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Nikon

NIKONOS

Speedlight

SB-105

INSTRUCTION MANUAL

IMPORTANT SAFETY NOTICE FOR NIKONOS SPEEDLIGHTS

- **BECAUSE YOUR NIKONOS SPEEDLIGHT USES BATTERIES FOR POWER, CERTAIN IMPORTANT PRECAUTIONS ARE NECESSARY IN ORDER TO ENSURE THE BEST PERFORMANCE AND TO AVOID POTENTIAL DAMAGE OR INJURY DUE TO BATTERY-GAS DISCHARGE.**
- **BATTERY-GAS DISCHARGE TYPICALLY OCCURS AS A BATTERY IS USED.** Because the speedlight is airtight, the gas discharge will be trapped within. On the rare occasion that the discharge is great, it is possible for the speedlight to burst under the pressure which is created within. To minimize the possibility of this condition, please follow these simple procedures.
- **IF MOISTURE IS DETECTED INSIDE THE FLASH UNIT OR BATTERY CHAMBER, IMMEDIATELY STOP USING THE UNIT.** Remove the batteries and keep the battery chamber open (cap removed.) Do not use the unit until it has been inspected and serviced by a qualified technician.
- **ALWAYS USE THE SAME TYPE OF BATTERIES.** Do not mix brands of batteries or different versions of the same brand together. Also, avoid mixing new and old batteries. Always use identical model and brand batteries, and ensure that the batteries you use are from the same manufacturing batch (same year and month of manufacture). Battery companies usually imprint the manufacturing code and time of manufacture on their batteries.
- **DO NOT MIX NiCd BATTERIES.** Do not mix brands of NiCd batteries and confirm that the batteries you are using were made in the same manufacturing batch. Do not use NiCd batteries which have been charged for different lengths of time. If the working time of a NiCd battery seems markedly reduced, even after it has been correctly charged, do not use it.
- **WHEN NOT USING THE SPEEDLIGHT FOR A PROLONGED PERIOD, REMOVE THE BATTERIES AND LEAVE THE BATTERY CHAMBER CAP OFF.** This will eliminate any potential damage due to corrosion from battery leakage. If corrosion becomes evident, do not use the speedlight, until it is properly repaired by a qualified technician.
- **DO NOT ATTEMPT TO DISASSEMBLE THE SPEEDLIGHT.** Its high voltage circuitry may cause severe electrical shock.
- **NIKON RECOMMENDS THAT YOU HAVE YOUR SPEEDLIGHT SERVICED AT AN AUTHORIZED NIKON DEALER OR SERVICE CENTER, AT LEAST ONCE EVERY TWO YEARS.** Although the unit may appear to be in good condition, internal conditions due to corrosion may exist and could cause malfunction. There will be a charge for service performed.

NOMENCLATURE

Flash head

Slave sensor

Wide adapter SW-103 (P.39)

Sync socket cover

"0.6m" position mark

"0.3m" position mark

Joint plate

Joint (P.18, 46)

Sync socket alignment index

Speedlight positioning index

Joint collar

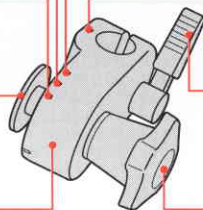
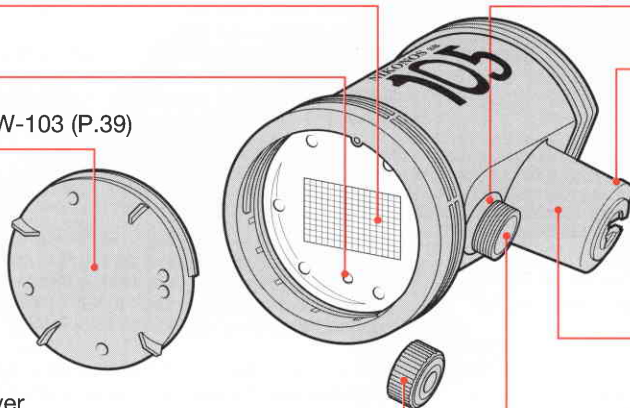
Sync socket

"Normal" position mark

Arm positioning index

Joint lever

Joint knob



Speedlight plug and locking ring

Sync cord (P.22)

Camera plug and locking ring

Bracket slot (P.22)

Cord fastening hanger (p.21)

Bracket screw

Tripod socket

Bracket

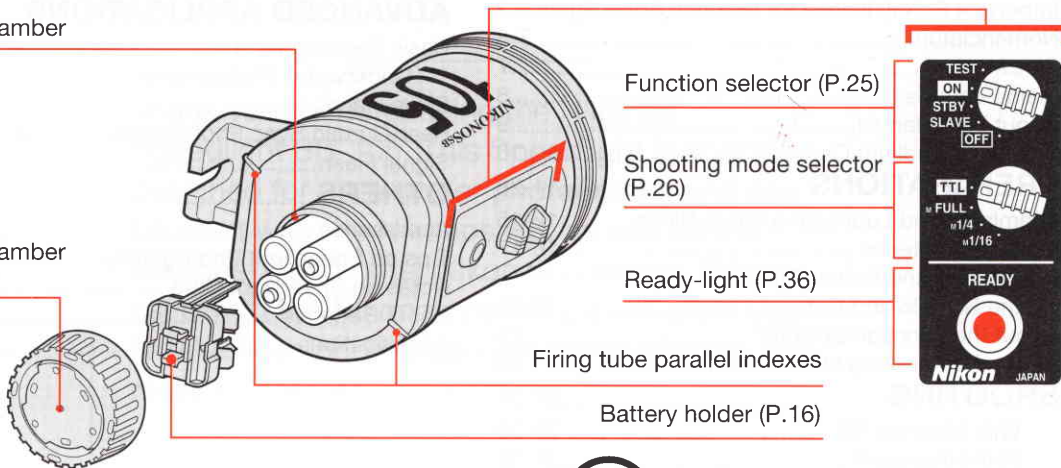
Arm positioning screw

Arm

Grip

Arm knob

Battery chamber
cap (P.16)



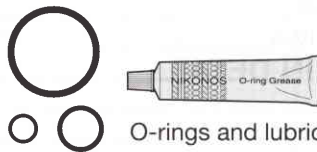
Exposure calculation chart (P.40)

under water
[m]

(ISO 122)
(ISO 1200 in
m/sec)

ISO	25	50	100	200	400	mFull	m/4	m/16
0.5					0.7		22	11
0.7				0.7	1		16	8
1			0.7	1	1.5		22	11
1.5		0.7	1	1.5	2		16	8
2	0.7	1	1.5	2	3		11	5.6
3	0.7	1	1.5	2	3	4	5.6	2.8
4	1	1.5	2	3	4	5	4	2

W ISO 25 50 100 200 400 800 mFull m/4 m/16



O-rings and lubricant

- Standard arm and bracket set SK-105
- Sync cord (with caps)
- O-rings and lubricant set

Important Safety Notice for Nikonos Speedlights.....	2
Nomenclature	3-5
Foreword	7
Main Features.....	8
About This Manual	9
Tips on Speedlight Care.....	10

PREPARATIONS.....11-26

Examining and Lubricating the O-Rings.....	12-15
Installing Batteries	16-17
Connecting and Setting Up the SB-105 and Camera	18-24
About the Function Selector	25
About the Shooting Mode Selector.....	26

SHOOTING27-34

With Nikonos RS	28-30
With Nikonos-V	31-32
With Nikonos IV-A	33-34

CONTROLS IN DETAIL.....35-44

Ready-Light	36
Warning Function	37-38
Cord Fastening Hanger	38
Wide-Flash Adapter SW-103.....	39
Attaching the SW-103	39
Reading the Exposure Calculation Chart.....	40-44

ADVANCED APPLICATIONS.....45-54

Basic Techniques in Underwater Photography.....	46-49
Slave Flash.....	50-52
Rear-Curtain Sync Photography.....	53-55
Signal Flash	56

OTHERS57-77

Accessories	58-65
Tips on Speedlight Photography.....	66
Notes on Speedlight Care	67-73
About Batteries	74-75
Specifications	76-77

Thank you for purchasing the Nikonos Speedlight SB-105. This Speedlight is specially designed for underwater photography and can be used with the Nikonos RS, as well as the Nikonos-V and other Nikonos cameras. When used with the Nikonos camera, it will allow you to take flash photographs at depth of up to 100 meters (328 feet).

FEATURES

Matrix Balanced Fill-Flash (Nikonos RS only)

Brightness of flash exposure on the foreground subject is automatically balanced with the ambient light of the background.

Slave Flash

The SB-105 located away from the camera fires simultaneously through its built-in slave sensor when it senses light fired from Speedlight attached to the camera.

Signal Flash

The SB-105 fires at 1/32 power approximately every two seconds to signal your location on the surface to others.

ABOUT THIS MANUAL

This Instruction Manual is organized as follows for easy reference. Use this guide to learn how to make the most of your Speedlight's potential.

PREPARATIONS

Preparation of Speedlight before taking pictures is described.

SHOOTING

Fundamentals of flash photography with the Nikonos RS, V and IV-A, and procedures for taking pictures using the SB-105 are explained.

CONTROLS IN DETAIL

The SB-105's various features in detail, points to be checked and other pertinent items are described.

ADVANCED APPLICATIONS

Advanced applications of the SB-105 to obtain various photographic effects are presented.

OTHERS

Lists accessories, tips on camera care, information about batteries and specifications.

Be sure to take trial shots first...

When taking important photographs with the SB-105 or using it again after a long period of disuse, be sure to take one or more trial shots first to be sure it is working properly.

Have Nikon spot check your Speedlight regularly...

Because the Speedlight is a precision instrument, we recommend taking your Speedlight to a Nikon service center once every year or two to have it spot checked, and to have it overhauled every three to five years.

- We recommend this service especially if the Speedlight is being used for commercial applications.
- If water gets inside the plastic case or the battery has decayed, be sure to have your Speedlight spot checked, or it may emit a flammable gas.

Using the Speedlight safely...

Use only Nikon products with this Speedlight, since the SB-105 has been designed for use with specialized Nikon camera and lens accessories. The Speedlight may become damaged if you attempt to use it with products of other manufacturers.

Do not fire toward eyes

Since the SB-105 is a high-power output Speedlight unit, be sure not to fire the unit directly at or in the vicinity of human eyes.

PREPARATIONS

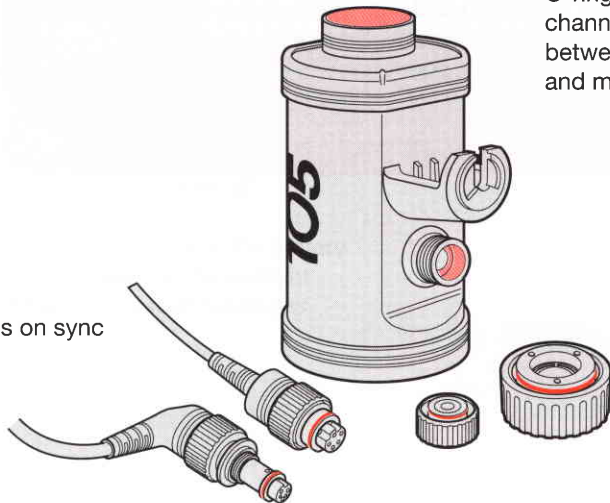
EXAMINING AND LUBRICATING THE O-RINGS

BE SURE TO CHECK THE O-RINGS BEFORE USE

This Speedlight uses O-rings to ensure that it is well sealed and waterproof. If dust or damage is found on the O-rings, water will leak into the Speedlight and cause damage. It is important to check all the O-rings and lubricate them before use.

