

**SEA&SEA**

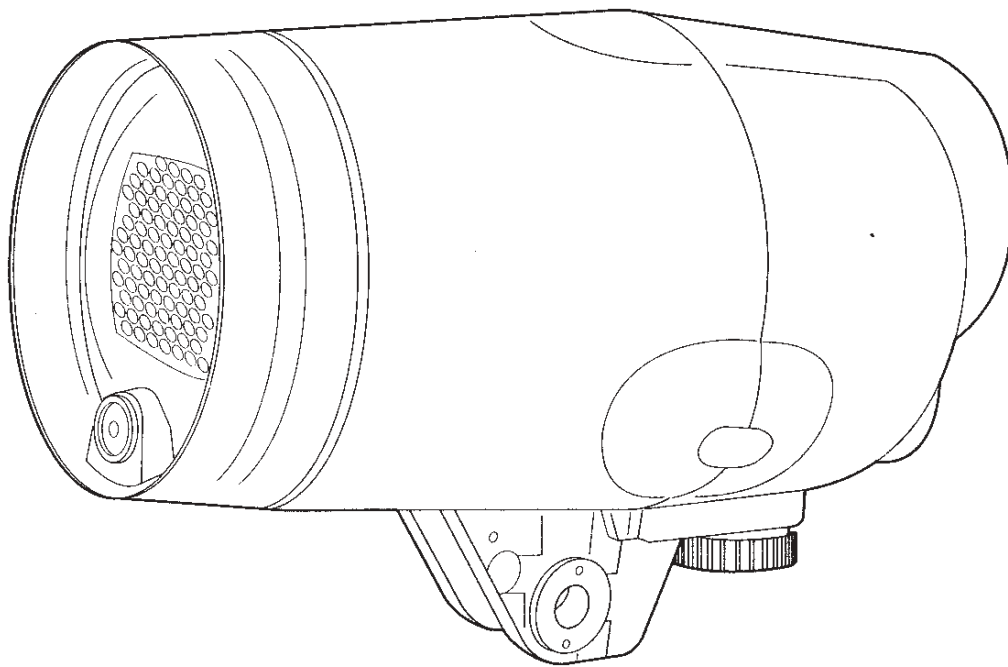


***UNDERWATER TTL STROBE***

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***YS-90DX***

**Instruction Manual**



***— Yellow Sub —***

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# ***YS-90DX***

Thank you and congratulations on your purchase of SEA & SEA's YS-90DX strobe. For proficient operation of all strobe functions and to maximize performance, please read this manual thoroughly before use. Retain for future reference.

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## Safety Precautions

- For safe handling of the product, please read the following precautions before use.

\* Misuses listed under the following precautions could lead to serious consequences. Please observe the precautions as they contain highly important information related to personal and product safety.

Definitions:

-  **WARNING!** Situations that could result in serious injury or death.
-  **CAUTION!** Situations that could result in property damage or personal injury. Please read carefully since failure to heed these precautions could have serious consequences.

### 〈General Precautions for Operation of the Strobe〉



#### **WARNING!**

- Use only manganese, alkaline, nickel-cadmium or lithium batteries rated 1000mA or less in this unit. Do not use any other type of battery. Doing so may generate a toxic gas.
- Do not fire this strobe with the reflector facing down on a table or the floor as that may cause overheating of the internal circuitry and/or fire.
- Do not trigger the strobe near combustible materials. It may cause fire.
- Heat from the batteries may cause pressure buildup inside the battery compartment. When opening the battery compartment, the battery cover may release with unexpected force. To avoid injury, open with extreme care.



#### **CAUTION!**

- Remove batteries from the strobe after use.
- Do not open the battery compartment in a flammable environment.
- Always make sure that the strobes and accessories are securely mounted to prevent them from falling off, becoming lost, causing personal injury or equipment malfunction.
- Do not attempt to disassemble the strobe. Contact with internal high voltage circuitry can cause personal injury.
- Do not alter or modify the strobe. User modifications can result in flooding or malfunction. User modifications will void the product warranty.
- If you detect smoke or an acrid odor, discontinue use immediately. Remove the batteries from the strobe and send the strobe to an authorized Sea & Sea dealer.

