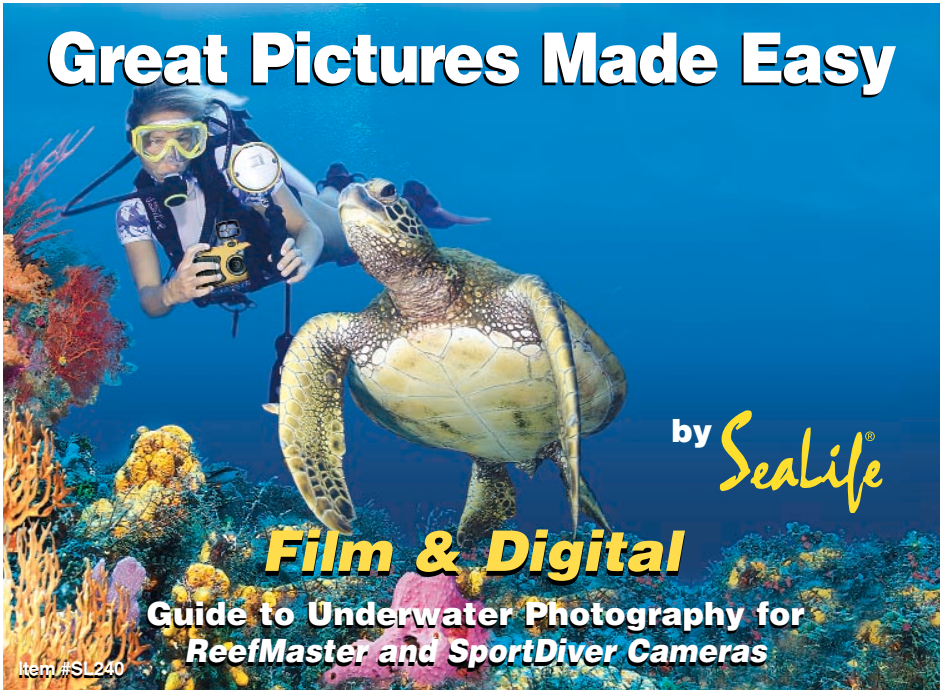
Great Pictures Made Easy



by Sealife®

Film & Digital

Guide to Underwater Photography for *ReefMaster and SportDiver Cameras*

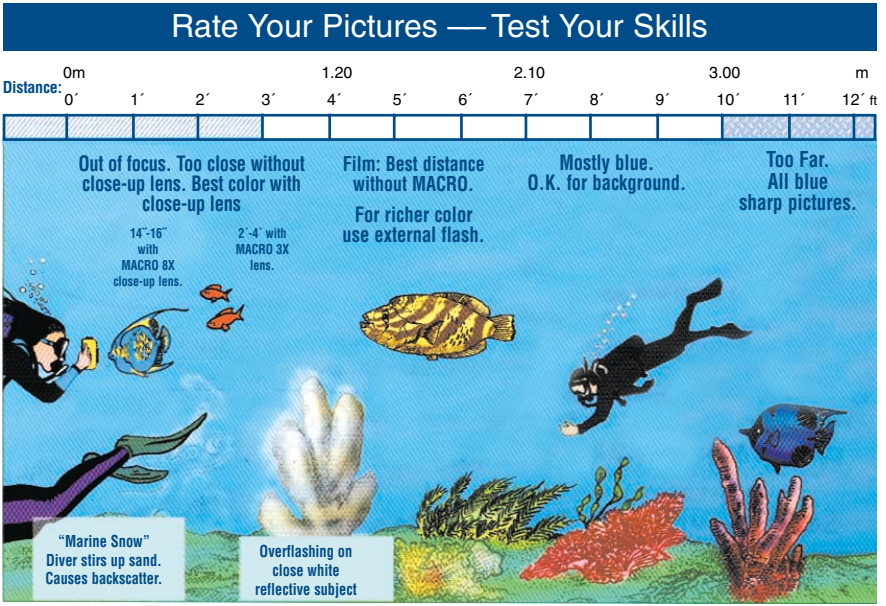
Item #SL240

Contents: PAGE

Warning: Before operating these cameras you must read and understand this manual. For updates to this manual visit www.sealife-cameras.com.

Send your suggestions regarding this manual to:

Pioneer Research
Attn: Sealife Manuals
97 Foster Rd, Moorestown, NJ 08057
info@pioneer-research.com



Proper shooting distance chart for all Sealife cameras

I. Summary: Troublefree Operation and the Key to Good Results

a. Key to trouble free operation:

Good care and extreme cleanliness of O-rings and sealing areas. Absolutely dry conditions when opening the camera. Load camera into housing in dry cool air, best in air conditioned room. Insert SeaLife anti-fog desiccant. Apply a drop of anti-fog lotion on inside of housing lens. Test camera before use (before inserting film). Follow proper film loading procedures. Use fresh AA batteries for 8 rolls of film and only SeaLife **NiMH batteries freshly and fully charged** for two **subsequent** dives with ditigal cameras. Do not replay your pictures between dives using up battery power. Use either type battery in the external flash(es) for about 100 shots. Use only approved memory flash cards, best SeaLife CF cards, 32 MB or better 128 MB. See Trouble Shooting Guide on page 50.

b. Key to good pictures:

Crystal clear water! For film cameras: shooting distance u/w 4 ft. to 5 ft. / 1.2 to 1.5 m. Better 2 to 4 feet and 3x macro lens. (Recommended also for digital cameras to improve colors). For digital cameras: shooting distance u/w 2 ft. to 5 ft./ 0.6 m to 1.5 m. FLASH READY light on. Be calm and patient and move very slowly. Hold camera steady. External flash(es) always get you the best pictures, especially below 30 feet/10 m or in darker light. **Shoot the same scene several times with different distances.**

Maximum depth ratings: ReefMaster Film: **164 ft. / 50 m**. SportDiver Film: 120 ft / 36 m. ReefMaster DC200 Digital 200 ft / 60 m, DC100 **100 ft. / 30 m.**

Film: ISO 200. Use ISO 100 print or slide film in extremely bright conditions, on beaches or snorkeling. **Processing:** Tell your photo lab that you're developing underwater pictures and to increase red and yellow as needed to balance the picture color. Request sample prints.

II. The Difference Between Film and Digital Cameras

In this guide you will learn the basics of underwater photography as well as how to enjoy your camera, easy and trouble free. You will be able to compare our digital and film cameras side by side. Much applies to both types of cameras, but the differences are pointed out and highlighted. If you have a film camera you will easily understand digital photography and perhaps appreciate your film camera even more; and if you have just bought a digital camera, it will be much easier for you to learn digital photography by comparing it with film cameras in every step. It will be well worth your time to read the whole text for both camera types. You will find some repetition: We start with a very brief summary of the key facts, then you read a Quick Guide, and then a more explicit version with picture examples.

The **fundamental advantages** of either system are well known: **Digital** does not need film, so with a large enough memory card, you can click away; a whole vacation without buying film. You can instantly see your picture, and - unique to SeaLife - you can instantly delete a picture, so you come home with only good pictures; you can show them on the TV set in the hotel lobby during cocktail hour, or email pictures from your laptop instead of sending postcards; and finally, you can edit and archive your pictures and create fascinating vacation stories.

Well, in today's digital world, you can do most of this with **film** too. The biggest advantage of film is that you are used to it, and less things can go wrong. Great pictures can not be made easier, if you have the patience to go to a photo lab. They can give you even a CD with your digitized film pictures.

But besides these general differences, SeaLife research has developed unique special

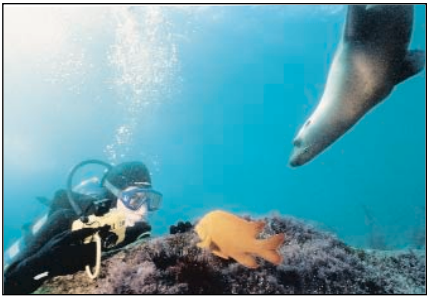
differences. Each camera type has a very unique **exposure program**, developed for underwater, but also usable on land. This beats any land camera trying to also take underwater pictures. SeaLife film cameras have a fixed exposure system. The advantage is that it is faster, easier to use, and produces great pictures in most underwater light conditions: Short exposure time, large aperture, fixed focus lens, flash is always on underwater. Designed so you cannot go wrong.

