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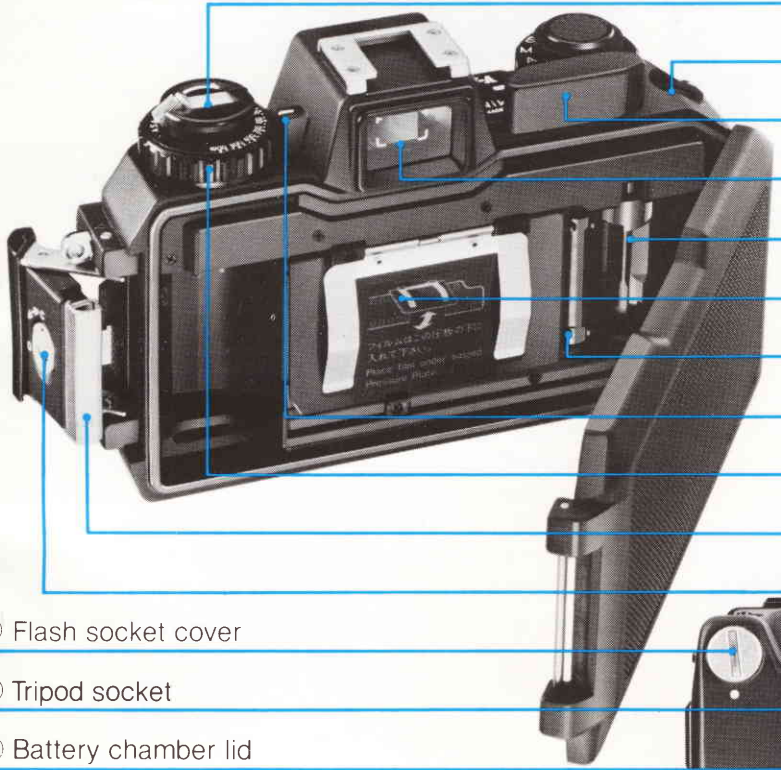
Nikon

NIKONOS IV-A

INSTRUCTION MANUAL

NOMENCLATURE

① Accessory shoe
② Shutter speed index
③ Shutter speed dial
④ Lens seating slot
⑤ Shutter release button
⑥ Shutter release button lock
⑦ Lens seating pin
⑧ Anatomical grip
⑨ Distance scale
⑩ Depth-of-field indicators
⑪ Lens aperture knob
⑫ Aperture scale
⑬ Lens focusing knob
⑭ Neckstrap eyelets



Film rewind knob with crank ⑮

Frame counter ⑯

Film advance lever ⑰

Viewfinder ⑱

Film takeup spool ⑲

Hinged pressure plate ⑳

Film advance sprockets ㉑

ASA/ISO film speed dial index ㉒

ASA/ISO film speed dial ㉓

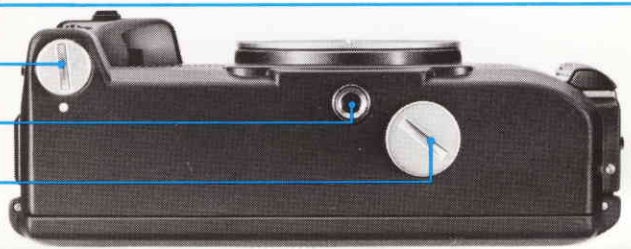
Camera back latch ㉔

O-C key ㉕

㉖ Flash socket cover

㉗ Tripod socket

㉘ Battery chamber lid



CONTENTS

FOREWORD

The Nikonos IV-A is the world's only 35mm underwater camera capable of going down to depths of 50 meters (160 feet) and withstanding pressure of 6kg/cm²(85 lb/in²) without a special underwater housing. Because of this ruggedness, you can use the Nikonos in situations where regular cameras would dare not go. Carry it to the beach, use it on your boat, even take it mountain climbing without worrying about camera care.

And now with automatic exposure control, picture-taking has been made easier than ever. Just set a shooting aperture, and the camera adjusts the shutter speed to give you the correct exposure AUTOMATICALLY.

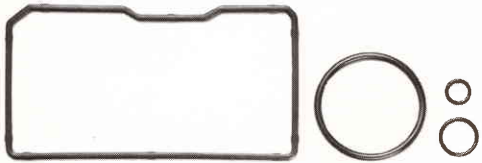
The Nikonos IV-A has a large, high-eyepoint viewfinder allowing you to see the entire field of view from up to 40mm away while wearing a diver's mask or goggles. In addition, its swing-open camera back and large shutter release button and film advance lever allow the Nikonos to be operated in the same manner as regular 35mm cameras.

Even though this camera is very easy to use, you should still familiarize yourself with its preparation and basic operation as presented in the first two sections of this manual. For more detailed information, please refer to "CONTROLS IN DETAIL" and "TIPS ON UNDERWATER SHOOTING." A few minutes wisely invested now will pay off later in years of rewarding photographic experiences.

PREPARATION

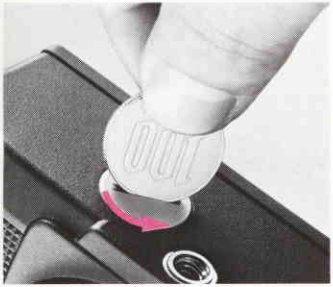
Prior to using the Nikonos IV-A, check to see that the O-rings are not scratched and that there is no sand or other foreign matter attached to the rings. Then, you must lubricate the four O-rings shown in red using the tube of lubricant provided. Lubrication makes the camera back easy to open and the lens or other parts easy to attach; it also protects the O-rings from excessive wear. Apply the lubricant sparingly, yet make sure there are no gaps between areas of application. It is recommended that lubricant be applied when necessary to ensure the longest possible service for the Nikonos IV-A. An extra set of O-rings, plus a tube of lubricant, is supplied with the camera.

O-rings



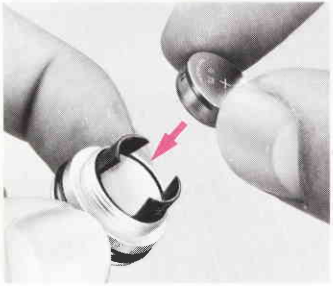
O-ring lubricant

BASIC OPERATION



1. Remove the battery chamber lid 28.

Use a coin to twist the lid counter-clockwise to unscrew it.



2. Install the batteries.

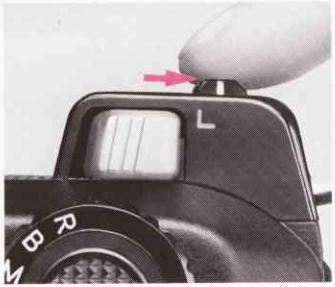
Insert the two 1.55V silver-oxide batteries supplied with the camera, making sure that the "+" signs are up.

3. Replace the battery chamber lid.

Slip the battery clip back into the camera body and screw the lid tightly into place.

4. Set the camera for automatic operation.

Rotate the shutter speed dial ③ until the "A" is opposite the white index ②.

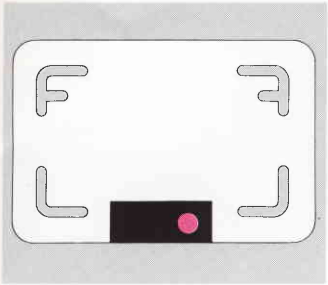


5. Unlock the shutter release button.

Move the shutter release button lock ⑥ off the "L" position.

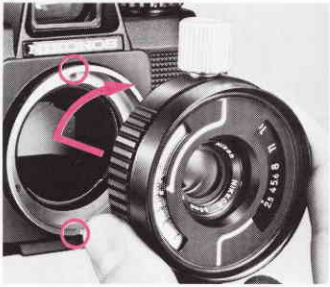
6. Depress the shutter release button ⑤ halfway.