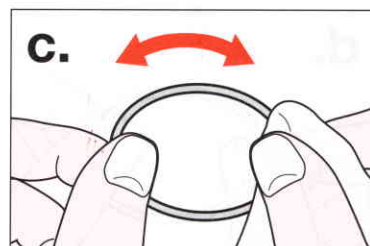
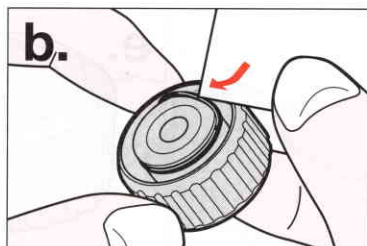
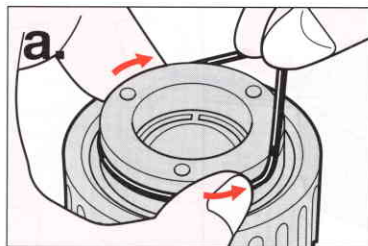
O-ring areas to check

Two O-rings on sync
cord plugs



O-ring on the main body, O-ring
channel, and contact area
between battery chamber cap
and main body

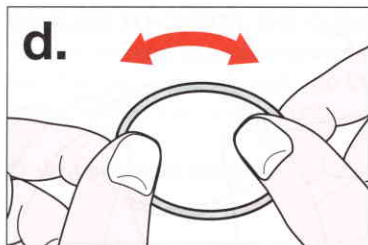
Sync socket cap O-ring,
and contact area between
sync socket and main body



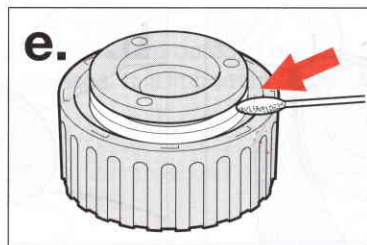
1. To remove the O-rings, except the one in the sync socket cover, grasp the ring between your thumb and forefinger. Pinch your fingers together as you slide them in the direction of the arrow to create slack in the O-ring. Then grasp the slack portion with your other hand and pull the ring off. (See a.)

To remove the O-ring in the sync socket cover, use the edge of a thin plastic card. Never use a knife or other sharp-edged object. Push up on the center of the cover with a fingertip (or pointed object), insert the card under the ring, and pull it up to lift the O-ring out. (See b.) Do not scratch the O-ring in the process.

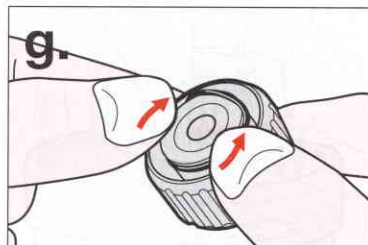
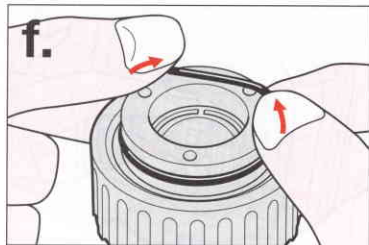
2. Examine each O-ring for imperfections. (See c.) If any O-ring is damaged (by tears, cuts, flat spots, or other imperfections), contact Nikon service center. If any O-ring has dirt, sand, hair, or foreign matter on it, rinse the O-ring in fresh water to remove it.
3. When lubricating various parts of your Speedlight unit, use only the special non-water-soluble Nikonos lubricating grease supplied with the Speedlight. Never use other lubricants (such as Vaseline) which are water-soluble.



4. To lubricate the O-rings, smear a small amount of the special lubricant on your fingertips and then gently run each O-ring between your fingertips. (See d.) Never use a brush or similar object to apply the lubricant; small hairs may fall into the channel and allow water to enter the Speedlight unit. While lubricating each O-ring, examine it with your fingertips for imperfections. If an O-ring is properly lubricated it will glisten and will not have “gobs” of lubricant on it. To ensure the longest possible Speedlight life, apply lubricant whenever necessary. Lubrication protects the O-rings from excessive wear; it also makes it easier to attach or remove other parts.



5. Visually examine the channels into which the O-rings fit to determine that each is clean and smooth. If any channel is dirty, clean it with a non-lint-bearing material. (See e.) Coat each channel with a thin film of lubricant while being careful not to apply too much.

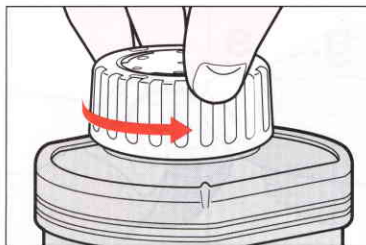


6. Reseat all of the O-rings with your fingertips by inserting one side of the ring into the channel and holding it in position while rolling the other side of the ring into place. (See f.) To insert the O-ring into the channel of the sync socket cover, push up on the center of the cover with a fingertip (or pointed object), place the ring over the channel, then press it down into place. Check that the O-ring is not twisted and that each of its edges is properly seated. (See g.)

7. Check the surfaces which are opposite the O-rings to determine that each is clean, smooth, and free of foreign matter. Clean and lubricate the surfaces in the same manner as the channels.
8. When reattaching the parts with O-rings, be sure that each O-ring seats properly and securely. All of the O-rings must be properly aligned and not "pinched".

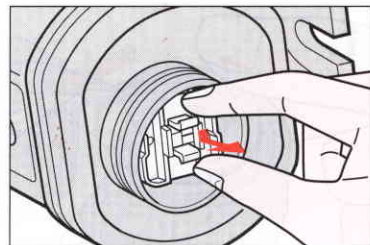
INSTALLING BATTERIES

- Do not insert the batteries improperly, leave the batteries installed when the Speedlight will not be used for an extended period, nor leave the function selector turned on except when using the Speedlight. Any of these may damage the Speedlight or cause the batteries to explode.
- Use only one brand or type of battery at any given time. When replacing batteries, replace all four at the same time.
- Warning: Batteries may be hot when you remove them; handle carefully.
- Use of manganese batteries is not recommended.
- Check proper battery installation before shooting. Turn Speedlight on and make sure the SB-105's ready-light lights up within 30 seconds.
- See "ABOUT BATTERIES" on pages 74-75.
- Make sure the O-ring is clean, without any imperfections and properly lubricated before replacing the battery chamber cap.

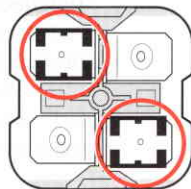


1. Remove the battery chamber cap.

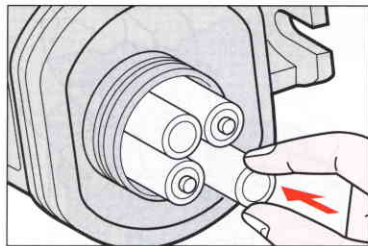
Turn the battery chamber cap counterclockwise and pull it off the Speedlight case.



2. Remove the battery holder.

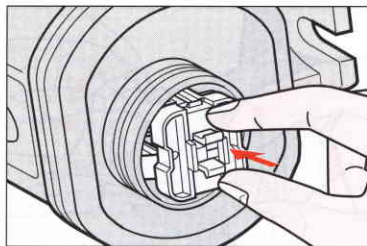


The plastic safety on the battery holder ensures the Speedlight does not function when the batteries are installed improperly. Make sure the plastic safety is on when installing batteries. Also, do not remove the plastic safety. If the batteries are installed improperly when the safety is removed, the gas discharge will be trapped within and may cause the Speedlight to burst under pressure.



3. Install the batteries.

Install four 1.5V AA-type alkaline-manganese or four 1.2V rechargeable NiCd batteries, making sure the positive and negative (+ and -) terminals are installed as shown inside the battery chamber.



4. Replace the battery holder.

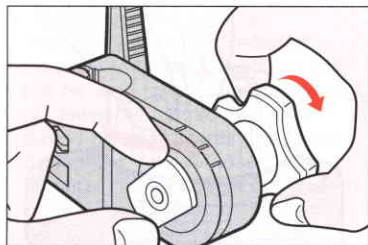
Be sure the Speedlight function selector is set to the "OFF" position, then align the marks on the battery chamber and the battery holder and push the holder in.



5. Replace the battery chamber cap.

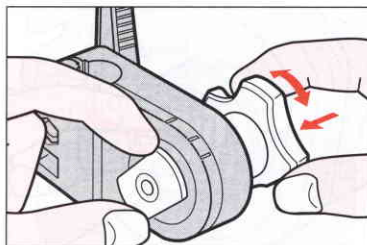
Push the center of the battery chamber cap into the Speedlight case, then turn the cap clockwise as far as it goes.

CONNECTING AND SETTING UP THE SB-105 AND CAMERA



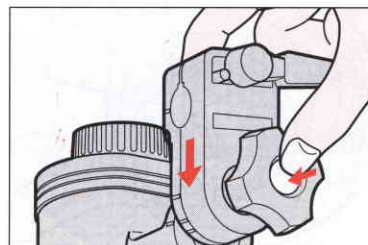
1. Loosen the joint knob.

To loosen the joint knob, turn it counterclockwise while holding the joint plate.



2. Properly position the joint plate.

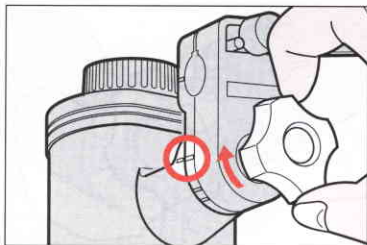
Turn the joint knob so the flat sides of the joint plate are parallel with the flat edges of the joint.



3. Insert the joint plate into the joint collar.

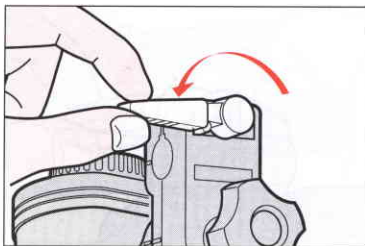
While holding the base of the joint knob against the joint, slide the joint plate into the joint collar until it is fully seated.

- When inserting the joint plate into the joint collar, be sure the flat edges of the joint plate remain parallel to the flat edges of the joint.



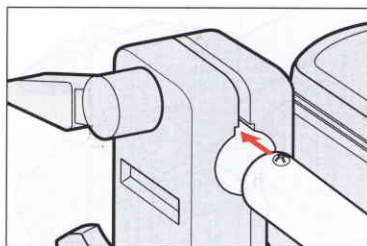
4. Lock the joint.

Align the flash head positioning index with the “normal” position mark on the flash head positioning scale, then turn the joint knob clockwise until the joint is locked in position.



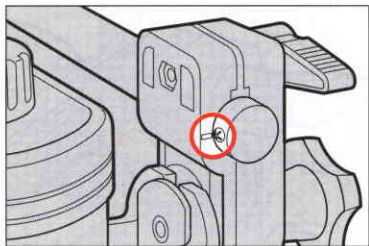
5. Loosen the joint lever.

Turn the joint lever counterclockwise as far as it will go to loosen it.



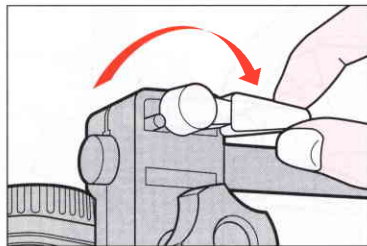
6. Insert the arm into the joint.

Insert the arm positioning screw into the slot in the joint. The arm can be inserted from either side of the joint. The normal position is shown in the illustration.



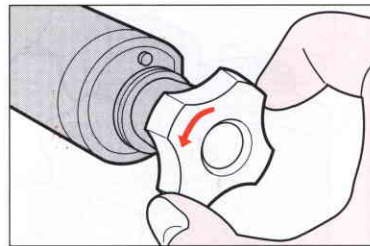
7. Position the arm.

Align the arm positioning screw with the arm positioning index on the joint by turning the arm 90°.



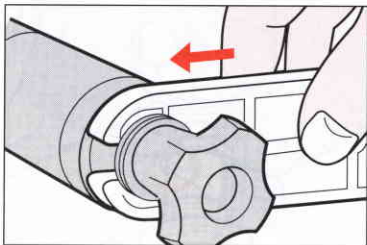
8. Lock the arm.