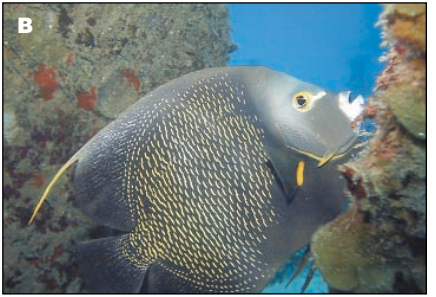
SeaLife Digital Cameras, however, have a computerized exposure system that evaluates the picture and then chooses the best combination of aperture, exposure time, “film” speed (sensitivity), flash or no flash. SeaLife is the first camera company that has specifically researched and developed an automatic underwater exposure system. This sounds great, but since it gives you more options, you need to understand it to get great results. Before you begin, you set the camera to one of 3 modes: Land, Sea, or External Flash. Sea mode will try to get the best picture without external flash. If it is dark, sea mode will work with a long exposure time of 1/42 second, and a large aperture of 2.8. This means you have to hold the camera very steady, when using sea mode. You see your picture and are asked “Delete?” By pressing the shutter button within 3 seconds again, the picture is gone. Note, that the picture you see was taken 1/4 of a second before the actual picture. The camera puts out a “pre-flash”, which tests the light condition, reprograms the exposure, shows you the pre-picture and then takes the real picture. This is different in the External Flash Mode: There is no pre-flash, the camera evaluates only the existing light, fires the internal and external flash, processes the actual picture you took (message: “processing”), and then shows you the actual picture with the question “Delete?”. The external flash allows a shorter exposure time, since there is more light, (besides of capturing richer colors).

Light and good visibility are the key to underwater photography, therefore an external flash will always improve your pictures, film or digital. Don't let the greater number of buttons of the digital camera confuse you. Most you do not need. Underwater you only need two: The shutter button and the power button.

Power is a major difference: You can take 8 rolls of film with 2 Alkaline batteries, and they will stay fresh in the camera for at least 6 months. But the digital cameras are so power-hungry that you have to recharge your batteries every night, you cannot even use regular batteries. Most power is consumed by the monitor, which you can turn off on land, but underwater it is too important to be turned off. Fully charged SeaLife batteries will get you through two dives, if you manage the power wisely. That's why we have built in the automatic power save mode and the power on/off button.

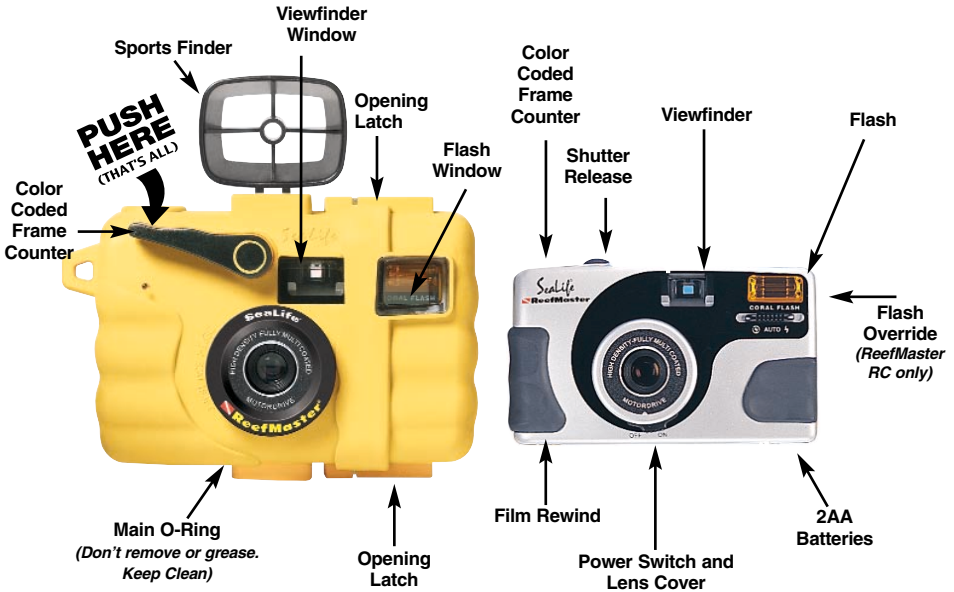
Some people say, digital photography is more difficult. But the truth is that you have to familiarize yourself with any new camera. The good thing is, that you can experiment and take dozens or hundreds of pictures without limitation of film. So, the most important method to take great pictures has remained the same: Just do it, try everything and you will become a master in no time, and have fun.





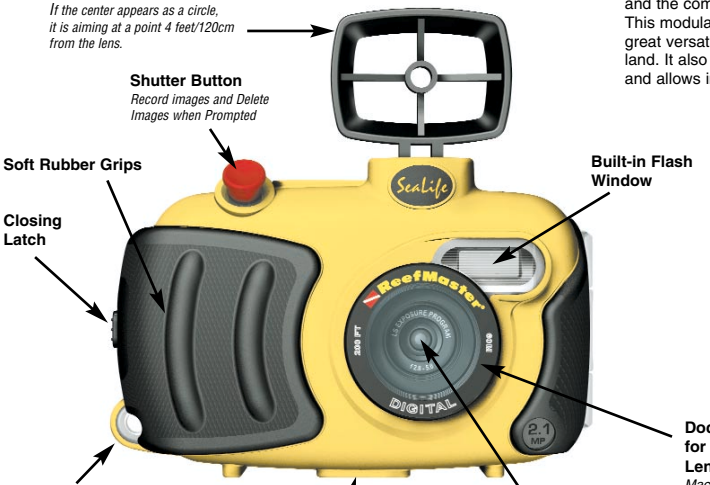
Film or digital? Take a great land shot.
A is film, B,C,and D are digital.

External Flash Mode (B) and Sea Mode (D).



Applies to SeaLife ReefMaster® RC, CL and Sport Diver

SeaLife Cameras consist of 2 parts: The waterproof “Housing” and the compact “Inner Camera”. This modular design gives you great versatility underwater and on land. It also makes cleaning easy and allows inexpensive service.



Applies to all ReefMaster® Digital Cameras

III. Tips for Great Pictures

1. Just do it!

One of the best ways to learn about underwater photography is to just do it and learn from your best shots and from mistakes. Even the best photographers have taken countless bad pictures… that's the way they became better and better. Here is the trick: Just shoot anything in front of your lens in a variety of conditions, distances, colors, objects etc. Then look at every picture and take a note of what's good or bad about the shot. We evaluated several thousand pictures and found that even amateurs can take great pictures by simply avoiding a few common mistakes. (For the most common errors see the picture examples on pages 13 - 16.) You will be surprised that among your snapshots you will find some award-winning pictures. Put the good ones in an album. But keep one bad shot of each typical error. After a while you will achieve good control and even perfection. Digital SeaLife cameras allow you to take several shots of the same subject and to delete the bad pictures instantly.

The best pictures are taken with a close-up lens which also acts as an underwater filter.. The SeaLife MACRO 3X Close-Up Lens has a distance range from 2ft. - 4 ft/60 - 120 cm. In lower water visibility, the SeaLife Close-Up Lens is a must. The key to good pictures is to get close. The reason is that water absorbs more light than air. In air you could see up to 30 miles, in water your eyes can see 100 ft. at most, but a cameras can see less than half of that and much less red and yellow than your eyes.

2. Capture the Magic

What do you want to capture on film? What attracts you to underwater photography? What scenes are so breathtaking that people say "this is so unbelievable, I wish I had a camera to show this to my friends"?