- In the event of flooding, turn off the strobe and camera. Discontinue use immediately. Remove batteries from camera and strobe. Send to an authorized Sea & Sea repair center for evaluation and repair.  
\* If flooded, beware of increased pressure inside the strobe. Handle with extreme care when opening.
- Do not short-circuit the connector pins. That may cause equipment malfunction.
- During transportation or when not in use for an extended time, remove batteries to avoid unwanted battery consumption due to accidental activation of the power switch.
- The YS-90DX strobe incorporates plastic parts. Do not subject this strobe to extreme heat, such as on a car dashboard, or to direct sunlight. Plastic parts are prone to warping.
- SEA & SEA Products Ltd. will not be responsible for costs incurred for film and/or processing should malfunction of the YS-90DX strobe, camera or accessories result in unsatisfactory photographs.

### <Precautions for Storage of the Strobe>

#### CAUTION!

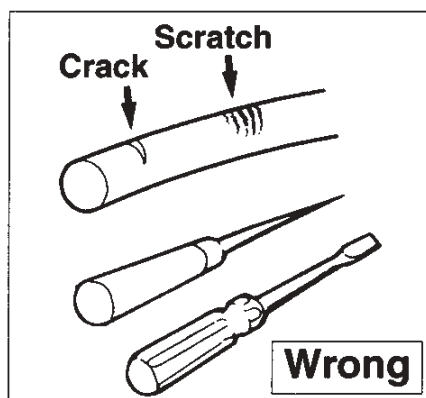
- When not in use for an extended period of time, remove batteries; possible battery leakage will cause equipment malfunction.
- Do not store in a damp or humid environment. It can cause mildew or malfunction.
- Do not store in a chemically-laden environment. Naphthalene, camphor, or other harmful chemicals can cause mildew, rust, corrosion, and other damage to the metal and rubber components in this product.
- When storing the strobe for a long period of time, periodically attach to the camera and trigger the shutter release (with batteries and without film). This will exercise the internal parts and keep the strobe in good working condition.

## Handling the O-Ring

The O-ring on the battery cover of your YS-90DX provides an airtight waterproof seal. Improper handling and maintenance of the O-ring can cause flooding. Please observe the following precautions carefully.

- **Always inspect the O-ring for scratches, cracks or cuts.**

If the O-ring is damaged, it must be replaced.  
Never remove the O-ring with a sharp tool. To



avoid damaging the O-ring, use the O-Ring Remover, a tool especially made for O-ring removal.

●**Inspect for debris.**

Make sure that there are no foreign particles, such as dust, sand, or hair on the O-ring, O-ring groove, or O-ring contact surface. Such contamination will breach the seal and cause flooding.

●**Lubricate with silicone grease.**

Silicone grease protects the O-ring from drying and abrasion. Dab a small amount of grease onto your finger and draw the O-ring through your fingers until evenly coated. Use the silicone grease sparingly. Too much grease attracts debris.

●**Do not crimp the O-Ring.**

Hold the O-ring straight and do not bend or twist it when fitting it into the O-ring groove.

●**O-ring storage.**

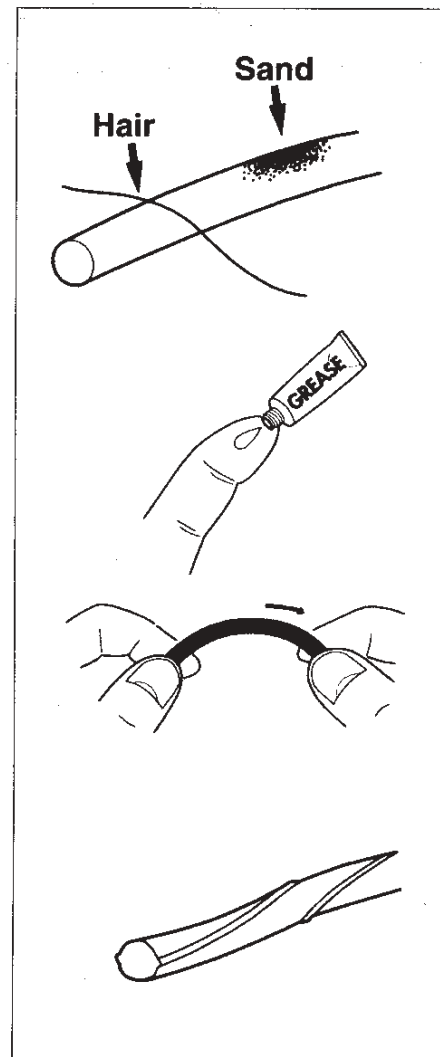
Always store your O-ring in an airtight container and in a cool environment. Keep out of direct sunlight. Take care that it is stored flat and not bent or twisted. Do not place any heavy objects on it; excessive weight will flatten it and impede its sealing capability.