After aligning the arm positioning screw with the arm positioning index, turn the joint lever clockwise as far as it goes to lock the arm into position.



9. Loosen the arm knob.

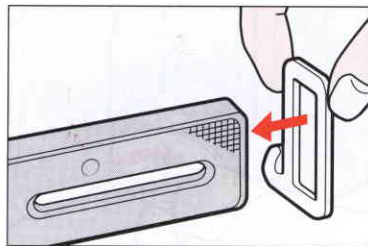
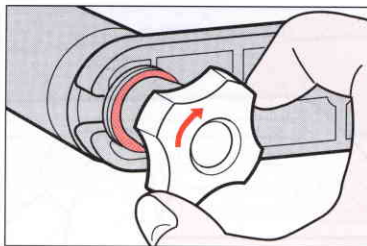
Turn the arm knob counterclockwise as far as it will go to loosen it (the two bracket positioning pins on the bottom of the grip will be visible).



10. Attach the bracket to the arm.

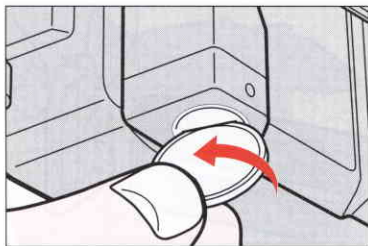
Slide the open end of the bracket between the arm knob and the grip, seat the two bracket positioning pins in the two indentations on the bracket, and turn the arm knob clockwise as far as it goes to lock the bracket into position.

- The correct arm/bracket position is with the three washers on the underside of the bracket and the rubber side of the bracket facing up.



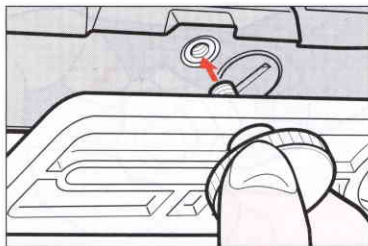
11. Attach the cord fastening hanger to the bracket.

Slide the cord fastening hanger onto the bracket as shown.



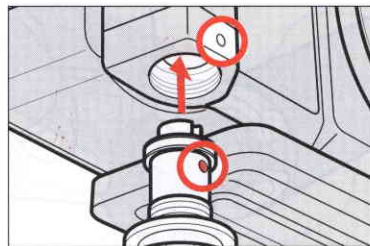
12. Remove the camera's flash sync socket cover.

Turn the camera's sync socket cover counterclockwise with a coin to remove it.



13. Attach the camera body to the bracket.

With the camera against the rubber side of the bracket and the camera's tripod socket over the bracket screw, screw the bracket screw into the camera's tripod socket until the camera and bracket are securely attached.



14. Connect the sync cord to the camera.

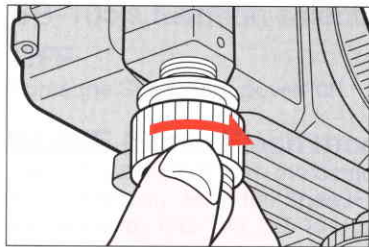
Remove the dust-proof plastic cap from the sync cord's camera plug (silver locking ring). Insert the camera plug in the camera's flash socket after aligning the white index on the flash sync socket with the red dot on the camera plug.

Nikonos-V or Nikonos IV-A

Nikonos RS

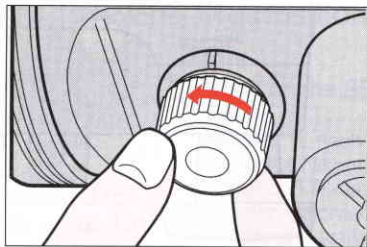


www.orphancameras.com



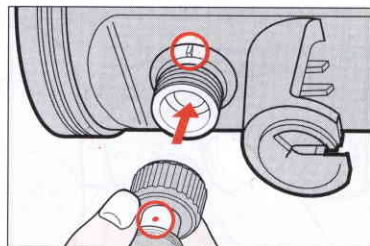
When the camera plug is inserted, turn its locking ring clockwise as far as it goes to secure the plug.

- Do not apply excessive force to the sync cord's camera plug and as much as possible, avoid twisting the cord.



15. Remove the sync socket cover.

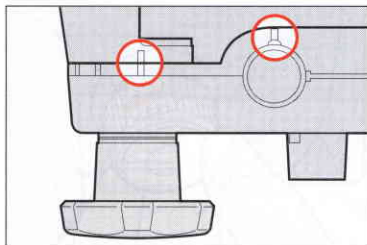
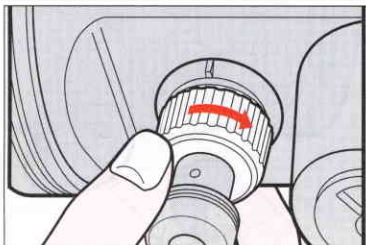
Turn the sync socket cover counterclockwise, then pull it up.



16. Connect the sync cord to the SB-105.

Remove the dust-proof plastic cap from the sync cord's Speedlight plug (black locking ring). Insert the Speedlight plug into the sync socket after aligning the sync socket index with the red index on the Speedlight plug. When the Speedlight plug is inserted, turn its locking ring clockwise as far as it goes to secure the plug.

- To keep the sync cord out of the way while shooting, attach it to the hook of the cord fastening hanger.



17. Confirm the position of the flash head.

Confirm that the arm positioning screw is aligned with the arm positioning index, the flash head positioning index is aligned with the “normal” position mark on the flash head positioning scale, and the flash head is facing in the same direction as the camera’s lens. If the arm positioning screw is not properly aligned, loosen the joint lever to reposition it. If the flash head positioning index is not properly aligned, loosen the joint knob to reposition it.

- See page 46 for information about positioning the flash head for close-up shooting within approximately 1m (3.3 ft.).

ABOUT THE FUNCTION SELECTOR

SB-105's function selector has following five positions.

OFF

Turns the Speedlight power off.

SLAVE (Slave Flash mode)

SB-105 set distant from the camera fires simultaneously when the Speedlight attached to camera body (SB-105, SB-104, SB-102 or SB-101) fires.

- Unique lighting effects, which cannot be attained with one Speedlight can be achieved.
- Sync cord is not used in Slave Flash operation. Make sure to keep the sync socket cap attached to prevent water leakage.

STBY (Standby mode with Nikonos RS or Nikonos-V only)

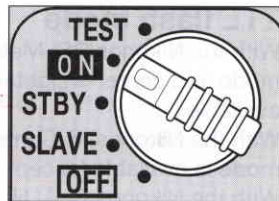
The Speedlight's power and ready light turn off automatically after 80 seconds without any operation. To turn on the Speedlight again: Lightly press the camera's shutter release button (Nikonos RS or Nikonos-V only). SB-105's power turns on as the camera's power turns on. (With Nikonos-V, standby mode cannot be use in M90 or B mode.)

- When using the double sync cord SC-100, do not set the Speedlight attached to the gray sync cord to standby mode. The Speedlight turns off automatically after approximately 80 seconds without any operation, and it only turns on without firing flash when the camera's shutter release button is pressed.

ON

Turns on the SB-105's power.

- TTL—TTL flash mode
With the Nikonos RS: Matrix balanced fill-flash mode and center-weighted TTL flash mode are available.
With the Nikonos-V: Center-weighted TTL flash mode is available.
With the Nikonos IV-A: No TTL flash is possible
- MFULL, M1/4 or M1/16 manual flash mode
When the SB-105 is used with a Nikonos camera, the flash output can be selected from three levels: MFULL, M1/4 or M1/16.



TEST (Test flash/Signal flash)

- Test flash
Flash fires when the function selector is set to TEST. The output level of the flash coincides with the setting of the shooting mode selector: FULL, 1/4, 1/16, or 1/32 at TTL setting.
- Signal flash
Flash fires every 2 seconds repeatedly at 1/32 output level when the function selector is set to TEST for more than 5 seconds. See page 56 for the Signal flash.

ABOUT THE SHOOTING MODE SELECTOR

The SB-105's shooting mode selector has the following four positions.

TTL flash mode

With the Nikonos RS: Matrix balanced fill-flash mode and center-weighted TTL flash mode are available.

With the Nikonos-V: Center-weighted TTL flash mode is available (except in M90 or B mode).

With the Nikonos IV-A: No TTL flash is possible.



MFULL, M1/16 or M1/4 Manual flash mode

When the SB-105 is used with a Nikonos camera, the flash output can be selected from among three levels: MFULL, M1/4 or M1/16.

SHOOTING

FOR THE FIRST TIME

ON THE NEW 35mm SLR

1978

The settings and shooting techniques that are possible with the SB-105 vary according to the camera used. For each combination, see the table below.

• See page 66 for basic tips on underwater flash photography.

With Nikonos RS

	SB-105 settings		Nikonos RS settings	
Possible shooting modes	Function selector	Shooting mode selector	Sync mode ¹⁾	Exposure mode ²⁾
Matrix balanced fill-flash ³⁾	ON/STBY	TTL	Desired mode	Aperture-priority auto
Center-weighted TTL flash ⁴⁾	ON/STBY	TTL	Desired mode	Manual
Rear-curtain sync	ON/STBY	Desired mode	Rear-curtain mode	Desired mode
Manual ⁵⁾	ON/STBY	MFULL, M1/4, M1/16	Desired mode	Desired mode

1) When the sync mode is set to "Normal" in aperture-priority auto exposure mode (A), the shutter speed is controlled between 1/125 and 1/30 second. (When it is set to "Rear", the shutter speed is controlled between 1/125 and 1 second.)

2) In manual exposure mode, the shutter speed can be set at 1/125 second to 1 second, or B (Bulb). (When shutter speed is set to 1/2000 to 1/250 second, it is automatically controlled at 1/125 second.)

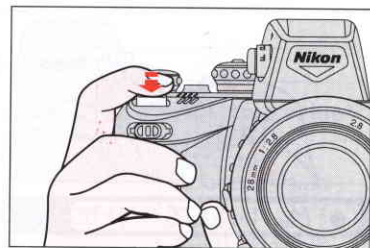
3) In matrix balanced fill-flash operation, set the aperture dial so that the electronic analog display in the viewfinder disappears. If the photograph is taken while the electronic analog display appears, the operation is automatically controlled by center-weighted TTL flash. (In this case, the main subject is taken at the correct exposure but with no background exposure adjustment.)

- 4) Center-weighted TTL Auto Exposure (Nikonos RS and Nikonos-V only)

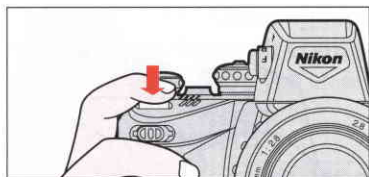
The flash output that falls on the foreground subject is automatically controlled by the camera as a result of measuring the amount of light which passes through the lens and strikes the film. It has no effect on the background ambient light, which is controlled manually by the photographer's shutter speed and aperture settings.

- 5) When setting the flash mode selector in manual shooting mode, select a guide number (MFULL, M1/4 or M1/16) so that the estimated shooting distance corresponds to that of the exposure calculation chart. The flash output that falls on the foreground subject is directly related to the selected output level setting of the SB-105 and the distance from the Speedlight to the subject.

1. Select a possible shooting mode and set the SB-105 and the camera.



2. Lightly press the shutter release button.



3. Confirm the flash shooting distance range and check that the ready-light and the in-focus indicator (●) are lit up, and fully press the shutter release button to shoot.

- In matrix balanced fill-flash operation, set the aperture dial so that the electronic analog display in the viewfinder disappears. If the photograph is taken while the electronic analog display appears, the operation is automatically controlled by center-weighted TTL flash. (In this case, the main subject is taken at the correct exposure but with no background exposure adjustment.)
- If both viewfinder ready-light and SB-105 ready-light blink for about three seconds after shooting, the flash has operated at maximum power. (In TTL flash mode only.)
In this case, either move closer to the subject or select a smaller f-number.