You will encounter strange creatures, see incredible effects of light and colors, explore wrecks, corals and plants that appear as if they were from a different planet, while you float effortlessly through space without gravity.

And after years of adventures with your SeaLife camera you will look at your albums, perhaps even at an impressive gallery of framed enlargements. And it may be only then that you discover the real treasure that you found with your camera: You have learned to use your eyes to see and experience the underwater world, one of the greatest miracles on earth.

As the manufacturers of SeaLife we believe that an easy-to-use underwater camera will help millions of divers and non-divers to experience and see a part of our world which is essential to our survival.

And we hope that you will enrich and enlighten your life by capturing valuable impressions in the underwater world with your SeaLife Camera.

3. The Great Hunt

While you hunt for a big strange fish or a good shot of your buddy with a stingray, always include the underwater magic in your pictures.

Get a mystic blue **background**, an interesting little red fish and yellow coral in the **foreground**. These color contrasts will add **depth** to your pictures.

Capture rising air bubbles against the reflections of the surface water. This will indicate motion.

Use the walls of a canyon as a **frame** for your object, look for **contrasting** colors, bizarre shapes, towering kelp forests, subtle shades of water colors, sand and rock, wild structures, or dark shades of a wreck penetrated by spears of sun rays.

The primary target for most people is, of course, a good picture of yourself and your friends surrounded by tropical fish. This is actually the easiest part.

A diver should be only 5ft./1 50 cm. away for a good picture. Portrait shots of diver and fish are best taken at 2ft. to 4 ft. with the snap-on MACRO 3X close up lens. Use the MACRO 8X lens for extreme close-up of 14" to 16" / 36 cm to 41 cm. For larger objects such as group shots or sharks use the SeaLife wide angle lens at distances of 3 - 5 ft. / 90-150 cm.

You may chum for fish with bits of food, but pick something that does not fall apart and cloud up the water (for example, bread dissolves and clouds up the water). Check with a local dive master to select chum that does not endanger the fish.

Be very calm and patient, and let that curious fish get closer and closer. There are two ways of using current to your advantage: 1. Drift motionless along with your camera in ready position. 2. Stay in a camera-ready waiting position, approach your subject facing the current.

Always take notes of your pictures and mark your films or create a digital dive log with pictures on your computer. It is very exciting to document every fish in your area in an album.

Once you have some expertise you might start to take slides and put a presentation together, possibly combined with music and video for dive clubs, schools and friends. Scan your best film pictures and use them just like digital images.

4. Great Effects

Everything about seeing and taking pictures is about light. Pay attention to **light and shade, colors and contrasts**, don't just get mesmerized by that big fish.

continued on page 17

Good & Bad Pictures

a) Stay within the ideal distance

Distance 6 ft. /1.80 m, regular lens, shallow, sunny

Distance 3 ft. /90 cm with MACRO 3X close-up lens

2 ft., too close for film camera

Distance 4 to 5 ft., regular lens

Distance 8 ft., too far

Good & Bad Pictures

b) Crystal Clear Water

No matter what equipment you use, good underwater pictures require crystal clear water. (It is important to remember that the human eye can see more detail than any camera.)

Avoid floating particles stirred up by currents, waves or divers.

Back scatter of the internal flash from sand.

Low visibility is caused by small particles, like algae. Use the MACRO 3X lens at a distance of 2.5 ft/75 cm or the Macro Set from 8 to 16" / 20 to 41 cm.

Low visibility

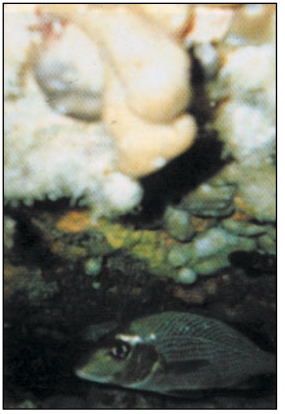
Visibility better than 50 ft./15m (horizontally) gives you the best pictures. Shoot at the ideal range, 4 to 5 ft./1.2 to 1.5 m. or even closer with a macro lens.

Perfect visibility

Good & Bad Pictures

c) External Flash: The purpose of a U/W flash is to bring out colors at the ideal shooting range, not to illuminate objects at longer distances. Also, with the digital camera the external flash affords a shorter exposure time, resulting in sharper pictures.

Distance 4 ft., In dark cave. (regular lens, double ext.flash)



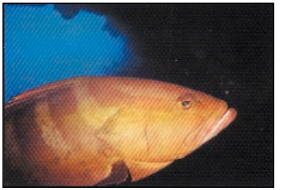
Overflash on close object. (regular lens, ext.flash,) also aimed too high)

The MACRO lens/uw filter corrects color and moderates the flash (2 ft. / 60cm)

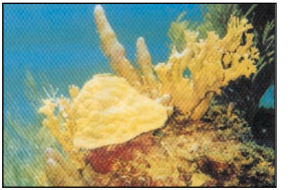
Good & Bad Pictures

d) Composition: Look for good color contrast between object (fish), surrounding (coral) and background (water). Look for exciting shapes.

Great shot, but poor contrast



Good contrast (with MACRO 3X close-up lens)



Interesting Coral Shapes (with regular lens)

e) Color correction: UW filter, macro lens, special processing, or editing are ways to increase yellow and red. *Request to see sample prints at your photo lab.*

Below 30 ft/10 m most yellow and red is absorbed by the water, leaving only blue.

Here the photo lab added yellow and red. Digital images can be edited on your computer

Your best colors and effects will be where the sun still penetrates the water: Dive or snorkel at a **vertical sun from 10 am to 2 pm in a depth not greater than 25 ft. / 8 m.**

Each depth and light condition has its own attraction. Experiment and capture different effects at different depths and scenes. **In crystal clear tropical waters** you will get great turquoise water colors to a depth of 20 ft. / 7 m, then an intense blue, and a wonderful deep blue beyond 40 ft. / 12 m. In the SeaLife ReefMaster RC film camera the built-in "Coral Flash" will intensify red and yellow colors of close objects (4 ft. to 6 ft. / 1.2 m to 1.8 m) and leave the blue background untouched. Color corrected macro lenses will intensify the warm colors (red and yellow) even more and moderate the flash.

Look for **rich color contrasts**. You may use the Sealife External Flash to add color and brightness. To really illuminate coral or any area further than 5 ft., you cannot just increase the power of your flash, but you must position one or two external flashes sideways of your lens and direct it at an angle of 20 to 30 degrees at the object. If the water is not as clear as you may wish, choose closer objects. Use 1 flash for high contrast, and two for even illumination and rich colors. The MACRO 3X Close-Up lens can be used for distances of 2 ft. to 4 ft. / 60 cm to 1.2 m, the MACRO 8X lens for 14" to 16"/35cm to 40cm.

Just a black **silhouette against the bright water surface** can make a dramatic shot.

A "halo" effect can be created by the sun or a light source behind a person or a sea creature.

In bright conditions on land or in snorkeling use ISO 100 print film or ISO 64 for slides. A secondary **strobe** can be used to reduce "marine snow", caused by the flash hitting microscopically small particles like algae or plankton. The primary flash of the camera must be covered with a flash reflector which reflects the light towards the external flash sensor and not directly towards the target. SeaLife Macro Lenses also help to reduce marine snow.

For pictures partially above and under water, coat the lens with a touch of detergent to let drops run off. This can take many trials until the water surface is exactly on the center of the lens.

5. Inspiring Books
Visit the website www.sealife-cameras.com and see pictures, links, and the latest SeaLife publications on underwater photography. Every dive or photo dealer with an underwater camera department will have some worthwhile books on underwater photography. An illustrated reference book should be your constant companion as well as this manual. Keep it inside your SeaLife Dry Box. The best book, however, is the one you yourself compose.

6. An U/W photo course can be very enjoyable.
Ask your dive instructor. Your dive store also offers a variety of trips with “Underwater Photo Safaris” to the world’s most beautiful reefs in good company and with a knowledgeable guide.

