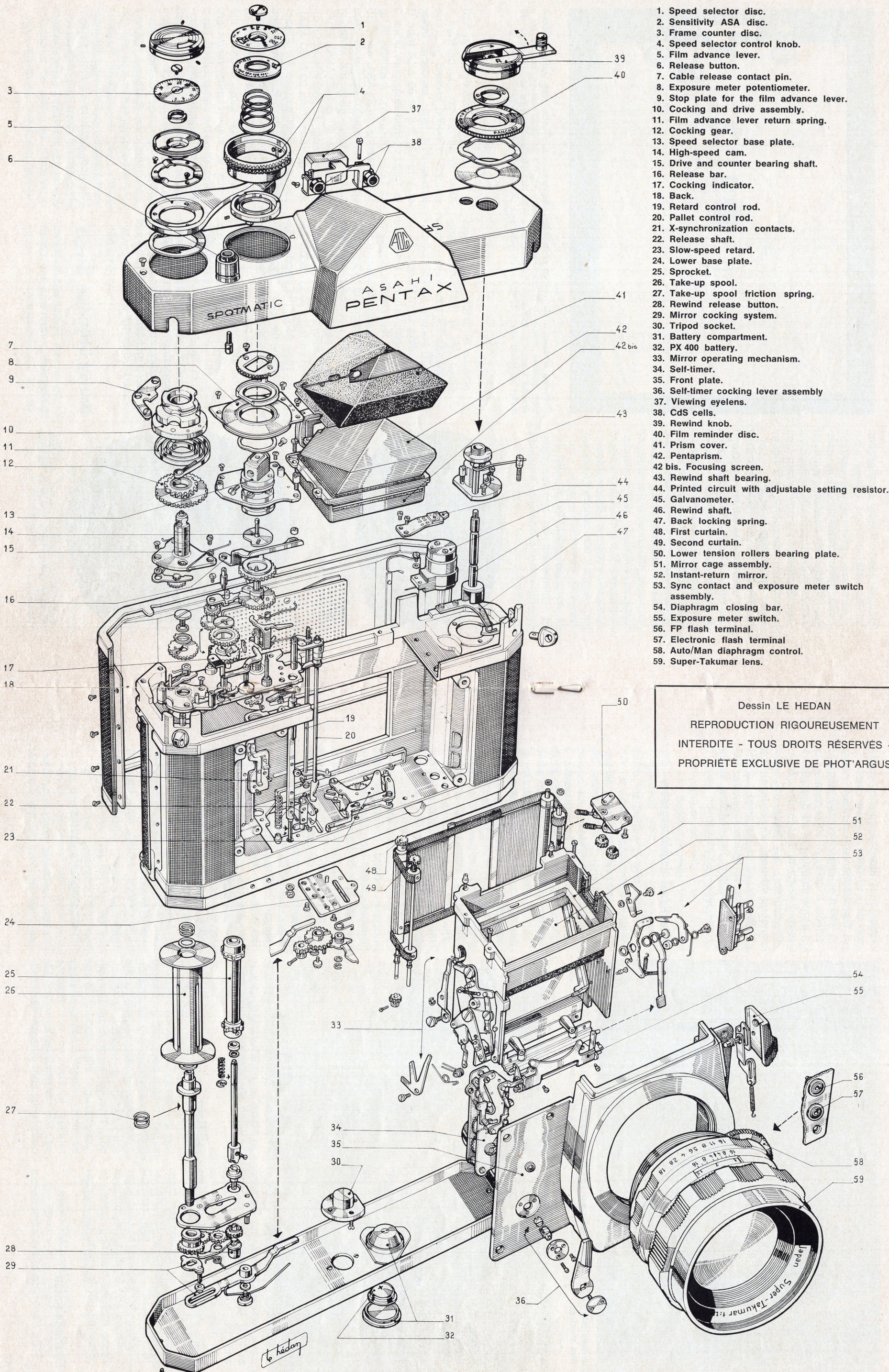
Since the metering is done by a zero method, centering is sometimes attained with a slight difference in the readings, depending on whether you start from a strong overexposure or from a strong underexposure, but this difference is not significant, as it does not exceed 1/8 to 1/4 f/stop.

Metering limits

As with all TTL cameras, the metering limits vary with the sensitivity of the film in use.