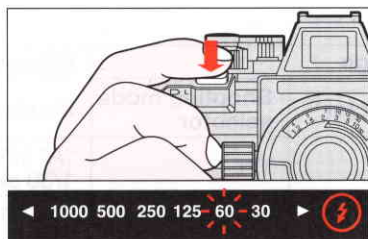
With Nikonos-V

Possible shooting modes	SB-105 settings		Nikonos-V settings	
	Function selector ¹⁾	Shooting mode selector	Shutter dial ²⁾	Aperture value ³⁾
Center-weighted TTL flash ⁴⁾	ON/STBY	TTL	"A" 1/1000 - 1/30 sec.	Desired aperture value
Manual ⁵⁾	ON/STBY	MFULL, M1/4, M1/16	"A" 1/1000 - 1/30 sec., "M90", "B"	Desired aperture value

- 1) Set the function selector to ON or STBY for operation other than Slave Flash.
- 2) If the shutter speed is set to "A" or 1/1000 - 1/125 second, it is automatically controlled at 1/90 second. If the shutter speed dial is set to 1/60 second or slower, the shutter speed is automatically controlled at the specific shutter speed.
- 3) If the shutter speed dial is set to "A", select the aperture value so that the shutter speed indicators for "125" and "60" blink, or "60" or "30" blinks.
If you set the shutter speed dial to 1/60 second or 1/30 second, select aperture value so that the specified shutter speed indicator blinks, or that a shutter speed slower than the one specified blinks.

- 4) If the usable film speed range in TTL flash mode exceeds ISO 400, the sync cord is not correctly connected, or the shutter speed dial is set to "M90" or "B", the ready-light will blink to alert.
- 5) When setting the flash mode selector in manual shooting mode, select a guide number (MFULL, M1/4, M1/16) so that the estimated shooting distance corresponds to that of the exposure calculation chart (see pages 40-44).

1. Select a possible shooting mode and set the SB-105 and the camera.



2. Check the flash shooting distance range and see if the ready-light is lit up, and press the shutter release button to shoot.

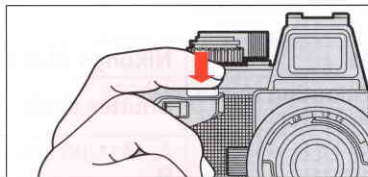
- If the shutter speed dial is set to “A”, select the aperture value so that the shutter speed indicators for “125” and “60” blink, or “60” or “30” blinks. This indicates the correct aperture and shutter speed settings for the ambient light exposure. If you set the shutter speed dial to 1/60 second or 1/30 second, select aperture value so that the specified shutter speed indicator blinks, or that a shutter speed slower than the one specified blinks.
- If both viewfinder ready-light and SB-105 ready-light blink for about three seconds after shooting, the flash has operated at maximum power. (In TTL flash mode only.) In this case, either move closer to the subject or select a smaller f-number.

With Nikonos IV-A

Possible shooting modes	SB-105 settings		Nikonos IV-A settings		
	Function selector	Shooting mode selector ¹⁾	Shutter dial ²⁾	Lens aperture value ³⁾	Lens distance scale
Manual	ON/STBY	MFULL, M1/4, M1/16	A, M (1/90 sec.), B	Desired aperture value	Distance to subject

- 1) When setting the flash mode selector, select a guide number (MFULL, M1/4, M1/16) so that the estimated shooting distance corresponds to that of the exposure calculation chart (see pages 40-44).
- 2) If the shutter speed dial is set to "A", the shutter speed is automatically controlled at 1/90 second.
- 3) Determine aperture value by reading the relationship between the shooting distance and the flash output level from the exposure calculation chart (see pages 40-44).

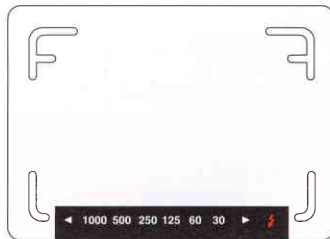
Note: If the shooting mode selector is set to TTL, the ready-light blinks. Reset the shooting mode selector.



1. Set the SB-105 and the camera.

2. Check the flash shooting distance range and see if the ready-light is lit up, and press the shutter release button to shoot.

CONTROLS IN DETAIL

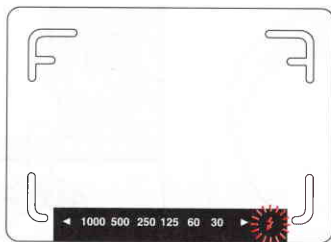


Ready-Light

After its power is turned on, the ready-light on the SB-105 lights to indicate that the Speedlight has recycled and is ready to fire. The camera's viewfinder ready-light will also light at the same time to let you know the Speedlight is ready for the next shot.

In addition, the viewfinder ready-light blinks to warn of improper settings. If this happens, check that: the camera and flash unit are securely connected, and the shutter speed/shooting mode and ISO film speed on the camera are correctly set.

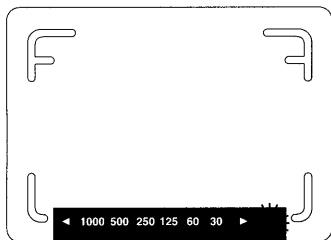
- The ready-light lights up when about 80% of the Speedlight's power is recycled. Wait a few seconds more until the power is fully recycled when shooting a relatively distant subject.
- The voltage of NiCd batteries decreases rapidly when their power is almost exhausted, increasing the recycling time. When this happens, stop using them immediately and recharge them or they may be damaged.
- When using alkaline-manganese batteries, if recycling takes 30 seconds or longer, replace the batteries with a new set.



Warning Function: Beyond Auto Shooting Range

In the TTL automatic mode, the ready-lights on the flash unit and in the camera's viewfinder blink for approximately 2 seconds if the flash unit has fired at its maximum output to indicate that the light output may not have been sufficient for correct exposure. If this happens, recheck the flash-to-subject distance. If it is beyond the coupling distance range, use a larger aperture (a numerically smaller f-number), if possible, or move closer to the subject.

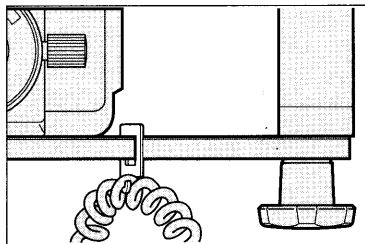
Because the voltage of batteries (especially alkaline-manganese batteries) decreases rapidly with use, the guide number of the flash unit decreases slightly. The flash output of the SB-105 also varies according to the amount of ambient light and the subject's reflectivity. Because of these three factors, the ready-light may blink to indicate that the light output was insufficient for correct exposure even if the subject was within the coupling distance range.



Other Warning Functions:

When the Speedlight's shooting mode selector is set at "TTL", the camera's ready-light blinks in the following situations.

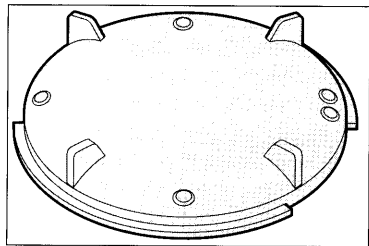
1. When the shutter speed/mode selector dial of the Nikonos-V is set to M90 (1/90 sec.) or B (Bulb).
2. When the Nikonos IV-A is being used.
3. When the sync cord is not securely connected to the Nikonos RS or Nikonos-V.
4. When the ISO film speed setting dial of the Nikonos-V is set above ISO 400.



Cord Fastening Hanger

This hanger secures the sync cord to the bracket to keep it out of the way while shooting.

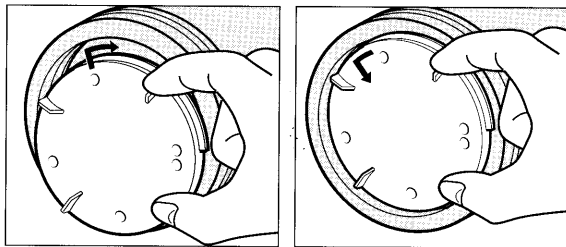
To use the cord fastening hanger, attach it to the Speedlight bracket as shown, then attach the sync cord to the hook.



Wide-Flash Adapter SW-103

Designed for use with SB-105, the Wide-Flash Adapter SW-103 increases the SB-105's angle of coverage circularly.

When the adapter is attached, the SB-105's guide number is reduced to 16 (m) or 52 (ft.) on land and 8 (m) or 26 (ft.) underwater (when using ISO 100 film at "MFULL").



Attaching the SW-103

To attach the adapter, align the adapter's mounting notches with the adapter mounting catches on the flash head, push the adapter onto the flash head as shown, then turn the adapter clockwise as far as it will go.

To remove: Turn the adapter counterclockwise and pull it off.

- To prevent the loss of the SW-103 and to enable it to be attached quickly, tie one end of a piece of string to its hole and tie the other end to the Speedlight.

Reading the Exposure Calculation Chart

In flash photography, which apertures can be used is closely related to the camera-to-subject distance. To determine the useable apertures, use the exposure calculation chart.

The distance scale of one exposure calculation chart is in meters and the other in feet. Use the system you prefer.

Film speed

Distance scale

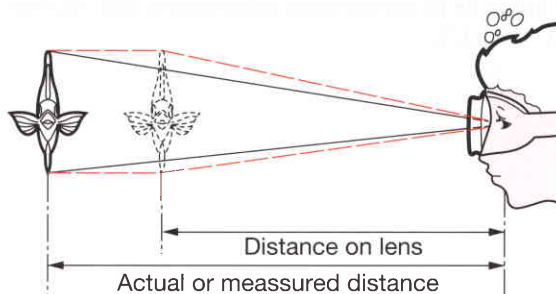
Film speed with wide adapter

under water [m]										Aperture		
Film speed										Flash output level		
Film speed with wide adapter												
ISO	25	50	100	200	400	mFULL m1/4 m1/16						
					0.3-0.5	0.7			22	11		
				0.3-0.5	0.7	1			16	8		
		0.3-0.5	0.7	1	1.5	2		22	11	5.6		
	0.3-0.5	0.7	1	1.5	2	3		16	8	4		
0.3-0.5	0.7	1	1.5	2	3	4		11	5.6	2.8		
0.7	1	1.5	2	3	4	5.6		8	4			
1	1.5	2	3	4	5.6	2.8		5.6	2.8			
							4					
W ISO 25 50 100 200 400 800										mFULL m1/4 m1/16		

Objects underwater appear closer than they actually are

For instance, if the estimated camera-to-subject distance underwater is 1m (3.3 ft.), the actual distance is 1.33m (4.3 ft.).

The distance scales on the exposure calculation chart and lenses are marked by estimate distance underwater. When you estimate the distance, read the flash shooting distance range from the chart directly.



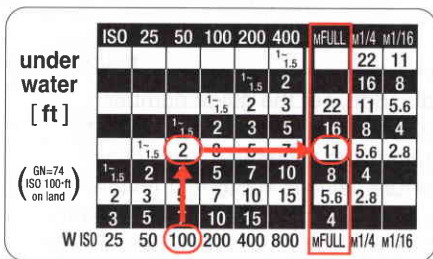
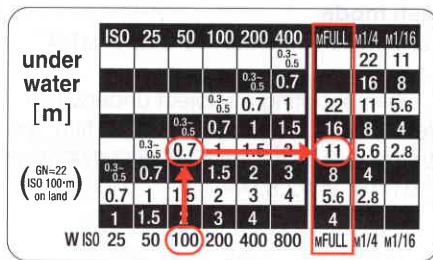
In TTL flash mode

Read the flash shooting distance range in the "MFULL" column on the left of the scale.

For example, when shooting a subject underwater at estimated 0.7m (2 ft.) using ISO 100 film, set the aperture to f/11 or larger (smaller f-number) to get the correct exposure.

When taking pictures with the arm removed from the bracket

Open the aperture one or more steps wider (f/8) than that (f/11) read in the "MFULL" column on the left of the scale.