IV. Quick Tips

1. Quick Setup of camera

A) **All camera models:**
Keep everything clean and dry. One drop of water inside the housing can cause the front lens to fog underwater.
Use SeaLife Anti-Fog Desiccant and a drop of anti fog lotion inside on the housing port. Load the camera in dry, cool air, best in an air conditioned room.

B) **Film camera models:**
Use 200 speed 24 exposure film and 2 fresh AA Alkaline Batteries. Replace batteries if "Flash Ready" light takes more than 15 seconds to recycle.

- Turn camera power ON (below lens of inner camera.)
- Before loading film, push shutter button once to test camera advance.
- Insert film roll. Make sure roll is properly seated onto rewind shaft.
- Pull film tab over and into take-up spool and press shutter button until film engages. Film should lay flat across film plane and sprocket teeth.
- Close film door. If the film door is obstructed by film roll, remove and re-insert roll until film door closes without any obstruction.

With camera power on, insert loaded camera into housing. Keep camera and inside of housing dry.

C) Digital Cameras:
Insert freshly and fully charged SeaLife NiMH batteries.
Lithium AA batteries may also be used. They're expensive but last twice as long.
Set camera to Sea Mode, External Flash Mode or Land Mode.
Camera power shuts off automatically after about 2 minutes.

D) Underwater, the Flash is always ON in all film models. The flash of digital cameras is automatic in the SEA mode and always on in the EXTERNAL FLASH mode. An external flash always enhances colors. Wait for FLASH READY light to turn on after each picture (about 8 to 10 seconds).

E) On land, outside the housing, the flash is automatic. The ReefMaster-RC film camera allows you to manually override it by holding the switch in the ON or OFF position while you are shooting. Digital models allow several flash modes.

F) Making prints: Film: Tell your processing lab that you have underwater pictures. Ask your lab to increase red and yellow until colors are balanced. Have your lab make a few proof prints with different settings. Digital: Use only the best photo glossy paper.

G) For best pictures use SeaLife Macro and Wide Angle lenses and external flashes.

SeaLife accessories can be used for digital as well as for film camera models.

2. Set up Housing

A) All models:

Inspect and clean O-ring before sealing camera in housing.

Close housing carefully. Make sure that the Moisture Muncher or any other debris does not obstruct O-ring.

Do not apply any force to the housing, lid, buttons, or trigger in order to avoid flooding the camera and housing.

Camera goes into power save mode after about 2 minutes. To reactivate, press shutter lever lightly.

B) Digital models

Keep power off as much as possible. Turn power on only before taking pictures.

3. Best Pictures

A) The clearer the water the better the picture. Visibility must be at least 10 times shooting distance. Algae, plankton, sand or microscopically small particles suspended in the water cause cloudy pictures or “Marine Snow” (backscatter of the flash). Shallow depth and vertical bright sunlight around mid-day will result in brighter, more colorful pictures.

B) Shooting Distance: Film: min. 4 ft. / 1.2 m, best: 5 ft. / 1.5 m, digital: 2 - 5 ft / 60 cm - 1.20 m. Measure your distance “Chin to Fin” and use as a reference in practicing your judgment of underwater distance. MACRO 3X close-up lens has 2 ft. to 4 ft. focus range, (stretch out your arm and fingertips). MACRO 8X close-up lens has 14” - 16”/ 36 - 41 cm focus range, and MACRO 16X 8 to 9” / 20-23 cm, which is best measured with the “Macro Wand” (enclosed with the Macro Set).

C) Move calmly. Hold the camera steady. Aim through the sports finder on top of the camera or the monitor at the digital camera.

D) Underwater, the Flash is always ON for enhanced colors. Wait for FLASH READY light to turn on after each picture (about 10 seconds).

E) On land, outside the housing, the flash is automatic. The ReefMaster-RC allows you to manually override it by holding the switch in the ON or OFF position while you are shooting.

F) Tell your processing lab that you have underwater pictures. Ask your lab to increase red and yellow until colors are balanced. Have your lab make a few proof prints with different settings. Note: There are great variations in picture quality between different labs depending on the processing machinery and corrections made to prints.

For great close-up pictures; ask your dealer for the SeaLife MACRO 3X lens or Macro Set.

3. MUST DO!

Very Important: Not following these points may void your warranty.

All Camera Models

A) Before opening the camera housing: Everything, including your hands, arms, dive suit, head must be ABSOLUTELY DRY: Have a dry towel handy. Change film or batteries in an air-conditioned or dry, cool room if possible. Insert the 1.5 g Moisture Muncher Capsule to prevent fogging. (See page 30). One drop of water in the housing may cause the lens to fog.

B) ***The ReefMaster O-ring sealing area must be absolutely flat, smooth and clean. DO NOT REMOVE or GREASE O-RING!*** Follow O-ring care instructions on page 29.

C) After use and before opening immediately **wash closed camera housing in fresh water** and **dry well**. It's normal for some water to become trapped between the ReefMaster armor and housing. This will not cause any damage and eventually dry. Also periodically wash open housing without inner camera. After washing, dry well. Clean lenses with cleaning pads lightly soaked in detergent and water, then rinse and dry. Do not let drops dry on lenses.

D) Use the unbreakable airtight **SeaLife Dry Case** for dry storage with a large 1 oz. Moisture Muncher Pack and for transportation on boats, airplanes, trucks etc. The life-time of batteries as well as the camera and other tools or electronics will be greatly extended. (See page 39.)

MUST DO! - Digital Cameras

A. Use only the following AA batteries: SeaLife Nickel Metal Hydride (NiMH) 1800mAh or higher rechargeable batteries. Carefully follow charging instructions.
   • Lithium non-rechargeable batteries. Lithium batteries last the longest of all batteries but they are expensive and they are not rechargeable.
   • We do not recommend using Alkaline batteries due to their short battery life, however new high-energy alkaline batteries, like Duracell Ultra, have a longer battery life and can be used with the SeaLife digital camera for 1-2 dives. Even high-energy alkaline batteries do not last as long as SeaLife Ni-MH batteries. Do not use standard alkaline batteries.
   • Charge batteries when battery power status indicator on camera is down one bar.
   • Turn camera power or LCD monitor OFF when not using camera to preserve battery power.
   • Always use freshly charged batteries. Batteries can discharge at room temperature up to 10% per day. Store batteries in plastic bag or container in refrigerator or cool, dry place.

B. Install the camera driver. You need to install the Photo Suite Imaging Software only if you do not want to use your existing picture editing software. Follow the correct computer connect sequence to download pictures:
   • First power up computer and connect USB cable to computer.
   • Turn camera power ON.
   • Turn Operating mode dial to PC.

continued on next page

- ONLY THEN connect USB cable to camera.
- Locate pictures in “Removable disk (:)” under “My Computer.”
- Some operating systems may require a few minutes before the camera connection is established.

C. Use only the following brands of Compact Flash memory cards:
- SeaLife®, SanDisk®, Kingston®, Lexar®, Ritek® and Pretec®. For other brands check www.sealife-cameras.com.

D. Keep main O-Rings and housing perfectly clean.
- Clean housing and main O-rings with fresh water after every use.
- Do not remove O-rings. Do not grease.
- Store camera and housing only after careful cleaning and when totally dry.

E. Never let any moisture or dirt get inside housing when opening.
- Only open and load the housing in dry cool air, such as inside an air-conditioned room.

F. For good underwater pictures you need:
- Clear water conditions.
- Control your buoyancy before taking picture.
- Get as close as possible to subject (ideal distance is 2’ to 5’).
- Make it a habit to use the SeaLife Macro Lens/Filter for superb details and vibrant colors.
- For best underwater pictures, use External Flashes and snap-on Macro or wide-angle lenses.

V. How easy it is... your new SeaLife Camera

Most important: When opening the housing, your hands, arms, head, dive suit, and the camera must be **completely dry and clean of water, sand and dust**. Always load your camera in an air-conditioned or dry cool room.

