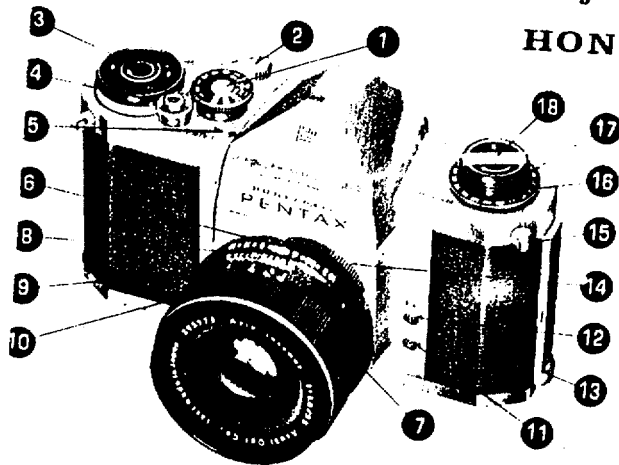


**OPERATING MANUAL
MODELS H1/H3**

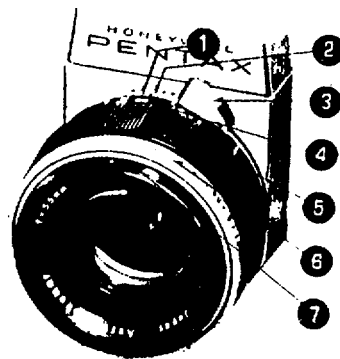
HONEYWELL PENTAX

major working parts of the
HONEYWELL PENTAX



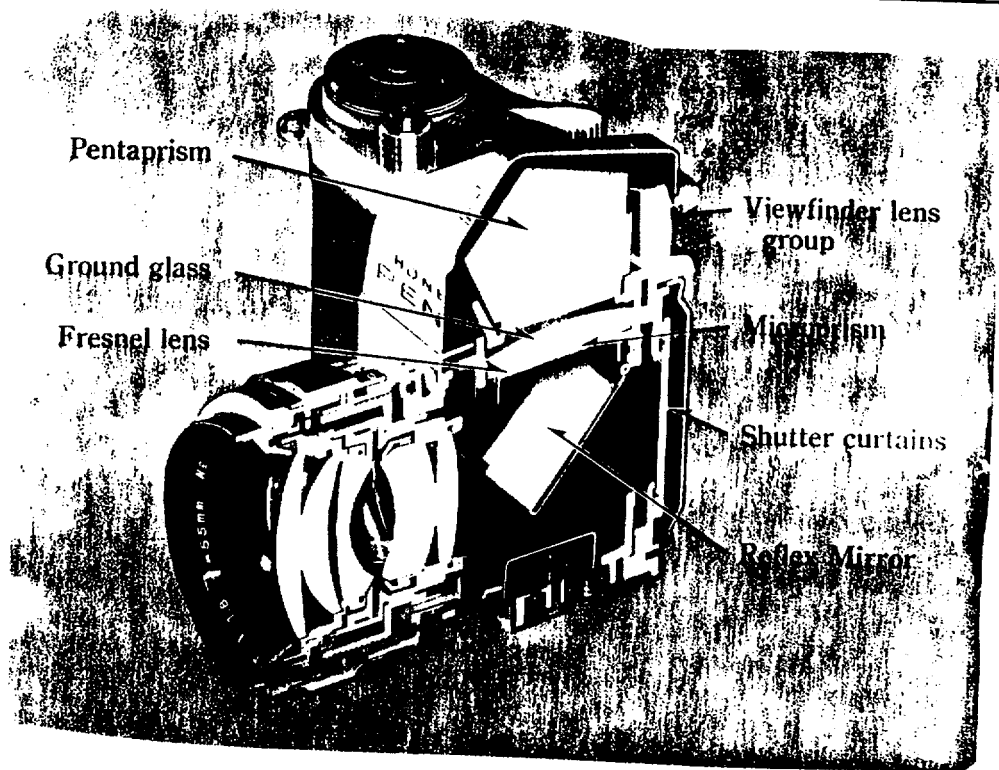
**HONEYWELL PENTAX
H-3**

- | | | | | | | | | | | | | | | | | | |
|-----------------------|------------------------------|-----------|---------------|----------------------|-------------|-------------------------|-------------|--------------|---------------------|------------------|-------------------|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| butler speed dial | Diaphragm and distance index | Back lock | Preview lever | Depth of field guide | D-ring hook | Film type reminder dial | Rewind knob | Rewind crank | Distance scale ring | X flash terminal | FP flash terminal | | | | | | |
| apud wind lever | | | | | | | | | | | | | | | | | |
| film exposure counter | | | | | | | | | | | | | | | | | |
| butler release | | | | | | | | | | | | | | | | | |
| locked indicator | | | | | | | | | | | | | | | | | |
| Diaphragm ring | | | | | | | | | | | | | | | | | |



**HONEYWELL PENTAX
H-1**

- | | | | | | | |
|-------------------------|---------------------|----------------|---------------------|----------------|-----------------|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Distance index | Distance scale ring | Distance scale | Distance scale ring | Diaphragm ring | Diaphragm index | |
| Depth of field guide | | | | | | |
| Diaphragm cocking lever | | | | | | |



Pentaprism

Ground glass

Fresnel lens

Viewfinder lens group

Microprism

Shutter curtains

Reflex Mirror

IMPORTANT...read this First!

1

Focus only after cocking the rapid wind lever. (Because of the instant return mirror of the PENTAX, the position of the mirror varies slightly before and after winding the film and cocking the shutter.)

2

When advancing the film, be sure to stroke the rapid wind lever *all the way* until it stops.

3

Do not touch the surface of the mirror. If the mirror gets dusty, use a blower to dust it off, or dust lightly with a good camel's hair brush.

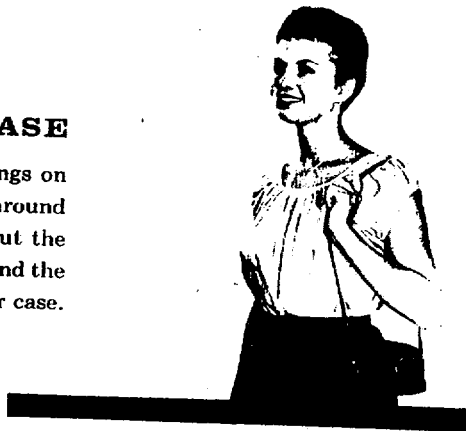
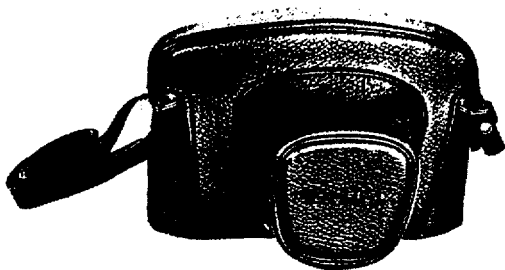
4

If your PENTAX should need repair, don't try to fix it yourself. Take it to the Honeywell PENTAX dealer from whom you purchased it. Further refer to the warranty Policy described on the last page.

2

HOW TO USE YOUR SOFT CASE

Attach the leather strap furnished to the D-rings on the camera. The camera may then be carried around your neck or over your shoulder with or without the case. A lenshood may be inverted over the lens, and the camera with lenshood carried in the soft leather case.





Hold the camera
firmly with your
left hand.

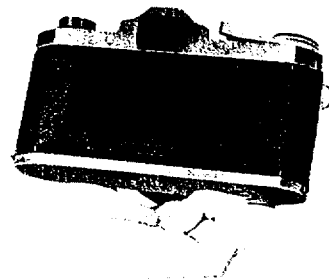
Draw your
arm close to
your body.