- When setting aperture, check the flash shooting distance range first. To obtain the best possible color reproduction, set the aperture to the larger f-number if available.
- Usable film speed range in TTL mode:
ISO 25 to 1000 for the Nikonos RS
ISO 25 to 400 for the Nikonos-V

In manual flash mode

The scales from the left indicate “mFULL”, “m1/4” and “m1/16”.

For example, when shooting a subject underwater at an estimated 0.7m (1.6 ft.) using ISO 100 film, the appropriate f/stop at “mFULL” is f/11, at “m1/4” is f/5.6, and at “m1/16” is f/2.8.

under water
[m]

(GN=22
ISO 100-m
on land)

ISO	25	50	100	200	400	mFULL	m1/4	m1/16
					0.3-0.5		22	11
				0.3-0.5	0.7		16	8
		0.3-0.5	0.7	1	1.5	22	11	5.6
	0.3-0.5	0.7	1	1.5	2	16	8	4
0.3-0.5	0.7	1	1.5	2	3	11	5.6	2.8
0.7	1	1.5	2	3	4	8	4	
1	1.5	2	3	4		5.6	2.8	
						4		

W ISO 25 50 100 200 400 800 mFULL m1/4 m1/16

under water
[ft]

(GN=74
ISO 100-ft
on land)

ISO	25	50	100	200	400	mFULL	m1/4	m1/16
					1-1.5		22	11
				1-1.5	2		16	8
		1-1.5	2	3	5	22	11	5.6
	1-1.5	2	3	5	7	16	8	4
1-1.5	2	3	5	7	10	11	5.6	2.8
2	3	5	7	10	15	8	4	
3	5	7	10	15		5.6	2.8	
						4		

W ISO 25 50 100 200 400 800 mFULL m1/4 m1/16

- In manual mode, set the guide number (mFULL, m1/4, or m1/16) corresponding to the aperture value selected.
If the aperture value is set to f/11 (in the above example), set the flash mode selector to “m1/4” to achieve the correct aperture. Or if the flash mode selector is set to “m1/4”, set the aperture to f/11 to achieve the correct aperture.
- The exposure calculation chart is effective only when the SB-105 is mounted on the standard arm with the standard bracket.

In manual mode, you can determine the correct f/stop using the following equation:

$$f/\text{stop} = \frac{\text{guide number}}{\text{flash-to-subject distance}}$$

See table below for the guide number at various film speeds.

Guide number at various film speeds

m (ft.)

Light output	Underwater shooting							
	ISO 25	50	64	100	200	400	800	1000
MFULL	5.6 (18)	8 (26)	9 (29)	11 (37)	16 (52)	22 (72)	32 (105)	36 (118)
M1/4	2.8 (9)	4 (13)	4.5 (15)	5.6 (18)	8 (26)	11 (37)	16 (52)	18 (59)
M1/16	1.4 (4.5)	2 (6.5)	2.3 (7.5)	2.8 (9)	4 (13)	5.6 (18)	8 (26)	9 (29)

m (ft.)

Light output	On-land shooting							
	ISO 25	50	64	100	200	400	800	1000
MFULL	11 (37)	16 (52)	18 (59)	22 (72)	32 (105)	44 (144)	64 (210)	72 (236)
M1/4	5.6 (18)	8 (26)	9 (29)	11 (37)	16 (52)	22 (72)	32 (105)	36 (118)
M1/16	2.8 (9)	4 (13)	4.5 (15)	5.6 (18)	8 (26)	11 (37)	16 (52)	18 (59)

- Guide number underwater varies according to water conditions.
- When aiming the Speedlight diagonally, open the aperture 1/2 to 1 step wider (smaller f-number) than the aperture value obtained in the above equation to compensate for the different angle of reflection.
- When taking photographs with the arm removed from the bracket, Nikon recommends you take various pictures with different apertures by adjusting the camera-to-subject distance.

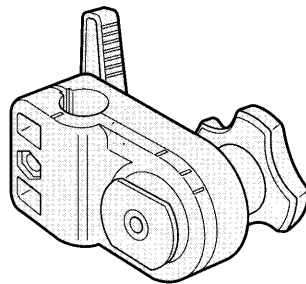
If the camera-to-subject distance is actually measured underwater, multiply the measured distance by 3/4 to get the estimated distance underwater.

For example, if the actual camera-to-subject distance is 1.33m (4.3 ft.), set the lens distance scale to 1m (3.3 ft.), and read the "1m" position on the exposure calculation chart.

ADVANCED APPLICATIONS

The Role of the Speedlight

The primary purpose of the Speedlight underwater is to accurately reproduce the subject's colors. At a depth of three meters (10 feet), the red content of the subject will begin to be absorbed by the water, resulting in a photograph strong in blue content. This phenomenon, known as "Selective Light Absorption" increases as you go deeper underwater and move farther from the subject. Using a Speedlight effectively will restore the lost color to your photographs and create better contrast. Try to stay as close as possible to your subject to reduce the amount of water between your camera and subject. This will result in a sharp, colorful photograph.

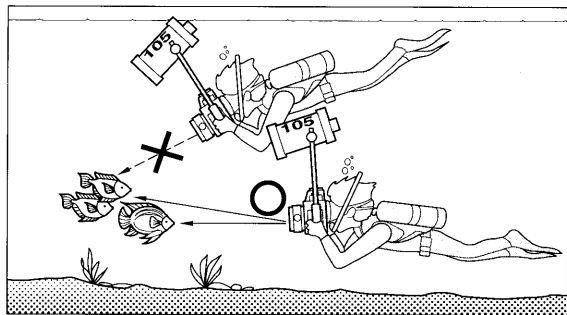


Note:

To shoot a subject within 1m (3 ft.), loosen the joint knob and adjust the Speedlight so it directly faces the subject.

"Normal", "0.6m" and "0.3m" position marks are provided on the joint to help adjust the angle of the Speedlight. (The indicated distances are the actual distance between the film surface and the subject.) Use the position marks on the joint only when the joint is attached normally (to the top of the arm facing front).

- Two sets of the position marks are provided on the joint; one is to use on the normal position and the other is to use when the double bracket is used and the joint is attached reversely to the arm.



Taking photographs highlighting the blue of the sea

Try to shoot at an upward angle to allow the background ambient light to enter into the picture.

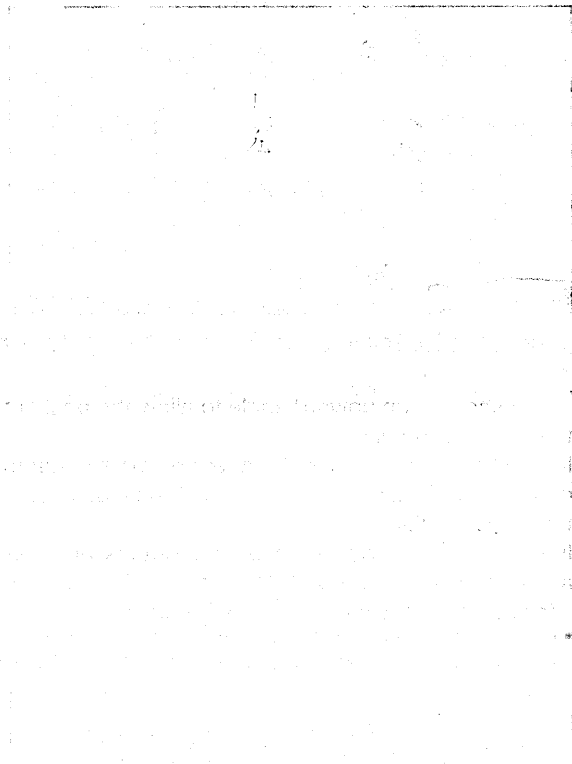
In TTL flash mode, select the aperture value to get the correct exposure while aiming the camera at the blue background. Then set the aperture dial.

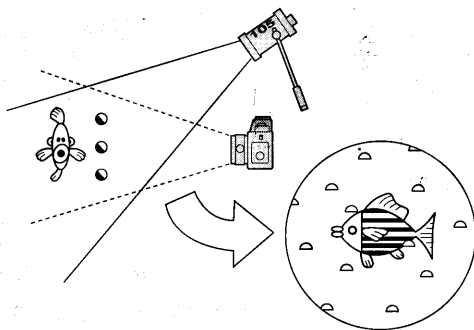
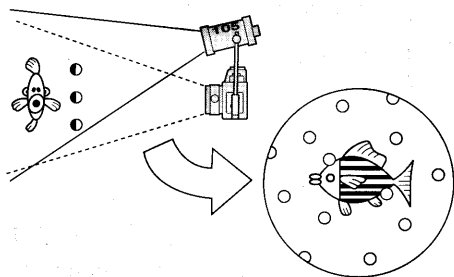
In this condition, you can take photographs with correct exposure and a natural blue background. The main subject can be reproduced in vivid colors by the light from the Speedlight.

- In manual flash mode, select the combination of shutter speed and aperture value to obtain the correct exposure against the background.

When shooting brightly shining fish

If the Speedlight is aimed at shiny silver fish from the front, correct exposure will be hard to obtain because of the bright light reflected from the fish. To shoot this sort of subject, remove the arm from the bracket, hold the Speedlight as far away from the camera as possible, and aim the Speedlight at the subject diagonally.

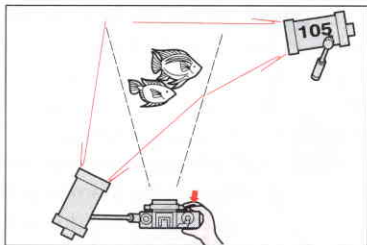




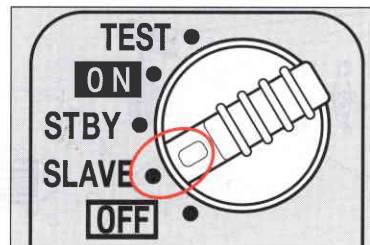
When sand has been stirred up in the water

When light from the Speedlight is reflected on particles floating in the water, the photograph turns out looking like it was taken in a snowstorm. It is best to wait until the sand settles down, or to remove the arm from the bracket and aim the Speedlight at the subject diagonally, as far away from the camera as possible.

SLAVE FLASH



When the SB-105 is used as a slave flash unit, it senses the light from a master flash and fires simultaneously, providing additional light for exposing the photograph. Because these Speedlights are not connected by a cord, more than two can be used to create special lighting effects.

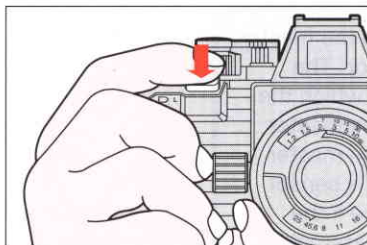


- 1** Set the function selector on the slave unit to **SLAVE**.
- Disconnect the sync cord from the slave unit and attach the sync socket cap before entering the water to prevent water leakage.

An SB-105, SB-104, SB-102 or SB-101 can be used as a flash activating unit.



2. Set the flash mode selector on the slave unit to either “mFULL”, “m1/4” or “m1/16” (Manual). Set the output to the desired flash power as a fill-in light. Determine the correct flash output from the camera’s aperture value and the distance between the subject and the Speedlight.



3. Release the shutter on the camera. When the master flash unit (connected to the camera) fires, the slave flash unit fires simultaneously.

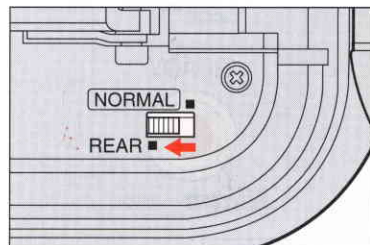
- If there are other people in the area firing a Speedlight, it may cause your slave unit to fire.
- The slave unit normally fires only when it senses a sudden burst of light. However, it can also fire in the event that a lamp such as a fluorescent light flickers when it is turned on.