Film: Open both latches

Digital: Push finger into rubber cover and lift latch

Remove Inner Camera: All Models

Remove the inner camera from the housing and insert fresh AA batteries. For digital cameras use only SeaLife NiMH (1800 mAh or higher). Make sure the lenses of the camera and the housing are clean and dust free.

RC, CL and SportDiver

Digital Models

Remove the inside camera

Film/Digital

Insert 2 fresh AA Alkaline batteries in film cameras and 4 freshly charged SeaLife NiMH batteries in digital models. Take a spare set along.

Turn Power On:

Turn **Power** on in **film cameras** before inserting camera in housing: Open the **lens cover** by moving the switch below the lens of the inner camera. This will also turn the power on. Push the shutter release to test power (without film).

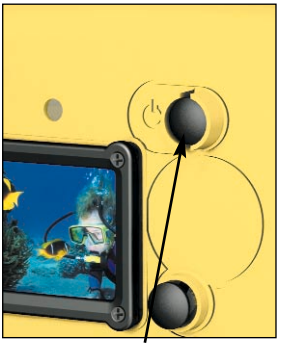
35mm

Power and lens cover switch in film model

35mm

Open film door by sliding down latch on back of inner camera.

Digital



Turn the power on in digital cameras only when taking pictures to conserve power. Insert flash memory card (8 MB memory is built in).

Loading film - Film Cameras

a) Use 200 speed 24 exposure film and 2 fresh AA Alkaline batteries. Replace batteries if “Flash Ready” light takes more than 15 seconds to recycle.

b) Turn camera power ON (below lens of inner camera.)

c) Before loading film, push shutter button once to test camera advance.

d) Insert film roll. Make sure roll is properly seated onto rewind shaft..

e) Pull film tab over and into take-up spool and press shutter until film engages. Film should lay flat across film plane and sprocket teeth.

f) Close film door. If the film door is obstructed by film roll, remove and re-insert roll until film door closes without any obstruction.

g) Push Shutter button to advance film to picture “1” in the frame counter window.

h) You might advance film by one frame with the film door open to check proper advance and position of the film.

Loading a Flash Card - Digital Cameras

Even though the camera has an 8 MB built-in memory, you should use a high capacity flash card with 32 or better 128 MB on your vacation.

Close door. If hatch does not close easily, film cartridge is not in correct position.

Advance until frame counter reads 1. Film counter turns red 4 frames before end of film.

Inserting a flash card must be slowly and carefully.

Clean O-ring / Seal Area: All models

The waterproof seal is the most critical part. It must be kept meticulously clean. You must check the O-ring area for **sand, dirt, hair etc**. **It is best to rinse with fresh water (do not use detergents)**. Dry thoroughly with clean, lint-free cloth. Important: **remove inner camera before washing.**

Wash the O-ring and let dry.

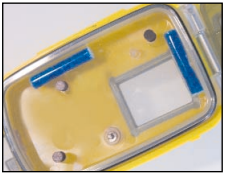
Do not remove O-rings.

Clean off O-ring with brush provided.

The O-ring should never be greased or removed. If the O-ring shows signs of damage have it replaced by an authorized SeaLife Service Facility. Ask your dealer or contact Pioneer Research (see back cover) or your country's distributor.

Film Cameras

Digital Cameras



Insert SeaLife Anti Fog Desiccant. This will prevent fogging of the lens and protect the electronics from humidity. The small 1.5 g capsule fits between 2 ribs of ReefMaster film camera models and 2 cartridges clip into the housing of digital cameras. Do this in dry air without delay since Moisture Muncher will absorb moisture immediately once you open the air tight package. It is best done the night before the dive so Moisture Muncher has enough time to absorb all the humidity inside the camera. Whenever possible, load the camera in dry air, such as in an air conditioned room.

Digital cameras should not be opened in humid air. If you have to change film in tropical, warm or humid air, make sure you insert fresh Moisture Muncher Drying Agent to prevent fogging. Always take a good supply of Moisture Muncher with you when you go on vacation. The larger 28 g / 1 oz. size is recommended to keep the inside of your airtight SeaLife Dive Travel and Accessory Case, tools and batteries completely dry and free from mildew and corrosion. SeaLife desiccant capsules for digital cameras and the larger, 28 g / 1 oz. Moisture Muncher Bag (used in SeaLife Dry Case or other closed container) contain a color indicator. Rub one drop of antifog lotion on the inside of the housing lens.

IMPORTANT: Do not obstruct O-ring or sealing area with Moisture Muncher or housing will flood.

Insert Inner Camera and close housing pressing lid with both hands tight

Insert the inner **film** camera with the **power on** and lens open (power switch below the lens). Make sure the Moisture Muncher or any other matter does not interfere with closing the housing. Insert the digital inner camera with power off.

Film Cameras

Hold the latch down deep inside the strike while closing. Do not use force.

Digital Cameras

Press the lid tight with both hands before closing latch.

Power save function:
The power will turn off automatically, when the camera is not used within about 2 to 3 minutes and will turn on again by a light touch on the shutter release.

Power-off function:
Digital cameras will also turn the systems power off in Sea Modes if not used for 15 minutes. Use the power button to turn the power back on.

Take a test picture. If **film** does not advance or FLASH READY light does not turn on, see section VII, Trouble Shooting Guide. If the digital monitor or top-side LCD do not turn on, check immediately, if the batteries have been inserted correctly. Remember, NiMH Batteries need to be freshly and fully charged.

Taking Pictures

Just push the trigger or the shutter button of the camera. Everything is automatic.

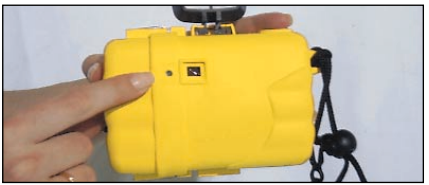
Film Cameras

Digital Cameras

Checking the Battery Condition

Film Cameras

1. If FLASH READY takes longer than 15 seconds to turn on after taking a picture, your batteries are not in good condition and should be replaced. Always take extra batteries along.



2 Alkaline AA batteries normally last for about 8 rolls of film.

Digital Cameras

3. If the battery status bar in the top LCD shows one bar, the batteries should be recharged. Battery life is shortened if the monitor is used frequently.

2 fully and freshly charged SeaLife NiMH batteries last about a day in land mode with monitor mostly off or for two dives.

Taking Pictures Underwater

Depth: All ReefMaster film models are tested to 164 ft./ 50 m. The SportDiver film camera and the digital model DC 100ft./ 36 m, the digital DC200, DC250, DC300, DC310 to 200 ft./ 60 m.

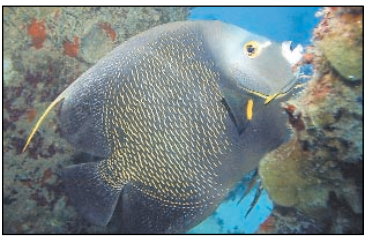
Approach your subject slowly. It's best to remain motionless. Wait for fish to become confident and swim into a good position, best against the current. Aiming of film cameras should be done only through the sports finder, holding it directly to your mask or learn to aim with stretched out arms. The ring in the center must appear as a circle, not as an oval. The optical viewfinder (looking through the camera housing) is intended only for a rough check on your framing. Digital cameras can be aimed using the monitor, which shows you the exact picture as seen through the lens.

Press the shutter release swiftly and completely down, not in a slow motion, holding the camera firm and steady. Let the trigger come up swiftly as well, don't keep it down. Never force the shutter release beyond its normal stop position. Protect it well from pressure by other gear in your dive bag.

Digital pictures can be deleted by pushing the shutter button again within 3 seconds.

Film Cameras

Digital Cameras



Distance Without Close-Up Lens:

The **distance of film cameras to the object should never be less than 4 ft. / 1.2 m, ideally 5 ft. to 6 ft. / 1.5 to 1.80 m**. Digital cameras can be taken as close as 2 ft / 60 cm. Longer distances are only successful in extremely clear water and to background objects.