HOW TO HOLD YOUR CAMERA

As a general rule, your camera should be held more firmly by the left hand which does not release the shutter. If you hold your camera with the right hand—the hand which releases the shutter—it may cause movement. Very often, pictures which are not sharp are due to movement of the camera.

When you focus with the camera held horizontally, hold the lens barrel as illustrated in photograph. Put the camera on the root of your left hand thumb and little finger. Turn the distance scale ring with your thumb and index finger.

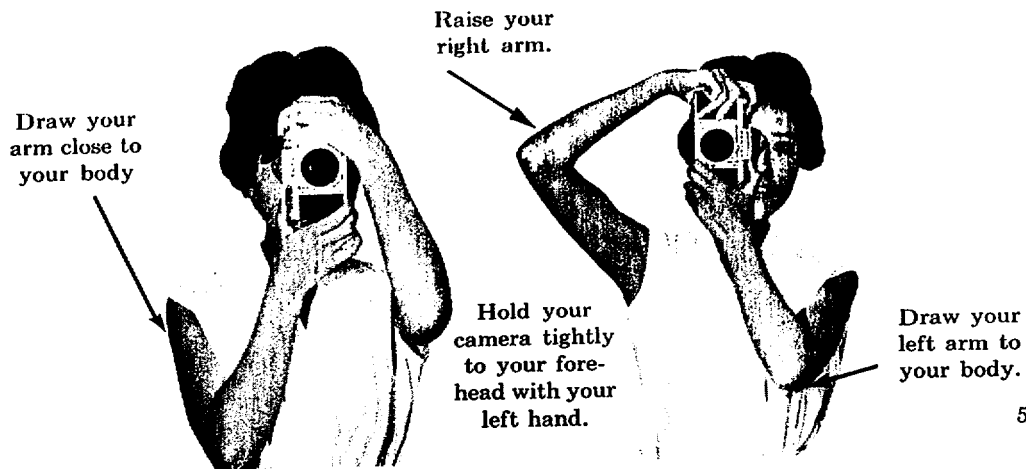
4



When holding the camera vertically, some people release the shutter with the thumb (Photo A), while others release it with the index finger (Photo B). Position B is more desirable for fast focusing and shooting. With the PENTAX, whether held vertically or horizontally, you can see your subject image through the taking lens, and this enables you to compose, focus and shoot faster than with any other type camera.

(Vertical Position A)

(Vertical Position B)





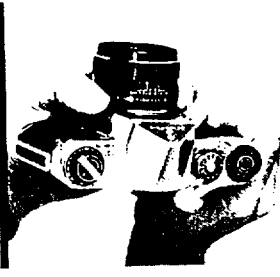
1 Cock the rapid wind lever.



2 Compose your picture.



3 To view exact depth of field at different apertures with the H-3, move the preview lever to "M" and view your subject while turning the diaphragm ring. On the H-1, simply turn the diaphragm ring.



4 Select the f stop you want by setting the diaphragm ring.

BEFORE TAKING PICTURES...

5 Set the proper shutter speed.



Set the H-3's preview lever on "A," or cock the H-1's diaphragm lever for full-aperture viewing.

6 Focus.



7 Trip the shutter.



FILM LOADING

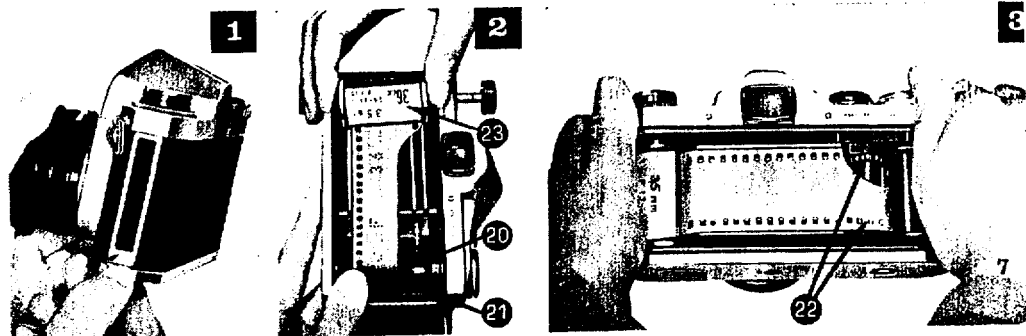
Avoid direct sunlight when loading your film.

1 Open the back by pulling out the lock [13].

2 Pull out the film rewind knob [17] completely, place the film cassette into the cassette chamber [23], and push back the rewind knob. Draw out the film leader and insert it into the slit [20] of the take-up spool [21]. If the slit is not in a proper

position to insert the film leader, turn the take-up spool with your finger.

3 Turn the rapid wind lever [2] and make sure that both sprockets [22] have properly engaged the film perforations. Close the back and fasten the lock [13].



FILM WIND AND REWIND

To wind the film . . .

4 Before turning the rapid wind lever, slowly turn the film rewind knob clockwise until a slight resistance is felt. This prevents loosening or warping of the film.

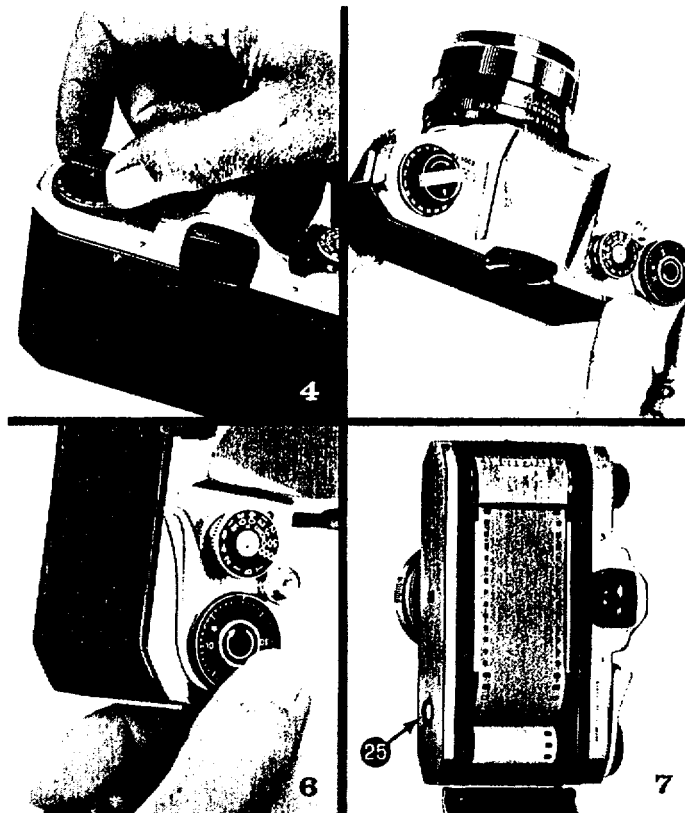
5 The first portions of the film cannot be used for picture taking as they have already been exposed to light. Generally, two blank exposures should be made before taking your first picture. Cock the rapid wind lever until it stops. Watch to see that the rewind knob is turning counter-

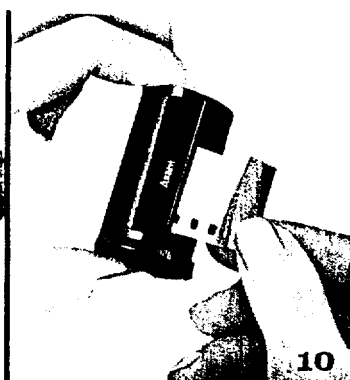
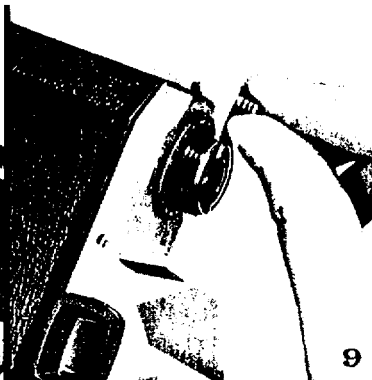
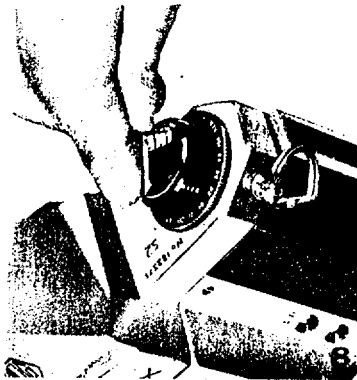
clockwise. This indicates that the film is moving from cassette to take-up spool. Trip the shutter and again cock the rapid wind lever. Set the exposure counter [a] to 0, and trip the shutter again. Your camera is now ready for the first picture. When cocking the rapid wind lever for the first picture, the exposure counter automatically turns to '1', indicating that the first picture is ready to be taken. ALWAYS COCK THE RAPID WIND LEVER COMPLETELY WITH A FULL STROKE.