●**The O-ring's life is one year.**

The life of the O-ring depends on the diligence of your maintenance, frequency of use, and storing conditions, but on average, if you maintain your O-ring properly, it will retain its watertight integrity for one year.

●**Remove the O-ring for inspection.**

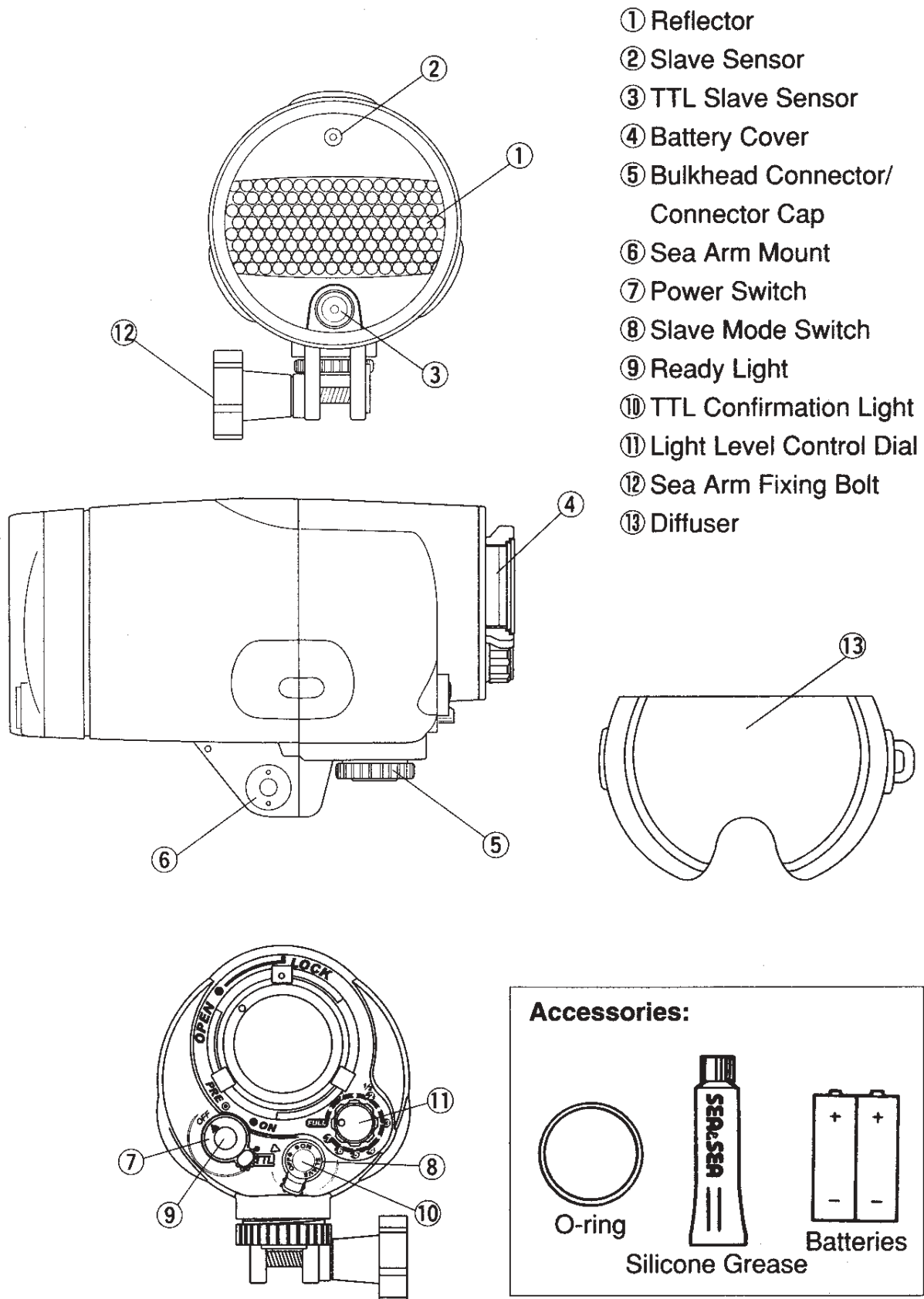
Before use, remove the O-ring from its groove and carefully check the O-ring, the O-ring groove, and the O-ring contact surface. A thorough examination of the O-ring and O-ring groove is not possible unless the O-ring has been removed.