The range is maximum at 100 ASA on all eleven speeds from 1 second to 1/1000 second (with the 50 mm f/1.4 lens: exposure index of 1 to 18) and at 50 ASA from B to 1/500 second (exposure index 0 to 17). The range becomes B to 1/125 second at 20 ASA, and 1/15 second to 1/1000 second at 1600 ASA. A table gives the metering ranges from 20 to 1600 ASA. When the metering is possible also on the B position (from 20 to 50 ASA), you must then expose for 2 seconds (this feature is not indicated in the French instruction manual).

In general, it is not necessary to use the range table because the limits of the metering range are indicated on the camera itself. For a given sensitivity, one can use a particular speed only when the speed indicator mark is black. If, when rotating the speed selector control knob, this mark becomes red, the corresponding speed can still be used, but the exposure meter is automatically cut off, and the needle goes back to its rest position. The system does not perform any metering thereafter. The camera may then be used as a camera without an exposure meter.



1. Speed selector disc.
2. Sensitivity ASA disc.
3. Frame counter disc.
4. Speed selector control knob.
5. Film advance lever.
6. Release button.
7. Cable release contact pin.
8. Exposure meter potentiometer.
9. Stop plate for the film advance lever.
10. Cocking and drive assembly.
11. Film advance lever return spring.
12. Cocking gear.
13. Speed selector base plate.
14. High-speed cam.
15. Drive and counter bearing shaft.
16. Release bar.
17. Cocking indicator.
18. Back.
19. Retard control rod.
20. Pallet control rod.
21. X-synchronization contacts.
22. Release shaft.
23. Slow-speed retard.
24. Lower base plate.
25. Sprocket.
26. Take-up spool.
27. Take-up spool friction spring.
28. Rewind release button.
29. Mirror cocking system.
30. Tripod socket.
31. Battery compartment.
32. PX 400 battery.
33. Mirror operating mechanism.
34. Self-timer.
35. Front plate.
36. Self-timer cocking lever assembly
37. Viewing eyelens.
38. CdS cells.
39. Rewind knob.
40. Film reminder disc.
41. Prism cover.
42. Pentaprism.
- 42 bis. Focusing screen.
43. Rewind shaft bearing.
44. Printed circuit with adjustable setting resistor.
45. Galvanometer.
46. Rewind shaft.
47. Back locking spring.
48. First curtain.
49. Second curtain.
50. Lower tension rollers bearing plate.
51. Mirror cage assembly.
52. Instant-return mirror.
53. Sync contact and exposure meter switch assembly.
54. Diaphragm closing bar.
55. Exposure meter switch.
56. FP flash terminal.
57. Electronic flash terminal
58. Auto/Man diaphragm control.
59. Super-Takumar lens.

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Picture taken with the Super-Takumar Fish-Eye. - Plus X film, f/4, TTL exposure metering and viewing.

This feature works well. However, (1) on B at 400-500-640 ASA; (2) on B and 1 second at 800-1000 and 1250 ASA; and (3) on B, 1 and 1/2 second at 1600 ASA, the speed reference mark remains black and the needle is not at rest, but the metering system is inoperative. One should not then rely on the meter; the exposure time indicated will be wrong. From 400 to 1600 ASA, consult the range table, or operate in a systematic manner (a trick which is not given in the manual). At these high sensitivities (400 to 1600 ASA) dial 1/15 second in front of the black mark (if you do not remember this value, just start from a faster speed—say maximum 1/1000 second). While setting slower and slower speeds, if you exceed the limit (for instance at 1600 ASA between 1/15 second and 1/8 second) the mark turns red; this is the true end of the range and you should not go beyond it. You should then realize that, if at slower speeds the mark turns back to black (for instance at 1600 ASA, it goes half red/half black on 1/2 second, and black on 1 second and B), this indication is wrong and the metering system is operating but is not to be trusted.

Synchronization

The front side of the camera has

two synchronization sockets, 3 mm standard diameter, with X and FP marks, located left of the lens mount.

The shutter is synchronized as follows:

- for electronic flash, on X from 1 second to 1/60 second (this higher speed is indicated by a red X close to the 60 figure on the speed selector);
- for F class magnesium bulbs, on X from 1 second to 1/15 second;
- for FP class magnesium bulbs, on FP - screw socket from 1/60 second to 1/1000 second and bayonet socket from 1/125 second to 1/1000 second.
- refer to the instruction table in order to avoid making errors when shooting.