- The slave unit fires when light from the master unit activates the slave unit's sensor. The maximum distance under water at which the slave unit can react to light from the master unit is about 10m (32.8 ft.) when the master unit is directly facing the slave unit's sensor. However, the slave unit may not fire if the water is cloudy or there is strong external light. Test fire the Speedlights in advance to be sure the slave flash works properly.
- Power of the Speedlight remains on when the slave flash mode is selected. Therefore, battery power of the equivalent power to fire one manual full flash is consumed in about 30 minutes. At this rate, battery power will be used up in about 25 hours with NiCd batteries and 60 hours with alkaline-manganese batteries even without a single firing of the flash.

REAR-CURTAIN SYNC PHOTOGRAPHY



When ambient light conditions are low and you wish to produce creative exposure by highlighting the movement of subjects at a slow shutter speed, you can use the rear-curtain sync feature on the Nikonos RS. The SB-105 synchronizes with the closing of the shutter producing a natural stream of light behind the subject.



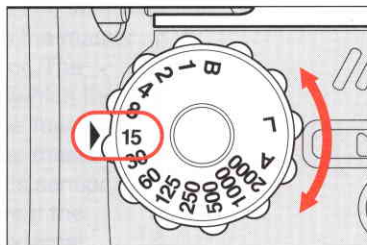
- 1 Before entering the water, open the camera back, set the camera's sync mode switch in the direction of the arrow, and close the camera back.

Rear-curtain sync photography is possible only with the Nikonos RS.



2. Turn on the SB-105's power and confirm the ready-light is on.

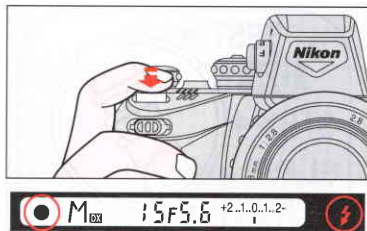
Set the shooting mode selector to a desired position.



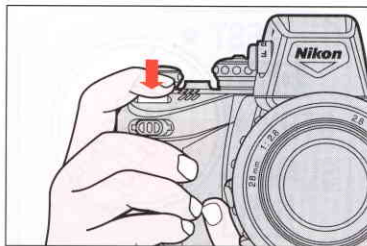
3. Set the f/stop and shutter speed on the camera.

- The Shutter Dial can be set to either "A" 1/125 - 1 second, or "B", but a shutter speed of 1/60 second or slower is most effective for rear-curtain sync photography.
- Set the Focus mode to a desired position.

When using rear-curtain sync flash in Aperture-Priority Auto Exposure (A) mode, the shutter speed is automatically set to between 1/125 - 1 second (standard operation is between 1/125 - 1/30 second). Be careful that your subject does not become blurred at these speeds.

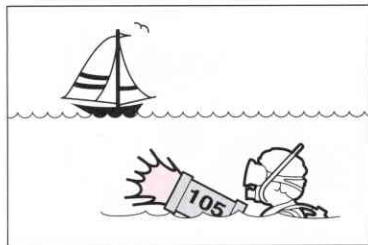


4. Lightly press the shutter release button and confirm that ● and ⚡ appear in the viewfinder.

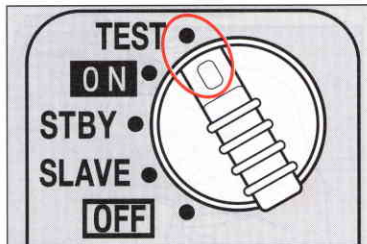


5. Check the flash shooting distance range, and release the shutter.
See pages 40-44 for details on the flash shooting distance range.

SIGNAL FLASH

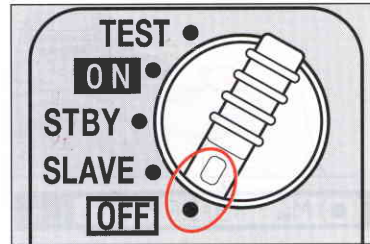


The signal flash function serves to indicate your position in the sea when resurfacing from under water.



1. Turn on the SB-105's power and set the function selector to TEST and wait about 6 seconds.

- From the second firing, the flash repeats firing at 1/32 output level about every two seconds.
- Fully charged NiCd batteries let the SB-105 continue firing in this mode about 1400 times (about 50 minutes), and alkaline-manganese about 3500 times (about 2 hours).



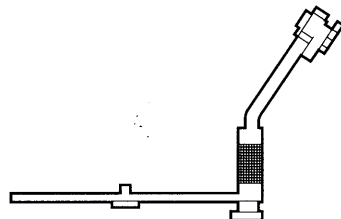
2. Turn off the power of the SB-105 to stop.

OTHERS



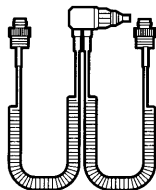
Extension Arm Set

This accessory increases the length of the arm when a special lighting effect is desired or needed or adds mobility for different lighting angles.



Double Flash Bracket Set

This accessory allows two flash units (SB-105 or SB-102) to be mounted on the Nikonos-V or Nikonos IV-A camera at the same time.



Double Sync Cord SC-100

This cord enables two SB-105 Speedlights (or an SB-105 and SB-104 or SB-102) to be controlled by one camera. TTL automatic flash operation is possible only with the Nikonos RS or Nikonos-V; manual flash operation is possible with other Nikonos cameras.

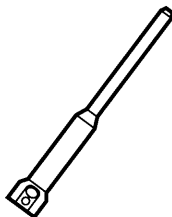
Multiple Flash Photography

When two flash units are the same distance from the subject and face approximately the same direction, the combined guide numbers of the two units can be determined with the following equation:

$$\text{Combined GN} = \sqrt{\text{GN1}^2 + \text{GN2}^2}$$

(GN1 and GN2 are the guide numbers of the flash units.)

- When using two flash units facing the same direction in either the TTL mode or one of the manual modes, compensate as follows according to the equipment in use.
- When using manual flash operation, set each Speedlight's shooting mode selector to the same position, for example, "M1/4". To use them at different positions, first calculate the combined guide number from the equation formula above, then determine the correct aperture from the combined guide number.
- If you decide to use only one Speedlight in the TTL automatic flash mode, turn off the Speedlight which is attached to the gray sync cord.
Should you turn off the Speedlight which is attached to the black cord, TTL automatic flash control is automatically canceled and the unit will fire at its maximum output regardless of the setting.
- **Make sure to set the function selector of the Speedlight attached to the gray sync cord to ON instead of STBY when using two flash units.**



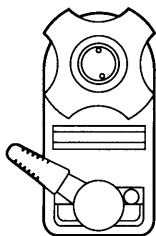
Arm SK-104C

This accessory connects the SB-105 or SB-102 to the SK-104B or SK-104W for multiple flash photography.



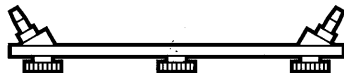
Bracket SK-104B

This accessory is used to connect a Speedlight unit to the Nikonos RS camera. The extension arm SK-104A or SK-104C (for the SB-105 and SB-102) can be attached.



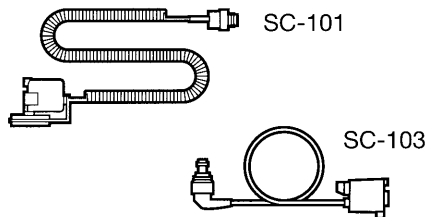
SB-102 Joint

This accessory connects two (SB-105 or SB-102) Speedlights to SK-104 used with the Nikonos RS camera.



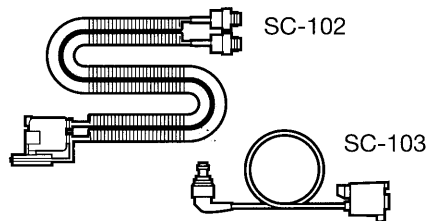
Double Bracket SK-104W

This accessory allows two flash units (SB-105 or SB-102) to be mounted on the camera at one time, thereby doubling the amount of flash illumination available. This bracket is especially useful during close-up shooting because it enables the subject to be evenly illuminated from the left- and right-hand sides.



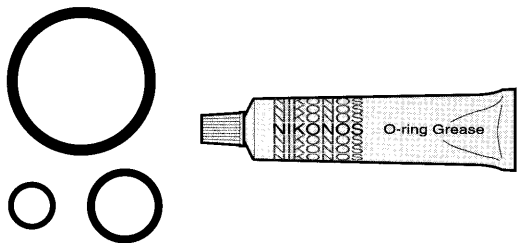
Sync Cord Set SC-101

This accessory allows you to connect the flash unit to the camera body underwater.



Double Sync Cord SET SC-102

This accessory allows you to connect the two flash units to the camera body underwater.

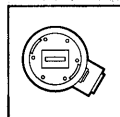


O-Rings and Lubricant

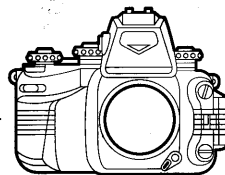
Additional O-rings and lubricant are available to allow you to maintain the flash unit in perfect condition.

Speedlight SB-105 optional accessories

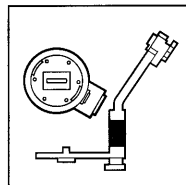
Following chart lists the standard combination of Speedlight SB-105 optional accessories. Refer to Nikon catalogues for more details.



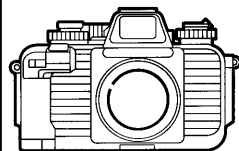
SB-105



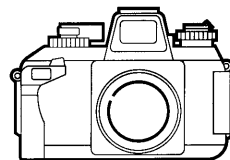
Nikonos RS



SB-105 set
(Wide-flash adapter
SW-103, Sync Cord
and O-ring set)



Nikonos-V



Nikonos IV-A



Flash bracket
SK-104B



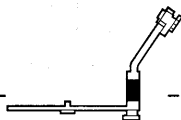
Arm SK-104C



Double flash bracket
SK-104W*



Double sync cord
SC-100*



Double flash
bracket set*



Double sync cord
SC-100*

* Needed to connect two flash units.
(Other double sync cords can be used with the cameras in this chart except for the R-UW 20-35mm lens attached to the Nikonos RS camera.)

1. The flash-to-subject coupling distances and usable apertures indicated by the exposure calculation chart are for clear-water shooting. Therefore, the correct exposure will be different if the water is muddy or has floating particles, and some exposure compensation must be made.
2. In shallower depths with natural lighting, overexposure may occur when shooting in the automatic mode. To prevent this, use the smallest aperture possible (the numerically largest f-number) or turn off the Speedlight and use only natural lighting. When shooting with the Nikonos RS or Nikonos-V, the correct shutter speed for the lighting conditions is displayed in the viewfinder. (For more information, refer to the camera's instruction manual.)
3. The Nikonos RS and the Nikonos-V's TTL flash control makes it easier than ever to shoot close-ups with the optional Close-Up Outfit. When using the optional Close-Up Outfit, set the shooting mode selector to "TTL" (Nikonos RS or Nikonos-V) or to "M1/4" (Nikonos IV-A), then turn on the SB-105 and set the appropriate aperture on the lens. For best results, use smaller apertures (numerically larger f-numbers) and, to prevent possible overexposure, attach the Wide-Flash Adapter SW-103.
4. One of the benefits of using a Speedlight underwater is that it restores natural colors to subjects by removing the water's bluish cast. Occasionally, though, you may want to include that bluishness in your photos. Normally, this is rather difficult to do because the flash unit renders the background either too light or too dark. To capture the bluishness, you must eliminate the difference in light levels between the subject (illuminated by the Speedlight) and the background (illuminated by natural light)—a difficult task in the manual flash mode. The easiest way to balance the light levels is to use the Nikonos RS or Nikonos-V and the SB-105 in the TTL automatic mode and follow the procedures explained in "SHOOTING" (pages 27-34).

Tips on Handling the Speedlight

Prevent dirt, mud, sand, dust, water, salt, or other foreign matter from entering the Speedlight

The Speedlight can be damaged if foreign matter finds its way inside the battery chamber. Damage of this sort is not always covered by the warranty.