Minimum distance without close-up lens.

The general rule is: **Water visibility (horizontally) should be 10 times the shooting distance.**

The built-in flash is designed for foreground illumination and richer colors at distances up to 5 ft. / 1.20 m. The orange "Coral Flash" of the ReefMaster RC will help to avoid the U/W blue effect of near-by objects. Always wait until the green FLASH READY light on the back of the camera turns on before taking a picture (about 10 sec).

Tip: Measure your closest distance "Chin to Fin" on land. Once you have determined a length of 5 ft. / 1.5 m, stretch out your legs under water and test your distance judgment.

You will soon learn that distances underwater appear 1/3 closer than they actually are. The ideal distance is 5 ft/1.20m… "from chin to fin" without macro or wide angle lens.

Distance Range for SeaLife Cameras

LENS	UNDERWATER				ON LAND			
	DIGITAL*		FILM		DIGITAL*		FILM	
	inches	cm	inches	cm	inches	cm	inches	cm
Standard	24 - ∞	60 - ∞	48 - ∞	120 - ∞	14 - ∞	60 - ∞	48 - ∞	120 - ∞
Macro 3x	12-36	30-90	24-48	60-120	6-10	15-25	10-14	25-36
Macro 8x	10-13	25-33	14-16	36-41	3.5-5	9-13	4-5	10-13
Macro 16x	7-10	18-25	8-9	20-23	2-3	5-7	2-3	5-8
Wide Angle 20mm	12 - ∞	30 - ∞	24 - ∞	60 - ∞	24 - ∞	60 - ∞	n/a	n/a

** For updates on distance range for newer digital cameras, see www.sealife-cameras.com*

The correct distances are easy to remember.

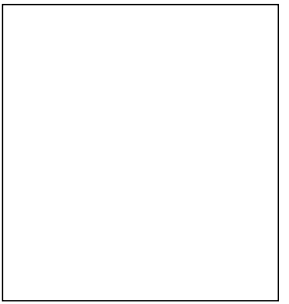
- Stretch out your fin: “from chin to fin” is the distance with a standard lens.
- Stretch out your arm as far as you can reach. This is the distance for the 3x Macro lens.
- The 8x and 16x Macro lens come with the practical Macro Wand, which gives you an exact distance. The SeaLife Wide Angle lens expands the picture frame by 50%.

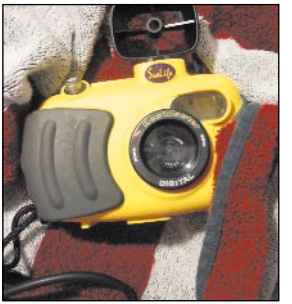
Macro lens on

Macro lens off

Cleaning: All Models

After leaving the water, **the sealed camera housing should be washed thoroughly in fresh water. Never let salt water dry on the camera or the housing.** Dry with a clean towel. Salt crystals will damage the O-ring and lens and attract humidity. **Never let water drops dry on any lens.** Wipe it dry with a soft lens cleaning tissue.





Before opening the camera, everything, including your hands, body, head and surroundings must be **totally dry**. Have a dry towel handy. If possible, prepare the camera in a **dry or air conditioned room** to prevent humidity from being trapped in the camera, which could lead to fogging, corrosion or draining of the batteries.

Re-winding the Film: Film Cameras

With power on, slide the small switch at the bottom of the inner camera.

When the film is completely rewound and winder has stopped, open the back cover and put your film in a marked dry container and store it cool. *When taking your film to the lab, remember to request sample prints, called index print. (See page 21, letter F.)*

Dry Storage

For long term storage remove the batteries from the camera. Leaking batteries can ruin your camera. Store the camera with the latches not tightened inside an air tight **SeaLife Dry Case** with one large 1 oz. bag of Moisture Muncher. (See list on page 53).

For storage of additional parts you can cut openings in the foam with a sharp knife. If you buy the case as an optional accessory, pick & pluck foam lets you customize it. The large knob below the handle is a pressure equalizing valve. Turn this open after being in an airplane or at high altitude.

The SeaLife Dry Box has enough space for optional accessories, close-up lens, extra film, batteries, and perhaps even your spare parts. (See Spare Parts list on page 49.)

Rechargeable NiMH batteries can lose up to 10% of power per day at room temperature. They should be stored refrigerated, but best is to re-charge them over night.

Pictures on Land in dry Conditions

On land, in dry conditions you will enjoy the compact and light weight SeaLife camera without housing.

Keep the lens cover of film cameras closed and keep the digital camera on land always in its soft case so the lens stays clean.

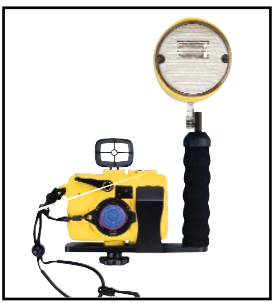
Film selection: On land or in shallow water, in bright light, you may also use ISO 100 film (instead of ISO 200). **Slides:** ISO 200 slide film can be used for diving, but in bright snorkel or beach conditions ISO 100 or 64 should be used.

Using the Flash

The built-in flash in **film cameras** is automatic on land and always on underwater. The ReefMaster RC allows manual over-ride for a fill flash to avoid dark shadows or to supress the flash. This is done by holding the slide switch as shown.

The built-in flash in **digital cameras** is automatic in the Sea and Land mode and always on in the external flash mode. On land the flash can be set also to red-eye reduction, on or off, by pushing the flash mode button. This is also possible in the Sea mode.

Truly colorful pictures require the **SeaLife External Flash**, particularly deeper than 30 ft./10 m. The External Flash reduces backscatter, if the flash head is moved far away from the lens. Two flashes reduce shadows and are used in most professional photography. **The External Flash mode of digital camera models** also allows a shorter exposure time resulting in sharper pictures. The camera takes about 2 seconds to process the image and displays it on the monitor. This makes it easy to review and delete the image and change the flash angle, to use a different flash diffuser setting, or to change the distance in another shot.



Film camera, ReefMaster Pro Set, with external flash and Macro 3x lens/filter.

Digital Camera, DC200 with one external flash and macro lens

Pictures on Boats and Beaches

SeaLife cameras should always be used in their waterproof housing when taking pictures in any humid, sandy, or hazardous environments. The tough housing is not only a good protection against moisture but also against sand as well as shocks and bumps on adventurous trips.

Catch, click and release

Sport fishermen can rely on their SeaLife Camera to capture the image of that trophy fish before it's released.

VI. Accessories and Related Products

Spare Parts: Most important spare parts and item numbers.

	FILM			DIGITAL
	ReefMaster RC	**ReefMaster CL**	**Sport Diver**	
inner camera	SL201	SL52001	SL54501	**Check with your dealer or visit www.sealife-cameras.com**
housing	SL210	SL2101	SL210A	
lid o-ring	SL214*			
body o-ring	not used			
o-ring cement	SL915*			
sports finder	SL22118			
Hard Case/Pick & Pluck Foam Insert	SL930			

Many SeaLife dealers carry spare parts. Ask your local dive, photo or sporting goods store. If you purchased your ReefMaster in the United States, you can also order replacement or spare parts from:Optic Options: orders only: (800) 872-0273 / information only: (765) 538-3484.

Accessories (continued)

SeaLife Soft Padded Camera Cases
Designed to hold all SeaLife Cameras and extra film.

Soft Case for UW Camera
Item SL945

Soft Case for UW Camera and External Flash
Item SL946

Soft Case for UW Camera and 2 External Flash Units and Macro Set
Item SL947

SeaLife Dive Travel & Accessory Case
Unbreakable airtight case with “pick & pluck” foam and air release valve for camera.

Item SL930

SeaLife MACRO and Wide Angle Lenses / U/W Filters for best close-up pictures

For distance ranges of each lenses see table on page 36.