Self-timer

A self-timer, located on the front of the camera body can be cocked before or after cocking the shutter. After cocking the self-timer, the self-timer release button is revealed. This self-timer is of sophisticated design; after cocking, it can be used (release by the self-timer release button) or not (release by the normal button—in this case you can release the self-

timer after the exposure by pushing the self-timer release button.

The mechanism is rather noisy. A full cocking over 180 degrees effects a delay of 12 seconds, and a partial cocking of 90 degrees effects a delay of 6 seconds. Under 90 degrees, the lever does not catch at the beginning of its stroke; further along it catches but the self-timer is still not usable. Between 90 and 180 degrees, all intermediate values can be used.

Intentional double exposure

This faculty is not noted in the French instruction manual.

Take the first exposure by releasing normally, then remove the slack from the film with the rewind knob. Hold this knob between 2 fingers and at the same time push on the rewind release button while cocking through a full stroke of the film advance lever (the rewind release button must be pushed in and the rewind knob held still during the entire cocking stroke). Then take the second exposure. The next cocking will be normal—the rewind release button springs back out and the film is again transported. However, as this happens only sometime after the new cocking stroke is started, one should shoot that frame with the lens covered by its cap or with the palm of the hand in order to avoid frame overlap. Then cock once more as usual. You may, if desired, make another intentional double exposure on this frame. Sometimes, during cocking for the second exposure, the film may move slightly; the second exposure is then slightly offset from the first. By the same procedure, you may take multiple exposures on the same frame simply by repetition.

This capacity for multiple exposures, not usually provided on SLR cameras, permits artistic or scientific effects which may be very useful.

Interchangeable lenses

The **Spotmatic** camera will accept all standard 42 mm diameter

screw-mount lenses. Hundreds of lenses are available in this category, but only the "Takumar" are specially designed by Asahi for the Spotmatic.

To remove the lens, be sure the meter switch is off—then unscrew the lens to the left and remove it. This operation can be done with only one hand, a practical feature. If the meter switch is on, the diaphragm plunger on the lens may strike the linkage during the unscrewing movement.

All **Super-Takumar** lenses are automatic and have a uniform configuration from front to rear, with the following characteristics:

A lens hood and accessory thread (49 mm diameter for most of the lenses from 28 mm to 135 mm).

A wide, smooth-motion focusing ring, rotating to the left from infinity to the closed distance over a stroke of 60 to 360 degrees depending on the lens.

A focusing range window, with pale blue figures in feet and yellow figures in meters.

An orange focusing range reading mark, surrounded by a white depth-of-field scale.

This scale also has an orange line, sometimes labelled R, indicating the focusing correction for infrared film.

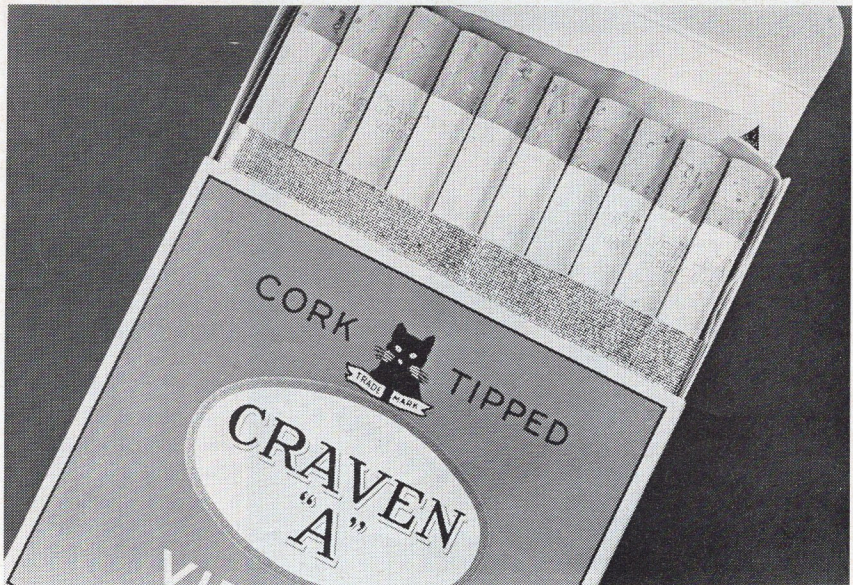
A diaphragm ring which rotates to the right from full aperture to closed, over about 45 degrees, each f/stop and 1/2 f/stop lightly indexed.

A swinging lever for the Auto-Man diaphragm operation method. The Auto position is used for all general purposes, since the diaphragm operates manually during the metering; the Man position serves in special instances such as for photomacrography.