6 Turn the exposure counter dial [3] in the direction indicated by the arrow. **DON'T TURN IT IN THE OPPOSITE DIRECTION.**

After the final picture on the roll (20 or 36 exposures) has been taken, the rapid wind lever will not turn all the way as you stroke it. This indicates that the final picture has been taken on your film.

7 After the final picture has been taken, **DON'T** open the back or *all* exposed frames will be ruined.





8 Unfold the film rewind crank [18].

9 Depress the film rewind release button [25] shown in photograph 7. Turn the rewind crank to rewind the film into the film cassette. The film rewind crank permits re-winding at a smooth, even rate. Under some atmospheric conditions, erratic or too rapid re-winding will cause static electricity marks on the film. You will feel the tension on the rewind crank lessen as the leader end of the film slips off take-up spool.

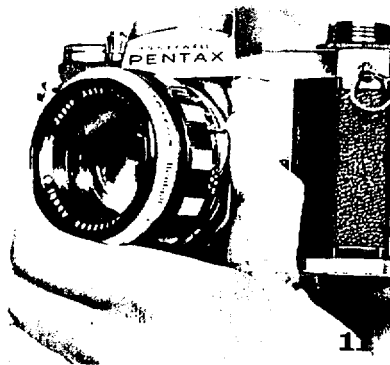
Stop re-winding when you feel this happen. **AVOID DIRECT SUNLIGHT WHEN UNLOADING YOUR FILM.** (The rewind release button [25] will return to normal position as you load your next film and turn the rapid wind lever.)

10 Open the back, pull out the film rewind knob [17] and remove the film cassette. Bend the leader end of the the film to indicate that the film is exposed and ready for development.

BRIGHT FIELD FOCUSING

11 Cock the rapid wind lever [2], and set the diaphragm ring [6] at the desired *f* setting. On the H-1, cock the automatic diaphragm lever [3] to fully open the diaphragm (when the preview lever [3] on the H-3 is set on "A," the diaphragm is fully open except for the moment of exposure); then start viewing and focusing through the viewfinder.

12 Turn the distance scale ring [10] on the H-3; [5] on the H-1) until your subject image is clearly in focus. It is not always necessary for you to view and focus with the diaphragm fully open. In bright sunlight, you can easily focus with the diaphragm closed to *f*/5.6 or *f*/8, and still observe the depth of field. It is easier, however, to focus with the diaphragm fully open as your subject image is much brighter.



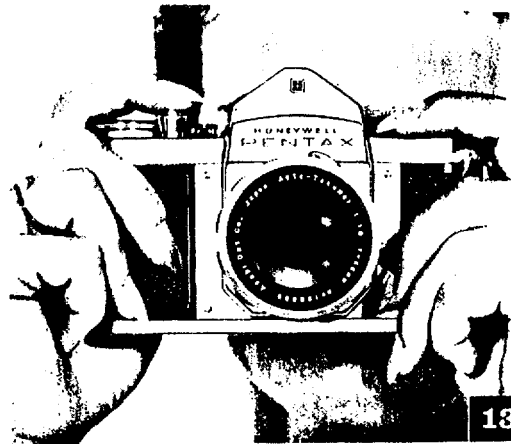
AUTOMATIC DIAPHRAGM

When the H-3's preview lever is set on "A" (Automatic), the fully automatic diaphragm is at its largest aperture (f/1.8) at all times, except for the instant of exposure, no matter what aperture is set on the diaphragm ring. When you release the shutter, the diaphragm automatically stops down to the predetermined aperture and the shutter curtains start traveling instantly. When the exposure is completed, the diaphragm reopens to maximum aperture completely automatically, and you are ready to compose, focus, and shoot your next picture. If you wish to visually check exact depth of field before making the exposure, move the preview lever to "M" (Manual). This stops the diaphragm to the aperture selected and shows you exactly how much depth of field will appear in your picture. The preview lever may be moved back to "A" before or after making your exposure, or, if you are making pictures in bright sunlight, it may be left on "M", which permits a constant check of depth of field.

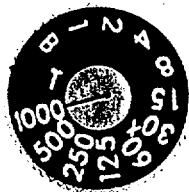
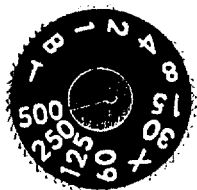
The diaphragm of the Pentax H-1 is semi-automatic, and is opened to its maximum aperture by means of the diaphragm cocking lever. When the shutter is released, the diaphragm automatically stops down to the preselected aperture. To fully open the diaphragm again, cock the diaphragm lever each time before you trip the shutter. You may

cock the H-1's diaphragm lever any time --before or after cocking the rapid wind lever, setting the shutter speed, or focusing. The H-1 has a two-position shutter release which lets you observe depth of field before making the exposure. With the diaphragm fully open and the rapid wind lever cocked, depress the shutter release very gently. A definite stop will be felt, and the diaphragm will stop down, allowing you to check depth of field before depressing the shutter release the remainder of the distance.

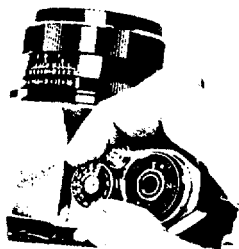
You may turn the H-1's diaphragm ring and change the preselected aperture after cocking the diaphragm lever. For example, you may change the diaphragm ring setting from $f/11$ to $f/5.6$ after cocking the diaphragm lever; the diaphragm will automatically stop down to $f/5.6$ when you trip the shutter.



NOTE: When you do not intend to use your Honeywell Pentax for a lengthy period, turn the diaphragm ring to its smallest aperture setting ($f/16$ on the H-3; $f/22$ on the H-1) to protect the spring mechanism.





14



SHUTTER

The Pentax H-3 is equipped with the following shutter speeds: T, B, 1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500, and 1/1000 sec. The H-1 has identical speeds with the exception of 1/1000 sec. On both cameras, only the figures 1, 2, 4, 8, 15, etc. appear on the shutter speed dial.

Adjustment of shutter speeds

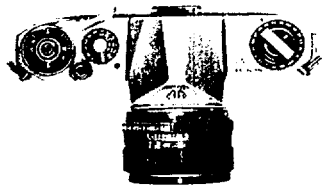
Turn the shutter dial  clockwise or counter-clockwise as you like, to the desired shutter speed. The shutter speed may be set either before or after cocking the rapid wind lever. As you cock the shutter by turning the rapid wind lever, the 'cocked' indicator  becomes red showing the shutter is cocked. (For the reason explained on the front cover flap, make sure the 'cocked' indicator shows red before you focus the lens.) The indicator window blacks out as you trip the shutter

14

button. For use of the X setting on the shutter dial, refer to page 24.

With the shutter speed dial set on B (bulb) the shutter will stay open as long as you depress the shutter button. As you release your finger from the shutter button, the shutter closes. When a long exposure is desired while using the B setting, attach a shutter release cable with a locking device to the shutter button. This will permit a "Time Exposure."