This activates the exposure meter. The meter stays on for approx. 20 seconds after you take your finger off the button and turns itself off automatically to conserve battery power.



7. Check battery power.

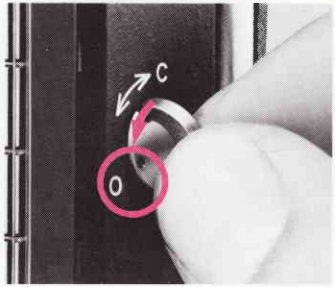
Look through the viewfinder ⑱. A red LED at the bottom of the frame should be displayed to show that the batteries have been properly installed and their power is adequate. If not, recheck the orientation of the "+" "–" symbols, and if necessary, replace both batteries with a fresh set.



8. Mount the lens on the camera.

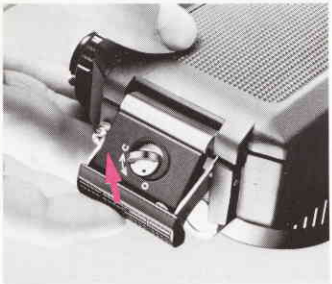
With the white lens focusing knob W positioned vertically in front of the viewfinder, push the lens firmly into the camera'd bayonet mount. Twist the lens 90° clockwise until the seating pins ⑦ click and lock into position in the slots ④. Now the camera and lens assembly are completely watertight.

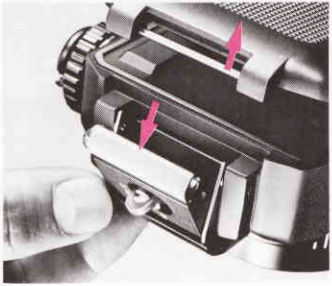
Note: *Mounting the lens upside down may make it easier to read the aperture and distance scales from above the camera.*



9. Unlock the camera back.

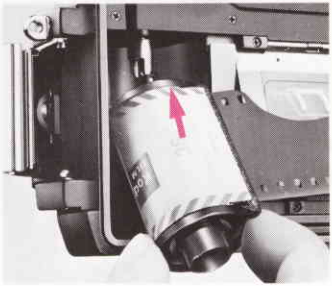
Turn the O-C key ㉕ to the "O" position.





10. Open the camera back.

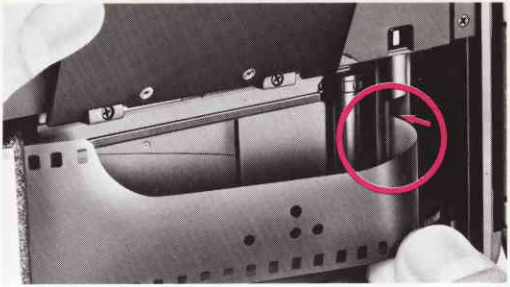
Press your thumb against the camera back as you lift up the camera back latch ㉔. Release thumb pressure, and the camera back will open.



11. Install the film cartridge.

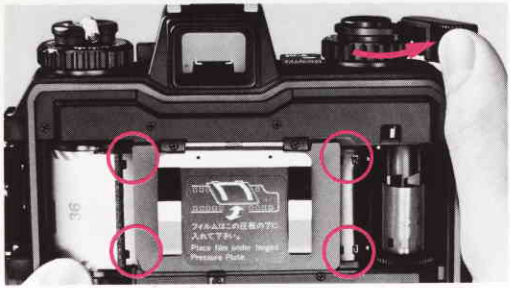
Slip the cartridge into the film cartridge chamber, so that the top of the cartridge engages the film rewind fork . Then push the bottom of the cartridge until it is fully seated in the chamber.

12. Lift up the pressure plate ⑳.



13. Insert the film leader in the takeup spool ⑲.

While holding the pressure plate in the "up" position, pull the leader across the camera and insert it into one of the slots in the film takeup spool. Then push the pressure plate back down until it locks into place.

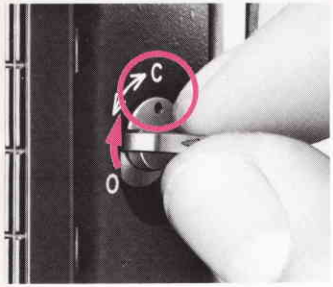


14. Wind the film advance lever ⑰ to advance film onto the takeup spool.

Depress the shutter release button and wind the film advance lever until the film sprockets ㉑ engage the perforations on both edges of the film.

15. Close the camera back.

Make sure the bottom of the cartridge is still fully seated in the chamber and the O-ring fits snugly in the groove around the camera back before swinging the camera back shut. Then, while pressing the camera back against the camera body, rotate the camera back latch to the rear. Push the back of the latch in so that the claw hooks onto the pin on the camera back. Finally, push the latch forward to clamp the camera back into place.



16. Lock the camera back.

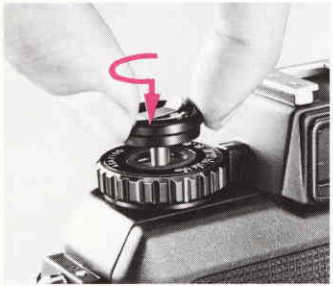
Return the O-C key to the "C" position to prevent the camera back from being accidentally opened during picture-taking.

17. Take up the film slack.

Fold out the film rewind crank ⑮. Rotate the film rewind knob in the direction of the arrow as you lift it up. Then with the knob in the raised position, rotate it in the same direction until you feel slight tension.

18. Make blank exposures until the frame counter shows "1."

Continue to depress the shutter release button and wind the film advance lever until the frame counter ⑯ shows **"1."** While making blank exposures, watch the rewind knob to see that it rotates. This indicates that the film has been loaded correctly and is being advanced.



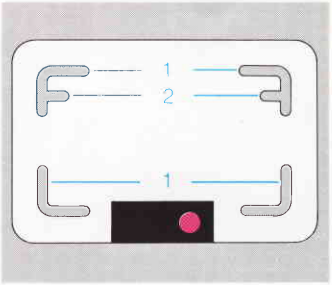
19. Push the rewind knob back down.

Fold the crank back in. Then rotate the knob slightly in the opposite direction of the arrow while pushing down. The knob will return to its normal position.

Caution: *Before you actually dive into the water, make sure the rewind knob is in the "down" position. Otherwise, water might get inside the camera.*

20. Set the ASA/ISO film speed.

Lift up the film speed dial 23 and rotate it in either direction until the ASA/ISO film speed is opposite the white index 22. This programs the camera's exposure meter so that it may provide a proper exposure for the speed of film in use.

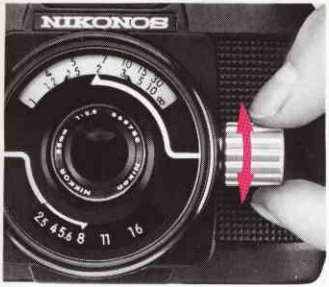


21. Frame the subject in the viewfinder.

The frame lines built into the viewfinder show the field of view for the normal 35mm lens. For proper framing, place your subject within the outlined area. When shooting subjects at distances as close as 0.8m (2.75ft), use the parallax correction marks for framing.

Inside the viewfinder

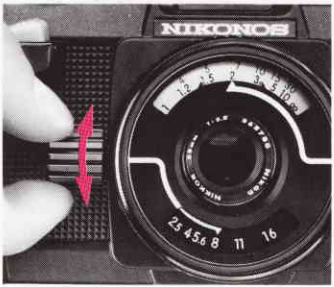
1. Frame lines showing the field of view for the normal 35mm lens
2. The parallax correction marks



22. Set the distance on the lens.

Estimate or measure* the camera-to-subject distance. Turn the white lens focusing knob until the estimated camera-to-subject distance in meters or feet is lined up with the index on the front of the lens.

**Refer to page 36 for more details.*



23. Set the lens aperture.

Turn the black aperture knob ⑪ until the desired f/number is opposite the index mark on the front of the lens.