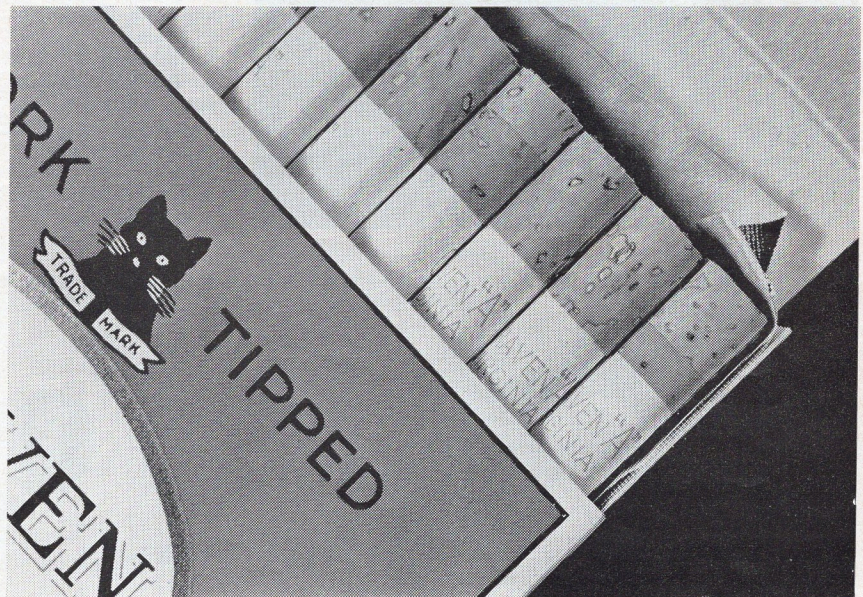
One opening value and one focusing value are marked in orange on the 17 to 50 mm lenses for rapid settings. At these values the depth of field ranges from infinity to a close distance.

The diaphragm preselection plunger, on the rear face of the lenses, is very vulnerable, and must be protected by the rear screw-on cap delivered with each lens.

Also delivered are the front lens cap, the leather bag with car-



Picture taken with the Super-Takumar 50 mm f/1.4 (on the closest focusing setting) with the No. 1 auxiliary lens. - Plus X film, f/11, TTL measurement.



Picture taken with the Macro-Super-Takumar at a ratio of $\times 1/2$ on the negative. - Plus X film, f/11, TTL measurement.

rying strap, and the lens hood. The lens hood may be either the slip-on type, which comes positioned inverted over the lens, covered by the front lens cap; or of the screw-on type, delivered in a separate case.

in 5 groups; or 50 mm f/1.4 to 16, focusing down to 45 cm, 7 elements in 6 groups. These should not be set down on the rear element, which protrudes and could be damaged. There is also a 55 mm f/2 to 16 lens.

Standard lenses

Super-Takumar 55 mm f/1.8 to 16, focusing down to 45 cm, 6 elements

Wide-angle lenses

Super-Takumar f/3.5 of 24 mm and 28 mm focal length, 35 mm f/2 and f/3.5.



Copy of a slide, done with bellows No. II equipped with slide-copying attachment and with the 50 mm f/1.4 lens. - Original Kodachrome II, copy on Plus X, reproduction ratio on the negative $\times 1$, TTL exposure metering, lighting by flood lamp DXC 500 W with built-in reflector.



Cropped version of the same slide, with the same equipment. Reproduction ratio on the negative $\times 1.5$. TTL exposure metering.

Tele-lenses

Super-Takumar 85 mm f/1.9; 105 mm f/2.8; 135 mm f/2.5 and f/3.5.

Very long tele-lenses

Super-Takumar 150 mm, 200 mm and 300 mm f/4; **Tele-Takumar** with diaphragm preselection 300 mm f/6.3 and **Tele-Takumar** with manual diaphragm 400 mm f/5.6, 500 mm f/4.5, 1000 mm f/8 (delivered with case and tripod).

Special lenses

Super-Takumar Fish Eye usable in reflex viewing! 17 mm f/4 to 22, focusing from infinity down to 20 cm, 11 elements in 7 groups with a diagonal field of 180 degrees; UV, yellow Y2 and orange O2 built-in filters.

Super-Macro-Takumar 50 mm f/4 to 22, focusing from infinity to a magnification ratio of 1/2, 4 elements in 3 groups, permitting all shots from landscape to very near close-up; the high clarity of the viewed image allows fast and accurate focusing.