Macro 3x - Item SL951
2-4ft/60-120 cm Item

Macro Wand

8x and 16x Filters

Wideangle Lens:
increases frame by 50 %, distance 2 ft/60 cm -infinity

Item SL970

Macro Set - Item SL959
includes all above 3 items.
Macro 8x: 14-16"/36-41 cm (Macro Set)
Macro 16x: 8-9"/20-23 cm (Macro Set)
Macro Wand: Distancing tool for 8x/ 16x retracts and extends, folds sideways when not in use, and attaches to the flash mounting bracket.

Accessories (continued)

External flash - Item SL960

External flash adds color and brightness to your pictures. It also helps reduce backscatter.

Two external flashes can be mounted for maximum brightness, color and to eliminate shadows.

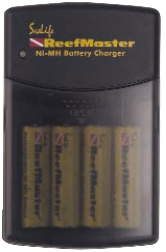
Care and Maintenance Items

SeaLife/Moisture Muncher Anti-Fog Desiccant

Large - Item M101
Use inside closed hard cases. Can be re-generated in oven at lowest heat. (3 1-ounce packs)

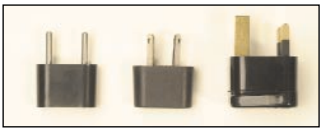
Capsules - Item SL911
10 - 1.5 gram capsules
SeaLife desiccant capsules for digital and film camera models.

Special Digital Accessories



4 Rechargeable Ni-MH Batteries, Size AA (Nickel Metal Hydride, 2100 mAh)
SL191

NiMH Battery Charger
SL190



3 Foreign Plug Adapters
(included with SL190)

AC/DC/Transformer Power Cable
SL10132*-DC100/200
SL13132-DC250/ DC300/DC310

PC-USB Cable
SL10130-DC200
SL13130-DC250, DC300, DC310

TV/Video Cable
SL10131
Fits all Digital Cameras.

Note: included only with the SL121, ReefMaster DC200 Digital Camera

SeaLife Film Camera Models

ReefMaster U/W Photo Set
ReefMaster RC with MACRO 3X Close-Up Lens and Dive Travel Hard Case
Item SL511

ReefMaster RC Pro Set
ReefMaster RC with External Flash, MACRO 3X Close-Up Lens and soft carry case.
Item SL560

SeaLife SportDiver -
Clear Lexan housing, f 5.6/1/125 sec, depth tested to 100 ft/36m.
Item SL545

ReefMaster CL
Compact, clear Lexan® housing fits in BC pocket. 5.6, 1/125 second,. depth tested to 165 ft/50m
Item SL520

VII. Trouble Shooting Guide:

Important: This section must be read before taking any action.

Film Cameras: Problem: Film jams or does not advance. *Reason: Most film advance problem are caused by improper film loading.* Solutions: Follow proper film loading instructions on page 19 and 28. If film is jammed (will not advance), hit rewind switch on camera, load film again and advance to the frame where it got jammed. If film will not rewind, have a photo shop with a black room remove film for you.

•**All Cameras:** Inspect camera batteries for sufficient power. Replace if necessary. Use only high capacity NiMH batteries for digital cameras (1800 mAh or more) that have been fully charged the morning you go diving. Use Alkaline batteries for film cameras and flash.

Problem: Pictures are not satisfactory: *Reasons: Poor water visibility* caused by microorganisms (algae) or stirred up sand or sediments. *Improper shooting distance.* Solutions: Keep the proper shooting distance, see chart on page 36.

Problem: Blue pictures. *Reasons: Too far, not enough light.* Solutions: Use macro lens, and/or external flash. Tell lab that you have underwater pictures and that they should make color corrections (Increase red and yellow). With digital pictures you can try to balance the color on your PC. However, it is not possible to increase red and yellow objects, if the picture does not contain any red and yellow at all to begin with.

Problem: Overflashing. *Reason: Close white, reflective objects (fish, rocks, skin, etc).* Solution: Aim camera better and be aware of distance of objects.

Problem: Picture too dark. *Reasons: Flash did not fire. Dark light and distance too far for flash.* Solutions: Always wait for flash ready light to turn on before taking pictures.

Problem: Pictures not sharp. *Reason: Quick, jerky movements while swimming or chasing fish.* Solutions: Control your buoyancy, stay calm and keep camera still when shooting. *Other reasons: Lenses not clean or fogged.* Solutions: Always keep camera and housing lenses clean. Finger prints and dirty lenses will result in unclear pictures. It's a good practice to inspect the glass port for fogging while underwater.

Problem: Housing fogs-up while underwater. *Reasons: One drop of water trapped inside the housing can cause the lens to fog.* Setting up the camera and sealing the housing in a hot, humid area can cause fogging, when the camera cools down in colder water. Solutions: Inner camera or inside housing must be perfectly dry. Use SeaLife Anti Fog Desiccant (page 30), set-up camera in an air-conditioned room, and rub a drop of antifog lotion on the inside of the port lens. If you still experience fogging you may have a leak.

Problem: Housing leaks water. *Reason: O-ring does not seal properly.* Solutions:

1) Hold the camera steady so that small amounts of water can stay in a corner of the housing and surface safely and slowly, handing the camera slowly to a person on the boat who must keep the camera in the same position. Remove the inner camera slowly. and, dry off camera as quickly as possible.
2) Remove batteries immediately. Never operate a camera that has been flooded or is wet. You can get a shock and cause more damages.
3) Inspect main O-ring and sealing area for damage or debris (sand, hair, etc.). If O-ring shows damage or imperfection, have it replaced by an authorized Sealife service center.
4) Make sure glass port is not split or cracked. Inspect for other obvious damages that may cause a leak in the housing (Cracks, tears, punctures, etc.)
5) Make sure the Moisture Muncher capsule is not interfering with the O-ring or sealing

may cause a leak in the housing (Cracks, tears, punctures, etc.)

5) Make sure the Moisture Muncher capsule is not interfering with the O-ring or sealing area. Follow instructions on page 30.

6) Inspect closing latches for damage and proper tension. If damaged or bent, have latches replaced by authorized Sealife service center. A waterproof test can be performed at most scuba dive stores. A simple home test can be made by submerging the housing without inner camera in water overnight. Place 2 lb./1kg soft weight wrapped in a paper napkin in housing. Carefully dry and open housing not to drip water inside and inspect towel for water spots indicating a leak.

Problem: Glare or reflection appears in picture *Reason: Improperly attached macro lens.* Solutions: The close-up lens must be completely pushed on the housing and sit flat. Make sure your hand does not push on the macro lens or pull on the safety lanyard of the lens. Or have a new docking port ring attached to your camera at a SeaLife service center.

Problem: Flash does not fire. *Reason: Flash-ready light was not on.* Or: External flash head sensor was not directed towards camera. Solution: Wait for flash ready light to turn on before shooting picture. Test and replace batteries if necessary. The default flash mode in the Sea mode of digital cameras is automatic: flash will not fire in bright light, possibly even if your main subject is too dark. Taking another shot at a different angle with more dark background will cause the flash to fire. The same applies to film cameras on land. Make sure the flash sensor of the external flash is directed towards the camera, since the primary flash of the camera triggers all secondary flashes.

Special Problems with Digital Cameras (First check under "All Cameras" section).

Problem: No power. Camera shuts down immediately after you turn the power on. *Reason: Batteries are empty.* Solutions: Use only NiMH batteries with a capacity of 1800 mAh or more, we recommend SeaLife Batteries. Batteries must be freshly and fully charged on the day that you take pictures. Do not mix different batteries in the camera or in the charger. Charging takes about 2 1/2 hours, but you might leave the batteries in the charger overnight. Avoid using the monitor on land, it consumes most of the power. Avoid reviewing your pictures while taking pictures. Full batteries have a charge of 1.39 to 1.42 V, empty batteries less than 1.22V.