With the shutter speed dial set on T (time), the shutter stays open after the shutter button is released. To close the shutter, turn the shutter speed dial in either direction. Unless you turn the shutter speed dial, the shutter will not close.



15

CAUTIONS

- 1 At slow speeds—slower than $1/30$ —support your camera rigidly or use a tripod to prevent movement of your camera.
- 2 To protect the shutter mechanism, trip the shutter release before putting the camera out of use for any extended period.

15

MAINTENANCE OF YOUR CAMERA

1

Protect your camera from humidity, salty air and dust. Hot temperatures above 120°f and low temperatures below—55°f will affect the shutter performance. In extremely hot weather, try to keep your camera cool. Never put it in the glove compartment or on the rear window sill of your car. When extremely cold, try to keep the camera warm.

2

To remove grit or dirt from the camera body, use a soft brush or a dry soft piece of cloth. For the lens, use only a spray of air, soft lens tissue, or a camel hair brush. For the reflex mirror, use a spray of air or a soft camel hair brush only. Never wipe the mirror or lens surface with cloth.

3

Never use oil in your camera and do not touch the shutter curtains.



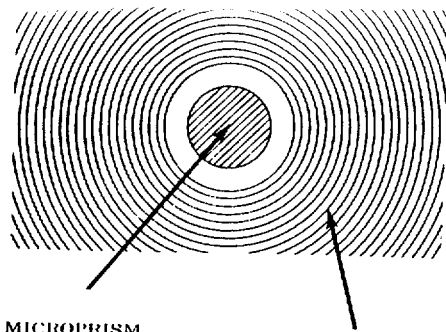
COMPLETE SYSTEM OF PHOTOGRAPHY . . . from photomicrography to macrophoto . . . from macrophoto to close-up . . . from close-up to infinity . . . with a complete range of accessories and lenses.

MAJOR FEATURES OF THE PENTAX H-1 AND H-3

Here's why Honeywell Pentax cameras are the outstanding values in their field:

Type	Single lens reflex.
Film size	35mm; 20 or 36 exposures.
Picture size	24mm x 36mm.
Standard Lenses	H-1: Auto-Takumar 55mm f:2.2 with semi-automatic diaphragm. H-3: Auto-Takumar 55mm f:1.8 with fully-automatic diaphragm.
Shutter	Focal plane shutter; single, non-rotating shutter speed dial. Speeds H-1: T (Time), B (Bulb), 1, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250 and 1/500 of a second. H-3: Same as H-1 with the addition of 1/1000 of a second.
Finder and Focusing	Pentaprism finder with microprism Fresnel lens brightened ground glass. Life size image viewing and focusing with standard 55mm lenses.
Reflex mirror	Instant return type.
Rapid film advance	Single-stroke rapid wind lever transports film and cocks shutter.
'Cocked' indicator	When shutter is cocked, a red disc appears in a small window alongside the shutter speed dial.
Film rewind	Rapid rewind crank speeds film take-up.
Double exposure	Coupled film wind and shutter cocking prevents double exposure.
Lens mount	Threaded lens mount for interchangeable lenses. Adaptor rings are available for the use of Leica-type and Asahiflex lenses.
Flash Synchronization	FP and X flash terminals.
Film type	Color coded film type dial with ASA ratings for color, black and white, and special films.
Accessory Clip	Grooves located on both sides of the viewfinder window frame accept accessory clip and 90° finder, available as accessories.

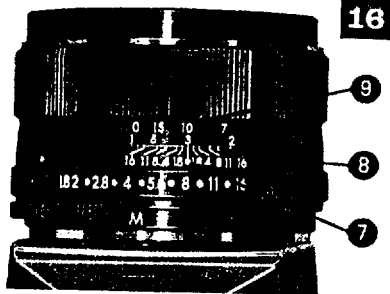
As shown on page 2, Honeywell Pentax cameras have a Fresnel lens with a microprism center underneath the ground glass. As you look through the finder, you will see that the Fresnel lens consists of many concentric rings which provide the brightest possible image on the ground glass.



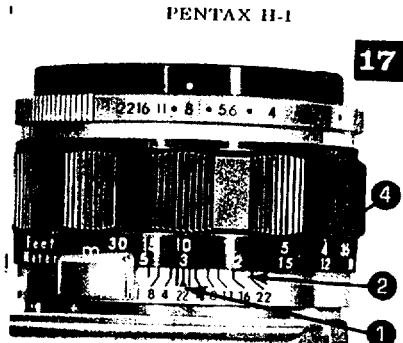
MICROPRISM

FRESNEL LENS

The microprism is the portion pointed out in this diagram. When your subject is in focus, the image in the microprism will be sharp and perfectly clear. If your subject is not in focus, the H-3's microprism will break the image up into many small dots, much like an engraver's screen, while a number of parallel diagonal lines will appear in the microprism of the H-1. You can focus on your subject at any portion of the ground glass of either Pentax model.



PENTAX H-3



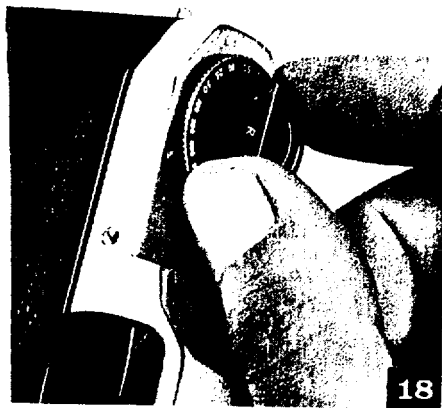
PENTAX H-1

DEPTH OF FIELD

Depth of field is the range between the nearest and farthest distances which are in focus at different lens apertures. With the Pentax, you can determine the depth of field in advance by looking through the camera's taking lens with the diaphragm stopped down to the desired opening.

DEPTH OF FIELD GUIDE

If you want to know how great the depth of field is at a certain aperture, look at the depth of field guide (8,2). In figures 16 and 17 both the H-3 and H-1 have their distance scales (9,4) set at 10 feet . . . the lens is focused on a subject 10 feet away. The figures on each side of the distance index (7,1) correspond to the diaphragm setting and indicate the range of in-focus distance for different lens apertures. For example, if the lens opening of $f/8$ is to be used, the range on the distance scale ring covered within the figure 8 indicates the area in focus at that lens opening. You will note from the depth of field guide that the range from 8 to 14 feet is in focus. Note that as the lens apertures change, the effective depth of field also changes. For the depth of field when using extension tubes, refer to pages 22, 23.



FILM TYPE REMINDER DIAL

The ASA film speed rating of all 35 mm films is given in the data sheet packed with each roll of film. As the ASA number increases, the sensitivity of the film also increases. For example, for two films of ASA 50 and ASA 200, the ASA 50 film requires 4 times more exposure than the ASA 200 film.

Use the film type dial (located beneath the rewind knob) to show what type of film is in your camera. Simply set the ASA number of the film you are using opposite the pointer. Use white figures for black and white film; red figures for color film; and green figures for special film, such as positive film, copying film, etc. To check whether the camera is loaded, turn the film rewind knob clockwise. If it turns freely, the camera is not loaded.