Macro-Takumar 50 mm f/4 to 22, focusing from infinity to a magnification ratio of 1, 4 elements in 3 groups (same configuration as the Super), manual diaphragm.

Bellows-Takumar 100 mm f/4 to 22 with short mount to be used on a bellows with preselected diaphragm.

Super-Takumar-Zoom 70 to 150 mm f/4.5 to 22.

Accessories

With many available accessories the SPOTMATIC may be converted into a complete photo system.

- Set of three **extension tubes** 9.5, 19 and 28.5 mm with or without diaphragm control linkage (ratio $\times 0.17$ to $\times 1.17$ with the 55 mm lens) in their own case.
- **Extension tube** with continuous screw-type variable length, from 16.8 mm to 30.6 mm ($\times 0.3$ to $\times 0.7$ with the 55 mm).

- **Standard monorail bellows** No. 1 ($\times 0.62$ to $\times 2.45$ with the 55 mm), orientation of the camera in all directions, scales for the 55 and 58 mm lenses.
- **2 rails bellows** No. 2, rear part with indexed displacement, front motion by large knurled knob (breaking and blocking possible), orientation of the camera in all directions, engravings: 1 to 18 cm, magnification ratio and exposure correction factors for the 55 mm.
- **Copying stand** for slides and roll film, with connecting bellows to the lens, and vertical off center of the slide up to 12 mm, reproduction ratio variable from 1 to 1.5 with the 50 mm lens.
- **Automatic bellows**, separate displacement of the camera and of the lens; double release; mobile carriage enabling to move together camera/bellows/lens; ratio infinity to $\times 1.32$ with the 100 mm Bellows-Takumar; slide copying stand adaptable.
- **Inversion ring** for Super-Takumar 55 mm and 50 mm and *adaptor ring* for the use of Leica lenses in close-up shooting.
- **Microscope adaptor** No. 2 for 25 mm diameter tubes, permitting an easy interchange of the eyepieces, delivered with a matt black tube avoiding the reflections when the microscope is being used without eyepiece.
- **Copipod**, 4 telescopic graduated legs stand, capable of being screwed on lenses with 46 or 49 mm thread.
- **Copy stand**, column mounted stand with base equipped with reference frames, and removable table mount.
- **Magnifier** to be mounted on the camera eyepiece, with $\times 2$ magnification of the center of the field (area of the ground ring) intended for very accurate focusing, adjustable eyepiece, hinged construction for swing out without unmounting, in a carrying bag.
- 49 mm diameter meniscus **additional lens** ($\times 0.15$ to 0.32 by using the focusing range of the 55 mm lens).
- **Angle viewer**, orientable, with

adjustable eyepiece and carrying bag.

- **90-degree reflecting mirror** (with case) adaptable to Takumar 200 mm f/3.5, Super-Takumar 200 mm f/4 and Tele-Takumar 300 mm f/6.3 lenses (a false lens in front makes it appear that the lens is being used normally for shooting straight ahead while actually the picture is being taken at a 90-degree angle).
- **Filters** (worth mentioning is the *UV Ghostless* meniscus filter reducing the risk of stray lens/filter reflections), **sunshades**, **releases**, **cases**, etc.
- **Accessory shoe No. II**, slip-on type to the eyepiece like the **rubber eyecup**, but retained in place by two flexible hooks.
- **Stereoscopic adaptor** for 55 mm lens, and **stereoscopic viewer**.
- **Cartridge; carrying case** for standard lens; **adaptor** to use the *Asahiflex lenses* on the *Spotmatic*; **caps**, etc.
- **Rigid case** for camera and accessories in plastic, leather and aluminum; *soft case blimp*; *soft*