The pincer-type depth-of-field indicators ⑩, coupled with the focusing knob, open or close to show the range of distances which will be in focus in the final photograph.*

**Refer to the example pictures on page 27.*

24. Take the picture.

Look through the viewfinder, and depress the shutter release button halfway. If the LED doesn't blink, depress the button all the way to take the picture. The shutter speed automatically selected is between approx. 1/30 sec. and 1/1000 sec. If the LED does blink, readjust the aperture until it stops blinking.

25. Advance the film.

Stroke the film advance lever to transport the film to the next frame and get the camera ready for the next shot.

26. Set the shutter speed dial to "R."

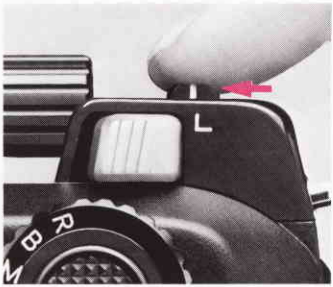
After the last exposure has been made, the film advance lever will stop working. You must then rewind the exposed film back into its cartridge. To do this, first turn the shutter speed dial to "R" to disengage the film sprocket drive.

27. Rewind the film.

Fold out the film rewind crank. Rotate the film rewind knob in the direction of the arrow as you lift it up. Then with the knob in the raised position, rotate it in the same direction to rewind the film. When you feel the tension lessen, continue winding one or two more turns so that the film leader is rewound completely back into the cartridge.

28. Remove the film cartridge.

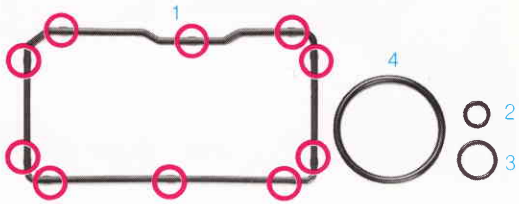
Open the camera back and take out the film cartridge.



29. Lock the shutter release button.

Return the shutter speed dial to the "A" position to make the camera ready for loading the next roll of film. Finally, set the shutter release button lock to the "L" position. This prevents the shutter release button from being depressed and causing inadvertent battery drain.

CONTROLS IN DETAIL



O-rings

The purpose of using O-rings on the Nikonos IV-A is to seal all joints making the camera completely watertight. As explained in the "PREPARATION" section, you should apply lubricant to the O-rings whenever necessary to insure smooth operation and long life. Please make sure to clean all sand and foreign matter off these parts. If you find a ring difficult to clean, remove it completely making certain not to scratch it. To ensure watertightness, replace all O-rings when they become scratched or worn.

To remove the O-rings, except the one around the camera back, grasp the ring between your thumb and forefinger. Pinch you fingers together as you slide them in the direction of the arrow to create slack in the O-ring. Then grasp the slack portion with your other hand and pull the ring off (Fig. 1). The O-ring around the camera back can be removed by inserting a pointed object under the ring and pulling up to lift it out (Fig. 2). However, make sure not to scratch the O-ring in doing so.

To install a new O-ring, insert one side of the ring into the groove and hold it in position while rolling the other side of the ring into place (Fig. 3). When inserting the O-ring into the groove in the camera back, first place it over the groove; then press it down in the groove making certain that the ten points having small winged-shaped projections (as circled in red above) are fully seated into the ten pairs of slots (Fig. 4).

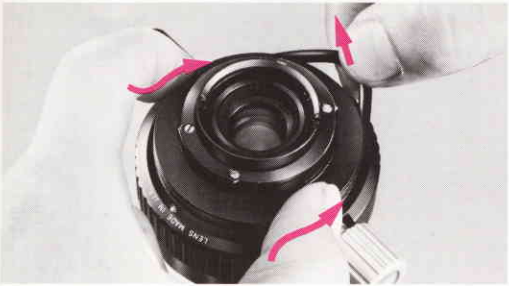


Fig. 1

Fig. 2

Fig. 3

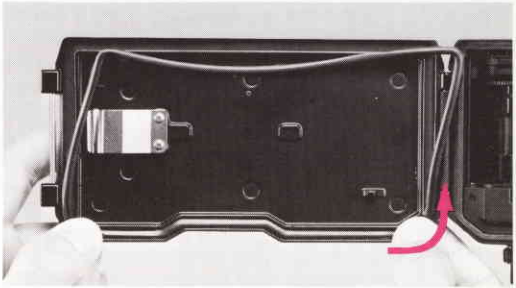
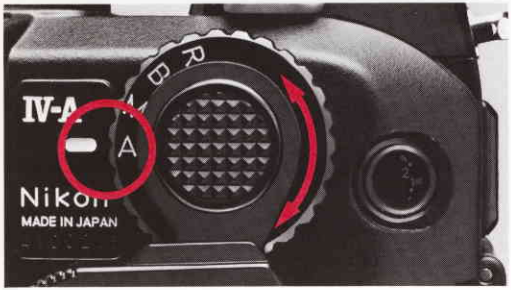


Fig. 4



Shutter speed dial ③

The shutter speed dial on the Nikonos IV-A has four settings: A, M, B and R.

At the A (AUTO) setting

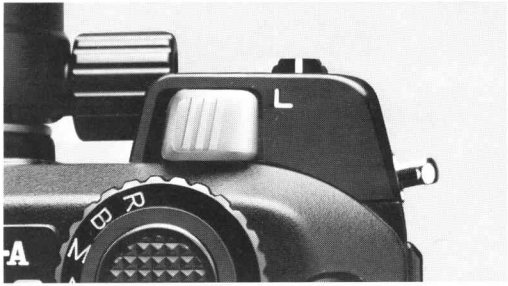
When the dial is set to "A," the shutter speed is automatically set to match the ASA/ISO film speed setting, the lens aperture setting, and the scene brightness. Turn the meter on, and an LED inside the viewfinder glows when the shutter speed is within the "safe" range of approx. 1/30—1/1000 sec. However, if the shutter speed is outside this range, the LED blinks as a warning. In this case, turn the lens aperture knob to another setting. If you are unable to stop the LED from blinking after all possible settings, then the subject is too bright or too dim for automatic exposure control. If the subject is too bright, use a neutral density filter or change the film to one with a lower ASA/ISO; if the subject is too dim, use a speedlight or faster film. With the Nikonos Speedlight SB-101, the shutter speed is automatically switched to 1/90 sec. for proper electronic flash synchronization. To speed up film loading, the shutter fires at approx. 1/1500 sec. for blank shots until the frame counter reaches "1."

Note: *The UW-Nikkor 15mm f/2.8 cannot be used for automatic exposure. When using it, set the dial to "M" and estimate the exposure or use an underwater exposure meter instead.*

At the M (MECHANICAL) setting
This setting provides a backup mechanical speed of 1/90 sec. in case the batteries become weak or exhausted or there are none loaded in the camera. This setting should also be used when speedlights other than the Nikonos Speedlight SB-101 are used.

At the B (BULB) setting
At "B," the shutter remains open for as long as you keep the shutter button depressed, allowing you to make time exposures or create "stroboscopic" effects by firing the flash repeatedly with the shutter open. "B" is also a mechanical setting.

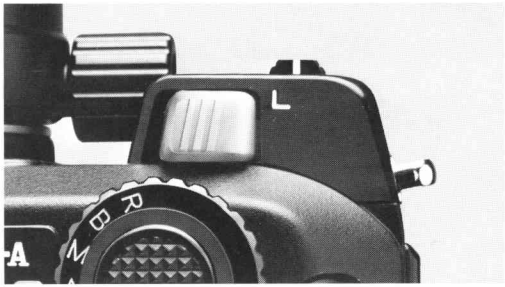
At the R (REWIND) setting
To disengage the film sprocket drive for rewinding, set the dial to "R." At this setting, the shutter release button cannot be operated.