Never disassemble the Speedlight

Never disassemble or remodel the Speedlight when damaged.

The Speedlight houses a high-voltage circuitry which is very dangerous. Take the Speedlight to a Nikon service center when it is damaged.

Protect the Speedlight from vibrations or shock

When carrying the SB-105 in a car or boat, insert the Speedlight and other equipment into bags to prevent them from bumping each other, or fill the gaps with a towel to absorb vibrations or shock.



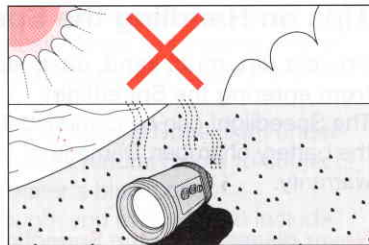
Do not subject the Speedlight to excessive heat

Do not leave the Speedlight inside an enclosed location, such as a car, that is subject to sunlight and high temperatures. Also avoid leaving it in any other area subject to high temperatures (over 60°C or 140°F).

If the Speedlight gets soiled

Use a blower to remove dust first, and then wipe the Speedlight clean with a soft, dry cloth.

Do not use thinner, benzene, or other active agents.



Tips on Using the Speedlight

Take care not to splash water into the battery chamber or onto the NiCd batteries

When changing batteries, be sure not to accidentally splash water into the battery chamber or onto the NiCd batteries. If water has been splashed, wipe it away immediately. Nikon recommends keeping the batteries in the plastic case provided until they are needed.

If a lot of water enters the battery chamber, the Speedlight may stop working. If this happens, remove the battery from the chamber and take the Speedlight to a Nikon service center with the chamber's cover open.



Do not carry the Speedlight by the sync cord

Do not carry the Speedlight dangling at the end of the sync cord.

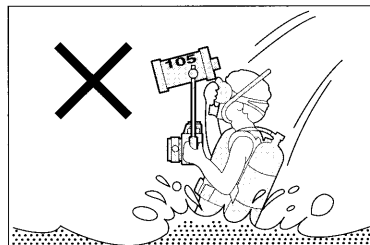


Do not subject the Speedlight to vibration or shock

Strong vibration or shock may cause damage to delicately adjusted parts. If you accidentally drop the Speedlight, take it to a Nikon service center to be checked for damage, even if there is no visible damage.

Do not jump into the water while holding the Speedlight

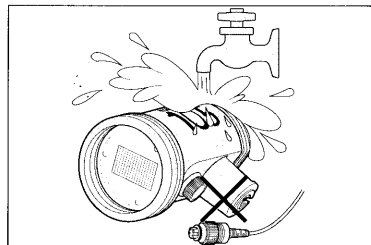
When entering the water from a boat, enter it yourself first and then have someone hand you the camera and Speedlight from the boat, or suspend the items on a rope and claim them after entering the water. Unforeseen damage may be caused by the shock of the Speedlight hitting the water surface if you jump into the water while holding it.



Tips on Speedlight Care After Use

Wash the Speedlight with fresh water

If the SB-105 Speedlight is stored without having been washed after use underwater (especially in seawater), salt and other foreign matter may stick to its parts, possibly causing corrosion or operation failures. With the Speedlight's cap closed, wash the Speedlight thoroughly with fresh water (do not use hot water). If the Speedlight was used in salt water or muddy places, submerge it in a sink or other suitable vessel filled with fresh water, and move all operating parts (such as the selectors) to remove any salt or dirt from the gaps around these parts. It is then a good idea to rinse the Speedlight under running water.

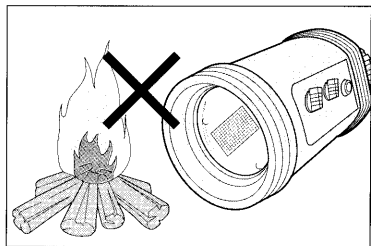


Do not let water get into the sockets

When washing the Speedlight, attach the supplied sync socket cap to prevent water from getting into the sync socket.

Drying the Speedlight

When drying the Speedlight after washing, do not subject it to flames or heat. Avoid direct sunlight. Let it dry in a well-ventilated area.



Be sure that all water has been removed

Several days are required for all water to dry from below the rubber cover. Keep in mind that water may still remain in hard-to-reach areas even after the surface has dried.

Do not let water get inside

If you must unplug the sync cord or cap when the Speedlight is not completely dry after washing, take extra care not to let water get inside.

Disconnect the sync cord from the socket and attach the cap

Salt and other foreign matter will remain on the sync cord and the socket if the cord is not disconnected. After washing and drying the Speedlight, remove the plug and remove all the salt. After that, apply a small amount of O-ring lubricant to the screw threads. Be sure always to attach the socket cap to prevent water or dirt from getting into the socket.

Also dry the battery chamber

After drying the main body, open the battery chamber, remove the batteries, and let the inside of the chamber dry completely before closing it again.

When transporting the SB-105

Do not put the SB-105 into the same bag as the batteries and other products. Water from below the rubber parts of the SB-105 may cause damage to batteries.

Tips on Storing the Speedlight

Remove the batteries

If the Speedlight will not be used for a long time, remove the batteries. If the battery leaks, flammable gas may be produced inside the battery chamber which is very hazardous. If that happens, do not use the Speedlight and take it to a Nikon service center.

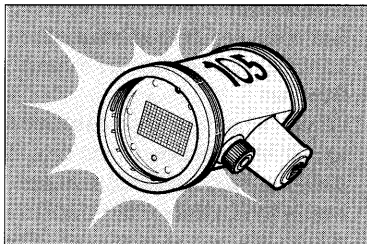
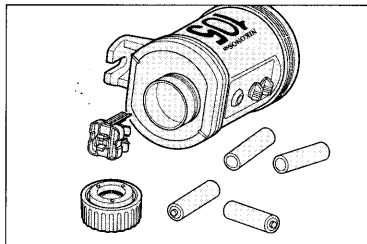
When storing the SB-105

Store the Speedlight in a cool, dry place to prevent mold from growing on it. Do not leave the Speedlight inside an enclosed location, such as humid or wet areas, or places subject to magnetism or chemicals such as camphor or naphthalene (mothballs).

Test fire the Speedlight about once a month

If the Speedlight is being kept in storage for a long time, take it out about once a month, install batteries, and fire the Speedlight several times to prevent the condenser from weakening. Before returning it to storage, turn off the power while the ready-light is lit, and remove the batteries.

- By occasionally test firing the SB-105, you can preserve the performance of the condenser for a long period of time.



ABOUT BATTERIES

1. New batteries

Between manufacture 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. 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 leakage which may damage the unit, or even cause combustible gases to be trapped inside the battery chamber. To minimize drain during the period of disuse, store the batteries in a cool, dry place below 20°C (68°F).

5. Battery brands

Do not mix brands of batteries or use batteries with different model numbers. Also, avoid mixing new and old batteries since proper performance will not be obtained and battery leakage may occur.

6. Disposal

Do not dispose of batteries by burning. Also, 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, take the SB-105 to an authorized Nikon dealer or service center. The SB-105 requires an excessive current, so the life span of the batteries may be shorter than with other Speedlights.

8. NiCd batteries

In comparison with regular batteries, NiCd batteries provide faster recycling and higher efficiency at low temperatures. However, the recycling time and the number of flashes per battery set depend upon the age of the batteries, their charges, and their capacities.

- Do not continue to use NiCd batteries after they are exhausted. Continued use may reduce their life span or cause leakage.
- Before charging, thoroughly read the battery and battery charger instructions.
- Charging should only be done for the designated number of hours on a battery charger recommended by the battery manufacturer. Excessive charging may cause battery deterioration.

- Charging should only be done in temperatures between 5°C (41°F) and 35°C (95°F). Never charge batteries while they are still hot from use.
- Never attempt to charge NiCd batteries that are incorrectly installed in the battery charger.
- The charging capacity of NiCd batteries may be shortened after a long period of storage. If this occurs, discharge and recharge them several times.
- If working time is markedly reduced even after they have been correctly charged, replace them with a fresh set.
- Do not mix new and old NiCd batteries.
- Do not use NiCd batteries which have been charged for different lengths of time.

- Electronic construction:** High-performance silicon-controlled rectifier and series circuitry
- Usable Exposure Modes:** TTL auto exposure (with Nikonos RS or Nikonos-V); Manual (with all Nikonos cameras): "mFULL", "m1/4" and "m1/16" settings
- Guide Numbers:** With ISO 100 film on land (underwater), full output: 22 (11); 1/4 output: 11 (5.6); 1/16 output: 5.6 (2.8)
- Angle of Coverage:** 103° x 84° on land; covers picture angle of 15mm lens on land and underwater; 115° with Wide-Flash Adapter SW-103 (on land); covers picture angle of 15mm lens
- Batteries:** Four AA-type NiCd batteries or four AA-type alkaline-manganese batteries (high-performance manganese and lithium batteries not recommended)
- Number of Flashes:** NiCd: 45 flashes (depending upon battery brand and amount of recharging)
Alkaline-manganese: 120 flashes
- Recycling Time:** NiCd: minimum approx. 4 sec. (depending upon battery brand and amount of recharging)
Alkaline-manganese: minimum approx. 6 sec.
- Flash Firing Duration:** mFULL: Approx. 1/1000 sec.
m1/4: Approx. 1/3500 sec.
m1/16: Approx. 1/10000 sec.

Usable Ranges:

ISO film speed coupling range: TTL with Nikonos RS: ISO 25 to 1000 ; TTL with Nikonos-V: ISO 25 to 400

Usable aperture range: f/2.5 to f/22

Coupling distance range: 0.3m (1 ft.) to 8.8m (29 ft.) (at ISO 100 on land); 0.3m (1 ft.) to 4.4m (14.4 ft.) (at ISO 100 underwater)

Resistant Pressure:

12kg/cm² (1702 lb/in²) maximum; usable to depth of 100m (320 ft.)

Multiple Flash Capability:

Requires optional Double Flash Bracket and Double Sync Cord in addition to two SB-105 Speedlights (or an SB-103 or SB-102)

Dimensions:

Flash head: Approx. 99mm (W) x 130mm (H) x 181mm(D)

Weight:

Flash head only (without batteries): Approx. 780g on land or -330g underwater

Flash head with arm, bracket, joint, sync cord and four AA-type batteries: Approx. 1730g on land and 150g underwater

Note: All performance data are for normal-temperature operation [20°C (68°F)].

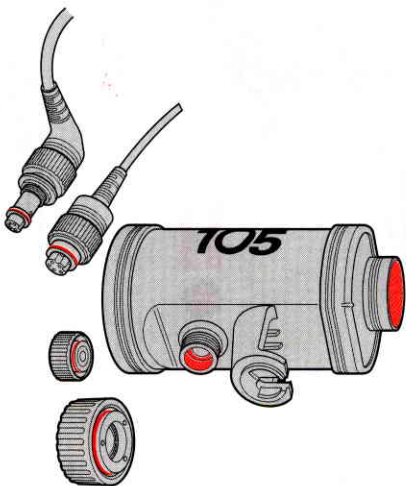
Specifications and design are subject to change without notice.

Supplied with: Main flash head, arm, bracket, joint, cord fastening hanger, sync cord, Wide-Flash Adapter SW-103, O-ring set and exposure calculation chart.

BE SURE TO CHECK THE O-RINGS BEFORE USE

(See page 12 in the instruction manual for more details)

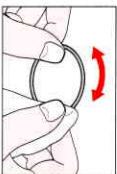
This Speedlight uses O-rings to ensure that it is well sealed and waterproof. It is important to check all the O-rings and lubricate them before use.



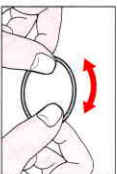
1 Remove the O-rings from the O-ring channels.



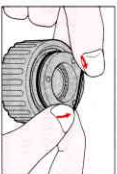
2 Examine the O-rings for imperfections.