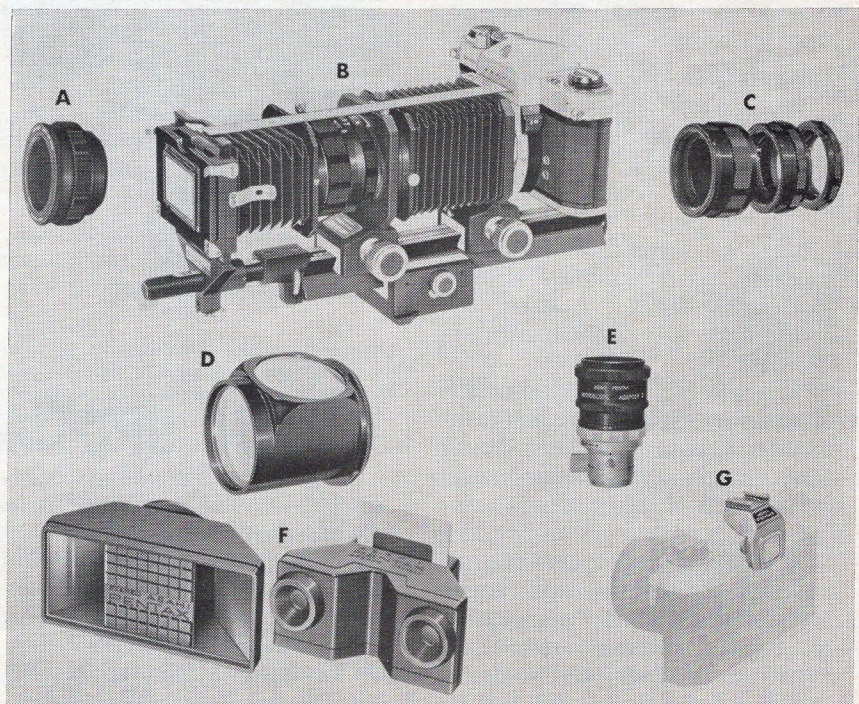
case with normal or extended snout for 135 mm lens (a compartment in the snout holds a spare battery).

- Worth mentioning, an accessory for special work, the *spot 1 degree exposure meter* (in a 21 degree field; range 6-6400 ASA; 9-39 DIN: 4 minutes to 1/4000 second; f/1 to f/120; exposure index 3 to 18). Sensitivity at 100 ASA from 1/2 second at f/2 to 1/1000 second at f/16.

Camera body

The body itself features: 2 rings for a carrying strap on the front; the serial number on the top (another number is engraved at the bottom on the edge of the bottom plate); tripod thread (do not use a longer than 4.5 mm screw); no film reference plane indicator.

This camera body, a very good overall design, looks quite small; its dimensions are indeed a few millimeters less than the average ones: length 143 mm, height 92 mm



Accessories: A. Extension tube with continuous screw-type variation length, from 16.8 to 30.6 mm. - B. Asahi Pentax Spotmatic with bellows No. II and slide copying attachment. - C. Set of 3 extension tubes with automatic diaphragm transmission. - D. 90-degree mirror adaptor. - E. Microscope adapter No. II. - F. Stereo adapter and viewer. - G. Accessory shoe No. II.

depth 90 mm (53 mm without lens); it is also slightly lighter than average: 820 grams with the 55 mm f/1.8 lens. It is available in matt chrome or black finish. When purchased from an authorized dealer, this camera carries a one year guarantee, and this is honored by all official dealers at home and abroad upon presentation of the international guarantee card.

The eveready case fits very snugly on the camera, and perhaps it is this overall modest size combined with the **Spotmatic** reputation which has made the camera such a success.

INDICATED SPEEDS	MEASURED SPEEDS
1	1/1.1
1/2	1/2.5
1/4	1/4.6
1/8	1/8
1/15	1/16
1/30	1/31
1/60	1/66
1/125	1/138
1/250	1/256
1/500	1/500
1/1000	1/880

Camera tested No. 266.9922

Disadvantages

- Metering range limited for extreme film sensitivities.
- Needle displacement sometimes slow and slight.
- Focusing screen and meter window not completely visible for people wearing glasses. No correction lens available (only holder).
- TTL metering at stopped-down aperture: viewing sometimes dark, possible stray light input.
- Lens diaphragm plungers very vulnerable if no rear cap in place.
- TTL metering by total integration of the viewed area requires interpretation for backlights.
- X synchronization limited to 1/60 second. Speed selector control knob small, difficult to grasp. No T exposure.
- Intermediate positions of the speed selector control knob not usable.

- Manual raising of the mirror not possible. Simple linkage, rather long mirror.
- Battery test primitive. No DIN/ASA conversion table.
- No film transport signal during cocking.
- Cocking stroke necessitating hand displacement on the camera body.
- Battery polarity not indicated on the body (but wrong positioning impossible).
- No film reference plane indication.