Shutter release button ⑤ (with lock ⑥)

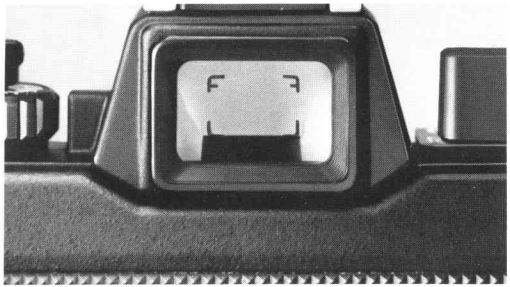
Located at the top of the anatomical grip, the large shutter release button on the Nikonos IV-A provides convenient operation either above or below the water. With the shutter speed dial set at "A," the shutter button serves as a meter-ON switch when depressed halfway; the meter then stays on for approx. 20 sec. after you take your finger off the button, turning itself off automatically to conserve battery power. When used in conjunction with the LED in the viewfinder, the shutter release button can be used as a battery check. When you release the shutter at "A" in a very dark place or with the front lens cap on, the shutter

shutter speed dial to either "B" or "M" to close the shutter. A shutter release button lock is provided to prevent wasting a frame or causing inadvertent battery drain in case the shutter release button is accidentally depressed while the camera is not in use.



Shutter release button ⑤ (with lock ⑥)

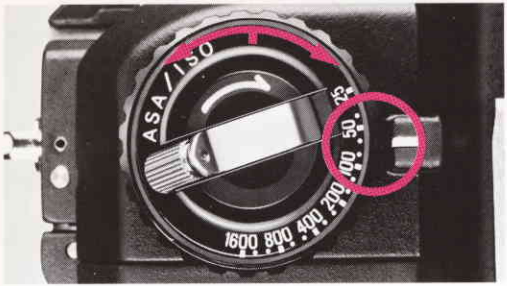
Located at the top of the anatomical grip, the large shutter release button on the Nikonos IV-A provides convenient operation either above or below the water. With the shutter speed dial set at "A," the shutter button serves as a meter-ON switch when depressed halfway; the meter then stays on for approx. 20 sec. after you take your finger off the button, turning itself off automatically to conserve battery power. When used in conjunction with the LED in the viewfinder, the shutter release button can be used as a battery check. When you release the shutter at "A" in a very dark place or with the front lens cap on, the shutter curtain may remain open. If this happens, turn the shutter speed dial to either "B" or "M" to close the shutter. A shutter release button lock is provided to prevent wasting a frame or causing inadvertent battery drain in case the shutter release button is accidentally depressed while the camera is not in use.



Viewfinder 18

The high-eyepoint viewfinder in the Nikonos IV-A allows you to place your eye up to 40mm away from the eyepiece, so that the entire field of view can be seen while wearing a diver's mask, goggles, or safety glasses. The built-in frame lines indicate the area of coverage for the normal 35mm lens; the parallax correction marks should be used to frame the subject when shooting at the closest focusing distance of 0.8m (2.75ft).

At the bottom of the viewfinder, there is an LED which glows when the shutter speed is between approx. 1/30 and 1/1000 sec. and blinks when the speed is outside this range. In addition, a flash ready-light in the form of a red lightning bolt appears when the Nikon Speedlight SB-101 is charged up and ready to fire.

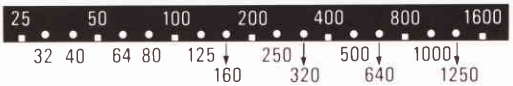


ASA/ISO film speed dial (23)

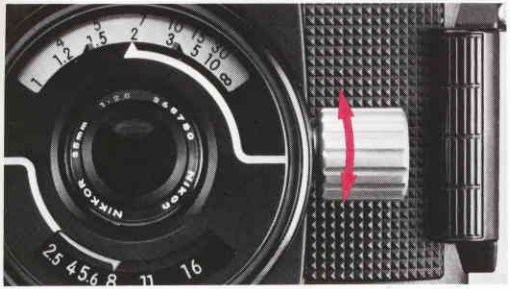
Providing ASA/ISO settings from 25 to 1600, the film speed dial is set by lifting up the knurled ring and rotating until the desired speed is opposite the white index. When the ring is released, it locks into place. The dial can be rotated even underwater without fear of water getting inside the camera.

To get the correct exposure when shooting backlit subjects or for creating special effects, you can reset the dial for exposure compensation. If you're using ASA/ISO 100 film, turn the dial from 100 to 50 and the final picture will be one f/stop overexposed; reset the dial from 100 to 200, and the final photograph will be one f/stop underexposed. The right amount of exposure compensation can be determined through trial and error.

ASA/ISO film speed scale



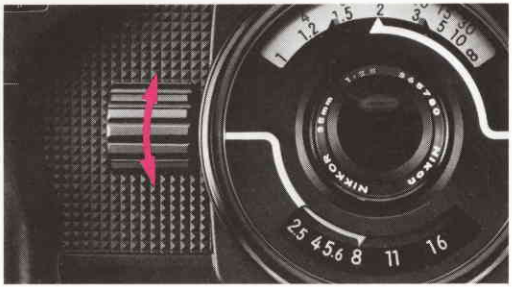
Note: **Make sure to return the ASA/ISO dial to the correct setting after you have finished making exposure compensation.**



Lens focusing knob (13)

The Nikonos IV-A does not offer through-the-lens focusing, nor is it equipped with a rangefinder. Therefore, you must focus by either estimating or actually measuring the camera-to-subject distance and then setting it on the lens. To focus the lens, turn the white focusing knob until the desired distance in meters or feet is opposite the white focusing index. In addition, a pair of pincer-type depth of field indicators shows the exact distance from near to far that will be in sharp focus in the final photograph.

Note: *When you actually measure the distance underwater, you must modify this distance before setting it on the lens. For more information, refer to "Tips on Underwater Photography" on page 36.*



Lens aperture knob ⑪

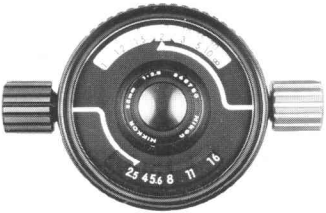
By turning the black lens aperture knob, you change the size of the lens aperture letting more or less light pass through the lens. At the same time the pincer-type depth-of-field indicators expand or contract, while the aperture scale moves in relation to the arrow index. By adjusting the aperture, the automatically selected shutter speed can be controlled. Choose a wide aperture (smaller f/number), and you let in more light thus increasing the shutter speed. On the other hand, by selecting a small aperture (larger f/number), the light is reduced resulting in a slower shutter speed. In addition to controlling the shutter speed, the size of the aperture also determines depth of field. Depth of field is to the zone of acceptable foucs extending in front of, and behind, the plane of sharpest focus and is indicated clearly by the depth-of-field indicators. Within this zone, image blur is negligible and everything can be considered as being in sharp focus. Three factors control depth of field: the focal length of the lens in use, the camera-to-subject distance, and the shooting aperture.

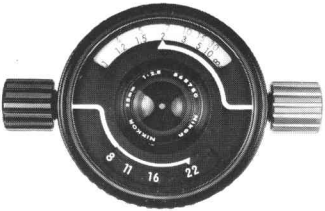
At wide apertures, depth of field is very shallow. But, as the lens is stopped down, depth of field increases proportionally. Please refer to the following examples for details.