DEPTH-OF-FIELD TABLE FOR AUTO-TAKUMAR 55mm F/1.8 LENS

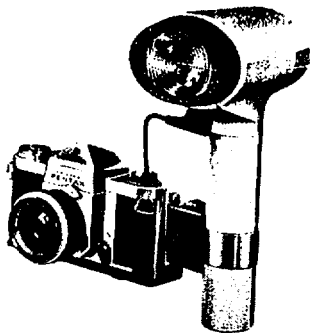
Distance Scale F Setting	Ext. Tubes 2, 3 @ 1.5 ft.	Ext. Tubes 2 @ 1.5 ft.	Ext. Tubes 1 @ 1.5 ft.	1.5 Ft.	1.7 Ft.	2 Ft.	2.25 Ft.	2.5 Ft.	3 Ft.	3.5 Ft.	4 Ft.	5 Ft.	7 Ft.	10 Ft.	15 Ft.	30 Ft.
	F/1.8	0.72 ~0.72	0.80 ~0.80	0.94 ~0.94	1.47 ~1.47	1.69 ~1.71	1.98 ~2.02	2.23 ~2.27	2.47 ~2.53	2.95 ~3.05	3.44 ~3.57	3.91 ~4.09	4.86 ~5.15	6.72 ~7.30	9.4 ~10.6	13.7 ~16.5
F/2	0.72 ~0.72	0.80 ~0.80	0.94 ~0.94	1.47 ~1.47	1.68 ~1.71	1.98 ~2.02	2.22 ~2.28	2.47 ~2.54	2.95 ~3.05	3.43 ~3.57	3.90 ~4.10	4.85 ~5.16	6.70 ~7.33	9.4 ~10.7	13.6 ~16.7	24.8 ~37.9
F/2.8	0.72 ~0.72	0.80 ~0.80	0.94 ~0.94	1.47 ~1.47	1.68 ~1.72	1.97 ~2.03	2.21 ~2.29	2.45 ~2.55	2.93 ~3.07	3.40 ~3.61	3.87 ~4.14	4.79 ~5.23	6.58 ~7.45	9.1 ~11.0	13.1 ~17.5	23.2 ~42.3
F/4	0.72 ~0.72	0.80 ~0.80	0.94 ~0.95	1.44 ~1.50	1.67 ~1.73	1.96 ~2.04	2.20 ~2.31	2.43 ~2.57	2.90 ~3.11	3.36 ~3.65	3.81 ~4.21	4.70 ~5.34	6.42 ~7.70	8.8 ~11.5	12.5 ~18.9	21.2 ~51.4
F/5.6	0.72 ~0.72	0.80 ~0.80	0.93 ~0.95	1.44 ~1.50	1.66 ~1.74	1.94 ~2.06	2.18 ~2.33	2.41 ~2.60	2.86 ~3.15	3.31 ~3.72	3.75 ~4.29	4.60 ~5.48	6.21 ~8.03	8.4 ~12.3	11.7 ~21.0	19.0 ~72.1
F/8	0.72 ~0.73	0.80 ~0.80	0.93 ~0.95	1.44 ~1.50	1.65 ~1.76	1.92 ~2.09	2.15 ~2.36	2.37 ~2.65	2.81 ~3.22	3.23 ~3.82	3.65 ~4.43	4.44 ~5.72	5.93 ~8.57	7.9 ~13.7	10.7 ~25.4	16.4 ~182.2
F/11	0.72 ~0.73	0.79 ~0.81	0.93 ~0.96	1.41 ~1.54	1.63 ~1.78	1.89 ~2.12	2.11 ~2.41	2.32 ~2.71	2.74 ~3.32	3.14 ~3.96	3.53 ~4.62	4.27 ~6.05	5.61 ~9.36	7.3 ~15.9	9.6 ~34.5	14.1 ~∞
F/16	0.72 ~0.73	0.79 ~0.81	0.92 ~0.96	1.41 ~1.57	1.60 ~1.82	1.85 ~2.18	2.05 ~2.49	2.25 ~2.81	2.64 ~3.49	3.00 ~4.21	3.35 ~4.98	4.00 ~6.70	5.14 ~11.8	6.5 ~21.7	8.3 ~85.3	11.3 ~∞

The depth-of-field distances above are expressed in feet, and the distance is measured from the film plane. When distances such as 0.72~0.72 appear, the depth-of-field is less than 0.01 ft. For PENTAX H3, use extension tubes for H3.

DEPTH-OF-FIELD TABLE FOR AUTO-TAKUMAR 55mm F/2.2 LENS

Distance Scale f Setting	Ext. Tubes			1.0 Ft.	2 Ft.	2.25 Ft.	2.5 Ft.	3 Ft.	3.5 Ft.	4 Ft.	5 Ft.	7 Ft.	10 Ft.	15 Ft.	30 Ft.
	1, 2, 3 (@ 1.0 Ft.)	1, 2 (@ 1.0 Ft.)	1 (@ 1.0 Ft.)												
F/2.2	0.72	0.79	1.09	1.78	1.98	2.22	2.46	2.94	3.42	3.90	4.83	6.67	9.3	13.5	24.4
	~0.72	~0.80	~1.10	~1.82	~2.02	~2.28	~2.54	~3.06	~3.58	~4.11	~5.18	~7.37	~10.8	~16.9	~38.9
F/2.8	0.72	0.79	1.09	1.78	1.97	2.21	2.45	2.93	3.40	3.87	4.79	6.58	9.1	13.1	23.2
	~0.72	~0.80	~1.10	~1.82	~2.03	~2.29	~2.55	~3.07	~3.61	~4.14	~5.23	~7.45	~11.0	~17.5	~42.3
F/4	0.72	0.79	1.08	1.77	1.96	2.20	2.43	2.90	3.36	3.81	4.70	6.42	8.8	12.5	21.2
	~0.72	~0.80	~1.10	~1.83	~2.04	~2.31	~2.57	~3.11	~3.65	~4.21	~5.34	~7.70	~11.5	~18.9	~51.4
F/5.6	0.72	0.79	1.08	1.76	1.94	2.18	2.41	2.86	3.31	3.75	4.60	6.21	8.4	11.7	19.0
	~0.72	~0.80	~1.10	~1.85	~2.06	~2.33	~2.60	~3.15	~3.72	~4.29	~5.48	~8.03	~12.3	~21.0	~72.1
F/8	0.72	0.79	1.08	1.74	1.92	2.15	2.37	2.81	3.23	3.65	4.44	5.93	7.9	10.7	16.4
	~0.72	~0.80	~1.11	~1.87	~2.09	~2.36	~2.65	~3.22	~3.82	~4.43	~5.72	~8.57	~13.7	~25.4	~182.2
F/11	0.72	0.79	1.07	1.73	1.89	2.11	2.32	2.74	3.14	3.53	4.27	5.61	7.3	9.6	14.1
	~0.73	~0.80	~1.12	~1.89	~2.12	~2.41	~2.71	~3.32	~3.96	~4.62	~6.05	~9.36	~15.9	~34.5	~∞
F/16	0.72	0.78	1.06	1.68	1.85	2.05	2.25	2.64	3.00	3.35	4.00	5.14	6.5	8.3	11.3
	~0.73	~0.80	~1.13	~1.94	~2.18	~2.49	~2.81	~3.49	~4.21	~4.98	~6.70	~11.8	~21.7	~85.3	~∞
F/22	0.72	0.78	1.05	1.64	1.80	1.99	2.17	2.52	2.85	3.16	3.73	4.68	5.8	7.1	9.2
	~0.73	~0.81	~1.14	~2.00	~2.26	~2.60	~2.95	~3.72	~4.56	~5.49	~7.70	~14.23	~39.1	~∞	~∞

The depth-of-field distances above are expressed in feet, and the distance is measured from the film plane. When distances such as 0.72~0.72 appear, the depth-of-field is less than 0.01 ft. For PENTAX HI, use extension tubes for HI.

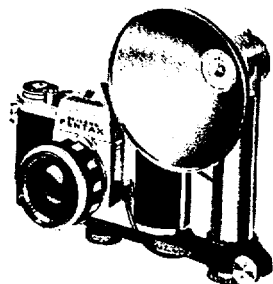


FLASH SYNCHRONIZATION

The PENTAX has two sets of terminals—FP and X. The table below shows which flash contacts, which shutter speed and which flash bulb may be combined for maximum lamp efficiency. Unless these combinations are rigidly followed, there will be a failure in flash synchronization. Note the "X" setting between 60 and 30 on the shutter speed dial.