**CAUTION!**

Use only the Sea & Sea brand silicone grease in the tube with a BLUE cap to lubricate this O-ring. Never use Sea & Sea silicone grease in a tube with a WHITE cap. Never use other brands of silicone grease to lubricate this O-ring, since they may impair the O-ring's sealing capability.

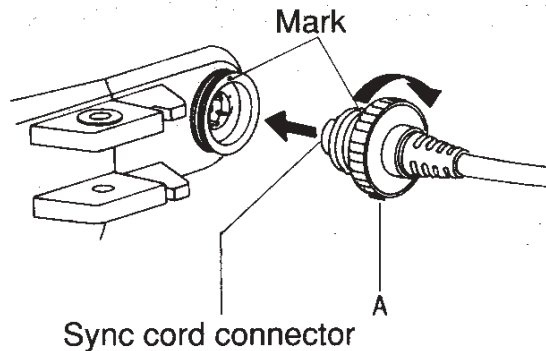
# Identification of Parts



## How to Connect the Sync Cord with the Strobe

The sync cords are detachable. One connector end mates with the strobe and the other with your camera or housing.

**Caution:** When attaching or detaching the sync cord, grasp the connector end, not the cord. Never pull, twist or bend the cord as that may damage the electrical wiring.



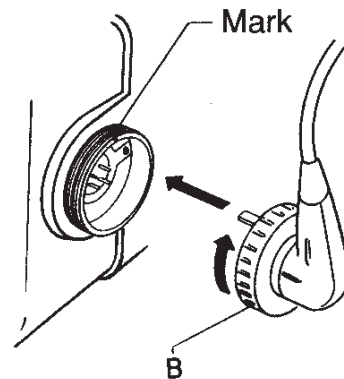
1. Examine the sync cord connector O-ring for cuts or debris. Lubricate the O-ring lightly.
2. Align the mark on the cord with the mark on the strobe. Insert the five-pin connector into the strobe's bulkhead connector and push in until the O-ring is seated. Rotate the threaded retaining ring (part A) clockwise until it is secure.

**To disconnect,** turn (part A) counterclockwise, then pull the connector straight out.

## How to Connect the Sync Cord with the Camera

### Four-pin sync cord (S) for Motor Marine II

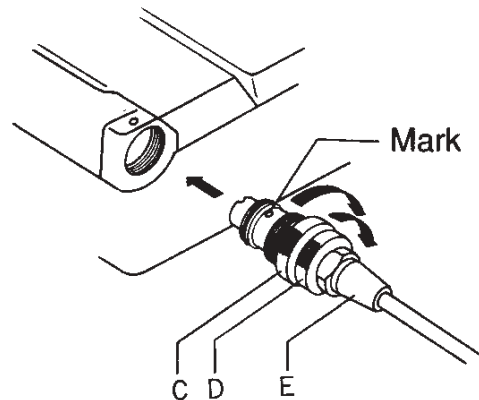
1. Examine the connector O-ring for cuts or debris. Lubricate the O-ring lightly.
2. Align the indexing pin on the cord with the notch in the camera's bulkhead connector, as shown. Insert the four-pin connector into the camera's bulkhead connector and push in until the O-ring is seated.
3. Turn the threaded retaining ring (part B) clockwise till tight.



**To disconnect,** turn the threaded retaining ring (part B) counterclockwise till loose and pull straight out.

### Five-pin sync cord (N) for Nikons

1. Examine the connector O-ring for cuts or debris. Lubricate the O-ring lightly.
2. Turn the large locking ring (C) counterclockwise until snug against the small ring (D).
3. Align the notch in the cord with the index mark on the camera's bulkhead connector, as shown. Insert the five-pin connector into the camera's

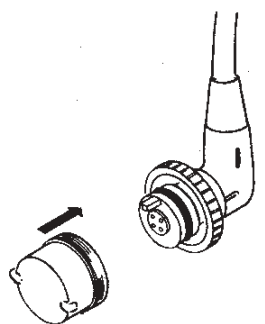


- bulkhead connector. Push the cord in until the O-ring is seated.
4. Rotate part (D) clockwise till secure.
  5. When connecting to a Nikonos III, turn part (C) till it securely holds the camera to the stay.

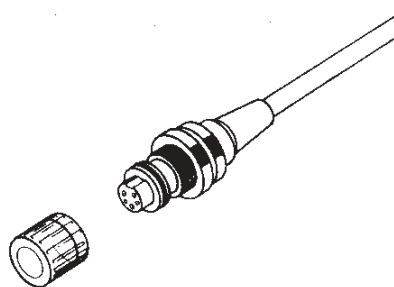
**To disconnect**, loosen and release the connector end by reversing steps 1-4 above. Pull out the connector straight out. When pulling out the connector, do it by holding part (E). Do not pull, twist or bend the cord.