Note: *To cover any error you might have made in focusing, use the smallest aperture possible. Alternately move farther away from the subject or use a lens with shorter focal length.*

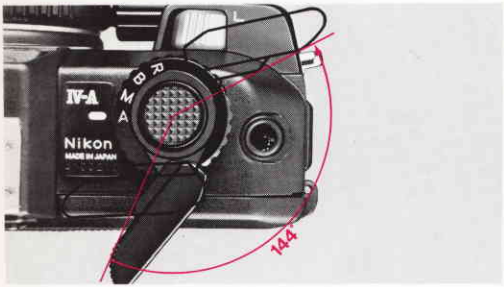
f/2.5—Shallow depth of field

f/22—Deep depth of field





CONTROLS IN DETAIL—continued

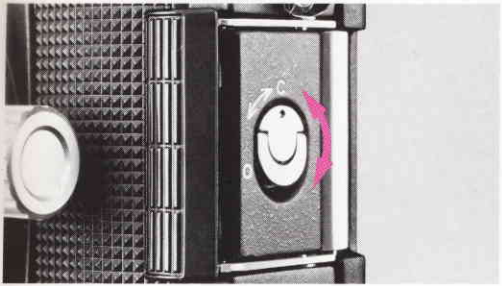


Film advance lever (17)

The film advance lever on the Nikonos IV-A operates in the same manner as a regular 35mm camera. Stroke the lever in the direction of the arrow to cock the shutter and advance the film to the next frame. The lever is ratcheted, so it may be operated in one continuous stroke or a series of shorter ones. In addition, the lever is hinged for compact storage in the rest position. The angle of throw is 144°.

Frame counter

To accommodate all commercially available film cartridges, the Nikonos IV-A frame counter goes up to 36. The "S" appears automatically as soon as the camera back is opened and signifies the "START" position. Then there are two dots between "S" and "1." After "1," even numbers are listed with odd numbers indicated by dots in between. All indications are in white against a black field for maximum legibility. On "AUTO," until the frame counter reaches "1," the shutter speed is approx. 1/1500 sec. for blank shots to facilitate film loading.



Camera back latch (24) (with O-C key (25))

New to the Nikonos IV-A is its swing-open type camera back. This design allows quick and easy film loading in the normal 35 mm camera way.

To allow the camera back to be opened or closed in a minimum amount of time, a quick-release camera back latch is employed. It can be opened after turning the O-C key to the "O" (OPEN) position. After loading film, to prevent the camera back from being accidentally opened and to insure complete watertightness, you must turn the O-C key to the "C" (CLOSED) position. It goes without saying that you should never attempt to load or unload the camera underwater or in situations where water might get inside the camera.

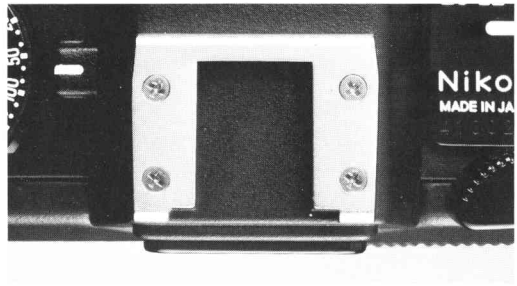
Pressure plate (20)

Instead of being attached to the camera back, the Nikonos IV-A's pressure plate is attached to the inside of the camera and is hinged.

This style pressure plate uses a safety catch to keep the film flat, and to protect the shutter curtains from accidental splashes or foreign matter when opening the camera back.

Anatomical grip 8

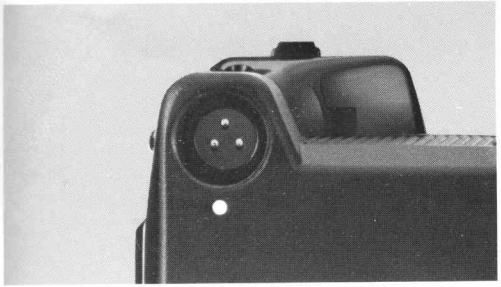
By placing your right forefinger on the shutter release button with the thumb behind the film advance lever, your other fingers just naturally wrap around the anatomical grip. With this comfortable and secure hold, you can change rapidly from horizontal to vertical-format shooting with a minimum of fumbling. One of the biggest causes of unsharp pictures is camera shake. When you release the shutter, support the camera with both hands and gently squeeze the shutter release button instead of jabbing it. Underwater, weightlessness makes steady camera holding even more difficult. Concentrate on steadiness even when using fast shutter speeds.



Accessory shoe 1

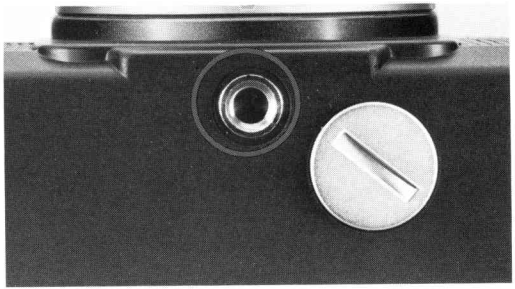
Built into the top of the viewfinder, the Nikonos IV-A's accessory shoe accepts the following accessories:

1. Two plastic frame finders, one for the UW-Nikkor 28mm f/3.5 and the other for the W-Nikkor 35mm f/2.5 or the Nikkor 80mm f/4.
2. Three optical viewfinders, one for the UW-Nikkor 15mm f/2.8, another for the 28mm lens, and the third for the 80mm for use on land.
3. The Sensor Unit SU-101 for the Nikonos Speedlight SB-101 as well as regular direct-mounting speedlights for non-underwater use.



Flash socket (26)

The flash socket is located in the camera's baseplate just below the anatomical grip. Use a coin to unscrew the flash socket cover. Like the battery chamber cover, it has an O-ring to insure absolute watertightness. Once the cover is removed, electrical connection between the camera and the Nikonos Speedlight SB-101 can be made via the coiled sync cord. Since the Nikonos IV-A's flash socket provides X-sync only, a flash unit utilizing flashbulbs *cannot* be used. A special Flash Unit Adapter is also available allowing other electronic flash units to be used for non-underwater photography with Nikonos IV-A.



Tripod socket (27)

A standard tripod socket is located in the camera's baseplate for attachment of the bracket for the Nikonos Underwater Speedlight SB-101. A regular tripod can also be used for shooting on land at slow shutter speeds or when making time exposures.

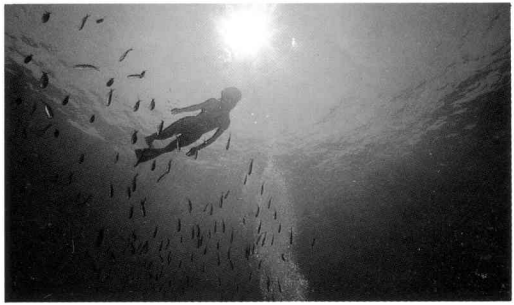
TIPS ON UNDERWATER PHOTOGRAPHY

Shooting on Automatic

For maximum visibility, pick a calm, sunny day and dive between the hours of 10 a.m. and 2 p.m. when the sun is high in the sky. Dive in a shallow area or don't attempt to take pictures below a depth of four or five meters (13 or 16 feet). Use the fastest possible film (e.g. ASA/ISO 400) and select wide to medium apertures, so that the shutter speed will be fast enough to prevent camera shake. Move in as close to the subject as possible and use lenses with the widest possible angles of view.

For dramatic backlit scenes in which objects appear as silhouettes, point the camera up toward the water's surface. If more detail in the silhouetted subjects is desired, make exposure compensation by resetting the ASA/ISO film speed dial to a lower number. (This can be done underwater.) If you are using ASA/ISO 400 film, for a one-stop increase in exposure, reset the dial from ASA/ISO 400 to 200; for a two-stop increase, go from 400 down to 100. After making exposure compensation, don't forget to return the dial to its original position.

For normal shooting, hold the camera horizontally for subject lighting with good contrast. Whenever possible, avoid shooting straight down on the subject, because the light source is directly behind the camera resulting in flat, low-contrast lighting.