The speed of this X setting is 1/50 of a second, and this indicates the highest shutter speed at which Honeywell Strobosars or other electronic flash units may be used.

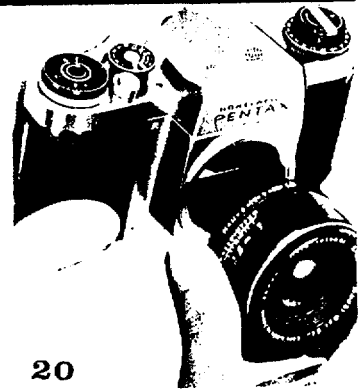
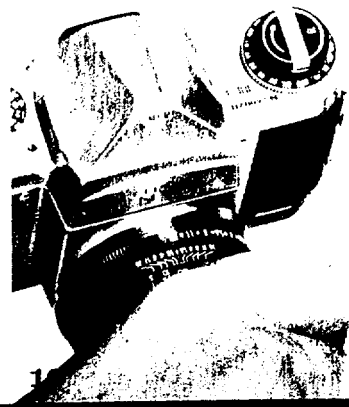
Flash terminal	Shutter speed	1000 S-3 ONLY	1/500	1/250	1/125	1/60	X	1/30	1/15	1/8	1/4	1/2	1	B
	FP		FP Class (screw base)											
		FP Class (bayonet base)												
X							F Class							
											M Class			
								Electronic flash						



INTERCHANGEABLE LENSES

The PENTAX offers many interchangeable lenses, all of which are widely respected by professional and amateur photographers for their fine resolution. The photographic coverage of the various Takumar lenses is illustrated on the next page. With focal lengths longer than 55mm, the subject image is seen through the viewfinder larger than its life size. Regardless of the lens selected for the PENTAX, there is never need for an accessory viewfinder, ordinarily required for rangefinder type cameras.

When interchanging lenses, hold the lens by the distance scale ring ⑩ as shown in photograph 20. When attaching a lens, filter, or lenshood, do not screw it too tightly, as you may find it difficult to unscrew.



25

20

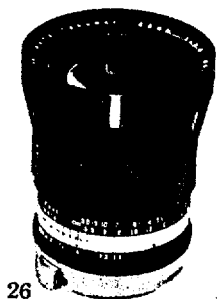
DIFFERENCE OF ANGLE OF TAKUMAR LENSES . . .



35mm

55mm

85mm



26



. . . All photographs were taken from the same location and distance from the subject.



105mm



135mm



200mm



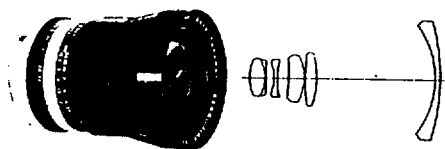
300mm



500mm



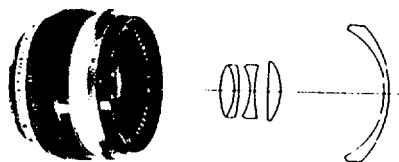
1000mm 27

Auto-Takumar 35mm f/2.3

One of the world's brightest retrofocus wide angle lenses for single lens reflex cameras. Edge-to-edge sharp resolution at full aperture; unique lens design without distortion; suitable for architectural photography.

Lens elements	6
Minimum aperture	f/22
Minimum distance	1.5 ft.
Angle of view	63°
Weight	11 ozs.

28

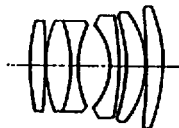
Takumar 35mm f/4

Same size as the standard lens; can be put into the camera case together with the PENTAX. Light in weight; easy to use. You do not usually need an aperture brighter than f4 for general daylight outdoor picture taking.

Lens elements	5
Minimum aperture	f/22
Minimum distance	1.5 ft.
Angle of view	63°
Weight	4.8 ozs.

Helicoidal lens barrel; without pre-set diaphragm ring.

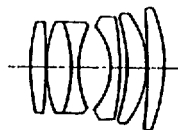
Auto-Takumar 55mm f/1.8



Razor-sharp, fully corrected, high-speed standard lens, using rare-earth glass, designed by top lens designers. Equipped with fully automatic diaphragm, with intermediate f/stop settings. Ideal for professional results.

Lens elements	6
Minimum aperture	f/16
Minimum Distance	1.5 ft.
Angle of view	43°
Weight	7.9 ozs.

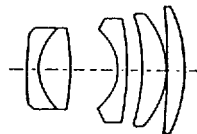
Auto-Takumar 55mm f/2.2



Newest high-speed 6-element lens, utilizing latest optical glass advances. High resolving power combines with outstanding brightness for easiest focusing. Ideal for exceptional results indoors or at night.

Lens elements	6
Minimum aperture	f/22
Minimum distance	1.8 ft.
Angle of view	43°
Weight	5.8 ozs.

Auto-Takumar 85mm f/1.8

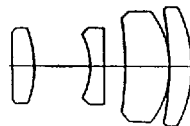


A new, ultra-fast 5-element lens which produces an image slightly larger than the standard lens. Perfect for available light portraiture, nature studies, and sports coverage. Used as a standard, general purpose lens by many photographers.

Lens elements	5
Minimum aperture	f/22
Minimum distance	3 ft.
Angle of view	29°
Weight	12 ozs.

30

Auto-Takumar 105mm f/2.8

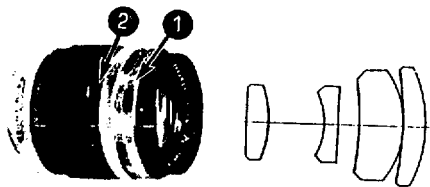


A quality medium telephoto lens of 4 elements, with well corrected aberrations. Light weight design for portability and easy handling. Recommended for scenery, portrait, news photos, other moderate telephoto effects.

Lens elements	4
Minimum aperture	f/22
Minimum distance	4 ft.
Angle of view	23°
Weight	9.9 ozs.

Automatic diaphragm; helicoidal lens barrel.

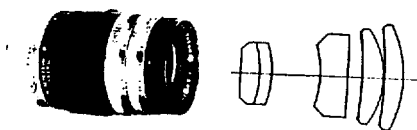
Takumar 105mm f/2.8



Exactly same as Auto-Takumar 105 mm; except this is equipped with pre-set diaphragm, weight 8.8 ounces.

The pre-set diaphragm ring [1] is set at a desired aperture before focusing. Turn the actual diaphragm ring [2] to f2.8 to focus with the diaphragm fully open. After accurate focusing has been achieved, turn the diaphragm ring [2] which automatically stops at the preselected aperture setting.

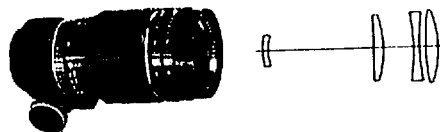
Takumar 135mm f/3.5



Produces a brilliant image in all corners of the photo even with the diaphragm fully open. Indispensable for distant subject matter and for portraits. Ideal for close-ups of animals or plants even at a distance. Recommended as the ideal long telephoto lens for hand held camera operation.

Lens elements	5
Minimum aperture	f/22
Minimum distance	6 ft.
Angle of view	18°
Weight	10.6 ozs.

Pre-set diaphragm; helicoidal lens barrel.

Takumar**200mm f/3.5**

A bright 4-element telephoto lens for handheld shooting. New optical glass used with recently advanced theory of design. Ideal for extraordinary snapshots, stage, sports and news photos with exceptionally fascinating telephotographic effects.

Lens elements	4
Minimum aperture	f/22
Minimum distance	9 ft.
Angle of view	12°
Weight	26.5 oz.

Pre-set diaphragm; helicoidal lens barrel.