**Note:**

- Do not touch the connector's contact pins with fingers. Be careful not to get silicone grease on the contact pins. It will impede its function. If grease does accidentally contaminate the pins, clean with alcohol.
- Whenever the sync cord is not connected to the camera and strobe, protect the ends of the cords and bulkhead connector with their plastic protective caps. Note: The cap for the end of the connector that attaches to the strobe is different from the end of the connector that attaches to the camera.
- Before rinsing a detached sync cord, be sure to put the connector caps on the exposed ends.



Sync Cord S



Sync Cord N

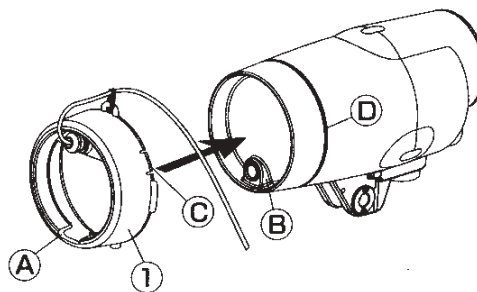
## Fiber Optic Cable

The YS-90DX can be dedicated to various digital camera housings by means of the Sea & Sea fiber optic cable (sold separately).

\* Some housings are not compatible.

## How to Connect the Fiber Optic Cable with the Strobe

1. Align the recessed part (A) of the fiber ring (C) with the TTL slave sensor (B). Push the ring onto the strobe until it clicks into the groove (D).

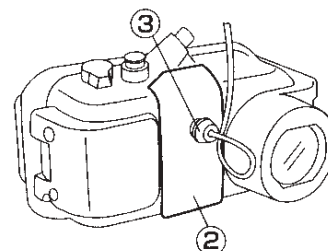


## How to Connect the Fiber Optic Cable to a Digital Camera Housing

1. Attach the strobe mask (2) on the housing in front of the camera's built-in flash.
2. Connect the fiber optic cable (3) to the strobe mask.

(See the instruction manual packaged with the Fiber Optic Cable for detailed instructions.)

- \* Remember to set the built-in strobe of the digital camera to the flash mode. The YS-90DX will not flash if the strobe of the camera does not flash.



## Using the YS-90DX with a Digital Camera

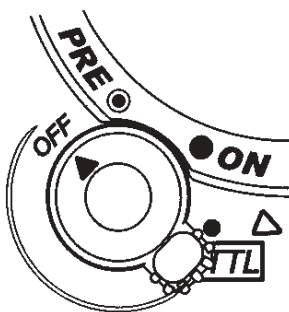
1. Depending on the design of your digital camera, set the power switch to the PRE or ON position. If your camera features a "preflash," make sure to set the strobe to PRE. Consult your camera's instruction manual.
  2. Set the slave mode switch to the ON position.
- \* Strobe will not flash if the slave mode switch is in the OFF position.
  - \* The diffuser cannot be used when a fiber optic cable is connected.

## Taking Photographs

The YS-90DX has three controls: the Power Switch, the Slave Mode Switch, and the Light Level Control Dial. You can operate this strobe in either manual mode or TTL with or without a sync cord.

### Operation of the Switches

#### Power Switch



**<OFF>** Turn the switch to the OFF position when not in use.

**<PRE>** This PRE position is for digital cameras equipped with pre-flash function.

1. Turn the switch to the PRE position if the built-in flash of your digital camera flashes twice in forced (manual) flash mode. The YS-90DX will synchronize with the second flash. It will fire with manual flash output, which can be adjusted with the light level control dial.

**<ON>** The ON position serves two functions:

1. It is used with digital cameras that do not have the preflash feature.
2. Activates the strobe for manual flash output. Flash output can be adjusted with the light level control dial.

### Manual Strobe Operation with Sync Cord

When connected with a sync cord, the strobe will be activated by the camera and will fire at full power when the light level control dial is set at FULL (GN22). Set the power switch at ON, the slave switch at OFF. Select an appropriate f-stop from the exposure calculation table on the next page. Since more light will be absorbed underwater, the guide number should be treated as  $1/2 \sim 1/3$  of that on land. GN11 is used to calculate the f-stops in the table (use as reference only). Flash output can be controlled by the light level control dial.