Backlit scene

Good visibility

Without flash

With flash

Shooting with the Nikonos Speedlight

As you dive below the water's surface, visibility is greatly reduced due to the selective filtration and light absorption of the water. Red is the first color to be absorbed with orange and yellow following close behind (See the graph on the next page). At ten meters (33 feet), everything takes on a blue-green cast. In addition, depending on the turbulence of the water, silt and microscopic particles of plankton in suspension may reduce the visibility even further. Therefore, below approx. five meters (16 feet), the use of flash is highly recommended to provide additional illumination for the subject and restore natural colors, especially those in the red portion of the spectrum.

To prevent light from being scattered by suspended particles and then being reflected directly back into the lens, position the flash head as far away from the lens as possible. If necessary, remove the flash from its bracket and hold it off to the side and slightly above the subject. Finally, remember that water absorbs the light from the speedlight, too. When shooting on Automatic, the Sensor Unit SU-101 compensates for the light loss to give the correct exposure. The only effect is that the maximum auto shooting distance is cut approximately in half. As a rule of thumb when shooting manually, reduce the speedlight's guide number by 1/2.

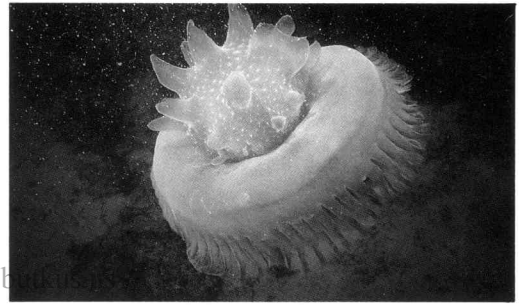
A convenient underwater exposure calculator is included on the SB-101 to simplify your calculations. However, poor visibility may reduce the maximum shooting distance and guide number even more. For best results, take the first shot at the recommended exposure and then additional shots with the lens opened up one or two f/stops.

Color Absorption Underwater

Depth	Color: Violet	Blue	Green	Yellow	Orange	Red
1 (m)						
5						
10						
15						
20						
30						
50						

= color is absorbed

On-camera flash



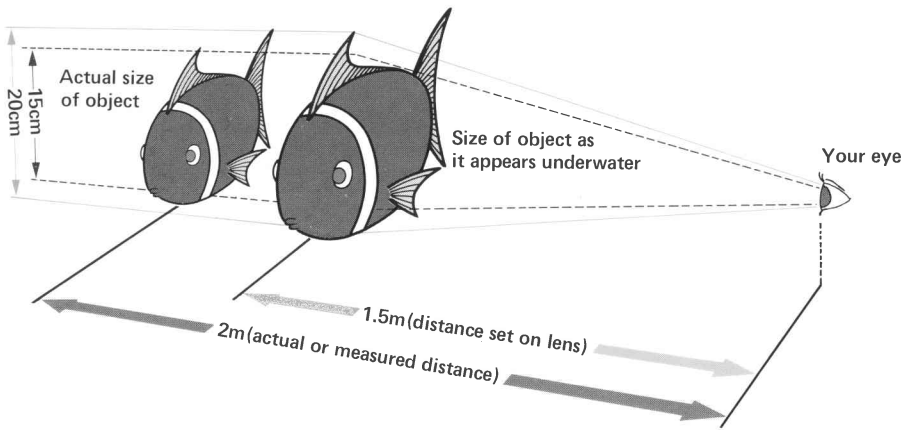
Off-camera flash

All underwater photos by Akira Tateishi

Focusing

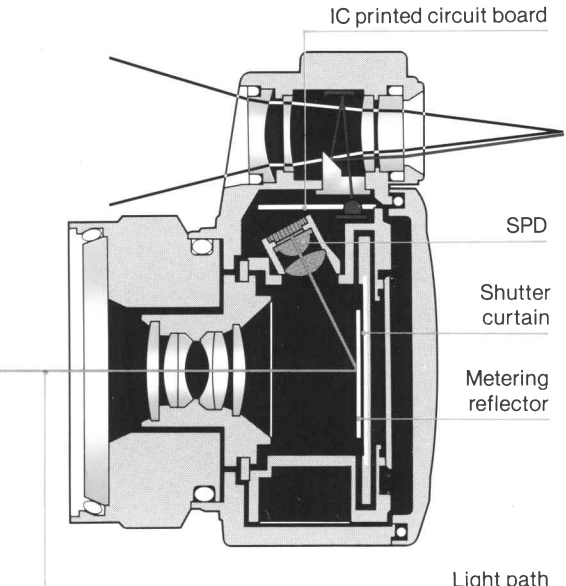
Because of the magnifying effect of water, objects underwater seem larger and closer than they actually are. If you estimate the distance underwater, there is no problem. Just set the estimated distance on the lens. The reason is simple: the water has the same magnifying effect on your eyes as it does on the lens.

However, if you actually measure the camera-to-subject distance (using a scale or some other device), you must reduce the distance to be set on the lens by 25%. For example, if the measured distance is two meters (7 feet), then you must set the focused distance on the lens to 1.5 m (5 ft).



TIPS ON CAMERA CARE

1. After using the camera in salt water, and whenever dirty, rinse it thoroughly in fresh running water to remove any residue. Then dry with a soft cloth before opening. Never dry the camera by heating.
2. Do not submerge the camera in water with the flash socket cover removed. And whenever using the Nikonos Speedlight, make sure that the sync cord and sensor cord plugs are securely attached before entering the water.
3. Should the lens or body be accidentally dropped in salt water during loading (or at any other time when the interior is exposed), rinse immediately in fresh water and take the unit to a Nikon Service Center or your dealer as soon as possible.
4. Do not attempt to adjust the focusing knob or aperture knob past the end limits of travel; forcing these knobs will result in damaging the lens mechanism.
5. Never attempt to change lenses, open the camera, or load/unload film underwater.



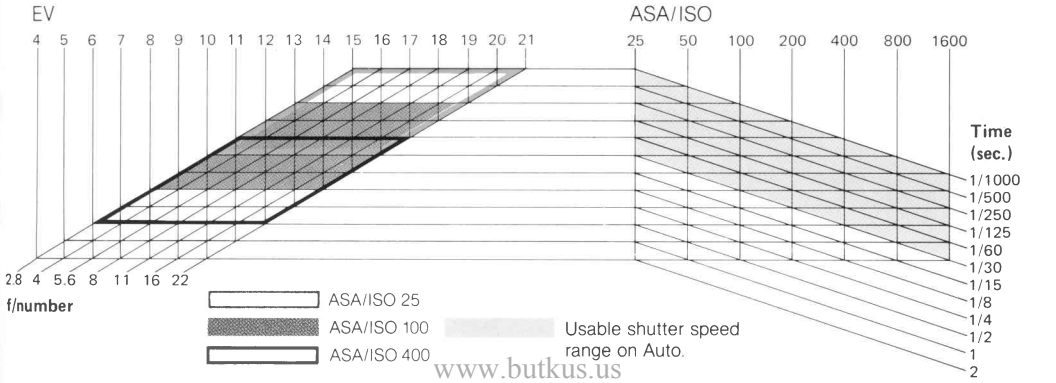
Automatic Exposure Control System

The Nikonos IV-A features a highly advanced automatic exposure control system. A fast-reacting silicon photo diode (SPD) used for metering is located just below the viewfinder and faces downward and toward the rear. Light from the subject passes through the lens, strikes a special metering reflector in front of the shutter and then is reflected back to the SPD. The intensity of the light, in addition to the setting on the ASA/ISO film speed dial, is translated into exposure information by an IC printed circuit board at the top of the camera. Processed in record time, the correct shutter speed is selected for proper exposure. At the instant of exposure, the electromagnetically controlled shutter stays open for precisely the required amount of time. Speeds are infinitely variable between approx. 1/30 and 1/1000 sec.

EV Chart

At ASA/ISO 100, the exposure range of the Nikonos IV-A is from EV8 (1/30 sec. at f/2.8) to EV19 (1/1000 sec. at f/22). The ranges at various ASA/ISO's are shown in the chart. For example, the range at ASA/ISO 100 is in pink; the range at ASA/ISO 25 is indicated by blue lines, while ASA/ISO 400 is in black.