Takumar**300mm f/4**

Light enough for hand-held picture taking, this lens is considered to be the most ideal for spectacular telephotographic effects. Even with the diaphragm fully open, the aberrations are corrected to the greatest extent possible. Gives needle-sharp resolution to every corner of the picture.

Lens elements	3
Minimum aperture	f/22
Minimum distance	25 ft.
Angle of view	8°
Weight	48.8 oz.

Screw-on lenshood; helicoidal lens barrel; without preset diaphragm ring.

Takumar

500mm f/5



Perfect ultra-telephoto lens for sports, scenic and wildlife photography. Bright f/5 image simplifies aiming and focusing. Produces edge-to-edge coverage of high resolution. Comparatively light and small for its performance.

Lens elements	2
Minimum aperture	f/22
Minimum distance	35 ft.
Angle of view	5°
Weight	6 lbs. 5 oz.

Built-on lenshood; rack and pinion focusing; without pre-set diaphragm ring.

Takumar

1000mm f/8

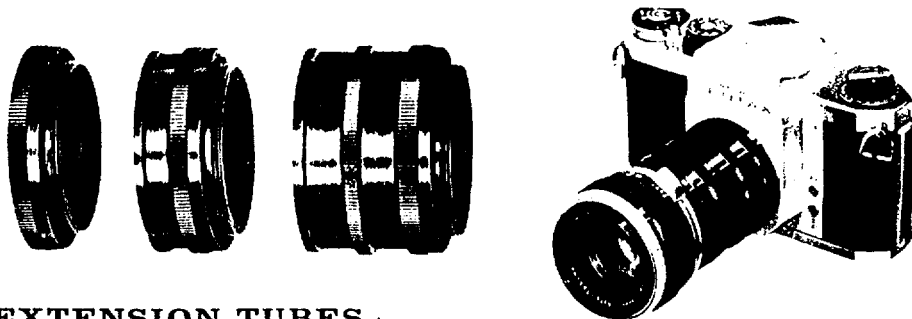


Photographs subjects which are too far away to be seen by the naked eye.

The ultimate in fine optics for the photographer who specializes in news, sports, scientific, or wildlife photography. Fast, accurate focusing. Furnished with tripod.

Lens elements	3
Minimum aperture	f/22
Minimum distance	98 ft.
Angle of view	2.5°
Weight of lens	16 lbs. 9 oz.
Weight of tripod	29 lbs. 15 oz.

Built-on lenshood; rack and pinion focusing; without pre-set diaphragm ring.



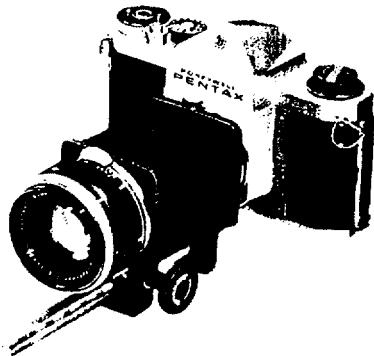
EXTENSION TUBES

By inserting any or all of the extension tubes between the camera body and the Takumar lens, close-ups of the subjects (as close as $3\frac{35}{64}$ inches from the front of the Auto-Takumar 55 mm lens) may be photographed. By adding more extension tubes, close-ups as close as the focal length of the lens may be easily and simply photographed. There are two types of extension tube sets: One for H-3 and the other for H-1.

The extension tube set consists of 3 rings: No. 1, No. 2 and No. 3; 9.5 mm, 19.0 mm, and 28.5 mm for H-3 type; and 7.5 mm, 15 mm and 30 mm for H-1 type, respectively. These rings may be used in combination as desired. Ring No. 1 is suited for moderate close-up work as in copying documents. When all extension tubes are used simultaneously with the Auto-Takumar 55 mm lens, the subject may be enlarged on the film to a magnification of 1.07 of the life size. Such extreme close-up photography is a special advantage of the single lens reflex camera because there is no parallax problem and you do not need an accessory viewfinder as is ordinarily required for rangefinder type cameras. NOTE: For PENTAX H3, use extension tubes for H3; for H1, use extension tubes for H1. When using extension tubes for H3 or bellows unit with Takumar lenses with semi-automatic diaphragm (35mm f/2.3, 35 mm f/3.5, 85 mm f/1.8 and Auto-Takumar 105 mm f/2.8), depress the firing pin on the back of the lens before mounting the lens to the extension tubes or bellows unit.

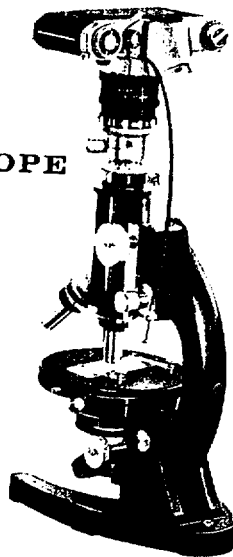
BELLOWS UNIT

An extremely flexible accessory for ultra-close-up photography. Permits use of the camera's own lens with a special calibrated gear shaft.

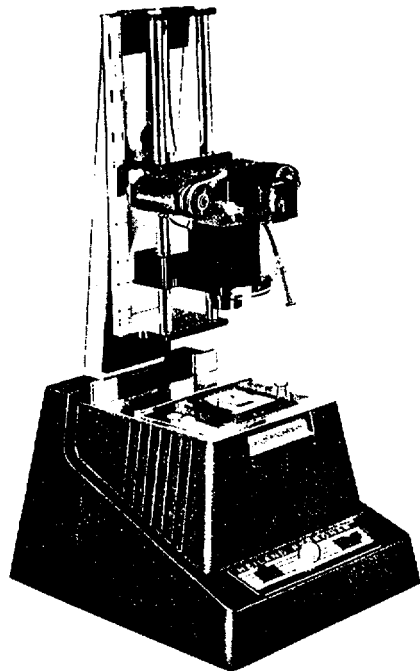


MICROSCOPE ADAPTER

By inserting this adapter between the camera body of the PENTAX and the microscope tube, photomicrography can be easily and simply accomplished with the optics of the microscope.



HONEYWELL REPRONAR



A desirable accessory for the Pentax owner who specializes in color transparencies, the Repronar incorporates a specially modified Pentax camera with a precision $f/3.5$ copying lens and a Strobonar electronic flash light source. It enables the user to duplicate original transparencies, correct for exposure errors and color balance, crop and enlarge portions of original transparencies, create special effects, and perform many other processes in color or black and white. Focusing and composition are quick and easy, and a built-in exposure scale takes the guesswork out of camera settings. Complete with filters, slide holders, lens cap and dust cover.

LEICA MOUNT ADAPTER

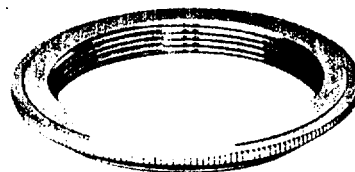
ADAPTER 'A'—For use of Leica mount lenses on the PENTAX camera body. Because the distance between the lens mount of the PENTAX and the film plane is approximately 17 mm longer than normal with Leica type lenses, Leica mount lenses may be used on the PENTAX camera body with the adapter ring *ONLY* for *closeup photography*. The above table illustrates the film plane-to-subject distance that can be covered by Leica-mount lenses with use of the Leica Mount Adapter A.

ADAPTER 'B'—For use of PENTAX-Takumar lenses on Leica-mount camera bodies. **FOR CLOSE-UPS ONLY.** Primarily for use with Leica lens mount enlargers. Takumar lenses make the finest enlarging lenses with this adapter.