Problem: Message "No memory". *Reason: Either the capacity of your built-in memory or flash card is used up, or your flash card is defective.* Solutions: First download and save important pictures to your computer. Then you might try to reformat the flash card, which deletes all pictures or delete pictures from the built-in memory. If problem persists, use a different flash card. Use a SeaLife flash card or another reputable brand. See the website www.sealife-cameras.com for tested and recommended flash cards.

Problem: Pictures have disappeared on the flash card. See above solution.

Problem: Message "Removable Disk F:" does not show up on "My Computer" when downloading. *Reason: Either the cable connection has not been done correctly or you just have to wait longer (up to 4 minutes on some computers).* Solution: Follow the sequence: Computer on, camera on, set camera on PC, connect cable to camera, then to computer.

Problem: Pictures don't appear on TV. *Reasons: Wrong connection, wrong TV system setting, TV not on video channel, camera power not on.* Solutions: Plug video cable into

“Video in” of your TV set. Set the camera to NTSC system when in America or to PAL when in Europe. Set your TV to video.

Problem: e-mailed pictures do not arrive. *Reason: The file size of your pictures may have exceeded the capicity or the recipient’s mail box at his server.* Solution: Send less pictures or compress the files more on your computer or take pictures with a lower resolution or higher compression.

Problem: Pictures are not sharp. *Reason: Camera in macro mode. Wrong shooting distance. Light conditions too dark. Camera was moved during picture taking, particularly underwater in Sea mode, or in dark condions in Land mode.* Solutions: Check the setting of the ring around the lens for macro or regular distance. In dark conditions on land try to take pictures with and without flash. Hold the camera still while pushing the shutter release. Always take several shots of the same subject, then keep the best one. This way you quickly learn what works best in certain light conditions.

Problem: Print quality not good. *Reason: Wrong paper, printer set to draft quality. Image not taken with highest quality and highest resolution. The original picture may not be sharp or lack contrast.* Solutions: Use only the best high gloss photo paper, there are huge differences. Set printer to highest quality and to the correct paper type. You may enlarge an original sharp uncropped picture up to 8 x 10 inches/in A4. Select only your best pictures taken in good light conditons with perfect water visibility and strong contrasts for enlargements. Particularly dark pictures often appear grainy and do not print well.

Problem: Picture too dark. *Reason: Flash reaches underwater only 4 to 6 feet, depending on visibility and available light. Flash did not fire.* Solution: External flash. Get closer. (Macro).

Problem: Pictures too bright, parts in picture white and washed out. *Reason: Overflashing.* Solution: Do not aim your flash at close-by bright objects. The camera will seek the correct average exposure for all dark and bright objects. Priority will be given to the center of the picture. Solution: Take several pictures aiming the camera in different directions.

Problem: Lens is fogging up. *Reason: Either a leak (see below) or high humidity in the camera housing, heat generated by batteries, and cold water at the glass lens causes condensation.* Solutions: Always load camera in dry, air-conditoned air. Apply anti-fog lotion on inside of port lens. Keep camera power off as much as possible so camera stays cool.Use SeaLife anti-fog desiccant/Moisture Muncher.

Problem: Water appears in housing, usually first indicated by fogging of lens. *Reason: Housing not properly sealed: Sand or dirt on O-ring. O-ring has been taken out and not correctly inserted. Lid not tightened while closing or warped/shifted during closing. Unusual force, such as twisting force applied to housing, for example pressing external flash to one side while holding and forcing camera to the other side may let a few drops of water enter. Damaged O-ring from an object being squeezed between O-ring and body or lid while closing, for example the camera strap. Damages can occur by attempts to remove the O-ring with a sharp object.* Solutions: First hold housing lens down and steady, so water level stays low. Surface safely and have someone take the camera on the dive boat holding it the same way. Open housing, remove inner camera and remove batteries. Do not touch the batteries. Do not use camera anymore, send to SeaLife service. Do not operate a camera that has been submersed or is wet. If the camera has not been immersed in water, and only a few water drops have caused fogging, you must wash the housing, dry camera and housing well. See **All Cameras.**

VIII. Service and Warranty:

After going through the Trouble Shooting Guide, if you cannot find a solution for a problem:
Call an underwater photography expert at Pioneer Research or send the housing with the camera to an authorized SeaLife service facility or directly to manufacturer. Include: US $10.00 for handling and domestic shipping; your day time phone number and return address (No PO BOX); a clear written description of problem. Ship prepaid to:

Pioneer Research, 97 Foster Road, Suite 5, Moorestown, NJ 08057 USA
Phone: (856)-866-9192 • Fax: (856)-866-8615.

Register your warranty online at www.sealife-cameras.com
E-mail: service@pioneer-research.com
Or contact the SeaLife distributor in your country.

Limited Warranty.

This product will be replaced or repaired free of charge within 1 year from the purchase date in the case of a manufacturing defect, if the complete defective product is sent freight prepaid at the sender's risk with prepayment for handling and shipping of US $10.00 to: Pioneer Research, 97 Foster Road, Suite 5, Moorestown, NJ 08057, or to the importer in a different country. The shipment must include an original purchase receipt or proof of purchase with the purchase date. Excluded are any consequential damages, cosmetic damages, damages to products which show abuse, non-conformance with the instructions, particularly water damage due to a damaged O-ring or removed O-ring or any particles wedged between the housing and the O-ring, or tampering and attempted repair of the product. Excluded are any software damages, damages caused by SeaLife software or products and damages to other peripheral products. Excluded are scratches on lenses or damaged lens coatings. Cameras used in rental operations are excluded from this warranty and have a special service support program *(Contact SeaLife / Pioneer Research).*

SeaLife®

ReefMaster® Accessories:

External Flash (SL960)
for more colorful pictures.

Macro Set with 8x and 16x lenses.
(SL959) for close-up pictures.

Wide angle lens increases
field of view by 50% (SL970).

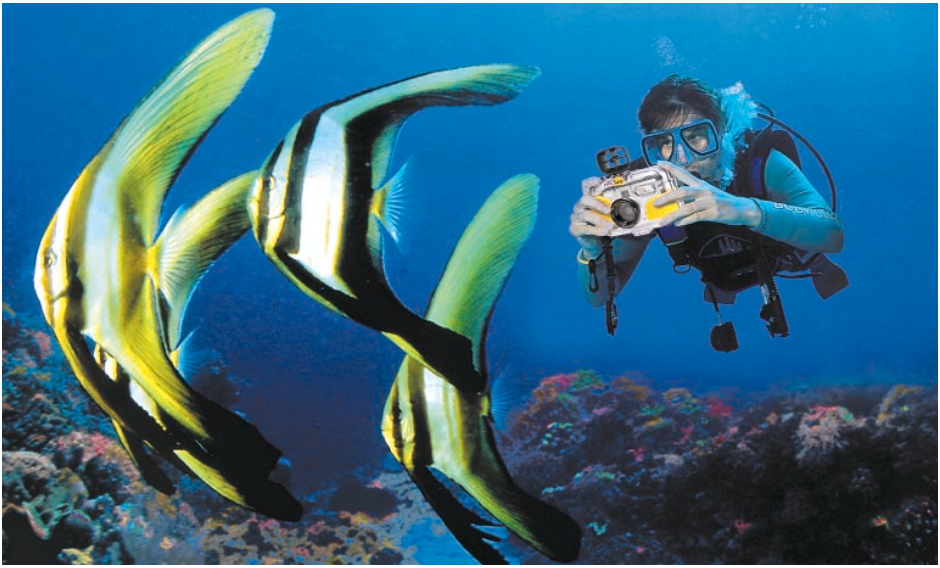
Moisture Muncher desiccant
to prevent fogging (SL911).

Flash diffuser (SL968) prevents
over exposing close-up pictures
within 2-1/2' of shooting distance.

Hard and soft carry cases.
4 sizes available.

For more information please visit the Sealife website at:

www.sealife-cameras.com



Pioneer Research, 97 Foster Rd, Moorestown NJ 08057