3 Lubricate the O-rings.



4 Reset the O-rings.

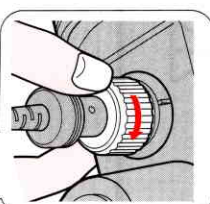
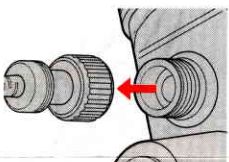


CONNECTING AND SETTING UP THE SB-105 AND CAMERA

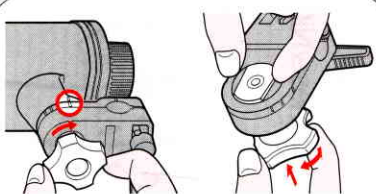
(See page 18 in the instruction manual for more details)
The Speedlight uses O-rings to ensure that it is well sealed and waterproof. It is important to check all the O-rings and lubricate them before use.

Cautions on unplugging the sync cord

When unplugging the sync cord from the Speedlight or camera, make sure to position the sync socket **downward** as shown and disconnect the plug **gently**. If you disconnect the plug abruptly, moisture left inside the plug may be sucked into the socket.

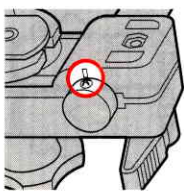


Connect the Speedlight plug to the Speedlight.



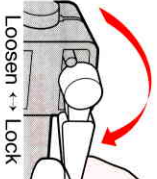
Loosen the joint knob.
Position the joint plate as shown.

Connect the joint to the joint collar and lock the joint.



Loosen the joint lever. Insert the arm and turn 90°. Lock the arm.

Joint lever

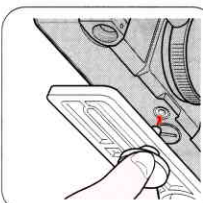


Loosen ↔ Lock

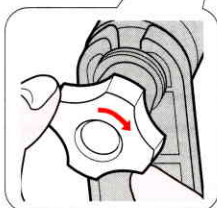


Lubricate

Connect the camera plug to the camera.



Attach the camera body to the bracket.



Loosen the arm knob and attach the bracket to the arm.

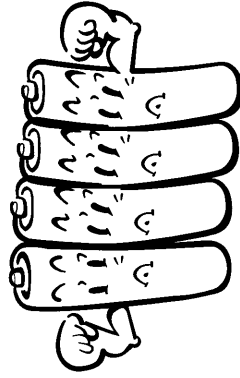
For safe use of the SB-105



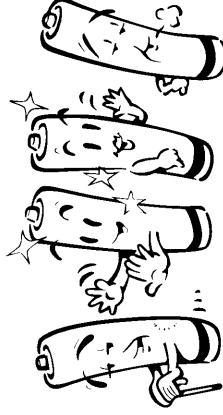
Warning

Because the Speedlight is airtight, combustible gas may be discharged from the batteries and trapped within. On rare occasions, when the Speedlight fires, this may ignite the gas, in which case the flash head may explode. To minimize the possibility of this occurring, please adhere to the following precautions.

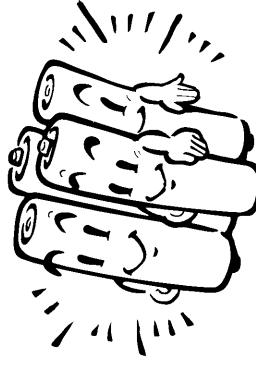
Alkaline-manganese/NiCd batteries



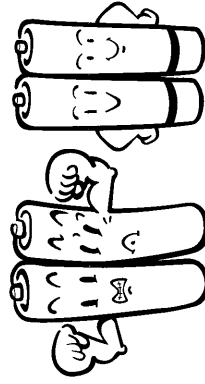
Use the same brand for all four batteries.



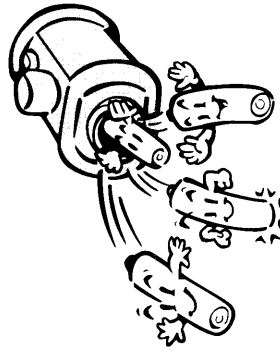
DO NOT mix new and old batteries.



Install batteries with the + and - poles correctly positioned.



DO NOT mix alkaline-manganese and NiCd batteries.

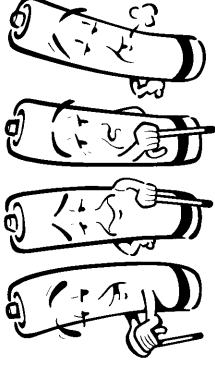
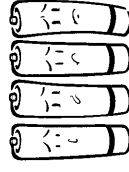


When the Speedlight is not in use, remove the batteries to prevent leakage. If leakage does occur, take the SB-105 to a Nikon service center.



DO NOT disassemble or short circuit the batteries. NEVER put the batteries into a fire.

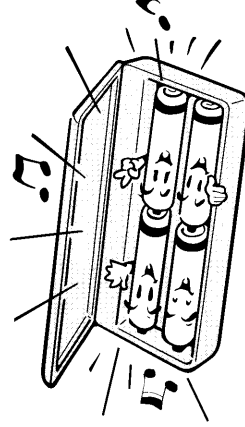
NiCd batteries



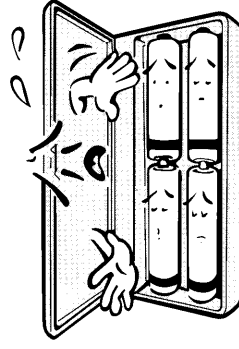
DO NOT use old or deteriorated NiCd batteries. DO NOT use NiCd batteries which are unequally recharged.



DO NOT discharge the NiCd batteries using the SB-105.

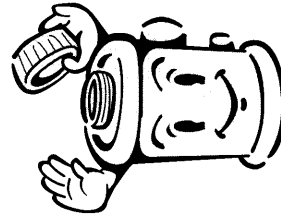


Charge the NiCd batteries in a charger designated by the battery maker. Follow the precautions on the charger. Always full charge all four batteries.



Be sure to install batteries in the charger with the + and - poles correctly positioned. DO NOT use batteries that have been charged incorrectly positioned in the charger.

Ventilate the battery chamber.



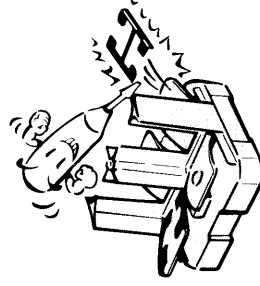
Before using the SB-105, open the battery chamber cap, and ventilate the battery chamber by turning it upward. Also ventilate the battery chamber when changing the batteries.

DO NOT allow water to get inside the Speedlight.



If any water gets inside the Speedlight, stop using it immediately. Remove the batteries out of the water and take the Speedlight to a Nikon service center with the battery chamber open.

DO NOT remove the plastic safety covers from the battery holder.



The plastic safety covers on the battery holder ensure the SB-105 does not function if the batteries are installed with incorrect +/- polarities to avoid any accident.

DO NOT drop the SB-105 or subject it to excessive shock.



If you do drop or jolt the SB-105, take it to a Nikon service center to be checked, even if there is no change to its external appearance.

DO NOT disassemble the SB-105.



NEVER attempt to disassemble the SB-105. It contains high-voltage circuitry that can be dangerous to touch.

SAFETY NOTICE FOR USING THE NIKONOS SPEEDLIGHTS

As the underwater Nikonos Speedlight is airtight, gas discharge will be trapped within. In rare cases, there may be an explosion of gases which results in serious accident causing injury. For safety sake, read carefully the cautions below and follow them.

1 Before using the Speedlight, vent the air within the battery chamber by leaving the SB-105 for more than 10 minutes with the battery chamber cap open and the battery chamber facing upward.

Even there was combustible gas (hydrogen gas) trapped within, it would be vented. For same reason, when replacing batteries with new ones, keep the battery chamber open for more than 10 minutes.

2 When not using the Speedlight, always remove the batteries from the battery chamber.

If battery leakage occurs in the airtight chamber, combustible gas (hydrogen gas) could be generated within the chamber and there may be an explosion. Never use the Speedlight with leaking batteries. If battery leakage occurs, remove batteries and leave the battery chamber cap off, then take your Speedlight to an authorized Nikon dealer or service center.

3 Usable batteries for the Nikonos SB-101 or SB-105 are AA-type alkaline-manganese or AA-type NiCd batteries.

Usable batteries for the SB-102 is C-type alkaline-manganese or C-type NiCd batteries. Do not use batteries of other types. When installing batteries, observe the voltage polarities carefully. When using the SB-101, which is not provided with the prevention device for reversal position, especially take care when installing batteries. Reversal of the + and - terminals will result in leakage. The battery leakage may generate a combustible gas (hydrogen gas) and may cause an explosion.

4 Use the same type of batteries of same brands and same versions.

Do not use batteries over the recommended period of use.

- Do not mix alkaline-manganese and NiCd batteries.
- Do not mix brands of batteries together.
- Do not mix different versions of the same brand batteries together. Always ensure that the batteries you use are from the same manufacturing batch (same year and month of manufacture). Ensure that they are within the recommended period of use, too.

5 When using rechargeable NiCd batteries, make sure to always use the same battery set—i.e., if you use one set of NiCd batteries, do not change the contents of the set.

- Use the same type of the NiCd batteries of the same brand. Always use the same set of batteries and recharge them at the same time.
- Do not replace one or some of the set with the new ones. The charging capacity of NiCd batteries becomes smaller as their life span is reduced.
- Do not mix new and old batteries and do not use batteries which have been charged for different length of time together. Doing so may cause a combustible gas (hydrogen gas) generated at the end of battery discharging.

6 NiCd batteries should be charged for the designated period of time with a battery charger recommended by the battery manufacturer.

If batteries, which you will use as a set, cannot be charged at the same time, make sure all batteries are fully charged and never charge them for different lengths of time. If you have set NiCd batteries in the reverse position by mistake and charged them, never use them.

7

Do not use deteriorated NiCd batteries.

- If recycling time becomes slow with the NiCd batteries even after they have been correctly charged, do not use them. Deteriorated NiCd batteries may generate a combustible gas (hydrogen gas).
- If number of flashes per charged battery set is greatly reduced (down to 70% of that with the new battery set) even after the batteries have been correctly charged, do not use them. Deteriorated NiCd batteries may generate a combustible gas (hydrogen gas).

8

Sometimes, the NiCd batteries are left inside the Speedlight unit for discharging and refreshing batteries. **Never leave the NiCd batteries inside the Speedlight with the Speedlight power on.** If the batteries are discharged too much, a combustible gas (hydrogen gas) may be generated inside the battery chamber.

9

If moisture is detected inside the Speedlight unit or battery chamber, immediately stop using the SB-105.

Electrically resolved moisture may generate a combustible gas (hydrogen gas). Using the Speedlight with the moisture detected inside it may cause an explosion. Remove batteries and leave the battery chamber cap off, then take your Speedlight to an authorized Nikon dealer or service center.

10

Some batteries are provided with safety guide which prevents the battery from incorrectly positioned.

If one or some parts of the battery chamber are broken, it is possible that the safety mechanism inside the battery chamber has also been broken. Never use the Speedlight with the battery chamber broken. Take it immediately to an authorized Nikon dealer or service center.

11

Never attempt to disassemble the Speedlight.

Its high voltage circuitry may cause severe electrical shock.

- For safety sake, the SB-104 and SB-105 are air-tight and designed so that it is dry and there is no oxygen inside the unit.
- We cannot guarantee the safety of the disassembled Speedlights.

12

Take your Speedlight to an authorized Nikon dealer or service center for inspection on a regular basis.

Underwater Speedlights are used under severe circumstances. Although the Speedlight may appear to be in good condition, internal conditions due to corrosion may exist and could cause malfunction. Have your Speedlight serviced at an authorized Nikon dealer or service center, once every two years. (There will be a charge for service performed.)

2

3