### Manual Strobe Operation without Sync Cord

For manual slave output without a sync cord, turn the slave switch to the ON position. Select an appropriate f-stop from the exposure calculation table on the next page. Since more light will be absorbed underwater, the guide number should be treated as  $1/2 \sim 1/3$  of that on land. GN11 is used to calculate the f-stops in the table (use as reference only). The YS-90DX will fire when the primary strobe fires. Flash output can be controlled by the light level control dial.

### Manual Strobe Operation with a Digital Camera (without a pre-flashing function)

Turn the slave switch to the ON position (the strobe will not flash at the OFF position). Select a desired strobe output using the light level control dial.

### TTL Strobe Operation

<TTL> When the power switch is set at the TTL position, the TTL automatic mode is activated. When the correct amount of light is detected for a proper exposure, the TTL confirmation lamp (green) will illuminate for approximately 3 seconds. If the subject is out of the proper strobe-to-subject range, the strobe will fire at full power and the TTL confirmation lamp will not light up. You will have an overexposure or underexposure. Recheck the distance and the aperture and shoot again.

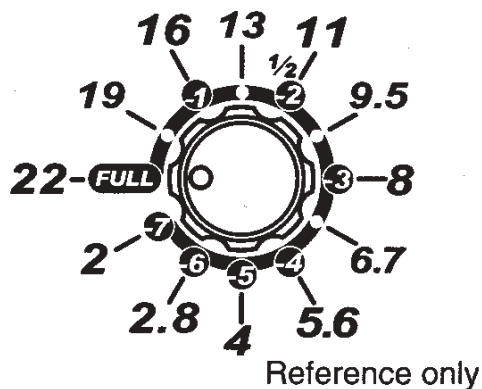
\*When the power switch is in the TTL position, the light level control dial is disabled. Note: The intensity of the light output will be automatically controlled regardless of the position of the light level control dial.

### Light Level Control Dial

Manual flash exposure can be adjusted in 12 increments with the light level control dial. The power switch must be set at the PRE or ON position.

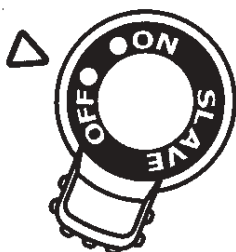
\*When the power switch is in the TTL position, the light level control function is disabled. Light intensity will be automatically controlled regardless of the position of the light level control dial.

Light Level Control Dial and Guide Number



The circled numbers in the figure represents the EV value. The 12 guide numbers shown are the f-stops on land (ISO 100/m). These f-stops are for reference only; adjust as necessary based on water conditions.

#### Slave ON/OFF Switch



**<ON>** In this position, the slave function is activated. Set the switch to this position when you want to use the strobe without a sync cord as a slave.

**<OFF>** In this position the slave function is disabled. Turn the switch to this position when you use the strobe with a sync cord attached or when you use the YS-90DX as your primary strobe.

Select a desired strobe light level using the 12-step light level control dial.

**Note:** If the slave ON/OFF switch is set at the OFF position and no sync cord is attached, the strobe will not fire even if the power switch is set at ON or TTL.

## Calculation of Exposure Value

Aperture = GN / Distance

\*Film speed: ISO 100

(Since more light will be absorbed underwater, the guide number should be treated as 1/2 to 1/3 of that on land.)

Guide number for multi-strobe lighting will be obtained by the following formula:

$$\text{Multi-strobe GN} = \sqrt{\text{GN}^2 + \text{GN}^2 + \dots}$$

### TTL Operating Range (reference only)

Aperture	ISO					Distance	
	400	200	100	50	25	m	ft
	5.6	4	2.8			0.7~3.9	2.3~13
	8	5.6	4	2.8		0.5~2.7	1.6~9
	11	8	5.6	4	2.8	0.3~1.9	1~6.3
	16	11	8	5.6	4	0.3~1.3	1~4.3
	22	16	11	8	5.6	0.3~1	1~3.3
		22	16	11	8	0.3~0.6	1~2
		22	16	11	0.3~0.5	1~1.6	
UNDER WATER EXPOSURE TABLE							

\*You may have to further adjust aperture from the above reference table depending on subject reflectivity, underwater conditions, visibility, etc.