Advantages

- Bright viewing image. Few reflections. No aberration. Excellent focusing screen with invisible Fresnel lens, even at f/16. Mirror damper.
- Practical meter switch. Battery tester. PX 400 battery. Metering with cross-linked speed or diaphragm variations. Semi-automatic operation with preselected diaphragm (or speed).
- Cocking signal. Exposure meter range limit indicated on the camera body.
- TTL metering at stopped-down aperture: directly visible depth of field, all lenses usable. Over and underexposure indications in the viewfinder.
- Easy loading. Back opens out 180 degrees. Good protection against accidental opening. Automatic reset counter. Rewind release button with automatic reengagement.
- Only one hand needed for lens interchange.
- Film transport indicator during rewind.
- Standardization of lens configurations (IR mark, manual operation possible, standard filters for some lenses). Standard 42 mm lens mount.
- Very smooth release button. Instant-return mirror. Normal noise level. Intentional multiple exposures possible.
- Adjustable self-timer, disarm-able, but rather noisy.
- Speed selector control knob with continuous settings, non-rotating during release.
- Cocking possible by small successive movements. Film advance lever easy to grasp.
- Rewind crank. Synchronization sockets with standard diameter. Serial number on the body. Tripod socket. Simple film reminder disc. Strap eye-lets.
- Many accessories. Good appearance. One year world-wide guarantee. Compact dimensions of the camera/eveready case setup. Simplified and less expensive versions available.
- Motor drive model with very pleasant drive system, compact dry or rechargeable battery power pack, very high shooting rate (2.5 to 3 frames/sec.).

OTHER SPOTMATIC VERSIONS

The **Spotmatic** body is the result of the evolution of the **Asahi-Pentax** introduced in 1957 (which followed the **Asahiflex I** of 1952 and the **Asahiflex II-A** of 1955). The **Asahi Pentax** was followed in 1958 by the **model K**, in 1959 by the **model S 2**, in 1961 by the **S 3**, in 1962 by the **S1a (Honeywell Pentax H1A)** and the **SV (Honeywell Pentax H3V)**.

The **S1a** is still in production. Its essential differences from the SPOTMATIC are: the Super-Takumar 55 mm f/2 lens, the absence of a light meter, the shutter limited to 1/500 second, X synchronization at 1/50 second, the presence of T Time exposure, the absence of a self-timer, (do not use the Super-Takumar 50 mm f/1.4 lens because its rear lens would be scratched

by the mirror mechanism, unless the R mark engraved on the rewind knob is orange; the same applies to the SV model).

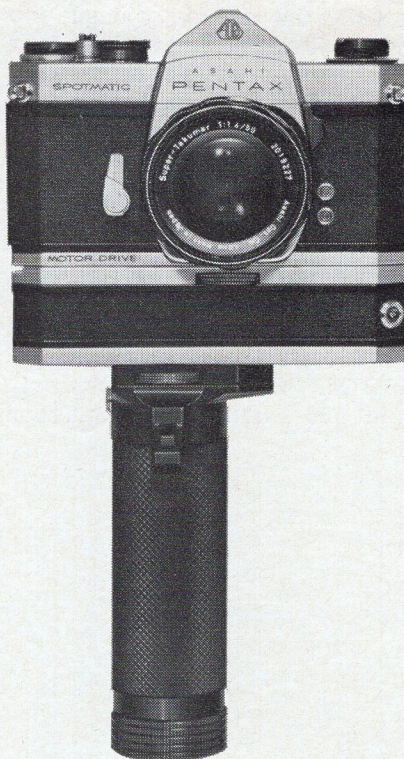
The **SV** model features the 1/1000 second speed, a self-timer, and is fitted (on the recently manufactured ones) with a Super-Takumar 55 mm f/1.8 lens; it can take a clip-on CdS light meter on its prism.

The **SL** model is a SPOTMATIC version introduced in 1968; it has the same body, but without an indicator for the film in use and without an exposure meter (therefore also without a switch). It is a second body of the same standard as the SPOTMATIC. It will take, at a later stage, a clip-on CdS exposure meter on the pentaprism housing.

The **Spotmatic motor drive** chrome model is the other version introduced in 1968. The *Set 36* is built-up with one ASAHI PENTAX SPOTMATIC MOTOR DRIVE fitted with a Super-Takumar 50 mm f/1.4 lens, one drive mechanism, a direct-contact handle holding the dry or rechargeable batteries (it can only be fitted vertically and this is slightly awkward when shooting vertically), a separate battery case, a one-meter-long connecting cable, a battery tester, a carrying strap and a soft bag for the whole set. The *Set 250* also features a high capacity magazine with two film cartridges, a bulk film loader and a suitcase. Accessories are available: a 10 meter long cable, a battery charger, a relay box, AC power packs, and timers.