EV is an abbreviation of Exposure Value. The exposure value is a number representing all the combinations of shutter speeds and f/stops which will give exactly the same amount of exposure. For instance, EV10 represents 1/30 sec. at f/5.6, but it can also mean 1/60 sec. at f/4 or 1/125 sec. at f/2.8.



OPTIMUM BATTERY PERFORMANCE

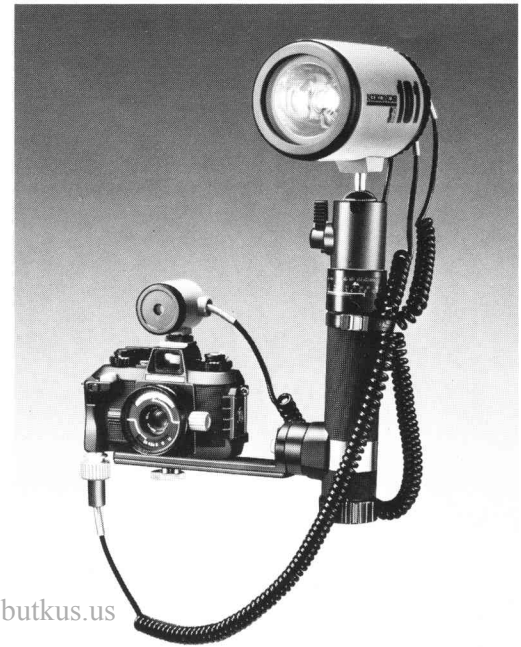
1. New batteries: Between manufacturing and first use, all batteries exhibit some drain. Therefore, care should be taken to purchase the newest (and freshest) ones possible. To help you do this, some manufacturers stamp the date of manufacture on the bottom of each battery. Ask your camera dealer for assistance in interpreting the codes.
2. Temperature: Battery life ratings are based on operation at around 20°C (68°F). At other temperatures, battery life is shortened. At 0°C, for instance, battery life is shortened by as much as 2/3. Spare batteries should therefore be kept available if operation in low temperatures is anticipated.
3. Continuous use: Batteries are drained much more quickly by continuous use than by intermittent use.
4. Storage: When not in use, the batteries should be removed to prevent damage from leakage. To minimize drain during the period of disuse, store the batteries in a cool, dry place.
5. Battery brands: Do not use mixed brands of batteries, nor batteries with different model numbers. Also, avoid mixing new and old batteries since proper performance will not be obtained and battery leakage into your Nikonos IV-A may occur.
6. Disposal: Do not dispose of batteries by throwing them in a fire. For safety's sake, never disassemble batteries.
7. Polarity: When installing batteries, observe the voltage polarities carefully. Reversal of the positive (+) and negative (−) terminals will result in leakage. If leakage should occur, clean carefully or take your Nikonos IV-A to your dealer.

Nikonos Speedlight SB-101

An indispensible accessory for underwater photography below approx. 5 meters (16 feet), the Nikonos Speedlight SB-101 complements the Nikonos IV-A perfectly.

Everything about this electronic flash unit is automatic. With the camera set to "A," the shutter speed is automatically switched to 1/90 sec. for proper flash synchronization. As soon as the speedlight is charged up and ready to fire, a bright red lightning bolt appears in the viewfinder as soon as the shutter button is depressed to let you know when to shoot. Then, at the instant of exposure, the flash fires and the Sensor Unit SU-101 (attached to either the camera's accessory shoe or the speedlight's sensor bracket) reads the light reflected back from the subject to give you the correct exposure automatically.

The SB-101 provides a choice of two f/stops on Auto. At ASA/ISO 100, you can use either f/8 or f/4. It has an extra-long handle so the flash head is positioned high above the subject for good-contrast lighting. The head also swivels on a ball-head allowing it to be angled in for close-ups. Manual operation is also possible at "FULL" or "1/4" power settings. The Nikonos Speedlight can handle all of your lighting requirements in or out of the water, and is supplied with its own carrying case, SS-101.

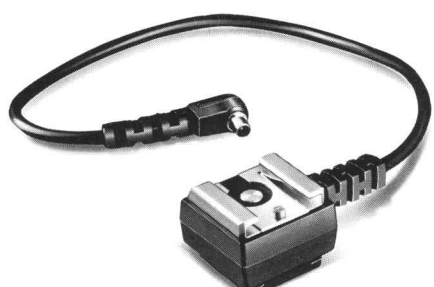


Flash Unit Adapter

If you want to use regular electronic flash units with the Nikonos IV-A for "on land" shooting, the Flash Unit Adapter is available. It screws into the camera's flash socket and provides a standard Nikon-type screw-in sync terminal for attachment of a PC cord between camera and flash.

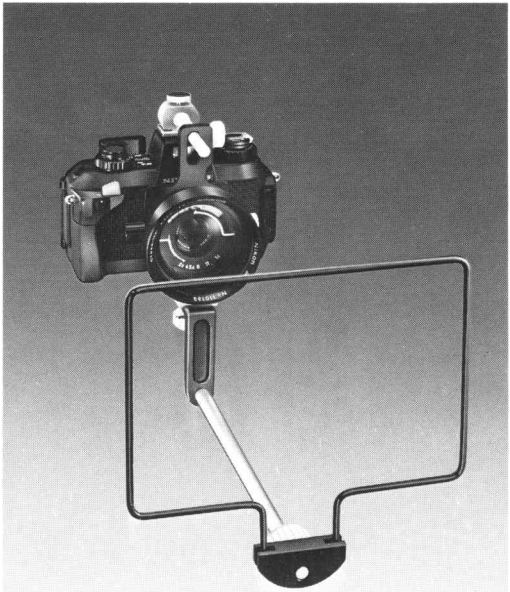
Sync Cord SC-10

One end connects to the camera's flash socket via the flash unit adapter while the other end has a hot shoe which attaches to the accessory shoe. Thus, any electronic flash unit having a standard ISO-type mounting foot such as the Nikon Speedlight SB-9, SB-10 or SB-E, can be used with Nikonos IV-A for "on land" shooting.



Nikonos Close-Up Outfit

Because of the incredible variety of aquatic life, half the fun of underwater photography is in taking close-ups. To simplify the process, the Nikonos Close-Up Outfit consists of a single close-up attachment lens, three field frames, and a frame support bracket. The close-up lens screws into the front of either the 28mm, 35mm, or 80mm lens to magnify the image. The three field frames indicate the area of coverage for each of the three lenses, while the frame support bracket holds the frames at exactly the right distance away from the camera for perfect focus. Just place your subject within the frame and take the shot. Nothing could be simpler. The outfit comes in its own stylish carrying case.



Nikonos IV-A Lenses

UW-Nikkor 15mm f/2.8

The UW-Nikkor 15mm f/2.8 lens provides a super-wideangle (94°) field of view, with exceptionally close focusing. Thus, you can move right in on the subject without fear of image cut-off. And with the large maximum aperture of f/2.8, low levels of illumination are less of a problem. The optics are corrected exclusively for underwater aberrations and provide excellent underwater photographs. This lens cannot be used out of water. Nikon Integrated Coating (NIC) applied. Automatic exposure is not possible with this lens.

Picture angle: 94° (underwater)
Lens construction: 9 elements in 5 groups
Minimum aperture: f/22
Closest focus: 0.3m (1 ft); scale graduations in meters and feet
Viewfinder: Accessory optical finder available

UW-Nikkor 28mm f/3.5

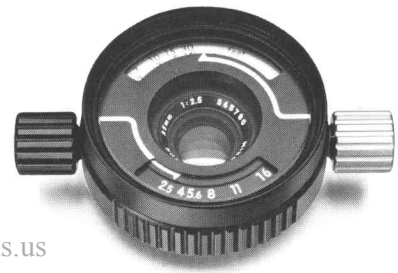
This UW-Nikkor lens is designed for exclusive underwater use, being corrected for maximum sharpness in this medium. The wideangle field of view (59°) is ideal for close-up photography without image cut-off. The distance scale is marked in optical underwater distances instead of true distances. Supplied with plastic protector. Cannot be used out of water. NIC applied.