### Exposure Calculation Table (reference only)

Calculated at Guide Number 11 (1/2 of land GN 22):

Distance (m)		ISO					Distance (ft)	
FULL	1/2	25	50	100	200	400	FULL	1/2
0.2		22					0.6	
0.3		16	22				1	
0.5	0.2	11	16	22			1.6	0.8
0.6	0.3	8	11	16	22		2	1
1	0.5	5.6	8	11	16	22	3.3	1.6
1.3	0.6	4	5.6	8	11	16	4.3	2
1.9	1	2.8	4	5.6	8	11	6.3	3.3
2.7	1.3		2.8	4	5.6	8	9	4.3
3.9	1.9			2.8	4	5.6	13	6.3
		Aperture						

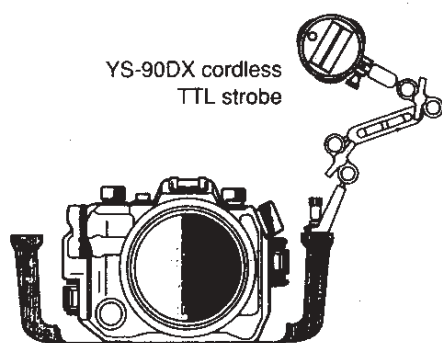
\*You may have to further adjust apertures from the above reference table depending on underwater conditions and visibility, etc.

## About Cordless TTL Photography

### What is a cordless TTL system?

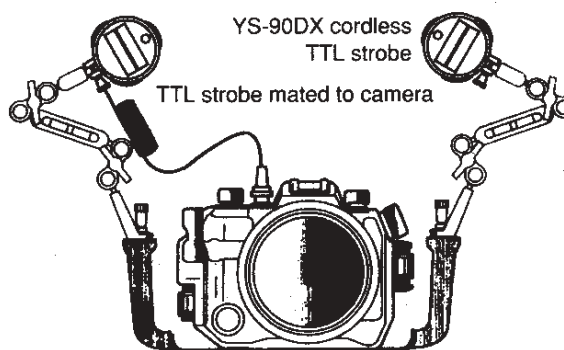
In dual strobe photography, the YS-90DX operates as a second TTL strobe when a master strobe in TTL mode is mated to the camera. It is capable of automatic TTL operation without a sync cord. To activate the YS-90DX's TTL system, turn the power switch to TTL and the slave mode switch to ON.

When you trigger the camera shutter, the master strobe fires, triggering the YS-90DX in TTL slave mode. The TTL circuitry within the camera limits the light from the master strobe, which in turn limits the light from the YS-90DX, thus yielding a correct exposure.



**WRONG**

(Single Cordless TTL Strobe)



**CORRECT**

(1x Coded/1x Cordless TTL Strobe)

### Notes on using the YS-90DX as a cordless TTL strobe:

1. To use the YS-90DX as a cordless strobe, you need another TTL strobe connected to camera. The YS-90DX operates only as a slave strobe and cannot perform cordless TTL photography alone.
2. Please observe the distance ranges shown in the TTL operating range table in this manual. Correct exposures cannot be achieved if the subject is out of range.
3. The master strobe's guide number must be equal to or higher than that of the YS-90DX. (If it is less, the YS-90DX may not yield a correct exposure.)

# Diffuser

## How to Use the Diffuser

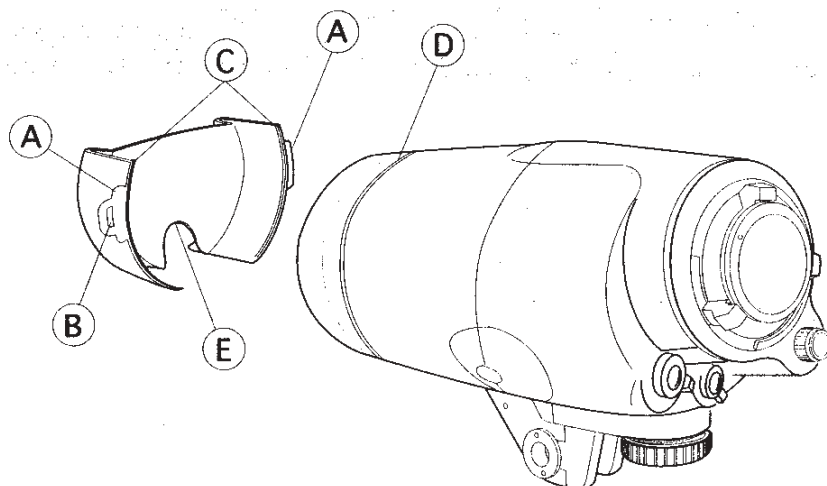
- This diffuser reduces the guide number of the YS-90DX to 16 on land (ISO 100/m) and 8 underwater (ISO 100/m). Open up by one f-stop when using this diffuser.
- Always rinse the diffuser with fresh water after use.
- Always dry the the diffuser with a soft cloth after rinsing.
- Do not subject this diffuser to extreme heat, such as on a car dashboard, or to direct sunlight.