The Motor Drive Model has an opening on the right side of the bottom plate which is revealed by unscrewing a cover disc: you can then position the motor drive unit and the power handle. The handle selector has three positions: (green dot) = off, S = Single frame, and C = Continuous shooting. Load the camera normally and set the counter on the motor drive unit to 36 or 20 (or to any number of frames you wish to expose). The motor automatically switches off at zero. On the motor selector, dial either:

- B (bulb exposure);
- or the common position C 60-1000/S1-1000;
- the common position is used for



Asahi Pentax Spotmatic motor drive 36 frames, equipped with motor and compact power pack usable as a handle.



Asahi Pentax Spotmatic motor drive equipped with the 250 frames back (all other elements are common to the 36 and 250 frame operation).

either continuous shooting or for single-frame exposures. The calibration "C 60-1000" indicates that in continuous shooting (2.5 to 3 frames/sec.) the shutter speed must be between 1/60 second and 1/1000 second. The calibration "S 1-1000" indicates that all speeds are usable in single-frame shooting. Release with the handle trigger (or use the remote control terminal for the motor). At the end of the film, push the disengaging button on

the motor, and rewind the film through the normal rewind crank. — time exposures can be made by setting the motor selector switch to B and the handle selector to S. Press the handle trigger and turn the handle selector to the green dot to keep the shutter open. To close the shutter, turn the handle selector back to S.

Eight AA batteries provide for 1500 frames at an average rate, and the NiCad pack gives over 2000 frames at an average rate (that is, the NiCad will last for 50 36-exposure rolls, or for 8 250 exposure rolls). The change from dry to rechargeable batteries requires removing the handle cover. When the weather is cold, it is advisable to keep the handle in your pocket and to use the one-meter connecting cable (but then the release is also from within your pocket). The battery tester is used by clipping it on top of the handle. The battery charger permits recharging the NiCad battery in 14 hours without having to take it out of the handle. The motor can be fed directly by a 12 volt 0.4 amp external source, or by AC Power Packs models for 100, 110, 120, 200, 220, 240 Volts, 50 or 60 cycles (these packs are used to drive the motor, recharge the battery, or as relays for long distance remote control from 10 meters to 6000 meters; unfortunately, each model has a different, specific voltage). The eveready case available for the *Set 36* may be left on the camera in use (openings are provided for operations, and the snout may be partially removed to uncover the lens). This slightly reduces the operating noise level.

For use with 250 frames, remove the back of the camera and replace it with the high capacity back. Screw on the motor, the handle and connect the motor to the 250-frame magazine counter by the wire. Prepare a cartridge with the bulk film loader (it takes 30 meter reels which permit you to make 3 cartridges of 250 frames each, or cartridges of the desired capacity from 0 to 250 frames) install it on the camera, and dial the desired number of frames.

The accessory relay, as is the

case for the Power Pack relay, can be located up to 10 meters from the camera, but it can be remotely controlled from a distance of up to 6000 meters by ordinary wires. Radio control is available and permits, in conjunction with the receiver connected to the Power Pack, wireless operation up to a distance of 500 meters in flat country (selector C/S; indicator light on the transmitter indicating the operation of the shutter). The 3 types of timers—5 to 60 seconds, 2 to 60 minutes and 1 to 24 hours

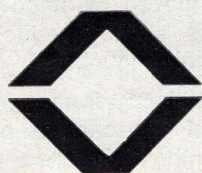
(specify the desired voltage; the models fit 50 and 60 cycles as their dials have a double scale)—can also perform the switching of auxiliary lights up to 600 watts from 2 seconds before the release until the end of the exposure.

When the motor is mounted on the SPOTMATIC MOTOR DRIVE, the manual controls can be used. This camera can also be used normally without the motor, even with the 250 frames back (the normal SPOTMATIC cannot be motorized).

In 36 frames configuration

(SPOTMATIC MOTOR DRIVE + Super-Takumar 50 mm f/1.4 + motor + dry battery power handle) the overall dimensions are: 143 mm in length; 97 mm in thickness; 274 mm in height; weight 1590 grams.

This system, designed for reportage work, for automatic control, for scientists, has been carefully developed since 1960, as one can see from the fact that it is possible to interconnect several cameras, or to trigger a phenomenon at the time of release through the camera (by using the X terminal)...



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