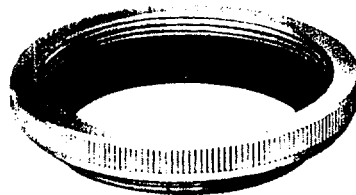
Focal length of Leica mount lens	Film-to-subject distance	Size of area to be photographed
50 mm	10 ¹⁵ / ₆₄ inches	2 ⁶¹ / ₆₄ x 3 ¹⁵ / ₁₆ in.
85 mm	22 ⁷ / ₁₆ inches	4 ¹¹ / ₆₄ x 6 ¹⁹ / ₆₄ in.
105 mm	32 ⁹ / ₃₂ inches	5 ¹⁵ / ₆₄ x 7 ⁷ / ₈ in.
135 mm	48 ⁵³ / ₆₄ inches	6 ¹¹ / ₁₆ x10 ¹ / ₃₂ in.

(When lens is focused at infinity).

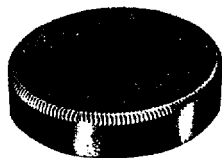
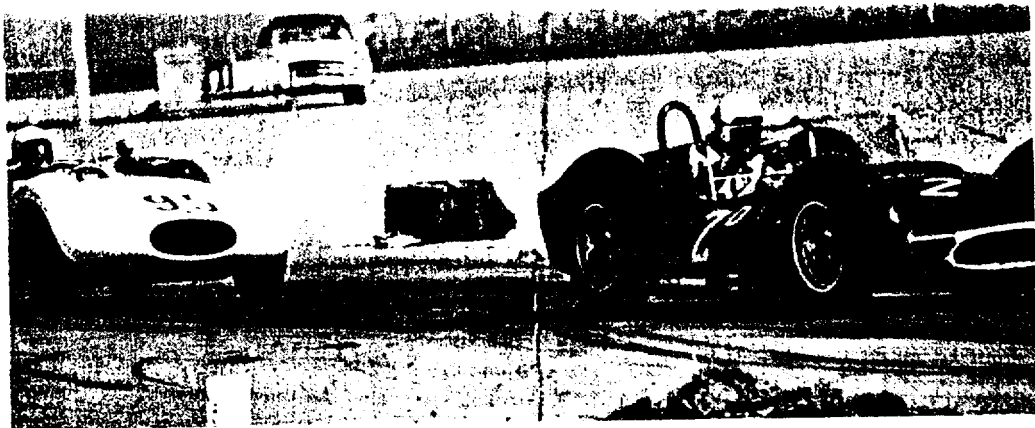
A



B



37



LENS MOUNT CAP

For use with all Takumar lenses. When your lenses are not on the PENTAX camera body, use this cap to avoid dust.



PENTAX BODY CAP

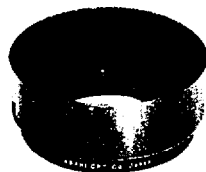
Use the body mount cap when you do not have a lens on your PENTAX camera body.

HONEYWELL CLIP-ON METER

Easily attached to the pentaprism housing of Honeywell Pentax H-1 and H-3 cameras, this meter couples directly to slotted shutter speed dial and is extremely convenient to use. Cadmium sulfite cell offers high sensitivity; measures an angle of only 9°, which results in complete exposure control. Operates on one 1.3v Mallory 640-R battery. Complete with battery and leather carrying case.



LENSHOODS



Recommended for use whenever possible to avoid off-angle rays, a lenshood is especially valuable when shooting against the light. Precision made, lenshoods for the Pentax are threaded to fit the lens and are available in the following sizes. 46mm for 55mm f/2.2, 55mm f/2, 105mm f/2.8 pre-set lens, and 135mm f/3.5 lens. 49mm for 55mm f/1.8 and 105mm f/2.8 automatic; 55mm for Auto-85 mm f/1.8; 65mm for 35mm f/2.3, and special 46mm lenshood for 35mm f/3.5 and f/4.0 lenses; 200, 300, 500, and 1000mm Takumar lens are supplied with lenshoods.

FILTERS



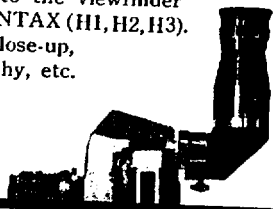
	(Exposure Factor)
UV (Ultraviolet; haze-cutting)	1
Y-47 (light yellow)	2
O-53 (light orange)	3

Following filters are available for Pentax lenses:

55mm f/2.2, 55mm f/2	46mm screw-on filter
35mm f/3.5, 35mm f/4	46mm screw-on filter
105mm f/2.8 pre-set	46mm screw-on filter
135mm f/3.5	46mm screw-on filter
55mm f/1.8	49mm screw-on filter
85mm f/1.8	55mm screw-on filter
105mm f/2.8 auto.	49mm screw-on filter
35mm f/2.3	65mm clip-on filter
200mm f/3.5	67mm screw-on filter
300mm f/4	83mm screw-on filter

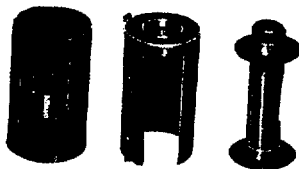
90° FINDER

A convenient accessory viewfinder to be attached to the viewfinder frame of the PENTAX (H1, H2, H3). For low-angle close-up, photo-micrography, etc.



FILM MAGAZINE

For use in loading bulk film.



LEATHER CASE

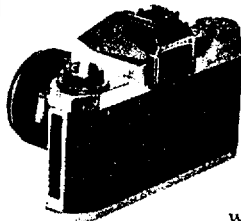
for standard lenses



When using an accessory lens on your PENTAX, put your standard lens in this leather case for protection.

ACCESSORY CLIP

Attach this to the PENTAX viewfinder window for mounting a folding flash gun (like the Honeywell Tilt-A-Mite), miniature exposure meter, etc.



RESOLVING POWER OF TAKUMAR LENSES

Resolving power of all Takumar lenses is factory-tested by skilled engineers. There are three types of tests: microscopic aerial test, projection test and photographed film test. Resolving power of a lens shown by lpm (lines per mm) varies depending upon the method of resolution test. Takumar lenses have been tested for resolving power to conform to Asahi standards, which are higher than those set by JIS (Japan Industrial Standards). All Takumar lenses bear the seal of the Japan Camera Inspection Institute which insures the performance standards.

When testing your lens performance . . .

Use a slow-speed fine grain film.

Generally, high speed films are grainy and are not suitable for resolution test. Support your camera on a good tripod. Use a shutter release cable to prevent movement of the camera. The definition of the picture on the negative film may decrease if exposure and developing time are not proper. Time your exposure and development correctly.

If you do your own developing and enlarging, see that your enlarger uses a fine quality enlarger lens. If it is not of a fine quality, your pictures can never be sharp no matter what superb lenses are mounted on your camera. Usually, the diaphragm of the enlarger should be closed down to $f/8$ or $f/11$.



WARRANTY POLICY

All Heiland Pentax camera equipment and accessories sold in the United States is unconditionally guaranteed against defects of material or workmanship for a period of twelve months from date of purchase. Service will be rendered and defective parts will be replaced without cost to you within that period, provided the equipment has not been abused, altered, or operated contrary to instructions. Heiland shall not be liable for any repair or alterations except those made with its written consent and shall not be liable for damages from delay or loss of use or from other indirect or consequential damages of any kind, whether caused by defective material or workmanship or otherwise; and it is expressly agreed that Heiland's liability under all guarantees or warranties, whether expressed or implied, is strictly limited to the replacement of parts as hereinbefore provided. *In order to validate your warranty, the warranty card must be filled in COMPLETELY and mailed to the factory within ten days of purchase.*

PROCEDURE DURING 12-MONTH WARRANTY PERIOD

Any equipment which proves defective during the 12-month warranty period should be returned to your Heiland dealer. The dealer will forward the equipment to the Heiland factory. If the equipment is covered by warranty (as evidenced by its registration in Heiland's files) repairs will be made and parts replaced free of charge, and the equipment returned prepaid to your dealer. If the equipment is not covered by warranty, Heiland's regular charges will apply.

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