## Attaching and Removing the Diffuser

1. Hold part (A) with your fingertips and press onto the front of the strobe. Two rims (part C) must fit snugly into the the groove (D) on the strobe.

### ⚠ CAUTION!

2. Always make sure that the two rims are fitted securely into the groove. The diffuser may come off and be lost or damaged unless it is securely attached.
  3. To detach the diffuser, hold part (A) with your fingertips and pull the rim (C) off the groove (D) at one side and then at the other side.
- \*To prevent loss of the diffuser, should it come loose from the strobe, thread a tie through the hole (B) and attach to the Sea Arm or Sea Arm bolt.



## Specifications with Diffuser

Beam angle (land): 105° vertically x 105° horizontally  
Guide number (land): 53/16 (ft/m)  
Color temperature (land): 5100° ± 300° K

## Maintenance and Storage

1. After use, rinse well with fresh water. Be sure that all protective caps and covers are securely in place.

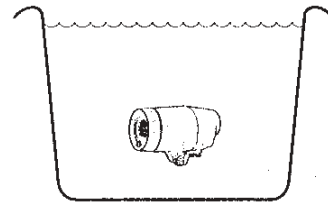
2. After rinsing, dry with a clean, soft cloth

**Note:** Do not use heater or hair dryer to dry the strobe.

3. Remove batteries after use. Be sure the battery compartment cover is completely dry before opening; be careful not to let water drip into the battery compartment. If water penetrates the battery compartment, dry immediately.

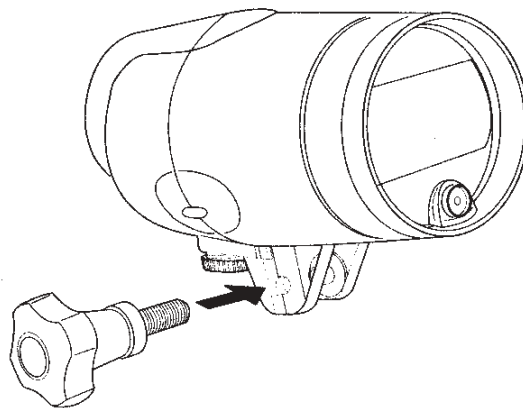
4. After use, lubricate the connector O-ring and cover the connector ends with their plastic caps.

5. When storing the strobe for a long period, take care not to expose the strobe to high temperature, high humidity, direct sunlight or extremely low temperature.



## Attaching the Arm Fixing Bolt

Insert the fixing bolt through the non-threaded side of the Sea Arm mount. With the arm correctly positioned, push the fixing bolt through the arm, then screw in to the threaded side of the Sea Arm mount till secure.



## Specifications

### Controls and Functions:

Operation:	Power Switch: OFF, PRE, ON, TTL Slave Mode Switch: ON, OFF Light Level Control Dial: GN22-GN 2
Indicators:	Ready lamp (Red LED lights up when charging is complete) TTL confirmation lamp (Green LED lights up for approximately 3 seconds to confirm a correct automatic exposure)
Guide Number:	22 (land, ISO 100/meters)
Beam Angle:	105° × 95°
Color Temperature:	5400°K +/− 300°K (full power) 5100°K +/− 300°K (with diffuser)
Recycle Time: (full power)	Approximately 6.5 seconds with AA alkaline batteries Approximately 4 seconds with AA Ni-Cd batteries Approximately 4 seconds with AA lithium batteries
Battery Requirements:	4 AA alkaline batteries (1.5V × 4 = 6V), or 4 AA Ni-Cd batteries (1.2V × 4 = 4.8V) or 4 AA lithium batteries (1.5V × 4 = 6V)
Battery Life: (full power)	Approximately 120 flashes with AA Ni-Cd batteries (at 700mA) Approximately 200 flashes with AA alkaline batteries Approximately 300 flashes with AA lithium batteries
Depth Rating:	60m (200 feet)
Dimensions:	115mm(H) × 88mm(W) × 160mm(D) (4.5 × 3.5 × 6.3 inches)
Weight:	740g (land), −60g (underwater), including batteries
Sync cord:	Detachable
Accessories:	4 AA alkaline batteries, Sea Arm fixing bolt, silicone grease, O-ring, diffuser, TTL operating range decal, exposure chart decal