Picture angle: 59° (underwater)
Lens construction: 6 elements in 5 groups
Minimum aperture: f/22

W-Nikkor 35mm f/2.5

The W-Nikkor 35mm f/2.5 lens is the standard lens for the Nikonos IV-A. The optical elements are sealed via a watertight front element while the lens barrel features a special spring-loaded mount to ensure proper alignment of the lens and camera body regardless of the water pressure. This lens may be used both in and out of water for maximum versatility. Threaded lens front accepts a variety of accessories. NIC applied.

Picture angle: 46°30′ (underwater); 62° (on land)
Lens construction: 7 elements in 5 groups
Minimum aperture: f/22
Closest focus: 0.8m (2.75 ft); graduated in meters and feet



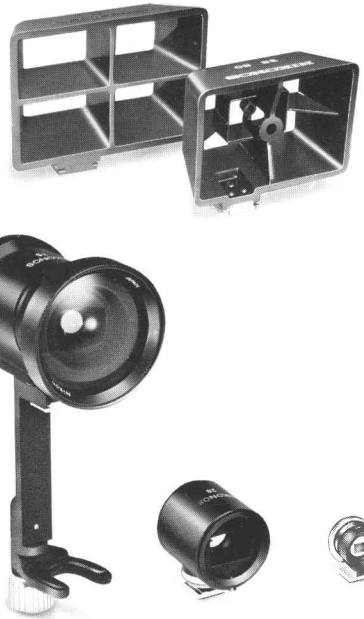
Nikkor 80mm f/4

The Nikkor 80mm f/4 lens, with its underwater picture angle of 22°45′ adds telephoto photography capability to the Nikonos IV-A. When used on land, the picture angle is 30°20′. As with the W-Nikkor 35mm f/2.5 and UW-Nikkor 28mm f/3.5 lenses, this lens can be used for close-up photography via the equipment provided in the Nikonos Close-Up Outfit. NIC applied.

Picture angle: 22°45′ (underwater); 30°20′ (on land)
Lens construction: 5 elements in 5 groups
Minimum aperture: f/22
Closest focus: 1m (3 ft); graduated in meters and feet

Accessory Viewfinders

Two special plastic frame finders and three optical finders are available as accessories for use with Nikonos lenses. The optical finders are for exclusive use with the UW-Nikkor 15mm f/2.8, the UW-Nikkor 28mm f/3.5, and Nikkor 80mm f/4 lenses, providing the same field of view as the lens. Of the plastic frame finders, one is for exclusive use with the UW-Nikkor 28mm f/3.5 lens, while the second is used with either the W-Nikkor 35mm f/2.5 or the Nikkor 80mm f/4 lens. Plastic frame finders provide rapid and accurate framing of moving subjects with the eye removed from the finder. Each finder is supplied with its own leatherette case for storage when not in use.



ACCESSORIES—continued

Nikon offers a full range of accessories for both underwater and on land picture-taking with the Nikonos IV-A. In addition to the lenses, flash unit, frame finders and close-up outfit already mentioned, the following are available:

Lens Hood

A special combination lens hood/filter adapter is available for the 35mm f/2.5 or 80mm f/4 lenses. The hood screws into the front of the lens; then standard 52mm filters screw directly into the front of the hood.

Rubber Lens Hood

This unit is a combination lens protector and lens hood for the 35mm lens. It slides over the front of the lens for protection when using the lens underwater.

Plastic Lens Protector

A special plastic lens protector is available for mounting on the front of either the 28mm f/3.5, 35mm f/2.5, or 80mm f/4. The resiliency of this unit effectively protects the lens against damage from scratches or bumping against solid underwater objects.

Lens Cases

Two types of leatherette lens cases are available for Nikonos IV-A lenses. The larger case accepts the Nikkor 80mm f/4 lens, while the other accepts either the UW-Nikkor 28mm f/3.5 or the W-Nikkor 35mm f/2.5 lens.

Camera Case

A pouch-style zippered case in beige with brown and black accent stripes. Accommodates the camera with lens, plus has a small front compartment for film, extra batteries, or storage of the camera's flash socket cover when using a speedlight.

Speedlight Case SS-101 *

Three cushioned compartments inside this stylish tote bag house all parts of the Nikonos Speedlight SB-101, including the camera.

Close-Up Outfit Case *

All items of the Nikonos Close-Up Outfit including the field frames fit into special contoured compartments in this rectangular zippered case.

* *These two cases come as standard equipment with the products.*

SPECIFICATIONS

Type of camera	35mm amphibious camera
Construction	Body made of die-cast aluminum alloy and reinforced plastic; all joints sealed by means of O-ring gaskets to insure absolute water-tightness; camera able to withstand pressures up to the 6kg/cm² (85 lb/in²) at depths down to 50m (160 ft)
Picture format	24mm × 36mm (standard 35mm film format)
Lens mount	Nikonos bayonet type
Lenses	W-Nikkor 35mm f/2.5 as standard; three additional lenses from super-wideangle to telephoto available
Shutter	Vertical-travel metal focal-plane type
Shutter speeds	A (AUTO): Electronically controlled stepless speeds from 1/30 to 1/1000 sec.; M (MANUAL): Mechanical speed of 1/90 sec.; B (BULB): Mechanical setting for long exposures; R (REWIND): Setting used when rewinding film
Shutter release	Via button at top of anatomical grip; initial pressure on button switches on meter, meter then stays on for approx. 20 sec. after finger is taken off button; shutter release lock incorporated
Exposure control	Aperture-priority automatic exposure with mechanical speeds at M and B; through-the-lens stopped-down metering via silicon photo diode (SPD) with center-weighted metering pattern
Film speed range	ASA/ISO 25 to 1600
Metering range	EV 8 to EV 19 at ASA/ISO 100 with f/2.8 lens
Accessory shoe	Provided; built into top of viewfinder
Flash synchronization	X-sync only via flash socket in camera's base; with Nikonos Speedlight SB-101, shutter speed is automatically switched to 1/90 sec. with shutter speed dial at "A"; with other electronic flash units, shutter speed dial is manually set to "M"
Viewfinder	Inverted Galilean type Albada finder built into camera for use with standard 35mm lens; bright

	frame lines show approx. 85% field of view; 0.55X magnification; diopter 0.9; high eyepoint allows viewing with eye 40mm away from finder; parallax correction marks provided; accessory optical viewfinders or frame finders available for various lenses
Viewfinder display	Large red LED in lower part of viewfinder glows when shutter speed is between approx. 1/30 to 1/1000 sec.; blinks if shutter speed is outside this range; red LED lightning bolt lights up when Nikonos Speedlight SB-101 is recycled and ready to fire; on automatic control, the lightning bolt glows only when the metering circuit is on
Film advance lever	Wound in single stroke or series of strokes; 144° winding angle; hinged for compact storage; shutter speed automatically set to approx. 1/1500 sec. until frame "1" for fast film loading
Frame counter	Additive type; self-resetting
Film rewind	Manual via film rewind crank
Camera back	Hinged with camera back latch and O-C key
Pressure plate	Hinged-type attached to camera body; locking catch provided
Batteries	Two 1.55V silver-oxide cells (Eveready EPX76, D76, or equivalent)
Battery check	LED inside viewfinder lights up if batteries are loaded properly and their voltage is approx. 2.6V or above
Dimensions (without lens)	149mm(W) × 99mm(H) × 58mm(D)
Weight (without lens)	Approx. 740g